PERKIN-ELMER

32 BIT SYSTEM EXERCISER

Consists of:

Program Description	06-159M95R09A15
Program Listing	06-159M91R09A13
Card Reader Test Data	06-159M44R02

06-159R09

32 BIT SYSTEM EXERCISER
TEST PROGRAM DESCRIPTION

1   32 BIT SYSTEM EXERCISER

RELATED DOCUMENTS

Program Listing   06-159M91R09

OTHER RELATED ITEMS

32 Bit System Exerciser HSPTR Test Tape   06-159M14R02
                                              or 06-136F01M14
32 Bit System   Exerciser   Card Reader   06-159M44R02
   Test Deck   or 06-038M03R04

2   PURPOSE OF TEST

This program tests a complete 32 bit system with CPU, memory, I/O
devices, selector channels, and other options running simultan-
eously. It detects failures caused by interaction between dif-
ferent elements of the system.

3   HARDWARE REQUIREMENTS

The minimum hardware that is required to run this program is:

Processor   - 32 bit processor, Models 7/32, 8/32, 3220,
                         or 3240.
Memory   - 64kb.
Console device   - A console TTY device or CRT that is on a
                         local current loop, PASLA, or PALM interface.
Program load device

The following is a list of devices that can be tested with this
program:

Optional multiplexor bus devices:

- display panel - M71-101 or M71-102

- universal clock module - M48-000

- paper tape reader or reader/punch - M46-250 interface

- card reader - M46-235 interface

- two line printers - M46-202 or 206 interface

- floppy disc system - M46-630 to 641
  (four drives may be tested simultaneously)

- universal logic interface M48-013

- eight-line interrupt module M48-001

Optional selector channel devices, configured in any combination on a maximum of four M73-105 selector channels:

- 9 track or 7 track, 800 or 1600 bpi magnetic tape transports - M46-470 or 475 controller (four drives on any combination of controllers may be tested simultaneously).

- 2.5 or 10 Mb removable cartridge disc system - M46-420 or 421 controller (four drives on any combination of controllers may be tested simultaneously).

- 40 Mb removable cartridge disc system - M46-429 or 430
  (four drives on any combination of controllers may be tested simultaneously).

- 67 or 300 Mb removable cartridge disc system - M46-600 and 604, respectively (four drives on any combination of controllers may be tested simultaneously).

- SELCH tester

Optional memory access multiplexor (MAM) devices:

A maximum of eight devices of one of the following types can be configured with the M47-010 MAM:

- QSA in BISYNC mode

- DSA in BISYNC mode

- PASLA in BISYNC mode

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Optional extended memory access multiplexor (EMAM) devices

A maximum of eight devices of the following types can be con-
figured with the M47-012 EMAM:

- QSA in ZBID mode

- Any one of the types listed under the optional MAM device
  section

See Appendix B, paragraph 4 for information on these communica-
tion devices.

4   REQUIREMENTS OF MACHINE UNDER TEST

The program assumes that the console device for the system is a
PASLA type device. If a current loop device is used, the memory
locations that define the console type "A10" and console address
"A12", must be altered accordingly.

	Memory	TTY	PASLA
Console type	A10	0000	0101
Console address	A12	0002	0010

This program assumes that the CPU, memory, and each peripheral
device were individually checked using the appropriate test
program.

A card reader test deck must be used to check the card reader
(06-159M44R02). See Appendix D for a description of the test
deck.

If no high-speed, paper-tape punch is present on the system, a
test paper tape (06-159M14R02) must be provided if the HSPTR is
to be tested.

A counter is incremented every time a device is sequentially
serviced (polled) but awaiting interrupt action. This count is
compared with a maximum count; if found to be equal, a time-out
error indicates that an interrupt may have been lost. This
count is reset every time an interrupt is serviced from that
device.

The maximum count is large enough so a device being tested by
itself will not time out if it is operating correctly. The max-
imum count is stored in the device definition block for the par-
ticular device at memory location DDB+10. See Section 7.

5   LOADING PROCEDURES

This program is only available on multimedia packages. Follow
instructions given in 06-176 or 06-225.

After the program is loaded, if the console device is not con-
nected to a Teletype interface with address X'02', then the
console definition table at location X'A0C' must be modified
to indicate the actual configuration. See Section 4.

The exerciser is normally started at location X'A00'. The pro-
gram initializes itself and outputs the following message to the
console:

           32 BIT SYSTEM EXERCISER 06-159 R09

The exerciser can be restarted at X'A04', bypassing some ini-
tialization and preserving the device definition blocks (DDB)
of previously selected devices.

When the exerciser is started at X'A00', it clears memory start-
ing from the address stored in the fullword at "MEMSTART". If
other programs are to be loaded at the same time as the exer-
ciser, MEMSTART should be modified so that these other programs
are not lost.

6   OPERATING PROCEDURES

The 32 Bit System Exerciser program consists of two major
tasks: the command processor and the device dispatcher. The
command processor communicates with the operator to build the
tables and data structures the device dispatcher uses.

The command processor is entered when the program is initially
started at location X'A00' or restarted at location X'A04'. The
command processor is also entered either normally or abnormally
whenever the device dispatcher terminates. When the command
processor types an asterisk, a command may be entered. See
Appendix A for command syntax. The RUN command causes the com-
mand processor to pass control to the device dispatcher.

The device dispatcher repeatedly searches the device service
table in an attempt to keep all devices busy. The device dis-
patcher is terminated and control returned to the command pro-
cessor in one of five ways:

          1.   depressing break key on the console

          2.   machine malfunction interrupt

3. error occurs, and HLT option selected

4. error queue overflows

5. unrecoverable error (Appendix E) occurs

6.1 NORMAL TESTING

All devices to be tested are placed on the device service table using the device selection commands listed in Appendix B.

Program options and pseudo devices (e.g. halt on error, floating point testing) should be selected as desired using program control commands (Appendix C).

Verify proper device selection and parameter values using the DST command; also verify the options and their values using the OPT command.

At start up and restart it is suggested that the system be initialized, particularly if communication devices (Appendix B, paragraph 5) are to be tested.

Enter RUN command to begin testing. All testing is done under interrupt control. The following background tests are executed once for each pass through the device service table:

1. illegal instruction interrupt test

2. protect mode interrupt test

3. simulate interrupt test

4. SVC interrupt test

5. fixed-point arithmetic test

6. floating-point test (if option FLT selected)

7. double-precision, floating-point test (if option DFT selected)

8. load multiple, store multiple test

9. double index test

10. memory access controller test (if option MAC selected) or memory address translator test (if option MAT selected).

Tests 1 through 10 can be deleted using the BCK% command. The display panel and/or video display unit console device is used to indicate testing on those devices that cannot be visually observed. See Appendix F for the meaning of each display bit or console character.

Press the break key on the console to terminate testing. Returning to the command mode from the test mode does not reset the option values.

Devices can be added to or deleted from the device service table at this time.

6.2 OPTIONAL TESTING

The polling of all devices while awaiting their interrupts is accomplished with the PSW enabling the following interrupts:

- immediate (PSW bit 17)

- machine malfunction (PSW bit 18)

- arithmetic fault (PSW bit 19)

- 8/32 or 3200 higher priority (PSW bit 20)

- relocation/protection if selected (PSW bit 21)

If you want to change this PSW, location DSPCHER can be changed to disable machine malfunction and/or arithmetic fault interrupts. If arithmetic fault is disabled, errors will be generated unless background testing is disabled by the BCK% command. Immediate interrupts must always be enabled. The MAC or MAT command controls the relocation/protection bit.

During testing, whenever error messages are not being printed, if the console is a video display unit on a PASLA type interface, an activity buffer is displayed. See Appendix F.

When the exerciser is started at X'A00', it builds a map of available memory. The map is 32 fullwords long where each bit represents 16kb. The MAP command prints the memory map to verify that the exerciser correctly located the memory present on the system. If the map is different than expected, one or more memory modules are malfunctioning or strapped incorrectly.

EXAMPLE:

*MAP

```
F8E00000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
*
```

Eight bits turned on indicate total memory of 8 by 16k = 128kb.
Bits 5, 6, and 7 are off, indicating a hole of size 3 by 16k =
48kb with low address of 5 by 16k = X'1400'.

6.3 ERROR PROCEDURES

When the program detects an error during testing, the following
occurs:

- The error counter in the offending device's DDB is incremented.

- If the LOG switch equals 1 and the BAD STATUS bit in the de-
  vice's DDB equals 0, an error message is placed on the error
  queue.

- BAD STATUS and NOT COUNTING bits in the device's DDB are set.

- If the error queue is full, testing is aborted.

- If the HLT switch equals 1, testing is aborted.

- If testing has not been aborted, testing resumes where the
  error routine was called. Testing may then be aborted if the
  error is considered unrecoverable.

Whenever testing is aborted, the error queue is printed, and
control is given to the command processor.

When a machine malfunction interrupt is detected, an error mes-
sage is stored in the system error queue (Appendix E) and the
processor is placed in the wait state. When RUN (on the display
panel) is depressed, the error is printed on the console device
and the program returns to the command processor.

An unformatted cartridge usually causes the SELCH write address
failure (error 41) on the disc. The status given for a SELCH
read or write address failure (errors 40, 41, 42, and 43) is the
SELCH status, not the device status.

A MAC or MAT malfunction (error 16) indicates a write into a write protected segment or a failure to write into a write/interrupt protected segment. Look in the listing at the address given to determine the type of failure.

An unexpected illegal instruction (error 04) at location '000Fxxxx' when MAC testing is enabled indicates an instruction was executed from an execute protected segment. The expected relocation/protection interrupt did not occur.

If disc testing is running and testing is then terminated, a disc controller interrupt may remain queued. When testing is started again by the RUN command, the controller interrupts, producing an unexpected interrupt (error 32). Re-enter the RUN command and testing will proceed normally. The extra interrupt can be avoided by initializing the processor and restarting at X'A04'. Also, the processor should be initialized if communication devices are to be tested.

An error of 80 for the communication devices, particularly the receiver, signifies an improper reason code generated by the MAM (or EMAM). This error can occur due to an excessive amount of time spent in servicing interrupts from these devices, particularly at the end of transmission sequence. To alleviate this problem, the option CCNT (Appendix C) may be set to "0" or a very large number which keeps these active but minimizes the number of times the device terminates transmission; or the option FSTC may be set to "1" which eliminates the testing and clearing of the receiver buffer which is done during the servicing of the receiver interrupt.

In order to display system activity on the PASLA console, the terminal should be a video display unit and should not have Auto-Line feed enabled. If so, the activity display will constantly be scrolled off the screen.

7 PROGRAMMING NOTES

7.1 PERIPHERAL DRIVERS

Each peripheral driver in the system exerciser is composed of many phases. These phases are independent software elements that represent a logical operation (under interrupt control) between the processor and the peripheral device under test. Separate phases check the status of the device, start an I/O operation, and handle interrupts that may result. They also check selector channel data transfer termination addresses; and, where possible, they make transferred data base comparisons.

When an error (i.e., bad status, wrong selector channel termination, data base did not compare) is encountered, the ERRENQ routine is called to log the error and the next logical phase is not entered. In some drivers (i.e., disc, magnetic tape, cassette), an attempt to restart the entire driver is made. But in any case, the peripheral driver is not permitted to continue until the trouble is cleared (i.e., hopper empty on the card reader driver). A software switch is set (bad status bit in the device definition block) to discontinue reporting the same error over again. If the program logic senses the trouble has cleared, this switch is reset and the peripheral driver continues data manipulation under interrupt control.

7.2 COMMUNICATION DEVICES

Data is transferred between the transmitter and receiver according to a particular sequence. The status of the device is determined by a reason code that forms part of the PIQ entry that a MAM (or EMAM) generates when a device completes the transmission or receiving of a data buffer.

For the QSA and DSA devices in the BISYNC mode, data is transmitted in one continuous message by linking buffers. When the data of a buffer is successively transmitted or received, the device generates a reason code of F. At the completion of the message, transmission is terminated, causing a reason code of 3 to be generated by the transmitter and a reason code of 7 to be generated by the receiver. Subsequently, the devices are restarted and transmission begins again.

The parameter CCNT (Appendix C) determines the times the buffers are to be linked.

The PASLA devices in the BISYNC mode operate similarly to the devices just described with the exception that a reason code of 6 can be generated by the transmitter and receiver at the start of transmission.

Reason Code Sequence

Transmitter	6	FFF...........F	3
Receiver	6	FFF...........F	7
	PASLA only	N times message	Termination
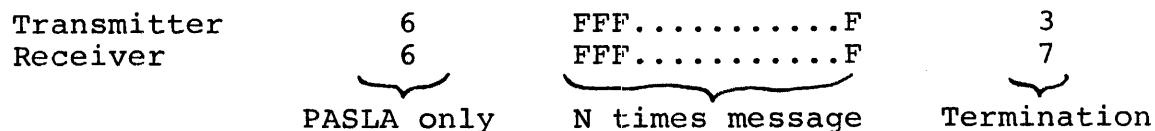
For the QSA devices in ZBID mode, data is transferred by transmitting one message frame consisting of one buffer, followed by a second message frame consisting of three buffers followed by an idle frame. After this sequence is repeated for the proper number of times, transmission is terminated and then restarted.

The sequence is repeated for the times the parameter CCNT speci-
fies. See Appendix C.

Reason Code Sequence

Transmitter	B	F	F	B	A	3
Receiver	E	F	F	E	C	7
	first frame	second frame		idle frame	termination
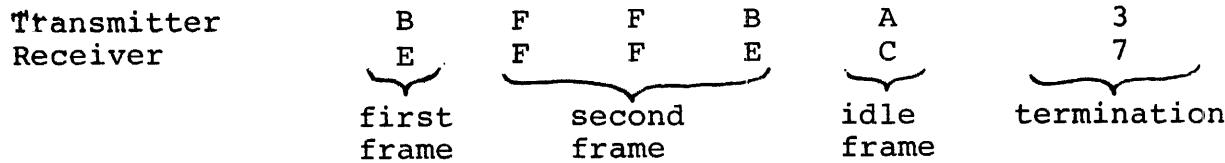
7.3 DEVICE DEFINITION BLOCK

When a device is selected through the command processor, the
address of a Device Definition Block (DDB) is placed on the
device service table. Each device has its own DDB and input
buffer. The DDB contains all information needed to service a
device. All device drivers are completely reentrant; they use
the DDB for any working storage which they might require. To
add support for an additional device of any type, only provide
a DDB and an input buffer. The address of the DDB should be
placed on one of the spare entries of the 'DEV2DDB' table.

All references to the DDB are symbolic offsets from the start
of the DDB. Refer to the structure at the beginning of the
listing for the basic DDB format. Not all of the fields are
appropriate to all devices. Only the appropriate fields need
to be provided. A description of the various flag fields follows:

Dispatching Flags

BIT	NAME	STATE	DESCRIPTION
0	Ignore	0	Performs action indicated by other flags
		1	Dispatcher should bypass this device
1	Busy	0	Available for dispatching
		1	If IGNORE = 0 indicates interrupt pending
2	Not Counting	0	Enables counting dispatcher or WAIT passes
		1	Disable counting; should be used with caution for long operations such as magnetic tape rewind
3	Bad Status	0	Sense status returned good status
		1	Error condition, cleared by driver. Set and tested by ERROR routine. 0 to 1 change causes error message print
4	Reserved		
5	Reserved		
6	Device Control 1		Meaningful only to driver; manipulated by parameter check sub-routines and drivers.
7	Device Control 2		See device control 1

DISPATCHING FLAG

INTERACTION AND

DEVICE STATUS

IGNORE	BUSY	NOT COUNTING	DISPATCHER ACTION	DEVICE STATUS	DISPATCH COUNTER	WAIT COUNTER
0	0	0	GO TO PHASE X	AVAILABLE	INCREMENT	CLEARED
0	0	1	GO TO PHASE X	UNKNOWN*	--	CLEARED
0	1	0	SELECT NEXT DEVICE	WAITING INTERRUPT	--	INCREMENT
0	1	1	SELECT NEXT DEVICE	WAITING INTERRUPT	--	--
1	0	X	SELECT NEXT DEVICE	UNKNOWN*	--	--
1	1	X	SELECT NEXT DEVICE	UNKNOWN*	--	--

*Cannot be determined from these flags; check driver phase and device status fields.

Priority

Register set used by interrupt handler. It must correspond to
interrupt request line used by hardware. An interrupt at the
wrong priority generates an error message and aborts all further
testing.

Phase

Driver routine that is currently active or next routine to be-
come active. It is used as index into phase table whenever
driver is entered, either by dispatcher or first level interrupt
handler.

Parameter Selection Flags

Command processor uses to fill in DDB.

BIT	PARAMETER SELECTED
0	Device address
1	Controller address
2	SELCH address
3	Priority (register set)
4	Max dispatch count
5	Cylinder address limits or logical record number limits for floppy disc
6	Head address limits
7	Sector address limits
8	Memory limits
9	Receiver address
10-15	Reserved

Device Type Flags

Define the type of device used throughout the program to perform operations unique to a particular device.

BIT	NAME	STATE	DESCRIPTION
0	SELCH	1	SELCH device
1	Memory	0	This DDB is not for memory test. It is a pseudo DDB for memory testing.
2	USESELCH	0	This device is not accessed on a SELCH.
		1	This device uses a SELCH.
3	Disc	1	Disc device
4	CCB1	0	Device does not use auto driver channel.
		1	CCB1 is appended to DDB.
5	DDB2	0	Either device uses only one DDB or device does not use auto driver channel.
		1	CCB2 is appended to DDB.
6	Floppy	1	Floppy device
7	MAM	1	MAM or EMAM device
8	QSA	1	QSA device (BISYNC mode)
9	QSA	1	QSA device (ZBID mode)
10	DSA	1	DSA device (BISYNC mode)
11	PASLA	1	PASLA device (BISYNC mode)
12	Receiver	1	Device is a receiver for the QSA, DSA, or PASLA
13	Reserved		
14,15	Buffers	00	Device has no buffer
		01	Device uses a buffer
		10	Device uses two buffers
		11	Illegal

MNEMONIC	TYPE FLAGS	NAME
--	8000	SELCH
CRD	0001	card reader
PTR	0002	paper-tape reader
PTP	0002	paper-tape punch
PTRP	0002	paper-tape reader/punch
LNP	0001	line printer
PIC	0001	precision interval clock
ACL	0000	A.C. line clock
MAG	2002	magnetic tape
DSC	3002	disc
MEM	4000	memory testing
--	0C02	console
MSM	3002	mass storage disc
FMD	0202	floppy disc
INT8	0000	8 line interrupt
ULI	0000	universal logic interface
SELT	2004	SELCH tester
MAM	0100	MAM or EMAM
QSN*	0080	QSA BISYNC
QZN*	0040	QSA ZBID
DSN*	0020	DSA BISYNC
PSN*	0010	PASLA BISYNC

*Where N is the device, pair number with a value 1 through 8.

APPENDIX A

CONSOLE COMMAND SYNTAX

When the command processor types an asterisk on the console,
a command can be entered. All commands are terminated by a
carriage return, except the open next cell command, that is a
line feed by itself. A hash or sharp symbol (#) deletes
the current command line, allowing the command to be reentered.

To select a device or turn a program option, type the command
mnemonic, one and only one space if parameters follow, optional
parameters separated by commas, and terminated by a carriage
return.   In the following examples, ⊔ indicates a required
space. All parameters are positional, separated by commas,
with no embedded blanks. All parameter values are hexadecimal.
Entering just a comma selects a default value for the missing
parameter. The parameter list may be. terminated at any time
by entering a carriage return. Default values are used for any
parameters not entered.

EXAMPLE:

*MAG1 ⊔ ,F1, 2   Ⓒ Ⓡ

Test magnetic tape unit one. Use default device address,
selector channel 'F1', priority 2, default maximum dispatch
count.

*PTR Ⓒ Ⓡ

Test paper tape reader. Use all default values.

*FLT Ⓒ Ⓡ

Turn on floating point optional test.

For parameters that require two values, the values are
separated by a hyphen.

e.g. CYLL-H

If only one value is specified without the hyphen, that value
is used for both fields (except for memory test limits,
which will default separately).

To remove a device from testing, or to turn off a program option,
type the command mnemonic followed by % and a carriage return.

EXAMPLE:

*LOG% (CR)

Delete error message printout.

*PTR% (CR)

Stop testing paper tape reader.

When selecting a device, if an error is detected, a diagnostic
is generated and the device is not placed on the device service
table. Selecting a device that has been previously selected
generates a warning message. The current (second) set of para-
meters then overrides the previous (first) set of parameters.
If an invalid parameter is detected in the overriding command,
a diagnostic is generated and the device is removed from the
device service table.

APPENDIX B

DEVICE SELECTION COMMAND SUMMARY

1 PARAMETER DEFINITIONS

ADR   device address
CADR   controller address
SELCH   selector channel address
PRI   priority

NOTE

For a 7/32 system, priority must be zero.
For an 8/32 or 3200 system, priority is
determined by hardware configuration and
must correspond to the register set used
with an interrupt.

DSPCH   number of times a device will be dispatched

NOTE

A value of zero for this parameter allows
the device to be dispatched indefinitely.
Otherwise, a device is dispatched for the
times specified and then terminated.
Most drivers require several dispatches
for each test cycle.

CYLL-H   cylinder low and high limits
HEADL-H   head low and high limits
SECTL-H   sector low and high limits
LRNL-H   logical record low and high limits
MEML-H   memory address low and high limits
XMIT   address of transmitter
RECV   address of receiver
FDADR   address of the first device on a MAM or EMAM
LDADR   address of the last device on a MAM or EMAM

All cylinders specified in the range CYLL-H are tested inclu-
sive, all heads in the range HEADL-H are tested inclusively for
each cylinder, and all sectors in the range SECTL-H are tested
inclusively for each selected head and cylinder. (A SEEK opera-
tion is performed prior to each read and write operation.)

DEVICE SELECTION COMMAND SUMMARY

2   DEVICE SELECTION (NONCOMMUNICATION)

Devices selected for test must be defined via the system console.
The definition consists of the device mnemonic followed by an
appropriate parameter field.

The following list contains a description of the device, the
device mnemonic and the parameters that apply to the particular
device. The list shows the default values of the parameter.
(Parameter values can be altered when defining a device for
test).

		MNEMONIC	ADR, PRI, DSPCH
1.	card reader	CRD	034,0,0
2.	paper tape	PTR	013,0,0
3.	paper tape	PTP	013,0,0
4.	paper tape	PTRR	013,0,0
5.	precision internal clock	PIC	06C,0,0
6.	AC line clock	ACL	06D,0,0
7.	line printer (two)	LNP1	062,0,0
8.		LNP2	062,0,0
9.	8 line interrupt	INT8	020,0,0
10.	universal logic interface	ULI	08B,0,0

		MNEMONIC	ADR,SELCH,PRI,DSPCH
11.	magnetic tape (four)	MAG1	085,0F0,0,0
12.		MAG2	085,0F0,0,0
13.		MAG3	085,0F0,0,0
14.		MAG4	085,0F0,0,0
15.	SELCH tester	SELT	0D0,0F0,0,0

		MNEMONIC	ADR,PRI,DSPCH,LRNL-H
16.	floppy disc (four)	FMD1	0C1,0,0,1-1
17.		FMD2	0C1,0,0,1-1
18.		FMD3	0C1,0,0,1-1
19.		FMD4	0C1,0,0,1-1

APPENDIX B (Continued)

DEVICE SELECTION COMMAND SUMMARY

		MNEMONIC	ADR,CADR,SELCH,PRI,DSPCH, CYLL-H, HEADL-H, SECTL-H
20.	2.5-10Mb disc	DSC1	0C6,0B6,0F0,0,0,0-0,0-0,0-0
21.		DSC2	0C6,0B6,0F0,0,0,0-0,0-0,0-0
22.		DSC3	0C6,0B6,0F0,0,0,0-0,0-0,0-0
23.		DSC4	0C6,0B6,0F0,0,0,0-0,0-0,0-0
24.	40Mb disc	DSCA	0FC,0FB,0F0,0,0,0-0,0-0,0-0
25.		DSCB	0FC,0FB,0F0,0,0,0-0,0-0,0-0
26.		DSCC	0FC,0FB,0F0,0,0,0-0,0-0,0-0
27.		DSCD	0FC,0FB,0F0,0,0,0-0,0-0,0-0
28.	16-300Mb disc	MSM1	0FC,0FB,0F0,0,0,0-0,0-0,0-0
29.		MSM2	0FC,0FB,0F0,0,0,0-0,0-0,0-0
30.		MSM3	0FC,0FB,0F0,0,0,0-0,0-0,0-0
31.		MSM4	0FC,0FB,0F0,0,0,0-0,0-0,0-0

		MNEMONIC	DSPCH,MEML-H
32.	memory	MEM	0, end-of-exerciser; top-of memory

		MNEMONIC	ADR
33.	memory access controller	MAC	300
34.	memory address translator	MAT	N.A.

3 DEVICE PARAMETER RANGE

Listed below is the range of values that can be used for certain parameters. The parameter values used in the device selection command are expressed in hexadecimal; the decimal equivalent is shown in parentheses.

DEVICE	CYLINDER L-H	HEAD L-H	SECTOR L-H
2.5Mb disc	0-CB (0-203)	0-1 (0-1)	0-17 (0-23)
10.0Mb disc	0-193 (0-403)	0-1 (0-1)	0-17 (0-23)
40.0Mb disc	0-195 (0-405)	0-13 (0-19)	0-13 (0-19)
16.0Mb removable CDD	0-336 (0-822)	0-0 (0-0)	0-3F (0-63)
16.0Mb fixed CDD	0-336 (0-822)	10-10 (16-16)	0-3F (0-63)
48.0Mb fixed CDD	0-336 (0-822)	10-12 (16-18)	0-3F (0-63)
80.0Mb fixed CDD	0-336 (0-822)	10-14 (16-20)	0-3F (0-63)
67.0Mb disc	0-336 (0-822)	0-4 (0-4)	0-3F (0-63)
300.0Mb disc	0-336 (0-822)	0-8 (0-8)	0-3F (0-63)

DEVICE	LOGICAL RECORD NUMBER L-H
floppy disc	1-7D2

DEVICE SELECTION COMMAND SUMMARY

4 DEVICE SELECTION (COMMUNICATION)

In addition to the devices previously described, communication devices also may be selected for testing. A maximum of eight pair, transmitter-receiver pair, of communication devices can be selected for test.

Four types of communication devices can be tested:

DESCRIPTION	MNEMONIC
QSA BISYNC mode, 4-wire, FDX, 'Delete Leading Sync' option must not be present.	QS<u>N</u>
DSA BISYNC mode, FDX, 8 bits, SYNC character is X'16', Test Cable #28-011.	DS<u>N</u>
PASLA BISYNC mode, FDX, Test Cable #28-014	PS<u>N</u>
QSA ZBID mode, 4-wire, FDX, Auto-Resync option must be present.	QZ<u>N</u>

Where <u>N</u> is the device, pair number with a value one through eight.

These devices must be configured on a MAM or EMAM. QSA, DSA, or PASLA devices (BISYNC mode only) can be configured with a MAM. QSA (ZBID mode) devices or devices of one of the other types can be configured with the EMAM. Also, the EMAM can be configured with QSA (ZBID mode) devices along with devices of one of the other three types.

For the BISYNC mode the TERMINATION command switches on the MAM (EMAM) must be set to X'70' for PASLA devices, X'79' for QSA devices, or X'58' for DSA devices. The operation of QSA ZBID mode devices is not affected by the switch settings.

The MAM or EMAM must be defined before any other communication device is selected for test. The MAM or EMAM is defined as follows:

MNEMONIC	ADR,PRI,FDADR,LDADR
MAM	100, 0, 101, 1C0

DEVICE SELECTION COMMAND SUMMARY

The communication devices are defined as follows:

	MNEMONIC	XMIT,RECV
1	QS1 or DS1 or PS1 or QZ1	No default value
2	QS2 or DS2 or PS2 or QZ2	No default value
3	QS3 or DS3 or PS3 or QZ3	No default value
4	QS4 or DS4 or PS4 or QZ4	No default value
5	QS5 or DS5 or PS5 or QZ5	No default value
6	QS6 or DS6 or PS6 or QZ6	No default value
7	QS7 or DS7 or PS7 or QZ7	No default value
8	QS8 or DS8 or PS8 or QZ8	No default value

There are no default transmitter or receiver addresses for those
devices. If no address is specified, the device is not added
to the device list for testing.

5   DEVICE SELECTION COMMAND EXAMPLES

EXAMPLE 1   MAM with one QSA

```
MAM         100
QS1         1BD,  1B8
QS2         1BF,  1BA
QS3         1B9,  1BC
QS4         1BB,  1BE
```

EXAMPLE 2   EMAM with one QSA

```
MAM         100
QZ1         1BD,  1B8
QZ2         1B9,  1BC      ZBID Mode

QS3         1BF,  1BA
QS4         1BB,  1BE      BISYNC Mode
```

NOTE

Half of the QSA, two pairs of devices, can
be in the ZBID mode and the other half in
the BISYNC mode if the relationship between
device addresses shown in this example is
maintained.

DEVICE SELECTION COMMAND SUMMARY

EXAMPLE 3   EMAM with one QSA and four DSA's

MAM	100
QZ1	1BD, 1B8
QZ2	1BF, 1BA
QZ3	1B9, 1BC
QZ4	1BB, 1BE
DS5	10F, 10E
DS6	10D, 10C
DS7	10A, 10B
DS8	109, 108

EXAMPLE 4   Noncommunication devices with EMAM and QSA

MAG1		magnetic tape 85
MAG2	C5	magnetic tape C5
FMD1	C1,0,0,1-300	floppy drive 1
FMD2	C1,0,0,1-300	floppy drive 2
ULI		universal logic interface 8B
INT8		8 line interrupt 20-27
DSC1	D6,B6,F1,0,0,90-A0, 0-1,8-10	10Mb disc
DSCA	FC,FB,F1,0,0,100-110,F-10,10-11	40Mb disc
MSM1	EC,EB,F3,0,0,200-202,2-3,30-34	67Mb disc
MSM2	ED,EB,F3,0,0,300-302,2-2,20-24	67Mb disc
MAM		EMAM 100
QS1	17D,178	QSA1 BISYNC
QS2	17F,17A	QSA2 BISYNC
QS3	179,17C	QSA3 BISYNC
QS4	17B,17E	QSA4 BISYNC
MAC	900	MAC 900
DFT		double-precision, floating point
CCNT	10	number of buffer links
BYTE	500	1280 byte buffer

APPENDIX C

PROGRAM CONTROL COMMAND SUMMARY

These commands control the operation of the program. These commands are used to enable or disable certain options, modify parameter values, or display parameter value. Parameter values that are listed are the default values used in the program. All values are expressed in hexadecimal.

COMMAND	PARAMETER	DESCRIPTION
HLT%	N/A	Continue testing after error (default).
HLT	N/A	Halt on error.
LOG%	N/A	Disable error print.
LOG	N/A	Print error messages (default).
FLT%	N/A	Disable floating-point test (default).
FLT	N/A	Enable floating-point testing.
DFT%	N/A	Disable double-precision, floating-point test (default).
DFT	N/A	Enable double-precision, floating-point test.
BCK%	N/A	Disable background testing; overrides FLT and DFT.
BCK	N/A	Enable background testing (default).
EXA	NNNNNN,n	NNNNNN = Memory address (default NNNNNN = 0) Examine command prints the address and contents of the n halfwords in memory starting at NNNNNN. NNNNNN and n are hexadecimal values.

PROGRAM CONTROL COMMAND SUMMARY

COMMAND	PARAMETER	DESCRIPTION
MOD	AAAAAA,n,n...	Replace the contents of location AAAAAA with the half-word value n.
ERR	N/A	Displays error summary for those devices currently on device service table.
DST	N/A	Displays device mnemonics and parameters for those devices currently on device service table.
RUN	N/A	Transfers control from command processor to device dispatcher. Testing of selected device begins.
MAP	N/A	Displays memory map.
OPT	N/A	Displays current options and values.
CPU	7	Selects increment value used to test for interrupt time-out. Adjusted according to CPU speed. CPU = 7 for 7/32 CPU = 8 for 8/32 CPU = 3220 for 3220 CPU = 3240 for 3240
MPIQ	N/A	Displays the last 48 PIQ entries from the MAM (EMAM).
MDCB	N/A	Displays the address and contents of all the active DCB's on the MAM (EMAM) (MPIQ and MDCB are used after the break key is depressed or a restart has occurred).

PROGRAM CONTROL COMMAND SUMMARY

COMMAND	PARAMETER	DESCRIPTION
LLB	1	Applies only to QSA devices in BISYNC on ZBID modes. Specifies the local loopback option. 1 local loopback 0 no local loopback
CCNT	8	Applies only to communication devices. Specifies the number of times buffers are to be linked to for a message. For the QSA device in the ZBID mode, specifies number of times the message sequence is to be repeated. See paragraph 7.2 for a detailed definition.
FSTC	0	Applies only to communication devices. Specifies the receiver buffer is tested and cleared. Eliminating the testing of this buffer alleviates the time spent in servicing these interrupts. 0 data is tested and cleared 1 data is not tested or cleared

PROGRAM CONTROL COMMAND SUMMARY

The next five commands apply only to 2.5, 10, and 40Mb disc,
MSM disc, magnetic tape, cassette tape, and SELCH tester. The
memory allocated to the buffers of these devices are outside
program memory.

COMMAND	PARAMETER	DESCRIPTION
MBUF	1	Specifies that the buffers of a device are moved throughout memory. Starting with memory defined by MSTR, the buffers are moved to the top of memory. 1. Buffers are moved. 2. Buffers remain stationary.
IMG	0	Specifies the data that is transferred between buffers during the write and read operations. If zero is specified, the data is 00,01,02... FE,FF,00...etc. For the SELCH tester the data always is 0000, 0101,...FEFE,FFFF,0000...etc.
BYTE	X'400'	Defines the size of the buffer. Since two buffers, a read and write buffer, are required per device, the memory allocated to the device is twice the value specified by BYTE.
MSTR	X'8400'	Specifies the starting address of memory that is allocated to the devices. The low limit of MSTR is EXEREND. The high limit is such that enough memory must exist between MSTR and the top of memory to accommodate the device. Top of memory - MSTR 2 X MSIZ X number of devices.

PROGRAM CONTROL COMMAND SUMMARY

COMMAND	PARAMETER	DESCRIPTION
FSTS	0	Specifies that the buffers of the cassette or devices using the SELCH are tested or not tested for correct data. Maximum DMA activity occurs when buffers are not tested; however, the accuracy of the data transferred is not tested.

0 - Buffers are tested for correct data.
1 - Buffers are not tested.

APPENDIX D

TEST DATA

1 SAMPLE CARD READER TEST CARD

The user should reproduce this card and use the resulting deck for the card reader test.

2 CRESCENT PLACE. OCEANPORT, NEW JERSEY 07757

advanced 75005

PRINTED IN U.S.A.

2 HIGH-SPEED PAPER TAPE READER TEST TAPE 06-159M14R02

The user should make this tape into a continuous loop (included in the system exerciser package) for testing high speed reader only systems.

3 EXAMPLE OF LINE PRINTER OUTPUT

```
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^<
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^<
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^<
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^<
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^<
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^<
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^<
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^<
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^<
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^<
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^<
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^<
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^<
```

APPENDIX E

ERROR MESSAGE SUMMARY

1 ERROR MESSAGE FORMAT AND DEFINITIONS

Fields: Error#⎵Device⎵Status⎵SELCH⎵Expected⎵Actual⎵Address

Characters: 2   3   2   3   8   8   8

DEV	Device Address
SS	Status
SCA	Selector Channel Address
REG	Register Number
OPSWSTAT	Old PSW Status
OPSWADDR	Old PSW Address
NPSWSTAT	New PSW Status or Reason Code if 3200
EXPROTY	Expected Priority Level
XXXXXXXX	Expected Data or Address
YYYYYYYY	Actual Data or Address
ZZZZZZZZ	Address of failure
QQQQQQQQ	PIQ Entry of MAM

2 ERROR MESSAGES

*01				OPSWSTAT	OPSWADDR	NPSWSTAT	machine mal-function
*02				OPSWSTAT	OPSWADDR	NPSWSTAT	data format fault
*04				OPSWSTAT	OPSWADDR		unexpected il-legal instruc-tion
05				OPSWSTAT	OPSWADDR		expected illegal instruction did not occur
*06				OPSWSTAT	OPSWADDR		unexpected SVC interrupt
07				OPSWSTAT	OPSWADDR		expected SVC did not occur
*08	000	SS		OPSWSTAT	OPSWADDR		unexpected relocation/ protection interrupt

ERROR MESSAGE SUMMARY

09				OPSWSTAT	OPSWADDR		expected relocation/protection did not occur
*10				OPSWSTAT	OPSWADDR		unexpected privilege instruction interrupt
11				OPSWSTAT	OPSWADDR		expected privilege instruction did not occur
*12				OPSWSTAT	OPSWADDR		unexpected arithmetic fault
13				OPSWSTAT	OPSWADDR		expected fixed point fault did not occur
14				OPSWSTAT	OPSWADDR		expected floating-point fault did not occur
15				XXXXXXXX	YYYYYYYY		floating-point data error
16				XXXXXXXX	YYYYYYYY	ZZZZZZZZ	MAC malfunction
17				XXXXXXXX	YYYYYYYY		MAC interrupt incorrect
18				OPSWSTAT	OPSWADDR		expected double-precision, floating-point fault did not occur
19				XXXXXXXX	XXXXXXXX		double-precision floating-point data error
20	DEV	SS					bad device status

ERROR MESSAGE SUMMARY

*21	DEV	SS					break key (NOTE 1)
25				XXXXXXX	YYYYYYY		double index data error
*30	DEV	SS		OPSWSTAT	OPSWADDR	EXPROTY	interrupt wrong priority
*32	DEV	SS		OPSWSTAT	OPSWADDR		unexpected immediate interrupt (NOTE 2)
33	DEV	SS					expected immediate interrupt did not occur (device time out)
34	DEV	SS		XXXXXXX	YYYYYYY		ULI data error, halfword mode
35	DEV	SS		XXXXXXX	YYYYYYY		ULI data error, byte mode
40	DEV	SS	SCA	XXXXXXX	YYYYYYY		SELCH read address fail
41	DEV	SS	SCA	XXXXXXX	YYYYYYY		SELCH write address fail
*42	DEV	SS	SCA	XXXXXXX	YYYYYYY		SELCH read address fail, abort condition
*43	DEV	SS	SCA	XXXXXXX	YYYYYYY		SELCH write address fail, abort condition
50	DEV	SS		XXXXXXX	YYYYYYY		data transfer error
60			REG	XXXXXXX	YYYYYYY		load, store multiple error

ERROR MESSAGE SUMMARY

61				XXXXXXXX	YYYYYYYY	ZZZZZZZZ	memory pattern error
62						ZZZZZZZZ	TS command failed
70	DEV	SS					MAM (EMAM) not in kill mode
71	DEV	SS					MAM (EMAM) not in kill mode and/or PIQ is not empty
80	DEV	SS		QQQQQQQQ	XXXXXXXX	ZZZZZZZZ	communication device data error
81	DEV	SS					communication device, improper number of buffer transfers
82	DEV	SS		QQQQQQQQ			improper reason code from message sequence
99	DEV	SS					dispatching discontinued, current dispatch count reached maximum

*Unrecoverable error.

3 INTERNAL FORMAT OF AN ERROR MESSAGE

The format of an error message is composed of five fullwords.

00	Flags	Error Number	Device
04	Status		SELCH
08	A	Expected data or old PSW or PIQ	
0C	B	Actual data or expected data or old location	
10	C	Address of failure or address of new PSW	

The first byte of the format is the flag field; the next two bytes are the error number field, and the fourth byte is the device number field. The second fullword is composed of the status and SELCH address fields. The third, fourth, and fifth fullwords are data fields that may contain expected data, actual data, old PSW, old location, address of new PSW or PIQ entry. See paragraph 2 of Appendix E.

FLAG BIT	SELECTS (FLAG BIT SET)
0	device, status field
1	SELCH address field
2	data A field
3	data B field
4	data C field
5-7	reserved

APPENDIX F
Activity Display

HEX DISPLAY PANEL

```
                MEMORY ADDRESS                          MEMORY DATA
 ┌─────┐  ┌─────┬─────┬─────┬─────┐      ┌─────┬─────┬─────┬─────┐
 │     │  │     │     │     │     │      │     │     │     │     │
 └─────┘  └─────┴─────┴─────┴─────┘      └─────┴─────┴─────┴─────┘

 CONSOLE  ⎫
 DISPLAY  ⎬ A B C D E F G H I J K L M N O P    Q R S T U V W X Y Z
 CHARACTER⎭
```

BACKGROUND
S.P. FLPT
D.P. FLPT
MAC/MAT
MEMORY
ACL
PIC
SELT

DSC1
DSC2
DSC3
DCS4

DSCA OR MSM1
DSCB OR MSM2
DSCC OR MSM3
DSCD OR MSM4

FMD1
FMD2
FMD3
FMD4

PASLA BISYNC (PS)
DSA BISYNC   (DS)
QSA ZBID   (QZ)
QSA BISYNC   (QS)

ULI   (ULI)
8-LINE INTERRUPT (INT8)
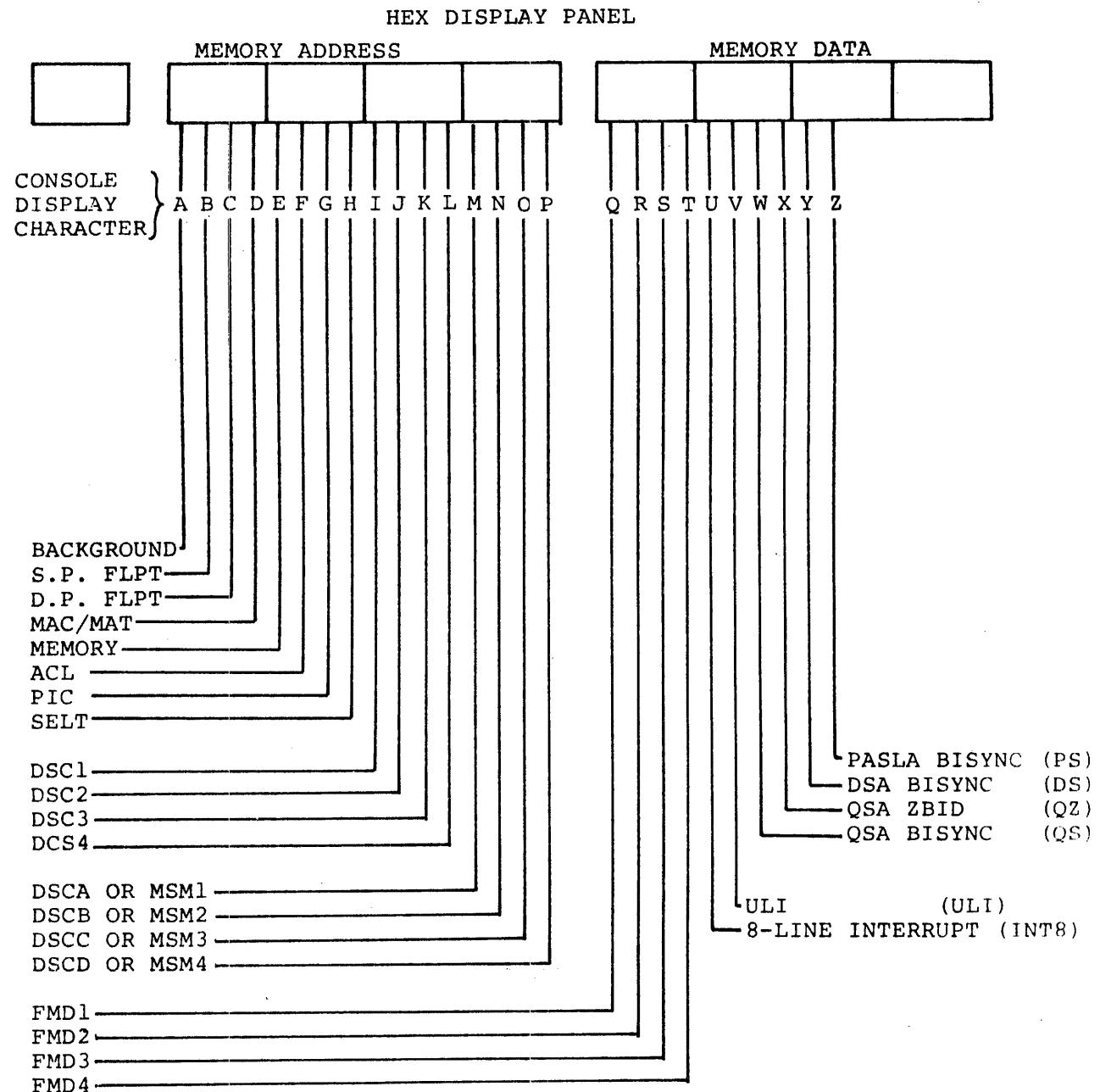
For communication devices (PS, DS, QZ, or QS), the display bits
or characters are only active at the start-up of these devices;
consequently, if the option CCNT is large or zero, these will
only blink occasionally.

```
  1  0615909  PROG  32 BIT SYSTEM EXERCISER 06-159R09M91A13
  2           WIDTH 120
  3           SQUEZ 9
  4           CROSS
  5  *        SQCHK
  6  *                    COPYRIGHT THE PERKIN-ELMER CORPORATION 1982
  7  *                    ALL RIGHTS RESERVED


  9  *   THIS PROGRAM IS DESIGNED TO TEST AN ENTIRE SYSTEM WITH ALL
 10  * PERIPHERALS RUNNING SIMULTANEOUSLY.  CHECKS ARE MADE FOR MISSING
 11  * INTERRUPTS AND UNEXPECTED INTERRUPTS.
 12  *
 13  *ASSUMPTIONS:
 14  * 1. ALL PROCESSOR AND PERIPHERAL DIAGNOSTICS HAVE BEEN RUN AND PASSED.
 15  * 2. ADDRESS OF PSW USED DURING TESTING IS 'DSPCHER'.  THIS PSW MUST
 16  *    HAVE IMMEDIATE INTERRUPTS ENABLED.
 17  *
 18  *LOADING THE PROGRAM:
 19  * 1. THIS TEST IS LOADED WITH THE STANDARD '50' SEQUENCE
 20  * 2. IF THE CONSOLE DEVICE IS NOT A   PASLA  WITH ADDRESS X'10', THE
 21  *    TWO HALFWORDS AT X'A10' AND X'A12' MUST BE MODIFIED AS FOLLOWS.
 22  *        X'A10'   DEVICE TYPE
 23  *                    =0 TELETYPE
 24  *                    =1 PASLA OR PALM (FULL DUPLEX)
 25  *        X'A12'   DEVICE ADDRESS
 26  *    FOR 8/32, IF THE CONSOLE DEVICE INTERRUPT PRIORITY IS NOT ZERO,
 27  *    THE HALFWORD AT X'A14' MUST BE MODIFIED TO THE CORRECT PRIORITY.
 28  * 3. PROGRAM IS STARTED AT X'A00' TO PERFORM COMPLETE INITIALIZATION.
 29  * 4. PROGRAM CAN BE RESTARTED AT X'A04' TO PRESERVE DEVICE SERVICE
 30  *    TABLE AND DEVICE DDB'S.
 31  *
 32  *NORMAL OPERATION:
 33  *   DEVICES ARE SELECTED AND PLACED ON THE DEVICE SERVICE TABLE BY
 34  * OPERATOR COMMANDS.  THE RUN COMMAND IS USED TO START TESTING.
 35  * EACH DEVICE ON THE SERVICE TABLE IS REPEATEDLY POLLED BY THE
 36  * DISPATCHER IN AN ATTEMPT TO KEEP ALL DEVICES BUSY.  ERRORS ARE
 37  * REPORTED ON THE  CONSOLE.  IF THE  CONSOLE FALLS BEHIND IN PRINTING
 38  * ERROR MESSAGES, THE ERROR QUEUE WILL FILL UP AND TESTING IS ABORTED.
 39  * CONTROL RETURNS TO THE COMMAND PROCESSOR AFTER THE ERRORS ARE
 40  * PRINTED.  DEPRESSING THE BREAK KEY ON THE  CONSOLE WILL ALSO ABORT
 41  * TESTING.
```

```
                          43 *GENERATION PARAMETERS.                                            *
                          44 *   THE FOLLOWING EQUATES MAY BE CHANGED TO ADJUST THE SIZES OF    *
                          45 *   VARIOUS TABLES, TO SELECT DRIVERS, AND TO INCLUDE MULTIPLE     *
                          46 *   DEVICE SUPPORT.                                                *


                          48 * PAPER TAPE READER, PUNCH, OR READ PUNCH (0-1)                    *
          0000 0001       49 PAPRTAPE EQU   1

                          51 * CARD READER   (0-1)                                             *
          0000 0001       52 CARDRDR  EQU   1

                          54 * HIGH SPEED LINE PRINTERS (0-2).                                 *
          0000 0002       55 PRINTERS EQU   2

                          57 * UNIVERSAL CLOCK MODULE ACL, PIC (0-1).                          *
          0000 0001       58 CLOCK    EQU   1

                          60 * INTERTAPE CASSETTE TAPE DRIVES (0-4).                           *
          0000 0000       61 CASSETTE EQU   0

                          63 * SELECTORS CHANNELS (1-4).                                       *
          0000 0004       64 SELCHS   EQU   4

                          66 * MAGNETIC TAPE TRANSPORTS (0-4).                                 *
          0000 0004       67 MAGTAPE  EQU   4

                          69 * CARTRIDGE DISC DRIVES, 2.5 AND 10 M.BYTE (0-4).                 *
          0000 0004       70 DISCS    EQU   4

                          72 * 40 MEGA BYTE DISK DRIVES (0-4).                                 *
          0000 0004       73 DSK40MB  EQU   4

                          75 * MSM 67-300 MEGA BYTE DRIVERS (0-4)
          0000 0004       76 MSMDISC  EQU   4

                          78 * FLOPPY DISK DRIVES (0-4)
          0000 0004       79 FLOPPY   EQU   4

                          81 * EIGHT LINE INTERRUPT
          0000 0001       82 EIGHTINT EQU   1

                          84 * UNIVERSAL LOGIC INTERFACE (0-1)
          0000 0001       85 ULI      EQU   1

                          87 * SELCH TESTER (0-1)
          0000 0001       88 SELCHTST EQU   1

                          90 * MAM DRIVE (0-1)
          0000 0001       91 MAM      EQU   1

                          93 * QSA BISYNC (0-8 )
          0000 0008       94 QSA      EQU   8

                          96 * DSA (0-8)
```

```
        0000 0008                    97  DSA       EQU    8

                                     99  * PASLA (0-8)
        0000 0008                   100  PASLA     EQU    8

                                    102  * QSA ZBID (0-8)
        0000 0008                   103  QSAZ      EQU    8

                                    105  * EXTENDED CONSOLE COMMANDS: DST, ERR, OPT (0=NO,1=YES).
        0000 0001                   106  CONCMNDS EQU    1

                                    108  * DEBUGGING COMMANDS, OPN, REP, NEXTCELL (0=NO.1=YES).          *
        0000 0001                   109  CONDEBUG EQU    1


        0000 0014                   112  QUESIZ    EQU    20            ERROR QUEUE SIZE
        0000 0014                   113  BUFLEN    EQU    20            INTERNAL ERROR BUFFER LENGTH
        0000 001E                   114  MAXDDB    EQU    30            MAXIMUM NUMBER OF DDBS ON LIST
        0000 03FF                   115  MAXDEV    EQU    X'03FF'       MAXIMUM DEVICE ADDRESS           R09
```

REGISTER DEFINITIONS

```
        0000 0000          117  R0        EQU    0
        0000 0000          118  OLDPSW    EQU    0
        0000 0001          119  R1        EQU    1
        0000 0002          120  R2        EQU    2
        0000 0002          121  DEV       EQU    2
        0000 0002          122  XDEV      EQU    2
        0000 0003          123  R3        EQU    3
        0000 0003          124  STAT      EQU    3
        0000 0003          125  XSTAT     EQU    3
        0000 0004          126  R4        EQU    4
        0000 0004          127  DDBADR    EQU    4
        0000 0005          128  R5        EQU    5
        0000 0005          129  RDEV      EQU    5
        0000 0006          130  R6        EQU    6
        0000 0006          131  RSTAT     EQU    6
        0000 0007          132  R7        EQU    7
        0000 0008          133  R8        EQU    8
        0000 0009          134  R9        EQU    9
        0000 000A          135  R10       EQU    10
        0000 000B          136  R11       EQU    11
        0000 000C          137  R12       EQU    12
        0000 000D          138  R13       EQU    13
        0000 000E          139  R14       EQU    14
        0000 000F          140  R15       EQU    15
                           141  *
                           142  *  FLOATING POINT REGISTERS
        0000 0002          143  FR2       EQU    2
        0000 0004          144  FR4       EQU    4
        0000 0006          145  FR6       EQU    6
        0000 0008          146  FR8       EQU    8
        0000 000A          147  FR10      EQU    10
        0000 000C          148  FR12      EQU    12
        0000 000E          149  FR14      EQU    14
                           150  *
                           151  *  DOUBLE PRECISION FLOATING POINT REGISTER
        0000 0002          152  DFR2      EQU    2
        0000 0004          153  DFR4      EQU    4
        0000 0006          154  DFR6      EQU    6
        0000 0008          155  DFR8      EQU    8
        0000 000A          156  DFR10     EQU    10
        0000 000C          157  DFR12     EQU    12
        0000 000E          158  DFR14     EQU    14
```

PHASE VALUE EQUATES

```
        0000 0000           160   PHASE.0   EQU    0
        0000 0004           161   PHASE.1   EQU    4
        0000 0004           162   ONE       EQU    4
        0000 0008           163   PHASE.2   EQU    8
        0000 000C           164   PHASE.3   EQU    12
        0000 0010           165   PHASE.4   EQU    16
        0000 0014           166   PHASE.5   EQU    20
        0000 0018           167   PHASE.6   EQU    24
        0000 001C           168   PHASE.7   EQU    28
        0000 0020           169   PHASE.8   EQU    32
        0000 0024           170   PHASE.9   EQU    36
        0000 0028           171   PHASE.A   EQU    40
        0000 002C           172   PHASE.B   EQU    44
        0000 0030           173   PHASE.C   EQU    48
        0000 0034           174   PHASE.D   EQU    52
        0000 0038           175   PHASE.E   EQU    56
        0000 003C           176   PHASE.F   EQU    60
        0000 0040           177   PHASE.10  EQU    64
        0000 0044           178   PHASE.11  EQU    68
        0000 0048           179   PHASE.12  EQU    72
        0000 004C           180   PHASE.13  EQU    76
        0000 0050           181   PHASE.14  EQU    80
        0000 0054           182   PHASE.15  EQU    84
```

CONTROL BLOCKS SYMBOLIC DEFINITIONS

```
                                    184  DDB      STRUC                    SYMBOLIC DEFINITIONS

000000                              186  DSPFLGS  DS   1                   DISPATCHING FLAGS
000001                              187  PRIORITY DS   1
000002                              188           ALIGN 2
000002                              189  PHASE    DS   2
000004                              190  PARMFLGS DS   2                   PARAMETER FLAGS
000006                              191  DTYPFLGS DS   2                   DEVICE TYPE FLAGS
000008                              192  DEVADR   DS   2                   DEVICE ADDRESS
00000A                              193  STATUS   DS   2                   LAST STATUS
00000C                              194           ALIGN 4
00000C                              195  DVRENTRY DS   4                   DRIVER PRIMARY ENTRY
000010                              196  MAXWAIT  DS   4                   MAXIMUM WAIT COUNTER
000014                              197  CURWAIT  DS   4                   CURRENT WAIT COUNTER
000018                              198  ERRCRCNT DS   4                   ERROR COUNTER
00001C                              199  MAXDSPCH DS   4                   MAXIMUM DISPATCH COUNTER
000020                              200  CURDSPCH DS   4                   CURRENT DISPATCH COUNTER
000024                              201  PARMCHCK DS   4                   PARAMETER CHECK SUBROUTINE
000028                              202  DVRWRK1  DS   4                   DRIVER WORK 1
00002C                              203  DVRWRK2  DS   4                   DRIVER WORK 2
000030                              204  MEMLOW   DS   0                   MEMORY TEST LOW LIMIT (BUF1STRT)
000030                              205  BUF1STRT DS   4                   BUFFER ONE START ADDRESS
000034                              206  MEMHIGH  DS   0                   MEM TEST HIGH LIMIT (BUF1END)
000034                              207  BUF1END  DS   4                   END ADDRESS
000038                              208  MEMMAP   DS   0                   4 WORD MEM PRESENCE MAP BY 8K BLOCKS
000038                              209  BUF1NEXT DS   4                   NEXT BYTE ADDRESS
00003C                              210  BUF2STRT DS   4                   BUFFER TWO START ADDRESS
000040                              211  BUF2END  DS   4                   END ADDRESS
000044                              212  BUF2NEXT DS   4                   NEXT BYTE ADDRESS
000048                              213  CCB1ADR  DS   0                   CCB (HDX) OR RECEIVER CCB (FDX)
000048                              214  SELCHADR DS   2                   SELCH ADDRESS
00004A                              215  CONTADR  DS   2                   CONTROLLER ADDRESS
00004C                              216  CYLLOW   DS   2                   CYLINDER LOW LIMIT
00004E                              217  CYLHIGH  DS   2                   CYLINDER HIGH LIMIT
000050                              218  HEADLOW  DS   2                   HEAD LOW LIMIT
000052                              219  HEADHIGH DS   2                   HEAD HIGH LIMIT
000054                              220  SCTRLOW  DS   2                   SECTOR LOW LIMIT
000056                              221  SCTRHIGH DS   2                   SECTOR ADDRESS HIGH LIMIT
000058                              222  CYLCUR   DS   2                   CYLINDER CURRENT ADDRESS
00005A                              223  HEADCUR  DS   2                   HEAD CURRENT ADDRESS
00005C                              224  SCTRCUR  DS   2                   SECTOR CURRENT ADDRESS
00005E                              225  WPROTFLG DS   2                   WRITE PROTECT FLAG
000060                              226  UNUSED   DS   2
000064                              227           ALIGN 4                  PRESERVE FULLWORD ALIGNMENT
          0000 004C                 228  LRNLOW   EQU  CYLLOW
          0000 0058                 229  LRNCUR   EQU  CYLCUR
          0000 004E                 230  LRNHIGH  EQU  CYLHIGH
          0000 0028                 231  MAMFDA   EQU  DVRWRK1
          0000 002A                 232  MAMLDA   EQU  DVRWRK1+2
000064                              233  CCB2ADR  DS   0                   TRANSMITTER CCB (FDX)
000064                              234           DS   22                  SPACE FOR CCB2
00007A                              235           ENDS
000000:I                            236           ALIGN 4
```

CONTROL BLOCKS SYMBOLIC DEFINITIONS

```
      0000 0008              237  XDEVADR   EQU   8           TRANSMIT DEVICE ADDRESS
      0000 0038              238  RDEVADR   EQU   56          RECEIVER DEVICE ADDRESS
      0000 000A              239  XSTATUS   EQU   10          TRANSMIT STATUS
      0000 003A              240  RSTATUS   EQU   58          RECEIVER STATUS
      0000 0000              241  XDSPFLGS  EQU   0           TRANSMIT FLAGS
      0000 0030              242  RDSPFLGS  EQU   48          RECEIVER FLAGS
      0000 0040              243  RBUFF0E   EQU   64          END ADDR OF RECV BUF 0
      0000 004C              244  RBUFF1E   EQU   76          END ADDR OF RECV BUF 1
      0000 003C              245  RBUFF0S   EQU   60          START ADDR OF RECV BUF 0
      0000 0048              246  RBUFF1S   EQU   72          START ADDR OF RECV BUF 1
```

CONTROL BLOCKS SYMBOLIC DEFINITIONS

```
                                    248  CCB       STRUC              SYMBOLIC CHANNEL COMMAND BLOCK

000000                              250  CCW       DS    0            COMMAND WORD
000000                              251  STATMASK  DS    1            STATUS MASK
000001                              252  CCWFLGS   DS    1            COMMAND FLAGS
000002                              253  BUFOCNT   DS    2            BUFFER 0 BYTE COUNT
000004                              254  BUFOEADR  DS    4            BUFFER 0 END ADDRESS
000008                              255  CHECK     DS    2            CHECK WORD
00000A                              256  BUF1CNT   DS    2            BUFFER 1 BYTE COUNT
00000C                              257  BUF1EADR  DS    4            BUFFER 1 END ADDRESS
000010                              258  TRANADR   DS    4            TRANSLATION TABLE ADDRESS
000014                              259  SUBADR    DS    2            SUBROUTINE ADDRESS
000016                              260            ENDS


                                    262  *   DDB DISPATCHING FLAG BIT OFFSETS
                                    263  *
          0000 0000                 264  IGNORE    EQU   0
          0000 0001                 265  BUSY      EQU   1
          0000 0002                 266  NOTCOUNT  EQU   2
          0000 0003                 267  BADSTAT   EQU   3
          0000 0006                 268  DEVCNTL1  EQU   6
          0000 0007                 269  DEVCNTL2  EQU   7
                                    270  *   CCW CONTROL BIT OFFSETS (FROM HALFWORD BOUNDRY)
          0000 0008                 271  EXECBIT   EQU   8
          0000 000B                 272  CHCKBIT   EQU   11
          0000 000C                 273  BUFBIT    EQU   12
          0000 000D                 274  RDWTBIT   EQU   13
          0000 000E                 275  TRANBIT   EQU   14
          0000 000F                 276  FASTBIT   EQU   15
                                    277  *
                                    278  *PROGRAM CONTROL SWITCH SYMBOLIC DEFINITIONS
                                    279  *
          0000 0000                 280  HLTSWTCH  EQU   0
          0000 0001                 281  LOGSWTCH  EQU   1
          0000 0002                 282  FLTSWTCH  EQU   2
          0000 0003                 283  BCKSWTCH  EQU   3
          0000 0004                 284  DFTSWTCH  EQU   4
                                    285  *   DEVICE TYPE FLAG DEFINITION
          0000 0002                 286  USESELCH  EQU   2
          0000 0006                 287  FLOPTYP   EQU   6
          0000 0007                 288  MAMTYP    EQU   7
          0000 0008                 289  QSATYP    EQU   8
          0000 0009                 290  DSATYP    EQU   9
          0000 000A                 291  PASLTYP   EQU   10
          0000 000B                 292  QSZTYP    EQU   11
          0000 000C                 293  RECVTYP   EQU   12
          0000 000D                 294  CASTYP    EQU   13
```

INITIALIZATION, START AND RESTART

```
000000:I                         296          ORG   X'A00'
000A00      230D      =000A1A     297          BS    START          PRIMARY ENTRY FOR SETUP
000A02      0200                  298          NOPR  *                                      R04
000A04      4300 0C1E             299          B     RESTART        SECONDARY ENTRY FOR RESTART
                                  300   *                           DRIVER LOOKUP TABLE     R04
000A08      0000 5514             301   CONTBL  DC    A(TTYPTR)      0= TTY                  R04
000A0C      0000 5674             302          DC    A(PASPTR)      1= PASLA                R04
                                  303   * CONSOLE DEVICE DEFINITION TABLE
000A10      0101                  304   CONTYP  DCX   0101           DEFAULT TYPE IS PASLA
000A12      0010                  305   CONADR  DCX   0010           DEFAULT ADDRESS IS '10'
000A14      0000                  306   CONPRITY DCX  0000           DEFAULT PRIORITY
000A16      0000                  307   FLAG3200 DCX  0000           *                      R04
                                  308   *
                                  309   *  FLAG TO INDICATE THAT PROGRAM HAS BEEN ENTERED AT PRIMARY ENTRY.
000A18      0001                  310   ENTRFLAG DCX  0001


000A1A      2400                  312   START   LIS   R0,0
000A1C      4000 0A16             313          STH   R0,FLAG3200    *                       R04
000A20      C810 0A36             314          LHI   R1,FULLWRD     SETUP LOW MEMORY FOR
000A24      4000 0030             315          STH   R0,X'30'       ILLEGAL INSTRUCTION
000A28      4000 0032             316          STH   R0,X'32'       TRAP TO FORCE A
000A2C      4000 0034             317          STH   R0,X'34'       NEW PSW
000A30      4010 0036             318          STH   R1,X'36'
000A34      0000                  319          DC    X'0'           ILLEGAL INSTRUCTION
                                  320   *
                                  321   *  LOW MEMORY INITIALIZATION
000A36      2400                  322   FULLWRD LIS   R0,0
000A38      4000 0A18             323          STH   R0,ENTRFLAG    ENTER FLAG SHOWS WE'VE BEEN HERE
000A3C      5000 0020             324          ST    R0,X'20'       CLEAR MACHINE MALFUNCTION
000A40      5000 0024             325          ST    R0,X'24'       OLD PSW
000A44      5000 0028             326          ST    R0,X'28'       RESERVED
000A48      5000 002C             327          ST    R0,X'2C'
000A4C      5000 0030             328          ST    R0,X'30'       ILLEGAL INSTRUCTION NEW PSW
000A50      E610 0A62             329          LA    R1,INIT1A
000A54      5010 0034             330          ST    R1,X'34'       NEW LOC
000A58      DF70 0034             331          XSTB  X'34'          ILLEGAL ON 7/32 & 8/32     R04
000A5C      2411                  332          LIS   R1,1           LEGAL ON 3200              R04
000A5E      4010 0A16             333          STH   R1,FLAG3200    SET 3200 FLAG              R04
000A62      E610 1D46             334   INIT1A  LA    R1,ILLEGINS    *                          R04
000A66      5010 0034             335          ST    R1,X'34'       RESTORE ILLEGAL INSTRUCTION TRAP
000A6A      5000 0038             336          ST    R0,X'38'       MACHINE MALFUNCTION NEW PSW
000A6E      E610 1E12             337          LA    R1,MALFUNCT
000A72      5010 003C             338          ST    R1,X'3C'       NEW LOC
000A76      5000 0040             339          ST    R0,X'40'       RESERVED
000A7A      5000 0044             340          ST    R0,X'44'
000A7E      5000 0048             341          ST    R0,X'48'       ARITHMETIC FAULT NEW PSW
000A82      E610 1D7E             342          LA    R1,ARITHFLT
000A86      5010 004C             343          ST    R1,X'4C'       NEW LOC
000A8A      E610 34C8             344          LA    R1,ZEROES      ADDRESS OF ZEROES
000A8E      5010 0080             345          ST    R1,X'80'       FOR SYSTEM QUEUE LIST
000A92      E610 0CF4             346          LA    R1,REGSAV      REGISTER SAVE AREA (LOW MEMORY)
000A96      4010 0086             347          STH   R1,X'86'
```

INITIALIZATION, START AND RESTART

```
000A9A    E610 0CEC          348          LA    R1,PSWSAV          CURRENT PSW SAVE POINTER (LOW MEMORY)
000A9E    4010 0084          349          STH   R1,X'84'
000AA2    4820 0A16          350          LH    R2,FLAG3200        TEST 3200 FLAG               R04
000AA6    2333      =000AAC  351          BZS   INIT1B             SKIP IF NOT SET              R04
000AA8    5010 0084          352          ST    R1,X'84'           POWER FAIL ADDRESS FOR 3200
000AAC    F910 0000 8000     353  INIT1B  LI    R1,X'8000'         WAIT STATE FOR SYSTEM QUEUE
000AB2    5010 0088          354          ST    R1,X'88'
000AB6    E610 0C1E          355          LA    R1,RESTART         RESTART
000ABA    5010 008C          356          ST    R1,X'8C'
000ABE    5000 0090          357          ST    R0,X'90'           RELOCATION/PROTECTION NEW PSW
000AC2    E610 1E70          358          LA    R1,MACINT
000AC6    5010 0094          359          ST    R1,X'94'           NEW LOC
000ACA    5000 0098          360          ST    R0,X'98'           SUPERVISOR CALL NEW STATUS
000ACE    E640 1DE4          361          LA    R4,SVCERR          NEW LOC INTO ALL VECTOR POSITIONS
000AD2    C810 009C          362          LHI   R1,X'9C'
000AD6    2422               363          LIS   R2,2
000AD8    C830 00BA          364          LHI   R3,X'BA'
000ADC    4041 0000          365  SVCFILL STH   R4,0(R1)           FILL IN SVC VECTORS (LOW MEMORY)
000AE0    C110 0ADC          366          BXLE  R1,SVCFILL
000AE4    2424               367          LIS   R2,4
000AE6    C830 00CC          368          LHI   R3,X'CC'
000AEA    5001 0000          369  FILL    ST    R0,0(R1)           ZERO X'BC' THROUGH X'CF'
000AEE    C110 0AEA          370          BXLE  R1,FILL
000AF2    E610 1EFC          371          LA    R1,FORFAULT        DATA FORMAT FAULT            R04
000AF6    5010 00CC          372          ST    R1,X'CC'           R04
                             373  *
                             374  *   TOP OF MEMORY SEARCH, BUILD MEMORY MAP
                             375  *
000AFA    5840 25B4          376          L     R4,MEMSTART        GET END OF EXERCISER
000AFE    104E               377          SRLS  R4,14              WHICH 16K BLOCK WE END IN
000B00    0834               378          LR    R3,R4
000B02    7530 2530          379  TOM1    SBT   R3,MEMRYMAP        MARK MEMORY UP TO END OF
000B06    2731               380          SIS   R3,1               EXERCISER AS PRESENT
000B08    2213      =000BC2  381          BNMS  TOM1
000B0A    2641               382          AIS   R4,1               ADVANCE TO NEXT 16K BLOCK
000B0C    0834               383          LR    R3,R4              SAVE BIT INDEX
000B0E    114E               384          SLLS  R4,14              GET ACTUAL ADDRESS FOR START
000B10    C850 4000          385          LHI   R5,Y'4000'         INDEX BY 16K
000B14    5860 25B0          386          L     R6,MEMSIZE         TO MAX MEMORY ALLOWED BY MEMMAP
000B18    2764               387          SIS   R6,4               LAST ADDRESSABLE FULLWORD
000B1A    4880 0A16          388          LH    R8,FLAG3200        *                           R04
000B1E    5000 0000          389          ST    R0,0               CLEAR FOR WRAP AROUND CHECK
000B22    F800 2424 2424     390          LI    R0,Y'24242424'     ARBITRARY NON ZERO PATTERN
000B28    7630 2530          391  TOM2    RBT   R3,MEMRYMAP        INITIALLY ASSUME NOT THERE
000B2C    5874 0000          392          L     R7,0(R4)           SAVE OLD CONTENTS
000B30    5004 0000          393          ST    R0,0(R4)           STORE PATTERN
000B34    0888               394          LR    R8,R8              TEST 3200 FLAG              R04
000B36    2333      =000B3C  395          BZS   TOM2A              SKIP IF RESET               R04
000B38    DF74 0000          396          XSTB  0(R4)              INVALIDATE CACHE            R04
000B3C    5824 0000          397  TOM2A   L     R2,0(R4)           READ BACK
000B40    0502               398          CLR   R0,R2              IS MEMORY THERE?
000B42    2138      =000B52  399          BNES  TOM3               B IF DOESN'T EXIT
000B44    5820 0000          400          L     R2,0               CHECK ZERO FOR WRAP
```

INITIALIZATION, START AND RESTART

```
000B48      213A       =000B5C     401            BNZS    TOM4             B IF WRAP AROUND
000B4A      5074 0000              402            ST      R7,0(R4)         RESTORE OLD CONTENTS
000B4E      7530 2530              403            SBT     R3,MEMRYMAP      MEMORY IS PRESENT
000B52      2631                   404    TOM3    AIS     R3,1            ADVANCE TO NEXT 16K
000B54      C140 0B28              405            BXLE    R4,TOM2          LOOP FOR ALL ADDRESSES
000B58      0824                   406            LR      R2,R4            SAVE LAST ADDRESS
000B5A      2307       =000B68     407            BS      TOM6
000B5C      0824                   408    TOM4    LR      R2,R4            SAVE LAST ADDRESS
000B5E      7630 2530              409    TOM5    RBT     R3,MEMRYMAP      CLEAR REST OF TABLE
000B62      2631                   410            AIS     R3,1
000B64      C140 0B5E              411            BXLE    R4,TOM5
                                   412    *  CALCULATE NUMBER OF CONTINGUOUS NON-EXIST MEMORY BLOCKS
000B68      2430                   413    TOM6    LIS     R3,0            CLEAR BIT POSITION
000B6A      2440                   414            LIS     R4,0            CLEAR NUMBER OF CONT NON-EXIST BLOCKS
000B6C      7430 2530              415    TOM7    TBT     R3,MEMRYMAP      TEST MAP BIT
000B70      2133       =000B76     416            BNZS    TOM8             BLOCK EXISTS
000B72      2641                   417            AIS     R4,1            INCREMENT NON-EXIST BLOCK
000B74      2302       =000B78     418            BS      TOM9             NEXT BLOCK
000B76      2440                   419    TOM8    LIS     R4,0            BLOCK EXISTS, CLEAR CONT NON-EXIST
000B78      2631                   420    TOM9    AIS     R3,1            NEXT BLOCK
000B7A      C530 0400              421            CLHI    R3,1024          MAXIMUM 1024 BLOCKS
000B7E      2089       =000B6C     422            BLS     TOM7             MORE BLOCKS TO TEST
                                   423    *   CALCULATE LAST MEMORY ADDRESS
000B80      C820 0400              424            LHI     R2,1024          1024 BLOCKS
000B84      0324                   425            SR      R2,R4            MINUS NO. OF CONTIG NON-PRESENT
000B86      112E                   426            SLLS    R2,14            ADDRESS OF MEMORY TOP + 1
000B88      2721                   427            SIS     R2,1            ADDRESS OF MEMORY TOP
000B8A      5020 25B8              428            ST      R2,MEMTOP        STORE ADDRESS
                                   429    *  CLEAR SHARED MEMORY CONTROL WORDS
000B8E      2450                   430            LIS     R5,0
000B90      5860 25B4              431            L       R6,MEMSTART      START OF MEMORY
000B94      2474                   432            LIS     R7,4            BY FULLWORDS
000B96      5880 25B8              433            L       R8,MEMTOP        TO END OF MEMORY
000B9A      5056 0000              434            ST      R5,0(R6)         CLEAR CORE
000B9E      C160 0B9A              435            BXLE    R6,*-4
000BA2      4050 34B2              436            STH     R5,MAMADR        CLEAR MAM ADDRESS
                                   437    *
                                   438    *   INTERRUPT SERVICE TABLE INITIALIZED IN COMMON SECTION
                                   439    *
                                   440    *
                                   441    *  LOW MEMORY SETUP COMPLETE, START PROGRAM TABLE SETUP.
                                   442    *
                                   443    *  CONSOLE DDB INITIALIZATION
000BA6      E640 25BC              444            LA      DDBADR,CONDDB
000BAA      2400                   445            LIS     R0,0
000BAC      D204 0000              446            STB     R0,DSPFLGS(DDBADR) RESET ALL FLAGS
000BB0      4810 0A14              447            LH      R1,CONPRITY      FETCH PRIORITY
000BB4      1114                   448            SLLS    R1,4            *                          R04
000BB6      D214 0001              449            STB     R1,PRIORITY(DDBADR) PLUG INTO DDB
000BBA      4810 CA12              450            LH      R1,CONADR        CONSOLE ADDRESS
000BBE      4014 0008              451            STH     R1,DEVADR(DDBADR)
000BC2      D310 0A10              452            LB      R1,CONTYP        USE DEVICE TYPE TO
000BC6      1112                   453            SLLS    R1,2            INDEX INTO DRIVER ADDRESS TABLE
```

INITIALIZATION, START AND RESTART

```
000BC8     5921 0A08           454          L     R2,CONTBL(R1)        DRIVER ENTRY ADDRESS
000BCC     5024 000C           455          ST    R2,DVRENTRY(DDBADR)  INTO DDB
                               456    *  DEVICE SERVICE TABLE INITIALIZATION
000BD0     E610 21E8           457          LA    R1,DST
000BD4     5010 2268           458          ST    R1,DSTNEXT           INITIALLY FIRST IS NEXT
000BD8     2714                459          SIS   R1,4                 ADDRESS OF LAST USED IS BEFORE
000BDA     5010 2264           460          ST    R1,DSTLAST           FIRST, NONE USED.
                               461    *  PLACE SELCH'S ON DST, IGNORE FLAG SET BY RESTART SEQUENCE
000BDE     E610 37C4           462          LA    R1,SLCHLIST          TABLE GIVING SELCH DDB ADDRESSES
000BE2     2424                463          LIS   R2,4                 ENTRY SIZE
000BE4     E630 37D0           464          LA    R3,SLCHLEND          END OF LIST
000BE8     5841 0000           465 ADDSLCH  L     DDBADR,0(R1)         FETCH A DDB ADDRESS
000BEC     41F0 227C           466          BAL   R14,DSTADD           ADD IT TO DST (IGNORING RETURN CODE)
000BF0     C110 0BE8           467          BXLE  R1,ADDSLCH           REPEAT FOR ALL SELCH DDBS.
                               468    *  INITIAL DEFAULTS FOR PROGRAM CONTROL SWITCHES
000BF4     4000 263E           469          STH   R0,SWITCHES          ALL ZERO EXCEPT FOLLOWING:
000BF8     2411                470          LIS   R1,LOGSWTCH
000BFA     7510 263F           471          SBT   R1,SWITCHES          LOG
000BFE     2413                472          LIS   R1,BCKSWTCH
000C00     7510 263E           473          SBT   R1,SWITCHES          BACKGROUND TESTING
000C04     4810 2642           474          LH    R1,CPUTABLE          CPU IS 7/32 UNLESS WE GET CPU COMND
000C08     4010 2640           475          STH   R1,CPUSWTCH          STORE 7/32 TIME VALUE
000C0C     4000 34E4           476          STH   R0,MACADR            NO MAC UNLESS WE GET MAC COMMAND
                               477    *  IDENTIFICATION MESSAGE
000C10     E6D0 3194           478          LA    R13,IDMESS           MESSAGE ADDRESS
000C14     E5E0 31BF           479          LA    R14,IDMESSE          MESSAGE END
000C18     41F0 232F           480          BAL   R15,CONPRINT
*000C1C    230D      =000C36   481          B     COMN                 GO TO COMMON INITIALIZATION


000C1E     2400                483 RESTART  LIS   R0,0                 CHECK PRIMARY ENTRY FLAG
000C20     4810 0A18           484          LH    R1,ENTRFLAG          MUST GO THROUGH START AT LEAST ONCE
000C24     4220 0A1A           485          BP    START                B IF NOT SET TO PRIMARY ENTRY
000C28     9510                486          EPSR  R1,R0                FORCE REGISTER SET ZERO
                               487    *  RESTART MESSAGE
000C2A     E6D0 31C0           488          LA    R13,REMESS           MESSAGE ADDRESS
000C2E     E6E0 31D3           489          LA    R14,REMESSE          MESSAGE END
000C32     41F0 232F           490          BAL   R15,CONPRINT


                               492    *  START AND RESTART COMMON INITIALIZATION
                               493    *
000C36     C810 0018           494 COMN     LHI   R1,24                INITIALIZE ACTIVITY        R04
000C3A     C800 2020           495          LHI   R0,X'2020'           BUFFER WITH SPACES         R04
000C3E     4001 3C26           496 COMN0    STH   R0,ACTIVITY(R1)      *                          R04
000C42     2712                497          SIS   R1,2                 *                          R04
000C44     2283      =000C3E   498          BNLS  COMN0                *                          R04
000C46     F800 5C3E 0000      499          LI    R0,Y'5C3E0000'       *                          R04
000C4C     5000 0000           500          ST    R0,0                 FILL IN ONE PST ENTRY      R04
                               501    *
```

```
                                    502   *    ALL INTERRUPT SERVICE ENTRIES POINT TO FIRST LEVEL HANDLER(LOW CORE)
                                    503   *      PUT HERE TO UNDO AUTO DRIVER CHANNEL COMMAND BLOCKS
                                    504   *
000C50    2400                      505            LIS    R0,0                    ZERO R0
000C52    C810 00D0                 506            LHI    R1,X'D0'                START OF INTERRUPT SERVICE TABLE
000C56    2422                       507            LIS    R2,2
000C58    C830 08CE                 508            LHI    R3,MAXDEV+MAXDEV+X'D0'  END OF TABLE
000C5C    E640 0FE8                 509            LA     R4,DUMMY                DUMMY HANDLER ADDRESS          P09
000C60    4041 0000                 510   INTFILL  STH    R4,0(R1)                FILL TABLE
000C64    C110 0C60                 511            BXLE   R1,INTFILL
                                    512   *  SET IGNORE IN SELCH DDB'S SINCE THEY'RE ALWAYS ON DST
000C68    E610 37C4                 513            LA     R1,SLCHLIST             START OF SELCH LIST
000C6C    2424                       514            LIS    R2,4                    SIZE OF EACH ENTRY
000C6E    E630 37D0                 515            LA     R3,SLCHLFND             END OF LIST
000C72    2450                       516            LIS    R5,IGNORE               FLAG BIT WE WANT TO SET
000C74    5841 0000                 517   COMN2    L      DDBADR,0(R1)
000C78    D204 0000                 518            STB    R0,DSPFLGS(DDBADR)      CLEAR ALL FLAGS
000C7C    7554 0000                 519            SBT    R5,DSPFLGS(DDBADR)      SET IGNORE
000C80    C110 0C74                 520            BXLE   R1,COMN2                LOOP FOR ALL SELCH'S
                                    521   *  CLEAR DDB LOOKUP TABLE, WILL BE BUILT BY RUN COMMAND
000C84    E610 28D8                 522            LA     R1,DDBLKUP              START OF TABLE
000C88    2422                       523            LIS    R2,2                    ENTRY SIZE
000C8A    E630 30D6                 524            LA     R3,DDBLKUPE             END OF TABLE
000C8E    4001 0000                 525   COMN3    STH    R0,0(R1)                STORE ZERO
000C92    C110 0C8E                 526            BXLE   R1,COMN3                LOOP THROUGH TABLE
                                    527   *
                                    528   *   INITIALIZE ERROR QUEUE, FREE BUFFER POOL
000C96    C810 0015                 529            LHI    R1,QUESIZ+1             NUMBER OF ENTRIES
000C9A    4010 2690                 530            STH    R1,ERRORQ
000C9E    4000 2692                 531            STH    R0,ERRORQ+2             ZERO USED
000CA2    5000 2694                 532            ST     R0,ERRORQ+4             ZERO CURRENT TOP, NEXT BOTTOM
000CA6    4010 26EC                 533            STH    R1,BUFPOOL              NUMBER OF ENTRIES
000CAA    4000 26EE                 534            STH    R0,BUFPOOL+2            ZERO USED
000CAE    5000 26F0                 535            ST     R0,BUFPOOL+4            ZERO CURRENT TOP, NEXT BOTTOM
000CB2    2711                       536            SIS    R1,1                    NUMBER OF BUFFERS
000CB4    E620 2748                 537            LA     R2,BUFAREA              BUFFER AREA TO BE SUBDIVIDED
000CB8    6520 26EC                 538   COMN4    ABL    R2,BUFPOOL              PUT A BUFFER IN THE POOL
000CBC    E622 0014                 539            LA     R2,BUFLEN(R2)           CALCULATE ADDRESS OF NEXT BUFFER
000CC0    2711                       540            SIS    R1,1                    DONE ALL BUFFERS?
000CC2    2025        =000CB8       541            BPS    COMN4                   B IF NO
                                    542   *  CLEAR QUEUE FULL FLAG
000CC4    4000 253C                 543            STH    R0,QFULL


                                    545   *
                                    546   *  ALL COMMON INITIALIZATION COMPLETE, GO TO COMMAND PROCESSOR
                                    547   *
000CC8    C200 0CCC                 548            LPSW   CMNDPSW
000CCC                              549            ALIGN  4
000CCC    0000 0000                 550   CMNDPSW  DC     Y'0',A(CMNDPROC)        COMMAND PROCESSOR PSW
000CD0    0000 122E
000CD4    0000 8000                 551   MALPSW   DC     Y'8000',A(STOPTEST) MACHINE MALFUNCTION PSW
000CD8    0000 1F0A
```

INITIALIZATION, START AND RESTART

```
000CDC      0000 70F0              552  DSPCHER  DC    Y'70F0',A(DISPATCH)
000CE0      0000 1428
000CE4      0000 0000              553  ABORT    DC    Y'0',A(STOPTEST)      PSW TO ABORT TESTING
000CE8      0000 1F0A
000CEC      0000 0000              554  PSWSAV   DC    Y'0',Y'0'
000CF0      0000 0000
            0000 0CF4              555  REGSAV   EQU   *                     *                              R09
000CF4                            556           DAS   16                    SET 0                          R09
000D34                            557           DAS   16                    SET 1                          R09
000D74                            558           DAS   16                    SET 2                          R09
000DB4                            559           DAS   16                    SET 3                          R09
000DF4                            560           DAS   16                    SET 4                          R09
000E34                            561           DAS   16                    SET 5                          R09
000E74                            562           DAS   16                    SET 6                          R09
000EB4                            563           DAS   16                    SET F                          R09
000EF4                            564           DS    32                    SPFP REGS                 R04
000F14                            565           DS    64                    DPFP REGS                 R04
000F54                            566           DS    64                    SCRATCHPAD REGISTERS           R09
000F94                            567           DS    64                    *                              R09
000FD4                            568  MALBUF   DS    BUFLEN                MACHINE MALFUNCTION MSG


000FE8      DE20 3432              570  DUMMY    OC    R2,DISABLE            DISABLE INTERRUPTS             R09
000FEC      E640 0FF8              571           LA    R4,INTRUPT           CHANGE SPT ENTRY               R09
000FF0      4042 4200 00D0         572           STH   R4,X'D0'(R2,R2)      *                              R09
000FF6      1800                   573           LPSWR R0                   RETURN TO CALL                 R09
```

```
                                575  *INTRUPT -- IMMEDIATE INTERRUPT COMMON SERVICE                        *
                                576  *                                                                      *
                                577  *    ALL IMMEDIATE INTERRUPTS ARE VECTORED THROUGH THIS ROUTINE FOR    *
                                578  * COMMON ERROR CHECKING.  THE DDB FOR THE INTERRUPTING DEVICE IS       *
                                579  * FOUND USING THE DDB LOOK UP TABLE.  IF THERE IS NO DDB FOR THE       *
                                580  * DEVICE, THE INTERRUPT IS SPURIOUS AND AN ERROR IS GENERATED.         *
                                581  * TESTING IS ABORTED SINCE THE INTERRUPT PRIORITY CAN NOT BE VERIFIED.*
                                582  * IF A DDB IS FOUND AND THE INTERRUPT IS OF THE WRONG PRIORITY,        *
                                583  * REGISTERS MAY HAVE BEEN DESTROYED AND TESTING IS ABORTED.  IF THE    *
                                584  * IGNORE FLAG IS SET, OR THE BUSY FLAG IS RESET, THE INTERRUPT IS      *
                                585  * UNEXPECTED AND AN ERROR IS GENERATED, BUT TESTING RESUMES.           *
                                586  *    FOR A SELCH INTERRUPT, THE "OWNER" DDB ADDRESS IS LOADED FROM     *
                                587  * THE SELCH DDB, AND THE OWNER DRIVER IS CALLED.                       *
                                588  *    AUTO DRIVER CHANNEL TERMINATION ALSO COMES THROUGH THIS ROUTINE   *
                                589  * BEFORE DRIVER IS ENTERED.  SPECIAL PRECAUTIONS ARE TAKEN TO          *
                                590  * PRESERVE THE CCB ADDRESS AND THE CONDITION CODES IN THE NEW PSW SO   *
                                591  * THE DRIVER MAY USE THEM TO DETERMINE THE TYPE OF TERMINATION.        *
                                592  *                                                                      *
                                593  *REGISTERS ON ENTRY TO DRIVER:                                         *
                                594  *   R0,R1 - OLD PSW, SHOULD BE RELOADED BY DRIVER                      *
                                595  *   R2     - DEVICE ADDRESS INTERRUPTING DEVICE                        *
                                596  *   R3     - DEVICE STATUE                                             *
                                597  *   R4     - DDB ADDRESS FROM LOOKUP TABLE                             *
                                598  *   R5     - ADDRESS OF CCB IF AUTO DRIVER CHANNEL TERMINATION         *
                                599  *   R6     - NEW PSW STATUS                                            *
                                600  *                                                                      *
                                601  *PSW WILL ENABLE INTERRUPTS OF HIGHER PRIORITY ( 8/32 ).              *
                                602  *                                                                      *
000FF8    9566                  604  INTRUPT  EPSR   R6,R6              SAVE CONDITION CODES (FOR ADC)
000FFA    0854                  605           LR     R5,R4              SAVE CCB ADDRESS (FOR ADC)
000FFC    4520 34B2             606           CLH    DEV,MAMADR         MAM INTERRUPT ?
001000    4330 10FC             607           BE     INTRUPTA           YES
001004    0892                  608  INTRUPTM LR     R9,DEV             USE DEVICE TO
001006    1191                  609  INTRUPTB SLLS   R9,1               INDEX LOOK UP TABLE
001008    7349 28D8             610           LHL    DDBADR,DDBLKUP(R9) GET DDB FOR DEVICE
00100C    4330 105E             611           BZ     INTRUPT2           B IF NO DDB, ABORT
001010    0896                  612  INTRUPTX LR     R9,R6              CHECK NEW PSW FOR PRIORITY
001012    C490 00F0             613           NHI    R9,X'F0'           CLEAR ALL BUT REGISTER SET BITS
001016    D494 0001             614           CLB    R9,PRIORITY(DDBADR) INTERRUPT ON CORRECT PRIORITY?
00101A    4230 1098             615           BNE    INTRUPT3           B IF NO, ABORT
00101E    2496                  616           LIS    R9,FLOPTYP         IF FOPPY TYPE
001020    7494 0006             617           TBT    R9,DTYPFLGS(DDBADR)
001024    2336      =001030     618           BZS    INTRUPTO           NOT FLOPPY
001026    D370 3498             619           LB     R7,FMDRIVE         GET THE CURRENT FLOPPY
00102A    1173                  620           SLLS   R7,3               AND RETRIEVE THE DDBADR
00102C    5847 3688             621           L      DDBADR,FMDSEL+4(R7) FROM THIS LIST
001030    2490                  622  INTRUPTO LIS    R9,IGNORE          CHECK IGNORE FLAG
001032    7494 0000             623           TBT    R9,DSPFLGS(DDBADR)
001036    4230 10C4             624           BNZ    INTRUPT4           B IF IGNORE SET, UNEXPECTED
00103A    2491                  625           LIS    R9,BUSY            CHECK BUSY BIT
00103C    7494 0000             626           TBT    R9,DSPFLGS(DDBADR)
001040    4330 10C4             627           BZ     INTRUPT4           B IF NOT BUSY, UNEXPECTED.
```

FIRST LEVEL INTERRUPT HANDLER

```
001044    2490                    628            LIS    R9,0              IS THIS A SELCH DDB?
001046    7494 0006               629            TBT    R9,DTYPFLGS(DDBADR)
00104A    2333      =001050        630            BZS    INTRUPT1          B IF NOT A SELCH
00104C    5844 000C               631            I      DDBADR,DVRENTRY(DDBADR) GET OWNER DDB
001050    4874 0002               632  INTRUPT1  LH     R7,PHASE(DDBADR)  PICK UP CURRENT DRIVER PHASE
001054    5A74 000C               633            A      R7,DVRENTRY(DDBADR) GET ENTRY ADDRESS
001058    5877 0000               634            L      R7,0(R7)          ADDRESS OF PHASE ROUTINE  R04
00105C    1806                    635            LPSWR  R6                GO TO DRIVER
                                  636  *
                                  637  *   NO DDB FOR DEVICE
00105E    0822                    638  INTRUPT2  LR     DEV,DEV           CHECK DEVICE ADDRESS
001060    233A      =001074        639            BZS    INTR20            ERROR IF ZERO
001062    48A0 34B4               640            LH     R10,INT8ADR       CHECK 8 LINE INTERRUPT
001066    052A                    641            CLR    DEV,R10           ADDRESSES
001068    2186      =001074        642            BLS    INTR20            IF LESS ERROR
00106A    089A                    643            LR     R9,R10            USE FIRST 8 LINE INT ADDR
00106C    26A8                    644            AIS    R10,8             MAX ADDR FOR 8 LINE INT.
00106E    052A                    645            CLR    DEV,R10
001070    4280 1006               646            BL     INTRUPTB          IF LESS VALID ADDR
001074    C850 B032               647  INTR20    LHI    R5,X'B032'        UNEXPECTED INTERRUPT
001078    4180 1FFC               648            BAL    R8,ERRGET         GET INTERNAL ERROR BUFFER
00107C    4057 0000               649            STH    R5,0(R7)          ERROR NUMBER 32
001080    4027 0002               650            STH    DEV,2(R7)         DEVICE ADDRESS
001084    4037 0004               651            STH    STAT,4(R7)        DEVICE STATUS
001088    5007 0008               652            ST     R0,8(R7)          OLD PSW STATUS
00108C    5017 000C               653            ST     R1,12(R7)         OLD PSW LOC
001090    4180 2034               654            BAL    R8,ERRENQ         PUT ERROR MESS IN QUEUE
001094    C200 0CE4               655            LPSW   ABORT             STOP TESTING
                                  656  *
                                  657  *   INTERRUPT WRONG PRIORITY
001098    C850 B830               658  INTRUPT3  LHI    R5,X'B830'
00109C    D364 0001               659            LB     R6,PRIORITY(DDBADR) EXPECTED PRIORITY
0010A0    4180 1FFC               660            BAL    R8,ERRGET
0010A4    4057 0000               661            STH    R5,0(R7)          ERROR NUMBER 30
0010A8    4027 0002               662            STH    DEV,2(R7)         DEVICE ADDRESS
0010AC    4037 0004               663            STH    STAT,4(R7)        DEVICE STATUS
0010B0    5007 0008               664            ST     R0,8(R7)          OLD PSW STATUS
0010B4    5017 000C               665            ST     R1,12(R7)         OLD PSW LOC
0010B8    5067 0010               666            ST     R6,16(R7)         NEW PSW STATUS
0010BC    4180 2034               667            BAL    R8,ERRENQ         QUEUE MESSAGE
0010C0    C200 0CE4               668            LPSW   ABORT             STOP TESTING
                                  669  *
                                  670  *   DEVICE NOT EXPECTING INTERRUPT
0010C4    245A                    671  INTRUPT4  LIS    R5,PASLTYP        PASLA TYPE
0010C6    7454 0006               672            TBT    R5,DTYPFLGS(DDBADR)
0010CA    2338      =0010DA        673            BZS    INTR40            IF NOT ERROR
0010CC    4850 34B8               674            LH     R5,PASCNT         ELSE CHECK PASLA COUNT
0010D0    2335      =0010DA        675            BZS    INTR40            IF ZERO ERROR
0010D2    2751                    676            SIS    R5,1              ALLOW ONE INTERRUPT FOR EACH PASLA
0010D4    4050 34B8               677            STH    R5,PASCNT
0010D8    1800                    678            LPSWR  OLDPSW
                                  679  *
0010DA    C850 B032               680  INTR40    LHI    R5,X'B032'        UNEXPECTED INTERRUPT
```

FIRST LEVEL INTERRUPT HANDLER

```
0010DE      4180 1FFC          681              BAL     R8,ERRGET
0010E2      4057 0000          682              STH     R5,0(R7)             ERROR NUMBER 32
0010E6      4027 0002          683              STH     DEV,2(R7)            DEVICE ADDRESS
0010EA      4037 0004          684              STH     STAT,4(R7)           DEVICE STATUS
0010EE      5007 0008          685              ST      R0,8(R7)             OLD PSW STATUS
0010F2      5017 000C          686              ST      R1,12(R7)            OLD PSW LOC
0010F6      4180 2034          687              BAL     R8,ERRENQ            QUEUE MESSAGE
0010FA      1800               688              LPSWR   OLDPSW               RETURN TO INTERRUPTED TASK
                               689     *
                               690     *
                               691     *
            0000 10FC          692  INTRUPTA EQU      *
0010FC                         693              IFP     MAM
                               694     *
                               695     * MAM INTERRUPT
                               696     *
0010FC      DE20 3456          697              OC      DEV,MAMPIQR          READ PIQ ENTRY
001100      992A               698              RHR     DEV,R10              GET ENTRY
001102      65A0 4000 544C     699              ABL     R10,MAMPIQES         ADD THIS PIQ ENTRY TO THE LIST
001108      2347      =001116  700              BFCS    4,INTA1              LIST NOT FULL
00110A      6690 4000 544C     701              RTL     R9,MAMPIQES          ELSE REMOVE EARLIEST ENTRY
001110      65A0 4000 544C     702              ABL     R10,MAMPIQES         ADD TO LIST
001116      0892               703  INTA1       LR      R9,DEV               MAM ADDRESS
001118      1191               704              SLLS    R9,1                 DOUBLE ADDRESS
00111A      7349 28D8          705              LHL     DDBADR,DDBLKUP(R9)   FOR DDBADR INDEX
00111E      4330 105E          706              BZ      INTRUPT2             ERROR IF NO DDB FOR MAM
001122      0896               707              LR      R9,R6                GET PSW
001124      C490 00F0          708              NHI     R9,X'F0'             PRIORITY ONLY
001128      D494 0001          709              CLB     R9,PRIORITY(DDBADR)  PROPER PRIORITY FOR MAM
00112C      4230 1098          710              BNE     INTRUPT3             ELSE ERROR
001130      089A               711              LR      R9,R10               GET PIQ ENTRY
001132      4090 1228          712              STH     R9,LASTPIQ           SAVE LAST ENTRY
001136      C490 00FF          713              NHI     R9,X'FF'             DEVICE ADDRESS
00113A      0A29               714              AR      DEV,R9               10 BIT ADDR
00113C      9D23               715              SSR     DEV,STAT             SENSE STATUS OF RECV-XMIT
00113E      0892               716              LR      R9,DEV               USE DEVICE TO
001140      1191               717              SLLS    R9,1                 INDEX LOOK UP TABLE
001142      7349 28D8          718              LHL     DDBADR,DDBLKUP(R9)   DDB FOR DEVICE
001146      4330 105E          719              BZ      INTRUPT2             ABORT IF NO DDB
00114A      089A               720              LR      R9,R10               SAVE IT
00114C      C490 0F00          721              NHI     R9,X'F00'            REASON CODE
001150      1098               722              SRLS    R9,8                 SHIFT BITS
001152      C590 000F          723              CLHI    R9,X'F'              F  PROPER TERMINATION
001156      4330 1030          724              BE      INTRUPT0             YES
00115A      C590 0007          725              CLHI    R9,7                 7  SPECIAL CHARACTER TERM.
00115E      4330 1030          726              BE      INTRUPT0             YES
001162      248B               727              LIS     R8,QSZTYP            QSA ZBID MODE
001164      7484 0005          728              TBT     R8,DTYPFLGS(DDBADR)
001168      4330 1190          729              BZ      INTA2                NOT QSA ZBID MODE
00116C      C590 000A          730              CLHI    R9,X'A'              FOR QSA ZBID TEST FOR REASON CODE A
001170      4330 1030          731              BE      INTRUPT0             YES, NON-INSERTION BUFFER COMPLETE
001174      C590 000B          732              CLHI    R9,X'B'              OR  B  FRAME TRANS COMPLETE
001178      4330 1030          733              BE      INTRUPT0             YES
```

FIRST LEVEL INTERRUPT HANDLER

```
00117C      C590 000C           734           CLHI    R9,X'C'              OR  C  INTERFRAME IDLE
001180      4330 1030           735           BE      INTRUPT0             YES
001184      C590 000E           736           CLHI    R9,X'E'              OR  E  GOOD FRAME TERM.
001188      4330 1030           737           BE      INTRUPT0             YES
00118C      4300 11C4           738           B       INTA4                LASTLY, TEST FOR RC  3
001190      248A                739  INTA2    LIS     R8,PASLTYP           IF PASLA DEVICE
001192      7484 0006           740           TBT     R8,DTYPFLGS(DDBADR)
001196      4330 11C4           741           BZ      INTA4                NOT PASLA
00119A      4524 0038           742           CLH     DEV,RDEVADR(DDBADR)  AND A RECEIVER DEVICE
*00119E     213F      =0011BC   743           BNE     INTA33               NOT RECV DEVICE
0011A0      C590 0003           744           CLHI    R9,3                 TEST  3  BUFFER NOT AVAILABLE
0011A4      2338      =0011B4   745           BES     INTA3                YES
0011A6      4884 002E           746           LH      R8,DVRWRK2+2(DDBADR) AND THE FIRST BUFFER TRANSFER
0011AA      4230 11CC           747           BNZ     INTA5                NO, THEN ERROR
0011AE      C590 0006           748           CLHI    R9,6                 EXPECT RC  6  FIRST BAD STATUS
0011B2      213D      =0011CC   749           BNES    INTA5                ELSE ERROR
0011B4      2486                750  INTA3    LIS     R8,DEVCNTL1          SET FLAG FOR THIS CONDITION
0011B6      7584 0000           751           SBT     R8,DSPFLGS(DDBADR)   IN PASLA DEVICE
0011BA      1800                752           LPSWR   OLDPSW               AND RETURN
                                753  *
0011BC      C590 0006           754  INTA33   CLHI    R9,6                 ALLOW RC 6 FOR PASLA RECV
0011C0      4330 1030           755           BE      INTRUPT0
0011C4      C590 0003           756  INTA4    CLHI    R9,3                 RC  3  BUFFER NOT AVAILABLE
0011C8      4330 1030           757           BE      INTRUPT0             YES  ELSE ERROR
                                758  *
0011CC      2481                759  INTA5    LIS     R8,BUSY
0011CE      7684 0000           760           RBT     R8,DSPFLGS(DDBADR)   RESET BUSY
0011D2      C880 0018           761           LHI     R8,PHASE.6           PHASE 6 NEXT
0011D6      4084 0002           762           STH     R8,PHASE(DDBADR)     SHUT DOWN THE DEVICE
0011DA      2483                763           LIS     R8,BADSTAT           BAD STATUS
0011DC      7484 0000           764           TBT     R8,DSPFLGS(DDBADR)   TEST FOR BAD STATUS BIT
0011E0      4230 1208           765           BNZ     INTA7                BIT ALREADY SET
0011E4      248A                766           LIS     R8,PASLTYP           PASLA TYPE
0011E6      7484 0006           767           TBT     R8,DTYPFLGS(DDBADR)  TEST FOR PASLA TYPE
0011EA      2338      =0011FA   768           BZS     INTA6                NO
0011EC      2481                769           LIS     R8,1                 ELSE INCREMENT
0011EE      6180 34B8           770           AHM     R8,PASCNT            PASLA COUNT
0011F2      2486                771           LIS     R8,DEVCNTL1          AND CLEAR
0011F4      7584 0000           772           SBT     R8,DSPFLGS(DDBADR)   PASLA TERMINATION FLAG
0011F8      2308      =001208   773           BS      INTA7                PRINT ERROR
                                774  *
0011FA      248B                775  INTA6    LIS     R8,QSZTYP            TEST
0011FC      7484 0006           776           TBT     R8,DTYPFLGS(DDBADR)  FOR QSA ZBID TYPE
001200      2334      =001208   777           BZS     INTA7                PRINT ERROR
001202      2481                778           LIS     R8,1                 INCREMENT
001204      6180 34BC           779           AHM     R8,QSZCNT            QSA ZBID COUNT
                                780  *
001208      C850 A082           781  INTA7    LHI     R5,X'A082'           ELSE ERROR 82
00120C      08BA                782           LR      R11,R10              SAVE LATEST PIQ ENTRY
00120E      4180 1FFC           783           BAL     R8,ERRGET
001212      4057 0000           784           STH     R5,0(R7)             ERROR NUMBER 82
001216      4027 0002           785           STH     DEV,2(R7)            DEVICE ADDRESS
00121A      4037 0004           786           STH     STAT,4(R7)           DEVICE STATUS
```

FIRST LEVEL INTERRUPT HANDLER

```
00121E      50B7 0008              787              ST    R11,8(R7)         PIQ ENTRY
001222      4180 2034              788              BAL   R8,ERRENQ         QUEUE MESSAGE
001226      1800                   789              LPSWR OLDPSW            RETURN TO DISPATCHER
001228                             790   LASTPIQ    DS    2                 LAST PIQ ENTRY
                                   791   *
                                   792              ENDC
00122A      4300 1004              793              B     INTRUPTM
                                   794   *
```

COMMAND PROCESSOR

```
                                     796  *CMNDPROC -- READ COMMANDS AND CALL PROPER COMMAND EXECUTION ROUTINE  *
                                     797  *                                                                    *
                                     798  *   RUNS UNDER PSW AT LOCATION CMNDPSW.                               *
                                     799  *COMMAND FORMAT:                                                      *
                                     800  *        CMND PARM1,PARM2,PARM3,...,PARMN                             *
                                     801  *  CMND IS THREE OR FOUR LETTER COMMAND NAME, FOLLOWED BY             *
                                     802  *  ONE AND ONLY ONE BLANK, OR LINE TERMINATOR.                        *
                                     803  *  PARAMETERS ARE POSITIONAL, SEPARATED BY COMMAS, WITH NO            *
                                     804  *  EMBEDDED BLANKS.  A DEFAULT VALUE IS USED FOR MISSING PARAMETERS.  *
                                     805  *                                                                    *
                                     806  *   OUTPUT PROMPTING CHARACTER
00122E     E6D0 33F0                 807  CMNDPROC LA     R13,PROMPTS
001232     E6E0 33F0                 808           LA     R14,PROMPTE
001236     41F0 232E                 809           BAL    R15,CONPRINT        OUTPUT OPERATOR PROMPT
00123A     48F0 34B2                 810           LH     R15,MAMADR          MAM AVAILBLE
00123E     2333        =001244       811           BZS    CMND00              NO
001240     41C0 BA46   =004C8A       812           BAL    R12,MAMIDLE         IDLE MAM AND ALL DEVICES
                                     813  *   READ COMMAND
001244     E6D0 30DC                 814  CMND00   LA     R13,CMNDBUFS        START OF COMMAND BUFFER
001248     E6E0 312B                 815           LA     R14,CMNDBUFE        END OF COMMAND BUFFER
00124C     F890 2020 2020            816           LI     R9,Y'20202020'      BLANK OUT START OF BUFFER
001252     509D 0000                 817           ST     R9,0(R13)           NOTE: THIS BUFFER MUST BE        *****
001256     509D 0004                 818           ST     R9,4(R13)           ON FULLWORD BOUNDRY
00125A     41F0 235C                 819           BAL    R15,CONREAD         READ THE COMMAND
00125E     58AD 0000                 820           L      R10,0(R13)          GET FOUR CHARACTER COMMAND
001262     E6BD 0003                 821           LA     R11,3(R13)          MAY BE 3 CHAR CMND, CHECK DELIM
001266     D38B 0000                 822           LB     R8,0(R11)           LOOK AT FOURTH CHARACTER
00126A     C580 0026                 823           CLHI   R8,X'26'            TERMINATOR ?
00126E     2183        =001274       824           BLS    CMND01              BB IF YES...3 CHARACTERS
001270     26B1                      825           AIS    R11,1               4 CHAR CMND, ADVANCE POINTER
001272     2302        =001276       826           BS     CMND04              GO LOOK UP COMMAND
001274     929A                      827  CMND01   STBR   R9,R10              FORCE FOURTH CHARACTER TO BLANK
                                     828  *
                                     829  *   HAVE ASSEMBLED COMMAND IN R10, R11 POINTS TO LEADING PARM DELIMITER*
                                     830  *   LOOK FOR COMMAND IN ACTION COMMAND TABLE
                                     831  *
001276     E650 34F4                 832  CMND04   LA     R5,ACMNDTBL         START OF TABLE
00127A     2468                      833           LIS    R6,8                ENTRY SIZE
00127C     E670 35BC                 834           LA     R7,ACMNDEND         END OF TABLE
001280     55A5 0000                 835  CMND05   CL     R10,0(R5)           IS THIS THE COMMAND?
001284     2334        =00128C       836           BES    CMND06              B IF YES
001286     C150 1280                 837           BXLE   R5,CMND05           LOOK AT NEXT COMMAND
00128A     2306        =001296       838           BS     CMND07              B IF NOT ACTION COMMAND
00128C     5855 0004                 839  CMND06   L      R5,4(R5)            ADDRESS OF COMMAND ROUTINE FROM TABL
001290     0105                      840           BALR   R0,R5               CALL COMMAND ROUTINE
001292     4300 122E                 841           B      CMNDPROC            GET NEXT COMMAND
                                     842  *
                                     843  *   LOOK FOR DEVICE IN DDB TABLE
                                     844  *
001296     E650 35C4                 845  CMND07   LA     R5,DEV2DDB          START OF TABLE
00129A     E670 37BC                 846           LA     R7,DEV2DDBE         END OF TABLE
00129E     55A5 0000                 847  CMND08   CL     R10,0(R5)           IS IT THIS DEVICE?
0012A2     233B        =0012E8       848           BES    CMND09              B IF YES
```

COMMAND PROCESSOR

```
C012A4      C150 129E           849            BXLE    R5,CMND08            LOOP FOR ALL DEVICES
0012A8      E6D0 3218           850            LA      R13,ERR3MESS         COMMAND OR DEVICE NOT FOUND
0012AC      E6E0 3237           851            LA      R14,ERR3MESE
0012B0      41F0 232E           852            BAL     R15,CONPRINT         PRINT ERROR
C012B4      4300 122E           853            B       CMNDPROC             GET NEXT COMMAND
            0000 12B8           854    CMND09   EQU     *                    DEVICE ACTION COMMAND
0012B8      5845 0004           855            L       DDBADR,4(R5)         GET DDBADR FROM TABLE
0012BC      41E0 2298           856            BAL     R14,DSTFIND          DEVICE ALREADY IN TABLE?
0012C0      08FF                857            LR      R15,R15              CHECK RETURN CODE
*0012C2     213F      =0012F0   858            BNZ     CMND10               B IF YES...ALREADY SELECTED
0012C4      D35B 0000           859            LB      R5,0(R11)            IF NEXT BYTE IN BUFFER IS %,
C012C8      C550 0025           860            CLHI    R5,X'25'             THIS IS A DELETE COMMAND
0012CC      4230 12FC           861            BNE     CMND11               B IF NOT DELETE
0012D0      E6D0 3238           862            LA      R13,ERR4MESS         DELETING A DEVICE WHICH IS NOT
0012D4      E6E0 324F           863            LA      R14,ERR4MESE         CURRENTLY SELECTED IS A NONO.
0012D8      41F0 232E           864            BAL     R15,CONPRINT         PRINT WARNING
0012DC      4300 122E           865            B       CMNDPROC             GET NEXT COMMAND
C012E0      41E0 22C0           866    CMND10   BAL     R14,DSTREMOV         REMOVE DEVICE BEFORE CONTINUING
0012E4      D35B 0000           867            LB      R5,0(R11)            IF NEXT BYTE IN BUFFER IS %,
0012E8      C550 0025           868            CLHI    R5,X'25'             THIS IS A DELETE COMMAND
0012EC      4330 122E           869            BE      CMNDPROC             B IF DELETE, WE'RE DONE
0012F0      E6D0 3250           870            LA      R13,ERR5MESS         WARNING, DEVICE PREVIOUSLY
0012F4      E6E0 326B           871            LA      R14,ERR5MESE         SELECTED
C012F8      41F0 232E           872            BAL     R15,CONPRINT         PRINT WARNING
            0000 12FC           873    CMND11   EQU     *                    CHECK PARAMETERS AND ADD DEVICE
                                874    *
                                875    *PARAMETER FLAG ZERO, DEVICE ADDRESS
                                876    *
C012FC      4864 0004           877    PARMFLG0 LH      R6,PARMFLGS(DDBADR)  TEST BIT ZERO IN FLAGS
001300      3466                878            EXHR    R6,R6                PUT FLAGS INTO HIGH BITS
001302      0866                879            LR      R6,R6                TEST BIT ZERO
001304      2315      =00130E   880            BNMS    PARMFLG1             B IF NOT SELECTED
001306      4190 13F6           881            BAL     R9,NEXTPARM          CONVERT NEXT PARAMETER
00130A      40D4 0008           882            STH     R13,DEVADR(DDBADR)   DEVICE ADDRESS INTO DDB
                                883    *
                                884    *PARAMETER FLAG ONE, CONTROLLER ADDRESS
                                885    *
00130E      0A66                886    PARMFLG1 AR      R6,R6                TEST BIT ONE
001310      2315      =00131A   887            BNMS    PARMFLG2             B IF NOT SELECTED
001312      4190 13F6           888            BAL     R9,NEXTPARM          CONVERT CONTROLLER ADDRESS
001316      40D4 004A           889            STH     R13,CONTADR(DDBADR)  INTO DDB
                                890    *
                                891    *PARAMETER FLAG TWO, SELCH ADDRESS
                                892    *
00131A      0A66                893    PARMFLG2 AR      R6,R6                TEST BIT TWO
C0131C      2315      =001326   894            BNMS    PARMFLG3             B IF NOT SELECTED
C0131E      4190 13F6           895            BAL     R9,NEXTPARM          CONVERT SELCH ADDRESS
C01322      40D4 0048           896            STH     R13,SELCHADR(DDBADR) INTO DDB
                                897    *
                                898    *PARAMETER FLAG THREE, PRIORITY
                                899    *
001326      0A56                900    PARMFLG3 AR      R6,R6                TEST BIT THREE
C01328      2316      =001334   901            BNMS    PARMFLG4             B IF NOT SELECTED
```

COMMAND PROCESSOR

00132A	4190 13F6		902		BAL R9,NEXTPARM	CONVERT PRIORITY
00132E	11D4		903		SLLS R13,4	POSITION FOR TESTING
001330	D2D4 0001		904		STB R13,PRIORITY(DDBADR)	INTO DDB
			905	*		
			906	*PARAMETER FLAG FOUR, MAX DISPATCH COUNT		
			907	*		
001334	0A66		908	PARMFLG4 AR	R6,R6	TEST BIT FOUR
001336	2315	=001340	909		BNMS PARMFLG5	B IF NOT SELECTED
001338	4190 13F6		910		BAL R9,NEXTPARM	CONVERT MAX DSPCH
00133C	50D4 001C		911		ST R13,MAXDSPCH(DDBADR)	INTO DDB
			912	*		
			913	*PARAMETER FLAG FIVE, CYLINDER ADDRESS LIMITS		
			914	*		
001340	0A66		915	PARMFLG5 AR	R6,R6	TEST BIT FIVE
*001342	231E	=00135F	916		BNM PARMFLG6	B IF NOT SELECTED
001344	4190 13F6		917		BAL R9,NEXTPARM	CONVERT CYLINDER LOW LIMIT
001348	40D4 004C		918		STH R13,CYLLOW(DDBADR)	INTO DDB
00134C	D37B 0000		919		LB R7,0(R11)	LOOK AT BYTE WHICH STOPPED SCAN
001350	C570 002D		920		CLHI R7,X'2D'	IF IT IS HYPHEN, HIGH LIMIT IS NEXT
001354	2133	=00135A	921		BNES PFLG5L1	B IF NO HIGH LIMIT
001356	4190 13F6		922		BAL R9,NEXTPARM	CONVERT CYLINDER HIGH LIMIT
00135A	40D4 004E		923	PFLG5L1 STH	R13,CYLHIGH(DDBADR)	INTO DDB
			924	*		
			925	*PARAMETER FLAG SIX, HEAD ADDRESS LIMITS		
			926	*		
00135E	0A66		927	PARMFLG6 AR	R6,R6	TEST BIT SIX
*001360	231E	=00137C	928		BNM PARMFLG7	B IF NOT SELECTED
001362	4190 13F6		929		BAL R9,NEXTPARM	CONVERSION SIMILAR TO CYL LIMITS
001366	40D4 0050		930		STH R13,HEADLOW(DDBADR)	
00136A	D37B 0000		931		LB R7,0(R11)	
00136E	C570 002D		932		CLHI R7,X'2D'	
001372	2133	=001378	933		BNES PFLG6L1	
001374	4190 13F6		934		BAL R9,NEXTPARM	
001378	40D4 0052		935	PFLG6L1 STH	R13,HEADHIGH(DDBADR)	
			936	*		
			937	*PARAMETER FLAG SEVEN, SECTOR ADDRESS LIMITS		
			938	*		
00137C	0A66		939	PARMFLG7 AR	R6,R6	TEST BIT SEVEN
*00137E	231E	=00139A	940		BNM PARMFLG8	B IF NOT SELECTED
001380	4190 13F6		941		BAL R9,NEXTPARM	CONVERSION SIMILAR TO CYL LIMITS
001384	40D4 0054		942		STH R13,SCTRLOW(DDBADR)	
001388	D37B 0000		943		LB R7,0(R11)	
00138C	C570 002D		944		CLHI R7,X'2D'	
001390	2133	=001396	945		BNES PFLG7L1	
001392	4190 13F6		946		BAL R9,NEXTPARM	
001396	40D4 0056		947	PFLG7L1 STH	R13,SCTRHIGH(DDBADR)	
			948	*		
			949	*PARAMETER FLAG EIGHT, MEMORY LIMITS		
			950	*		
00139A	0A66		951	PARMFLG8 AR	R6,R6	TEST BIT EIGHT
00139C	2319	=0013AE	952		BNES PARMFLG9	B IF NOT SELECTED
00139E	4190 13F6		953		BAL R9,NEXTPARM	CONVERT LOW MEMORY LIMIT
0013A2	50D4 0030		954		ST R13,MEMLOW(DDBADR)	INTO DDB

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COMMAND PROCESSOR

```
0013A6      4190 13F6              955          BAL    R9,NEXTPARM       CONVERT HIGH MEMORY LIMIT
0013AA      50D4 0034              956          ST     R13,MEMHIGH(DDBADR) INTO DDB
                                   957   *
                                   958   *
                                   959   *PARAMETER FLAG NINE, RECEIVER ADDRESS
                                   960   *
0013AE      0A66                   961   PARMFLG9 AR    R6,R6             TEST BIT NINE
0013B0      2315        =0013BA    962          BNMS   PARMFLGA          B IF NOT SELECTED
0013B2      4190 13F6              963          BAL    R9,NEXTPARM       CONVERT TO RECV ADDR
0013B6      40D4 0038              964          STH    R13,RDEVADR(DDBADR) RECV ADDR
                                   965   *
                                   966   *PARAMETER FLAG TEN, FIRST AND LAST DEVICE ADDR ON MAM
                                   967   *
0013BA      0A66                   968   PARMFLGA AR    R6,R6             TEST BIT TEN
0013BC      2319        =0013CE    969          BNMS   PARMFLGG          NO
0013BE      4190 13F6              970          BAL    R9,NEXTPARM       CONVERT TO DEV ADDR
0013C2      40D4 0028              971          STH    R13,MAMFDA(DDBADR) FIRST DEVICE ADDR
0013C6      4190 13F6              972          BAL    R9,NEXTPARM       CONVERT TO DEV ADDRESS
0013CA      40D4 002A              973          STH    R13,MAMLDA(DDBADR) LAST DEVICE ADDR
                                   974   *
                                   975   *PARAMETER FLAGS B TO F  CURRENTLY RESERVED
                                   976   *
            0000 13CE              977   PARMFLGG EQU   *
                                   978   * CALL PARM CHECK ROUTINE TO VERIFY AND SUPPLY DEFAULTS.
                                   979   *
0013CE      58F4 0024              980          L      R15,PARMCHCK(DDBADR)
0013D2      01EF                   981          BALR   R14,R15
0013D4      08FF                   982          LR     R15,R15           CHECK RETURN CODE
0013D6      2333        =0013DC    983          BZS    CMND12            B IF OK
                                   984   * ERROR, NOT SELECTED. PARMCHECK SHOULD PRINT MESSAGE
0013D8      4300 122E              985          B      CMNDPROC          GET NEXT COMMAND
                                   986   *
                                   987   * ADD DEVICE TO TABLE
0013DC      41E0 227C              988   CMND12   BAL   R14,DSTADD        ADD DEVICE TO TABLE
0013E0      08FF                   989          LR     R15,R15           CHECK IF ADDED OK
0013E2      4330 122E              990          BZ     CMNDPROC          B IF YES
0013E6      E6D0 326C              991          LA     R13,ERR6MESS      DEVICE SERVICE TABLE FULL, NOT ADDED
0013EA      E6E0 328D              992          LA     R14,ERR6MESE
0013EE      41F0 232E              993          BAL    R15,CONPRINT      PRINT ERROR
0013F2      4300 122E              994          B      CMNDPROC          GET NEXT COMMAND
                                   995   *
                                   996   *NEXTPARM -- COMMON ROUTINE FOR PARM DECODE SECTION OF DEVICE SELECTION
                                   997   *                                                          *
                                   998   *   EXPECTS REGISTER SETUP FOR PARMSCAN.  CALLS PARMSCAN.  IF      *
                                   999   *   RETURN CODE IS 0 OR 2, RETURNS TO CALLER.                      *
                                   1000  *   RC=4 CAUSES BRANCH TO CMNDERR1 FOR MESSAGE PRINT.              *
                                   1001  *   RC=6  CAUSES BRANCH TO CMNDERR2 FOR MESSAGE PRINT.             *
                                   1002  *                                                                 *
                                   1003  *CALLING SEQUENCE                                                 *
                                   1004  *        BAL    R9,NEXTPARM                                        *
                                   1005  *                                                                 *
0013F6      41E0 2134              1006  NEXTPARM BAL   R14,PARMSCAN      CONVERT NEXT PARAMETER
0013FA      430F 13FE              1007  PARM.ERR B     *+4(R15)          BRANCH INTO BRANCH TABLE TO CHECK RC
```

COMMAND PROCESSOR

```
0013FE    2304    =001406    1008         BS    NXTPRME       RC=0  VALUE OK
001400    2303    =001406    1009         BS    NXTPRME       RC=2  FC VALUE, DEFAULT TO ZERO
001402    2303    =001408    1010         BS    CMNDERR1      RC=4  BAD FORMAT
001404    230A    =001418    1011         BS    CMNDERR2      RC=6  BAD DIGIT
001406    0309               1012  NXTPRME BR   R9            RETURN TO CALLER, VALUE IN R13
                            1013    *
001408    E6D0 31E6          1014  CMNDERR1 LA  R13,ERR1MESS   INVALID COMMAND FORMAT
00140C    E6F0 3201          1015          LA   R14,ERR1MESE
001410    41F0 232E          1016          BAL  R15,CONPRINT   PRINT MESSAGE
001414    4300 122E          1017          B    CMNDPROC
                            1018    *
001418    E6D0 3202          1019  CMNDERR2 LA  R13,ERR2MESS   INVALID HEX DIGIT
00141C    E6E0 3217          1020          LA   R14,ERR2MESE
001420    41F0 232E          1021          BAL  R15,CONPRINT   PRINT MESSAGE
001424    4300 122E          1022          B    CMNDPROC
```

DEVICE DISPATCHER

```
                                        1024  *DISPATCHER -- ATTEMPTS TO KEEP ALL DEVICES BUSY            *
                                        1025  *                                                          *
                                        1026  *   CHECKS IF CONSOLE DEVICE BUSY. IF NOT BUSY, FORMATS AND PRINTS  *
                                        1027  * NEXT ERROR MESSAGE.  IF CONSOLE BUSY, OR NO MESSAGES TO PRINT,    *
                                        1028  * SEARCHES DEVICE SERVICE TABLE FOR A DEVICE TO DISPATCH.  COUNTS   *
                                        1029  * BUSY PASSES AND DISPATCH PASSES FOR EACH DEVICE.          *
                                        1030  *                                                          *
                                        1031  *   RUNS UNDER PSW 'DSPCHER' USING REGISTER SET F, ALL INTERRUPTS   *
                                        1032  * ENABLED, EXCEPT PROTECT MODE.  IMMEDIATE INTERRUPT MUST BE ENABLED. *
                                        1033  * OTHER INTERRUPTS MAY BE DISABLED BY USER IF DESIRED BEFORE RUN    *
                                        1034  * COMMAND IS EXECUTED.                                      *
                                        1035  *                                                          *

                                        1037  *
                                        1038  * CHECK IF CONSOLE NEEDS SERVICE.
                                        1039  *
001428      2400                        1040  DISPATCH LIS   R0,0               CONSTANT 0                  R09
00142A      E640 25BC                   1041           LA    DDBADR,CONDDB      FIND CONSOLE DDB
00142E      2457                        1042           LIS   R5,DEVCNTL2        TEST ERROR PRINT IN PROGRESS
001430      7454 0000                   1043           TBT   R5,DSPFLGS(DDBADR)
001434      4230 147A                   1044           BNZ   DSPCH01            B IF PRINTING ERROR
                                        1045  * GET NEXT ERROR MESSAGE TO PRINT
001438      6670 2690                   1046           RTL   R7,ERRORQ          REMOVE FROM QUEUE
00143C      2348        =00144C         1047           BNOS  DSPCH001           B IF QUEUE NOT EMPTY
00143E      D370 0A1C                   1048           LB    R7,CONTYP
001442      2771                        1049           SIS   R7,1              IF CONSOLE IS ON PASLA,
001444      4330 3BE2                   1050           BZ    RUN10B             START OUTPUT OF ACTIVITY BUFFER
001448      4300 147A                   1051           B     DSPCH01
                                        1052  *
00144C      E6D0 312C                   1053  DSPCH001 LA    R13,OUTBUF         PRINT BUFFER FOR FORMATTED MESSAGE
001450      41F0 2078                   1054           BAL   R15,FMATERR        FORMAT MESSAGE
001454      50D4 0030                   1055           ST    R13,BUF1STRT(DDBADR) START OF ERROR BUFFER
001458      50E4 0034                   1056           ST    R14,BUF1END(DDBADR) END OF ERROR BUFFER
00145C      50D4 0038                   1057           ST    R13,BUF1NEXT(DDBADR) FIRST BYTE IS NEXT BYTE
001460      6570 26EC                   1058           ABL   R7,BUFPOOL         FREE INTERNAL ERROR BUFFER
001464      2484                        1059           LIS   R8,PHASE.1         READY FOR PHASE ONE, ADC START
                                        1060  * TEMPORARILY NON INTERRUPTABLE WHILE MODIFYING CONTROL BLOCKS
001466      95EE                        1061           EPSR  R14,R14            CURRENT STATUS
001468      08DE                        1062           LR    R13,R14            SAVE A COPY
00146A      C4D0 B7FF                   1063           NHI   R13,X'B7FF'        CLEAR ENABLE BITS
00146E      95AD                        1064           EPSR  R10,R13            UNINTERRUPTABLE
001470      4084 0002                   1065           STH   R8,PHASE(DDBADR)   SET ADC START PHASE
001474      4100 157A                   1066           BAL   R0,DRIVER          CALL DRIVER
001478      95AE                        1067           EPSR  R10,R14            RESTORE STATUS
                                        1068  *
                                        1069  * CHECK IF ANY DEVICE ON TABLE NEEDS SERVICE
                                        1070  *
00147A      5860 226E                   1071  DSPCH01  L     R6,DSTNEXT         ADDRESS OF NEXT TABLE ENTRY
00147E      5960 2264                   1072           C     R6,DSTLAST         REACHED END OF TABLE?
001482      4320 14AE                   1073           BFC   2,DSPCH03          B IF NO, SERVICE NEXT ENTRY
001486      E660 21E8                   1074           LA    R6,DST             SET NEXT POINTER TO
00148A      5060 2268                   1075           ST    R6,DSTNEXT         TOP OF TABLE
                                        1076  * UPDATE DISPATCH COUNT AND DISPLAY
```

DEVICE DISPATCHER

```
001488    2421              1077         LIS    DEV,1             DISPLAY ADDRESS
001490    5120 268C         1078         AM     DEV,DSPCHCNT      BUMP COUNT
001494    DE20 3465         1079         OC     DEV,DSPLYINC      DISPLAY TO INCREMENT MODE
001498    DA20 B111 =0045A3 1080         WD     DEV,BLINKY+3      DEVICE BITS, FIRST HALFWORD
00149C    DA20 B10C =0045AC 1081         WD     DEV,BLINKY+2      LOW BYTE OF COUNT
0014A0    DA20 B107 =0045AE 1082         WD     DEV,BLINKY+1
0014A4    DA20 B102 =0045AA 1083         WD     DEV,BLINKY        SECOND BYTE OF COUNT
0014A8    0744              1084 DSPCH02 XR     DDBADR,DDBADR     NO DDB FOR BACKGROUND TESTS
0014AA    4300 1588         1085         B      BACKGRND          GO TO BACKGROUND TESTING
                            1086 *
                            1087 *   SERVICE NEXT DEVICE
                            1088 *
0014AE    5846 0000         1089 DSPCH03 L      DDBADR,0(R6)      GET ADDRESS OF NEXT ENTRY
0014B2    2664              1090         AIS    R6,4              ADVANCE POINTER
0014B4    5060 2268         1091         ST     R6,DSTNEXT        SAVE FOR NEXT TIME THROUGH
0014B8    2456              1092         LIS    R5,FLOPTYP
0014BA    7454 0006         1093         TBT    R5,DTYPFLGS(DDBADR)
0014BE    2337      =0014CC 1094         BZS    DSPCH03A
0014C0    D360 3498         1095         LB     R6,FMDRIVE
0014C4    4564 002E         1096         CLH    R6,DVRWRK2+2(DDBADR)
0014C8    4230 1428         1097         BNE    DISPATCH
0014CC    2450              1098 DSPCH03A LIS   R5,IGNORE         CHECK IGNORE FLAG SET
0014CE    7454 0000         1099         TBT    R5,DSPFLGS(DDBADR)
0014D2    4230 1428         1100         BNZ    DISPATCH          B IF SET, LOOP FOR NEXT ENTRY
0014D6    2451              1101         LIS    R5,BUSY           CHECK BUSY FLAG SET
0014D8    7454 0000         1102         TBT    R5,DSPFLGS(DDBADR)
0014DC    4330 1522         1103         BZ     DSPCH04           B IF NOT BUSY
0014E0    2452              1104         LIS    R5,NOTCOUNT       ARE WE COUNTING BUSY PASSES?
0014E2    7454 0000         1105         TBT    R5,DSPFLGS(DDBADR)
0014E6    4230 1428         1106         BNZ    DISPATCH          B IF NO
0014EA    4860 2640         1107         LH     R6,CPUSWTCH       INCREMENT ADJUSTED BY CPU SPEED
0014EE    5164 0014         1108         AM     R6,CURWAIT(DDBADR) INCREMENT WAIT COUNT
0014F2    5874 0014         1109         L      R7,CURWAIT(DDBADR) IS CURRENT WAIT COUNT
0014F6    5974 0010         1110         C      R7,MAXWAIT(DDBADR) LESS THAN MAXIMUM?
0014FA    4280 1428         1111         BL     DISPATCH          B IF YES
                            1112 *  DEVICE HAS TIMED OUT, GENERATE ERROR
0014FE    4180 1FFC         1113         BAL    R8,ERRGET         GET INTERNAL ERROR BUFFER
001502    C880 8033         1114         LHI    R8,X'8033'        DEV, STATUS, ERROR 33
001506    4087 0000         1115         STH    R8,0(R7)
00150A    4884 0008         1116         LH     R8,DEVADR(DDBADR) DEVICE ADDRESS
00150E    4087 0002         1117         STH    R8,2(R7)
001512    D384 000A         1118         LB     R8,STATUS(DDBADR) DEVICE STATUS
001516    4087 0004         1119         STH    R8,4(R7)
00151A    4180 2034         1120         BAL    R8,ERRENQ         QUEUE ERROR MESSAGE
00151E    4300 1428         1121         B      DISPATCH          SERVICE NEXT DEVICE
                            1122 *
                            1123 *  DEVICE NOT BUSY, TRY TO GO TO DRIVER
                            1124 *
001522    2460              1125 DSPCH04 LIS    R6,0              NOT WAITING,
001524    5064 0014         1126         ST     R6,CURWAIT(DDBADR) CLEAR WAIT COUNT
001528    2452              1127         LIS    R5,NOTCOUNT       ARE WE COUNTING DISPATCHES?
00152A    7454 0000         1128         TBT    R5,DSPFLGS(DDBADR)
00152E    4230 1572         1129         BNZ    DSPCH05           B IF NO
```

DEVICE DISPATCHER

```
001532        2461                1130            LIS     R6,1
001534        5164 0020           1131            AH      R6,CURDSPCH(DDBADR) NCREMENT DISPATCH COUNT
001538        5874 001C           1132            L       R7,MAXDSPCH(DDBADR) IF MAX IS ZERO, DON'T CHECK
00153C        4330 1572           1133            BZ      DSPCH05             B IF NO MAXIMUM
001540        5974 0020           1134            C       R7,CURDSPCH(DDBADR) HAVE WE REACHED MAX?
001544        4220 1572           1135            BTC     2,DSPCH05           B IF NO
                                  1136    * DEVICE DISPATCHED MAX TIMES, START IGNORING IT
001548        2450                1137            LIS     R5,IGNORE           SET IGNORE FLAG
00154A        7554 0000           1138            SBT     R5,DSPFLGS(DDBADR)
00154E        4180 1FFC           1139            BAL     R8,ERRGET           GET ERROR BUFFER SO CAN TELL USER
001552        C880 8099           1140            LHI     R8,X'8099'          DISPATCHING DISCONTINUED
001556        4087 0000           1141            STH     R8,0(R7)
00155A        4884 0008           1142            LH      R8,DEVADR(DDBADR)   DEVICE ADDRESS
00155E        4087 0002           1143            STH     R8,2(R7)
001562        D384 000A           1144            LB      R8,STATUS(DDBADR)   STATUS
001566        4087 0004           1145            STH     R8,4(R7)
00156A        4180 2034           1146            BAL     R8,ERRENQ           QUEUE ERROR MESSAGE
00156E        4300 1428           1147            B       DISPATCH            SERVICE NEXT DEVICE
                                  1148    *
                                  1149    * DEVICE AVAILABLE FOR SERVICE, GO TO DRIVER
                                  1150    *
001572        4100 157A           1151    DSPCH05 BAL     R0,DRIVER           CALL DRIVER
001576        4300 1428           1152            B       DISPATCH            CONTINUE DISPATCHING


00157A        5814 000C           1154    DRIVER  L       R1,DVRENTRY(DDBADR) GET ADDRESS OF PHASE TABLER04
00157E        4A14 0002           1155            AH      R1,PHASE(DDBADR)    PLUS CURRENT DRIVER PHASE R04
001582        5811 0000           1156            L       R1,0(R1)            FETCH ROUTINE ADDRESS       R04
001586        0301                1157            BR      R1                  GO TO IT                    R04
```

```
                                       1159  *    MOST BACKGROUND TESTS ARE IN TWO PARTS: A TEST WHICH SHOULD CAUSE *
                                       1160  * AN INTERRUPT, AND THE CORRESPONDING INTERRUPT HANDLER.  THE SAME    *
                                       1161  * INTERRUPT HANDLERS ALSO TRAP UNEXPECTED INTERRUPTS OF THAT TYPE.    *
                                       1162  *                                                                    *

001588    2453                         1164  BACKGRND LIS   R5,BCKSWTCH
00158A    7450 263E                    1165           TBT   R5,SWITCHES          BACKGROUND TESTING SELECTED?
00158E    4330 196F                    1166           BZ    MACTEST              B IF NO
001592    0000                         1167  ILLEGAL  DC    H'0'                 ILLEGAL INSTRUCTION
001594    2303        =00159A          1168           BS    ILG1                 COME HERE IF NO INTERRUPT
001596    4300 15B8                    1169           B     USER                 COME HERE IF INTERRUPT OK
00159A    4180 1FFC                    1170  ILG1     BAL   R8,ERRGET
00159E    C890 3005                    1171           LHI   R8,X'3005'           EXPECTED ILLEGAL DIDN'T OCCUR
0015A2    4087 0000                    1172           STH   R8,0(R7)
0015A6    9588                         1173           EPSR  R8,R8                OLD PSW STATUS
0015A8    5087 0008                    1174           ST    R8,8(R7)
0015AC    F680 1592                    1175           LA    R8,ILLEGAL           LOCATION OF ILLEGAL THAT WASN'T
0015B0    5087 000C                    1176           ST    R8,12(R7)
0015B4    4180 2034                    1177           BAL   R8,ERRENO            PRINT MESSAGE
                                       1178  *
0015B8    9566                         1179  USER     EPSR  R6,R6                GET CURRENT STATUS
0015BA    C660 0100                    1180           OHI   R6,X'100'            SET USER MODE
0015BE    9556                         1181           EPSR  R5,R6                ENTER USER MODE
0015C0    9565                         1182  USERMODE EPSR  R6,R5                EXECUTE PRIVLEGED INSTRUCTION
0015C2    2302        =0015C6          1183           BS    USER1                COME HERE IF NO INTERRUPT
*0015C4   230F        =0015E2          1184           B     SIMULATE             HERE IF INTERRUPT OK
                                       1185  * NOTE: INTERRUPT HANDLER CLEARS USER MODE BEFORE RETURNING
0015C6    4180 1FFC                    1186  USER1    BAL   R8,ERRGET
0015CA    C880 3011                    1187           LHI   R8,X'3011'           EXPECTED PRIVLEGE DIDN'T OCCUR
0015CE    4087 0000                    1188           STH   R8,0(R7)
0015D2    5057 0008                    1189           ST    R5,8(R7)             OLD PSW STATUS
0015D6    E680 15C0                    1190           LA    R8,USERMODE
0015DA    5087 000C                    1191           ST    R8,12(R7)            LOCATION OF PRIVLEGED THAT WASN'T
0015DE    4180 2034                    1192           BAL   R8,ERRENO            PRINT MESSAGE
                                       1193  *
0015E2    2421                         1194  SIMULATE LIS   DEV,1                DEVICE # 1
0015E4    1121                         1195           SLLS  DEV,1                INDEX INTO SERVICE TABLE
0015E6    E650 1622                    1196           LA    R5,SIMINT            HANDLER FOR SINT
0015EA    4862 00D0                    1197           LH    R6,X'D0'(DEV)        SAVE OLD HANDLER
0015EE    4052 00D0                    1198           STH   R5,X'D0'(DEV)        REPLACE WITH SINT HANDLER
0015F2    1021                         1199           SRLS  DEV,1                PUT BACK DEVICE
0015F4    E202 0000                    1200  SINT1    SINT  0(DEV)               SIMULATE INTERRUPT
                                       1201  * FALL THROUGH IF FAILS
0015F8    4180 1FFC                    1202           BAL   R8,ERRGET
0015FC    C890 B034                    1203           LHI   R8,X'B034'           SINT DIDN'T CAUSE INTERRUPT
001600    4087 0000                    1204           STH   R8,0(R7)
001604    4027 0002                    1205           STH   DEV,2(R7)            DEVICE
001608    9D23                         1206           SSR   DEV,STAT
00160A    4037 0004                    1207           STH   STAT,4(R7)           STATUS
00160E    9588                         1208           EPSR  R8,R8
001610    5087 0008                    1209           ST    R8,8(R7)             OLD PSW STATUS
001614    E680 15F4                    1210           LA    R8,SINT1
001618    5087 000C                    1211           ST    R8,12(R7)            ADDRESS OF SINT WHICH FAILED
```

BACKGROUND TESTING AND INTERRUPT HANDLERS

```
00161C    4180 2034              1212          BAL    R8,ERRENQ          PRINT ERROR
001620    2302      =001624      1213          BS     SINT2             BRANCH AROUND SINT HANDLER
001622    9510                   1214  SIMINT  EPSR   R1,R0             PUT BACK OLD PSW STATUS
001624    1121                   1215  SINT2   SLLS   DEV,1
001626    4062 00D0              1216          STH    R6,X'D0'(DEV)     RESTORE INTERRUPT SERVICE TABLE
                                 1217  *
00162A    E110 1630              1218          SVC    1,SVCTEST+2
00162E    2303      =001634      1219  SVCTEST BS     SVCTST1           COME HERE IF NO SVC INTERRUPT
001630    4300 1652              1220          B      ARITH             HERE IF INTERRUPT OK
001634    4180 1FFC              1221  SVCTST1 BAL    R8,ERRGET
001638    C880 3007              1222          LHI    R8,X'3007'        EXPECTED SVC DIDN'T OCCUR
00163C    4087 0000              1223          STH    R8,0(R7)
001640    9588                   1224          EPSR   R8,R8
001642    5087 0008              1225          ST     R8,8(R7)          OLDPSW    STATUS
001646    E680 162A              1226          LA     R8,SVCTEST-4
00164A    5087 000C              1227          ST     R8,12(R7)         ADDRESS OF SVC THAT DIDN'T
00164E    4180 2034              1228          BAL    R8,ERRENQ         PRINT ERROR
                                 1229  *
001652    2471                   1230  ARITH   LIS    R7,1
001654    2460                   1231          LIS    R6,0
001656    1D66                   1232  FIXTEST DR     R6,R6             DIVISION BY ZERO
001658    2303      =00165F      1233          BS     ARITH1            COME HERE IF NO INTERRUPT
00165A    4300 167C              1234          B      FLOAT             HERE IF INTERRUPT OK
00165E    4180 1FFC              1235  ARITH1  BAL    R8,ERRGET
001662    C880 3013              1236          LHI    R8,X'3013'        EXPECTED FIXED POINT DIDN'T OCCUR
001666    4087 0000              1237          STH    R8,0(R7)
00166A    9588                   1238          EPSR   R8,R8             OLD PSW STATUS
00166C    5087 0008              1239          ST     R8,8(R7)
001670    E680 1656              1240          LA     R8,FIXTEST        ADDRESS OF ILLEGAL DIVIDE
001674    5087 000C              1241          ST     R8,12(R7)
001678    4180 2034              1242          BAL    R8,ERRENQ         PRINT ERROR
                                 1243  *
00167C    2452                   1244  FLOAT   LIS    R5,FLTSWTCH
00167E    7450 263E              1245          TBT    R5,SWITCHES       FLOATING POINT ENABLED?
001682    4330 178C              1246          BZ     DFLOAT            B IF NO
001686    2491                   1247          LIS    R9,1
001688    4180 AF14 =0045A0      1248          BAL    R8,BLINK          BLINK FLOAT DISPLAY BIT
00168C    E680 1752              1249          LA     R8,EFLOATZ
001690    6820 2418              1250          LE     FR2,FLP1          LOAD BOTH FLOATING POINT REGISTERS
001694    6840 2418              1251          LE     FR4,FLP1          WITH SAME CONSTANT
001698    2A24                   1252  FLTTEST1 AER   FR2,FR4           FLOATING POINT ADD
00169A    6920 2420              1253          CE     FR2,FLP2          SHOULD EQUAL
00169E    4230 171C              1254          BNE    EFLOAT0           B IF OK
0016A2    6840 2428              1255  FLOAT1  LE     FR4,FLP3          ZERO
0016A6    2D24                   1256  FLTTEST2 DER   FR2,FR4           FLOATING DIVISION BY ZERO
0016A8    4300 176E              1257          B      EFLOATX           COME HERE IF NO INTERRUPT
                                 1258  *
0016AC    6820 2408              1259          LE     FR2,FLP00
0016B0    6840 2410              1260          LE     FR4,FLP0
0016B4    2B24                   1261          SER    FR2,FR4           SUBTRACT
0016B6    6920 2410              1262          CE     FR2,FLP0          EXPECTED RESULT
0016BA    4230 173E              1263          BNE    EFLOAT5           ELSE ERROR
                                 1264  *
```

BACKGROUND TESTING AND INTERRUPT HANDLERS

```
0016BE      6840 2418      1265           LE    FR4,FLP1
0016C2      5820 2420      1266           LE    FR2,FLP2
0016C6      5C40 2430      1267           ME    FR4,FLP4          MULTIPY BY 2
0016CA      2942           1268           CER   FR4,FR2           EXPECTED VALUE
0016CC      4230 1744      1269           BNE   FFLOAT6           ELSE ERROR
                           1270    *
0016D0      6860 2430      1271           LE    FR6,FLP4
0016D4      6A60 2438      1272           AE    FR6,FLP5          ADD NEGATIVE NUMBER
0016D8      6960 2440      1273           CE    FR6,FLP6          EXPECTED VALUE
0016DC      4230 1722      1274           BNE   EFLOAT1           ELSE ERROR
                           1275    *
0016E0      7220 242C      1276           LME   FR2,FLP3+4        LOAD MULTIPLE
0016E4      7120 2448      1277           STME  FR2,BKSAVE        STORE MULTIPLE
0016E8      6940 244C      1278           CE    FR4,BKSAVE+4      EXPECTED RESULT
0016EC      4230 174C      1279           BNE   EFLOAT7           ELSE ERROR
0016F0      69C0 245C      1280           CE    FR12,BKSAVE+20    EXPECTED RESULTS
0016F4      4230 1730      1281           BNE   EFLOAT3           ELSE ERROR
                           1282    *
0016F8      2452           1283           LIS   R5,2
0016FA      2F25           1284           FLR   FR2,R5            CONVERT 2 TO FLOATING POINT
0016FC      6920 2430      1285           CE    FR2,FLP4          EXPECTED RESULT
001700      4230 1738      1286           BNE   EFLOAT4           ELSE ERROR
001704      2450           1287           LIS   R5,0
001706      5050 244C      1288           ST    R5,BKSAVE+4       CLEAR THESE LOCATIONS
00170A      5050 245C      1289           ST    R5,BKSAVE+20
00170E      2E52           1290           FXR   R5,FR2            CONVERT FLOATING "2" TO HEX VALUE
001710      C950 0002      1291           CHI   R5,2              EXPECTED VALUE
001714      4230 1738      1292           BNE   EFLOAT4           ELSE ERROR
001718      4300 178C      1293           B     DFLOAT            END OF FLOATING POINT TEST
                           1294    *
00171C      6840 2420      1295  EFLOAT0   LE    FR4,FLP2         FLOATING POINT ERRORS
001720      0308           1296           BR    R8
001722      2826           1297  EFLOAT1   LER   FR2,FR6
001724      6840 2440      1298           LE    FR4,FLP6
001728      0308           1299           BR    R8
00172A      6840 2418      1300  EFLOAT2   LE    FR4,FLP1
00172E      0308           1301           BR    R8
001730      282C           1302  EFLOAT3   LER   FR2,FR12
001732      6840 245C      1303           LE    FR4,BKSAVE+20
001736      0308           1304           BR    R8
001738      6840 2430      1305  EFLOAT4   LE    FR4,FLP4
00173C      0308           1306           BR    R8
00173E      6840 2410      1307  EFLOAT5   LE    FR4,FLP0
001742      0308           1308           BR    R8
001744      2862           1309  EFLOAT6   LER   FR6,FR2
001746      2824           1310           LER   FR2,FR4
001748      2846           1311           LER   FR4,FR6
00174A      0308           1312           BR    R8
00174C      2824           1313  EFLOAT7   LER   FR2,FR4
00174E      6840 244C      1314           LE    FR4,BKSAVE+4
001752      4180 1FFC      1315  EFLOATZ   BAL   R8,ERRGET
001756      C880 3015      1316           LHI   R8,X'3015'        FLOATING POINT DATA ERROR
00175A      4087 0000      1317           STH   R8,0(R7)
```

BACKGROUND TESTING AND INTERRUPT HANDLERS

```
00175E      6047 0008          1318           STE    FR4,8(R7)
001762      6027 000C          1319           STE    FR2,12(R7)        ACTUAL
001766      4180 2034          1320           BAL    R8,ERRENQ
00176A      4300 178C          1321           B      DFLOAT
00176E      4180 1FFC          1322   EFLOATX BAL    R8,ERRGET
001772      C880 3014          1323           LHI    R8,X'3014'        EXPECTED FLOATING POINT DIDN'T OCCUR
001776      4097 0000          1324           STH    R8,0(R7)
00177A      9588               1325           EPSR   R8,R8             OLD PSW STATUS
00177C      5087 0008          1326           ST     R8,8(R7)
001780      E680 16A6          1327           LA     R8,FLTTEST2       ADDRESS OF ILLEGAL DIVIDE
001784      5087 000C          1328           ST     R8,12(R7)
001788      4180 2034          1329           BAL    R8,ERRENQ
                               1330   *
00178C      2454               1331   DFLOAT  LIS    R5,DFTSWTCH       DOUBLE FLOATING POINT TEST
00178E      7450 263E          1332           TBT    R5,SWITCHES       TEST FLAG
001792      4330 186C          1333           BZ     REGISTER          NO
                               1334   *
001796      2492               1335           LIS    R9,2             DOUBLE FLOATING POINT TEST
001798      4180 AE04 =0045A0  1336           BAL    R8,BLINK          DISPLAY CODE
00179C      7820 2418          1337           LD     DFR2,FLP1
0017A0      7840 2418          1338           LD     DFR4,FLP1
0017A4      3A24               1339           ADR    DFR2,DFR4         ADD
0017A6      7920 2420          1340           CD     DFR2,FLP2         EXPECTED RESULT
0017AA      4230 1858          1341           BNE    EDFLOATZ          ELSE ERROR
                               1342   *
0017AE      7840 2428          1343           LD     DFR4,FLP3
0017B2      3D24               1344   DFLTTEST DDR   DFR2,DFR4         DIVIDE BY ZERO
0017B4      4300 1828          1345           B      EDFLOATX          ERROR IF NO DOUBLE FP INTERRUPT
                               1346   *
0017B8      7820 2408          1347           LD     DFR2,FLP00        CONTINUE
0017BC      7840 2410          1348           LD     DFR4,FLP0
0017C0      3B24               1349           SDR    DFR2,DFR4         SUBTRACT
0017C2      7920 2410          1350           CD     DFR2,FLP0         EXPECTED RESULT
0017C6      4230 1858          1351           BNE    EDFLOATZ          ELSE ERROR
                               1352   *
0017CA      7840 2418          1353           LD     DFR4,FLP1
0017CE      7820 2420          1354           LD     DFR2,FLP2
0017D2      7C40 2430          1355           MD     DFR4,FLP4         MULTIPLY BY 2
0017D6      3942               1356           CDR    DFR4,DFR2         EXPECTED RESULT
0017D8      4230 184A          1357           BNE    EDFLOATO          ELSE ERROR
                               1358   *
                               1359   *
0017DC      7860 2430          1360           LD     DFR6,FLP4
0017E0      7A60 2438          1361           AD     DFR6,FLP5         ADD NEGATIVE NUMBER
0017E4      7960 2440          1362           CD     DFR6,FLP6         EXPECTED RESULT
0017E8      4230 184E          1363           BNE    EDFLOAT1          ELSE ERROR
                               1364   *
0017EC      7E60 2420          1365           LMD    DFR6,FLP2         LOAD MULTIPLE
0017F0      7E60 2448          1366           STMD   DFR6,BKSAVE       STORE MULTIPE
0017F4      7960 2448          1367           CD     DFR6,BKSAVE       EXPECTED RESULT
0017F8      4230 184E          1368           BNE    EDFLOAT1          ELSE ERROR
0017FC      79E0 2468          1369           CD     DFR14,BKSAVE+32   EXPECTED RESULT
001800      4230 1852          1370           BNE    EDFLOAT3          ELSE ERROR
```

BACKGROUND TESTING AND INTERRUPT HANDLERS

```
001804      2452              1371  *              LIS     R5,2
001806      3FA5              1372                 FLDR    DFR10,R5        CONVERT "2" TO DOUBLE FP
001808      79A0 2430         1373                 CD      DFR10,FLP4      EXPECTED RESULT
00180C      4230 1855         1374                 BNE     EDFLOAT4        ELSE ERROR
001810      2450              1375                 LIS     R5,0
001812      5050 2448         1376                 ST      R5,BKSAVE       CLEAR THESE LOCATIONS
001816      5050 2468         1377                 ST      R5,BKSAVE+32
00181A      3E5A              1378                 FXDR    R5,DFR10
00181C      C950 0002         1379                 CHI     R5,2            EXPECTED RESULTS
001820      4230 1856         1380                 BNE     EDFLOAT4        ELSE ERROR
001824      4300 186C         1381                 B       REGISTER        END OF DOUBLE FLOATING POINT TEST
                              1382  *
001828      4180 1FFC         1383  EDFLOATX BAL    R8,ERRGET       DOUBLE FLOATING POINT ERRORS
00182C      C880 3018         1384             LHI     R8,X'3018'
001830      4087 0000         1385             STH     R8,0(R7)
001834      9588              1386             EPSR    R8,R8
001836      5087 0008         1387             ST      R8,8(R7)
00183A      E680 17B2         1388             LA      R8,DFLTTEST
00183E      5087 000C         1389             ST      R8,12(R7)
001842      4180 2034         1390             BAL     R8,ERRENQ
001846      4300 186C         1391             B       REGISTER
                              1392  *
00184A      3824              1393  EDFLOATO LDR    DFR2,DFP4
00184C      2306      =001858 1394             BS      EDFLOATZ
00184E      3826              1395  EDFLOAT1 LDR    DFR2,DFR6
001850      2304      =001858 1396             BS      EDFLOATZ
001852      382E              1397  EDFLOAT3 LDR    DFR2,DFR14
001854      2302      =001858 1398             BS      EDFLOATZ
001856      382A              1399  EDFLOAT4 LDR    DFR2,DFR10
                              1400  *
001858      4180 1FFC         1401  EDFLOATZ BAL    R8,ERRGET
00185C      C880 3019         1402             LHI     R8,X'3019'
001860      4087 0000         1403             STH     R8,0(R7)
001864      7027 0008         1404             STD     DFR2,8(R7)
001868      4180 2034         1405             BAL     R8,ERRENQ
                              1406  *
00186C      D100 2470         1407  REGISTER LM     R0,LMTST1       LOAD,STORE MULLTIPLE TEST
001870      D000 0CF4         1408             STM     R0,REGSAV       FIRST DATA PATTERN
001874      0744              1409             XR      DDBADR,DDBADR   NO DDB FOR BACKGROUND
001876      24B0              1410             LIS     R11,0
001878      24C4              1411             LIS     R12,4
00187A      C8D0 003C         1412             LHI     R13,60
00187E      585B 2470         1413  REGTST1  L      R5,LMTST1(R11)  EXPECTED EQUAL
001882      595B 0CF4         1414             C       R5,REGSAV(R11)  ACTUAL?
001886      4330 18AE         1415             BE      REGTST2         B IF YES
00188A      4180 1FFC         1416             BAL     R8,ERRGET
00188E      C880 7060         1417             LHI     R8,X'7060'      LOAD,STORE MULTIPLE ERROR
001892      4087 0000         1418             STH     R8,0(R7)
001896      088B              1419             IR      R8,R11          USE INDEX TO GIVE
001898      1082              1420             SRLS    R8,2            REGISTER NUMBER
00189A      4087 0006         1421             STH     R8,6(R7)
00189E      5057 0008         1422             ST      R5,8(R7)        EXPECTED
```

BACKGROUND TESTING AND INTERRUPT HANDLERS

```
0018A2        588B 0CF4           1424              L      R8,REGSAV(R11)
0018A6        5087 000C           1425              ST     R8,12(R7)            ACTUAL
0018AA        4180 2034           1426              BAL    R8,ERRENQ
0018AE        C1B0 187E           1427   REGTST2    BXLE   R11,REGTST1          LOOP FOR ALL REGISTERS
                                  1428   *
0018B2        D100 24B0           1429              LM     R0,LMTST2
0018B6        D000 0D34           1430              STM    R0,REGSAV+64         SECOND DATA PATTERN
0018BA        0744                1431              XR     DDBADR,DDBADR        NO DDB FOR BACKGROUND
0018BC        24B0                1432              LIS    R11,0
0018BE        24C4                1433              LIS    R12,4
0018C0        C8D0 003C           1434              LHI    R13,60
0018C4        585B 24B0           1435   REGTST3    L      R5,LMTST2(R11)       EXPECTED EQUAL
0018C8        595B 0D34           1436              C      R5,REGSAV+64(R11)    ACTUAL?
0018CC        4330 18F4           1437              BE     REGTST4              B IF YES
0018D0        4180 1FFC           1438              BAL    R8,ERRGET
0018D4        C880 7060           1439              LHI    R8,X'7060'           LOAD,STORE MULTIPLE ERROR
0018D8        4087 0000           1440              STH    R8,0(R7)
0018DC        088B                1441              LR     R8,R11               USE INDEX TO GIVE
0018DE        1082                1442              SRLS   R8,2                 REGISTER NUMBER
0018E0        4087 0006           1443              STH    R8,6(R7)
0018E4        5057 0008           1444              ST     R5,8(R7)             EXPECTED
0018E8        588B 0D34           1445              L      R8,REGSAV+64(R11)
0018EC        5087 000C           1446              ST     R8,12(R7)            ACTUAL
0018F0        4180 2034           1447              BAL    R8,ERRENQ
0018F4        C1B0 18C4           1448   REGTST4    BXLE   R11,REGTST3          LOOP FOR ALL REGISTERS
                                  1449   *                                                                    *
                                  1450   *  ADDITIONAL BACK GROUND TESTING GOES HERES.                        *
                                  1451   *                                                                    *
                                  1452   *
0018F8        5850 3490           1453   INDEXRR    L      R5,DPAT1             DOUBLE INDEX TEST GET ANY CONSTANT
0018FC        24A0                1454              LIS    R10,0                ZERO INDICIES
0018FE        2480                1455              LIS    R8,0
001900        5058 4A00 2448      1456              ST     R5,BKSAVE(R8,R10)    LOAD DATA
001906        2484                1457              LIS    R8,4                 INCREMENT FIRST INDEX
001908        5058 4A00 2448      1458              ST     R5,BKSAVE(R8,R10)    STORE DATA
00190E        24A4                1459              LIS    R10,4                INCREMENT SECOND INDEX
001910        5058 4A00 2448      1460              ST     R5,BKSAVE(R8,R10)    LOAD DATA
001916        24A0                1461              LIS    R10,0                ZERO FIRST INDEX
001918        25B4                1462              LCS    R8,4                 NEGATIVE SECOND INDEY
00191A        5058 4A00 245C      1463              ST     R5,BKSAVE+20(R8,R10) STORE DATA
001920        25A4                1464              LCS    R10,4                NEGATIVE SECOND INDEX
001922        5058 4A00 245C      1465              ST     R5,BKSAVE+20(R8,R10) STORE DATA
                                  1466   *
001928        24B0                1467              LIS    R11,0
00192A        2480                1468              LIS    R8,0
00192C        2494                1469              LIS    R9,4
00192E        C8A0 002C           1470              LHI    R10,44
001932        5958 2448           1471   INDEXRR1   L      R5,BKSAVE(R8)        ACTUAL DATA
001936        50B8 2448           1472              ST     R11,BKSAVE(R8)       CLEAR THIS LOCATION
00193A        5550 3490           1473              CL     R5,DPAT1             EXPECTED RESULTS
00193E        2134      =001946   1474              BNES   EINDEX0              ELSE ERROR
001940        C180 1932           1475              BXLE   R8,INDEXRR1          TEST ALL LOCATION
001944        2304      =00194C   1476              BS     EINDEX1              END OF DOUBLE INDEX TEST
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BACKGROUND TESTING AND INTERRUPT HANDLERS

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                                        1477  *
001946      C980 0014                   1478  EINDEX0  CHI   R8,20             DOUBLE INDEX ERROR
*00194A     233F      =001968           1479           BE    ABACK
00194C      4180 1FFC                   1480  EINDEX1  BAL   R8,ERRGET
001950      C880 3025                   1481           LHI   R8,X'3025'        ERROR 25
001954      4087 0000                   1482           STH   R8,0(R7)
001958      5880 3490                   1483           L     R8,DPAT1
00195C      5087 0008                   1484           ST    R8,8(R7)
001960      5057 000C                   1485           ST    R5,12(R7)
001964      4180 2034                   1486           BAL   R8,ERRENQ
                                        1487  *
001968      2490                        1488  ABACK    LIS   R9,0              BIT TO BLINK
00196A      4180 AC32 =0045A0           1489           BAL   R8,BLINK
                                        1490  *
                                        1491  *   MEMORY ACCESS CONTROLLER TESTING.
                                        1492  *
                                        1493  *   NOTE: MAC INTERRUPT HANDLER RETURNS WITH MAC DISABLED.
00196E      4820 34E4                   1494  MACTEST  LH    DEV,MACADR        IS MAC TESTING SELECTED?
001972      4330 1B1C                   1495           BZ    MATTEST           B IF NO
001976      0700                        1496           XR    R0,R0             HANDY CONSTANT
001978      F8C0 000F 0000              1497           LI    R12,Y'000F0000'   ADDRESS LAST SEGMENT REGISTER
00197E      F880 0FF0 0000              1498           LI    R8,Y'0FF00000'    SEG.REG.TO ADDRESS LOW MEMORY
001984      0898                        1499           LR    R11,R8            SAVE A COPY
001986      9555                        1500           EPSR  R5,R5             GET CURRENT PSW STATUS
001988      F450 0000 FBFF              1501           NI    R5,Y'FBFF'        CLEAR MAC BIT
                                        1502  *
                                        1503  *   WRITE/INTERRUPT TEST
00198E      9565                        1504           EPSR  R6,R5             TURN OFF MAC
001990      C680 0050                   1505           CHI   R8,X'50'          SET WRITE/INTERRUPT,PRESENCE
001994      5082 003C                   1506           ST    R8,60(DEV)        SEG.REG. 15
001998      5880 2470                   1507           L     R8,LMTST1         KNOWN PATTERN
00199C      5080 1AB4                   1508           ST    R8,MACBUF
0019A0      5880 24B0                   1509           L     R8,LMTST2         A DIFFERENT PATTERN
0019A4      5002 0040                   1510           ST    R0,64(DEV)        CLEAR MAC STATUS
0019A8      9556                        1511           EPSR  R5,R6             TURN ON MAC
0019AA      E670 19DE                   1512           LA    R7,MACTST2        INTERRUPT RETURN ADDRESS
0019AE      5070 1AB8                   1513           ST    R7,MACRETRN       STORE FOR INTERRUPT HANDLER
0019B2      2472                        1514           LIS   R7,2              EXPECTED STATUS
0019B4      D270 1ABC                   1515           STB   R7,MACSTAT
0019B8      508C 1AB4                   1516  MACTST1  ST    R8,MACBUF(R12)    SHOULD INTERRUPT AFTER WRITE
0019BC      9565                        1517           EPSR  R6,R5             TURN MAC OFF, NO INTERRUPT
0019BE      5000 1AB8                   1518           ST    R0,MACRETRN       NO RETURN ADDRESS
0019C2      4180 1FFC                   1519           BAL   R8,ERRGET
0019C6      C880 3009                   1520           IHI   R8,X'3009'        NO MAC INTRPT ERROR
0019CA      4087 0000                   1521           STH   R8,0(R7)
0019CE      5067 0008                   1522           ST    R6,8(R7)          OLD PSW STATUS
0019D2      E680 19B8                   1523           LA    R8,MACTST1
0019D6      5087 000C                   1524           ST    R8,12(R7)         OLD PSW LOC
0019DA      4180 2034                   1525           BAL   R8,ERRENQ
0019DE      58D0 1AB4                   1526  MACTST2  L     R13,MACBUF        RETURN FROM MAC INTERRUPT
0019E2      55D0 24B0                   1527           CL    R13,LMTST2        VERIFY WRITE
0019E6      4330 1A0E                   1528           BE    MACTST3           B IF OK
0019EA      4180 1FFC                   1529           BAL   R8,ERRGET
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BACKGROUND TESTING AND INTERRUPT HANDLERS

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0019EE    C880 3816        1530           LHI    R8,X'3816'           MAC MALFUNCTION ERROR
0019F2    4087 0000        1531           STH    R8,0(R7)
0019F6    5880 24B0        1532           L      R8,LMTST2            EXPECTED
0019FA    5087 0008        1533           ST     R8,8(R7)
0019FE    50D7 000C        1534           ST     R13,12(R7)           ACTUAL
001A02    E680 19B8        1535           LA     R8,MACTST1           WHERE IT HAPPENED
001A06    5087 0010        1536           ST     R8,16(R7)
001A0A    4180 2034        1537           BAL    R8,ERRENQ
                           1538    *
                           1539    *   WRITE PROTECT TEST
001A0E    088B             1540    MACTST3 LR     R8,R11              PROTOTYPE SEGMENT REGISTER
001A10    C580 0030        1541           OHI    R8,X'30'             WRITE PROTECT, PRESENT
001A14    5082 003C        1542           ST     R8,60(DEV)           SEG REG 15
001A18    5880 24B0        1543           L      R8,LMTST2
001A1C    5080 1AB4        1544           ST     R8,MACBUF            KNOW PATTERN
001A20    5880 2470        1545           L      R8,LMTST1            DIFFERENT PATTERN
001A24    5002 0040        1546           ST     R0,64(DEV)           CLEAR MAC STATUS
001A28    9556             1547           EPSR   R5,R6               TURN ON MAC
001A2A    E670 1A5E        1548           LA     R7,MACTST5           RETURN ADDRESS
001A2E    5070 1AB8        1549           ST     R7,MACRETRN
001A32    2474             1550           LIS    R7,4                 EXPECTED STATUS
001A34    D270 1ABC        1551           STB    R7,MACSTAT
001A38    508C 1AB4        1552    MACTST4 ST     R8,MACBUF(R12)      SHOULD INTERRUPT, NO WRITE
001A3C    9565             1553           EPSR   R6,R5               TURN MAC OFF, NO INTERRUPT
001A3E    5000 1AB8        1554           ST     R0,MACRETRN          NO RETURN ADDRESS
001A42    41R0 1FFC        1555           BAL    R8,ERRGET
001A46    C880 3009        1556           LHI    R8,X'3009'           NO MAC INTERRUPT ERROR
001A4A    4087 0000        1557           STH    R8,0(R7)
001A4E    5067 0008        1558           ST     R6,8(R7)             OLD PSW STATUS
001A52    E680 1A38        1559           LA     R8,MACTST4
001A56    5087 000C        1560           ST     R8,12(R7)            OLD PSW LOC
001A5A    4180 2034        1561           BAL    R8,ERRENQ
001A5E    58D0 1AB4        1562    MACTST5 L      R13,MACBUF          RETURN FROM MAC INTERRUPT
001A62    55D0 24B0        1563           CL     R13,LMTST2           VERIFY NO WRITE
001A66    4330 1A8E        1564           BE     MACTST6             B IF OK
001A6A    4180 1FFC        1565           BAL    R8,ERRGET
001A6E    C880 3816        1566           LHI    R8,X'3816'           MAC MALFUNCTION ERROR
001A72    4087 0000        1567           STH    R8,0(R7)
001A76    5880 24B0        1568           L      R8,LMTST2            EXPECTED
001A7A    5087 0008        1569           ST     R8,8(R7)
001A7E    50D7 000C        1570           ST     R13,12(R7)           ACTUAL
001A82    E680 1A38        1571           LA     R8,MACTST4           WHERE IT HAPPENED
001A86    5087 0010        1572           ST     R8,16(R7)
001A8A    4180 2034        1573           BAL    R8,ERRENQ
                           1574    *
                           1575    *   EXECUTE PROTECT INTERRUPT
001A8E    088B             1576    MACTST6 LR     R8,R11              PROTOTYPE SEGMENT REGISTER
001A90    C680 0090        1577           OHI    R8,X'90'             EXECUTE PROTECT, PRESENT
001A94    5082 003C        1578           ST     R8,60(DEV)           SEG.REG. 15
001A98    5000 1AB4        1579           ST     R0,MACBUF            ILLEGAL INST. TO GET US OUT
                           1580    *                                  (JUST IN CASE)
001A9C    5002 0040        1581           ST     R0,64(DEV)           CLEAR MAC STATUS
001AA0    9556             1582           EPSR   R5,R6               TURN ON MAC
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BACKGROUND TESTING AND INTERRUPT HANDLERS

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001AA2      E670 1ABE         1583           LA     R7,MACTST7      INTERRUPT RETURN ADDRESS
001AA6      5070 1AB8         1584           ST     R7,MACRETRN
001AAA      2471              1585           LIS    R7,1            EXECUTE PROTECT STATUS
001AAC      D270 1ABC         1586           STB    R7,MACSTAT
001AB0      430C 1AB4         1587           B      MACBUF(R12)     B TO PROTECTED SEGMENT
001AB4                        1588           CNOP   4
001AB4      0000 0000         1589  MACBUF   DC     F'0'
001AB8      0000 0000         1590  MACRETRN DC     F'0'
001ABC      0000              1591  MACSTAT  DC     H'0'
                              1592  *
                              1593  *   NON PRESENCE TEST               EXECUTE PROTECT INTRUPT RETURN
001ABE      5880 2470         1594  MACTST7  L      R8,LMTST1       KNOWN PATTERN
001AC2      5080 1AB4         1595           ST     R8,MACBUF
001AC6      5082 003C         1596           ST     R11,60(DEV)     NOT PRESENT SEG 15
001ACA      5002 0040         1597           ST     R0,64(DEV)      CLEAR MAC STATUS
001ACE      9556              1598           EPSR   R5,R6           TURN MAC ON
001AD0      E670 1B04         1599           LA     R7,MACTST9      INTERRUPT RETURN ADDRESS
001AD4      5070 1AB8         1600           ST     R7,MACRETRN
001AD8      2478              1601           LIS    R7,8            NON PRESENT STATUS
001ADA      D270 1ABC         1602           STB    R7,MACSTAT
001ADE      588C 1AB4         1603  MACTST8  L      R8,MACBUF(R12)  SHOULD INTERRUPT NOT PRESENT
001AE2      9565              1604           EPSR   R6,R5           TURN MAC OFF
001AE4      5000 1AB8         1605           ST     R0,MACRETRN
001AE8      4180 1FFC         1606           BAL    R8,ERRGET
001AEC      C880 3009         1607           LHI    R8,X'3009'      NO MAC INTERRUPT ERROR
001AF0      4987 0000         1608           STH    R8,0(R7)
001AF4      5067 0008         1609           ST     R6,8(R7)        OLD PSW STATUS
001AF8      E680 1ADE         1610           LA     R8,MACTST8
001AFC      5087 000C         1611           ST     R8,12(R7)       OLD PSW LOC
001B00      4180 2034         1612           BAL    R8,FRRENQ
                              1613  *
                              1614  *   END OF MAC TESTING
001B04      5880 252C         1615  MACTST9  L      R8,MACREGS+60   NON PRESENT INTERRUPT RETURN
001B08      5082 003C         1616           ST     R8,60(DEV)      RESTORE NORMAL SEG REG 15
001B0C      5002 0040         1617           ST     R0,64(DEV)      CLEAR MAC STATUS
001B10      9556              1618  MATEXT   EPSR   R5,R6           TURN ON MAC
001B12      2493              1619           LIS    R9,3            MAC TESTING BIT
001B14      4180 AA88 =0045A0 1620           BAL    R8,BLINK
            0000 1B18         1621  NOMAC    EQU    *               *                              R04
001B18      C200 0CDC         1622           LPSW   DSPCHER         *                              R04


            0000 1B1C         1624  MATTEST  EQU    *               *                              R04
001B1C      4820 34E6         1625           LH     DEV,MATFLAG     MAT TO TEST?                   R04
*001B20     2234      =001B18 1626           BZ     NOMAC           NO, MAT EXIT                   R04
                              1627  *                               *                              R04
                              1628  * INVALID VIRTUAL ADDRESS (PST) INTERRUPT TEST                 R04
                              1629  *                                                              R04
001B22      9555              1630           EPSR   R5,R5           GET CURRENT PSW                R04
001B24      C450 FBFF         1631           NHI    R5,X'FBFF'      TURN OFF MAT BIT (21)          R04
001B28      9565              1632           EPSR   R6,R5           TURN OF MAT                    R04
001B2A      2400              1633           LIS    R0,0            *                              R04
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BACKGROUND TESTING AND INTERRUPT HANDLERS

001B2C	4000 3C40	1634		STH	R0,APSSTD	SET SIZE =0 ,	R04
001B30	DF10 3C40	1635		LPSTD	APSSTD	LOAD DESCRIPTOR	P04
001B34	E620 1B6C	1636		LA	R2,MATTST1X	SET UP RETURN ADDRESS	R04
001B38	5020 1AB8	1637		ST	R2,MACRETRN	FROM MAT INTERRUPT HANDLER	R04
001B3C	2428	1638		LIS	R2,8	*	R04
001B3E	D220 1ABC	1639		STB	R2,MACSTAT	FAULT REASON CODE	P04
001B42	9556	1640		EPSR	R5,R6	TURN ON MAT	R04
001B44	5820 4001 0000	1641	MATTST0	L	R2,Y'10000'	REF ENTRY ONE	P04
		1642	*			INTERRUPT SHOULD OCCUR	R04
001B4A	9565	1643		EPSR	R6,R5	TURN OFF MAT	P04
001B4C	5000 1AB8	1644		ST	R0,MACRETRN	*	P04
001B50	4180 1FFC	1645		BAL	R8,ERRGET	*	P04
001B54	C880 3009	1646		LHI	R8,X'3009'	NO MAT INTERRUPT ERROR	R04
001B58	4087 0000	1647		STH	R8,0(R7)	*	R04
001B5C	5067 0008	1648		ST	R6,8(R7)	OLD PSW	R04
001B60	E680 1B44	1649		LA	R8,MATTST0	*	P04
001B64	5087 000C	1650		ST	R8,12(R7)	OLD LOC	R04
001B68	4180 2034	1651		BAL	R8,ERRENQ	*	R04
		1652	*				P04
		1653	* NON PRESENT INTERRUPT TEST				P04
		1654	*				R04
001B6C	C810 01FE	1655	MATTST1X	LHI	R1,X'1FE'	*	R04
001B70	4010 3C40	1656		STH	R1,APSSTD	SET SIZE TO 256	R04
001B74	5000 4000 8D80	1657		ST	R0,PST	ZERO ENTRY	R04
001B7A	DF10 3C40	1658		LPSTD	APSSTD	INVALIDATE B-R STACK	P04
001B7E	E520 1BB4	1659		LA	R2,MATTST2X	RETURN ADDRESS	R04
001B82	5020 1AB8	1660		ST	R2,MACRETRN	FROM MAT HANDLER	R04
001B86	2426	1661		LIS	R2,6	*	R04
001B88	D220 1ABC	1662		STB	R2,MACSTAT	FAULT REASON CODE	R04
001B8C	9556	1663		EPSR	R5,R6	ENABLE MAT	R04
001B8E	4200 0000	1664	MATTST1	NOP		NON PRESENT INTERRUPT	R04
		1665	*				P04
001B92	9565	1666		EPSR	R6,R5	DISABLE MAT	P04
001B94	5000 1AB8	1667		ST	R0,MACRETRN	ERROR	R04
001B98	4180 1FFC	1668		BAL	R8,ERRGET	*	R04
001B9C	C880 3009	1669		LHI	R8,X'3009'	*	R04
001BA0	4087 0000	1670		STH	R8,0(R7)	*	R04
001BA4	5067 0008	1671		ST	R6,8(R7)	*	R04
001BA8	E680 1B8E	1672		LA	R8,MATTST1	*	R04
001BAC	5087 000C	1673		ST	R8,12(R7)	*	R04
001BB0	4180 2034	1674		BAL	R8,ERRENQ	*	R04
		1675	*				P04
		1676	* SEGMENT LIMIT FAULT TEST				P04
		1677	*				R04
*001BB4	C810 1BEC	1678	MATTST2X	LI	R1,MATTST2	GET PAGE FIELD OF VIRTUAL	R04
001BB8	F410 0000 F800	1679		NI	R1,Y'F800'	ADDRESS	P04
001BBE	CA10 0800	1680		AHI	R1,X'800'	*	P04
001BC2	1116	1681		SLLS	R1,6	*	R04
001BC4	F820 5C00 0000	1682		LI	R2,Y'5C000000'	*	P04
001BCA	0621	1683		OR	R2,R1	SET UP SLF IN ENTRY	R04
001BCC	5020 4000 8D80	1684		ST	R2,PST	SET UP ENTRY	R04
001BD2	DF10 3C40	1685		LPSTD	APSSTD	INVALIDATE B-R STACK	R04
001BD6	E630 1C12	1686		LA	R3,MATTST3X	*	R04

BACKGROUND TESTING AND INTERRUPT HANDLERS

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001BDA    5030 1AB8         1687              ST    R3,MACRETRN      SET UP RETURN ADDRESS          R04
001BDE    2435              1688              LIS   R3,5             *                              R04
001BE0    D230 1ABC         1689              STB   R3,MACSTAT       FAULT RETURN ADDRESS           R04
001BE4    1016              1690              SRLS  R1,6             *                              R04
001BE6    CA10 0800         1691              AHI   R1,X'800'        *                              R04
001BEA    9556              1692              EPSR  R5,R6            TURN ON MAT                    R04
001BEC    5821 0000         1693    MATTST2  L     R2,0(R1)         SLF  INTERRUPT SHOULD OCCUR    R04
                            1694          *                                                        R04
001BF0    9565              1695              FPSR  R6,R5            DISABLE MAT                    R04
001BF2    5000 1AB8         1696              ST    R0,MACRETRN      *                              R04
001BF6    4180 1FFC         1697              BAL   R8,ERRGET        *                              R04
001BFA    C880 3009         1698              LHI   R8,X'3009'       *                              R04
001BFE    4087 0000         1699              STH   R8,0(R7)         *                              R04
001C02    5067 0008         1700              ST    R6,8(R7)         OLD PSW                        R04
001C06    E680 1BEC         1701              LA    R8,MATTST2       *                              R04
001C0A    5087 000C         1702              ST    R8,12(R7)        OLD LOC                        R04
001C0E    4180 2034         1703              BAL   R8,ERRENQ        *                              R04
                            1704          *                                                        R04
                            1705          * ACCESS  LEVEL INTERRUPT TEST                            R04
                            1706          *                                                        R04
001C12    F810 5F3E 0000    1707    MATTST3X LI    R1,Y'5F3E0000'   SET UP LEVEL BITS=11           R04
001C18    5010 4000 8D80    1708              ST    R1,PST           *                              R04
001C1E    DF10 3C40         1709              LPSTD APSSTD           INVALIDATE B-R STACK           R04
001C22    0846              1710              LR    R4,R6            *                              R04
001C24    F440 000F FFFF    1711              NI    R4,Y'FFFFF'      ZERO BITS 10,11               R04
001C2A    E630 1C60         1712              LA    R3,MATTST4X      SET UP RETURN                 R04
001C2E    5030 1AB8         1713              ST    R3,MACRETRN      ADDRESSES FROM MAT HANDLER    R04
001C32    2434              1714              LIS   R3,4             *                              R04
001C34    D230 1ABC         1715              STB   R3,MACSTAT       *                              R04
001C38    9554              1716              EPSR  R5,R4            ENABLE MAT                     R04
001C3A    4200 0000         1717    MATTST3  NOP                    ACCESS LVL INTRPT SHOULD OCCUR R04
                            1718          *                                                        R04
001C3E    9545              1719              EPSR  R4,R5            DISABLE MAT                    R04
001C40    5000 1AB8         1720              ST    R0,MACRETRN      *                              R04
001C44    4180 1FFC         1721              BAL   R8,ERRGET        *                              R04
001C48    C880 3009         1722              LHI   R8,X'3009'       *                              R04
001C4C    4087 0000         1723              STH   R8,0(R7)         *                              R04
001C50    5047 0008         1724              ST    R4,8(R7)         OLD PSW                        R04
001C54    E680 1C3A         1725              LA    R8,MATTST3       OLD LOC                        R04
001C58    5087 000C         1726              ST    R8,12(R7)        *                              R04
001C5C    4180 2034         1727              BAL   R8,ERRENQ        *                              R04
                            1728          *                                                        R04
                            1729          * READ  PROTECT INTERRUPT TEST                            R04
                            1730          *                                                        R04
001C60    F810 443E 0000    1731    MATTST4X LI    R1,Y'443E0000'   READ PROTECT                   R04
001C66    5010 4000 8D80    1732              ST    R1,PST           *                              R04
001C6C    DF10 3C40         1733              LPSTD APSSTD           INVALIDATE B-R STACK           R04
001C70    E630 1CA6         1734              LA    R3,MATTST5X      *                              R04
001C74    5030 1AB8         1735              ST    R3,MACRETRN      *                              R04
001C78    2433              1736              LIS   R3,3             FAULT REASON CODE              R04
001C7A    D230 1ABC         1737              STB   R3,MACSTAT       *                              R04
001C7E    9556              1738              EPSR  R5,R6            ENABLE MAT                     R04
001C80    5820 1AB4         1739    MATTST4  L     R2,MACBUF        READ INTERRUPT SHOULD OCCUR    R04
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BACKGROUND TESTING AND INTERRUPT HANDLERS

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001C84    9565              1740          EPSR   R6,R5            DISABLE                          R04
001C86    5000 1AB8         1741          ST     R0,MACRETRN      *                                R0C
001C8A    4180 1FFC         1742          BAL    R8,ERRGET        *                                R04
001C8E    C880 3009         1743          LHI    R8,X'3009'       *                                R04
001C92    4087 0000         1744          STH    R8,0(R7)         *                                R04
001C96    5067 0008         1745          ST     R6,8(R7)         OLD PSW                          R04
001C9A    E680 1C3A         1746          LA     R8,MATTST3       *                                R04
001C9E    5087 000C         1747          ST     R8,12(R7)        OLD LOC                          R04
001CA2    4180 2034         1748          BAL    R8,ERRENQ        *                                R04
                            1749   *                                                               R04
                            1750   * WRITE PROTECT INTERRUPT TEST                                  R04
                            1751   *                                                               R04
001CA6    F810 543E 0000    1752   MATTST5X LI   R1,Y'543E0000'   WRITE PROTECT                    R04
001CAC    5010 4000 8D80    1753          ST     R1,PST           *                                R04
001CB2    DF10 3C40         1754          LPSTD  APSSTD           INVALIDATE OLD ENTRY             R04
001CB6    E610 1CEC         1755          LA     R1,MATTST6X      SET UP RETURN ADDRESSES          R04
001CBA    5010 1AB8         1756          ST     R1,MACRETRN      FROM MAT HANDLER                 R04
001CBE    2432              1757          LIS    R3,2             *                                R04
001CC0    D230 1ABC         1758          STB    R3,MACSTAT       FAULT REASON CODE                R04
001CC4    9556              1759          EPSR   R5,R6            *                                R04
001CC6    5050 1AB4         1760   MATTST5 ST    R5,MACBUF        WRITE PROTECT INTERRUPT SHOULD OR04?
001CCA    9565              1761          EPSR   R6,R5            DISABLE MAT                      R04
001CCC    5000 1AB8         1762          ST     R0,MACRETRN      ERROR                            R04
001CD0    4180 1FFC         1763          BAL    R8,ERRGET        *                                R04
001CD4    C880 3009         1764          LHI    R8,X'3009'       *                                R04
001CD8    4087 0000         1765          STH    R8,0(R7)         *                                R04
001CDC    5067 0008         1766          ST     R6,8(R7)         OLD PSW                          R04
001CE0    E680 1CC6         1767          LA     R8,MATTST5       *                                R04
001CE4    5087 000C         1768          ST     R8,12(R7)        OLD LOC                          R04
001CE8    4180 2034         1769          BAL    R8,ERRENQ        *                                R04
                            1770   *                                                               R04
                            1771   * EXECUTE PROTECT INTERRUPT TEST                                R04
                            1772   *                                                               R04
001CEC    F810 583F 0000    1773   MATTST6X LI   R1,Y'583F0000'   EXECUTE PROTECT                  R04
C01CF2    5010 4000 8D80    1774          ST     R1,PST           SET UP ENTRY                     R04
001CF8    DF10 3C40         1775          LPSTD  APSSTD           INVALIDATE B-R STACK             R04
001CFC    E610 1D32         1776          LA     R1,MATEND        RETURN ADDRESS FROM              R04
001D00    5010 1AB8         1777          ST     R1,MACRETRN      MAT INTERRUPT HANDLER            R04
001D04    2431              1778          LIS    R3,1             *                                R04
001D06    D230 1ABC         1779          STB    R3,MACSTAT       FAULT REASON CODE                R04
001D0A    9556              1780          EPSR   R5,R6            ENABLE MAT                       R04
001D0C    5810 1AB4         1781   MATTST6 L     R1,MACBUF        EXECUTE PROTECT FAULT SHOULD OCCR04
001D10    9565              1782          EPSR   R6,R5            DISABLE MAT                      R04
001D12    5000 1AB8         1783          ST     R0,MACRETRN      ERROR                            R04
001D16    4180 1FFC         1784          BAL    R8,ERRGET        *                                R04
001D1A    C880 3009         1785          LHI    R8,X'3009'       *                                R04
001D1E    4087 0000         1786          STH    R8,0(R7)         *                                R04
001D22    5067 0008         1787          ST     R6,8(R7)         OLD PSW                          R04
001D26    E680 1D0C         1788          LA     R8,MATTST6       *                                R04
001D2A    5087 000C         1789          ST     R8,12(R7)        OLD LOC                          R04
001D2E    4180 2034         1790          BAL    R8,ERRENQ        *                                R04
                            1791   *                                                               R04
                            1792   *END OF MAT TEST                                                R04
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                                   1793  *
001D32      F810 5C3E 0000         1794  MATEND   LI    R1,Y'5C3E0000'     INIT  PSTE 0                 R04
001D38      5010 400C 8D8C         1795           ST    R1,PST             *                           R04
001D3E      DF10 3C40              1796           LPSTD APSSTD             INVALIDATE B-R STACK        R04
001D42      4300 1B10              1797           B     MATEXT             RETURN                      R04


                                   1799  *   ILLEGAL INSTRUCTION TRAP HANDLER.                            *
                                   1800  *                                                                *
                                   1801  *     IF ILLEGAL IS EXPECTED, RETURN IS TO OLD LOC + 4 WITH USER  *
                                   1802  * MODE RESET.  OTHERWISE MESSAGE IS QUEUED AND TESTING IS ABORTED. *
                                   1803  *                                                                *
001D46      C5F0 1592              1804  ILLEGINS CLHI  R15,ILLEGAL        EXPECTED THIS ONE?
001D4A      4330 1D74              1805           BE    ILLOK              B IF YES
001D4E      C5F0 15C0              1806           CLHI  R15,USERMODE       THIS IS OK TOO
001D52      4330 1D74              1807           BE    ILLOK              B IF YES
                                   1808  *  UNEXPECTED ILLEGAL
001D56      0744                   1809           XR    DDBADR,DDBADR      NO DDB FOR BACKGROUND TESTS
001D58      4180 1FFC              1810           BAL   R8,ERRGET
001D5C      C880 3004              1811           LHI   R8,X'3004'         UNEXPECTED ILLEGAL
001D60      4087 0000              1812           STH   R8,0(R7)
001D64      50E7 0008              1813           ST    R14,8(R7)          OLD PSW STATUS
001D68      50F7 000C              1814           ST    R15,12(R7)         OLD PSW LOC
001D6C      4180 2034              1815           BAL   R8,ERRENQ
001D70      C200 0CE4              1816           LPSW  ABORT              STOP TESTING
                                   1817  *
001D74      26F4                   1818  ILLOK    AIS   R15,4             ADVANCE OLD LOC
001D76      F4E0 0000 FEFF         1819           NI    R14,Y'FEFF'       CLEAR USER MODE BIT
001D7C      180E                   1820           LPSWR R14               RETURN


                                   1822  * ARITHMETIC FAULT HANDLER                                        *
                                   1823  *                                                                *
                                   1824  *     IF FAULT IS EXPECTED, RETURN IS TO OLD LOC + 2. OTHERWISE    *
                                   1825  * MESSAGE IS QUEUED.                                              *
                                   1826  *                                                                *
001D7E      2186       =001D8A     1827  ARITHFLT BCS   AFLT1             B IF FLOATING POINT FAULT
001D80      C5F0 1558              1828           CLHI  R15,FIXTEST+2     EXPECTED FIXED POINT?
001D84      2138       =001D94     1829           BNES  AFLT2             B IF NO
001D86      26F2                   1830           AIS   R15,2             GOOD FAULT, ADVANCE LOC
001D88      180E                   1831           LPSWR R14               RETURN
                                   1832  *
001D8A      C5F0 16A8              1833  AFLT1    CLHI  R15,FLTTEST2+2    EXPECTED FLOATING POINT?
001D8E      2133       =001D94     1834           BNES  AFLT2             B IF NO
001D90      26F4                   1835           AIS   R15,4             GOOD FAULT, ADVANCE LOC
001D92      180E                   1836           LPSWR R14               RETURN
                                   1837  *
001D94      C5F0 17B4              1838  AFLT2    CLHI  R15,DFLTTEST+2
001D98      2133       =001D9E     1839           BNES  AFLT4
001D9A      26F4                   1840  AFLT3    AIS   R15,4
001D9C      180E                   1841           LPSWR R14
```

BACKGROUND TESTING AND INTERRUPT HANDLERS

```
                                   1842   *
001D9E    4880 0A16                1843   AFLT4   LH    R8,FLAG3200        TEST 3200 FLAG          R04
001DA2    4330 1DC6                1844           BZ    AFLT9              UNEXPECTED FAULT IF NOT SET
001DA6    C5F0 1656                1845           CLHI  R15,FIXTEST        *                       R04
001DAA    2133       =001DB0       1846           BNES  AFLT5              *                       R04
001DAC    08DD                     1847           LR    R13,R13            SHOULD HAVE REASON CODE 0
*001DAE   223A       =001D9A       1848           BZ    AFLT3              GO IF OK
001DB0    C5F0 16A6                1849   AFLT5   CLHI  R15,FLTTEST2
001DB4    2136       =001DC0       1850           BNES  AFLT7
001DB6    C5D0 0002                1851   AFLT6   CLHI  R13,2              SHOULD HAVE REASON CODE 2
001DBA    2136       =001DC6       1852           BNES  AFLT9              ERROR IF NO
001DBC    26F6                     1853           AIS   R15,6              R15 GETS ADDRESS OF NEXT INSTR
001DBE    180E                     1854           LPSWR R14                RETURN
001DC0    C5F0 17B2                1855   AFLT7   CLHI  R15,DFLTTEST
001DC4    2237       =001DB6       1856           BES   AFLT6
001DC6    0744                     1857   AFLT9   XR    DDBADR,DDBADR      NO DDB FOR BACKGROUND TESTS
001DC8    4180 1FFC                1858           BAL   R8,ERRGET
001DCC    C880 3012                1859           LHI   R8,X'3012'
001DD0    4087 0000                1860           STH   R8,0(R7)
001DD4    50E7 0008                1861           ST    R14,8(R7)          OLD PSW STATUS
001DD8    50F7 000C                1862           ST    R15,12(R7)         OLD PSW LOC
001DDC    4180 2034                1863           BAL   R8,ERRENQ          QUEUE MESSAGE
001DE0    C200 0CE4                1864           LPSW  ABORT


                                   1966   * SUPERVISOR CALL TRAP HANDLER                                           *
                                   1967   *                                                                        *
                                   1968   *    IF SVC IS EXPECTED, RETURN IS TO OLD LOC + 2.  OTHERWSIE AN         *
                                   1969   * ERROR MESSAGE IS QUEUED.                                               *
                                   1970   *                                                                        *
001DE4    C5F0 162E                1971   SVCERR  CLHI  R15,SVCTEST        EXPECTED?
001DE8    2136       =001DF4       1972           BNES  SVCERR1            B IF NO
001DEA    C5D0 1630                1973           CLHI  R13,SVCTEST+2      CORRECT ADDRESS?
001DEE    2133       =001DF4       1974           BNES  SVCERR1            B IF NO
001DF0    26F2                     1975           AIS   R15,2              SVC OK, ADVANCE LOC
001DF2    180E                     1976           LPSWR R14                RETURN TO TESTING
001DF4    0744                     1977   SVCERR1 XR    DDBADR,DDBADR      NO DDB FOR BACKGROUND TESTS
001DF6    4180 1FFC                1978           BAL   R8,ERRGET
001DFA    C880 3006                1979           LHI   R8,X'3006'         UNEXPECTED SVC
001DFE    4037 0000                1880           STH   R8,0(R7)
001E02    50E7 0008                1881           ST    R14,8(R7)          OLD PSW STATUS
001E06    50F7 000C                1882           ST    R15,12(R7)         OLD PSW LOC
001E0A    4190 2034                1883           BAL   R8,ERRENQ
001E0E    C200 0CE4                1884           LPSW  ABORT


                                   1886   * MACHINE MALFUNCTION TRAP HANDLER                                       *
                                   1887   *                                                                        *
                                   1888   *    PLACES ERROR MESSAGE IN QUEUE AND ENTERS WAIT STATE.  PRESSING      *
                                   1889   * "RUN" ON DISPLAY WILL PRINT ERROR MESSAGE AND RESTART EXERCISER.       *
                                   1890   * NOTE: ERRORQ IS ONE LARGER THAN THE NUMBER OF ERROR BUFFERS TO         *
```

```
                                      1891  * ACCOMODATE THE SPECIAL MAFFUNCTION BUFFER, EVEN IF QUEUE FULL      *
                                      1892  * IS SET.                                                           *
001E12    9566                        1893  MALFUNCT EPSR  R6,R6               CAPTURE PSW
001E14    4880 0A18                   1894           LH    R8,ENTRFLAG
001E18    2116        =001E24         1895           BMS   MALF1
001E1A    2581                        1896           LCS   R8,1
001E1C    4080 0A18                   1897           STH   R8,ENTRFLAG
001E20    C200 0020                   1898           LPSW  X'20'
001E24    E670 0FD4                   1899  MALF1    LA    R7,MALBUF           GET SPECIAL ERROR BUFFER
001E28    C880 3801                   1900           LHI   R8,X'3801'          MACHINE MALFUNCTION ERROR
001E2C    4087 0000                   1901           STH   R8,0(R7)
001E30    5880 0020                   1902           L     R8,X'20'            OLD PSW STATUS
001E34    5087 0008                   1903           ST    R8,8(R7)
001E38    5880 0024                   1904           L     R8,X'24'            OLD PSW LOC
001E3C    5087 000C                   1905           ST    R8,12(R7)
001E40    5067 0010                   1906           ST    R6,16(R7)           NEW PSW STATUS
001E44    6570 2690                   1907           ABL   R7,ERRORQ           QUEUE SPECIAL MESSAGE BUFFER
001E48    F850 0000 8000              1908           LI    R5,Y'8000'
001E4E    9565                        1909           EPSR  R6,R5               ENTER WAIT STATE, ALL MASKED
001E50    4810 34E4                   1910           LH    R1,MACADP           IS MAC SELECTED?
001E54    233C        =001F6C         1911           BZS   MALFUNC1            B IF NO
                                      1912  *   RESTORE MAC REGISTERS AFTER POWER FAIL
001E56    D1E0 24F0                   1913           LM    R14,MACREGS         MAC REGS 0 AND 1
001E5A    D0F1 0000                   1914           STM   R14,0(R1)           INTO BLACK HOLE
001E5E    D120 24F8                   1915           LM    R2,MACREGS+8        MAC REGS 2 THRU F
001E62    D021 0008                   1916           STM   R2,8(R1)            INTO BLACK HOLE
001E66    2420                        1917           LIS   R2,0
001E68    5021 0040                   1918           ST    R2,64(R1)           CLEAR MAC STATUS REGISTER
001E6C    C200 0CE4                   1919  MALFUNC1 LPSW  ABORT               PRINT MESSAGE AND RESTART


                                      1921  *   RELOCATION-PROTECTION INTERRUPT HANDLER
                                      1922  *                                                                   *
                                      1923  * THE LOCATION AND TYPE OF MAC/MAT INTERRUPT IS COMPARED WITH SEVERAL
                                      1924  * POSSIBLE  TESTS WHICH SHOULD CAUSE AN INTERRUPT.  IF THE
                                      1925  * INTERRUPT IS EXPECTED, RETURN IS TO THE BACKGROUND TESTING.
                                      1926  * OTHERWISE A MESSAGE IS QUEUED AND TESTING IS ABORTED.
                                      1927  *
001E70    0744                        1928  MACINT   XR    DDBADR,DDBADR       NO DDB FOR BACKGROUND TESTS
001E72    C830 00FF                   1929           LHI   STAT,X'FF'          INVALID STATUS IF NOT TESTING MAC
001E76    4850 34E6                   1930           LH    R5,MATFLAG
001E7A    4230 1EF4                   1931           BNZ   MATINT
001E7E    4850 34E4                   1932           LH    R5,MACADR
001E82    4330 1ED0                   1933           BZ    MACINT2             B IF NOT TESTING MAC
001E86    D335 0043                   1934           LB    STAT,67(R5)         GET CAUSE OF MAC INTERRUPT
001E8A    4860 0A16                   1935           LH    R6,FLAG3200
001E8E    2332        =001F92         1936           BZS   MACINT0
001E90    083D                        1937           LR    STAT,R13
001E92    2450                        1938  MACINT0  LIS   R6,0
001E94    5055 0040                   1939           ST    R6,64(R5)           CLEAR MAC STATUS
001E98    5870 1AB8                   1940  MATINT0  L     R7,MACRETRN         EXPECTING?
001E9C    4330 1ED0                   1941           BZ    MACINT2             B IF NO
```

BACKGROUND TESTING AND INTERRUPT HANDLERS

```
001EA0      08F7                    1942          LR     R15,R7           THIS IS RETURN
001EA2      5060 1AB8               1943          ST     R6,MACRETRN      NO LONGER EXPECTING
001EA6      F4E0 0000 FBFF          1944          NI     R14,Y'FBFF'      TURN OFF MAC
001EAC      D430 1ABC               1945          CLB    STAT,MACSTAT     CORRECT STATUS?
*001EB0     233F      =001ECE       1946          BE     MACINT1          B IF YES
001EB2      4180 1FFC               1947          BAL    R8,ERRGET
001EB6      C880 3017               1948          LHI    R8,X'3017'       BAD MAC STATUS
001EBA      4087 0000               1949          STH    R8,0(R7)
001EBE      D380 1ABC               1950          LB     R8,MACSTAT       EXPECTED STATUS
001EC2      5087 0008               1951          ST     R8,8(R7)
001EC6      5037 000C               1952          ST     STAT,12(R7)      ACTUAL STATUS
001ECA      4180 2034               1953          BAL    R8,ERRENQ
001ECE      180E                    1954  MACINT1 LPSWR  R14              RETURN TO TESTING
001ED0      4180 1FFC               1955  MACINT2 BAL    R8,ERRGET
001ED4      C880 B008               1956          LHI    R8,X'B008'       UNEXPECTED MAC INTERRUPT
001ED8      4087 0000               1957  MACINT3 STH    R8,0(R7)
001EDC      4067 0002               1958          STH    R6,2(R7)         ZERO DEVICE
001EE0      4037 0004               1959          STH    STAT,4(R7)       MAC STATUS
001EE4      50E7 0008               1960          ST     R14,8(R7)        OLD PSW STATUS
001EE8      50F7 000C               1961          ST     R15,12(R7)       OLD PSW LOC
001EEC      4180 2034               1962          BAL    R8,ERRENQ        QUEUE MESSAGE
001EF0      C200 0CE4               1963          LPSW   ABORT            STOP TESTING


001EF4      083D                    1965  MATINT  LR     STAT,R13
001EF6      2460                    1966          LIS    R6,0
001EF8      4300 1E98               1967          B      MATINT0


001EFC      083D                    1969  FORFAULT LR    STAT,R13
001EFE      4180 1FFC               1970          BAL    R8,ERRGET        GET SPACE ON THE ERROR QUEUE
001F02      C880 B002               1971          LHI    R8,X'B002'       ERROR NUMBER #2
001F06      4300 1ED8               1972          B      MACINT3
```

```
                                1974   *STOPTEST -- TERMINATE TESTING, AND EMPTY ERROR MESSAGE QUEUE          *
                                1975   *                                                                     *
                                1976   *   THIS ROUTINE IS ENTERED AS THE RESULT OF A LPSW ABORT, WHEN IT    *
                                1977   * IS DESIRED TO TERMINATE TESTING.  ANY ERROR MESSAGE WHICH IS        *
                                1978   * CURRENTLY BEING PRINTED IS FINSIHED. IF THE QFULL FLAG IS SET,      *
                                1979   * A MESSAGE TO THAT EFFECT IS RPINTED.  FINALLY THE ERROR QUEUE IS    *
                                1980   * EMPTIED AND THE EXERCISER IS RESTARTED.                             *
                                1981   *                                                                     *
                                1982   *
                                1983   *   FINISH PRINTING CURRENT MESSAGE.
                                1984   *
*001F0A    C940 73F0            1985   STOPTEST LI     DDBADR,PTPRDDB       PAPER TAPE READER PUNCH
 001F0E    4854 0002            1986            LH     R5,PHASE(DDBADR)     PHASE
 001F12    2758                 1987            SIS    R5,PHASE.2           TWO
 001F14    4230 1F38            1988            BNZ    STOPTST1             NO
 001F18    5854 0028            1989            L      R5,DVRWRK1(DDBADR)   IN MIDDLE OF RECORD
 001F1C    212E       =001F38   1990            BPS    STOPTST1             NO
 001F1E    5654 0038            1991            L      R5,BUF1NEXT(DDBADR)  NEXT BYTE
 001F22    4824 0008            1992            LH     DEV,DEVADR(DDBADR)   DEVICE ADDRESS
 001F26    9723                 1993   PTPSTAT  SSR    DEV,STAT             STATUS
 001F28    2118       =001F38   1994            BMS    STOPTST1             DU
 001F2A    2082       =001F26   1995            BCS    PTPSTAT              WAIT FOR NONE BUSY
 001F2C    DA25 0000            1996            WD     DEV,0(R5)            WRITE NEXT BYTE OF RECORD
 001F30    2551                 1997            AIS    R5,1                 NEXT BYTE
 001F32    5554 0034            1998            CL     R5,BUF1END(DDBADR)   END OF RECORD
 001F36    2228       =001F26   1999            BNPS   PTPSTAT              NO
                                2000   *
 001F38    E640 25BC            2001   STOPTST1 LA     DDBADR,CONDDB        GET CONSOLE DDB
 001F3C    E654 0048            2002            LA     R5,CCB1ADR(DDBADR)   AND WRITE CCB
 001F40    2467                 2003            LIS    R6,DFVCNTL2          TEST ERROR IN PROGRESS FLAG
 001F42    7454 0000            2004            TBT    R6,DSPFLGS(DDBADR)
 001F46    233A       =001F5A   2005            BZS    STOP02               B IF NOT SET
 001F48    58F5 0004            2006            L      R14,BUFOEADR(R5)     END OF MESSAGE BEING PRINTED
 001F4C    48D5 0002            2007            LH     R13,BUFOCNT(R5)      RESIDUE BYTE COUNT
 001F50    2125       =001F5A   2008            BPS    STOP02               B IF NOTHING LEFT TO PRINT
 001F52    0ADE                 2009            AR     R13,R14              COMPUTED START OF BUFFER ADDRESS
 001F54    27D1                 2010            SIS    R13,1                ALLOW FOR ONE LOST BY BREAK
 001F56    41F0 232E            2011            BAL    R15,CONPRINT         FINISH PRINTING
                                2012   *
                                2013   *   IS ERROR QUEUE FULL?
                                2014   *
 001F5A    4860 263C            2015   STOP02   LH     R6,QFULL
 001F5E    2337       =001F6C   2016            BZS    STOP03               B IF NOT FULL
 001F60    E6D0 32A8            2017            LA     R13,ERR8MESS
 001F64    E6E0 32BB            2018            LA     R14,ERR8MESE
 001F68    41F0 232E            2019            BAL    R15,CONPRINT         PRINT QUEUE FULL MESSAGE
                                2020   *
                                2021   *   NOW EMPTY QUEUE
                                2022   *
 001F6C    C860 0015            2023   STOP03   LHI    R6,QUESIZ+1          LOOP COUNTER FOR SAFETY
 001F70    2761                 2024   STOP04   SIS    R6,1                 PRINTED MAXIMUM ERROR MESSAGES?
 001F72    2318       =001F82   2025            BNMS   STOP05               B IF NO
 001F74    E6D0 32BC            2026            LA     R13,ERR9MESS
```

TERMINATE TESTING, PRINT ERRORS

```
001F78      E6E0 32DB         2027           LA    R14,ERR9MESE
001F7C      41F0 232E         2028           BAL   R15,CONPRINT       PROGRAM ERROR, ABORT HANDLER
*001F80     230E      =001F9C 2029           B     STOPEXIT           GO RESTART EXERCISER
                              2030    * GET ERROR MESSAGE TO PRINT
001F82      6670 2690         2031  STOP05   RTL   R7,ERRORQ
001F86      214B      =001F9C 2032           BTCS  4,STOPEXIT         B IF QUEUE EMPTY,WE'RE DONE
001F88      E6D0 312C         2033           LA    R13,OUTBUF         PRINT BUFFER
001F8C      41F0 2078         2034           BAL   R15,FMATERR        FORMAT THE MESSAGE
001F90      6570 26EC         2035           ABL   R7,BUFPOOL         RELEASE BUFFER
001F94      41F0 232E         2036           BAL   R15,CONPRINT       PRINT IT
001F98      4300 1F70         2037           B     STOP04             LOOP FOR REST OF MESSAGES
                              2038    *
001F9C                        2039  STOPEXIT IFP   MAM
001F9C      48F0 34B2         2040           LH    R15,MAMADR         GET MAM ADDR
001FA0      4330 1FCA         2041           BZ    STOPZ              EXIT IF NONE
001FA4      C8D0 00FF         2042           LHI   R13,255            255 ENTRIES MAXIMUM
001FA8      DEF0 3457         2043           OC    R15,MAMDKILL       DISABLE, KILL, & PIQ READ
001FAC      9DFE              2044  STOPEX1  SSR   R15,R14            SENSE STATUS
001FAE      C3E0 0002         2045           THI   R14,2              PIQ TABLE EMPTY
*001FB2     213C      =001FCA 2046           BNZ   STOPZ              EXIT IF EMPTY
001FB4      27D1              2047           SIS   R13,1
001FB6      233A      =001FCA 2048           BZS   STOPZ              EXIT IF ZERO
001FB8      99FE              2049           RHR   R15,R14            READ PIQ ENTRY
001FBA      65E0 B48E =00544C 2050           ABL   R14,MAMPIQES       ADD LAST PIQ ENTRY TO LIST
001FBE      2049      =001FAC 2051           BTCS  4,STOPEX1          LIST NOT FULL
001FC0      66C0 B488 =00544C 2052           RTL   R12,MAMPIQES       MAKE ROOM IF LIST IS FULL
001FC4      65E0 B484 =00544C 2053           ABL   R14,MAMPIQES
*001FC8     220E      =001FAC 2054           B     STOPEX1            READ ALL PIQ ENTRIES
                              2055           ENDC
001FCA                        2056  STOPZ    IFP   FLOPPY             FLOPPY EXIST
001FCA      E6A0 21E8         2057           LA    R10,DST            SEARCH FOR FLOPPY
001FCE      24B4              2058           LIS   R11,4
001FD0      58C0 2264         2059           L     R12,DSTLAST
001FD4      584A 0000         2060  STOPEX2  L     DDBADR,0(R10)
001FD8      24D6              2061           LIS   R13,FLOPTYP        FLOPPY
001FDA      74D4 0006         2062           TBT   R13,DTYPFLGS(DDBADR)
001FDE      233B      =001FF4 2063           BZS   STOPEX3            NO
001FE0      48D4 0008         2064           LH    R13,DEVADR(DDBADR) FLOPPY ADDRESS
001FE4      DED0 3490         2065           CC    R13,FMDDSTOP       STOP AND DISARM
001FE8      DED0 3491         2066           OC    R13,FMDDSTOP+1
001FEC      DED0 3492         2067           OC    R13,FMDDSTOP+2
001FF0      DED0 3493         2068           OC    R13,FMDDSTOP+3
001FF4      C1A0 1FD4         2069  STOPEX3  BXLE  R10,STOPEX2
                              2070           ENDC
001FF8      4300 0C1E         2071  STOPZZ   B     RESTART
```

ERROR AND BUFPOOL MANIPULATION ROUTINES

```
                              2073  *ERRGET -  AN INTERNAL ERROR BUFFER FROM FREE POOL          *
                              2074  *                                                            *
                              2075  *    REMOVES A BUFFER FROM THE TOP OF THE FREE BUFFER POOL.  IF THIS  *
                              2076  * IS LAST AVAILABLE BUFFER THE QUEUE FULL FLAG IS SET.  MUST NOT      *
                              2077  * BE INTERRUPTED BETWEEN REMOVING THE BUFFER AND TESTING FOR EMPTY.   *
                              2078  * BECOMES UNINTERRUPTABLE DURING THIS PROCESS.  IF QUEUE FULL FLAG    *
                              2079  * SETS, REMAINS UNINTERRUPTABLE SO THAT THE TEST COMES TO AN ORDERLY  *
                              2080  * TERMINATION.                                                *
                              2081  *                                                            *
                              2082  *NO PARAMETERS.                                              *
                              2083  *                                                            *
                              2084  *RETURNED VALUE:                                             *
                              2085  *   R7 - ADDRESS OF INTERNAL ERROR BUFFER                     *
                              2086  *   QUEUE FULL FLAG MAY BE TURNED ON.                         *
                              2087  *                                                            *
                              2088  *CALLING SEQUENCE:                                           *
                              2089  *         BAL    R8,ERRGET                                    *
                              2090  *                                                            *
                              2091  *REGISTERS R9 AND R10 DESTROYED.                             *
                              2092  *                                                            *
001FFC    95AA                2093  ERRGET    EPSR   R10,R10              GET STATUS
001FFE    F4A0 0000 B7FF      2094            NI     R10,Y'0000B7FF'      CLEAR ENABLE BITS
002004    959A                2095            EPSR   R9,R10               BECOME UNINTERRUPTABLE
002006    6670 26EC           2096            RTL    R7,BUFPOOL           GET A BUFFER
*00200A    23FF      =002C28  2097            BFC    15,ERRGET01          POOL NOW EMPTY
00200C    4220 2030           2098            BTC    2,ERRGET02           POOL NOT EMPTY
                              2099  *  MALFUNCTION, POOL SHOULDN'T ALREADY BE EMPTY
002010    D000 0CF4           2100            STM    R0,REGSAV            SAVE EVIDENCE
002014    24A0                2101            LIS    R10,0
002016    959A                2102            EPSR   R9,R10               FORCE NO INTERRUPTS, REG SET ZERO
002018    E6D0 328F           2103            LA     R13,ERR7MESS         PROGRAM ERROR, ERRGET
00201C    E6E0 32A7           2104            LA     R14,ERR7MESE
002020    41F0 232E           2105            BAL    R15,CONPRINT
002024    C200 0CE4           2106            LPSW   ABORT                TERMINATE TESTING
                              2107  *
                              2108  *  POOL NOW EMPTY, SET FULL FLAG, REMAIN UNINTERRUPTABLE
                              2109  *
002028    25A1                2110  ERRGET01  LCS    R10,1
00202A    40A0 263C           2111            STH    R10,QFULL            SET FLAG
00202E    0308                2112            BR     R8                   RETURN
                              2113  *
                              2114  *  NOT YET EMPTY, RESTORE CALLER PSW
                              2115  *
002030    95A9                2116  ERRGET02  EPSR   R10,R9               OLD PSW SAVED IN R9
002032    0308                2117            BR     R8                   RETURN
```

```
                                        2119  *ERRENQ -- ADD AN INTERNAL ERROR BUFFER TO PRINT QUEUE          *
                                        2120  *                                                              *
                                        2121  *    ADDS AN ERROR BUFFER TO THE PRINT QUEUE IF LOG SWITCH IS ON, *
                                        2122  * AND IF DEVICES' BAD STATUS IS RESET.  OTHERWISE THE BUFFER IS  *
                                        2123  * RETURNED TO THE FREEPOOL.  IN EITHER CASE, THE DEVICES DDB IS  *
                                        2124  * UPDATED TO INDICATE AN ERROR.  TESTING IS ABORTED IF THE QFULL *
                                        2125  * FLAG IS SET, THE HALT SWITCH IS ON, OR IF THE ERROR IS ON THE  *
                                        2126  * CONSOLE DEVICE ( "BREAK" STATUS).                             *
                                        2127  *                                                              *
                                        2128  *PARAMETER:                                                     *
                                        2129  *  R7 - ADDRESS OF INTERNAL ERROR BUFFER                        *
                                        2130  *  DDBADR - ADDRESS OF DDB FOR DEVICE IN ERROR                  *
                                        2131  *                                                              *
                                        2132  *NO RETURNED VALUE.                                             *
                                        2133  *                                                              *
                                        2134  *CALLING SEQUENCE:                                              *
                                        2135  *         BAL   R8,ERRENQ                                       *
                                        2136  *                                                              *
                                        2137  *REGISTER R9 IS DESTROYED.                                      *

002034      0844                        2139  ERRENQ   LR    DDBADR,DDBADR       IS THERE A DDB?
002036      233B      =00204C           2140           BZS   ERRENQ00            B IF NO, SKIP DDB UPDATES
002038      2491                        2141           LIS   R9,1
00203A      5194 0018                   2142           AH    R9,ERRORCNT(DDBADR) INCREMENT ERROR COUNT
00203E      2492                        2143           LIS   R9,NOTCOUNT         SET NOT COUNTING
002040      7594 0000                   2144           SBT   R9,DSPFLGS(DDBADR)
002044      2493                        2145           LIS   R9,BADSTAT
002046      7594 0000                   2146           SBT   R9,DSPFLGS(DDBADR)  SET BAD STATUS
00204A      2138      =00205A           2147           BNZS  ERRENQ01            B IF ALREADY SET, PREVIOUS ERROR
00204C      2491                        2148  ERRENQ00 LIS   R9,LOGSWTCH         TEST LOG SWITCH
00204E      7490 263E                   2149           TBT   R9,SWITCHES
002052      2334      =00205A           2150           BZS   ERRENQ01            B IF NOT LOGGING MESSAGES
002054      6570 2690                   2151           ABL   R7,ERRORQ           QUEUE THE ERROR MESSAGE
002058      2303      =00205E           2152           BS    ERRENQ02            SKIP FREE SECTION
00205A      6570 26EC                   2153  ERRENQ01 ABL   R7,BUFPOOL          FREE BUFFER IF NOT GOING TO QUEUE IT
00205E      4890 263C                   2154  ERRENQ02 LH    R9,QFULL            TEST FULL FLAG
002062      2139      =002074           2155           BNZS  ERRENQ03            B IF SET
002064      2490                        2156           LIS   R9,HLTSWTCH         IS HALT SWITCH SET
002066      7490 263E                   2157           TBT   R9,SWITCHES
00206A      2135      =002074           2158           BNZS  ERRENQ03            B IF SET
00206C      C940 25BC                   2159           CHI   DDBADR,CONDDB       IS ERROR ON CONSOLE?
002070      2332      =002074           2160           BES   ERRENQ03            B IF YES
002072      0308                        2161           BR    R8                  EVERYTHING OK, RETURN
                                        2162  *
                                        2163  *   TERMINATION CONDITION, ABORT TESTING
                                        2164  *
002074      C200 0CE4                   2165  ERRENQ03 LPSW  ABORT
```

```
                                     2167  *FMATERR -- FORMAT AN INTERNAL ERROR BUFFER TO BE PRINTED        *
                                     2168  *                                                               *
                                     2169  *PARAMETERS:                                                    *
                                     2170  *   R7 -  ADDRESS OF INTERNAL ERROR BUFFER                      *
                                     2171  *   R13 - ADDRESS OF PRINT BUFFER TO BE GENERATED.              *
                                     2172  *                                                               *
                                     2173  *RETURNED VALUE:                                                *
                                     2174  *   R14 - ADDRESS OF END OF FORMATTED BUFFER.                   *
                                     2175  *                                                               *
                                     2176  *CALLING SEQUENCE:                                              *
                                     2177  *        PAL   R15,FMATERR                                      *
                                     2178  *                                                               *
                                     2179  *REGISTERS R8 THROUGH R12 USED BY HEXASCII, DESTROYED.          *
                                     2180  *                                                               *
                                     2181  *   ROUTINE IS REENTRANT, INTERRUPTABLE                         *
                                     2182  *                                                               *
002078      C88D 0002                2183  FMATERR  LHI   R8,2(R13)          START OF BUFFER
00207C      C890 0C0A                2184           LHI   R9,X'0D0A'
002080      409D 0000                2185           STH   R9,0(R13)          CR LF TO START
002084      2491                     2186           LIS   R9,1               INCREMENT BY ONE
002086      E6A8 0029                2187           LA    R10,41(R8)         FOR 42 BYTES
00208A      C8B0 0020                2188           LHI   R11,X'20'          ASCII BLANK
00208E      D2B8 0000                2189  FMAT01   STB   R11,0(R8)          STORE A BLANK
002092      C180 208E                2190           BXLE  R8,FMAT01          LOOP TO END OF BUFFER
                                     2191  *  CONVERT ERROR NUMBER
002096      C88D 0002                2192           LHI   R11,2(R13)         PLACE AT FRONT OF BUFFER
00209A      D397 0001                2193           LB    R9,1(R7)           ERROR NUMBER
00209E      24A2                     2194           LIS   R10,2              TWO DIGITS
0020A0      41C0 21B4                2195           BAL   R12,HEXASCII
                                     2196  *  ARE DEVICE, STATUS FIELDS SELECTED?
0020A4      2480                     2197           LIS   R8,0               TEST FLAG IN CONTROL FIELD
0020A6      7487 0000                2198           TBT   R8,0(R7)
*0020AA     233F        =0020C8      2199           BZ    FMAT02             B IF NOT SELECTDD
0020AC      E6BD 0005                2200           LA    R11,5(R13)         WHERE TO PUT DEVICE
0020B0      4897 0002                2201           LH    R9,2(R7)           DEVICE ADDRESS
0020B4      24A3                     2202           LIS   R10,3              THREE DIGITS
0020B6      41C0 21B4                2203           BAL   R12,HEXASCII       CONVERT DEVICE ADDRESS
0020BA      E6BD 0009                2204           LA    R11,9(R13)         WHERE TO PUT STATUS
0020BE      4897 0004                2205           LH    R9,4(R7)           GET STATUS FROM INTERNAL BUFFER
0020C2      24A2                     2206           LIS   R10,2              TWO DIGITS
0020C4      41C0 21B4                2207           BAL   R12,HEXASCII       CONVERT
                                     2208  *  IS SELCH FIELD SELECTED?
0020C8      2481                     2209  FMAT02   LIS   R8,1               TEST FLAG IN CONTROL FIELD
0020CA      7487 0000                2210           TBT   R8,0(R7)
0020CE      2338        =0020DE      2211           BZS   FMAT03             B IF NOT SELECTED
0020D0      E6BD 000C                2212           LA    R11,12(R13)        WHERE TO PUT SELCH
0020D4      4897 0006                2213           LH    R9,6(R7)           GET SELCH ADDRESS
0020D8      24A3                     2214           LIS   R10,3              THREE DIGITS
0020DA      41C0 21B4                2215           BAL   R12,HEXASCII
                                     2216  *  IS EXPECTED VALUE FIELD SELECTED (OLD PSW STATUS)?
0020DE      24B2                     2217  FMAT03   LIS   R8,2               TEST FLAG IN CONTROL FIELD
0020E0      7487 0000                2218           TBT   R8,0(R7)
0020E4      2338        =0020F4      2219           BZS   FMAT04             B IF NOT SELECTED
```

ERROR BUFFER FORMAT FOR PRINT

```
0020E6      E6BD 0010              2220          LA    R11,16(R13)       WHERE IT GOES
0020EA      5897 0008              2221          L     R9,8(R7)          GET VALUE
0020EE      24A8                   2222          LIS   R10,8             EIGHT DIGITS
0020F0      41C0 21B4              2223          BAL   R12,HEXASCII
                                   2224   *  HOW ABOUT ACTUAL VALUE FIELD (OLD PSW LOC)?
0020F4      2483                   2225   FMAT04 LIS   R8,3              TEST FLAG
0020F6      7487 0000              2226          TBT   R8,0(R7)
0020FA      2338       =00210A     2227          BZS   FMAT05            B IF NOT SELECTED
0020FC      E6BD 0019              2228          LA    R11,25(R13)       WHERE IT GOES
002100      5897 000C              2229          L     R9,12(R7)         GET VALUE
002104      24A8                   2230          LIS   R10,8             EIGHT DIGITS
002106      41C0 21B4              2231          BAL   R12,HEXASCII
                                   2232   *  NOW CHECK ADDRESS FIELD (NEW PSW STATUS)
00210A      2484                   2233   FMAT05 LIS   R8,4              TEST FLAG
00210C      7487 0000              2234          TBT   R8,0(R7)
002110      2338       =002120     2235          BZS   FMAT06            B IF NOT SELECTED
002112      E6BD 0022              2236          LA    R11,34(R13)       WHERE IT GOES
002116      5897 0010              2237          L     R9,16(R7)         GET VALUE
00211A      24A8                   2238          LIS   R10,8             EIGHT DIGITS
00211C      41C0 21B4              2239          BAL   R12,HEXASCII
            0000 2120              2240   FMAT06 EQU   *
002120      E6EB 0001              2241          LA    R14,1(R11)        R14 RETURNS LAST BYTE ADDRESS
002124      248D                   2242          LIS   R8,X'0D'          LOAD CR
002126      D28E 0000              2243          STB   R8,0(R14)         STORE
00212A      248A                   2244          LIS   R8,X'0A'          LOAD LF
00212C      D28E 0001              2245          STB   R8,1(R14)         STORE
002130      26E2                   2246          AIS   R14,2             INCREMENT
002132      030F                   2247          BR    R15              RETURN
```

```
                                2249  *PARMSCAN -- PARAMETER SCAN AND CONVERSION              *
                                2250  *                                                        *
                                2251  *   PARAMETERS ARE SEPARATED BY A LEADING DELIMITER AND A TRAILING  *
                                2252  * DELIMITER, WHERE THE TRAILING DELIMITER OF ONE PARAMETER IS THE   *
                                2253  * LEADING DELIMITER OF THE NEXT. SCAN IS TERMINATED WHEN BUFFER     *
                                2254  * LIMIT IS REACHED, OR CARRIAGE RETURN OR LINE FEED IS FOUND.       *
                                2255  *                                                        *
                                2256  *LEADING DELIMITERS:                                     *
                                2257  *            ' '    BLANK                                 *
                                2258  *            ','    COMMA                                 *
                                2259  *            '-'    HYPHEN (MINUS)                        *
                                2260  *                                                        *
                                2261  *TRAILING DELIMITERS:                                    *
                                2262  *            ','    COMMA                                 *
                                2263  *            '-'    HYPHEN                                *
                                2264  *                                                        *
                                2265  *INPUT PARAMETERS:                                       *
                                2266  *   R11    ADDRESS OF LEADING DELIMITER, WHERE TO START SCAN  *
                                2267  *   R12    ADDRESS OF LAST BYTE IN BUFFER, BUFFER LIMIT   *
                                2268  *                                                        *
                                2269  *RETURNED VALUES:                                        *
                                2270  *   R11    ADDRESS OF TRAILING DELIMITER, WHERE SCAN STOPPED  *
                                2271  *   R13    CONVERTED VALUE OF PARAMETER                   *
                                2272  *   R15    RETURN CODE                                    *
                                2273  *          RC=0  PARAMETER CONVERTED WITHOUT ERROR        *
                                2274  *          RC=2  MISSING PARAMETER,CR BUFFER TERMINATOR, OR BUFFER LIMIT*
                                2275  *          RC=4  FORMAT ERROR, FIRST CHARACTER NOT LEADING DELIMITER  *
                                2276  *          RC=6  INVALID HEX DIGIT                        *
                                2277  *                                                        *
                                2278  *CALLING SEQUENCE:                                       *
                                2279  *          BAL    R14,PARMSCAN                           *
                                2280  *                                                        *
                                2281  *REGISTERS PRESERVED EXCEPT RETURNED VALUES - R11,R13,R15 *
                                2282  *                                                        *
002134        50A0 21AC         2283  PARMSCAN ST    R10,PSCNSAV            SAVE REGISTERS THAT GET MODIFIED
002138        50E0 21B0         2284           ST    R14,PSCNSAV+4
00213C        08AB              2285           LR    R10,R11               START SCAN ADDRESS
00213E        24B1              2286           LIS   R11,1                 INDEX BY ONE BYTE
002140        07DD              2287           XR    R13,R13               VALUE IS INITIALLY ZERO
002142        24F2              2288           LIS   R15,2                 RETURN CODE INITIALLY 2, NO VALUE
002144        09CA              2289           CR    R12,R10               PAST END OF BUFFER?
002146        4280 219E         2290           BL    PRMSCN9               B IF YES
00214A        D3EA 0000         2291           LB    R14,0(R10)            LOOK AT FIRST CHARACTER
00214E        C5E0 000E         2292           CLHI  R14,X'0E'             CARRIAGE RETURN?
002152        4280 219E         2293           BL    PRMSCN9               B IF YES
002156        24F4              2294           LIS   R15,4                 RC=4 IN CASE DELIMITER TESTS FAIL
                                2295  * CHECK FOR LEADING DELIMITERS
002158        C5E0 002E         2296           CLHI  R14,X'2E'             LESS THAN HYPHEN IS TERMINATOR
00215C        4380 219E         2297           BNL   PRMSCN9               B IF NO, DELIMITER NOT FOUND
002160        24F2              2298  PRMSCN1  LIS   R15,2                 RC=2 NO VALUE, BUT FORMAT OK
002162        C0A0 219E         2299  PRMSCN2  BXH   R10,PRMSCN9           ADVANCE TO NEXT BYTE IF NOT AT END,
                                2300  *                                   OTHERWISE RETURN
002166        D3EA 0000         2301           LB    R14,0(R10)            LOOK AT NEXT CHAR
```

PARAMETER SCAN AND CONVERSION

```
                                     2302  *  CHECK FOR TRAILING DELIMITERS
00216A        C5E0 002E              2303          CLHI  R14,X'2E'          LESS THAN HYPHEN IS TERMINATOR
00216E        4280 219E              2304          BL    PRMSCN9            B IF YES
                                     2305  *  CONVERT ASCII TO HEX
002172        24F6                   2306          LIS   R15,6             RC=6 IF CONVERSION FAILS          S
002174        C5E0 0030              2307          CLHI  R14,X'30'          TEST LOW RANGE
002178        4280 219E              2308          BL    PRMSCN9            B IF OUT OF RANGE
00217C        C5E0 003A              2309          CLHI  R14,X'3A'          CHECK IF 0-9
002180        2188      =002190      2310          BLS   PRMSCN3            B IF YES, CONVERT
002182        C5E0 0041              2311          CLHI  R14,X'41'          TOO LOW FOR  A-F ?
002186        218C      =00219E      2312          BLS   PRMSCN9            B IF OUT OF RANGE
002188        C5E0 0047              2313          CLHI  R14,X'47'          TOO HIGH FOR A-F ?
00218C        2389      =00219E      2314          BNLS  PRMSCN9            B IF OUT OF RANGE
00218E        26E9                   2315          AIS   R14,9             BUMP ASCII A-F TO HEX A-F
002190        C4E0 000F              2316  PRMSCN3 NHI   R14,X'F'           STRIP ASCII BITS TO GET HEX
002194        11D4                   2317          SLLS  R13,4             SHIFT PREVIOUS DIGITS
002196        0ADE                   2318          AR    R13,R14           ADD IN CURRENT DIGIT
002198        07FF                   2319          XR    R15,R15           RC=0 SUCCESSFUL CONVERSION
00219A        4300 2162              2320          B     PRMSCN2            CONTINUE SCANNING
                                     2321  *
                                     2322  *  CLEAN UP REGISTERS AND EXIT
00219E        08BA                   2323  PRMSCN9 LR    R11,R10            RETURN BUFFER POINTER
0021A0        58A0 21AC              2324          L     R10,PSCNSAV        RESTORE REGISTERS
0021A4        58E0 21B0              2325          L     R14,PSCNSAV+4
0021A8        030E                   2326          BR    R14               RETURN
0021AC                               2327          ALIGN 4
0021AC                               2328  PSCNSAV DS    8                 SAVE AREA
```

```
                                  2330  *HEXASCII -- FULLWORD HEX TO ASCII CONVERSION                        *
                                  2331  *                                                                    *
                                  2332  *PARAMETERS:                                                         *
                                  2333  *  R8 - WORK REGISTER, DESTROYED                                     *
                                  2334  *  R9 - 32 BIT MEMORY VALUE TO CONVERT                               *
                                  2335  *  R10 - NUMBER OF HEX DIGITS TO CONVERT, RIGHTMOST N DIGITS OF      *
                                  2336  *        R9 ARE CONVERTED                                            *
                                  2337  *  R11 - ADDRESS OF BUFFER TO PUT ASCII CHARACTERS                   *
                                  2338  *                                                                    *
                                  2339  *RETURNED VALUES:                                                    *
                                  2340  *  ASCII CHARACTERS ARE PLACE IN MEMORY STARTING AT ADDRESS IN R11   *
                                  2341  *  R8  - DESTROYED.                                                  *
                                  2342  *  R10 - DESTROYED.                                                  *
                                  2343  *  R11 - ADDRESS OF  NEXT AVAILABLE BYTE IN CONVERTED VALUE BUFFER.  *
                                  2344  *        R11(RETURN) = R11(ENTRY) + R10(ENTRY)                       *
                                  2345  *                                                                    *
                                  2346  *CALLING SEQUENCE:                                                   *
                                  2347  *        BAL    R12,HEXASCII                                         *
                                  2348  *                                                                    *
                                  2349  *  REENTRANT, INTERRUPTABLE, CAN USE ANY REGISTER SET.               *
                                  2350  *                                                                    *

0021B4      11A2                  2352  HEXASCII SLLS   R10,2                FOUR BITS PER DIGIT
0021B6      EA9A 0000             2353           RRL    R9,0(R10)            CIRCULATE RIGHT, CONVERSION WILL
                                  2354  *                                      PUT IT BACK BY CIRCULATE LEFT
0021BA      10A2                  2355           SRLS   R10,2                PUT BACK COUNT
0021BC      27A1                  2356  HEXASC1  SIS    R10,1                HAVE WE CONVERTED ALL DIGITS?
0021BE      021C                  2357           BMR    R12                  B IF YES, RETURN
0021C0      EB90 0004             2358           RLL    R9,4                 GET 4 BITS, ONE DIGIT
0021C4      9389                  2359           LBR    R8,R9                INTO WORK REGISTER
0021C6      C480 000F             2360           NHI    R8,X'F'              CLEAR GARBAGE
0021CA      D388 21D6             2361           LB     R8,HEXATBL(R8)       TRANSLATE
0021CE      D28B 0000             2362           STB    R8,0(R11)            INTO BUFFER
0021D2      26B1                  2363           AIS    R11,1                BUMP BUFFER POINTER
0021D4      220C      =0021BC     2364           BS     HEXASC1              GO CONVERT MORE
            0000 21D6             2365  HEXATBL  EQU    *                    HEX TO ASCII TRANSLATE TABLE
0021D6      3031                  2366           DC     X'3031',X'3233'      0-1,2-3
0021D8      3233
0021DA      3435                  2367           DC     X'3435',X'3637'      4-5,6-7
0021DC      3637
0021DE      3839                  2368           DC     X'3839',X'4142'      8-9,A-B
0021E0      4142
0021E2      4344                  2369           DC     X'4344',X'4546'      C-D,E-F
0021E4      4546
```

DEVICE SERVICE TABLE AND DST MANIPULATION ROUTINES

```
0021E8                          2371          ALIGN 4
                                2372  *  DEVICE SERVICE TABLE
0021E8    0000 0000             2373  DST     DC    Y'0'
0021EC                          2374          DO    MAXDDB
0021EC    0000 0000             2375          DC    Y'0'
0021F0    0000 0000             2375          DC    Y'0'
0021F4    0000 0000             2375          DC    Y'0'
0021F8    0000 0000             2375          DC    Y'0'
0021FC    0000 0000             2375          DC    Y'0'
002200    0000 0000             2375          DC    Y'0'
002204    0000 0000             2375          DC    Y'0'
002208    0000 0000             2375          DC    Y'0'
00220C    0000 0000             2375          DC    Y'0'
002210    0000 0000             2375          DC    Y'0'
002214    0000 0000             2375          DC    Y'0'
002218    0000 0000             2375          DC    Y'0'
00221C    0000 0000             2375          DC    Y'0'
002220    0000 0000             2375          DC    Y'0'
002224    0000 0000             2375          DC    Y'0'
002228    0000 0000             2375          DC    Y'0'
00222C    0000 0000             2375          DC    Y'0'
002230    0000 0000             2375          DC    Y'0'
002234    0000 0000             2375          DC    Y'0'
002238    0000 0000             2375          DC    Y'0'
00223C    0000 0000             2375          DC    Y'0'
002240    0000 0000             2375          DC    Y'0'
002244    0000 0000             2375          DC    Y'0'
002248    0000 0000             2375          DC    Y'0'
00224C    0000 0000             2375          DC    Y'0'
002250    0000 0000             2375          DC    Y'0'
002254    0000 0000             2375          DC    Y'0'
002258    0000 0000             2375          DC    Y'0'
00225C    0000 0000             2375          DC    Y'0'
002260    0000 0000             2375          DC    Y'0'
          0000 2264             2376  DSTEND  EQU   *


002264    0000 21E4             2378  DSTLAST DC    DST-4          LAST USED ENTRY INITIALLY NONE USED
002268    0000 21E8             2379  DSTNEXT DC    DST            NEXT ENTRY TO DISPATCH
00226C                          2380  DSTSAV12 DS   12             SAVE AREA FOR DST ROUTINES
002278                          2381  DSTSAV15 DS   4
```

DEVICE SERVICE TABLE AND DST MANIPULATION ROUTINES

```
                              2383  *DSTADD -- ADD A DDB TO THE DEVICE SERVICE TABLE            *
                              2384  *                                                          *
                              2385  *   PARAMETER:                                             *
                              2386  *     DDBADR (REGISTER) CONTAINS ADDRESS CF DDB TO BE ADDED *
                              2387  *   RETURN CODE:                                           *
                              2388  *     RETURN CODE IN R15                                   *
                              2389  *         RC=0   DDB ADDED CK                              *
                              2390  *         RC=4   TABLE FULL,DDB NOT ADDED                  *
                              2391  *   CALLING SEQUENCE:                                      *
                              2392  *         BAL    R14,DSTADD                               *
                              2393  *   REGISTER PRESERVED EXCEPT R15, RETURN CODE.            *
                              2394  *                                                          *
00227C    58F0 2264           2395  DSTADD   L      R15,DSTLAST          ADDRESS OF LAST ENTRY
002280    25F4               2396  .         AIS    R15,4                PLUS 4 = ADDRESS OF NEXT SLOT
002282    C5F0 2264           2397            CLHI   R15,DSTEND           AT END OF TABLE?
002286    2183      =00228C   2398            BLS    DSTADD1              B IF NO
002288    24F4               2399            LIS    R15,4                SET RC=4, TABLE FULL
00228A    030E               2400            BR     R14                  RETURN
00228C    504F 0000           2401  DSTADD1  ST     DDBADR,0(R15)        PUT DDB IN TABLE
002290    50F0 2264           2402            ST     R15,DSTLAST          UPDATE LAST ENTRY ADDRESS
002294    07FF               2403            XR     R15,R15              RC=0, ADDED OK
002296    030E               2404            BR     R14                  RETURN


                              2406  *DSTFIND -- FIND A DDB IN DEVICE SERVICE TABLE              *
                              2407  *                                                          *
                              2408  *   PARAMETER:                                             *
                              2409  *     DDBADR (REGISTER) CONTAINS ADDRESS CF DDB TO BE FOUND. *
                              2410  *   RETURNED VALUE:                                        *
                              2411  *     R15 = 0    DDB WAS NOT FOUND IN TABLE                *
                              2412  *     R15 =       TABLE ADDRESS WHERE DDB WAS FOUND (USED BY DSTREMOV). *
                              2413  *   CALLING SEQUENCE:                                      *
                              2414  *         BAL    R14,DSTFIND                               *
                              2415  *   REGISTERS PRESERVED EXCEPT R15, RETURNED VALUE.         *
                              2416  *                                                          *
002298    D0C0 226C           2418  DSTFIND  STM    R12,DSTSAV12         ##
00229C    E6D0 21E8           2419            LA     R13,DST              START ADDRESS FOR LOOKUP
0022A0    24E4               2420            LIS    R14,4                TABLE ENTRY SIZE
0022A2    58F0 2254           2421            L      R15,DSTLAST          LAST ADDRESS FOR LOOKUP
0022A6    594D 0000           2422  DSTFIND1 C      DDBADR,0(13)         IS THIS ENTRY THE ONE WE WANT?
0022AA    2334      =0022B2   2423            BES    DSTFIND2             B IF YES
0022AC    C1D0 22A6           2424            BXLE   R13,DSTFIND1         LOOP THROUGH TABLE
0022B0    07DD               2425            XR     R13,R13              FELL THROUGH, NO MATCH
0022B2    50D0 2278           2426  DSTFIND2 ST     R13,DSTSAV15         PUT RETURN VALUE IN SAVE AREA
0022B6    D1C0 226C           2427            LM     R12,DSTSAV12         RESTORE REGISTERS, PICK UP RETURN
0022BA    58F0 2278           2428            L      R15,DSTSAV15         GET DST ADDRESS
0022BE    030E               2429            BR     R14                  RETURN
```

```
                           2431  *DSTREMOV -- REMOVE A DDB FROM THE DEVICE SERVICE TABLE          *
                           2432  *                                                                *
                           2433  *   PARAMETERS:                                                  *
                           2434  *     DDBADR (REGISTER) CONTAINS ADDRESS OF DDB TO BE REMOVED    *
                           2435  *     R15              CONTAINS ADDRESS IN TABLE RETURNED BY     *
                           2436  *                               DSTFIND. IF DDBADR NOT EQUAL DDB IN    *
                           2437  *                               TABLE, ERROR, RC=4               *
                           2438  *   RETURN CODE:                                                 *
                           2439  *     RETURN CODE IN R15                                         *
                           2440  *        RC=0   DDB REMOVED                                      *
                           2441  *        RC=4   DDB DID NOT MATCH, NOT REMOVED                   *
                           2442  *   CALLING SEQUENCE:                                            *
                           2443  *        BAL   R14,DSTREMOV                                      *
                           2444  *   REGISTERS PRESERVED EXCEPT R15, RETURN CODE                  *
                           2445  *                                                                *
0022C0     D0C0 226C       2446  DSTREMOV STM   R12,DSTSAV12       SAVE REGISTERS WE USE
0022C4     08DF            2447           LR    R13,R15            TABLE ADDRESS
0022C6     24E4            2448           LIS   R14,4              TABLE ENTRY SIZE, INITIAL RETURN CODE
0022C8     58F0 2264       2449           L     R15,DSTLAST        ADDRESS OF LAST ENTRY
0022CC     0BFE            2450           SR    R15,R14            NEW LAST ENTRY AFTER REMOVAL
0022CE     594D 0000       2451           C     DDBADR,0(13)       ARE WE ADDRESSING CORRECT TABLE ENTRY
0022D2     4230 2304       2452           BNE   DSTREM3            B IF NO
0022D6     C5F0 21E8       2453           CLHI  R15,DST            IS TABLE NOW EMPTY?
0022DA     2189  =0022FC   2454           BLS   DSTREM2            B IF YES
0022DC     09FD            2455           CR    R15,R13            REMOVING LAST ENTRY?
0022DE     2187  =0022EC   2456           BLS   DSTREM2            B IF YES
0022E0     58CD 0004       2457  DSTREM1  L     R12,4(R13)         PUSH UP EACH ENTRY WHICH COMES AFTER
0022E4     50CD 0000       2458           ST    R12,0(R13)
0022E8     C1D0 22E0       2459           BXLE  R13,DSTREM1
0022EC     50F0 2264       2460  DSTREM2  ST    R15,DSTLAST        UPDATE LAST ENTRY ADDRESS
0022F0     07EE            2461           XR    R14,R14            RETURN CODE = 0, REMOVED OK.
0022F2     24D7            2462           LIS   R13,MAMTYP         MAM
0022F4     74D4 0006       2463           TBT   R13,DTYPFLGS(DDBADR)
0022F8     2336  =002304   2464           BZS   DSTREM3            NO
0022FA     24D0            2465           LIS   R13,0
0022FC     40D0 34B2       2466           STH   R13,MAMADR         ELSE ZERO MAM ADDR
002300     4300 2324       2467           B     DSTREM4            EXIT
002304     24D6            2468  DSTREM3  LIS   R13,FLOPTYP
002306     74D4 0005       2469           TBT   R13,DTYPFLGS(DDBADR)
00230A     233D  =002324   2470           BZS   DSTREM4
00230C     93DA            2471           LBR   R13,R10
00230E     CBD0 0031       2472           SHI   R13,X'31'
002312     2461            2473           LIS   R6,1
002314     CD5D 0000       2474           SLHL  R6,0(R13)
002318     C760 FFFF       2475           XHI   R6,X'FFFF'
00231C     4460 3498       2476           NH    R6,FMDRIVE
002320     4060 3498       2477           STH   R6,FMDRIVE
002324     5050 2278       2478  DSTREM4  ST    R14,DSTSAV15       PUT RETURN CODE IN SAVE AREA FOR LOAD
002328     D1C0 226C       2479           LM    R12,DSTSAV12       RESTORE REGISTERS, GET RETURN CODE
00232C     030E            2480           BR    R14
```

CONSOLE I/O ROUTINES

```
                                    2482  *CONPRINT -- PRINT A MESSAGE ON THE CONSOLE.              *
                                    2483  *                                                         *
                                    2484  *   USES SEPCIAL DRIVER PHASE 3 FOR STATUS LOOP OUTPUT,   *
                                    2485  * WITH SUBROUTINE RETURN.                                 *
                                    2486  *                                                         *
                                    2487  *PARAMETERS:                                              *
                                    2488  *   R13 - ADDRESS OF MESSAGE BUFFER START                 *
                                    2489  *   R14 - ADDRESS OF LAST BYTE PRINT                      *
                                    2490  *                                                         *
                                    2491  *NO RETURNED VALUE.                                       *
                                    2492  *                                                         *
                                    2493  *CALLING SEQUENCE:                                        *
                                    2494  *          BAL    R15,CONPRINT                            *
                                    2495  *                                                         *
                                    2496  *REGISTERS ARE PRESERVED.                                 *
                                    2497  *                                                         *
00232E      D000 264C               2498  CONPRINT STM    R0,CCNSAV            SAVE REGISTERS
002332      E640 25BC               2499           LA     DDBADR,CONDDB        DRIVER PARM BLOCK
002336      4824 0008               2500           LH     DEV,DEVADR(DDBADR)   DEVICE ADDRESS
00233A      241C                    2501           LIS    R1,PHASE.3
00233C      4010 0002               2502           STH    R1,PHASE(DDBADR)     SET SPECIAL PHASE THREE
002340      08CD                    2503           LR     R12,R13              START OF BUFFER
002342      24D1                    2504           LIS    R13,1                BY 1
002344      D35C 0000               2505  CONPRNT1 LB     R5,0(R12)            A CHARACTER TO WRITE
002348      4100 157A               2506           BAL    R0,DRIVER            CALL DRIVER
00234C      C1C0 2344               2507           BXLE   R12,CONPRNT1         LOOP THROUGH BUFFER
002350      2450                    2508           LIS    R5,0
002352      4100 157A               2509           BAL    R0,DRIVER            FORCE OUT LAST CHARACTER
002356      D100 264C               2510           LM     R0,CCNSAV            RESTORE REGISTERS
00235A      030F                    2511           BR     R15                  RETURN


                                    2513  *CONREAD -- READ A MESSAGE FROM THE CONSOLE               *
                                    2514  *                                                         *
                                    2515  *   USES SPECIAL DRIVER PHASE 2 FOR STATUS LOOP INPUT,    *
                                    2516  * WITH SUBROTUINE RETURN.                                 *
                                    2517  *                                                         *
                                    2518  *PARAMETERS:                                              *
                                    2519  *   R13 - ADDRESS OF START OF INPUT BUFFER                *
                                    2520  *   R14 -ADDRESS OF END OF INPUT BUFFER                   *
                                    2521  *                                                         *
                                    2522  *RETURNED VALUE:                                          *
                                    2523  *   R12 - ADDRESS OF LAST CHARACTER READ. WILL BE ADDRESS OF  *
                                    2524  *         TERMINATOR OR END OF BUFFER.                    *
                                    2525  *                                                         *
                                    2526  *CALLING SEQUENCE:                                        *
                                    2527  *          BAL    R15,CONREAD                             *
                                    2528  *                                                         *
                                    2529  *REGISTERS ARE PRESERVED EXCEPT R12, RETURNED VALUE.      *
                                    2530  *                                                         *
00235C      D000 264C               2531  CONREAD  STM    R0,CCNSAV            SAVE REGISTERS
002360      E640 25BC               2532           LA     DDBADR,CONDDB        DRIVER PARAM BLOCK
```

CONSOLE I/O ROUTINES

002364	4824 0008		2533		LH	DEV,DEVADR(DDBADR)	DEVICE ADDRESS
002368	2458		2534	CONREAD1	LIS	R5,PHASE.2	
00236A	4054 0002		2535		STH	R5,PHASE(DDBADR)	SPECIAL PHASE TWO
00236E	0799		2536		XR	R9,R9	CLEAR LINE DELETE FLAG
002370	08AD		2537		LR	R10,R13	START OF BUFFER
002372	24B1		2538		LIS	R11,1	BY 1 BYTE
002374	08CE		2539		LR	R12,R14	TO END OF BUFFER
002376	4100 157A		2540	CONREAD2	BAL	R0,DRIVER	CALL DRIVER, READ A CHARACTER
00237A	C450 007F		2541		NHI	R5,X'7F'	STRIP PARITY
00237E	C550 0060		2542		CLHI	R5,X'60'	TEST FOR LOWER CASE
002382	2183	=002388	2543		BLS	CONRD21	NO
002384	CB50 0020		2544		SHI	R5,X'20'	YES, THEN ADJUST VALUE
002388	C550 005F		2545	CONRD21	CLHI	R5,X'5F'	BACK ARROW
00238C	2334	=002394	2546		BES	CONRD21A	NO
00238E	C550 0008		2547		CLHI	R5,X'08'	BACK SPACE
002392	213B	=0023A8	2548		BNES	CONRD22	
002394	27A1		2549	CONRD21A	SIS	R10,1	YES, ELIMINATE CHARACTER
002396	05AD		2550		CLR	R10,R13	
002398	4320 23CC		2551		BNP	CONRFAD3	
00239C	C850 0020		2552		LHI	R5,X'20'	BLANK
0023A0	D25A 0000		2553		STB	R5,0(R10)	IN MESSAGE
0023A4	4300 2376		2554		B	CONREAD2	
0023A8	D25A 0000		2555	CONRD22	STB	R5,0(R10)	PUT IN BUFFER
0023AC	C550 000D		2556		CLHI	R5,X'0D'	CARRIAGE RETURN TERMINATOR?
0023B0	4330 23D4		2557		BE	CONREAD4	B IF YES
0023B4	C550 000A		2558		CLHI	R5,X'0A'	LINE FEED TERMINATOR?
0023B8	4330 23DC		2559		BE	CONREAD5	B IF YES
0023BC	C550 0023		2560		CLHI	R5,X'23'	#, LINE DELETE?
0023C0	2336	=0023CC	2561		BES	CONREAD3	B IF YES
			2562	*	MUST BE GOOD CHARACTER	
0023C2	C1A0 2376		2563		BXLE	R10,CONREAD2	LOOP FOR MORE CHARACTERS
			2564	*	FELL THROUGH, BUFFER FULL	
0023C6	C850 0A0D		2565		LHI	R5,X'0A0D'	OUTPUT CR,LF
0023CA	230B	=0023E0	2566		BS	CONREAD6	GO TO COMMON TERMINATION SECTION
0023CC	2591		2567	CONREAD3	LCS	R9,1	SET LINE DELETE HANDLER FLAG
0023CE	C850 0A0D		2568		LHI	R5,X'0A0D'	OUTPUT CR,LF
0023D2	2307	=0023F0	2569		BS	CONREAD6	COMMON SECTION
0023D4	0AAB		2570	CONREAD4	AR	R10,R11	UPDATE POINTER...GOT CR
0023D6	C850 0A00		2571		LHI	R5,X'0A00'	ECHO WITH NULL,LF
0023DA	2303	=0023E0	2572		BS	CONRFAD6	COMMON SECTION
0023DC	0AAB		2573	CONREAD5	AR	R10,R11	UPDATE POINTER...GOT LF
0023DE	245D		2574		LIS	R5,X'000D'	ECHO WITH CR,NULL
0023E0	246C		2575	CONREAD6	LIS	R6,PHASE.3	COMMON TERMINATION SECTION
0023E2	4064 0002		2576		STH	R6,PHASE(DDBADR)	SPECIAL PHASE THREE
0023E6	4100 157A		2577		BAL	R0,DRIVER	WRITE FIRST BYTE
0023EA	9455		2578		EXBR	R5,R5	
0023EC	4100 157A		2579		BAL	R0,DRIVER	WRITE SECOND BYTE
0023F0	2450		2580		LIS	R5,0	
0023F2	4100 157A		2581		BAL	R0,DRIVER	FORCE OUT LAST CHARACTER
0023F6	0899		2582		LR	R9,R9	CHECK LINE DELETE FLAG
0023F8	4230 2368		2583		BNZ	CONREAD1	B IF SET, RESTART
0023FC	27A1		2584		SIS	R10,1	MINUS 1 = ADDRESS OF LAST BYTE
0023FE	50A0 267C		2585		ST	R10,CONSAV+48	PUT IN SAVE AREA FOR RESTORE

CONSOLE I/O ROUTINES

002402   D100 264C   2586   LM   R0,CONSAV   RESTORE REGISTERS
002406   030F   2587   BR   R15   RETURN

```
                                2589  * CONSTANTS FOR FLOATING POINT TESTS
002408                          2590        ALIGN 4
002408      7F20 0000           2591  FLP00  DC    Y'7F200000',Y'0'
00240C      0000 0000
002410      7F10 0000           2592  FLP0   DC    Y'7F100000',Y'00000000'
002414      0000 0000
002418      7EFF FFF0           2593  FLP1   DC    Y'7EFFFFF0',Y'00000000'
00241C      0000 0000
002420      7F1F FFFE           2594  FLP2   DC    Y'7F1FFFFE',Y'00000000'
002424      0000 0000
002428      0000 0000           2595  FLP3   DC    Y'0',Y'0'          TRUE ZERO
00242C      0000 0000
002430      4120 0000           2596  FLP4   DC    Y'41200000',Y'0'
002434      0000 0000
002438      BE40 0000           2597  FLP5   DC    Y'BE400000',Y'0'
00243C      0000 0000
002440      411F FC00           2598  FLP6   DC    Y'411FFC00',Y'0'
002444      0000 0000
002448                          2599  BKSAVE DS    40
                                2600  *
                                2601  * LOAD AND STORE MULTIPLE DATA PATTERNS
002470                          2602  LMTST1 DO    16
002470      5555 5555           2603         DC    Y'55555555'
002474      5555 5555           2603         DC    Y'55555555'
002478      5555 5555           2603         DC    Y'55555555'
00247C      5555 5555           2603         DC    Y'55555555'
002480      5555 5555           2603         DC    Y'55555555'
002484      5555 5555           2603         DC    Y'55555555'
002488      5555 5555           2603         DC    Y'55555555'
00248C      5555 5555           2603         DC    Y'55555555'
002490      5555 5555           2603         DC    Y'55555555'
002494      5555 5555           2603         DC    Y'55555555'
002498      5555 5555           2603         DC    Y'55555555'
00249C      5555 5555           2603         DC    Y'55555555'
0024A0      5555 5555           2603         DC    Y'55555555'
0024A4      5555 5555           2603         DC    Y'55555555'
0024A8      5555 5555           2603         DC    Y'55555555'
0024AC      5555 5555           2603         DC    Y'55555555'
0024B0                          2604  LMTST2 DO    16
0024B0      AAAA AAAA           2605         DC    Y'AAAAAAAA'
0024B4      AAAA AAAA           2605         DC    Y'AAAAAAAA'
0024B8      AAAA AAAA           2605         DC    Y'AAAAAAAA'
0024BC      AAAA AAAA           2605         DC    Y'AAAAAAAA'
0024C0      AAAA AAAA           2605         DC    Y'AAAAAAAA'
0024C4      AAAA AAAA           2605         DC    Y'AAAAAAAA'
0024C8      AAAA AAAA           2605         DC    Y'AAAAAAAA'
0024CC      AAAA AAAA           2605         DC    Y'AAAAAAAA'
0024D0      AAAA AAAA           2605         DC    Y'AAAAAAAA'
0024D4      AAAA AAAA           2605         DC    Y'AAAAAAAA'
0024D8      AAAA AAAA           2605         DC    Y'AAAAAAAA'
0024DC      AAAA AAAA           2605         DC    Y'AAAAAAAA'
0024E0      AAAA AAAA           2605         DC    Y'AAAAAAAA'
0024E4      AAAA AAAA           2605         DC    Y'AAAAAAAA'
```

MISC. CONTROL WORDS

```
0024E8      AAAA AAAA        2605          DC    Y'AAAAAAAA'
0024EC      AAAA AAAA        2605          DC    Y'AAAAAAAA'
                             2606    *
                             2607    * MAC SEGMENTATION REGISTERS ----  ALL MEM PRESENT, NOT PROTECTED
0024F0      0FF0 0010        2608  MACREGS DC    Y'0FF00010'     0
0024F4      0FF1 0010        2609          DC    Y'0FF10010'     1
0024F8      0FF2 0010        2610          DC    Y'0FF20010'     2
0024FC      0FF3 0010        2611          DC    Y'0FF30010'     3
002500      0FF4 0010        2612          DC    Y'0FF40010'     4
002504      0FF5 0010        2613          DC    Y'0FF50010'     5
002508      0FF6 0010        2614          DC    Y'0FF60010'     6
00250C      0FF7 0010        2615          DC    Y'0FF70010'     7
002510      0FF8 0010        2616          DC    Y'0FF80010'     8
002514      0FF9 0010        2617          DC    Y'0FF90010'     9
002518      0FFA 0010        2618          DC    Y'0FFA0010'     A
00251C      0FFB 0010        2619          DC    Y'0FFB0010'     B
002520      0FFC 0010        2620          DC    Y'0FFC0010'     C
002524      0FFD 0010        2621          DC    Y'0FFD0010'     D
002528      0FFE 0010        2622          DC    Y'0FFE0010'     E
00252C      0FFF 0010        2623          DC    Y'0FFF0010'     F


                             2625    *
                             2626    * MEMORY MAP, EACH BIT REPRESENTS 32K BYTES
                             2627    *
                             2628    *
002530      0000 0000        2529  MEMRYMAP DCY  0               000000-07FFFF
002534      0000 0000        2630          DCY   0               080000-0FFFFF
002538      0000 0000        2631          DCY   0               100000-17FFFF
00253C      0000 0000        2632          DCY   0               180000-1FFFFF
002540      0000 0000        2633          DCY   0               200000-27FFFF
002544      0000 0000        2634          DCY   0               280000-2FFFFF
002548      0000 0000        2635          DCY   0               300000-37FFFF
00254C      0000 0000        2636          DCY   0               380000-3FFFFF
002550      0000 0000        2637          DCY   0               400000-47FFFF
002554      0000 0000        2638          DCY   0               480000-4FFFFF
002558      0000 0000        2639          DCY   0               500000-57FFFF
00255C      0000 0000        2640          DCY   0               580000-5FFFFF
002560      0000 0000        2641          DCY   0               600000-67FFFF
002564      0000 0000        2642          DCY   0               680000-6FFFFF
002568      0000 0000        2643          DCY   0               700000-77FFFF
00256C      0000 0000        2644          DCY   0               780000-7FFFFF
002570      0000 0000        2645          DCY   0               800000-87FFFF
002574      0000 0000        2646          DCY   0               880000-8FFFFF
002578      0000 0000        2647          DCY   0               900000-97FFFF
00257C      0000 0000        2648          DCY   0               980000-9FFFFF
002580      0000 0000        2649          DCY   0               A00000-A7FFFF
002584      0000 0000        2650          DCY   0               A80000-AFFFFF
002588      0000 0000        2651          DCY   0               B00000-B7FFFF
00258C      0000 0000        2652          DCY   0               B80000-BFFFFF
002590      0000 0000        2653          DCY   0               C00000-C7FFFF
002594      0000 0000        2654          DCY   0               C80000-CFFFFF
002598      0000 0000        2655          DCY   0               D00000-D7FFFF
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```
00259C      0000 0000        2656           DCY    0          D80000-DFFFFF
0025A0      0000 0000        2657           DCY    0          E00000-E7FFFF
0025A4      0000 0000        2658           DCY    0          E80000-EFFFFF
0025A8      0000 0000        2659           DCY    0          F00000-F7FFFF
0025AC      0000 0000        2660           DCY    0          F80000-FFFFFF
            0000 25B0        2661  MEMMAPE  EQU    *
                             2662  *
0025B0      0100 0000        2663  MEMSIZE  DC     MEMMAPE-MEMRYMAP*Y'20000' SIZE OF MEMORY MAP
                             2664  *
0025B4      0000 9580        2665  MEMSTART DC     A(EXEREND)       LOWEST ADDRESS FOR MEM TEST
                             2666  *
0025B8      0000 0000        2667  MEMTOP   DC     F'0'             ACTUAL TOP OF MEMORY


                             2669  *CONSOLE DDB.
                             2670  *  FILLED IN BY INITIALIZATION SECTION FROM LOW MEMORY TABLES.      *
                             2671  *                                                                   *
0025BC                       2672           ALIGN  4                                                    *
0025BC      0000 0000        2673  CONDDB   DC     F'0'             DSPCHFLGS, PRIORITY, PHASE
0025C0      0000             2674           DC     H'0'             NO PARAMETER FLAGS
0025C2      0C02             2675           DC     X'0C02'          TYPE = TWO BUFFERS , TWO CCBS
0025C4      0000             2676           DC     H'0',H'0'        ADDRESS, STATUS
0025C6      0000
0025C8      0000 0000        2677           DC     F'0'             DRIVER ENTRY
0025CC      0000 0FFF        2678           DC     Y'FFF'           MAX WAIT COUNT
0025D0                       2679           DO     26               REMAINING FIELDS ALL ZERO
0025D0      0000 0000        2680           DC     F'0'
0025D4      0000 0000        2680           DC     F'0'
0025D8      0000 0000        2680           DC     F'0'
0025DC      0000 0000        2680           DC     F'0'
0025E0      0000 0000        2680           DC     F'0'
0025E4      0000 0000        2680           DC     F'0'
0025E8      0000 0000        2680           DC     F'0'
0025EC      0000 0000        2680           DC     F'0'
0025F0      0000 0000        2680           DC     F'0'
0025F4      0000 0000        2680           DC     F'0'
0025F8      0000 0000        2680           DC     F'0'
0025FC      0000 0000        2680           DC     F'0'
002600      0000 0000        2680           DC     F'0'
002604      0000 0000        2680           DC     F'0'
002608      0000 0000        2680           DC     F'0'
00260C      0000 0000        2680           DC     F'0'
002610      0000 0000        2680           DC     F'0'
002614      0000 0000        2680           DC     F'0'
002618      0000 0000        2680           DC     F'0'
00261C      0000 0000        2680           DC     F'0'
002620      0000 0000        2680           DC     F'0'
002624      0000 0000        2680           DC     F'0'
002628      0000 0000        2680           DC     F'0'
00262C      0000 0000        2680           DC     F'0'
002630      0000 0000        2680           DC     F'0'
002634      0000 0000        2680           DC     F'0'
                             2681  *
```

MISC. CONTROL WORDS

```
002638      0000 0000              2682  OPENCELL DC    F'0'          ADDRESS OF CURRENT OPEN CELL
00263C      0000                   2683  QFULL    DC    H'0'          ERROR QUEUE FULL FLAG
00263E      0000                   2684  SWITCHES DC    H'0'          PROGRAM CONTROL OPTIONS
002640      0000                   2685  CPUSWTCH DC    H'0'          INCREMENT FOR BUSY PASS COUNTER
                                   2686  *                              DEPENDANT ON CPU SPEED
002642      0080                   2687  CPUTABLE DC    X'60'         CPU 7  => 7/32
002644      000F                   2688           DC    X'0F'         CPU 8  => 8/32
002646      000F                   2689           DC    X'0F'         CPU = 3220
002648      0007                   2690           DC    X'07'         CPU = 3240
00264C                             2691           ALIGN 4
00264C                             2692  CONSAV   DS    64            SAVE AREA FOR CONSOLE ROUTINES
00268C      0000 0000              2693  DSPCHCNT DC    F'0'          DISPATCHER PASSES COUNTER
002690      0015 0000 0000 0000    2694  ERRCRQ   DLIST QUESIZ+1      ERROR QUEUE
0026EC      0015 0000 0000 0000    2695  BUFPOOL  DLIST QUESIZ+1      FREE BUFFER POOL
            0000 2748              2696  BUFAREA  EQU   *             BUFFER AREA SUBDIVIDED INTO ERROR BUF
002748                             2697           DS    QUESIZ*BUFLEN  STORAGE FOR TEN 20 BYTE BUFFERS
                                   2698  *DDB LOOKUP TABLE.                                            *
                                   2699  *                                                            *
                                   2700  *    ONE ENTRY FOR EACH POSSIBLE DEVICE.  DEVICE ADDRESS IS   *
                                   2701  * USED TO INDEX INTO THIS TABLE TO GET CORRESPONDING DDB.     *
0028D8                             2702           ALIGN 2
0028D8                             2703  DDBLKUP  DSH   MAXDEV         DEVICES 0 TO MAXDEV-1
0030D6                             2704  DDBLKUPE DSH   1              LAST DEVICE
0030D8      0000                   2705  CELL.CNT DCX   0000           EXAMINE CELL COUNT
```

MESSAGES AND CONSOLE BUFFERS

```
0030DC                                2707           ALIGN 4
0030DC                                2708  CMNDBUFS DS    80
          0000 312B                   2709  CMNDBUFE EQU   *-1
00312C                                2710  OUTBUF   DS    80
          0000 317B                   2711  OUTPUFE  EQU   *-1
00317C    4F50 5449 4F4E 533A         2712  OPTBUF   DC    C'OPTIONS:'
003184    0D0A                        2713  OPTBUF1  DC    X'0D0A'
003188                                2714           ALIGN 4
003188    2020 2020 2020              2715  OPTBUF2  DC    C'      '
00318E    2020 2020 2020              2716  OPTBUF3  DC    C'      '
003194    0D0A                        2717  IDMESS   DC    X'0D0A'
003196    5345 5249 4553 2033         2718           DC    C'SERIES 32 SYSTEM EXERCISER 06-159 R09  '
00319E    3220 5359 5354 454D
0031A6    2045 5845 5243 4953
0031AE    4552 2030 362D 3135
0031B6    3920 5230 3920 2020
0031BE    0D0A                        2719           DC    X'0D0A'
          0000 31BF                   2720  IDMESSE  EQU   *-1
0031C0    4558 4552 4349 5345         2721  REMESS   DC    C'EXERCISER RESTART',X'0D0A'
0031C8    5220 5245 5354 4152
0031D0    5420
0031D2    0D0A                        2722  REMESSE  EQU   *-1
          0000 31D3
0031D4    4445 5620 2041 4452         2723  ERRSUM   DC    C'DEV  ADR  ERRORS',X'0D0A'
0031DC    2020 4552 524F 5253
0031E4    0D0A
          0000 31E5                   2724  ERRSUME  EQU   *-1
0031E6    3F3F 2049 4E56 414C         2725  ERR1MESS DC    C'?? INVALID COMMAND FORMAT',X'0D0A'
0031EE    4944 2043 4F4D 4D41
0031F6    4E44 2046 4F52 4D41
0031FE    5420
003200    0D0A
          0000 3201                   2726  ERR1MESE EQU   *-1
003202    3F3F 2049 4E56 414C         2727  ERR2MESS DC    C'?? INVALID HEX DIGIT',X'0D0A'
00320A    4944 2048 4558 2044
003212    4947 4954
003215    0D0A
          0000 3217                   2728  ERR2MESE EQU   *-1
003218    3F3F 2043 4F4D 4D41         2729  ERR3MESS DC    C'?? COMMAND OR DEVICE NOT FOUND',Y'0D0A'
003220    4E44 204F 5220 4445
003228    5649 4345 204E 4F54
003230    2046 4F55 4E44
003236    0D0A
          0000 3237                   2730  ERR3MESE EQU   *-1
003238    3F3F 2044 4556 4943         2731  ERR4MESS DC    C'?? DEVICE NOT ON TABLE',Y'0D0A'
003240    4520 4E4F 5420 4F4E
003248    2054 4142 4C45
00324E    0D0A
          0000 324F                   2732  ERR4MESE EQU   *-1
003250    414C 5245 4144 5920         2733  ERR5MESS DC    C'ALREADY SELECTED, REPLACED',X'0D0A'
003258    5345 4C45 4354 4544
003260    2C20 5245 504C 4143
003268    4544
```

MESSAGES AND CONSOLE BUFFERS

```
00326A       0D0A
             0000 326B              2734      ERR5MESE  EQU    *-1
00326C       3F3F 2044 4556 4943    2735      ERR6MESS  DC     C'?? DEVICE TABLE FULL, NOT ADDED',X'0D0A'
003274       4520 5441 424C 4520
00327C       4655 4C4C 2C20 4E4F
003284       5420 4144 4445 4420
00328C       0D0A
             0000 328D              2736      ERR6MESE  EQU    *-1
00328E       0D0A                   2737      ERR7MESS  DC     X'0D0A',C'PROGRAM ERROR, ERRGET',X'0D0A'
003290       5052 4F47 5241 4D20
003298       4552 524F 522C 2045
0032A0       5252 4745 5420
0032A6       0D0A
             0000 32A7              2738      ERR7MESE  EQU    *-1
0032A8       0D0A                   2739      ERR9MESS  DC     X'0D0A',C'ERROR QUEUE FULL',X'0D0A'
0032AA       4552 524F 5220 5155
0032B2       4555 4520 4655 4C4C
0032BA       0D0A
             0000 32BB              2740      ERR8MESE  EQU    *-1
0032BC       0D0A                   2741      ERR9MESS  DC     X'0D0A',C'PROGRAM ERROR, ABORT HANDLER',X'0D0A'
0032BE       5052 4F47 5241 4D20
0032C6       4552 524F 522C 2041
0032CE       424F 5254 2048 414E
0032D6       444C 4552
0032DA       0D0A
             0000 32DB              2742      ERR9MESE  EQU    *-1
0032DC       5345 4C43 4820 2020    2743      ERRAMESS  DC     C'SELCH       PRIORITY       CONFLICT       AT PR1   '
0032E4       2020 5052 494F 5249
0032EC       5459 2020 2020 434F
0032F4       4E46 4C49 4354 2020
0032FC       2020 2041 5420 5052
003304       3120 2020
003308       0D0A                   2744                DC     X'0D0A'
             0000 3309              2745      ERRAMESE  EQU    *-1
00330A       4E4F 5420 454E 4F55    2746      ERRBMESS  DC     C'NOT ENOUGH SELCH DDBS',X'0D0A'
003312       4748 2053 454C 4348
00331A       2044 4442 532C
003320       0D0A
             0000 3321              2747      ERRBMESE  EQU    *-1
003322       4455 504C 4943 4154    2748      ERRCMESS  DC     C'DUPLICATE DEVICE    ',X'0D0A'
00332A       4520 4445 5649 4345
003332       2020 2020
003336       0D0A
             0000 3337              2749      ERRCMESE  EQU    *-1
003338       4641 4C53 4520 5359    2750      ERRDMESS  DC     C'FALSE SYNC    ',X'0D0A'
003340       4E43 2020 2020
003346       0D0A
             0000 3347              2751      ERRDMESE  EQU    *-1
003348       5052 4F47 5241 4D20    2752      ERREMESS  DC     C'PROGRAM ERROR, NO MNEMONIC FOR DDB',X'0D0A'
003350       4552 524F 522C 2045
003358       4F20 4D4E 454D 4F4E
003360       4943 2046 4F52 2044
003368       4442
```

MESSAGES AND CONSOLE BUFFERS

```
00336A          0D0A
                0000 336B              2753 ERREMESE EQU    *-1
00336C          494E 5641 4C49 4420    2754 ERRFMESS DC     C'INVALID CPU NUMBER, 7 ASSUMED',X'0D0A'
003374          4350 5520 4E55 4D42
00337C          4552 2C20 3720 4153
003384          5355 4D45 4420
00338A          0D0A
                0000 338B              2755 ERRFMESE EQU    *-1
00338C          5350 4543 4946 5920    2756 ERRGMESS DC     C'SPECIFY MAM ADDR',X'0D0A'
003394          4D41 4D20 4144 4452
00339C          0D0A
                0000 339D              2757 ERRGMESE EQU    *-1
00339E          5350 4543 4946 5920    2758 ERRHMESS DC     C'SPECIFY XMIT-RECV ADDR',X'0D0A'
0033A6          584D 4954 2D52 4543
0033AE          5620 4144 4452
0033B4          0D0A
                0000 33B5              2759 ERRHMESE EQU    *-1
0033B6          4D45 4D4F 5259 2041    2760 ERRJMESS DC     C'MEMORY ALLOCATION ERROR',X'0D0A'
0033BE          4C4C 4F43 4154 494F
0033C6          4E20 4552 524F 5220
0033CE          0D0A
                0000 33CF              2761 ERRJMESE EQU    *-1
0033D0          4255 4646 4552 2053    2762 ERRKMESS DC     C'BUFFER SPACE IS NOT AVAILABLE',X'0D0A'
0033D8          5041 4345 2049 5320
0033E0          4E4F 5420 4156 4149
0033E8          4C41 424C 4520
0033EE          0D0A
                0000 33EF              2763 ERRKMESE EQU    *-1
0033F0          2A                     2764 PROMPTS  DB     X'2A'                    *
                0000 33F0              2765 PROMPTE  EQU    *-1
0033F2          4D41 432F 4D41 5420    2766 ERRLMESS DC     C'MAC/MAT CONFLICT, MAT SELECTED',X'0D0A'
0033FA          434F 4E46 4C49 4354
003402          2C20 4D41 5420 5345
00340A          4C45 4354 4544
003410          0D0A
                0000 3411              2767 ERRLMESE EQU    *-1
003412          4D41 432F 4D41 5420    2768 ERRMMESS DC     C'MAC/MAT CONFLICT, MAC SELECTED',X'0D0A'
00341A          434F 4E46 4C49 4354
003422          2C20 4D41 4320 5345
00342A          4C45 4354 4544
003430          0D0A
                0000 3431              2769 ERRMMESE EQU    *-1
```

I/O DEVICE COMMANDS

003432	80		2771	DISABLE	DB	X'80'	DISABLE INTERRUPTS
003433	00		2772	NULL	DB	X'00'	NULL COMMAND
003434	C0		2773	DISARM	DB	X'C0'	
003435	40		2774	ENABLE	DB	X'40'	ENABLE
003436	E4		2775	TTYINCMD	DB	X'E4'	
003437	D8		2776	TTYOUT	DB	X'D8'	
003438	54		2777	TTYRDCMD	DB	X'54'	ENABLE BLOCK READ
003439	48		2778	TTYWTCMD	DB	X'48'	ENABLE WRITE
00343A	E1		2779	PTRSTOP	DB	X'E1'	STOP, SELECT READER, DISARM
00343B	59		2780	PTRON	DB	X'59'	ENABLE,RUN,INCR,READ
00343C	E2		2781	PTPSTOP	DB	X'E2'	STOP, SELECT PUNCH, DISARM
00343D	42		2782	PTPON	DB	X'42'	ENABLE, WRITE
00343E	E0		2783	CASCLEAR	DB	X'E0'	DISARM,CLEAR
00343F	B0		2784	CASEOF	DB	X'B0'	DISABLE, WRITE EOF
003440	62		2785	CASWRT	DB	X'62'	ENABLE,WRITE
003441	51		2786	CASBKSPC	DB	X'51'	ENABLE,BACK SPACE
003442	61		2787	CASREAD	DB	X'61'	ENABLE,READ
003443	F8		2788	CASREWND	DB	X'F8'	DISARM, REWIND
003444	D0		2789	DSAIDLE	DB	X'D0'	
003445	D9		2790	DSADSRR	DB	X'D9'	DISARM,SYNSCH,READY,READ
003446	CA		2791	DSADRW	DB	X'CA'	DISARM,READY,WRITE
003447	59		2792	DSAESRR	DB	X'59'	ENABLE,SYNSCH,READY,READ
003448	4A		2793	DSAERW	DB	X'4A'	ENABLE,READY,WRITE
003449	48		2794	STOPCMND	DB	X'48'	
00344A	54		2795	SELCHGO	DB	X'54'	EXTENDED, GO, SELCH STATUS
00344B	74		2796	SLCHREAD	DB	X'74'	EXTENDED, READ, GO, SELCH STATUS
00344C	02		2797	SLCHCLR	DB	X'02'	
00344D	04		2798	SLCHINCR	DB	X'04'	
00344E	16		2799	SYNC	DB	X'16'	SYNC CHARACTER
00344F	B0		2800	MAGEOF	DB	X'B0'	DISABLED WRITE EOF
003450	20		2801	MAGCLEAR	DB	X'20'	CLEAR
003451	E2		2802	MAGWRT	DB	X'E2'	DISARMED WRITE
003452	51		2803	MAGBKSPC	DB	X'51'	ENABLE, BACKSPACE
003453	E1		2804	MAGREAD	DB	X'E1'	DISARMED READ
003454	F8		2805	MAGREWND	DB	X'F8'	DISARMED REWIND
003455	C3		2806	MAMKILL	DB	X'C3'	DISARM,KILL & PIQ READ
003456	41		2807	MAMPIQR	DB	X'41'	ARM AND PIQ READ
003457	83		2808	MAMDKILL	DB	X'83'	DISABLE, KILL, & PIQ READ
003458	41		2809	RESTORE	DB	X'41'	ENABLE,RESTORE
003459	42		2810	DSCSEEK	DB	X'42'	ENABLE, SEEK
00345A	42		2811	DSCWRT	DB	X'42'	ENABLE, WRITE
00345B	41		2812	DSCREAD	DB	X'41'	ENABLE,READ
00345C	08		2813	DSCRESET	DB	X'08'	CONTROLLER RESET
00345D	08		2814	D40REATN	DB	X'08'	40 M.BYTE RESET ATTENTION
00345E	04		2815	D40REHD	DB	X'04'	40 M.BYTE RESET HEAD
00345F	10		2816	D40CYL	DB	X'10'	40 M.BYTE CYLINDER TAG
003460	20		2817	D40HEAD	DB	X'20'	40 M.BYTE HEAD TAG
003461	70		2818	MSMCLFLT	DB	X'70'	MSM CLEAR FAULT
003462	C8		2819	CRDCLEAR	DB	X'C8'	DISARM, CLEAR
003463	60		2820	CRDFEED	DB	X'60'	ENABLE, FEED
003464	80		2821	DSPLYMOD	DB	X'80'	
003465	40		2822	DSPLYINC	DB	X'40'	DISPLAY INCREMENT MODE
003466	E0		2823	PICSTART	DB	X'E0'	DISARMED, START

R09
R09

I/O DEVICE COMMANDS

003467	B9		2824	PASINCMD DB	X'B9'	DISABLE, READ
003468	3B		2825	PASRQ2S DB	X'3B'	REQUEST TO SEND
003469	EE		2826	PASCMND2 DB	X'EE'	CLKB, 7 DATA, 1 STOP, EVEN PARITY
00346A	AB		2827	PASOUT DB	X'AB'	DISABLE, WRITE
00346B	69		2828	PASRDCMD DB	X'69'	ENABLE, READ
00346C	6B		2829	PASWTCMD DB	X'6B'	ENABLE, WRITE
00346D	81		2830	PASDSARM DB	X'81'	PASLA DISABLE
00346E	70		2831	PASCOM DB	X'70'	
00346F	89		2832	PASDR DB	X'89'	DISABLE, RTC
003470	A9		2833	PASDDR DB	X'A9'	
003471	2B		2834	PASNDRW DB	X'2B'	
003472	6B		2835	PASEDRW DB	X'6B'	
003473	69		2836	PASEDRR DB	X'69'	
003474	80		2837	INT8DSBL DB	X'80'	
003475	08		2838	INT8CLR DB	X'08'	
003476	20		2839	INT8REST DB	X'20'	
003477	48		2840	ULIEBL DB	X'48'	
003478	E0		2841	ULIHW DB	X'E0'	
003479	C0		2842	ULIB DB	X'C0'	
00347A			2843	DB	*	
00347C			2844	ALIGN 4		
00347C	0000 0000	2845	BLINKYSV DCY	00000000	
003480	C8D8 E8F8	2846	FMDRESET DC	Y'C8D8E8F8'	
003484	0212 2232	2847	FMDWRT DC	Y'02122232'	
003488	4757 6777	2848	FMDSTOP DC	Y'47576777'	
00348C	C1D1 E1F1	2849	FMDREAD DC	Y'C1D1E1F1'	
003490	C7D7 E7F7	2850	FMDDSTOP DC	Y'C7D7E7F7'	
003494	0000 0000	2851	MNEMONIC DC	Y'0'	
003498	0000	2852	FMDRIVE DC	X'0'	
00349A	C1E1	2853	QIDLE DC	X'C1E1'	
00349C	C9E9	2854	QIDLEE DC	X'C9E9'	
00349E	D9F9	2855	QIDLEZ DC	X'D9F9'	
0034A0	DBFB	2856	QXDRRQ DC	X'DBFB'	
0034A2	D9F9	2857	QRDSSR DC	X'D9F9'	
0034A4	5979	2858	QRESSR DC	X'5979'	
0034A6	4B6B	2859	QXERRQ DC	X'4B6B'	
0034A8	3232	2860	QZBID DC	X'3232'	
0034AA	D9F9	2861	QZDRR DC	X'D9F9'	
0034AC	5979	2862	QZESR DC	X'5979'	
0034AE	5B7B	2863	QZERRW DC	X'5B7B'	
0034B0	3030	2864	COMMONX DC	X'3030'	
0034B2	0000	2865	MAMADR DC	X'0'	MAM ADDRESS
0034B4	0000	2866	INT8ADR DC	X'0'	EIGHT LINE INTERRUPT ADDR
0034B6	0000	2867	PASRCNT DC	X'0'	
0034B8	0000	2868	PASCNT DC	X'0'	
0034BA	0000	2869	QSZRCNT DC	X'0'	
0034BC	0000	2870	QSZCNT DC	X'0'	
0034BE	0000	2871	QSZCNT1 DC	X'0'	
0034C0	0000	2872	SELCHBSY DC	X'0'	
0034C2	0000	2873	QSADISP DC	X'0'	
0034C4	0000	2874	DC	X'0'	
			2875	* CONSTANTS		
0034C8			2876	ALIGN 4		

I/O DEVICE COMMANDS

```
0034C8        0000 0000           2877  ZEROES   DCY   0
0034CC        0000 0000           2878  ZERO     DCY   0
                                  2879  *
                                  2880  * THE FOLLOWING MUST BE IN ORDER OF OPTNLST
0034D0        0000 9580           2881  MSTART   DC    A(EXEREND)
0034D4        0000 C400           2882  BUFSIZE  DC    Y'400'
0034D8        0001                2883  MBUF     DC    X'1'
0034DA        0000                2884  IMAGE    DC    X'0'
0034DC        0001                2885  LLBACK   DC    X'1'
0034DF        0006                2886  CCNT     DC    X'06'
0034E0        0000                2887  FSTC     DC    X'0'
0034E2        0000                2888  FSTS     DC    X'0'
0034E4        0000                2889  MACADR   DC    H'0'              ADDRESS OF MAC AND SELECT FLAG
0034E6        0000                2890  MATFLAG  DC    H'0'
0034E8        0000                2891  SWSAVE   DC    X'0'
0034EA        FFFF                2892  FOXS     DC    X'FFFF'
0034EC        FF81                2893  CM128    DC    X'FF81'
0034EE        FF7D                2894  CM132    DC    X'FF7D'
0034F0        FF7B                2895  CM134    DC    X'FF7B'
              0000 00CC           2896  IRBUF    EQU   RBUFF1S-RBUFF0S
              0000 0030           2897  RECEIVER EQU   A(QSADD01A-QSADD01)
              0000 9580           2898  EXER0S   EQU   A(EXEREND)
              0000 957C           2899  EXER0E   EQU   A(EXEREND+252)
              0000 9680           2900  EXER1S   EQU   A(EXEREND+256)
              0000 977C           2901  EXER1E   EQU   A(EXEREND+508)
              0000 9780           2902  EXER1N   EQU   A(EXEREND+512)
              0000 3490           2903  DPAT1    EQU   FMDDSTOP
                                  2904  *
                                  2905  *ACTION COMMAND TABLE.                                    *
                                  2906  *                                                         *
                                  2907  *    TO ADD AN ACTION COMMAND, SIMPLY PLACE THE FOUR CHARACTER  *
                                  2908  *  COMMAND NAME AND THE ADDRESS OF AN EXECUTION SUBROUTINE IN   *
                                  2909  *  THIS TABLE.                                             *
                                  2910  *                                                         *
                                  2911  *EXECUTION SUBROUTINE PARAMETERS:                         *
                                  2912  *  R10 - COMMAND BEING EXECUTED                            *
                                  2913  *  R11 - ADDRESS OF START OF PARAMETER LIST                *
                                  2914  *  R12 - ADDRESS OF END OF PARM LIST                       *
                                  2915  *                                                         *
                                  2916  *CALLING SEQUENCE:                                        *
                                  2917  *        BAL   R0,ROUTINE                                 *
                                  2918  *                                                         *
                                  2919  *REGISTERS NEED NOT BE PRESERVED                           *
                                  2920  *                                                         *
0034F4                            2922           ALIGN 4
              0000 34F4           2923  ACMNDTBL EQU   *
0034F4        5255 4E20           2924           DC    C'RUN ',A(RUNCMND)
0034F8        0000 3794
0034FC                            2925           IFNZ  CONDEBUG
0034FC        4558 4120           2926           DC    C'EXA ',A(OPNCMND)
003500        0000 3C94
003504        4D4F 4420           2927           DC    C'MOD ',A(PEPCMND)
```

I/O DEVICE COMMANDS

```
003508          0000 3D18
                                2928            ENDC
00350C                          2929            IFNZ    CONCMNDS
00350C          4453 5420       2930            DC      C'DST ',A(DSTCMND)
003510          0000 3E2A
003514          4552 5220       2931            DC      C'ERR ',A(ERRCMND)
003518          0000 3D58
00351C          4F50 5420       2932            DC      C'OPT ',A(OPTCMND)
003520          0000 4306
                                2933            ENDC
003524          4D41 5020       2934            DC      C'MAP ',A(MAPCMND)
003528          0000 43C4
00352C          4350 5520       2935            DC      C'CPU ',A(CPUCMND)
003530          0000 3C44
003534          4D44 4342       2936            DC      C'MDCB',A(MDCBCMND)
003538          0000 4052
00353C          4D50 4951       2937            DC      C'MPIQ',A(MPIQCMND)
003540          0000 40E6
003544          434F 4E20       2938            DC      C'CON ',A(HALTCMND)
003548          0000 3E1A
00354C          4D53 5452       2939   OPTNLST  DC      C'MSTR',A(MSTRCMND)
003550          0000 422E
003554          4259 5445       2940            DC      C'BYTE',A(MSIZCMND)
003558          0000 418C
00355C          4D42 5546       2941            DC      C'MBUF',A(MBUFCMND)
003560          0000 41EA
003564          494D 4720       2942            DC      C'IMG ',A(IMGCMND)
003568          0000 42A2
00356C          4C4C 4220       2943            DC      C'LLB ',A(LLBCMND)
003570          0000 4152
003574          4343 4E54       2944            DC      C'CCNT',A(CCNTCMND)
003578          0000 4162
00357C          4653 5443       2945            DC      C'FSTC',A(FSTCCMND)
003580          0000 420F
003584          4653 5453       2946            DC      C'FSTS',A(FSTSCMND)
003588          0000 421E
00358C          4D41 4320       2947            DC      C'MAC ',A(MACCMND)
003590          0000 440E
003594          4D41 5420       2948            DC      C'MAT ',A(MATCMND)
003598          0000 445C
00359C          484C 5420       2949            DC      C'HLT ',A(HLTCMND)
0035A0          0000 439C
0035A4          4C4F 4720       2950            DC      C'LOG ',A(LOGCMND)
0035A8          0000 43A0
0035AC          464C 5420       2951            DC      C'FLT ',A(FLTCMND)
0035B0          0000 43A4
0035B4          4243 4B20       2952            DC      C'BCK ',A(BACKCMND)
0035B8          0000 43AC
0035BC          4446 5420       2953            DC      C'DFT ',A(DFTCMND)
0035C0          0000 43A8
                0000 35BC       2954   ACMNDEND EQU     *-8
```

```
                                        2956    *DEVICE DDB TABLE.                                      *
                                        2957    *                                                      *
                                        2958    *   THIS TABLE IS USED TO LOOKUP A DDB ADDRESS GIVEN A DEVICE   *
                                        2959    *   MNEMONIC, AND TO LOOK UP A MNEMONIC GIVEN A DDB ADDRESS.    *
                                        2960    *   TO ADD A DEVICE, SIMPLY PLACE THE FOUR CHARACTER MNEMONIC   *
                                        2961    *   AND THE ADDRESS OF THE DDB IN THIS TABLE.           *
                                        2962    *                                                      *
0035C4                                  2964            ALIGN 4
           0000 35C4                    2965    DEV2DDB EQU    *
0035C4                                  2966            IFNZ   PAPRTAPE
0035C4     5054 5250                    2967            DC     C'PTRP',A(PTRPDDB)
0035C8     0000 73F0
0035CC     5054 5020                    2968            DC     C'PTP ',A(PTRPDDB)
0035D0     0000 73F0
0035D4     5054 5220                    2969            DC     C'PTR ',A(PTRPDDB)
0035D8     0000 73F0
                                        2970            ENDC
0035DC                                  2971            IFNZ   CARDRDR
0035DC     4352 4420                    2972            DC     C'CRD ',A(CRDDDB)
0035E0     0000 7190
                                        2973            ENDC
0035E4                                  2974            IFNZ   PRINTERS
0035E4     4C4E 5031                    2975            DC     C'LNP1',A(LNPDDB1)
0035E8     0000 7318
0035EC                                  2976            IFP    PRINTERS-1
0035EC     4C4E 5032                    2977            DC     C'LNP2',A(LNPDDB2)
0035F0     0000 7354
                                        2978            ENDC
                                        2979            ENDC
0035F4                                  2980            IFNZ   CLOCK
0035F4     4143 4C20                    2981            DC     C'ACL ',A(ACLDDB)
0035F8     0000 7538
0035FC     5049 4320                    2982            DC     C'PIC ',A(PICDDB)
003600     0000 7568
                                        2983            ENDC
003604                                  2984            IFNZ   CASSETTE
                                        2985            DC     C'CAS1',A(CASDDB1)
                                        2986            IFP    CASSETTE-1
                                        2987            DC     C'CAS2',A(CASDDB2)
                                        2988            IFP    CASSETTE-2
                                        2989            DC     C'CAS3',A(CASDDB3)
                                        2990            IFP    CASSETTE-3
                                        2991            DC     C'CAS4',A(CASDDB4)
                                        2992            ENDC
                                        2993            ENDC
                                        2994            ENDC
                                        2995            ENDC
003604                                  2996            IFNZ   MAGTAPE
003604     4D41 4731                    2997            DC     C'MAG1',A(MAGDDB1)
003608     0000 75AC
00360C                                  2998            IFP    MAGTAPE-1
00360C     4D41 4732                    2999            DC     C'MAG2',A(MAGDDB2)
```

I/O DEVICE COMMANDS

```
003610          0000 75F8
003614                              2000            IFP     MAGTAPE-2
003614          4D41 4733           3001            DC      C'MAG3',A(MAGDDB3)
003618          0000 7644
00361C                              3002            IFP     MAGTAPE-3
00361C          4D41 4734           3003            DC      C'MAG4',A(MAGDDB4)
003620          0000 7690
                                    3004            ENDC
                                    3005            ENDC
                                    3006            ENDC
                                    3007            ENDC
003624                              3008            IFNZ    DISCS
003624          4453 4331           3009            DC      C'DSC1',A(DSCDDB1)
003628          0000 76DC
00362C                              3010            IFP     DISCS-1
00362C          4453 4332           3011            DC      C'DSC2',A(DSCDDB2)
003630          0000 773C
003634                              3012            IFP     DISCS-2
003634          4453 4333           3013            DC      C'DSC3',A(DSCDDB3)
003638          0000 779C
00363C                              3014            IFP     DISCS-3
00363C          4453 4334           3015            DC      C'DSC4',A(DSCDDB4)
003640          0000 77FC
                                    3016            ENDC
                                    3017            ENDC
                                    3018            ENDC
                                    3019            ENDC
003644                              3020            IFNZ    DSK40MB
003644          4453 4341           3021            DC      C'DSCA',A(DSCDDBA)
003648          0000 785C
00364C                              3022            IFP     DSK40MB-1
00364C          4453 4342           3023            DC      C'DSCB',A(DSCDDBB)
003650          0000 78BC
003654                              3024            IFP     DSK40MB-2
003654          4453 4343           3025            DC      C'DSCC',A(DSCDDBC)
003658          0000 791C
00365C                              3026            IFP     DSK40MB-3
00365C          4453 4344           3027            DC      C'DSCD',A(DSCDDBD)
003660          0000 797C
                                    3028            ENDC
                                    3029            ENDC
                                    3030            ENDC
                                    3031            ENDC
003664                              3032            IFNZ    MSMDISC
003664          4D53 4D31           3033            DC      C'MSM1',A(MSMDDB1)   MSM DISC 1
003668          0000 79DC
00366C                              3034            IFP     MSMDISC-1
00366C          4D53 4D32           3035            DC      C'MSM2',A(MSMDDB2)   MSM DISC 2
003670          0000 7A3C
003674                              3036            IFP     MSMDISC-2
003674          4D53 4D33           3037            DC      C'MSM3',A(MSMDDB3)   MSM DISC 3
003678          0000 7A9C
00367C                              3038            IFP     MSMDISC-3
```

I/O DEVICE COMMANDS

```
00367C      4D53 4D34        3039            DC     C'MSM4',A(MSMDDB4)   MSM DISC 4
003680      0000 7AFC
                             3040            ENDC
                             3041            ENDC
                             3042            ENDC
                             3043            ENDC
003684                       3044    FMDSEL  IFNZ   FLOPPY
003684      464D 4431        3045            DC     C'FMD1',A(FMDDDB1)   FLOPPY DISC 1
003688      0000 7B5C
00368C                       3046            IFP    FLOPPY-1
00368C      464D 4432        3047            DC     C'FMD2',A(FMDDDB2)   FLOPPY DISC 2
003690      0000 7C38
003694                       3048            IFP    FLOPPY-2
003694      464D 4433        3049            DC     C'FMD3',A(FMDDDB3)   FLOPPY DISC 3
003698      0000 7D14
00369C                       3050            IFP    FLOPPY-3
00369C      464D 4434        3051            DC     C'FMD4',A(FMDDDB4)   FLOPPY DISC 4
0036A0      0000 7DF0
                             3052            ENDC
                             3053            ENDC
                             3054            ENDC
                             3055            ENDC
0036A4                       3056            IFNZ   EIGHTINT
0036A4      494E 5438        3057            DC     C'INT8',A(INT8DDB)
0036A8      0000 7ECC
                             3058            ENDC
0036AC                       3059            IFNZ   ULI
0036AC      554C 4920        3060            DC     C'ULI ',A(ULIDDB)
0036B0      0000 7EFC
                             3061            ENDC
0036B4                       3062            IFNZ   SELCHTST
0036B4      5345 4C54        3063            DC     C'SELT',A(SLCHTDDB)
0036B8      0000 7F28
                             3064            ENDC
0036BC                       3065            IFNZ   MAM
0036BC      4D41 4D20        3066            DC     C'MAM ',A(MAMDDB)
0036C0      0000 7F74
                             3067            ENDC
0036C4                       3068            IFNZ   QSA
0036C4      5153 3120        3069            DC     C'QS1 ',A(QSADD01)   QSA 1  XMIT-RECV 1
0036C8      0000 7FA0
0036CC                       3070            IFP    QSA-1
0036CC      5153 3220        3071            DC     C'QS2 ',A(QSADD02)   QSA 1  XMIT-RECV 2
0036D0      0000 8104
0036D4                       3072            IFP    QSA-2
0036D4      5153 3320        3073            DC     C'QS3 ',A(QSADD03)   QSA 1  XMIT-RECV 3
0036D8      0000 8268
0036DC                       3074            IFP    QSA-3
0036DC      5153 3420        3075            DC     C'QS4 ',A(QSADD04)   QSA 1  XMIT-RECV 4
0036E0      0000 83CC
0036E4                       3076            IFP    QSA-4
0036E4      5153 3520        3077            DC     C'QS5 ',A(QSADD05)   QSA 2  XMIT-RECV 1
0036E8      0000 8530
```

I/O DEVICE COMMANDS

```
0036EC                          3078        IFP    QSA-5
0036EC        5153 3620         3079        DC     C'QS6 ',A(QSADD06)   QSA 2   XMIT-RECV 2
0036F0        0000 8694
0036F4                          3080        IFP    QSA-6
0036F4        5153 3720         3081        DC     C'QS7 ',A(QSADD07)   QSA 2   XMIT-RECV 3
0036F8        0000 87F8
0036FC                          3082        IFP    QSA-7
0036FC        5153 3820         3083        DC     C'QS8 ',A(QSADD08)   QSA 2   XMIT-RECV 4
003700        0000 895C
                                3084        ENDC
                                3085        ENDC
                                3086        ENDC
                                3087        ENDC
                                3088        ENDC
                                3089        ENDC
                                3090        ENDC
                                3091        ENDC
003704                          3092        IFNZ   DSA
003704        4453 3120         3093        DC     C'DS1 ',A(QSADD01)
003708        0000 7FA0
00370C                          3094        IFP    DSA-1
00370C        4453 3220         3095        DC     C'DS2 ',A(QSADD02)
003710        0000 8104
003714                          3096        IFP    DSA-2
003714        4453 3320         3097        DC     C'DS3 ',A(QSADD03)
003718        0000 8268
00371C                          3098        IFP    DSA-3
00371C        4453 3420         3099        DC     C'DS4 ',A(QSADD04)
003720        0000 83CC
003724                          3100        IFP    DSA-5
003724        4453 3520         3101        DC     C'DS5 ',A(QSADD05)
003728        0000 8530
00372C                          3102        IFP    DSA-6
00372C        4453 3620         3103        DC     C'DS6 ',A(QSADD06)
003730        0000 8694
003734                          3104        IFP    DSA-7
003734        4453 3720         3105        DC     C'DS7 ',A(QSADD07)
003738        0000 87F8
00373C                          3106        IFP    DSA-8
                                3107        DC     C'DS8 ',A(QSADD08)
                                3108        ENDC
                                3109        ENDC
                                3110        ENDC
                                3111        ENDC
                                3112        ENDC
                                3113        ENDC
                                3114        ENDC
                                3115        ENDC
00373C                          3116        IFNZ   PASLA
00373C        5053 3120         3117        DC     C'PS1 ',A(QSADD01)
003740        0000 7FA0
003744                          3118        IFP    PASLA-1
003744        5053 3220         3119        DC     C'PS2 ',A(QSADD02)
```

I/O DEVICE COMMANDS

```
003748        0000 8104
00374C                           3120      IFP     PASLA-2
00374C        5053 3320          3121      DC      C'PS3 ',A(QSADD03)
003750        0000 8268
003754                           3122      IFP     PASLA-3
003754        5053 3420          3123      DC      C'PS4 ',A(QSADD04)
003758        0000 83CC
00375C                           3124      IFP     PASLA-4
00375C        5053 3520          3125      DC      C'PS5 ',A(QSADD05)
003760        0000 8530
003764                           3126      IFP     PASLA-5
003764        5053 3620          3127      DC      C'PS6 ',A(QSADD06)
003768        0000 8694
00376C                           3128      IFP     PASLA-6
00376C        5053 3720          3129      DC      C'PS7 ',A(QSADD07)
003770        0000 87F8
003774                           3130      IFP     PASLA-7
003774        5053 3820          3131      DC      C'PS8 ',A(QSADD08)
003778        0000 895C
                                 3132      ENDC
                                 3133      ENDC
                                 3134      ENDC
                                 3135      ENDC
                                 3136      ENDC
                                 3137      ENDC
                                 3138      ENDC
                                 3139      ENDC
00377C                           3140      IFNZ    QSAZ
00377C        515A 3120          3141      DC      C'QZ1 ',A(QSADD01)
003780        0000 7FA0
003784                           3142      IFP     QSAZ-1
003784        515A 3220          3143      DC      C'QZ2 ',A(QSADD02)
003788        0000 8104
00378C                           3144      IFP     QSAZ-2
00378C        515A 3320          3145      DC      C'QZ3 ',A(QSADD03)
003790        0000 8268
003794                           3146      IFP     QSAZ-3
003794        515A 3420          3147      DC      C'QZ4 ',A(QSADD04)
003798        0000 83CC
00379C                           3148      IFP     QSAZ-4
00379C        515A 3520          3149      DC      C'QZ5 ',A(QSADD05)
0037A0        0000 8530
0037A4                           3150      IFP     QSAZ-5
0037A4        515A 3620          3151      DC      C'QZ6 ',A(QSADD06)
0037A8        0000 8694
0037AC                           3152      IFP     QSAZ-6
0037AC        515A 3720          3153      DC      C'QZ7 ',A(QSADD07)
0037B0        0000 87F8
0037B4                           3154      IFP     QSAZ-7
0037B4        515A 3820          3155      DC      C'QZ8 ',A(QSADD08)
0037B8        0000 895C
                                 3156      ENDC
                                 3157      ENDC
```

I/O DEVICE COMMANDS

```
                                  3158              ENDC
                                  3159              ENDC
                                  3160              ENDC
                                  3161              ENDC
                                  3162              ENDC
                                  3163              ENDC
0037BC        4D45 4D20           3164              DC      C'MEM ',A(MEMDDB)
0037C0        0000 8BC0
              0000 37BC           3165  DEV2DDBE EQU        *-8


0037C4        0000 7100           3167  SLCHLIST DC        A(SLCH1DDB)
0037C8                            3168              IFP     SELCHS-1
0037C8        0000 7124           3169              DC      A(SLCH2DDB)
0037CC                            3170              IFP     SELCHS-2
0037CC        0000 7148           3171              DC      A(SLCH3DDB)
0037D0                            3172              IFP     SELCHS-3
0037D0        0000 716C           3173              DC      A(SLCH4DDB)
                                  3174              ENDC
                                  3175              ENDC
                                  3176              ENDC
              0000 37D0           3177  SLCHLEND EQU        *-4
```

```
                                      3179  *RUNCMND -- INITIALIZE DDBS AND TABLES FOR DISPATCHER              *
                                      3180  *                                                                  *
                                      3181  *     TWO PASSES ARE MADE THROUGH THE DEVICE SERVICE TABLE.  ON THE *
                                      3182  * FIRST PASS THE SELECTOR CHANNEL DDB'S ARE FILLED IN FROM THE DDB'S *
                                      3183  * OF DEVICES WHICH USE THE SELECTOR CHANNELS.  AN OUTPUT COMMAND     *
                                      3184  * STOP IS ISSUED TO EACH SELCH.  IF THERE ARE MORE SELCH ADDRESSES   *
                                      3185  * THAN SELCH DDBS, AN ERROR MESSAGE IS PRINTED.  IF DEVICES ON THE   *
                                      3186  * SAME SELCH SPECIFY DIFFERENT PRIORITIES AN ERROR MESSAGE IS PRINTED.*
                                      3187  *    ON THE SECOND PASS THROUGH THE DST, EACH DDB IS ENTERED IN THE   *
                                      3188  * DDB LOOKUP TABLE.  VARIOUS FIELDS IN THE DDB ARE INITIALIZED.      *
                                      3189  * EACH DEVICE IS CHECKED FOR FALSE SYNC.  IF FALSE SYNC OCCURS, AN    *
                                      3190  * ERROR IS PRINTED AND IGNORE IS SET IN THE DEVICES DDB.  IF TWO OR  *
                                      3191  * MORE DEVICES HAVE THE SAME ADDRESS, AN ERROR MESSAGE IS PRINTED.   *
                                      3192  *                                                                  *
                                      3193  *     FINALLY, SEVERAL GLOBAL CONTROL WORDS ARE INITIALIZED AND THE   *
                                      3194  * ECHO TEST IS STARTED ON THE CONSOLE IF NO ERRORS HAVE OCCURED.     *
                                      3195  * RETURN IS MADE TO THE COMMAND PROCESSOR IF ERRORS HAVE OCCURED.    *
                                      3196  * OTHERWISE PSW DSPCHER IS LOADED TO START TESTING.                  *
                                      3197  *                                                                  *
0037D4     2400                       3198  RUNCMND  LIS   R0,0                CLEAR ERROR FLAG
0037D6     C870 03FF                  3199           LHI   R7,MAXDEV           GET MAXIMUM DEVICE ADDRESS        R09
0037DA     0A77                       3200           AR    R7,R7               2X ADDRESS                       R09
0037DC     E680 CFF8                  3201           LA    R8,INTRUPT          SET ISP TABLE TO INTERRUPT       R09
0037E0     4087 00D0                  3202  RUNLOOP1 STH   R8,X'D0'(R7)        SERVICE ROUTINE ADDRESS          R09
0037E4     2772                       3203           SIS   R7,2                *                                R09
0037E6     2283       =0037E0         3204   .       BNLS  RUNLOOP1            *                                R09
                                      3205  *  BUILD SELCH DDB'S FROM OTHER DDB'S ON DST
0037E8     E670 37C4                  3206           LA    R7,SLCHLIST         START OF SELCH LIST
0037EC     2484                       3207           LIS   R8,4                ENTRY SIZE
0037EE     E690 37D0                  3208           LA    R9,SLCHLEND         END OF TABLE
0037F2     2450                       3209           LIS   R5,0
0037F4     5847 0000                  3210  RUN00    L     DDBADR,0(R7)
0037F8     D254 0001                  3211           STB   R5,PRIORITY(DDBADR) MARK SELCH DDB
0037FC     4054 0008                  3212           STH   R5,DEVADR(DDBADR)   NOT USED
003800     C170 37F4                  3213           BXLE  R7,RUN00
003804     E610 21E8                  3214           LA    R1,DST              START OF DEVICE SERVICE TABLE
003808     2424                       3215           LIS   R2,4                ENTRY SIZE
00380A     5830 2264                  3216           L     R3,DSTLAST          LAST ENTRY
00380E     5841 0000                  3217  RUN01    L     DDBADR,0(R1)        LOOK AT A DDB
003812     5850 34D0                  3218           L     R5,MSTART           BUFFER START ADDRESS
003816     2134       =00381E         3219           BNZS  RUN01A              USE SPECIFIED ADDRESS
003818     F850 0000 9580             3220           LI    R5,EXEREND          ELSE USE DEFAULT ADDRESS, EXEREND
00381E     5050 8FFA =00481C          3221  RUN01A   ST    R5,BUFNEXT          BUFFER START ADDRESS
003822     2450                       3222           LIS   R5,0                CLEAR COUNTERS
003824     4050 34B8                  3223           STH   R5,PASCNT
003828     4050 34B6                  3224           STH   R5,PASPCNT
00382C     4050 34BA                  3225           STH   R5,QSZPCNT
003830     4050 34BC                  3226           STH   R5,QSZCNT
003834     4050 34C0                  3227           STH   R5,SELCHBSY
003838     7454 0006                  3228           TBT   R5,DTYPFLGS(DDBADR) IS THE DEVICE A SELCH?
00383C     4230 38E4                  3229           BNZ   RUN05               B IF YES
003840     2451                       3230           LIS   R5,1
003842     7454 0006                  3231           TBT   R5,DTYPFLGS(DDBADR) IS THIS PSUEDO DDB FOR MEMORY?
```

```
003846      4230 38E4              3232          BNZ    RUN05              B IF YES
00384A      2452                   3233          LIS    R5,2               DOES THIS DEVICE USE A SELCH
00384C      7454 0006              3234          TBT    R5,DTYPFLGS(DDBADR)
003850      4330 38E4              3235          BZ     RUN05              B IF NO
003854      4854 0048              3236          LH     R5,SELCHADR(DDBADR) THIS IS THE SELCH WE WANT
003858      D364 0001              3237          LB     R6,PRIORITY(DDBADR) THIS IS ITS PRIORITY
                                   3238    *  LOOK FOR A SELCH DDB
00385C      E670 37C4              3239          LA     R7,SLCHLIST        START OF TABLE OF SELCH DDBS
003860      2484                   3240          LIS    R8,4               ENTRY SIZE
003862      E690 37D0              3241          LA     R9,SLCHLEND        END OF TABLE
003866      58A7 0000              3242   RUN02  L      R10,0(R7)
00386A      48BA 0008              3243          LH     R11,DEVADR(R10)    IS THIS DDB AVAILABLE?
00386E      2139         =003880   3244          BNZS   RUN03              B IF NO
003870      405A 0008              3245          STH    R5,DEVADR(R10)     PUT SELCH ADDRESS
003874      D26A 0001              3246          STB    R6,PRIORITY(R10)   AND PRIORITY IN DDB
003878      DE50 3449              3247          OC     R5,STOPCMND        STOP SELCH
00387C      4300 38E4              3248          B      RUN05              LOOK AT NEXT DDB ON DST
                                   3249    *  THIS SELCH DDB USED, CHECK FOR PRIORITY CONFLICTS
003880      455A 0008              3250   RUN03  CLH    R5,DEVADR(R10)     SAME SELCH?
003884      4230 38D2              3251          BNE    RUN04              B IF NO
003888      D46A 0001              3252          CLB    R6,PRIORITY(R10)   SAME PRIORITY?
00388C      4330 38E4              3253          BE     RUN05              B IF YES
                                   3254    *  SELCH PRIORITY CONFLICT
003890      E6D0 32DC              3255          LA     R13,ERRAMESS       SELCH XXY PRIORITY XX CONFLICT XXX
003894      E6BD 0013              3256          LA     R11,19(R13)
003898      D39A 0001              3257          LB     R9,PRIORITY(R10)   SELCH PRIORITY
00389C      24A2                   3258          LIS    R10,2              TWO DIGITS
00389E      41C0 21B4              3259          BAL    R12,HEXASCII
0038A2      E6BD 0006              3260          LA     R11,6(R13)
0038A6      0895                   3261          LR     R9,R5              SELCH ADDRESS
0038A8      24A3                   3262          LIS    R10,3              THREE DIGITS
0038AA      41C0 21B4              3263          BAL    R12,HEXASCII
0038AE      E6BD 0003              3264          LA     R11,3(R13)
0038B2      4894 0008              3265          LH     R9,DEVADR(DDBADR)  CONFLICTING DEVICE ADDRESS
0038B6      24A3                   3266          LIS    R10,3
0038B8      41C0 21B4              3267          BAL    R12,HEXASCII
0038BC      E6BD 002A              3268          LA     R11,42(R13)
0038C0      0896                   3269          LR     R9,R6              CONFLICTING PRIORITY
0038C2      24A2                   3270          LIS    R10,2
0038C4      41C0 21B4              3271          BAL    R12,HEXASCII
0038C8      E6E0 3309              3272          LA     R14,ERRAMESE
0038CC      41F0 232E              3273          BAL    R15,CONPRINT       PRINT ERROR MESSAGE
0038D0      2404                   3274          LIS    R0,4               SET ERROR CODE
                                   3275    *  LOOK AT NEXT SELCH DDB
0038D2      C170 3866              3276   RUN04  BXLE   R7,RUN02
0038D6      E6D0 330A              3277          LA     R13,ERRBMESS       DROP THROUGH, ALL SELCH DDB'S
0038DA      E6F0 3321              3278          LA     R14,ERRBMESE       ARE USED, NO MATCH FOR THIS
0038DE      41F0 232E              3279          BAL    R15,CONPRINT       DEVICE
0038E2      2404                   3280          LIS    R0,4               SET ERROR CODE
                                   3281    *  SELCH REQUIREMENTS OF THIS DEVICE SATISFIED, GET NEXT DEVICE
0038E4      C110 380E              3282   RUN05  BXLE   R1,RUN01
                                   3283    *
                                   3284    *  DST PASS TWO.  DDB INITIALIZATION
```

RUN COMMAND ROUTINE

```
                                   3285  *
                                   3286  *   ENTER CONSOLE IN DDB LOOK UP TABLE
0038E8      E640 25BC              3287        LA    DDBADR,CONDDB
0038EC      4854 0008              3288        LH    R5,DEVADR(DDBADR)     CONSOLE DEVICE ADDRESS
0038F0      1151                   3289        SLLS  R5,1                 INDEX INTO TABLE
0038F2      4045 28D8              3290        STH   DDBADR,DDBLKUP(R5)   STORE DDB ADDRESS FOR INTERRUPT
0038F6      E610 21E8              3291        LA    R1,DST               ADDRESS OF START OF TABLE
                                   3292  *     LIS   R2,4                 ENTRY SIZE (FROM PASS ONE)
                                   3293  *     L     R3,DSTLAST           LAST ENTRY ADDRESS (FROM PASS ONE)
0038FA      5841 0000              3294  RUN06 L     DDBADR,0(R1)         GET DEVICE DDB
0038FE      4854 0008              3295        LH    R5,DEVADR(DDBADR)    DEVICE ADDRESS
003902      213B       =003918     3296        BNZS  RUN06A               B IF GOOD ADDRESS
003904      2460                   3297        LIS   R6,0                 CHECK FOR SELCH
003906      7464 0006              3298        TBT   R6,DTYPFLGS(DDBADR)
00390A      4230 3A0C              3299        BNZ   RUN09                B IF SELCH WITH ZERO ADDRESS, TYPASS
00390E      2461                   3300        LIS   R6,1                 CHECK FOR MEMORY
003910      7464 0006              3301        TBT   R6,DTYPFLGS(DDBADR)
003914      4230 397E              3302        BNZ   RUN07A               B IF YES
003918      1151                   3303  RUN06A SLLS R5,1                 INDEX FOR DDB LOOKUP TABLE
00391A      7365 28D8              3304        LHL   R6,DDBLKUP(R5)       CHECK IF SLOT ALREADY TAKEN
00391E      4330 3960              3305        BZ    RUN06B               B IF NO, OK
003922      2466                   3306        LIS   R6,FLOPTYP           FLOPPY ?
003924      7454 0006              3307        TBT   R6,DTYPFLGS(DDBADR)  EXPECT SAME CONTROL ADDRESS
003928      233C       =003940     3308        BZS   RUN06A.1             ELSE, DUPLICATE DEVICE
00392A      1051                   3309        SRLS  R5,1                 R5 = FLOPPY DEVICE ADDRESS
00392C      4864 002E              3310        LH    R6,DVRWRK2+2(DDBADR) R6 GETS DRIVE SELECT BITS
003930      D366 3488              3311        LB    R6,FMDSTOP(R6)       GET STOP COMMAND FOR THIS
003934      C660 00C0              3312        OHI   R6,X'C0'             DRIVE.
003938      9E56                   3313        OCR   R5,R6                ISSUE DISARM STOP...
00393A      0A55                   3314        AR    R5,R5                PUT R5 BACK
00393C      4300 397A              3315        B     RUN07
003940      E6D0 3322              3316  RUN06A.1 LA R13,ERRCMESS         DUPLICATE DEVICE ERROR
003944      E6BD 0011              3317        LA    R11,17(R13)
003948      4894 0008              3318        LH    R9,DEVADR(DDBADR)    DEVICE ADDRESS
00394C      24A3                   3319        LIS   R10,3                CONVERT THREE DIGITS
00394E      41C0 21B4              3320        BAL   R12,HEXASCII         PUT DEVICE ADDRESS INTO ERROR BUFFER
003952      E6E0 3337              3321        LA    R14,ERRCMESE
003956      41F0 232E              3322        BAL   R15,CONPRINT         PRINT ERROR MESSAGE
00395A      2404                   3323        LIS   R0,4                 SET ERROR CODE
00395C      4300 3B1A              3324        B     RUN09AA
003960      246C                   3325  RUN06B LIS  R6,RECVTYP           RECEIVER
003962      7464 0006              3326        TBT   R6,DTYPFLGS(DDBADR)  TEST
003966      233A       =00397A     3327        BZS   RUN07
003968      4854 0008              3328        LH    R5,DEVADR(DDBADR)    RECV ADDR
00396C      1151                   3329        SLLS  R5,1                 X 2
00396E      0864                   3330        LR    R6,DDBADR
003970      CB60 0030              3331        SHI   R6,RECEIVER          ADJUST DDBADR FOR XMIT
003974      4065 28D8              3332        STH   R6,DDBLKUP(R5)       STORE IT HERE
003978      2303       =00397E     3333        BS    RUN07A
00397A      4045 28D8              3334  RUN07 STH   DDBADR,DDBLKUP(R5)   ENTER DDB INTO TABLE
00397E      2451                   3335  RUN07A LIS  R5,BUSY
003980      7654 0000              3336        RBT   R5,DSPFLGS(DDBADR)   RESET BUSY FLAG
003984      2453                   3337        LIS   R5,BADSTAT
```

BTS COMMAND ROUTINE

```
003986      7654 0000          3338          RBT   R5,DSPFLGS(DDBADR)  RESET BAD STATUS FLAG
00398A      2452              3339          LIS   R5,NOTCOUNT
00398C      7654 0000          3340          RBT   R5,DSPFLGS(DDBADR)  RESET NOT COUNTING FLAG
00399C      2450              3341          LIS   R5,0
003992      4054 0002          3342          STH   R5,PHASE(DDBADR)    CLEAR PHASE,
003996      246C              3343          LIS   R6,RECVTYP          RECEIVER
003998      7464 0006          3344          TBT   R6,DTYPFLGS(DDBADR)
*00399C      213F      =0039BA  3345          BNZ   RUN07AA
00399E      5054 0020          3346          ST    R5,CURDSPCH(DDBADR) CURRENT DISPATCH COUNT,
0039A2      5054 0018          3347          ST    R5,ERRORCNT(DDBADR) ERROR COUNT
                              3348  *   CHECK FOR FALSE SYNC
0039A6      2451              3349          LIS   R5,1                IF MEMORY, NO DEVICE TO CHECK
0039A8      7454 0006          3350          TBT   R5,DTYPFLGS(DDBADR)
0039AC      4230 39FE          3351          BNZ   RUN08               B IF YES
0039B0      2457              3352          LIS   R5,MAMTYP           MAM DEVICE
0039B2      7454 0006          3353          TBT   R5,DTYPFLGS(DDBADR) TEST
0039B6      4230 39F6          3354          BNZ   RUN07C
0039BA      4854 0008          3355  RUN07AA  LH    R5,DEVADR(DDBADR)
0039BE      9D56              3356          SSR   R5,R6               GET DEVICE STATUS
0039C0      D264 000A          3357          STB   R6,STATUS(DDBADR)   SAVE FOR USER
0039C4      C560 0004          3358          CLHI  R6,X'04'            EXAMINE WITH NOTHING ELSE
0039C8      4230 39FE          3359          BNE   RUN08               B IF NOT FALSE SYNC
0039CC      4864 0006          3360          LH    R6,DTYPFLGS(DDBADR) IF SELCH TESTER
0039D0      C560 2004          3361          CLHI  R6,X'2004'          DO NOT TEST FALSE SYNC
0039D4      4330 39FE          3362          BE    RUN08
0039D8      E6D0 3338          3363  RUN07B   LA    R13,ERRDMESS        FALSE SYNC ERROR MESSAGE
0039DC      E6BD 000B          3364          LA    R11,11(R13)
0039E0      0895              3365          LR    R9,R5               DEVICE ADDRESS
0039E2      24A3              3366          LIS   R10,3
0039E4      41C0 21B4          3367          BAL   R12,HEXASCII
0039E8      E6E0 3347          3368          LA    R14,ERRDMESE
0039EC      41F0 232E          3369          BAL   R15,CONPRINT        PRINT ERROR MESSAGE
0039F0      2404              3370          LIS   R0,4                SET ERROR CODE
0039F2      4300 3B1A          3371          B     RUN09AA             BYPASS NEXT TEST
0039F6      41C0 9290  =004C8A 3372  RUN07C   BAL   R12,MAMIDLE         IDLE MAM AND DEVICES
0039FA      41C0 92C4  =004CC2 3373          BAL   R12,MAMCLRAM        CLEAR MAM DCB'S
                              3374  *   IF DEVICE NOT A SELCH, CLEAR IGNORE
0039FE      2450              3375  RUN08    LIS   R5,0                TEST SELCH BIT IN TYPE FLAGS
003A00      7454 0006          3376          TBT   R5,DTYPFLGS(DDBADR)
003A04      2134      =003A0C  3377          BNZS  RUN09               B IF SELCH
003A06      2450              3378          LIS   R5,IGNORE           CLEAR IGNORE FLAG
003A08      7654 0000          3379          RBT   R5,DSPFLGS(DDBADR)
                              3380  *   GET NEXT DEVICE FROM DST
003A0C      4854 0006          3381  RUN09    LH    R5,DTYPFLGS(DDBADR) TEST
003A10      C550 4000          3382          CLHI  R5,X'4000'          MEMORY TEST
003A14      2138      =003A24  3383          BNES  RUN090A             NO
003A16      5864 0040          3384          L     R6,BUF2END(DDBADR)  CLEAR MEMORY BUFFER
003A1A      2664              3385          AIS   R6,4
003A1C      5064 0044          3386          ST    R6,BUF2NEXT(DDBADR)
003A20      4300 3AA8          3387          B     RUN0900             AND CONTINUE
                              3388  *
003A24      C350 2004          3389  RUN090A  THI   R5,X'2004'          DEVICE IS CASETTE OR USES SELCHH
003A28      4330 3AA8          3390          BZ    RUN0900             NO
```

RUN COMMAND ROUTINE

```
003A2C      5864 0040              3391          L       R6,BUF2END(DDBADR)  YES, THEN CLEAR BUFFER
003A30      2664                   3392          AIS     R6,4
003A32      5064 0044              3393          ST      R6,BUF2NEXT(DDBADR)
                                   3394    *
003A36      4850 34D8              3395          LH      R5,MBUF             TEST MOVE BUFFER OPTION
003A3A      4230 3B1A              3396          BNZ     RUN09AA             MOVE BUFFER OPTION USED
                                   3397    *
003A3E      5850 8DDA =00481C      3398          L       R5,BUFNEXT
003A42      0865                   3399          LR      R6,R5
003A44      5A60 34D4              3400          A       R6,BUFSIZE          SIZE OF BUFFER
003A48      5560 25B8              3401          CL      R6,MEMTOP           OVER TOP OF MEMORY?
003A4C      4380 3A98              3402          BNL     RUN090X             ERROR
003A50      F560 0000 9580         3403          CLI     R6,EXEREND          END OF PROGRAM
003A56      4280 3A98              3404          BL      RUN090X             ERROR IF PROGRAM MEMORY
003A5A      5054 0030              3405          ST      R5,BUF1STRT(DDBADR) START ADDRESS
003A5E      5054 0038              3406          ST      R5,BUF1NEXT(DDBADR) CLEAR BUFFER
003A62      2764                   3407          SIS     R6,4
003A64      5064 0034              3408          ST      R6,BUF1END(DDBADR)  END ADDRESS
003A68      2664                   3409          AIS     R6,4
003A6A      0956                   3410          LR      R5,R6
003A6C      5A60 34D4              3411          A       R6,BUFSIZE          CALCULATE SECOND BUFFER ADDRESSES
003A70      5560 25B8              3412          CL      R6,MEMTOP           TOP OF MEMORY
003A74      4380 3A98              3413          BNL     RUN090X             ERROR IF EXCEEDS
003A78      F560 0000 9580         3414          CLI     R6,EXEREND          END OF PROGRAM
*003A7E     218D      =003A98      3415          BL      RUN090X             ERROR OF IN PROGRAM MEMORY
003A80      5054 003C              3416          ST      R5,BUF2STRT(DDBADR) START ADDRESS
003A84      5054 0044              3417          ST      R5,BUF2NEXT(DDBADR) CLEAR BUFFER
003A88      2764                   3418          SIS     R6,4
003A8A      5064 0040              3419          ST      R6,BUF2END(DDBADR)  END ADDRESS
003A8E      2664                   3420          AIS     R6,4
003A90      5060 8D88 =00481C      3421          ST      R6,BUFNEXT          NEXT BUFFER AVAILBLE
003A94      4300 3B1A              3422          B       RUN09AA
                                   3423    *
003A98      E6D0 33B6              3424  RUN090X LA      R13,ERRJMESS
003A9C      E6E0 33CF              3425          LA      R14,ERRJMESE
003AA0      41F0 232E              3426          BAL     R15,CONPRINT
003AA4      4300 122E              3427          B       CMNDPROC
                                   3428    *
003AA8      C450 00F0              3429  RUN0900 NHI     R5,X'F0'            XMIT AND RECV PAIR
003AAC      4330 3B1A              3430          BZ      RUN09AA
003AB0      4850 34B2              3431          LH      R5,MAMADR           MAM ADR
003AB4      2139      =003AC6      3432          BNZS    RUN090              YES
003AB6      E6D0 338C              3433          LA      R13,ERRGMESS        ELSE ERROR
003ABA      E6E0 339D              3434          LA      R14,ERRGMESE
003ABE      41F0 232E              3435          BAL     R15,CONPRINT        PRINT
003AC2      4300 122E              3436          B       CMNDPROC            RETURN TO COMMAND
003AC6      245A                   3437  RUN090  LIS     R5,PASLTYP          CHECK FOR PASLA
003AC8      7454 0006              3438          TBT     R5,DTYPFLGS(DDBADR)
003ACC      4330 3B04              3439          BZ      RUN09AB             NOT A PASLA DEVICE
003AD0      2456                   3440          LIS     R5,DEVCNTL1         ZERO
003AD2      7654 0000              3441          RBT     R5,DSPFLGS(DDBADR)  PASLA TERMINATION FLAG
003AD6      2451                   3442          LIS     R5,1
003AD8      6150 34B6              3443          AHM     R5,PASRCNT          COUNT THE NUM. OF PASLA DEVICES
```

RUN COMMAND ROUTINE

```
003ADC      6150 34B8                    3444              AHM   R5,PASCNT
003AE0      4854 0008                    3445              LH    R5,XDEVADR(DDBADR)    PASLA XMIT ADDR
003AE4      DE50 346D                    3446              OC    R5,PASDSARM           DISARM IT
003AE8      2751                         3447              SIS   R5,1                  ADJACENT RECV
003AEA      DE50 346D                    3448              OC    R5,PASDSARM           DISARM IT
003AEE      4240 39D8                    3449              BTC   4,RUN07B              FALSE SYNC CHECK
003AF2      4854 0038                    3450              LH    R5,RDEVADR(DDBADR)    PASLA RECV ADDR
003AF6      DE50 346D                    3451              OC    R5,PASDSARM           DISARM IT
003AFA      2651                         3452              AIS   R5,1                  ADJACENT XMIT
003AFC      DE50 346D                    3453              OC    R5,PASDSARM           DISARM IT
003B00      4240 39D8                    3454              BTC   4,RUN07B              FALSE SYNC CHECK
003B04      245B                         3455    RUN09AB   LIS   R5,QSZTYP
003B06      7454 0006                    3456              TBT   R5,DTYPFLGS(DDBADR)
003B0A      2334        =003B12          3457              BZS   RUN09AC
003B0C      2451                         3458              LIS   R5,1
003B0E      6150 34BA                    3459              AHM   R5,QSZRCNT            INCREMENT QSA ZBID COUNT
003B12      CA40 0030                    3460    RUN09AC   AHI   DDBADR,RECFIVER       ADJUST VALUE
003B16      4300 38FE                    3461              B     RUN06+4
003B1A      C110 38FA                    3462    RUN09AA   BXLE  R1,RUN06
                                         3463    *   DISPATCHER INITIALIZATION
003B1E      E650 21E8                    3464              LA    R5,DST
003B22      5050 2268                    3465              ST    R5,DSTNEXT           SET NEXT POINTER TO TOP OF TABLE
003B26      2450                         3466              LIS   R5,0
003B28      4050 8A7E   =0045AA          3467              STH   R5,BLINKY            CLEAR DISPLAY
003B2C      4050 8A7C   =0045AC          3468              STH   R5,BLINKY+2
003B30      5050 268C                    3469              ST    R5,DSPCHCNT          CLEAR DISPATCH COUNT
003B34      5850 0CDC                    3470              L     R5,DSPCHER           SET UP DISPATCHER PSW
003B38      C450 7AFF                    3471              NHI   R5,X'7AFF'           CLEAR HW, PROTECT, WAIT, MAC
003B3C      C650 48F0                    3472              OHI   R5,X'48F0'           SET IMMEDIATE, REG SET F
003B40      4860 34E4                    3473              LH    R6,MACADR            MAC SELECTED?
003B44      4660 34E6                    3474              CH    R6,MATFLAG           OR MAT?
003B48      2333        =003B4E          3475              BZS   RUN09A               B IF NO
003B4A      C650 0400                    3476              OHI   R5,X'400'            TURN ON MAC
003B4E      5050 0CDC                    3477    RUN09A    ST    R5,DSPCHER
003B52      4850 3498                    3478              LH    R5,FMDRIVE
003B56      C450 000F                    3479              NHI   R5,X'F'
003B5A      2337        =003B68          3480              BZS   RUN09B
003B5C      D350 3498                    3481              LB    R5,FMDRIVE
003B60      0880                         3482              LR    R8,R0
003B62      4100 A64E   =0061B4          3483              BAL   R0,FMDSELS
003B66      0808                         3484              LR    R0,R8
                                         3485    *   CLEAR INTERLOCK ARRAY
003B68      E650 89A4   =004510          3486    RUN09B    LA    R5,INTRLOCK          START OF ARRAY
003B6C      2464                         3487              LIS   R6,4                 ON WORD BOUNDRY
003B6E      E675 007F                    3488              LA    R7,127(R5)           128 BYTES LONG
003B72      2480                         3489              LIS   R8,0
003B74      5085 0000                    3490    RUN10     ST    R8,0(R5)             CLEAR ARRAY
003B78      C150 3B74                    3491              BXLE  R5,RUN10
                                         3492    *
                                         3493    *   IF ANY ERRORS, GO TO RESTART SEQUENCE TO CLEAN UP AND START
                                         3494    *   COMMAND PROCESSOR AGAIN.
003B7C      0800                         3495              LR    R0,R0                TEST ERROR CODE
003B7E      4230 0C1E                    3496              BNZ   RESTART              B IF ERROR
```

```
                                            3497  *  SET UP MAC IF MAC  TESTING SELECTED
003B82      4810 34E4                       3498           LH    R1,MACADR          TESTING MAC?
003B86      233C        =003B9F             3499           BZS   RUN10A             B IF NO
003B88      D1E0 24F0                       3500           LM    R14,MACREGS        MAC REGS 0 AND 1
003B8C      D0E1 0000                       3501           STM   R14,0(R1)          INTO BLACK HOLE
003B90      D120 24F8                       3502           LM    R2,MACREGS+8       MAC REGS 2 THRU F
003B94      D021 0008                       3503           STM   R2,8(R1)           INTO BLACK HOLE
003B98      2420                            3504           LIS   R2,0
003B9A      5021 0040                       3505           ST    R2,64(R1)          CLEAR MAC STATUS REGISTER
003B9F      4810 34E6                       3506  RUN10A   LH    R1,MATFLAG         MAT SELECTED?
003BA2      4330 3BE2                       3507           BZ    RUN10B
003BA6      2440                            3508           LIS   R4,0
003BA8      2410                            3509           LIS   R1,0
003BAA      0821                            3510  RUNMAT   LR    R2,R1              SET UP PST ENTRIES FOR 1:1 RELOCATION
003BAC      1027                            3511           SRLS  R2,7
003BAE      F830 5C3E 0000                  3512           LI    R3,Y'5C3E0000'     PST ENTRY
003BB4      0632                            3513           OR    R3,R2              OR IN THE SRF FIELD
003BB6      5034 4000 8D80                  3514           ST    R3,PST(R4)         SET UP TABLE
003BBC      2648                            3515           AIS   R4,8               INCREMENT INDEX INTO TABLE
003BBE      FA10 0001 0000                  3516           AI    R1,Y'10000'        INCREMENT SEGMENT RELOCATION FIELD
003BC4      C540 0800                       3517           CLHI  R4,2048            ALL 256 ENTRIES SET UP?
*003BC8     208F        =003BAA             3518           BL    RUNMAT             NO,LOOP BACK TO SETUP
003BCA      F810 01FE 0000                  3519           LI    R1,Y'1FE0000'      SET UP DESCRIPTOR
003BD0      F820 0000 8D80                  3520           LI    R2,PST             SIZE = X'FF' & TABLE ADDRESS =PST
003BD6      1027                            3521           SRLS  R2,7
003BD8      0612                            3522           OR    R1,R2
003BDA      5010 3C40                       3523           ST    R1,APSSTD          INTIALIZE DESCRIPTOR
003BDE      DF10 3C40                       3524           LPSTD APSSTD             LOAD DESCRIPTOR
003BE2      E640 25BC                       3525  RUN10B   LA    DDBADR,CONDDB
003BE6      E6E0 3C24                       3526           LA    R14,ACTIVITY-2     ACTIVITY BUFFER
003BEA      E6F0 3C3F                       3527           LA    R15,ACTIVITE
003BEE      D0E4 0030                       3528           STM   R14,BUF1STRT(DDBADR) OUTPUT BUFFER
003BF2      E6E0 30DC                       3529           LA    R14,CMNDBUFS
003BF6      08FE                            3530           LR    R15,R14
003BF8      D0E4 003C                       3531           STM   R14,BUF2STRT(DDBADR)
003BFC      2400                            3532           LIS   R0,0               *                        P09
003BFE      D20E 0000                       3533           STB   R0,0(R14)          NULL CHARACTER
003C02      5854 000C                       3534           L     R5,DVRENTRY(DDBADR)
*003C06     C550 5674                       3535           CLI   R5,PASPTR
003C0A      2333        =003C10             3536           BES   RUN10C
003C0C      D0E4 0030                       3537           STM   R14,BUF1STRT(DDBADR)
003C10      2453                            3538  RUN10C   LIS   R5,BADSTAT         CLEAR BAD STATUS FLAG
003C12      7654 0000                       3539           RBT   R5,DSPFLGS(DDBADR)
003C16      2454                            3540           LIS   R5,PHASE.1         SET PHASE 1, ADC START
003C18      4054 0002                       3541           STH   R5,PHASE(DDBADR)
003C1C      4100 157A                       3542           BAL   R0,DRIVER          CALL DRIVER
                                            3543  *  BEGIN TESTING SELECTED DEVICES
003C20      C200 0CDC                       3544           LPSW  DSPCHER            GO TO DISPATCHER


003C24      0D0D                            3546           DCX   0D0D
003C26                                      3547  ACTIVITY DS    26
```

RUN COMMAND ROUTINE

```
                    0000 3C3F            3548  ACTIVITE EQU    *-1
003C40              01FE 0000            3549  APSSTD   DCY    01FE0000
```

CPU COMMAND ROUTINE

```
                                  3551  *   CPU COMMAND                                                    *
                                  3552  *                                                                  *
                                  3553  *     THE CPU NUMBER IS USED TO INDEX A TABLE OF TIME INCREMENT VALUES.*
                                  3554  *   THE INCREMENT VALUE IS ADDED TO THE CURRENT WAIT COUNTER WHEN A    *
                                  3555  *   DEVICE IS WAITING FOR AN INTERRUPT.  THE FASTER THE CPU, THE       *
                                  3556  *   SMALLER THE INCREMENT.                                          *
                                  3557  *                                                                  *
003C44       4190 13F6            3558  CPUCMND  BAL    R9,NEXTPARM            FETCH CPU TYPE
003C48       C5D0 3220            3559           CLHI   R13,X'3220'
*003C4C      218A      =003C60    3560           BL     CPUCMNDA
003C4E       2134      =003C56    3561           BNES   CPUCMND0
003C50       2402                 3562           LIS    R13,2
003C52       4300 3C78            3563           B      CPUCMND2
003C56       C5D0 3240            3564  CPUCMND0 CLHI   R13,X'3240'
*003C5A      2138      =003C6A    3565           BNE    CPUCMND1
003C5C       2403                 3566           LIS    R13,3
*003C5E      230D      =003C78    3567           B      CPUCMND2
003C60       27D7                 3568  CPUCMNDA SIS    R13,7                 CONVERT CPU NUMBER TO TABLE INDEX
003C62       2114      =003C6A    3569           BMS    CPUCMND1              B IF CPU LESS THAN SEVEN
003C64       C5D0 0002            3570           CLHI   R13,X'02'             NUMBER LESS THAN NINE?
003C68       2188      =003C78    3571           BLS    CPUCMND2              B IF GOOD CPU NUMBER
003C6A       E6D0 336C            3572  CPUCMND1 LA     R13,ERRFMESS          INVALID CPU NUMBER, 7 ASSUMED
003C6E       E6E0 338B            3573           LA     R14,ERRFMESE
003C72       41F0 232E            3574           BAL    R15,CONFPINT          PRINT ERROR
003C76       07DD                 3575           XR     R13,R13               ASSUME 7/32
003C78       486D 4D00 2642       3576  CPUCMND2 LH     R6,CPUTABLE(R13,R13)  PICK UP INCREMENT
003C7E       4060 2640            3577           STH    R6,CPUSWTCH           MAKE IT CURRENT
003C82       0300                 3578           BR     R0                    RETURN
003C84                            3579           IFNZ   CONDEBUG
```

```
                                      3581   *OPEN MEMORY CELL COMMAND
                                      3582   *
003C84     4190 13F6                  3583   OPNCMND  BAL    R9,NEXTPARM        CONVERT MEMORY ADDRESS PARM
003C88     C4D0 FFFE                  3584            NHI    R13,-2             FORCE EVEN ADDRESS
003C8C     50D0 2638                  3585            ST     R13,OPENCELL       ADDRESS OF CURRENT OPEN CELL
003C90     41E0 2134                  3586            BAL    R14,PARMSCAN       GET NUMBER OF HALFWORDS
003C94     40D0 30D8                  3587            STH    R13,CELL.CNT       TO EXAMINE
003C98     C5F0 0003                  3588            CLHI   R15,3              TEST PARMSCAN RETURN CODE
003C9C     4380 13FA                  3589            BNL    PARM.ERR           BAD VALUE
                                      3590   *
                                      3591   *PRINT ADDRESS OF OPEN CELL AND CONTENTS
                                      3592   *
003CA0     E5B0 312C                  3593   PRNTCELL LA     R11,OUTBUF         PRINT BUFFER START ADDRESS
003CA4     5890 2638                  3594            L      R9,OPENCELL        ADDRESS OF OPEN CELL
003CA8     24A6                       3595            LIS    R10,6              SIX  DIGIT ADDRESS
003CAA     41C0 21B4                  3596            BAL    R12,HEXASCII       CONVERT AND STORE IN BUFFER
003CAE     C880 0020                  3597   PRNTCEL1 LHI    R8,X'20'           BLANK
003CB2     D28B 0000                  3598            STB    R8,0(R11)          SEPARATE ADDRESS AND CONTENTS
003CB6     26B1                       3599            AIS    R11,1              WHERE TO PUT CONTENTS IN BUFFER
003CB8     4899 0000                  3600            LH     R9,0(R9)           CONTENTS OF OPEN CELL
003CBC     24A4                       3601            LIS    R10,4              FOUR  DIGITS IN HALFWORD
003CBE     41C0 21B4                  3602            BAL    R12,HEXASCII
003CC2     50B0 3D54                  3603            ST     R11,EXASAVE3       SAVE OUTBUF POINTER
003CC6     24D2                       3604            LIS    R13,2
003CC8     51D0 2638                  3605            AM     R13,OPENCELL       INCREMENT OPEN CELL ADDRESS
003CCC     48D0 30D8                  3606            LH     R13,CELL.CNT
003CD0     27D1                       3607            SIS    R13,1              DECREMENT COUNT
003CD2     40D0 30D8                  3608            STH    R13,CELL.CNT
003CD6     4220 3CFC                  3609            BP     PRNTCEL3           KEEP GOING IF POSITIVE
003CDA     248D                       3610   PRNTCEL2 LIS    R8,X'0D'           END THIS LINE
003CDC     D28B 0000                  3611            STB    R8,0(R11)          CARRIAGE RETURN
003CE0     248A                       3612            LIS    R8,X'0A'
003CE2     D28B 0001                  3613            STB    R8,1(R11)          LINE FEED
003CE6     26B1                       3614            AIS    R11,1
003CE8     08EB                       3615            LR     R14,R11            END OF DATA
003CEA     E6D0 312C                  3616            LA     R13,OUTBUF         START OF DATA
003CEE     50D0 3D54                  3617            ST     R13,EXASAVE3       QUEUE NEW LINE
003CF2     41F0 232E                  3618            BAL    R15,CONPRINT       PRINT ADDRESS AND CONTENTS
003CF6     48B0 30D8                  3619            LH     R11,CELL.CNT
003CFA     0320                       3620            BNPR   R0                 DONE IF NOT PLUS
                                      3621   *
003CFC     58B0 3D54                  3622   PRNTCEL3 L      R11,EXASAVE3       GET OUTBUF POINTER
*003D00    C5B0 312C                  3623            CLI    R11,OUTBUF         FINISHED ONE LINE?
003D04     4330 3CA0                  3624            BE     PRNTCELL           YES, START ANOTHER
*003D08    C5B0 315A                  3625            CLI    R11,OUTBUF+46      END OF THIS LINE?
003D0C     4380 3CDA                  3626            BNL    PRNTCEL2           YES, DO CARRIAGE RETURN,LINE FEED
003D10     5890 2638                  3627            L      R9,OPENCELL        NO, GET OPEN CELL ADDRESS
003D14     4300 3CAE                  3628            B      PRNTCEL1           AND PRINT ANOTHER HALFWORD
                                      3629   *
                                      3630   *
                                      3631   * REPLACE CONTENTS OF MEMORY CELL(S)
                                      3632   *
003D18     4190 13F6                  3633   REPCMND  BAL    R9,NEXTPARM        GET FIRST CELL ADDRESS
```

OPEN CELL, REPLACE CELL COMMAND ROUTINES

```
003D1C      C4C0 FFFE       3634              NHI   R13,-2          FORCE EVEN ADDRESS
003D20      50C0 2638       3635              ST    R13,OPENCELL    SAVE OPENCELL ADDRESS
003D24      41E0 2134       3636              BAL   R14,PARMSCAN    GET FIRST VALUE TO STORE
003D28      C5F0 0003       3637  REPCMND1    CLHI  R15,3           TEST RETURNED CODE
003D2C      4380 13FA       3638              BNL   PARM.ERR
003D30      5890 2638       3639              L     R9,OPENCELL     GET OPEN CELL ADDRESS
003D34      40C9 0000       3640              STH   R13,0(R9)       STORE HALFWORD VALUE
003D38      2692           3641              AIS   R9,2            INCREMENT OPEN CELL ADRS
003D3A      5090 2638       3642              ST    R9,OPENCELL
003D3E      41E0 2134       3643              BAL   R14,PARMSCAN    GET ANOTHER VALUE
003D42      C5F0 0002       3644              CLFI  R15,2           LAST VALUE?
003D46      0330           3645              BER   R0              NEXT COMMAND IF YES
003D48      4300 3D28       3646              B     REPCMND1        ELSE, LOOP
003D4C                      3647              ALIGN 4
003D4C      0000 0000       3648  EXASAVE1    DC    0
003D50      0000 0000       3649  EXASAVE2    DC    0
003D54      0000 0000       3650  EXASAVE3    DC    0
                            3651              ENDC
003D58                      3652              IFNZ  CONCMNDS
```

```
                                3654    *ERRCMND -- PRINT ERROR SUMMARY FOR DEVICES ON DST
                                3655    *
003D58    E6D0 31D4             3656    ERRCMND   LA    R13,ERRSUM          PRINT HEADING
003D5C    E6E0 31E5             3657              LA    R14,ERRSUME
003D60    41F0 232E             3658              BAL   R15,CONPRINT
003D64    2428                  3659              LIS   R2,8                DEV2DDB TABLE ENTRY SIZE
003D66    E630 35C4             3660              LA    R3,DEV2DDB          END OF TABLE
003D6A    C850 0020             3661              LHI   R5,X'20'            ASCII BLANK
003D6E    246D                  3662              LIS   R6,X'0D'            CARRIAGE RETURN
003D70    247A                  3663              LIS   R7,X'0A'            LINE FEED
003D72    E680 21E8             3664              LA    R8,DST              INITIALIZE NEXT POINTER
003D76    5080 2268             3665              ST    R8,DSTNEXT
003D7A    5880 2268             3666    ERRCMND1  L     R8,DSTNEXT          POINTER TO NEXT ENTRY
003D7E    5980 2264             3667              C     R8,DSTLAST          AT END OF TABLE?
003D82    0220                  3668              BPR   R0                  B IF YES, DONE, RETURN
003D84    5848 0000             3669              L     DDBADR,0(R8)        FETCH NEXT DDB
003D88    2684                  3670              AIS   R8,4                UPDATE TABLE POINTER
003D8A    5080 2268             3671              ST    R8,DSTNEXT
003D8E    E6B0 312C             3672              LA    R11,OUTBUF          PRINT BUFFER ADDRESS
003D92    4894 0008             3673              LH    R9,DEVADR(DDBADR)   GET DEVICE ADDRESS, IF ANY
003D96    2481                  3674              LIS   R8,1                PSUEDO DDB FOR MEMORY?
003D98    7484 0006             3675              TBT   R8,DTYPFLGS(DDBADR)
003D9C    213D       =003DB6    3676              BNZS  ERRCMND2            B IF YES, SKIP ADDRESS CHECK
003D9E    0899                  3677              LR    R9,R9               CHECK DEVICE ADDRESS
003DA0    4330 3D7A             3678              BZ    ERRCMND1            B IF NO ADDRESS, IGNORE THIS DDB
003DA4    2480                  3679              LIS   R8,0                IS THIS A SELCH DDB?
003DA6    7484 0006             3680              TBT   R8,DTYPFLGS(DDBADR)
003DAA    2336       =003DB6    3681              BZS   ERRCMND2            B IF NO, GET MNEMONIC
003DAC    F880 534C 4348        3682              LI    R8,C'SLCH'          THIS IS MNEMONIC FOR SELCH
003DB2    4300 3DE2             3683              B     ERRCMND5
003DB6    E610 35C4             3684    ERRCMND2  LA    R1,DEV2DDB          START OF LOOKUP TABLE
003DBA    2428                  3685              LIS   R2,8                EIGHT BYTES PER ENTRY
003DBC    E630 37BC             3686              LA    R3,DEV2DDBF         END OF LOOKUP TABLE
003DC0    5941 0004             3687    ERRCMND3  C     DDBADR,4(R1)        FOUND THIS DDB?
003DC4    233D       =003DDE    3688              BES   ERRCMND4            B IF YES
003DC6    C110 3DC0             3689              BXLE  R1,ERRCMND3         CONTINUE LOOKING
003DCA    E6D0 3348             3690              LA    R13,ERREMESS        PROGRAM ERROR
003DCE    E6E0 336B             3691              LA    R14,ERREMESE
003DD2    41F0 232E             3692              BAL   R15,CONPRINT        NO MNEMONIC FOR DDB
003DD6    F880 3F3F 3F3F        3693              LI    R8,C'????'          UNKNOWN MNEMONIC
003DDC    2303       =003DE2    3694              BS    ERRCMND5
003DDE    5881 0000             3695    ERRCMND4  L     R8,0(R1)            MNEMONIC FROM TABLE
003DE2    508B 0000             3696    ERRCMND5  ST    R8,0(R11)           ***** NOTE OUTBUF ALIGNED 4 *****
003DE6    D25B 0004             3697              STB   R5,4(R11)           FOLLOW BY BLANK
003DEA    26B5                  3698              AIS   R11,5               ADVANCE POINTER
003DEC    24A3                  3699              LIS   R10,3               THREE DIGIT DEVICE ADDRESS
003DEE    41C0 21B4             3700              BAL   R12,HEXASCII        CONVERT DEVICE ADDRESS
003DF2    D25B 0000             3701              STB   R5,0(R11)           FOLLOW BY BLANK
003DF6    26B1                  3702              AIS   R11,1
003DF8    5894 0018             3703              L     R9,ERRORCNT(DDBADR) CONVERT ERROR COUNT
003DFC    24A8                  3704              LIS   R10,8               EIGHT DIGITS
003DFE    41C0 21B4             3705              BAL   R12,HEXASCII
003E02    D26B 0000             3706              STB   R6,0(R11)           PUT IN CARRIAGE RETURN
```

ERROR SUMMARY PRINT

```
003E06      I27B 0001              3707       STB    R7,1(R11)        ADD LINE FEED
003E0A      E5EB 0001              3708       LA     R14,1(R11)       ADDRESS OF LAST BYTE USED
003E0E      E6D0 312C              3709       LA     R13,OUTBUF       START OF BUFFER
003E12      41F0 232E              3710       BAL    R15,CONPRINT     PRINT IT
003E16      4300 3D7A              3711       B      ERPCMND1         LOOP FOR NEXT DEVICE


                                  3713  * HALTCMND -- IF SERIES 3200, DO A BREAKPOINT
                                  3714  *
003E1A      4880 0A16              3715  HALTCMND LH    R8,FLAG3200
003E1E      2334        =003E26    3716           BZS   HALTCMD1
003E20      9800                   3717           DCX   8800
003E22      4300 0C1E              3718           B     RESTART
003E26      C200 0CD4              3719  HALTCMD1 LPSW  HALTPSW
```

```
                                      3721  *DSTCMND --LIST DEVICES AND PARAMETERS CURRENTLY SELECTED          *
                                      3722  *                                                                 *
                                      3723  *    FOR EACH DDB ON THE DEVICE SERVICE TABLE, USES THE DEV2DDB    *
                                      3724  * TABLE TO OBTAIN THE DEVICE MNEMONIC.  THEN USES THE PARM FLAGS TO *
                                      3725  * PRINT THE PARAMETERS CURRENTLY SELECTED FOR THIS DEVICE.         *
                                      3726  *                                                                 *
003E2A      E670 21E8                 3727  DSTCMND LA      R7,DST              INITIALIZE
003E2E      5070 2268                 3728          ST      R7,DSTNEXT          NEXT POINTER
003E32      C850 0020                 3729          LHI     R5,X'20'            CONSTANT ASCII BLANK
003E36      C860 002D                 3730          LHI     R6,X'2D'            CONSTANT ASCII HYPHEN
003E3A      2428                      3731          LIS     R2,8                DEV2DDB TABLE ENTRY SIZE
003E3C      E630 37BC                 3732          LA      R3,DEV2DDBE         END OF TABLE
003E40      5870 2268                 3733  DSTCMND1 L      R7,DSTNEXT          POINTER TO NEXT ENTRY
003E44      5970 2264                 3734          C       R7,DSTLAST          AT END OF TABLE?
003E48      0220                      3735          BPR     R0                  B IF YES, DONE
003E4A      5847 0000                 3736          L       DDBADR,0(R7)        GET NEXT DDB FROM DST
003E4E      2674                      3737          AIS     R7,4                UPDATE POINTER
003E50      5070 2268                 3738          ST      R7,DSTNEXT          AND SAVE
003E54      2480                      3739          LIS     R8,0                IS THIS A SELCH?
003E56      7484 0006                 3740          TBT     R8,DTYPFLGS(DDBADR)
003E5A      203D        =003F40       3741          BNZS    DSTCMND1            B IF YES, DON'T PRINT
003E5C      E510 35C4                 3742          LA      R1,DEV2DDB          START OF TABLE
003E60      5941 0004                 3743  DSTCMND2 C      DDBADR,4(R1)        LOOK FOR DDB TO GET MENMONIC
003E64      233B        =003F7A       3744          BES     DSTCMND4            B IF MATCH
003E66      C110 3E60                 3745  DSTCMND3 BXLE   R1,DSTCMND2         LOOP THROUGH TABLE
003E6A      E6D0 3348                 3746          LA      R13,ERREMESS        NO NMEMONIC FOR DDB
003E6E      E6E0 336B                 3747          LA      R14,ERREMESE
003E72      41F0 232E                 3748          BAL     R15,CONPRINT        PRINT ERROR
003E76      4300 3E40                 3749          B       DSTCMND1            CONTINUE
003E7A      4894 0006                 3750  DSTCMND4 LH     R9,DTYPFLGS(DDBADR) DEVICE TYPE
003E7E      C490 00F0                 3751          NHI     R9,X'F0'            CHECK FOR COMMUNICATION DEVICES
003E82      4330 3EBE                 3752          BZ      DSTCMNDZ            NONE
003E86      5881 0000                 3753          L       R8,0(R1)            YES, GET FIRST TWO ASC CHAR
003E8A      EC80 0010                 3754          SRL     R8,16               OF NMEMONIC
003E8E      C580 5153                 3755          CLHI    R8,C'QS'            TEST FOR QSA BISYNC NMEMONIC
003E92      2137        =003FA0       3756          BNES    DSTCMND5            AND
003E94      C590 0080                 3757          CLHI    R9,X'80'            QSA BISYNC TYPE
003E98      4330 3EBE                 3758          BE      DSTCMNDZ            FOUND IT
003E9C      4300 3E66                 3759          B       DSTCMND3            ELSE CONTINUE SEARCH
003EA0      C580 4453                 3760  DSTCMND5 CLHI   R8,C'DS'            NEXT, TEST FOR DAS NMEMONIC
003EA4      2136        =003EE0       3761          BNES    DSTCMND6            AND
003EA6      C590 0040                 3762          CLHI    R9,X'40'            DSA DEVICE TYPE
003EAA      233A        =003FBE       3763          BES     DSTCMNDZ            FOUND IT
003EAC      4300 3E66                 3764          B       DSTCMND3            ELSE CONTINUE SEARCH
003EB0      C580 5053                 3765  DSTCMND6 CLHI   R8,C'PS'            NEXT TEST FOR PASLA NMEMONIC
003EB4      2135        =003ESE       3766          BNES    DSTCMNDZ            AND
003EB6      C590 0020                 3767          CLHI    R9,X'20'            PASLA DEVICE TYPE
003EBA      4230 3E66                 3768          BNE     DSTCMND3            IF NOT CONTINUE SEARCH
                                      3769  *                                  IF SEARCH FAILS ASSUME QSA 7BIB
003EBE      E6B0 312C                 3770  DSTCMNDZ LA     R11,OUTBUF          BUFFER START
003EC2      5881 0000                 3771          L       R8,0(R1)            GET MNEMONIC
003EC6      508B 0000                 3772          ST      R8,0(R11)           INTO BUFFER    **NOTE BUF ALIGNED 4
003ECA      D25B 0004                 3773          STB     R5,4(R11)           FOLLOWED BY BLANK
```

003ECE	26B5		3774		AIS	R11,5	ADVANCE POINTER
			3775	*			
			3776	*	USE PARM FLAGS TO PRINT PARAMETERS		
			3777	*			
003ED0	2470		3778	DSTPRM0	LIS	R7,0	DEVICE ADDRESS
003ED2	7474 0004		3779		TBT	R7,PARMFLGS(DDBADR)	
003ED6	2339	=003FE8	3780		BZS	DSTPRM1	B IF NOT SELECTED
003ED8	4894 0008		3781		LH	R9,DEVADR(DDBADR)	
003EDC	24A3		3782		LIS	R10,3	THREE DIGITS
003EDE	41C0 21B4		3783		BAL	R12,HEXASCII	
003EE2	D25B 0000		3784		STB	R5,0(R11)	FOLLOWED BY BLANK
003EE6	26B1		3785		AIS	R11,1	
			3786	*			
003EE8	2471		3787	DSTPRM1	LIS	R7,1	CONTROLLER ADDRESS
003EEA	7474 0004		3788		TBT	R7,PARMFLGS(DDBADR)	
003EEE	2339	=003F00	3789		BZS	DSTPRM2	B IF NOT SELECTED
003EF0	4894 004A		3790		LH	R9,CONTADR(DDBADR)	
003EF4	24A3		3791		LIS	R10,3	THREE DIGITS
003EF6	41C0 21B4		3792		BAL	R12,HEXASCII	
003EFA	D25B 0000		3793		STB	R5,0(R11)	FOLLOWED BY BLANK
003EFE	26B1		3794		AIS	R11,1	
			3795	*			
003F00	2472		3796	DSTPRM2	LIS	R7,2	SELCH ADDRESS
003F02	7474 0004		3797		TBT	R7,PARMFLGS(DDBADR)	
003F06	2339	=003F18	3798		BZS	DSTPRM3	B IF NOT SELECTED
003F08	4894 0048		3799		LH	R9,SELCHADR(DDBADR)	
003F0C	24A3		3800		LIS	R10,3	THREE DIGITS
003F0E	41C0 21B4		3801		BAL	R12,HEXASCII	
003F12	D25B 0000		3802		STB	R5,0(R11)	FOLLOWED BY BLANK
003F16	26B1		3803		AIS	R11,1	
			3804	*			
003F18	2473		3805	DSTPRM3	LIS	R7,3	PRIORITY
003F1A	7474 0004		3805		TBT	R7,PARMFLGS(DDBADR)	
003F1E	233A	=003F32	3807		BZS	DSTPRM4	B IF NOT SELECTED
003F20	D394 0001		3808		LB	R9,PRIORITY(DDBADR)	
003F24	1094		3809		SRLS	R9,4	
003F26	24A1		3810		LIS	R10,1	ONE DIGIT
003F28	41C0 21B4		3811		BAL	R12,HEXASCII	
003F2C	D25B 0000		3812		STB	R5,0(R11)	FOLLOWED BY BLANK
003F30	26B1		3813		AIS	R11,1	
			3814	*			
003F32	2474		3815	DSTPRM4	LIS	R7,4	MAX DISPATCH COUNT
003F34	7474 0004		3816		TBT	R7,PARMFLGS(DDBADR)	
003F38	2339	=003F4A	3817		BZS	DSTPRM5	B IF NOT SELECTED
003F3A	5894 001C		3818		L	R9,MAXDSPCH(DDBADR)	
003F3E	24A8		3819		LIS	R10,8	EIGHT DIGITS
003F40	41C0 21B4		3820		BAL	R12,HEXASCII	
003F44	D25B 0000		3821		STB	R5,0(R11)	FOLLOWED BY BLANK
003F48	26B1		3822		AIS	R11,1	
			3823	*			
003F4A	2475		3824	DSTPRM5	LIS	R7,5	CYLINDER ADDRESS LIMITS
003F4C	7474 0004		3825		TBT	R7,PARMFLGS(DDBADR)	
003F50	4330 3F74		3826		BZ	DSTPRM6	B IF NOT SELECTED

LIST DEVICES ON DST

```
 :3F54      4894 004C        3827            LH     R9,CYLLOW(DDBADR)     LOW LIMIT
 :3F58      24A4             3828            LIS    R10,4                 FOUR DIGITS
 :3F5A      41C0 21B4        3829            BAL    R12,HEXASCII
 :3F5E      D26B 0000        3830            STB    R6,0(R11)             FOLLOWED BY HYPHEN
 :3F62      26B1             3831            AIS    R11,1
 :3F64      4894 004E        3832            LH     R9,CYLHIGH(DDBADR)    HIGH LIMIT
 :3F68      24A4             3833            LIS    R10,4                 FOUR MORE DIGITS
 :3F6A      41C0 21B4        3834            BAL    R12,HEXASCII
 :3F6E      D25B 0000        3835            STB    R5,0(R11)             FOLLOWED BY BLANK
 :3F72      26B1             3836            AIS    R11,1
                             3837     *
 :3F74      2476             3838   DSTPRM6  LIS    R7,6                  HEAD ADDRESS LIMITS
 :3F76      7474 0004        3839            TBT    R7,PARMFLGS(DDBADR)
 :3F7A      4330 3F9E        3840            BZ     DSTPRM7               B IF NOT SELECTED
 :3F7E      4894 0050        3841            LH     R9,HEADLOW(DDBADR)    LOW LIMIT
 :3F82      24A4             3842            LIS    R10,4                 FOUR DIGITS
 :3F84      41C0 21B4        3843            BAL    R12,HEXASCII
 :3F88      D26B 0000        3844            STB    R6,0(R11)             FOLLOWED BY HYPHEN
 :3F8C      26B1             3845            AIS    R11,1
 :3F8E      4894 0052        3846            LH     R9,HEADHIGH(DDBADR)   HIGH LIMIT
 :3F92      24A4             3847            LIS    R10,4                 FOUR DIGITS
 :3F94      41C0 21B4        3848            BAL    R12,HEXASCII
 :3F98      D25B 0000        3849            STB    R5,0(R11)             FOLLOWED BY BLANK
 :3F9C      26B1             3850            AIS    R11,1
                             3851     *
 :3F9E      2477             3852   DSTPRM7  LIS    R7,7                  SECTOR ADDRESS LIMITS
 :3FA0      7474 0004        3853            TBT    R7,PARMFLGS(DDBADR)
 :3FA4      4330 3FC8        3854            BZ     DSTPRM8               B IF NOT SELECTED
 :3FA8      4894 0054        3855            LH     R9,SCTRLOW(DDBADR)    LOW LIMIT
 :3FAC      24A4             3856            LIS    R10,4                 FOUR DIGITS
 :3FAE      41C0 21B4        3857            BAL    R12,HEXASCII
 :3FB2      D26B 0000        3858            STB    R6,0(R11)             FOLLOWED BY HYPHEN
 :3FB6      26B1             3859            AIS    R11,1
 :3FB8      4894 0056        3860            LH     R9,SCTRHIGH(DDBADR)   HIGH LIMIT
 :3FBC      24A4             3861            LIS    R10,4                 FOUR DIGITS
 :3FBE      41C0 21B4        3862            BAL    R12,HEXASCII
 :3FC2      D25B 0000        3863            STB    R5,0(R11)             FOLLOWED BY BLANK
 :3FC6      26B1             3864            AIS    R11,1
                             3865     *
 :3FC8      2478             3866   DSTPRM8  LIS    R7,8                  MEMORY LIMITS
 :3FCA      7474 0004        3867            TBT    R7,PARMFLGS(DDBADR)
 :3FCE      4330 3FF2        3868            BZ     DSTPRM9               B IF NOT SELECTED
 :3FD2      5894 0030        3869            L      R9,MEMLOW(DDBADR)     LOW LIMIT
 :3FD6      24A8             3870            LIS    R10,8                 EIGHT DIGITS
 :3FD8      41C0 21B4        3871            BAL    R12,HEXASCII
 :3FDC      D26B 0000        3872            STB    R6,0(R11)             FOLLOWED BY HYPHEN
 :3FE0      25B1             3873            AIS    R11,1
 :3FE2      5894 0034        3874            L      R9,MEMHIGH(DDBADR)    HIGH LIMITS
 :3FE6      24A8             3875            LIS    R10,8                 EIGHT DIGITS
 :3FE8      41C0 21B4        3876            BAL    R12,HEXASCII
 :3FEC      D25B 0000        3877            STB    R5,0(R11)             FOLLOWED BY BLANK
 :3FF0      26B1             3878            AIS    R11,1
                             3879     *
```

LIST DEVICES ON DST

```
                          3880  *
003FF2   2479            3881  DSTPRM9  LIS   R7,9                RECEIVER ADDR
003FF4   7474 0004       3882           TBT   R7,PARMFLGS(DDBADR)
003FF8   2339    =00400A 3883           BZS   DSTPRMA             NO
003FFA   4894 0038       3884           LH    R9,RDEVADR(DDBADR)  RECV ADDR
003FFE   24A3            3885           LIS   R10,3               3 BYTES
004000   41C0 21B4       3886           BAL   R12,HEXASCII
004004   D25B 0000       3887           STB   R5,0(R11)           BLANK
004008   26B1            3888           AIS   R11,1
                          3889  *
00400A   247A            3890  DSTPRMA  LIS   R7,10               FIRST DEVICE ADDR ON MAP
00400C   7474 0004       3891           TBT   R7,PARMFLGS(DDBADR)
004010   4330 8020 =004034 3892         BZ    DSTPRMG
004014   4894 0028       3893           LH    R9,MAPFDA(DDBADR)   DEVICE ADDR
004018   24A3            3894           LIS   R10,3               3 BYTES
00401A   41C0 21B4       3895           BAL   R12,HEXASCII        ASC
00401E   D25B 0000       3896           STB   R5,0(R11)
004022   26B1            3897           AIS   R11,1               BLANK
004024   4894 002A       3898           LH    R9,MAPLDA(DDBADR)   LAST DEVICE ADDR
004028   24A3            3899           LIS   R10,3               3 BYTES
00402A   41C0 21B4       3900           BAL   R12,HEXASCII        ASC
00402E   D25B 0000       3901           STB   R5,0(R11)
004032   26B1            3902           AIS   R11,1               BLANK
                          3903  *
         0000 4034       3904  DSTPRMG  EQU   *                   REMAINING FLAGS NOT ASSIGNED
004034   C880 0A0D       3905           LHI   R8,X'0A0D'          CARRIAGE RETURN, LINE FEED
004038   D28B 0000       3905           STB   R8,0(R11)           CR INTO BUFFER
00403C   9489            3907           EXBR  R8,R9
00403E   D28B 0001       3908           STB   R8,1(R11)           LF INTO BUFFER
004042   E6EB 0001       3909           LA    R14,1(R11)          LAST BYTE
004046   E6D0 312C       3910           LA    R13,OUTBUF
00404A   41F0 232E       3911           BAL   R15,CONPRINT        PRINT
00404E   4300 3E40       3912           B     DSTCMND1            LOOP FOR ALL DEVICES
```

DISPLAY MAM DCB

```
                                          3914  *
                                          3915  *MDCBCMND -- LIST CURRENTLY ASSIGNED MAM DCB ADDRESSES AND CONTENTS
                                          3916  *
                                          3917  *
                                          3918  *     COMMAND "MDCB"
                                          3919  *     DISPALY FORMAT:
                                          3920  *
                                          3921  *     MDCB ADDR
                                          3922  *     (DCB0) (DCB2) (DCB4) (DCB6) (DCB8) (DCBA) (DCBC) (DCBE)
                                          3923  *
                                          3924  *     DISPLAY EXAMPLE:
                                          3925  *
                                          3926  *     380
                                          3927  *     0000  FF00  5B67  FF78  9180  FF00  5B67  FF81
                                          3928  *
                                          3929  *
004052                                    3930  MDCBCMND IFP    MAM
004052      4820 34B2                      3931           LH     R2,MAMADR         MAM ADR
004056      4330 8078 =0040D2             3932           BZ     MDCBZ             NO MAM, THEN EXIT
00405A      DE20 3455                     3933           OC     R2,MAMKILL        MAM KILL AND PIQ READ MODE
00405E      2470                          3934           LIS    R7,0              START WITH ADDR 0
004060      9827                          3935           WHR    R2,R7             ADDR MAM DCB
004062      2460                          3936  MDCB1    LIS    R6,0              CLEAR COUNTER
004064      9925                          3937  MDCB2    RHR    R2,R5             READ CONTENTS OF MDCB
004066      4056 806A =0040D4             3938           STH    R5,MDCBSAVE(R6)   SAVE CONTENTS
00406A      2662                          3939           AIS    R6,2              INCREMENT BY 2
00406C      C560 0010                     3940           CLHI   R6,16             EIGHT LOCATIONS
004070      2086      =004064             3941           BLS    MDCB2             TO BE READ
004072      4850 8066 =0040DC             3942           LH     R5,MDCBSAVE+8     GET THIS DCW CONTENTS
004076      4330 8048 =0040C2             3943           BZ     MDCB4             IF ZERO IDLE MDCB
                                          3944  *
00407A      E6B0 312C                     3945           LA     R11,OUTBUF        IF ACTIVE MDCB DISPLAY ITS CONTENTS
00407E      0897                          3946           LR     R9,R7             MDCB ADDR
004080      24A4                          3947           LIS    R10,4             4 CHAR
004082      41C0 21B4                     3948           BAL    R12,HEXASCII      FORM MESSAGE
004086      C850 0A0D                     3949           LHI    R5,X'0A0D'        CARR RETURN L.F.
00408A      405B 0000                     3950           STH    R5,0(R11)         ADD TO MESSAGE
00408E      26B2                          3951           AIS    R11,2             2 MORE CHAR
004090      2460                          3952           LIS    R6,0              CLEAR INDEX
004092      4896 803E =0040D4             3953  MDCB3    LH     R9,MDCBSAVE(R6)   GET DATA TO BE DISPLAYED
004096      24A4                          3954           LIS    R10,4             4 CHAR
004098      41C0 21B4                     3955           BAL    R12,HEXASCII      FORM MESSAGE
00409C      2662                          3956           AIS    R6,2              INCREMENT INDEX BY 2
00409E      C850 2020                     3957           LHI    R5,X'2020'        DOUBLE SPACE
0040A2      405B 0000                     3958           STH    R5,0(R11)         ADD TO MESSAGE
0040A6      26B2                          3959           AIS    R11,2             ADD THESE 2 CHAR
0040A8      C560 0010                     3960           CLHI   R6,16             MAXIMUM OF EIGHT
0040AC      208D      =004092             3961           BLS    MDCB3             IF NOT, NEXT CONTENTS
0040AE      C850 0A0D                     3962           LHI    R5,X'0A0D'        CARR RETURN & L.F.
0040B2      405B 0000                     3963           STH    R5,0(R11)         END OF MESSAGE
0040B6      E6EB 0001                     3964           LA     R14,1(R11)        LAST ADDR OF MESSAGE
0040BA      E6D0 312C                     3965           LA     R13,OUTBUF        FIRST ADDR
0040BE      41F0 232E                     3966           BAL    R15,CONPRINT      DISPLAY MESSAGE
```

DISPLAY MAM DCB

0040C2	CA70 0010		3967	MDCB4	AHI R7,16	NEXT MDCB ADDRESS
0040C6	C570 0400		3968		CLHI R7,X'400'	MAX ADDRESS X'400'
0040CA	4280 FF94	=0040C62	3969		BL MDCB1	IF NOT AT MAX READ NEXT MDCB
0040CE	DE20 3455		3970		OC R2,MAMKILL	RESTORE MODE OF MAM
0040D2	0300		3971	MDCBZ	BR R0	RETURN
			3972	*		
0040D4			3973		ALIGN 2	
C040D4			3974	MDCBSAVE	DS 16	TEMPORARY SAVE LOCATION OF MDCB
			3975		ENDC	
0040E4	0300		3976		BR R0	RETURN OF NO MAM

```
                                          3978  *
                                          3979  *MPIQCMND -- DISPLAYS THE LAST 48 PIQ ENTRIES OF THE MAM OR EMAM
                                          3980  *
                                          3981  *    COMMAND "MPIQ"
                                          3982  *
                                          3983  *
                                          3984  *
                   0000 40E6              3985  MPIQCMND EQU   *
0040E6                                    3986          IFP   MAM
0040E6             4820 3EB2              3987          LH    R2,MAMADR           MAM ADDR
0040EA             4330 8060  =00414E     3988          BZ    MPIQZ               EXIT IF NO MAM PRESENT
0040EE             DE20 3455              3989          OC    R2,MAMKILL          MAM KILL AND PIQ READ MODE
0040F2             2460                   3990          LIS   R6,0                CLEAR COUNTER
0040F4             6790 9354  =00544C     3991  MPIQ3   RBL   R9,MAMPIQES         GET FIRST PIQ ENTRY FROM THE LIST
0040F8             4240 8030  =00412C     3992          BTC   4,MPIQ6             END OF LIST
0040FC             2661                   3993          AIS   R6,1                INCREMENT COUNTER
0040FE             E6B0 312C              3994          LA    R11,OUTBUF          OUTPUT BUFFER ADDR
004102             24A4                   3995          LIS   R10,4               4 CHARACTERS
004104             41C0 21B4              3996          BAL   R12,HEXASCII        FORM MESSAGE
004108             C360 0007              3997          THI   R6,7                EIGHT ENTRIES
00410C             2334        =004114    3998          BZS   MPIQ4               NO
00410E             C850 2020              3999          LHI   R5,X'2020'          THEN DOUBLE SPACE
004112             2303        =004118    4000          BS    MPIQ5               BETWEEN ENTRIES
004114             C850 0A0D              4001  MPIQ4   LHI   R5,X'0A0D'          CARR RETURN & L.F. AT END
004118             405B 0000              4002  MPIQ5   STH   R5,0(R11)           STORE SPECIAL CHAR AT END
00411C             E6EB 0001              4003          LA    R14,1(R11)          LAST ADDR OF MESSAGE
004120             E6D0 312C              4004          LA    R13,OUTBUF          FIRST ADDR
004124             41F0 232E              4005          BAL   R15,CONPRINT        DISPLAY MESSAGE
004128             4300 FFC8  =0040F4     4006          B     MPIQ3               NEXT ENTRY TO BE DISPLAYED
                                          4007  *
00412C             DE20 3455              4008  MPIQ6   OC    R2,MAMKILL          RESTORE MAM MODE
004130             C360 0007              4009          THI   R6,7                TEST FOR MULTIPE OF 8 ENTRIES
004134             233D        =00414E    4010          BZS   MPIQZ               IF MULTIPLE OF 8, EXIT
004136             E6B0 312C              4011          LA    R11,OUTBUF          ELSE ADD
00413A             C850 0A0D              4012          LHI   R5,X'0A0D'          A CARR. RETURN & L.F. TO END
00413E             405B 0000              4013          STH   R5,0(R11)           OF MESSAGE
004142             E6D0 312C              4014          LA    R13,OUTBUF
004146             E6EB 0001              4015          LA    R14,1(R11)
00414A             41F0 232E              4016          BAL   R15,CONPRINT        DISPLAY IT
                                          4017  *
00414E             0300                   4018  MPIQZ   BR    R0                  RETURN
                                          4019          ENDC
004150             0300                   4020          BR    R0                  RETURN IF NO MAM
                                          4021  *
                                          4022  *LLBCMND -- ENTER LOCAL LOOP BACK OPTION COMMAND FOR THE QSA
                                          4023  *           DEVICES (BISYNC OR ZBID).
                                          4024  *
                                          4025  *           0  NO LOCAL LOOP BACK
                                          4026  *           1  LOCAL LOOP BACK
                                          4027  *
                                          4028  *    COMMAND  "LLB"
                                          4029  *
                                          4030  *
```

DISPALAY MAM PIQ ENTRIES

```
004152      4190 13F6           4031  LLBCMND  BAL   R9,NEXTPARM        PARAMETER VALUE IN HEX
004156      C4D0 0001           4032           NHI   R13,1              0 OR 1 ALLOWED
00415A      40D0 34DC           4033           STH   R13,LLBACK         SAVE FOR FUTURE USE
00415E      4300 8094 =0041F6   4034           B     COMCMND            SEND MESSAGE
                                4035  *
                                4036  *CCNTCMND -- COMMAND THAT SPECIFIES THE NUMBER OF TIMES BUFFERS
                                4037  *         ARE LINKED TO FORM A MESSAGE FOR THE QSA, DSA OR
                                4038  *         PASLA (BISYNC MODE) OR SPECIFIES THE NUMBER OF TIMES
                                4039  *         THE TRANSMISSION SEQUENCE IS REPEATED FOR THE QSA
                                4040  *         (ZBID).
                                4041  *
                                4042  *         COMMAND "CCNT"
                                4043  *
                                4044  *
                                4045  *
004162      4190 13F6           4046  CCNTCMND BAL   R9,NEXTPARM        PARAMETER VALUE IN HEX
004166      C4D0 7FFE           4047           NHI   R13,X'7FFE'        EVEN COUNT
00416A      2133      =00417C   4048           BNZS  CCNT1
00416C      C8D0 7FFE           4049           LHI   R13,X'7FFE'        LARGE VALUE IF ZERO IS SPECIFIED
004170      40D0 34DE           4050  CCNT1    STH   R13,CCNT           SAVE FOR FUTURE USE
004174      E6B0 312C           4051           LA    R11,OUTBUF         MESSAGE BUFFER
004178      50AB 0000           4052           ST    R10,0(R11)         COMMAND MNEMONIC
00417C      C850 0020           4053           LHI   R5,X'20'           AND
004180      D25B 0004           4054           STB   R5,4(R11)          BLANK
004184      26B5                4055           AIS   R11,5              INCREMENT BUFFER
004186      24A4                4056           LIS   R10,4              SIX BYTES OF DATA
004188      4300 8132 =0042EE   4057           B     CMNDZ              PRINT COMMAND & VALUE
                                4058  *
                                4059  *
                                4060  *MSIZCMND -- SPECIFIES THE SIZE OF A BUFFER.
                                4061  *
                                4062  *         COMMAND "BYTE"
                                4063  *
                                4064  *
00418C      4190 13F6           4065  MSIZCMND BAL   R9,NEXTPARM        PARAMETER VALUE IN HEX
004190      F4D0 0000 FFFC      4066           NI    R13,Y'FFFC'        FULL WORD BOUNDARY
004196      5850 34D0           4067           L     R5,MSTART          NEXT AVAILABLE MEMORY
00419A      086D                4068           LR    R6,R13             SAVE PARAMETER
00419C      1161                4069           SLLS  R6,1               DOUBLE IT
00419E      0A65                4070           AR    R6,R5              END ADDRESS OF BUFFER
0041A0      5560 25BE           4071           CL    R6,MEMTOP          IF IT EXCEEDS TOP OF MEMORY
0041A4      4380 8142 =0042FA   4072           BNL   MSTRX              ERROR
0041A8      F550 0000 958C      4073           CLI   R5,EXEREND         OR WRAPS AROUND
0041AE      4280 8138 =0042FA   4074           BL    MSTRX              ERROR
0041B2      105E                4075           SRLS  R5,14              BLOCK NUMBER OF START ADDRESS
0041B4      106E                4076           SRLS  R6,14              BLOCK NUMBER OF END ADDRESS
0041B6      2661                4077           AIS   R6,1               INCREMENT BLOCK
0041B8      7450 2530           4078  MSIZ0    TBT   R5,MEMRYMAP        TEST MEMORY MAP
0041BC      4330 8138 =0042F8   4079           BZ    MSTRXX             CONTIGUOUS MEMORY DOES NOT EXIST
0041C0      2651                4080           AIS   R5,1               NEXT BLOCK
0041C2      0956                4081           CR    R5,R6              TEST NEXT BLOCK
0041C4      2086      =0041B8   4082           BLS   MSIZ0              YES
0041C6      08DD                4083           LR    R13,R13            TEST VALUE
```

DISPALAY MAM PIQ ENTRIES

```
0041C8      2133       =0041CE      4084            BNZS   MSIZ1
0041CA      3530 0400                4085            LHI    R13,Y'400'        DEFAULT VALUE
0041CE      5030 34D4                4086   MSIZ1    ST     R13,BUFSIZE       NEXT MEMORY SPACE AVAILBLE
0041D2      E630 312C                4087            LA     R11,OUTBUF        MESSAGE BUFFER
0041D6      50AB 0000                4088            ST     R10,0(R11)        COMMAND MNEMONIC
0041DA      C850 0020                4089            LHI    R5,X'20'          AND
0041DE      D25B 0004                4090            STB    R5,4(R11)         BLANK
0041E2      2585                     4091            AIS    R11,5             INDEX BUFFER BY 5
0041E4      24A6                     4092            LIS    R10,6             SIX BYTES OF DATA
0041E6      4300 80D4  =0042BE       4093            B      CMNDZ             PRINT COMMAND & VALUE
                                     4094   *
                                     4095   *MBUFCMND -- COMMNADS THE BUFFERS ALLOCATED FOR DEVICE USE TO BE
                                     4096   *             MOVED THROUGHOUT MEMORY STARTING AT "MSTART".
                                     4097   *
                                     4098   *            0  BUFFERS ARE NOT MOVED
                                     4099   *            1  BUFFERS ARE MOVED
                                     4100   *
                                     4101   *            COMMAND "MBUF"
                                     4102   *
                                     4103   *
0041EA      4190 13F6                4104   MBUFCMND BAL    R9,NEXTPARM       PARAMETER VALUE IN HEX
0041EE      C4D0 0001                4105            NHI    R13,1             0 OR 1 ALLOWED
0041F2      40D0 34D8                4106            STH    R13,MBUF          SAVE FOR FUTURE USE
0041F6      E630 312C                4107   COMCMND  LA     R11,OUTBUF        MESSAGE BUFFER
0041FA      50AB 0000                4108            ST     R10,0(R11)        COMMAND MNEMONIC
0041FE      C850 0020                4109            LHI    R5,X'20'          AND
004202      D25B 0004                4110            STB    R5,4(R11)         BLANK
004206      2585                     4111            AIS    R11,5             INDEX BUFFER BY 5
004208      24A1                     4112            LIS    R10,1             ONE BYTE OF DATA
00420A      4300 80B0  =0042BE       4113            B      CMNDZ             PRINT COMMAND & VALUE
                                     4114   *
                                     4115   *FSTCCMND -- SPECIFIES THAT THE BUFFERS OF COMMUNCIATION
                                     4116   *             ARE TO BE TESTED FOR PROPER CONTENT AND CLEARED.
                                     4117   *             IF THESE DEVICES OPERATE AT A FAST THROUGH PUT,
                                     4118   *             TESTING BUFFERS MAY CAUSE EXCESSIVE DELAYS IN
                                     4119   *             SERVICING THESE DEVICES CREATING AN IMPROPER
                                     4120   *             REASON CODE ON THE MAM (EMAM).
                                     4121   *
                                     4122   *            0  THE BUFFERS ARE TESTED AND CLEAR AFTER
                                     4123   *               INTERRUPT.
                                     4124   *
                                     4125   *            1  BUFFERS ARE NOT TESTED TO ALLOW FASTER
                                     4126   *               RESPONSE TIME TO SERVICE OTHER COMMUNICATION
                                     4127   *               DEVICES.
                                     4128   *
00420E      4190 13F6                4129   FSTCCMND BAL    R9,NEXTPARM       PARAMETER VALUE IN HEX
004212      C4D0 0001                4130            NHI    R13,1             0 OR 1 ALLOWED
004216      40D0 34E0                4131            STH    R13,FSTC          SET FLAG VALUE
00421A      4300 FFD8  =0041F6       4132            B      COMCMND           SEND MESSAGE
                                     4133   *
                                     4134   *FSTSCMND -- SPECIFIES THAT THE BUFFERS OF DEVICES USING THE
                                     4135   *             SELCH OR THE CASSETTE ARE NOT TESTED FOR CORRECT
                                     4136   *             DATA AFTER TRANSFER  MOREOVER, NO KNOW DATA IS
```

```
                                    4137  *               INSERT IN THE WRITE BUFFER NOR ARE THE BUFFERS
                                    4138  *               CLEARED AFTER TRANSFER.
                                    4139  *               THIS OPTION IS USED ONLY TO GENERATE MAXIMUM
                                    4140  *               DMA ACTIVITY IN THE SYSTEM.
                                    4141  *               USE IT WISELY! THIS OPTION DOES NOT CHECK FOR
                                    4142  *               CORRECT DATA TRANSFER.
                                    4143  *               THIS OPTION IS INVOKED PRIMARILY WHEN THE
                                    4144  *               BUFFER SIZE IS LARGE "BYTE".
                                    4145  *
                                    4146  *               0   CONTENTS OF THE BUFFERS ARE TESTED.
                                    4147  *
                                    4148  *               1   CONTENTS OF THE BUFFERS ARE NOT TESTED.
                                    4149  *
00421E      4190 13F6              4150  FSTSCMND BAL   R9,NEXTPARM        PARAMETER VALUE IN HEX
004222      C4D0 0001              4151           NHI   R13,1              0 OR 1 ALLOWED
004226      40D0 34E2              4152           STH   R13,FSTS           SET FLAG VALUE
00422A      4300 FFC8 =0041F6      4153           B     COMCMND            SEND MESSAGE
                                    4154  *
                                    4155  *MSTRCMMND -- SPECIFIES THE STARTING ADDRESS OF MEMORY WHERE THE
                                    4156  *             DEVICE BUFFERS ARE TO BE ALLOCATED.
                                    4157  *
                                    4158  *             MSTR > OR = EXEREND
                                    4159  *             MSTR < TOP OF MEMORY - 2 X MSIZ
                                    4160  *
                                    4161  *             COMMAND "MSTR"
                                    4162  *
00422E      4190 13F6              4163  MSTRCMND BAL   R9,NEXTPARM
004232      F4D0 00FF FFFC         4164           NI    R13,Y'FFFFFC'      HALF WORD BOUNDARY
004238      4330 805A =004296      4165           BZ    MSTR1              IF ZERO USE EXEREND ADDRESS
00423C      F5D0 0000 9580         4166           CLI   R13,EXEREND        IF LESS THAN EXEREND
004242      4280 80A4 =0042EA      4167           BL    MSTRX              ERROR
004246      085D                   4168           LR    R5,R13             SAVE PARAMETER
004248      5860 34D4              4169           L     R6,BUFSIZE         BUFFER SIZE
00424C      1161                   4170           SLLS  R6,1               MULTIPLY BY 2
00424E      0A65                   4171           AR    R6,R5              MEMORY SPACE REQUIRED BY ONE DEVICE
004250      5560 25B8              4172           CL    R6,MEMTOP          IF > THAN TOP OF MEMORY
004254      4380 8088 =0042E0      4173           BNL   MSTRX1             ERROR
004258      F550 0000 9580         4174           CLI   R5,EXEREND         OR WRAPS AROUND
00425E      4280 807E =0042E0      4175           BL    MSTRX1             ERROR
004262      105E                   4176           SRLS  R5,14              BLOCK OF START ADDRESS
004264      106E                   4177           SRLS  R6,14              BLOCK OF END ADDRESS
004266      2661                   4178           AIS   R6,1               INCREMENT BLOCK
004268      7450 2530              4179  MSTR0    TBT   R5,MEMRYMAP        TEST MEMORY MAP
00426C      4330 8088 =0042F8      4180           BZ    MSTRXX             CONTIGUOUS MEMORY DOES NOT EXIST
004270      2651                   4181           AIS   R5,1              ·NEXT BLOCK
004272      0956                   4182           CR    R5,R6              TEST NEXT BLOCK
004274      2086                   4183           BLS   MSTR0              YES
004276      50D0 85A2 =00481C      4184           ST    R13,BUFNEXT        NEXT AVAILABLE SPACE
00427A      50D0 34D0              4185           ST    R13,MSTART         ALSO MEMORY START
00427E      E6B0 312C              4186           LA    R11,OUTBUF         MESSAGE BUFFER
004282      50AB 0000              4187           ST    R10,0(R11)         COMMAND MNEMONOC
004286      C850 0020              4188           LHI   R5,X'20'           AND
00428A      D25B 0004              4189           STB   R5,4(R11)          BLANK
```

DISPALAY WAM PIQ ENTRIES

```
00428E     2635                 4190           AIS    R11,5              INDEX BUFFER BY 5
004290     2AA6                 4191           LIS    R10,6              SIX   BYTES OF DATA
004292     4300 9028  =0042BE   4192           B      CMNDZ              PRINT MESSAGE
                                4193   *
004296     F800 0000 9580       4194   MSTR1   LI     R13,EXEREND        DEFAULT ADDRESS "EXEREND"
00429C     50D0 34D0            4195           ST     R13,MSTART         USE AS START ADDRESS
0042A0     0300                 4196           BR     R0                 RETURN
                                4197   *
                                4198   *IMGCMD -- SPECIFIES THE DATA THAT IS USED TO GENERATE THE READ
                                4199   *           BUFFER.
                                4200   *           SPECIFIES A HALWORD OF DATA.
                                4201   *
                                4202   *
                                4203   *           DEFAULT VALUE IS "00 01 02 ..... FE FF 00...."
                                4204   *
                                4205   *           COMMAND "IMG"
                                4206   *
0042A2     4190 13F6            4207   IMGCMND BAL    R9,NEXTPARM        PARAMETER VALUE IN HEX
0042A6     40D0 34DA            4208           STH    R13,IMAGE          SAVE IMAGE
0042AA     E6B0 312C            4209           LA     R11,OUTBUF         MESSAGE BUFFER
0042AE     50AB 0000            4210           ST     R10,0(R11)         COMMAND MNEMONIC
0042B2     C850 0020            4211           LHI    R5,X'20'           AND
0042B6     D25B 0005            4212           STB    R5,5(R11)          BLANK
0042BA     2635                 4213           AIS    R11,5              INDEX BUFFER BY 5
0042BC     2AA4                 4214           LIS    R10,4              FOUR BYTES OF DATA
                                4215   *
                                4216   *CMNDZ -- PRINTS COMMAND MNEMONIC AND PARAMETER VALUE
                                4217   *
                                4218   *
0042BE     089D                 4219   CMNDZ   LR     R9,R13             PARAMETER VALUE IN HEX
0042C0     41C0 21B4            4220           BAL    R12,HEXASCII       CONVERT TO ASCII
0042C4     C880 0A0D            4221           LHI    R8,X'0A0D'         CR AND LF
0042C8     D28B 0000            4222           STB    R8,0(R11)          STORE BYTE IN MESS. BUFFER
0042CC     9488                 4223           EXBR   R8,R8              AND
0042CE     D28B 0001            4224           STB    R8,1(R11)          THIS BYTE
0042D2     E6EB 0001            4225           LA     R14,1(R11)         START ADDRESS OF MESSAGE
0042D6     E6D0 312C            4226           LA     R13,OUTBUF         END ADDRESS
0042DA     41F0 232E            4227           BAL    R15,CONPRINT       PRINT THIS MESSAGE
0042DE     0300                 4228           BR     R0                 RETURN TO CMND PROCESS
                                4229   *
                                4230   *MSTRX -- PRINTS MEMORY ALLOCATION ERROR
                                4231   *
0042E0     F800 0000 9580       4232   MSTRX1  LI     R13,EXEREND        CLEAR MEMORY START ADDRESS
0042E6     50D0 34D0            4233           ST     R13,MSTART         TO DEFAULT VALUE
0042EA     E6D0 33B6            4234   MSTRX   LA     R13,ERRJMESS       "MEMORY ALLOCATION ERROR"
0042EE     E6E0 33CF            4235           LA     R14,ERRJMESE       END ADDRESS
0042F2     41F0 232E            4236           BAL    R15,CONPRINT       PRINT MESSAGE
0042F6     0300                 4237           BR     R0                 RETURN TO CMND PROCESS
                                4238   *
0042F8     E6D0 33D0            4239   MSTRXX  LA     R13,ERRKMESS       BUFFER AREA IS NOT AVAILABLE
0042FC     E6E0 33EF            4240           LA     R14,ERRKMESE       END ADDRESS OF MESSAGE
004300     41F0 232E            4241           BAL    R15,CONPRINT       PRINT MESSAGE
004304     0300                 4242           BR     R0                 RETURN TO CMND PROCESS
```

DISPLAY OPTIONS COMMAND

```
                                    4244   *   OPT COMMAND ROUTINE                                        *
                                    4245   *                                                             *
                                    4246   *       PRINT CURRENT OPERATING OPTIONS                       *
                                    4247   *                                                             *
004306      E6D0 317C               4248   OPTCMND  LA    R13,OPTBUF        START OF OPTIONS BUFFER
00430A      E6E0 3185               4249            LA    R14,OPTBUF1+1     END OF OPTION MESSAGE
00430E      41F0 232E               4250            BAL   R15,CONPRINT      PRINT "OPTIONS:"
004312      2440                     4251            LIS   R4,0             CLEAR INDICES
004314      2450                     4252            LIS   R5,0
004316      E6D0 3188               4253            LA    R13,OPTBUF2       START ADDRESS OF TEXT
00431A      E6E0 3195               4254            LA    R14,IDMESS+1      END ADDRESS OF TEXT
00431E      08BD                     4255   OPTC1    LR    R11,R13          INITIALIZE START ADDRESS
004320      5884 354C               4256            L     R8,OPTNLST(R4)   OPTION NAME
004324      50B3 0000               4257            ST    R8,0(R11)        STORE IT IN THE OPTION BUFFER
004328      26B6                     4258            AIS   R11,6            MOVE OPTION BUFFER
00432A      C540 0010               4259            CLFI  R4,16            FIRST TWO OPTIONS DISPLAYED ?
00432E      2384      =004336        4260            BNLS  OPTC2            YES
004330      5895 34D0               4261            L     R9,MSTART(R5)    ELSE USE FULL WORD
004334      2303      =00433A        4262            BS    OPTC3            CONTINUE
004336      7395 34D0               4263   OPTC2    LHL   R9,MSTART(R5)    USE HALF WORD
00433A      24A6                     4264   OPTC3    LIS   R10,6            SIX CHARACTERS
00433C      41C0 21B4               4265            BAL   R12,HEXASCII      CONVERT TO ASCII
                                    4266   *
004340      E6C0 318E               4267            LA    R12,OPTBUF3      START ADDRESS OF PARAMETERS
004344      D3AC 0000               4268   OPTC4    LB    R10,0(R12)       GET CHARACTER
004348      C5A0 0030               4269            CLHI  R10,C'0'         LEADING CHAR IS "0" ?
00434C      2139      =00435E        4270            BNES  OPTC5            NO, FINISHED
00434E      C8A0 2020               4271            LHI   R10,C' '         SPACE
004352      D2AC 0000               4272            STB   R10,0(R12)       INSERT SPACE
004356      26C1                     4273            AIS   R12,1            INCREMENT
004358      C5C0 3193               4274            CLFI  R12,IDMESS-1     LAST CHARACTER ?
00435C      208C      =004344        4275            BLS   OPTC4            NO, SEARCH FOR MORE LEADING CHARACTER
00435E      41F0 232E               4276   OPTC5    BAL   R15,CONPRINT      PRINT OPTION NAME AND VALUE
                                    4277   *
004362      C540 0048               4278            CLHI  R4,72            LIMIT OF OPTION NAME
004366      233A      =00437A        4279            BES   OPTC9            FINISHED MAC OPTION
004368      238C      =004380        4280            BNLS  OPTC10           CONTINUE FOR SWITCH OPTION
00436A      2648                     4281            AIS   R4,8             INCREMENT OPTION NAME LIST
00436C      C540 0018               4282            CLHI  R4,24            FINISHED WITH OPTION 1 & 2 ?
004370      2382      =004374        4283            BNLS  OPTC7            YES
004372      2652                     4284            AIS   R5,2             INCREMENT VALUE LIST BY 4
004374      2652                     4285   OPTC7    AIS   R5,2             INCREMENT VALUE LIST BY 2
004376      4300 FFA4 =00431F        4286   OPTC8    B     OPTC1            NEXT OPTION
                                    4287   *
00437A      2470                     4288   OPTC9    LIS   R7,0             SWITCH OPTION BIT
00437C      2652                     4289            AIS   R5,2             INCREMENT INDEX
00437E      2302      =004382        4290            BS    OPTC11           TEST SWITCH SETTING
004380      2671                     4291   OPTC10   AIS   R7,1             NEXT SWITCH SETTING
004382      24A0                     4292   OPTC11   LIS   R10,0
004384      7470 263E               4293            TBT   R7,SWITCHES      TEST SWITCH BIT
004388      2332      =00438C        4294            BZS   OPTC12           SWITCH NOT SELECTED ?
00438A      24A1                     4295            LIS   R10,1            SWITCH SELECTED
00438C      40A0 34E8               4296   OPTC12   STH   R10,SWSAVE       SET VALUE OF THIS OPTION
```

DISPLAY OPTIONS COMMAND

```
004390      2648                    4297        AIS   R4,8        INCREMENT OPTION NAME LIST
004392      2540 0078               4298        CLHI  R4,120      END OF LIST
004396      4280 FF84 =00431E       4299        BL    OPTC1       NO, PRINT THIS OPTION
00439A      0300                    4300        BR    R0          ELSE EXIT
                                    4301  *
                                    4302        ENDC
```

PROGRAM CONTROL SWITCH ROUTINES

```
                                    4304   *   IF COMMAND IS FOLLOWED BY %, SWITCH IS TURNED OFF, OTHERWISE    *
                                    4305   * SWITCH IS TURNED ON.                                             *
                                    4306   *                                                                  *
                                    4307   *PARAMETER:                                                        *
                                    4308   *   R11 - ADDRESS OF DELIMITER FOLLOWING COMMAND, OR PERCENT       *
                                    4309   *                                                                  *
                                    4310   *CALLING SEQUENCE:                                                 *
                                    4311   *         BAL   R0,ROUTINE                                         *
                                    4312   *                                                                  *


                                    4314   *   HALT ON ERROR SWITCH
                                    4315   *
00439C      2480                    4316   HLTCMND  LIS   R8,HLTSWTCH       SWITCH BIT
00439E      2308        =0043AE     4317            BS    SWITCOMN          COMMON SWITCH HANDLING


                                    4319   *   LOG ERRORS SWITCH
                                    4320   *
0043A0      2481                    4321   LOGCMND  LIS   R8,LOGSWTCH       WHICH SWITCH BIT
0043A2      2306        =0043AE     4322            BS    SWITCOMN


                                    4324   *   FLOATING POINT TESTING
                                    4325   *
0043A4      2482                    4326   FLTCMND  LIS   R8,FLTSWTCH       WHICH SWITCH BIT
0043A6      2304        =0043AE     4327            BS    SWITCOMN
                                    4328   *
                                    4329   *   DOUBLE PRECISION FLOATING POINT
                                    4330   *
0043A8      2484                    4331   DFTCMND  LIS   R8,DFTSWTCH
0043AA      2302        =0043AE     4332            BS    SWITCOMN


                                    4334   *   BACKGROUND TESTING
                                    4335   *
0043AC      2483                    4336   BACKCMND LIS   R8,BCKSWTCH       WHICH SWITCH BIT


0043AE      C870 0025               4338   SWITCOMN LHI   R7,X'25'          PERCENT
0043B2      D47B 0000               4339            CLB   R7,0(R11)         TURN OFF?
0043B6      2334        =0043BF     4340            BES   SWITCOM1          B IF YES
0043B8      7580 263E               4341            SBT   R8,SWITCHES       TURN ON
0043BC      0300                    4342            BR    R0                RETURN
0043BE      7680 263E               4343   SWITCOM1 RBT   R8,SWITCHES       TURN OFF
0043C2      0300                    4344            BR    R0                RETURN
```

PROGRAM CONTROL SWITCH ROUTINES

```
                                   4346  *  PRINT MEMORY MAP                                        *
                                   4347  *                                                          *
                                   4348  *  EACH BIT REPRESENTS 16K BYTES
                                   4349  *                                                          *
0043C4      24D0                   4350  MAPCMND  LIS   R13,0                 R13 IS INDEX
0043C6      E6B0 312C              4351  MAPCMND0 LA    R11,OUTBUF
0043CA      589D 2530              4352  MAPCMND1 L     R9,MEMRYMAP(R13)      FIRST FOUR BYTES OF MAP
0043CE      24A8                   4353           LIS   R10,8                 EIGHT HEX DIGITS
0043D0      41C0 21B4              4354           BAL   R12,HEXASCII          CONVERT AND INTO BUFFER
0043D4      C880 0020              4355           LHI   R8,X'20'
0043D8      D28B 0000              4356           STB   R8,0(R11)             LEAVE A BLANK
0043DC      26B1                   4357           AIS   R11,1
0043DE      26D4                   4358           AIS   R13,4
0043E0      C3D0 001F              4359           THI   R13,X'1F'             8 FULLWORDS PER LINE
*0043E4     203D       =0043CA     4360           BNZ   MAPCMND1
0043E6      C880 0A0D              4361           LHI   R8,X'0A0D'            CARRIAGE RETURN, LINE FEED
0043EA      D28B 0000              4362           STB   R8,0(R11)
0043EE      9488                   4363           EXBR  R8,R8
0043F0      D28B 0001              4364           STB   R8,1(R11)
0043F4      089D                   4365           LR    R9,R13
0043F6      E6D0 312C              4366           LA    R13,OUTBUF
0043FA      E6EB 0001              4367           LA    R14,1(R11)            LAST BYTE OF DATA
0043FE      41F0 232E              4368           BAL   R15,CONPRINT          PRINT MAP
004402      08D9                   4369           LR    R13,R9                RESTORE R13
004404      C5D0 0080              4370           CLHI  R13,32*4              TOTAL 32 FULLWORDS
004408      4280 FFBA  =0043C6     4371           BL    MAPCMND0
00440C      0300                   4372           BR    R0                    RETURN


                                   4374  *  MAC COMMAND ROUTINE.                                    *
                                   4375  *                                                          *
                                   4376  *    A '%' WILL DELETE MAC TESTING, OTHERWISE EXPECTS ONE PARAMETER   *
                                   4377  *  WHICH IS THE ADDRESS OF THE MAC.  IF NO ADDRESS IS GIVEN, THE      *
                                   4378  *  DEFAULT ADDRESS IS X'300'.                              *
                                   4379  *                                                          *
00440E      C870 0025              4380  MACCMND  LHI   R7,X'25'              PERCENT
004412      D47B 0000              4381           CLB   R7,0(R11)             TURN OFF?
004416      2135       =004420     4382           BNES  MACCMND1              B IF NO
004418      2460                   4383           LIS   R6,0
00441A      4060 34F4              4384           STH   R6,MACADR             CLEAR ADDRESS, FLAG
00441E      0300                   4385           BR    R0                    RETURN
                                   4386  *
004420      4190 13F6              4387  MACCMND1 BAL   R9,NEXTPARM           CONVERT MAC ADDRESS PARM
004424      08DD                   4388           LR    R13,R13               WAS ADDRESS GIVEN?
004426      2133       =00442C     4389           BNZS  MACCMND2              B IF YES
004428      C8D0 0300              4390  MACCMND3 LHI   R13,X'300'            LOAD DEFAULT ADDRESS
00442C      C5D0 0300              4391  MACCMND2 CLHI  R13,X'300'            LEGAL??
004430      2337       =00443E     4392           BES   MACCMND4             YES, STORE
004432      C5D0 0500              4393           CLHI  R13,X'500'            LEGAL??
004436      2334       =00443E     4394           BES   MACCMND4             YES, STORE
004438      C5D0 0900              4395           CLHI  R13,X'900'            LEGAL??
00443C      203A       =004428     4396           BNES  MACCMND3             USE DEFAULT
```

PROGRAM CONTROL SWITCH ROUTINES

```
00443E        40D0 34E4            4397  MACCMND4 STH    R13,MACADR          SET FLAG
004442        4850 34E6            4398           LH     R6,MATFLAG
004446        0330                 4399           BZR    R0
004448        2460                 4400           LIS    R6,0
00444A        4060 34E6            4401           STH    R6,MATFLAG
00444E        E6D0 3412            4402           LA     R13,ERRMMESS
004452        E6E0 3431            4403           LA     R14,ERRMMESE
004456        41F0 232E            4404           BAL    R15,CONPRINT
00445A        0300                 4405           BR     R0                  RETURN


00445C        C870 0025            4407  MATCMND  LHI    R7,C'X'
004460        D47B 0000            4408           CLB    R7,0(R11)
004464        2135      =00446F    4409           BNES   MATCMND1
004466        2460                 4410           LIS    R6,0
004468        4060 34E6            4411           STH    R6,MATFLAG
00446C        0300                 4412           BR     R0
00446E        4860 34E4            4413  MATCMND1 LH     R6,MACADR
*004472       233A      =004486    4414           BZ     MATCMND2
004474        E6D0 33F2            4415           LA     R13,ERRLMESS
004478        E6E0 3411            4416           LA     R14,ERRLMESE
00447C        41F0 232E            4417           BAL    R15,CONPRINT
004480        2460                 4418           LIS    R6,0
004482        4060 34E4            4419           STH    R6,MACADR
004486        2461                 4420  MATCMND2 LIS    R6,1
004488        4060 34E6            4421           STH    R6,MATFLAG
00448C        0300                 4422           BR     R0
```

SHARED DRIVER SUBROUTINES

```
                                      4424    *BSTATERR -- BAD STATUS ERROR                                   *
                                      4425    *                                                               *
                                      4426    *PARAMETERS:                                                    *
                                      4427    *   DEV  - DEVICE ADDRESS                                        *
                                      4428    *   STAT - STATUS                                               *
                                      4429    *                                                               *
                                      4430    *CALLING SEQUENCE:                                              *
                                      4431    *         BAL    R11,BSTATERR                                   *
                                      4432    *                                                               *
                                      4433    *REGISTERS R7,R8,R9,R10 DESTROYED                               *
                                      4434    *                                                               *
00448E      2450                      4435    BSTATERO LIS   R5,0                    PHASE ZERO
004490      4054 0002                 4436             STH   R5,PHASE(DDBADR)        NEXT PHASE
004494      2451                      4437             LIS   R5,BUSY                 BUSY BIT
004496      7554 0000                 4438             SBT   R5,DSPFLGS(DDBADR)      SET BUSY BIT - DO NOT DISPATCH
00449A      2453                      4439             LIS   R5,BADSTAT              BUSY BIT
00449C      7454 0000                 4440             TBT   R5,DSPFLGS(DDBADR)      TEST THIS BIT
0044A0      4230 8026    =0044CA      4441             BNZ   BSTATERR                ALREADY SET - JUST PRINT ERROR
0044A4      245A                      4442             LIS   R5,PASLTYP              PASLA TYPE
0044A6      7454 0006                 4443             TBT   R5,DTYPFLGS(DDBADR)     TEST FOR PASLA TYPE
0044AA      213B         =0044C0      4444             BNZS  BSTAT00                 PASLA TYPE
0044AC      245B                      4445             LIS   R5,QSZTYP               ELSE TEST FOR QSA ZBID
0044AE      7454 0006                 4446             TBT   R5,DTYPFLGS(DDBADR)     TEST FOR QSA ZBID
*0044B2     233C         =0044CA      4447             BZ    BSTATERR                NO QSA ZBID, JUST PRINT ERROR
0044B4      4850 34BA                 4448             LH    R5,QSZRCNT              IF QSA ZBID,
0044B8      2751                      4449             SIS   R5,1                    DECREMENT REAL #NUMBER OF DEVICES
0044BA      4050 34BA                 4450             STH   R5,QSZRCNT
0044BE      2306         =0044CA      4451             BS    BSTATERR                PRINT ERROR
0044C0      4850 34B6                 4452    BSTAT00  LH    R5,PASRCNT              IF PASLA,
0044C4      2751                      4453             SIS   R5,1                    DECREMENT REAL NUMBER OF DEVICES
0044C6      4050 34B6                 4454             STH   R5,PASRCNT
                                      4455    *
                                      4456    *
                                      4457    *
0044CA      4180 1FFC                 4458    BSTATERR BAL   R8,ERRGET               GET AN ERROR BUFFER
0044CE      C880 8020                 4459             LHI   R8,X'8020'              BAD STATUS ERROR
0044D2      4087 0000                 4460    BSTAT1   STH   R8,0(R7)
0044D6      4027 0002                 4461             STH   DEV,2(R7)               DEVICE
0044DA      4037 0004                 4462             STH   STAT,4(R7)              STATUS
0044DE      4180 2034                 4463             BAL   R8,ERRENQ               QUEUE FOR PRINT
0044E2      030B                      4464             BR    R11                     RETURN




                                      4466    *STARTIO -- SET FLAGS, NEXT PHASE IN DDB, OUTPUT A COMMAND      *
                                      4467    *                                                               *
                                      4468    *PARAMETERS:                                                    *
                                      4469    *   DDBADR - ADDRESS OF DDB TO OPERATE ON                       *
                                      4470    *   DEV - DEVICE ADDRESS FOR COMMAND                            *
                                      4471    *   R5  - NEXT PHASE                                            *
                                      4472    *   R6  - COMMAD                                                *
```

SHARED DRIVER SUBROUTINES

```
                                 4473  *                                                              *
                                 4474  *CALLING SEQUENCE:                                             *
                                 4475  *          BAL    R11,STARTIO                                  *
                                 4476  *                                                              *
                                 4477  *REGISTERS PRESERVED.                                          *
                                 4478  *                                                              *
0044E4      4054 0002            4479  STARTIO  STH    R5,PHASE(DDBADR)    SET NEXT PHASE
0044E8      4854 0000            4480           LH     R5,DSPFLGS(DDBADR)  GET DISPATCH FLAGS
0044EC      C450 CFFF            4481           NHI    R5,X'CFFF'          RESET 'BADSTAT' & 'NOTCOUNT'
0044F0      C650 4000            4482           OHI    R5,Y'4000'          SET 'BUSY'
0044F4      4054 C000            4483           STH    R5,DSPFLGS(DDBADR)
0044F8      4854 C002            4484           LH     R5,PHASE(DDBADR)    RESTORE PHASE REGISTER
0044FC      9F26                 4485           OCR    DEV,R6              OUTPUT A COMMAND
0044FE      030B                 4486           BR     R11                 RETURN
```

```
                              4488  *TESTLOCK -- TEST THE DEVICE INTERLOCK BIT                        *
                              4489  *                                                                 *
                              4490  *   IF THE INTERLOCK IS CLEAR, RETURN IS MADE TO THE CALLER.  IF  *
                              4491  *  INTERLOCK IS SET, NOT COUNTING IS SET IN THE CALLERS DDB, AND  *
                              4492  * RETURN IS TO  RO (USUALLY THE DISPATCHER).                      *
                              4493  *                                                                 *
                              4494  *PARAMETERS:                                                      *
                              4495  *  RO     - LOCK RETURN ADDRESS                                   *
                              4496  *  DDBADR - DDB OF DEVICE WE'RE SERVICING                         *
                              4497  *  R5     - HASHED DEVICE NUMBER, BIT TO TEST                     *
                              4498  *                                                                 *
                              4499  *CALLING SEQUENCE:                                                *
                              4500  *          BAL   R8,TESTLOCK                                      *
                              4501  *                                                                 *
                              4502  *REGISTER R8 DESTROYED IF LOCK SET.                               *
                              4503  *                                                                 *
004500      7450 800C =004510 4504  TESTLOCK TBT   R5,INTRLOCK         IS INTERLOCK SET
004504      0338             4505           BZR   R8                  B IF NO, RETURN
004506      2482             4506           LIS   R8,NOTCOUNT         SET NOT COUNTING WHILE WE WAIT
004508      7584 0000        4507           SBT   R8,DSPFLGS(DDBADR)
00450C      0300             4508           BR    RO                  SPECIAL EXIT
                              4509  *
                              4510  *   DEVICE INTERLOCK ARRAY.  THIS ARRAY CONTAINS ONE BIT FOR EVERY *
                              4511  * DEVICE ADDRESS.  ALL DEVICES WHICH CONFLICT HASH TO THE SAME BIT  *
                              4512  * POSITION IN THE ARRAY.  IF THAT BIT IS SET, AN I/O OPERATION IS IN *
                              4513  * PROGRESS ON ONE OF THE DEVICES, THE OTHER DEVICES SHOULD NOT BE   *
                              4514  * ADDRESSED. IF THE BIT IS RESET, ANY DEVICE MAY BE ACCESSED.       *
                              4515  *                                                                 *
                              4516  *   NOTE: INTERLOCK MUST NOT BE SET AS THE RESULT OF AN INTERRUPT. *
004510                        4517           ALIGN 4
004510                        4518  INTRLOCK DS    128
                              4519  *
                              4520  *
                              4521  *SLCHLOCK -- PERMITS ONLY ONE 40 MEG OR MSM DISC TO BE IN
                              4522  *            SELCH WRITE OR READ PHASE AT A TIME. OTHER
                              4523  *            DEVICE DEVICE MAY BE IN THE SELCH WRITE OR READ
                              4524  *            PHASE AT THIS TIME.
                              4525  *
                              4526  *PARAMETER:
                              4527  *  DDBADR - DDB OF DEVICE
                              4528  *  RO     - RETURN ADDRESS IF ANOTHER 40 M OR MSM IN WRITE OR READ
                              4529  *
                              4530  *CALLING SEQUENCE:
                              4531  *          BAL   R8,SLCHLOCK
                              4532  *
                              4533  *REGISTER R11 DESTROYED
                              4534  *
                              4535  *
                              4536  *
004590      24B6             4537  SLCHLOCK LIS   R11,DEVCNTL1        40 M. OR MSM
004592      7434 0000        4538           TBT   R11,DSPFLGS(DDBADR)
004596      0338             4539           BZR   R8                  NO
                              4540  *
```

SHARED DRIVER SUBROUTINES

```
004598      4830 34C0              4541          LH    R11,SELCHBSY        IF ANOTHER 40 MEG OR MSM DISC
00459C      0230                   4542          BNZR  R0                  IN WRITE OR READ PHASE, WAIT!
00459E      0308                   4543          BR    R8                  ELSE CONTINUE
                                   4544   *
                                   4545   *
                                   4546   *


                                   4548   *BLINK -- COMPLEMENT A BIT ON THE DISPLAY           *
                                   4549   *                                                   *
                                   4550   *PARAMETER:                                         *
                                   4551   *  R9 - BIT TO BLINK (DESTROYED).                   *
                                   4552   *                                                   *
                                   4553   *CALLING SEQUENCE:                                  *
                                   4554   *          BAL   R8,BLINK                           *
                                   4555   *                                                   *
0045A0      5080 347C              4556   BLINK    ST    R8,BLINKYSV
0045A4      7790 8002 =0045AA      4557            CBT   R9,BLINKY           REVERSE SELECTED BIT
0045A8      2303      =0045AE      4558            BS    CRTBLINK            GO UPDATE ACTIVITY
0045AA      0000                   4559   BLINKY   DCX   0,0
0045AC      0000
0045AE      D389 3C26              4560   CRTBLINK LB    R8,ACTIVITY(R9)     LOOK AT PREVIOUS CHARACTER
0045B2      C580 0020              4561            CLHI  R8,X'20'
0045B6      2134      =0045BE      4562            BNES  CBLINK1             SKIP IF NOT A SPACE
0045B8      C889 0041              4563            LHI   R8,X'41'(R9)        CHANGE SPACE TO A LETTER
0045BC      2303      =0045C2      4564            BS    CBLINK2
0045BE      C880 0020              4565   CBLINK1  LHI   R8,X'20'            CHANGE LETTER TO A SPACE
0045C2      D289 3C26              4566   CBLINK2  STB   R8,ACTIVITY(R9)     UPDATE ACTIVITY BUFFER
0045C6      5880 347C              4567            L     R8,BLINKYSV
0045CA      0308                   4568            BR    R8                  RETURN TO CALL
```

```
                                        4570    *COMPARE -- COMPARE EXPECTED AND ACTUAL DATA
                                        4571    *
                                        4572    *PARAMETER:
                                        4573    *   DDBADR - ADDRESS OF DDB,BUF 1 EXPECTED, BUF 2 ACTUAL
                                        4574    *
                                        4575    *CALLING SEQUENCE:
                                        4576    *           BAL    R1,COMPARE
                                        4577    *
                                        4578    *           * * * * * * * * * * * * * * * * * * * * * * * *
                                        4579    *           *                                             *
                                        4580    *           * CAUTION: ALL REGISTERS DESTROYED EXCEPT 0,1,D-F *
                                        4581    *           *                                             *
                                        4582    *           * * * * * * * * * * * * * * * * * * * * * * * *
                                        4583    *
0045CC      4854 0006                   4585    COMPARE   LH     R5,DTYPFLGS(DDBADR)  DEVICE TYPE
0045D0      C350 2004                   4586              THI    R5,X'2004'           CASETTE OR USE A SELCH
0045D4      2334          =0045DC       4587              BZS    COMPARE0             NO, CONTINUE
0045D6      4850 34E2                   4588              LH     R5,FSTS              ELSE, TEST FOR FAST OPTION
0045DA      0231                        4589              BNZR   R1                   IF OPTION IS SELECTED, RETURN
0045DC      4824 0008                   4590    COMPARE0  LH     DEV,DEVADR(DDBADR)   HAVE THIS HANDY IN CASE ERROR
0045E0      D334 000A                   4591              LB     STAT,STATUS(DDBADR)
0045E4      5854 0030                   4592              L      R5,BUF1STRT(DDBADR)  START COMPARISON
0045E8      5864 003C                   4593              L      R6,BUF2STRT(DDBADR)
0045EC      D3B5 0000                   4594    COMPARE1  LB     R11,0(R5)            EXPECTED
0045F0      D3C6 0000                   4595              LB     R12,0(R6)            ACTUAL
0045F4      09BC                        4596              CR     R11,R12              DOES DATA MATCH?
0045F6      4330 8034     =00462E       4597              BE     COMPARE3             B IF DATA OK
0045FA      C510 5F98                   4598              CLHI   R1,MAGPHP+4
0045FE      2138          =00460E       4599              BNES   COMPARE2
004600      C4B0 003F                   4600              NHI    R11,X'3F'
004604      C4C0 003F                   4601              NHI    R12,X'3F'
004608      09BC                        4602              CR     R11,R12
00460A      4330 8020     =00462E       4603              BE     COMPARE3
00460E      4180 1FFC                   4604    COMPARE2  BAL    R8,ERRGET
004612      C880 B050                   4605              LHI    R8,X'B050'           DATA TRANSFER ERROR
004616      4087 0000                   4606              STH    R8,0(R7)
00461A      4027 0002                   4607              STH    DEV,2(R7)            DEVICE
00461E      4037 0004                   4608              STH    STAT,4(R7)           STATUS
004622      50B7 0008                   4609              ST     R11,8(R7)            EXPECTED DATA
004626      50C7 000C                   4610              ST     R12,12(R7)           ACTUAL DATA
00462A      4180 2034                   4611              BAL    R8,ERRENQ            QUEUE ERROR FOR PRINT
00462E      2551                        4612    COMPARE3  AIS    R5,1                 ADVANCE POINTERS
004630      2661                        4613              AIS    R6,1
004632      5964 0040                   4614              C      R6,BUF2END(DDBADR)   REACHED END?
004636      4320 FFB2     =0045EC       4615              BNP    COMPARE1             B IF NO
00463A      2452                        4616              LIS    R5,NOTCOUNT          CLEAR NOT COUNTING
00463C      7654 0000                   4617              RBT    R5,DSPFLGS(DDBADR)
004640      2453                        4618              LIS    R5,BADSTAT           CLEAR BAD STATUS IF HAD ERROR
004642      7654 0000                   4619              RBT    R5,DSPFLGS(DDBADR)
                                        4620    *  NOTE CONDITION CODE ON RETURN CAN BE USED TO CHECK
                                        4621    *  PREVIOUS STATUS OF BADSTAT BIT.
004646      0301                        4622              BR     R1                   RETURN
```

SHARED DRIVER SUBROUTINES

```
                                      4623  *
                                      4624  *BUFCLEAR -- CLEARS THE WRITE BUFFER (BUFFER 2)
                                      4625  *
                                      4626  *PARAMETER:
                                      4627  * DDBADR - DDB OF DEVICE IN USE
                                      4628  *
                                      4629  *CALLING SEQUENCE:
                                      4630  *         BAL   R11,BUFCLEAR
                                      4631  *
                                      4632  *REGISTERS R8,9,10 AND 13 DESTROYED
                                      4633  *
004648    4884 0006                   4634  BUFCLEAR LH    R8,DTYPFLGS(DDBADR) DEVICE TYPE
00464C    C380 2004                   4635           THI   R8,X'2004'         CASETTE OR USES A SELCH
004650    2334       =004658          4636           BZS   BUFCLO             NO, CONTINUE
004652    4880 34E2                   4637           LH    R8,FSTS            ELSE TEST FOR FAST OPTION
004656    023B                        4638           BNZR  R11                RETURN OF SELECTED
004658    5884 003C                   4639  BUFCLO   L     R8,BUF2STRT(DDBADR) START ADDRESS OF BUFFER 2
00465C    5084 0044                   4640           ST    R8,BUF2NEXT(DDBADR) NEXT BUFFER ADDR
004660    2491                        4641           LIS   R9,1               BYTE INCREMENTS
004662    58A4 0040                   4642           L     R10,BUF2FND(DDBADR) END ADDRESS OF BUFFER 2
004666    24D0                        4643           LIS   R13,0              ZERO
004668    D2D8 0000                   4644  BUFCL1   STB   R13,0(R8)          CLEAR THIS LOCATION
00466C    C180 FFF8 =004668           4645           BXLE  R8,BUFCL1
004670    030B                        4646           BR    R11                RETURN
```

SHAPED DRIVER SUBROUTINES

```
                              4648  *
                              4649  *MOVEBUF -- COMMANDS THE DEVICE BUFFERS TO BE MOVED TO THE
                              4650  *          NEXT AVAILABLE MEMORY SPACE. INSERTS THE IMAGE TEST
                              4651  *          PATTERN INTO THE READ BUFFER (BUFFER 1),  AND CLEARS
                              4652  *          THE WRITE BUFFER (BUFFER 2).
                              4653  *
                              4654  *PARAMETER:
                              4655  * DDBADR - DDB OF DEVICE IN USE
                              4656  *
                              4657  *CALLING SEQUENCE:
                              4658  *          BAL R7,MOVEBUF
                              4659  *
                              4660  *REGISTERS R8,9,10,11,12 AND 13 DESTROYED.
                              4661  *
                              4662  *
                              4663  *
004672   48C4 0006            4664  MOVEBUF LH    R12,DTYPFLGS(DDBADR)
004676   C5C0 4000            4665          CLHI  R12,X'4000'
00467A   2335      =004684    4666          BES   MB000
00467C   4880 34D8            4667          LH    R8,MBUF                MOVE BUFFER OPTION
004680   4330 80D6 =00475A    4668          BZ    MB07A                  DO NOT MOVE BUFFER
                              4669  *
004684   5880 8194 =00481C    4670  MB000   L     R8,BUFNEXT             ELSE, NEXT AVAILABLE MEMORY SPACE
004688   5890 34D4            4671  MB00    L     R9,BUFSIZE             BUFFER SIZE
00468C   1191                 4672          SLLS  R9,1                   MULTIPLY SIZE BY 2
00468E   2793                 4673          SIS   R9,3                   LAST FULL WORD OF BUFFER
004690   0A98                 4674          AR    R9,R8                  END ADDRESS OF MEMORY SPACE
004692   5990 25B8            4675          C     R9,MEMTOP              IF LESS THAN TOP OF MEMORY
004696   4280 8020 =0046BA    4676          BL    MB01                   OK
                              4677  *
00469A   4880 8182 =004820    4678          LH    R8,MSEARCH             ELSE TEST SEARCH FLAG
00469E   2335      =0046A8    4679          BZS   MB001                  IF CLEAR, TEST MEMSTART ADDR
                              4680  *
0046A0   2480                 4681          LIS   R8,0                   CLEAR MEM SEARCH FLAG
0046A2   4080 817A =004820    4682          STH   R8,MSEARCH
0046A6   0300                 4683          BR    R0                     AND RETURN TO DISPATCHER
                              4684  *
0046A8   2481                 4685  MB001   LIS   R8,1                   SET SEARCH FLAG
0046AA   4080 8172 =004820    4686          STH   R8,MSEARCH
0046AE   5880 34D0            4687          L     R8,MSTART              RESTART WITH MEMORY START
0046B2   5080 8166 =00481C    4688          ST    R8,BUFNEXT             FOR THE NEXT AVAILABLE MEMORY
0046B6   4300 FFCE =004688    4689          B     MB00                   CONTINUE
                              4690  *
0046BA   08A8                 4691  MB01    LR    R10,R8                 START OF BUFFERS
0046BC   10AE                 4692          SRLS  R10,14                 16 K BYTE SIZE
0046BE   74A0 2530            4693  MB02    TBT   R10,MEMRYMAP           TEST FOR THE EXISTENCE OF MEMORY
0046C2   2337      =0046D0    4694          BZS   MB03                   THIS 16 K BLOCK DOES NOT EXISTS
                              4695  *
0046C4   08B9                 4696          LR    R11,R9                 END ADDRESS OF BUFFER
0046C6   10BE                 4697          SRLS  R11,14                 THIS 16 K BLOCK
0046C8   09AB                 4698          CR    R10,R11                TEST FOR LAST 16 K BLOCK OF BUFFERS
0046CA   2339      =0046DC    4699          BES   MB04                   ALL BLOCK TESTED
0046CC   26A1                 4700          AIS   R10,1                  NO, TEST NEXT BLOCK
```

SHARED DRIVER SUBROUTINES

```
0046CE      2208        =0046BE     4701            BS      MB02
                                    4702    *
0046D0      26A1                    4703    MB03    AIS     R10,1                   NEXT 16 K BLOCK
0046D2      11AE                    4704            SLLS    R10,14                  FIRST ADDRESS OF THIS BLOCK
0046D4      50A0 8144   =00481C     4705            ST      R10,BUFNEXT             IS THE NEXT AVAILABLE MEMORY SPACE
0046D8      4300 FF96   =004672     4706            B       MOVEBUF                 START OVER
                                    4707    *
0046DC      E6A0 21E8               4708    MB04    LA      R10,DST                 FIRST DEVICE IN SYSTEM
0046E0      24B4                    4709            LIS     R11,4                   INDEX
0046E2      58C0 2264               4710            L       R12,DSTLAST             LAST DEVICE
0046E6      58DA 0000               4711    MB05    L       R13,0(R10)              DDB ADDRESS OF THIS DEVICE
0046EA      489D 0006               4712            LH      R9,DTYPFLGS(R13)        DEVICE USE A SELCH
0046EE      C390 6004               4713            THI     R9,X'6004'              OR IS A CASETTE
0046F2      2334        =0046FA     4714            BZS     MB055                   NO
0046F4      598D 0030               4715            C       R8,BUF1STRT(R13)        IF THE SAME STARTING ADDRESS
0046F8      2335        =004702     4716            BES     MB06                    TEST THE BUFFER FOR BUSY CONDITION
0046FA      C1A0 FFE8   =0046E6     4717    MB055   BXLE    R10,MB05                TEST ALL DEVICE BUFFERS
0046FE      4300 8020   =004722     4718            B       MB07                    THEN BUFFERS CLEAR FOR USE
                                    4719    *
004702      094D                    4720    MB06    CR      DDBADR,R13              OWN DDB
004704      2235        =0046FA     4721            BES     MB055                   YES
004706      589D 0044               4722            L       R9,BUF2NEXT(R13)        NEXT ADDRESS OF BUFFERS
00470A      2794                    4723            SIS     R9,4
00470C      599D 0040               4724            C       R9,BUF2END(R13)         AT THE END OF THE BUFFERS
004710      223B        =0046FA     4725            BES     MB055                   YES, THEN BUFFER IS NOT BUSY
004712      5890 34D4               4726            L       R9,BUFSIZE              ELSE BUFFER SIZE
004716      1191                    4727            SLLS    R9,1                    MULTIPLY BY 2
004718      0A89                    4728            AR      R8,R9                   END OF BUFFERS
00471A      5080 80FE   =00481C     4729            ST      R8,BUFNEXT              NEXT AVAILABLE MEMORY SPACE
00471E      4300 FF50   =004672     4730            B       MOVEBUF                 START AGAIN
                                    4731    *
004722      58A0 34D4               4732    MB07    L       R10,BUFSIZE             BUFFER SIZE
004726      0AA8                    4733            AR      R10,R8                  END ADDRESS OF
004728      27A4                    4734            SIS     R10,4                   READ BUFFER
00472A      5084 0030               4735            ST      R8,BUF1STRT(DDBADR)     START ADDRESS
00472E      5084 0038               4736            ST      R8,BUF1NEXT(DDBADR)     IS ALSO NEXT ADDRESS
004732      50A4 0034               4737            ST      R10,BUF1END(DDBADR)     END ADDRESS
004736      48C4 0006               4738            LH      R12,DTYPFLGS(DDBADR)
00473A      C5C0 4000               4739            CLHI    R12,X'4000'             MEMORY TEST
00473E      4230 8026   =004768     4740            BNE     MB070                   NO
004742      26A4                    4741            AIS     R10,4
004744      50A4 003C               4742            ST      R10,BUF2STRT(DDBADR)    START ADDRESS OF BUFFER 2
004748      50A4 0044               4743            ST      R10,BUF2NEXT(DDBADR)    CLEAR BUFFER
00474C      5AA0 34D4               4744            A       R10,BUFSIZE
004750      27A4                    4745            SIS     R10,4
004752      50A4 0040               4746            ST      R10,BUF2END(DDBADR)     END ADDRESS
004756      4300 80AA   =004804     4747            B       MB13                    NEXT BUFFER ADDRESS
00475A      5884 0030               4748    MB07A   L       R8,BUF1STRT(DDBADR)     FOR NON MOVEABLE BUFFER
00475E      5084 0038               4749            ST      R8,BUF1NEXT(DDBADR)     NEXT ADDRESS IS START ADDRESS
004762      58A4 0034               4750            L       R10,BUF1END(DDBADR)     END ADDRESS
004766      26A2                    4751            AIS     R10,2
004768      2432                    4752    MB070   LIS     R9,2                    INDEX
00476A      48B0 34E2               4753            LH      R11,FSTS                FAST DATA TRANSFER OPTION
```

SHARED DRIVER SUBROUTINES

```
00476E        4230 8056  =0047C8    4754            BNZ    MB11                   YES
004772        4B34 0006            4755            LH     R11,DTYPFLGS(DDBADR)  DEVICE TYPE              P09
004776        CBB0 2004            4756            SHI    R11,X'2004'           SELCH TESTER?           P09
*00477A       2336       =004786    4757            BZ     MB07C                 BRANCH IF YES           P09
00477C        4BB4 005E            4758            LH     R11,WPROTFLG(DDBADR)  WRITE PROTECT??
004780        4230 8044  =0047C8    4759            BNZ    MB11                  YES, SKIP BUFFER GENERATE
*004784       230E       =0047A0    4760            B      MB07B                 NO                      P09
                                    4761     *
004786        40B8 0000            4762    MB07C   STH    R11,0(R8)             GENERATE SELCH PATTERN
00478A        CAB0 0101            4763            AHI    R11,X'101'            0000,0101,0202,0303,ETC.
00478E        F5B0 0001 0000       4764            CLI    R11,Y'10000'          MAX FFFF
004794        2182       =004798    4765            BLS    MB07D
004796        24B0                 4766            LIS    R11,0                 START WITH ZERO AGAIN
004798        C180 FFEA  =004786    4767    MB07D   BXLE   R8,MB07C             FILL ENTIRE BUFFER
00479C        4300 8028  =0047C8    4768            B      MB11                 CONTINUE
                                    4769     *
0047A0        48B0 34DA            4770    MB07B   LH     R11,IMAGE            IMAGE
0047A4        213E       =0047C0    4771            BNZS   MB10                 NON ZERO IMAGE
                                    4772     *
0047A6        24B1                 4773            LIS    R11,1                IF ZERO IMAGE
0047A8        40B8 0000            4774    MB08    STH    R11,0(R8)            BUFFER 00,01,02......FF,FF,00 ETC.
0047AC        CAB0 0202            4775            AHI    R11,X'202'           INCREMENT BY 202
0047B0        F5B0 0001 0000       4776            CLI    R11,Y'10000'         DATA OVER X'10000'
0047B6        2182       =0047BA    4777            BLS    MB09                 NO
0047B8        24B1                 4778            LIS    R11,1                RESET DATA TO 00,01
0047BA        C180 FFEA  =0047A8    4779    MB09    BXLE   R8,MB08             FILL ENTIRE BUFFER
0047BE        2305       =0047C8    4780            BS     MB11
                                    4781     *
0047C0        40B8 0000            4782    MB10    STH    R11,0(R8)            IMAGE
0047C4        C180 FFF8  =0047C0    4783            BXLE   R8,MB10             FILL ENTIRE BUFFER
                                    4784     *
0047C8        4880 34D8            4785    MB11    LH     R8,MBUF              MOVE BUFFER OPTION
0047CC        4330 801E  =0047EE    4786            BZ     MB110               DO NOT MOVE BUFFER
0047D0        5880 804B  =00481C    4787            L      R8,BUFNEXT          NEXT AVAILBLE MEMORY
0047D4        5A80 34D4            4788            A      R8,BUFSIZE           BUFFER SIZE
0047D8        5084 003C            4789            ST     R8,BUF2STRT(DDBADR)  START ADDRESS OF WRITE BUFFER
0047DC        5084 0044            4790            ST     R8,BUF2NEXT(DDBADR)  ALSO NEXT ADDRESS
0047E0        08A8                 4791            LR     R10,R8               SAVE START ADDRESS
0047E2        5AA0 34D4            4792            A      R10,BUFSIZE          BUFFER SIZE
0047E6        27A4                 4793            SIS    R10,4                LAST ADDRESS
0047E8        50A4 0040            4794            ST     R10,BUF2END(DDBADR)  OF BUFFER
0047EC        2307       =0047FA    4795            BS     MB11A
                                    4796     *
0047EE        5884 003C            4797    MB110   L      R8,BUF2STRT(DDBADR)  IF NON MOVEABLE BUFFER
0047F2        5084 0044            4798            ST     R8,BUF2NEXT(DDBADR)  NEXT ADDRESS IS START ADDRESS
0047F6        58A4 0040            4799            L      R10,BUF2END(DDBADR)  AND GET END ADDRESS
0047FA        24B0                 4800    MB11A   LIS    R11,0                ZERO
0047FC        40B8 0000            4801    MB12    STH    R11,0(R8)            CLEAR
004800        C180 FFF8  =0047FC    4802            BXLE   R8,MB12             ENTIRE BUFFER
004804        4B80 34D8            4803    MB13    LH     R8,MBUF              MOVE BUFFER OPTION
004808        0337                 4804            BZR    R7                   IF NON MOVEABLE OPTION RETURN
                                    4805     *
00480A        5880 800E  =00481C    4806            L      R8,BUFNEXT          ELSE NEXT AVAILABLE MEMORY
```

SHARED DRIVER SUBROUTINES

```
00480E     5890 34D4            4807          L      R9,BUFSIZE            AND BUFFER SIZE
004812     1191                 4808          SLLS   R9,1                  DOUBLE SIZE
004814     0A89                 4809          AR     R8,R9                 TOTAL MEMORY TO BE ALLOCATED
004816     5080 8002 =00481C    4810          ST     R8,BUFNEXT            NEW NEXT MEMORY SPACE
00481A     0307                 4811          BR     R7                    RETURN
                                4812   *
00481C                          4813          ALIGN  4
00481C     0000 9580            4814   BUFNEXT DC     A(EXEREND)            ADDRESS OF NEXT AVAILBLE MEMORY
004820     0000                 4815   MSEARCH DC     X'0'                 MEMORY SEARCH FLAG
                                4816   *
                                4817   *
                                4818   *MBUFCLR -- CLEAR BUSY CONDITION OF BUFFER
                                4819   *          IF BUFFER 2 NEXT ADDRESS = BUFFER 2 END ADDRESS + 4
                                4820   *          BUFFER IS NOT BUSY, ELSE IT IS BUSY.
                                4821   *
                                4822   *PARAMETER:
                                4823   * DDBADR - DDB OF DEVICE IN USE
                                4824   *
                                4825   *CALLING SEQUENCE:
                                4826   *          BAL   R11,MBUFCLR
                                4827   *
                                4828   *REGISTER R12 DESTROYED
                                4829   *
                                4830   *
004822     58C4 0040            4831   MBUFCLR L      R12,BUF2END(DDBADR) END ADDRESS OF BUFFER 2
004826     26C4                 4832          AIS    R12,4
004828     50C4 0044            4833          ST     R12,BUF2NEXT(DDBADR) IS NEXT ADDRESS OF BUFFER 2
00482C     030B                 4834          BR     R11                  CLEARS BUSY CONDITION
00482E                          4835          IFNZ   QSA
```

```
                        4837 *QSACOMP -- APPLIES ONLY TO COMMUNICATION DEVICE. (QSA, DSA AND
                        4838 *          PASLA IN BISYNC MODE AND QSA IN ZBID MODE)
                        4839 *          TEST THE RECEIVER BUFFER DATA.
                        4840 *          AFTER TEST THE RECEIVER BUFFER IS CLEARED.
                        4841 *
                        4842 *PARAMETERS:
                        4843 * DDBADR - DDB OF DEVICE IN USE
                        4844 * R8     - INDEX REGISTER FOR TRANSMITTER R8 = 0,
                        4845 *          FOR RECEIVER R8 = IRBUF
                        4846 *
                        4847 *CALLING SEQUENCE:
                        4848 *          BAL  R3,QSACOMP
                        4849 *
                        4850 *REGISTERS R5,6,7,8,9,10,11 AND R12 DESTROYED.
                        4851 *
                        4852 *NOTE:
                        4853 * THE DATA TRANSMITTED TO THE RECEIVER ESSENTIALLY CONSISTS
                        4854 * OF '80,81,82......FE,FF'.THE BUFFER SIZE VARIES ACCORDING TO
                        4855 * THE PHASE OF TRANSMISSION, IT RANGES FROM 128 TO 134 BYTES.
                        4856 * THE BUFFER IS ALTERED TO ACCOMMODATE SYNC  CHARACTERS, BEGINNING
                        4857 * AND END OF TEXT CHARACTERS.
                        4858 * SPECIAL CONSIDERATION MUST BE GIVEN TO THE BUFFER DISPLACEMENT
                        4859 * WHICH TAKES PLACE IN THE BISYNC MODE. THE RECEIVE BUFFER MAY NOT
                        4860 * RECEIVE DATA UNTIL A NUMBER OF SYNC CHARACTERS ARE TRANSMITTED.
                        4861 * THIS DISPLACEMENT OF DATA IS MAINTAINED THROUGH THE TRANSMISSION
                        4862 * OF A MESSAGE. ALSO, IN THE DSA CASE THE FIRST BYTE OF DATA IS
                        4863 * GARBAGE.
                        4864 * FOR THE QSA IN ZBID MODE, AN IDLE FRAME IS SENT TO THE RECEIVER
                        4865 * AFTER EVERY MESSAGE SEQUENCE. IN THIS CASE TWO "FF" BYTES ARE
                        4866 * RECEIVED.
                        4867 *
00482E     4870 34E0    4868 QSACOMP LH   R7,FSTC              FAST COMMUNICATION RESPONSE
004832     0233         4869         BNZR R3                   EXIT IF REQUIRED
004834     5874 4800 0040 4870       L    R7,RBUFFOE(DDBADR,R8) END ADDRESS OF BUFFER
00483A     246B         4871         LIS  R6,QSZTYP            QSA ZBID
00483C     7464 0006    4872         TBT  R6,DTYPFLGS(DDBADR)
004840     4230 8070 =0048B4 4873    BNZ  QSZC1                YES
004844     2451         4874         LIS  R6,1                 ELSE, GET BYTE SIZE
004846     0857         4875         LR   R5,R7                SAVE END ADDRESS
004848     CB50 0085    4876         SHI  R5,133               ASSUME 134 BYTES LONG
00484C     C890 0080    4877         LHI  R9,X'80'             FIRST BYTE OF DATA X'80'
004850     C8C0 0015    4878         LHI  R12,21               EXAMINE 21 BYTES IN ARRAY QSADATX
004854     D3B5 0000    4879 QSAC1   LB   R11,0(R5)            ONE BYTE OF DATA
004858     05B9         4880         CLR  R11,R9               EXPECTED VALUE
00485A     4230 8026 =004884 4881    BNE  QSAXX                NO, TEST EXPECTIONS
00485E     2691         4882 QSAC2   AIS  R9,1                 INDEX DATA BYTE VALUE
004860     C590 0100    4883         CLHI R9,X'100'            OVER X'100'
004864     2133      =00486A 4884    BNES QSAC3                NO
004866     C890 0080    4885         LHI  R9,X'80'             RESET VALUE TO 80
00486A     C150 FFE6 =004854 4886 QSAC3 BXLE R5,QSAC1          TEST ENTIRE BUFFER
00486E     24A0         4887 QSAC4   LIS  R10,0                FINISHED
004870     0857         4888         LR   R5,R7                END ADDRESS
004872     CB50 0085    4889         SHI  R5,133               START ADDRESS, 134 BYTES LONG
```

SHARED DRIVER SUBROUTINES

```
004876    2464                    4890            LIS    R6,4                FULL WORD INDEX
004878    2771                    4891            SIS    R7,1                FULL WORD BOUNDARY
00487A    50A5 0000               4892   QSAC5    ST     R10,0(R5)           CLEAR
00487E    C150 FFF8  =00487A      4893            BXLE   R5,QSAC5            ENTIRE BUFFER
004882    0303                    4894            BR     R3                  RETURN
                                  4895   *
                                  4896   *                                  EXCEPTIONS:
                                  4897   *                                  FIRST TEST FOR FIRST BYTE IF DSA
                                  4898   *
004884    2489                    4899   QSAXX    LIS    R8,DSATYP           IF THIS DEVICE IS A DSA
004886    7484 0006               4900            TBT    R8,DTYPFLGS(DDBADR)
00488A    233B       =0048A0      4901            BZS    QSAX1
00488C    2481                    4902            LIS    R8,1                AND THIS THE FIRST BUFFER
00488E    4584 002E               4903            CLH    R8,DVRWRK2+2(DDBADR)
004892    2137       =0048A0      4904            BNES   QSAX1
004894    C5C0 000E               4905            CLHI   R12,14              AND THIS IS THE FIRST BYTE
004898    2134       =0048A0      4906            BNES   QSAX1
00489A    27C1                    4907            SIS    R12,1               IGNORE THIS BYTE
00489C    4300 FFCA  =00486A      4908            B      QSAC3
                                  4909   *
                                  4910   *                                  TEST FOR OTHER POSSIBLE BYTES
0048A0    27C1                    4911   QSAX1    SIS    R12,1               NEXT BYTE IN ARRAY
0048A2    D4BC 80A8  =00494E      4912            CLB    R11,QSADATX(R12)    TEST THIS BYTE
0048A6    4330 808E  =004938      4913            BE     QSAX2               OK
0048AA    08CC                    4914            LR     R12,R12             TEST FOR END OF ARRAY
0048AC    4230 FFD4  =004884      4915            BNZ    QSAXX               NOT AT END
0048B0    4300 80B0  =004964      4916            B      QSAZZ               IF AT END ERROR
                                  4917   *
                                  4918   *                                  QSA ZBID MODE
                                  4919   *
0048B4    2461                    4920   QSZC1    LIS    R6,1                BYTE SIZE
0048B6    0857                    4921            LR     R5,R7               END ADDRESS
0048B8    CB50 0085               4922            SHI    R5,133              START ADDRESS, 134 BYTES LONG
0048BC    D384 002D               4923            LB     R8,DVRWRK2+1(DDBADR) SEQUENCE COUNT OF RECV
0048C0    0888                    4924            LR     R8,R8
0048C2    233F       =0048DF      4925            BZS    QSZC4               IF ZERO, IDLE BUFFER
0048C4    24C0                    4926            LIS    R12,0               ZERO
0048C6    C890 0080               4927            LHI    R9,X'80'            FIRST BYTE SHOULD BE 80
0048CA    D3B5 0000               4928   QSZC2    LB     R11,0(R5)           BYTE OF BUFFER
0048CE    05B9                    4929            CLR    R11,R9              COMPARE
0048D0    4230 8024  =0048F8      4930            BNE    QSZXX               CHECK FOR EXCEPTIONS
0048D4    2591                    4931            AIS    R9,1                ELSE CHECK FOR NEXT BYTE
0048D6    C150 FFF0  =0048CA      4932   QSZC3    BXLE   R5,QSZC2            UNTIL END OF BUFFER
0048DA    4300 FF90  =00486E      4933            B      QSAC4               THEN CLEAR BUFFER
                                  4934   *
0048DE    73B5 0000               4935   QSZC4    LHL    R11,0(R5)           AT IDLE BUFFER
0048E2    F5B0 0000 FFFF          4936            CLI    R11,Y'FFFF'         EXPECT TWO FF'S
0048E8    4230 8078  =004964      4937            BNE    QSAZZ               ELSE ERROR
0048EC    73B5 0002               4938            LHL    R11,2(R5)           FOLLOWED BY ZEROS
0048F0    4330 FF7A  =00486E      4939            BZ     QSAC4               CONTINUE
0048F4    4300 806C  =004964      4940            B      QSAZZ               ELSE ERROR
                                  4941   *
                                  4942   *
```

SHARED DRIVER SUBROUTINES

```
0048F8    C590 0080           4943  QSZXX   CLHI  R9,X'80'              EXPECTIONS TO ZBID RECV BUFFERS
0048FC    213B      =0C4912   4944          BNES  QSZX1                 CHECK FOR FIRST BYTE
0048FE    26C1                4945          AIS   R12,1
004900    C5C0 0007           4946          CLHI  R12,7                 CAN HAVE SIX  ZEROS AT START
004904    4380 805C =004964   4947          BNL   QSAZZ                 OF BUFFER
004908    08BB                4948          LR    R11,R11               CHECK FOR ZEROS
00490A    4330 FFC8 =0048D6   4949          BZ    QSZC3
00490E    4300 8052 =004964   4950          B     QSAZZ                 ELSE ERROR
                              4951  *
004912    C590 0100           4952  QSZX1   CLHI  R9,X'100'             CHECK FOR LAST BYTE
004916    4280 804A =004964   4953          BL    QSAZZ                 IF NOT ERROR
00491A    C580 0001           4954          CLHI  R8,1                  CHECK FOR SEQ 1
00491E    2335      =004928   4955          BES   QSZX2
004920    C580 0004           4956          CLHI  R8,4                  OR SEQ 4
004924    4230 803C =004964   4957          BNE   QSAZZ                 ELSE ERROR
004928    73B5 0000           4958  QSZX2   LHL   R11,0(R5)
00492C    C5B0 7E00           4959          CLHI  R11,X'7E00'           CHECK FOR END OF FRAME FLAG
004930    4330 FF3A =00486F   4960          BE    QSAC4                 FOLLOWED BY ZERO
004934    4300 802C =004964   4961          B     QSAZZ                 ELSE ERROR
                              4962  *
                              4963  *
004938    C5B0 0080           4964  QSAX2   CLHI  R11,X'80'             IF < 80, SPECIAL CHARACTER
00493C    4280 FF2A =00486A   4965          BL    QSAC3                 CONTINUE
004940    C5B0 00FF           4966          CLHI  R11,X'FF'             OR END OF FRAME
004944    4330 FF22 =00486A   4967          BE    QSAC3                 THEN CONTINUE
004948    089B                4968          LR    R9,R11                THIS IS THE FIRST BYTE OF DATA
00494A    4300 FF10 =00485F   4969          B     QSAC2                 CONTINUE
                              4970  *
                              4971  * DATA BYTE ARRAY
                              4972  *
00494E    FFFF                4973  QSADATX DCX   FFFF,0385,8483,8281,0216,1616
004950    0385
004952    8483
004954    8281
004956    0216
004958    1616
00495A    1616                4974          DCX   1616,1600,0000,0000,0000
00495C    1600
00495E    0000
004960    0000
004962    0000
                              4975  *
004964    58B5 0000           4976  QSAZZ   L     R11,0(R5)             ADDRESS OF BUFFER
004968    08F3                4977          LR    R15,R3
00496A    C8D0 B880           4978          LHI   R13,X'B880'           ERROR 80
00496E    4180 1FFC           4979          BAL   R8,ERRGET
004972    40D7 0000           4980          STH   R13,0(R7)             ERROR NUMBER
004976    9D23                4981          SSR   DEV,STAT              SENSE CURRENT STATUS
004978    48C0 1228           4982          LH    R12,LASTPIQ           LAST PIQ ENTRY
00497C    4027 0002           4983          STH   DEV,2(R7)             DEVICE
004980    4037 0004           4984          STH   STAT,4(R7)            STATUS
004984    50C7 0008           4985          ST    R12,8(R7)             PIQ ENTRY
004988    50B7 000C           4986          ST    R11,12(R7)            ACTUAL DATA
```

SHARED DRIVER SUBROUTINES

```
00498C       5057 0010              4987      ST    R5,16(R7)        BUFFER ADDRESS
004990       4180 2034              4988      BAL   R8,ERRENQ
004994       030F                   4989      BR    R15              RETURN
                                    4990      ENDC
004996                              4991      IFNZ  MAGTAPE+CASSETTE
```

SEARED DRIVER SUBROUTINES

```
                                    4993  *MAGSTAT -- MAG TAPE AND CASSETTE STATUS CHECK AFTER INTERRUPT      *
                                    4994  *                                                                   *
                                    4995  *    TESTS DU, NMTN, ET, ERR IN THAT ORDER. EXPECTS REGISTER SETUP  *
                                    4996  * FROM FIRST LEVEL INTERRUPT HANDLER.                               *
                                    4997  *                                                                   *
                                    4998  *RETURN CODE:                                                       *
                                    4999  *  R5 - RETURN CODE, SET ACCORDING TO STATUS                        *
                                    5000  *        RC    DU,NMTN,EOT,ERR                                      *
                                    5001  *        0     0   1   0   0       ALL OK                           *
                                    5002  *        1     1   X   X   X       DEVICE UNAVAILABLE               *
                                    5003  *        2     0   0   X   X       MOTION                           *
                                    5004  *        3     0   1   1   X       END OF TAPE                      *
                                    5005  *        4     0   1   0   1       ERROR                            *
                                    5006  *                                                                   *
                                    5007  *CALLING SEQUENCE:                                                  *
                                    5008  *        BAL   R6,MAGSTAT                                           *
                                    5009  *                                                                   *
                                    5010  *REGISTERS R5 THROUGH R11 DESTROYED.                                *
                                    5011  *                                                                   *
00499E      D234 000A               5012  MAGSTAT  STB   STAT,STATUS(DDBADR)  SAVE STATUS
0049A2      2452                    5013           LIS   R5,2                 INITIAL RETURN CODE, MOTION
00499C      C330 0011               5014           THI   STAT,X'11'           NO MOTION OR DU?
0049A6      0336                    5015           BZR   R6                   B IF NO, RETURN
0049A2      DE20 3434               5016           OC    DEV,DISARM
0049A6      2451                    5017           LIS   R5,BUSY              INTERRUPT GOT US HERE.
0049A8      7654 0000               5018           RBT   R5,DSPFLGS(DDBADR)   NO LONGER EXPECTING
0049AC      5854 0028               5019           L     R5,DVRWRK1(DDBADR)   NO MOTION, NO MORE INTERRUPTS
0049BC      7650 FB5C =004510       5020           RBT   R5,INTRLOCK          LET ANOTHER DEVICE RUN
0049B4      2450                    5021           LIS   R5,0                 IF NEXT TEST FAILS, ALL OK
0049B6      C330 00A1               5022           THI   STAT,X'A1'           DU OR ET OR ERR?
0049BA      0336                    5023           BZR   R6                   B IF NO, ALL OK
0049BC      41B0 FB0A =0044CA       5024           BAL   R11,BSTATERR         BAD STATUS ERROR
0049C0      2451                    5025           LIS   R5,1                 RC=1 IF DU
0049C2      C330 0001               5026           THI   STAT,X'1'            CHECK DU
0049C6      0236                    5027           BNZR  R6                   B IF SET, RETURN
0049C8      2453                    5028           LIS   R5,3                 RC=3 IF EOT
0049CA      C330 0020               5029           THI   STAT,X'20'           CHECK EOT
0049CE      4230 95D2 =005FA4       5030           BNZ   MAGPHC               AUTOMATIC REWIND IF EOT    R04
                                    5031  *                                  NO LONGER COMPATIBLE WITH
                                    5032  *                                  CASSETTE TAPE DRIVE?...    R04
0049D2      2454                    5033           LIS   R5,4                 RC=4 MUST BE ERROR
0049D4      0306                    5034           BR    R6                   RETURN
                                    5035           ENDC
```

SHARED DRIVER SUBROUTINES

```
                                       5037  *SLCHEND -- STOP SELCH, CHECK ENDING ADDRESSES                          *
                                       5038  *                                                                       *
                                       5039  *   TWO ENTRY POINTS, SLCHENDR FOR READ, SLCHENDW FOR WRITE             *
                                       5040  * EXPECTS REGISTER SETUP FROM FIRST LEVEL INTERRUPT HANDLER             *
                                       5041  *                                                                       *
                                       5042  *PARAMETERS:                                                            *
                                       5043  *  DDBADR - OWNER DDB ADDRESS                                           *
                                       5044  *  DEV    - SELCH ADDRESS                                               *
                                       5045  *  STAT   - STATUS SAVED BY INTERRUPT                                   *
                                       5046  *  R5     - ADDRESS OF TWO WORDS: EXPECTED BUF END, ACTUAL BUF END      *
                                       5047  *                                                                       *
                                       5048  *CALLING SEQUENCE                                                       *
                                       5049  *          BAL   R6,SLCHEND                                             *
                                       5050  *                                                                       *
                                       5051  *REGISTERS R7 THROUGH R11 DESTROYED.                                    *
                                       5052  *                                                                       *
0049D6      C8D0 F040                  5053  SLCHENDR LHI   R13,X'F040'        SELCH READ ADDRESS FAIL
0049DA      2303      =0049E0          5054           BS    SLCHEND
0049DC      C8D0 F041                  5055  SLCHENDW LHI   R13,X'F041'        SELCH WRITE ADDRESS FAIL
0049E0      24C6                       5056  SLCHEND  LIS   R12,DEVCNTL1
0049E2      74C4 0000                  5057           TBT   R12,DSPFLGS(DDBADR) 40 M. OR MSM
0049E6      2334      =0049EE          5058           BZS   SLCHEND0           NO
                                       5059  *
0049E8      24C0                       5060           LIS   R12,0              IF 40 M. OR MSM
0049EA      40C0 34C0                  5061           STH   R12,SELCHBSY       CLEAR SELCH BUSY
0049EE      08C4                       5062  SLCHEND0 LR    R12,DDBADR         SAVE OWNER DDB
0049F0      DE20 3449                  5063           OC    DEV,STOPCMND       STOP SELCH
0049F4      7620 FB18 =004510          5064           RBT   DEV,INTRLOCK       CLEAR SELCH INTERLOCK
0049F8      1121                       5065           SLLS  DEV,1              INDEX INTO LOOKUP TABLE
0049FA      7342 28D8                  5066           LHL   DDBADR,DDBLKUP(DEV) GET SELCH DDB
0049FE      1021                       5067           SRLS  DEV,1              PUT BACK SELCH ADDRESS
004A00      D334 000A                  5068           LB    STAT,STATUS(DDBADR) SAVE STATUS
004A04      0833                       5069           LR    STAT,STAT          GOOD SELCH STATUS?
004A06      2333      =004A0C          5070           BZS   SLCHEND1           B IF YES
004A08      41B0 FABE =0044CA          5071           BAL   R11,BSTATERR
004A0C      2480                       5072  SLCHEND1 LIS   R8,IGNORE          SET IGNORE IN SELCH DDB
004A0E      7584 0000                  5073           SBT   R8,DSPFLGS(DDBADR)
                                       5074  *  LEAVE BUSY SET TO PREVENT ACCIDENTAL DISPATCHING.
004A12      9B28                       5075           RDR   DEV,R8             END ADDRESS HIGH      ** ESELCH **
004A14      4085 0004                  5076           STH   R8,4(R5)
004A18      9928                       5077           RHR   DEV,R8             END ADDRESS LOW
004A1A      4085 0006                  5078           STH   R8,6(R5)
004A1E      5885 0004                  5079           L     R8,4(R5)           GET COMPLETE ADDRESS
004A22      5985 0000                  5080           C     R8,0(R5)           ACTUAL EQUAL EXPECTED?
004A26      4330 8040 =004A6A          5081           BE    SLCHEND3           B IF YES, RETURN
                                       5082  *  SELCH ENDING ADDRESS FAILURE
004A2A      C580 7100                  5083           CLHI  R8,SLCH1DDB        CHECK END ADDRESS
004A2E      2383      =004A34          5084           BNLS  SLCHEND2           FOR PROGRAM ADDRESS
004A30      C6D0 0002                  5085           OHI   R13,2              IF PROGRAM VIOLATED SET FLAG
004A34      41B0 1FFC                  5086  SLCHEND2 BAL   R8,ERRGET
004A38      40D7 0000                  5087           STH   R13,0(R7)          STORE ERROR CODE SET BY ENTRY
004A3C      488C 0008                  5088           LH    R8,DEVADR(R12)     ADDRESS OF DEVICE USING SELCH
004A40      4087 0002                  5089           STH   R8,2(R7)
```

SHARED DRIVER SUBROUTINES

```
004A44    4037 0004            5090           STH    STAT,4(R7)          STATUS ON INTERRUPT
004A48    4027 0006            5091           STH    DEV,6(R7)           SELCH ADDRESS
004A4C    5885 0000            5092           L      R8,0(R5)            EXPECTED END ADDRESS
004A50    5087 0008            5093           ST     R8,8(R7)
004A54    5885 0004            5094           L      R8,4(R5)            ACTUAL END ADDRESS
004A58    5087 000C            5095           ST     R8,12(R7)
004A5C    4180 2034            5096           BAL    R8,ERRENQ           QUEUE ERROR FOR PRINT
004A60    C3D0 0002            5097           THI    R13,2               TEST FOR ABORT FLAG
004A64    2333      =004A6A    5098           BZS    SLCHEND3            NOT SET
004A66    C200 0CE4            5099           LPSW   ABORT               ELSE ABORT
004A6A    084C                 5100   SLCHEND3 LR    DDBADR,R12          USE OWNER DDB
004A6C    0306                 5101           BR     R6                  RETURN


                               5105   *SELCHSET -- SET UP SELCH AND CONTROL BLOCKS FOR TRANSFER      *
                               5106   *                                                             *
                               5107   *PARAMETERS:                                                  *
                               5108   *  DDBADR - OWNER DDB ADDRESS                                  *
                               5109   *  R7     - SELCH ADDRESS                                      *
                               5110   *  R8     - ADDRESS OF TWO WORDS CONTAINING BUF START, END ADDRESSES *
                               5111   *                                                             *
                               5112   *RETURNED VALUE:                                              *
                               5113   *  R10    - PROCESSOR STATUS ON ENTRY, SHOULD BE RESTORED BY CALLER. *
                               5114   *                                                             *
                               5115   *CALLING SEQUENCE:                                            *
                               5116   *          BAL    R11,SELCHSET                                *
                               5117   *                                                             *
                               5118   *REGISTERS R9,R10 DESTROYED.                                  *
                               5119   *                                                             *
.004A6E    7570 FA9E =004510   5120   SELCHSET SBT   R7,INTRLOCK         SET SELCH INTRLOCK
004A72    2496                 5121           LIS    R9,DEVCNTL1         40 M. OR MSM DISC
004A74    7494 0000            5122           TBT    R9,DSPFLGS(DDBADR)
004A78    2334      =004A80    5123           BZS    SLSET1              NO
                               5124   *
004A7A    2491                 5125           LIS    R9,1                IF 40 M. OR MSM
004A7C    4090 34C0            5126           STH    R9,SELCHBSY         SET SELCH BUSY
                               5127   *
004A80    0897                 5128   SLSET1  LR     R9,R7
004A82    1191                 5129           SLLS   R9,1               INDEX INTO LOOKUP TABLE
004A84    7399 28D8            5130           LHL    R9,DDBLKUP(R9)     GET SELCH DDB
004A88    24A0                 5131           LIS    R10,0              CLEAR WAIT COUNT
004A8A    50A9 0014            5132           ST     R10,CURWAIT(R9)
004A8E    24A0                 5133           LIS    R10,IGNORE         CLEAR IGNORE
004A90    76A9 0000            5134           RBT    R10,DSPFLGS(R9)
004A94    24A3                 5135           LIS    R10,BADSTAT        CLEAR BAD STATUS
004A96    76A9 0000            5136           RBT    R10,DSPFLGS(R9)
004A9A    24A2                 5137           LIS    R10,NOTCOUNT       CLEAR NOT COUNTING
004A9C    76A9 0000            5138           RBT    R10,DSPFLGS(R9)
004AA0    24A1                 5139           LIS    R10,BUSY           SET BUSY
004AA2    75A9 0000            5140           SBT    R10,DSPFLGS(R9)
004AA6    5049 00CC            5141           ST     DDBADR,DVRENTBY(R9) SET OWNER IN DRIVER ENTRY
004AAA    9599                 5142           EPSR   R9,R9              GET CURRENT STATUS
```

SHARED DRIVER SUBROUTINES

```
004AAC     C490 37FF          5143          NHI   R9,X'37FF'          CLEAR INTERRUPT ENABLES
004AB0     95A9               5144          EPSR  R10,R9              BECOME UNINTERRUPTABLE FOR SELCH
004AB2     DE70 3449          5145          OC    R7,STOPCMND         STOP SELCH
004AB6     DA78 0001          5146          WD    R7,1(R8)            START ADDRESS HIGH  ** ESELCH **
004ABA     DA78 0002          5147          WD    R7,2(R8)            START ADDRESS LOW
004ABE     DA78 0003          5148          WD    R7,3(R8)
004AC2     DA78 0005          5149          WD    R7,5(R8)            END ADDRESS HIGH    ** ESELCH **
004AC6     DA78 0006          5150          WD    R7,6(R8)            END ADDRESS LOW
004ACA     DA78 0007          5151          WD    R7,7(R8)
004ACE     030B               5152          BR    R11                 RETURN
                              5153   *
004AD0                        5154          IFNZ  DISCS+DSK40MB+MSMDISC
```

SHARED DRIVER SUBROUTINES

```
                                    5156  *FILESET -- STATUS CHECKS, SET FILE FOR SEEK,RESTORE,READ,WRITE    *
                                    5157  *                                                                  *
                                    5158  *  1. CHECKS SELCH AND CONTROLLER INTERLOCK                        *
                                    5159  *  2. ADJUST DEVICE ADDRESS ACCORDING TO TRACK (10 M.BYTE ONLY).   *
                                    5160  *  3. TEST DU AND WRT PROTECT STATUS.                              *
                                    5161  *  4. SENDS CYLINDER AND HEAD (40 M.BYTE) TO FILE.                 *
                                    5162  *                                                                  *
                                    5163  * PARAMETERS:                                                      *
                                    5164  *   RO - DRIVER EXIT RETURN                                        *
                                    5165  *   DDBADR - ADDRESS OF DDB FOR FILE                               *
                                    5166  *                                                                  *
                                    5167  * RETURNED VALUES:                                                 *
                                    5168  *   DEV - DEVICE ADDRESS (ADJUSTED IF 10 M.BYTE)                   *
                                    5169  *   R7 - SELCH ADDRESS                                             *
                                    5170  *   R12 - CONTROLLER ADDRESS                                       *
                                    5171  *                                                                  *
                                    5172  *CALLING SEQUENCE:                                                 *
                                    5173  *          BAL   R11,FILESET                                       *
                                    5174  *                                                                  *
                                    5175  *REGISTERS R5,R8 DESTROYED.                                        *
004AD0      4854 004A               5176  FILESET   LH    R5,CONTADR(DDBADR)   CHECK CONTROLLER INTERLOCK
004AD4      4180 FA28 =004500       5177            BAL   R8,TESTLOCK
004AD8      08C5                    5178            LR    R12,R5               SAVE CONTROLLER ADDRESS
004ADA      4854 0048               5179            LH    R5,SELCHADR(DDBADR)  CHECK SELCH INTERLOCK
004ADE      4180 FA1E =004500       5180            BAL   R8,TESTLOCK
004AE2      0875                    5181            LR    R7,R5                SAVE SELCH ADDRESS
004AE4      4824 0008               5182            LH    DEV,DEVADR(DDBADR)   GET DEVICE ADDRESS
004AE8      2456                    5183            LIS   R5,DEVCNTL1
004AEA      7454 0000               5184            TBT   R5,DSPFLGS(DDBADR)   40 M. OR MSM DISC
004AEE      2135      =004AF8       5185            BNZS  FILESET1             B IF YES
004AF0      4884 005A               5186            LH    R8,HEADCUR(DDBADR)   ADJUST DEVICE ADDRESS
004AF4      1081                    5187            SRLS  R8,1                 ACCORDING TO CURRENT TRACK
004AF6      0A28                    5188            AR    DEV,R8               ADD ONE OR ZERO
004AF8      9D23                    5189  FILESET1  SSR   DEV,STAT
004AFA      D234 000A               5190            STB   STAT,STATUS(DDBADR)  SAVE STATUS
004AFE      C330 0001               5191            THI   STAT,X'01'           TEST DU
004B02      2335      =004B0C       5192            BZS   FILESET2             B IF NOT SET
004B04      2450                    5193            LIS   R5,0
004B06      4054 0002               5194            STH   R5,PHASE(DDBADR)     HANG IN PHASE ZERO
004B0A      0300                    5195            BR    RO                   RETURN
004B0C      7454 0000               5196  FILESET2  TBT   R5,DSPFLGS(DDBADR)   40 M. OR MSM DISC
004B10      2134      =004B18       5197            BNZS  FILESET3             B IF YES
004B12      D824 0058               5198            WH    DEV,CYLCUR(DDBADR)   SEND CYLINDER TO SERIES 30,40
004B16      030B                    5199            BR    R11
004B18      DE20 345D               5200  FILESET3  OC    DEV,D40REATN         RESET ATTENTION
004B1C      9DC3                    5201            SSR   R12,STAT             WAIT CONTROLLER IDLE
004B1E      2221      =000001       5202            BFBS  2,1
004B20      DE20 3433               5203            OC    DEV,NULL             NULL COMMAND TO DRIVE        R09
004B24      9DC3                    5204            SSR   R12,STAT             WAIT FOR CONTROLLER IDLE     R09
004B26      2221      =000001       5205            BFBS  2,1                  *                           R09
004B28      DE20 345E               5206            OC    DEV,D40REHD          RESET HEAD                   R09
004B2C      9DC3                    5207            SSR   R12,STAT             WAIT CONTROLLER IDLE         R09
004B2E      2221      =000001       5208            BFBS  2,1                  *                           R09
```

SHARED DRIVER SUBROUTINES

```
004B30      D824 005A                5209          WH     DEV,HEADCUR(DDBADR) SELECT HEAD                    R09
004B34      DE20 3460                5210          OC     DEV,D40HEAD         LOAD HEAD INTO FILE            R09
004B38      9DC3                     5211          SSR    R12,STAT            WAIT CONTROLLER IDLE           R09
004B3A      2221       =000001       5212          BFBS   2,1                                               R09
004B3C      D824 0058                5213          WH     DEV,CYLCUR(DDBADR)  SEND CYLINDER                  P09
004B40      DE20 345F                5214          OC     DEV,D40CYL          LOAD CYLINDER INTO FILE        R09
004B44      9DC3                     5215          SSR    R12,STAT            WAIT CONTROLLER IDLE
004B46      2221       =000001       5216          BFBS   2,1
004B48      D824 005A                5217          WH     DEV,HEADCUR(DDBADR) REASSERT HEAD INFO             P09
004B4C      030B                     5218          BR     R11                 RETURN


                                     5220   *FILESTAT -- DISC FILE STATUS CHECK AFTER SEEK OR RESTORE.           *
                                     5221   *                                                                    *
                                     5222   *    TESTS DU, ILL ADDR, SEEK INC, WRT CHK, WRT PROT.  SHOULD NOT    *
                                     5223   * BE CALLED FROM INTERRUPT HANDLER SINCE CONTROLLER MAY BE BUSY.     *
                                     5224   *                                                                    *
                                     5225   *RETURN CODE:                                                        *
                                     5226   *   R5 - RETURN CODE, SET ACCORDING TO STATUS.                       *
                                     5227   *          RC = 0      ALL OK                                        *
                                     5228   *          RC = 1      DISC NOT READY OR WRT PROT                    *
                                     5229   *          RC = 2      ILL ADDR OR SEEK INC                          *
                                     5230   *          RC = 3      WRT CHK (NONE OF THE ABOVE)                   *
                                     5231   *                                                                    *
                                     5232   *CALLING SEQUENCE:                                                   *
                                     5233   *          BAL    R6,FILESTAT                                        *
                                     5234   *                                                                    *
                                     5235   *REGISTERS R5 THROUGH R11 DESTROYED.                                 *
                                     5236   *                                                                    *
004B4E      4854 0048                5237   FILESTAT LH    R5,SELCHADR(DDBADR) CHECK SELCH INTERLOCK
004B52      4180 F9AA  =004500       5238            BAL   R8,TESTLOCK
004B56      4854 004A                5239            LH    R5,CONTADR(DDBADR)  CHECK CONTROLLER INTERLOCK
004B5A      4180 F9A2  =004500       5240            BAL   R8,TESTLOCK
004B5E      4824 0008                5241            LH    DEV,DEVADR(DDBADR)
004B62      9D23                     5242            SSR   DEV,STAT
004B64      D234 000A                5243            STB   STAT,STATUS(DDBADR) SAVE STATUS
004B68      2450                     5244            LIS   R5,0               INITIALLY ASSUME ALL OK
004B6A      2476                     5245            LIS   R7,6               LOAD BIT MASK
004B6C      7474 0000                5246            TBT   R7,DSPFLGS(DDBADR)  BIT SET??
004B70      2334       =004B78       5247            BZS   FILESTA1           NOT SET = NOT 40MB OR MSM
004B72      C330 005B                5248            THI   STAT,X'5B'         TEST BAD STATUS
004B76      2303       =004B7C       5249            BS    FILESTA2           TEST
004B78      C330 005F                5250   FILESTA1 THI   STAT,X'5F'         TEST FOR BAD STATUS
004B7C      0336                     5251   FILESTA2 BZR   R6                 B IF ALL OK, RETURN (RC=0)
004B7E      41B0 F948  =0044CA       5252            BAL   R11,BSTATERR       BAD STATUS ERROR
004B82      2451                     5253            LIS   R5,1               GET READY TO CHECK DU
004B84      C330 0001                5254            THI   STAT,X'01'         TEST DU
004B88      0236                     5255            BNZR  R6                 B IF SET, RETURN (RC=2)
004B8A      2452                     5256            LIS   R5,2               CHECK FOR BAD SEEK ERRORS
004B8C      C330 0022                5257            THI   STAT,X'22'         SEEK INC OR ILL ADDR?
```

SHARED DRIVER SUBROUTINES

```
004590        0236                   5258        BNZR  R6              B IF YES, RETURN (RC=4)
004592        2453                   5259        LIS   R5,3            MUST BE SOME OTHER ERROR
004594        0306                   5260        BR    R6              RETURN (RC=6)
```

SHARED DRIVER SUBROUTINES

```
                              5262  *CONTSET -- SET UP CONTROLLER FOR READ/WRITE                       *
                              5263  *                                                                  *
                              5264  *   SENDS HEAD, SECTOR AND CYLINDER (40 M.BYTE) TO CONTROLLER      *
                              5265  *                                                                  *
                              5266  *PARAMETERS:                                                       *
                              5267  *   DDBADR - ADDRESS OF DDB FOR FILE                               *
                              5268  *   R12 - CONTROLLER ADDRESS                                       *
                              5269  *                                                                  *
                              5270  *CALLING SEQUENCE:                                                 *
                              5271  *        BAL    R11,CONTSET                                        *
                              5272  *                                                                  *
                              5273  *REGISTERS R5,R6 DESTROYED.                                        *
                              5274  *                                                                  *
004B96   2456                5275  CONTSET  LIS    R5,DEVCNTL1
004B98   7454 0000           5276           TBT    R5,DSPFLGS(DDBADR)   40 M. OR MSM DISC
004B9C   213C      =004BB4   5277           BNZS   CONTSET1             B IF YES
004B9E   D824 0058           5278           WH     DEV,CYLCUR(DDBADR)   SEND CYLINDER
004BA2   4854 005A           5279           LH     R5,HEADCUR(DDBADR)
004BA6   1155                5280           SLLS   R5,5                 MOVE OVER HEAD
004BA8   4654 005C           5281           OH     R5,SCTRCUR(DDBADR)   COMBINE HEAD AND SECTOR
004BAC   C450 003F           5282           NHI    R5,X'3F'             CLEAR HIGH ORDER BITS
004BB0   9AC5                5283           WDR    R12,R5               SEND HEAD, SECTOR TO CONT
004BB2   030B                5284           BR     R11                  RETURN
004BB4   DE20 345D           5285  CONTSET1 OC     DEV,D40REATN         RESET ATTENTION
004BB8   9DC3                5286           SSR    R12,STAT
004BBA   2221      =000001   5287           BFBS   2,1                  WAIT FOR IDLE
004BBC   DEC0 3433           5288           OC     R12,NULL             NULL COMMAND TO CONTROLLER     R09
004BC0   9DC3                5289           SSR    R12,STAT             WAIT FOR IDLE                  R09
004BC2   2221      =000001   5290           BFBS   2,1                  *                              R09
004BC4   4854 005A           5291           LH     R5,HEADCUR(DDBADR)
004BC8   115A                5292           SLLS   R5,10                MOVE OVER HEAD
004BCA   4654 0058           5293           OH     R5,CYLCUR(DDBADR)    COMBINE HEAD AND CYLINDER
004BCE   C450 7FFF           5294           NHI    R5,X'7FFF'           CLEAR UNUSED BITS
                             5295  *        OC     DEV,D40REHD          RESET HEAD                     R09
                             5296  *        SSR    R12,STAT                                            R09
                             5297  *        BFBS   2,1                  WAIT FOR IDLE                  R09
                             5298  *        WH     DEV,HEADCUR(DDBADR)  OUTPUT HEAD NO. TO DRIVE       R09
                             5299  *        OC     DEV,D40HEAD          SET HEAD                       R09
                             5300  *        SSR    R12,STAT                                            R09
                             5301  *        BFBS   2,1                  WAIT FOR IDLE                  R09
004BD2   DAC4 005D           5302           WD     R12,SCTRCUR+1(DDBADR) SEND SECTOR TO CONT
004BD6   98C5                5303           WHR    R12,R5               SEND HEAD, CYL TO CONT
004BD8   2457                5304           LIS    R5,DEVCNTL2          MSM DISC?
004BDA   7454 0000           5305           TBT    R5,DSPFLGS(DDBADR)
004BDE   033B                5306           BZR    R11                  NO, EXIT
004BE0   D824 005A           5307           WH     DEV,HEADCUR(DDBADR)  SEND HEAD TO DEVICE
004BE4   030B                5308           BR     R11                  RETURN
```

```
                                  5310  *CONTSTAT -- DISC CONTROLLER INTERRUPT STATUS CHECK.              *
                                  5311  *                                                                *
                                  5312  *    TESTS CONTROLLER IDLE, FILE ADDR INTLK, DATA TRANSFER ERROR, *
                                  5313  * FILE DU.  EXPECTS REGISTER SETUP FROM FIRST LEVEL INTERRUPT     *
                                  5314  * HANDLER.                                                        *
                                  5315  *                                                                *
                                  5316  *RETURN CODE:                                                     *
                                  5317  *   R5 - RETURN CODE                                              *
                                  5318  *          RC    CAUSE:                  NORMAL NEXT ACTION:       *
                                  5319  *          0     ALL OK                  CONTINUE TESTING          *
                                  5320  *          1     FILE DU                 WAIT FOR DU TO CLEAR      *
                                  5321  *          2     CONT NOT IDLE           WAIT CONT IDLE INTERRUPT  *
                                  5322  *          3     EXAMINE                 GO ON TO NEXT SECTOR      *
                                  5323  *          4     DATA TRANSFER ERROR     RETRY READ/WRITE          *
                                  5324  *                                                                *
                                  5325  *CALLING SEQUENCE:                                                *
                                  5326  *          BAL   R6,CONTSTAT                                       *
                                  5327  *                                                                *
                                  5328  *REGISTERS R5 THROUGH R11 DESTROYED.                              *
                                  5329  *                                                                *
004BE6      4824 004A             5330  CONTSTAT LH    DEV,CONTADR(DDBADR) GET CONTROLLER ADDRESS
004BEA      9D23                  5331  CONT1    SSR   DEV,STAT           LOOK AT CONTROLLER STATUS
004BEC      0788                  5332           XR    R8,R8              DELAY
004BEE      9D25                  5333           SSR   DEV,R5             LOOK AGAIN IN CASE IT CHANGES
004BF0      0535                  5334           CLR   STAT,R5            IS STATUS CHANGING?
004BF2      2034      =004BEA     5335           BNES  CONT1             B IF YES, LOOP UNTIL TWO THE SAME
004BF4      D234 000A             5336           STB   STAT,STATUS(DDBADR) SAVE STATUS
004BF8      2452                  5337           LIS   R5,2              RC=2 IF CONTROLLER NOT IDLE
004BFA      C330 0002             5338           THI   STAT,X'02'        CHECK CONTROLLER IDLE
004BFE      0336                  5339           BZR   R6                B IF NOT IDLE, RETURN
004C00      2451                  5340           LIS   R5,BUSY           NOT EXPECTING ANY MORE INTERRUPTS
004C02      7654 0000             5341           RBT   R5,DSPFLGS(DDBADR) CLEAR BUSY
004C06      7620 F306 =004510     5342           RBT   DEV,INTRLOCK      CLEAR CONTROLLER INTERLOCK
004C0A      2450                  5343           LIS   R5,0
004C0C      1121                  5344           SLLS  DEV,1             INDEX LOOKUP TABLE
004C0E      4052 28D8             5345           STH   R5,DDBLKUP(DEV)   CLEAR CONTROLLER ENTRY
004C12      1021                  5346           SRLS  DEV,1             PUT BACK CONT ADDRESS
004C14      2456                  5347           LIS   R5,DEVCNTL1
004C16      7454 0000             5348           TBT   R5,DSPFLGS(DDBADR) 40MB OR MSM??
004C1A      4230 802E =004C4C     5349           BNZ   CONT4             YES, CHECK WRITE PROTECT
004C1E      4884 0008             5350           LH    R8,DEVADR(DDBADR) GET FILE ADDRESS
004C22      9D85                  5351  CONT2    SSR   R8,R5             CHECK FILE STATUS
004C24      C350 0010             5352           THI   R5,X'10'          DISC ADDRESS INTERLOCK SET?
004C28      2033      =004C22     5353           BNZS  CONT2             B IF YES, WAIT FOR IT TO CLEAR
004C2A      2450                  5354  CONT3    LIS   R5,0              RC=0 IF ALL OK
004C2C      C330 00F0             5355           THI   STAT,X'F0'        ANY ERRORS SET?
004C30      0336                  5356           BZR   R6                B IF NO, RETURN
004C32      41B0 F894 =0044CA     5357           BAL   R11,BSTATERR      BAD STATUS ERROR
004C36      2451                  5358           LIS   R5,1              RC=1 IF DU SET
004C38      4884 0008             5359           LH    R8,DEVADR(DDBADR) GET FILE ADDRESS
004C3C      9D87                  5360           SSR   R8,R7             CHECK FILE DU
004C3E      0216                  5361           BTCR  1,R6              B IF SET, RETURN (RC=2)
004C40      2454                  5362           LIS   R5,4              RC=4,    DATA ERRORS
```

SHARED DRIVER SUBROUTINES

004C42	C330 00F1	5363		THI STAT,X'F1'	ANY SET?
004C46	0236	5364		BNZR R6	B IF YES, RETURN
004C48	2453	5365		LIS R5,3	ASSUME NON-DATA ERRORS
004C4A	0306	5366		BR R6	RETURN
004C4C	2450	5367	CONT4	LIS R5,0	ASSUME WRITE PROTECT
004C4E	C330 0080	5368		THI STAT,X'80'	WRITE PROTECT??
004C52	0236	5369		BNZR R6	YES,RETURN
004C54	4300 FFD2 =004C2A	5370		B CONT3	CONTINUE STATUS CHECK

SHARED DRIVER SUBROUTINES

```
                              5372  *WAITSEEK -- ALLOW SEEK TO COMPLETE ON ALL DRIVES              *
                              5373  *                                                              *
                              5374  *     ALLOWS SEEKS TO COMPLETE ON ALL DRIVES SERVICED BY A CONTROLLER  *
                              5375  * SO THAT THE CONTROLLER MAY BE RESET WITHOUT LOSS OF FILE INTERRUPTS.*
                              5376  * BITS IN THE INTERLOCK ARRAY INDICATE A DRIVE IS SEEKING.      *
                              5377  *                                                              *
                              5378  * PARAMETER:                                                   *
                              5379  *   R5 - CONTROLLER ADDRESS                                     *
                              5380  *                                                              *
                              5381  * CALLING SEQUENCE:                                            *
                              5382  *         BAL   R11,WAITSEEK                                    *
                              5383  *                                                              *
                              5384  * REGISTERS R6,R7 DESTROYED.                                    *
                              5385  *                                                              *
004C58   C870 0010            5386  WAITSEEK LHI   R7,X'10'            2.5 AND 10 ADDRESS INCREMENT
004C5C   2466                 5387           LIS   R6,DEVCNTL1
004C5E   7464 0000            5388           TBT   R6,DSPFLGS(DDBADR)  CHECK 40 M.BYTE FLAG
004C62   2332      =004C66    5389           BZS   WAITSEK1            B IF NOT 40 M.BYTE
004C64   2471                 5390           LIS   R7,1               40 M.BYTE ADDRESS INCREMENT
004C66   0865                 5391  WAITSEK1 LR    R6,R5              GET CONTROLLER ADDRESS
004C68   0A67                 5392           AR    R6,R7              DRIVE ZERO
004C6A   7460 F8A2 =004510    5393  WAITSEK2 TBT   R6,INTRLOCK        TEST SEEK FLAG
004C6E   2022      =004C6A    5394           BTBS  2,WAITSEK2         HANG IF SET
004C70   0A67                 5395           AR    R6,R7              DRIVE ONE
004C72   7460 F89A =004510    5396  WAITSEK3 TBT   R6,INTRLOCK        TEST SEEK FLAG
004C76   2022      =004C72    5397           BTBS  2,WAITSEK3         HANG IF SET
004C78   0A67                 5398           AR    R6,R7              DRIVE TWO
004C7A   7460 F892 =004510    5399  WAITSEK4 TBT   R6,INTRLOCK        TEST SEEK FLAG
004C7E   2022      =004C7A    5400           BTBS  2,WAITSEK4         HANG IF SET
004C80   0A67                 5401           AR    R6,R7              DRIVE THREE
004C82   7460 F88A =004510    5402  WAITSEK5 TBT   R6,INTRLOCK        TEST SEEK FLAG
004C86   2022      =004C82    5403           BTBS  2,WAITSEK5         HANG IF SET
004C88   030B                 5404           BR    R11                RETURN
                              5405           ENDC
004C8A                        5406           IFNZ  MAM
```

SHARED DRIVER SUBROUTINES

```
                                        5408  *MAMIDLE -- THE MAM (EMAM) IS PLACED IN AN IDLE STATE.
                                        5409  *              A X'C1' COMMAND (DISARM, KILL AND PIQ READ) IS
                                        5410  *              ISSUED TO THE MAM. SUBSEQUENTLY ALL DEVICES ON THE
                                        5411  *              MAM STARTING WITH DEVICE ADDRESS "MAMFDADR" AND
                                        5412  *              ENDING WITH "MAMLDADR" ARE ISSUED A X'C1' COMMAND
                                        5413  *              (DISARM).
                                        5414  *
                                        5415  *CALLING SEQUENCE:
                                        5416  *              BAL  R12,MAMIDLE
                                        5417  *
                                        5418  *REGISTERS R5,6,7,8 AND 9 ARE DESTROYED
                                        5419  *
                                        5420  *
                                        5421  *
004C8A       4850 34B2                  5422  MAMIDLE  LH    R5,MAMADR        MAM ADDR
004C8E       DE50 3455                  5423           OC    R5,MAMKILL       DISARM,KILL + PIQ READ
004C92       9D56                       5424           SSR   R5,R6            MAM STATUS
004C94       C360 0004                  5425           THI   R6,4
004C98       4230 807A =004D16          5426           BNZ   MAMFSYC          FALSE SYNC ERROR
004C9C       C360 0001                  5427           THI   R6,1             KILL MODE
004CA0       4330 80AE =004D52          5428           BZ    MAMBST1          ERROR IF NOT IN KILL MODE
004CA4       2483                       5429           LIS   R8,BADSTAT       CLEAR BAD STATUS
004CA6       5870 81BA =004F64          5430           L     R7,MAMDADR       MAM DDB ADDRESS
004CAA       7687 0000                  5431           RBT   R8,0(R7)
004CAE       2481                       5432           LIS   R8,1             BXLE PARAMETERS
004CB0       4870 838C =005040          5433           LH    R7,MAMFDADR      FIRST DEVICE ON MAM
004CB4       4890 838A =005042          5434           LH    R9,MAMLDADR      LAST DEVICE ON MAM
004CB8       DE70 349A                  5435  MAMID1   OC    R7,QIDLE         DISARM ALL OF THEM
004CBC       C170 FFF8 =004CB8          5436           BXLE  R7,MAMID1
004CC0       030C                       5437           BR    R12              RETURN
                                        5438  *
                                        5439  *
                                        5440  *MAMCLRAM -- CLEARS THE ENTIRE DCB RAM OF THE MAM (EMAM).
                                        5441  *              ALSO CLEARS THE PIQ ENTRY LIST.
                                        5442  *
                                        5443  *CALLING SEQUENCE:
                                        5444  *              BAL  R12,MAMCLRAM
                                        5445  *
                                        5446  *REGISTERS R5,6,7,8,9,10,11 AND 13 ARE DESTROYED
                                        5447  *
                                        5448  *
004CC2       4850 34B2                  5449  MAMCLRAM LH    R5,MAMADR        MAM ADDRESS
004CC6       DE50 3455                  5450           OC    R5,MAMKILL       DISABLE, PIQ READ, & KILL
004CCA       9D56                       5451           SSR   R5,R6            MAM STATUS
004CCC       C360 0001                  5452           THI   R6,1             KILL MODE
004CD0       4330 807E =004D52          5453           BZ    MAMBST1          ERROR IF NOT KILL
004CD4       24D0                       5454           LIS   R13,0            BXLE PARAMETER
004CD6       24E2                       5455           LIS   R14,2
004CD8       C8F0 03FE                  5456           LHI   R15,X'3FE'       LAST DCB RAM ADDRESS
004CDC       D850 835F =00503F          5457           WH    R5,MAMRAMST      MAM RAM START ADDRESS = 0
004CE0       D850 835B =00503C          5458  MAMCLR1  WH    R5,MAMIDCB0      WRITE ZERO INTO DCB RAM
004CE4       C1D0 FFF8 =004CE0          5459           BXLE  R13,MAMCLR1      IDLE DCBS FOR ALL DEVICES
004CE8       DE50 3455                  5460           OC    R5,MAMKILL       DISABLE,PIQ READ, & KILL
```

SHARED DRIVER SUBROUTINES

```
004CEC    9D56                     5461          SSR    R5,R6              MAM STATUS
004CEE    C560 0003                5462          CLHI   R6,3               KILL AND PIQ EMPTY
004CF2    4230 8066  =004D5C       5463          BNE    MAMBST2            ERROR IF NOT KILL OR PIQ ENTRY
004CF6    24A3                     5464          LIS    R10,BADSTAT        CLEAR BAD STATUS
004CF8    5870 8168  =004E64       5465          L      R7,MAMDADR         MAM DDR ADDRESS
004CFC    76A7 0000                5466          RBT    R10,0(R7)
004D00    24A0                     5467          LIS    R10,0              ZERO
004D02    E670 8748  =00544F       5468          LA     R7,MAMPIQES+2      FIRST ADDR OF MAM PIQ LIST
004D06    2482                     5469          LIS    R8,2               HALF WORD INCREMENTS
004D08    E690 8307  =005513       5470          LA     R9,MAMPIQEE        LAST ADDR OF LIST
004D0C    40A7 0000                5471  MAMCLR3  STH    R10,0(R7)          CLEAR THE LIST
004D10    C170 FFF8  =004D0C       5472          BXLE   R7,MAMCLR3
004D14    030C                     5473          BR     R12                RETURN
                                   5474  *
                                   5475  *
                                   5476  *MAMSYNC -- DISPLAYS "FALSE SYNC" MESSAGE FOR THE MAM (FMAM)
                                   5477  *             IF FALSE SYNC ERROR OCCURS.
                                   5478  *
                                   5479  *
                                   5480  *CALLING SEQUENCE:
                                   5481  *       CALLS ARE MADE FROM "MAMIDLE" OR "MAMCLRAM"
                                   5482  *       RETURNS ARE MADE TO R12
                                   5483  *
                                   5484  *REGISTERS R9,10,11,13,14 AND 15 ARE DESTROYED.
                                   5485  *
                                   5486  *
004D16    50C0 832A  =005044       5487  MAMFSYC  ST     R12,MAMSAV         SAVE REGISTER
004D1A    24D3                     5488          LIS    R13,BADSTAT        TEST BAD STATUS
004D1C    58C0 8144  =004E64       5489          L      R12,MAMDADR
004D20    74DC 0000                5490          TBT    R13,0(R12)         OF MAM
004D24    4230 8022  =004D4A       5491          BNZ    MAMFSYZ
004D28    E6D0 3338                5492          LA     R13,ERRDMESS       START OF MESSAGE
004D2C    E6BD 000B                5493          LA     R11,11(R13)
004D30    0895                     5494          LR     R9,R5
004D32    24A3                     5495          LIS    R10,3
004D34    41C0 21B4                5496          BAL    R12,HEXASCII
004D38    E6B0 3347                5497          LA     R14,ERRDMESE
004D3C    41F0 232E                5498          BAL    R15,CONPRINT
004D40    24D3                     5499          LIS    R13,BADSTAT        SET BAD STATUS
004D42    58C0 811E  =004E64       5500          L      R12,MAMDADR
004D46    75DC 0000                5501          SBT    R13,0(R12)         OF MAM
004D4A    2404                     5502  MAMFSYZ  LIS    R0,4
004D4C    58C0 82F4  =005044       5503          L      R12,MAMSAV
004D50    030C                     5504          BR     R12                RETURN
                                   5505  *
                                   5506  *
                                   5507  *MAMBST1,2 -- DISPLAYS ERROR NO. 70 IF MAM IS NOT IN KILL MODE.
                                   5508  *             DISPLAYS ERROR NO. 71 IF MAM IS NOT IN KILL MODE OR
                                   5509  *             PIQ IS NOT EMPTY.
                                   5510  *
                                   5511  *CALLING SEQUENCE:
                                   5512  *       CALLS ARE MADE FROM "MAMIDLE" OR "MAMCLRAM" IF ERROR
                                   5513  *       OCCURS. RETURN IS MADE TO R12.
```

SHARED DRIVER SUBROUTINES

```
                                    5514  *
004D52      4180 1FFC               5515  MAMBST1  BAL   R8,ERRGET
004D56      C880 8070               5516           LHI   R8,X'8070'       ERROR 70
004D5A      2305        =004D64     5517           BS    MAMBSTAT
                                    5518  *
004D5C      4180 1FFC               5519  MAMBST2  BAL   R8,ERRGET
004D60      C880 8071               5520           LHI   R8,X'8071'       ERROR 71
004D64      4097 0000               5521  MAMBSTAT STH   R8,0(R7)
004D68      4057 0002               5522           STH   R5,2(R7)         MAM ADDRESS
004D6C      4067 0004               5523           STH   R6,4(R7)         MAM STATUS
004D70      4180 2034               5524           BAL   R8,ERRENQ
004D74      2404                    5525           LIS   R0,4             SET FLAG
004D76      030C                    5526           BR    R12              RETURN
                                    5527  *
                                    5528  *
                                    5529  *MAMFDCB -- LOADS MAM (EMAM) RAM WITH THE INITIAL DCB
                                    5530  *           OF THE TRANSMITTER OR RECEIVER.
                                    5531  *
                                    5532  *PARAMETERS:
                                    5533  *   DEV   - COMMUNICATION DEVICE ADDRESS
                                    5534  *   R6    - ADDRESS OF THE INITIAL DCB
                                    5535  *
                                    5536  *CALLING SEQUENCE:
                                    5537  *        BAL   R9,MAMFDCB
                                    5538  *
                                    5539  *REGISTERS R6,7,8,10,11 & 12 ARE DESTROYED.
                                    5540  *
                                    5541  *
004D78      0872                    5542  MAMFDCB  LR    R7,DEV           COMM DEVICE ADDRESS
004D7A      C470 003F               5543           NHI   R7,X'3F'         BITS 10-15 ONLY
004D7E      1174                    5544           SLLS  R7,4             TIMES 16
004D80      4880 34B2               5545           LH    R8,MAMADR        MAM ADDR
004D84      24A0                    5546           LIS   R10,0
004D86      95CC                    5547           EPSR  R12,R12          CURRENT PSW
004D88      C4C0 37FF               5548           NHI   R12,X'37FF'      UNINTERRUPTABLE
004D8C      95BC                    5549           EPSR  R11,R12          MODIFIED PSW
004D8E      DE80 3456               5550           OC    R8,MAMPIQR       PIQ READ
004D92      9887                    5551           WHR   R8,R7            START RAM ADDRESS
004D94      D886 0000               5552  MAMF1    WH    R8,0(R6)         WRITE DCB TO MAM
004D98      2662                    5553           AIS   R6,2
004D9A      26A2                    5554           AIS   R10,2            INC COUNTER
004D9C      C5A0 0010               5555           CLHI  R10,16           EIGHT HALF WORDS IN DCB
004DA0      2086        =004D94     5556           BLS   MAMF1
004DA2      DE80 3456               5557           OC    R8,MAMPIQR       PIQ READ AGAIN
004DA6      95CB                    5558           EPSR  R12,R11          RESTORE PSW
004DA8      0309                    5559           BR    R9               RETURN
                                    5560  *
                                    5561  *
                                    5562  *MAMDCBBC -- MODIFIES THE BYTE COUNT OF BUFFER 0 OR BUFFER 1.
                                    5563  *            THE SPECIFIC RAM LOCATION IN THE MAM (EMAM) IS
                                    5564  *            LOAD WITH A NEW BYTE COUNT.
                                    5565  *
                                    5566  *PARAMETERS:
```

SHARED DRIVER SUBROUTINES

```
                               5567  * DEV    - COMM DEVICE ADDR.
                               5568  * R7     - DCB INDEX  R7 = 5 FOR BUFFER 0; R7 = 14 FOR BUFFER 1.
                               5569  * R8     - CONTAIN BYTE COUNT (NEGATIVE VALUE).
                               5570  *
                               5571  *CALLING SEQUENCE:
                               5572  *         BAL   R9,MAMDCBBC
                               5573  *
                               5574  *REGISTERS R5,6,11 & 12 DESTROYED.
                               5575  *
                               5576  *
004DAA    4850 34B2            5577  MAMDCBBC LH    R5,MAMADR            MAM ADDRESS
004DAE    0862                 5578           LR    R6,DEV              COMM DEVICE ADDRESS
004DB0    C460 003F            5579           NHI   R6,X'3F'            BITS 10-15 ONLY
004DB4    1164                 5580           SLLS  R6,4                X 16
004DB6    0A67                 5581           AR    R6,R7               RAM ADDR (ADD INDEX)
004DB8    95CC                 5582           EPSR  R12,R12             CURRENT PSW
004DBA    C4C0 37FF            5583           NHI   R12,X'37FF'         UNITERRUPTABLE
004DBE    95BC                 5584           EPSR  R11,R12             EXCHANGE PSW
004DC0    DE50 3456            5585           OC    R5,MAMPIQR          PIQ READ
004DC4    9856                 5586           WHR   R5,R6               MAM RAM ADDRESS
004DC6    9858                 5587           WHR   R5,R8               BYTE COUNT
004DC8    DE50 3456            5588           OC    R5,MAMPIQR          RESTORE PIQ REAR
004DCC    95CB                 5589           EPSR  R12,R11             RESTORE PSW
004DCE    0309                 5590           BR    R9                  RETURN
                               5591  *
                               5592  *
                               5593  *MAMDCBAD -- MODIFIES THE END ADDRESS OF BUFFER 0 OR BUFFER 1
                               5594  *            THE SPECIFIC MAM (EMAM) RAM LOCATIONS ARE LOAD
                               5595  *            WITH A NEW END ADDRESS.
                               5596  *
                               5597  *PARAMETERS:
                               5598  * DEV    - COMM DEVICE ADDRESS
                               5599  * R7     - DCB INDEX R7 = 2 FOR BUFFER 0; R7 = 10 FOR BUFFER 1
                               5600  * R8     - CONTAINS END ADDRESS FOR BUFFER
                               5601  *
                               5602  *CALLING SEQUENCE:
                               5603  *         BAL   R9,MAMDCBAD
                               5604  *
                               5605  *REGISTERS R5,6,9,11 & 12 ARE DESTROYED.
                               5606  *
                               5607  *
004DD0    4850 34B2            5608  MAMDCBAD LH    R5,MAMADR            MAM ADDRESS
004DD4    0862                 5609           LR    R6,DEV              COMM DEVICE ADDR
004DD6    C460 003F            5610           NHI   R6,X'3F'            BITS 10-15 ONLY
004DDA    1164                 5611           SLLS  R6,4                X 16
004DDC    0A67                 5612           AR    R6,R7               RAM ADDR (ADD INDEX)
004DDE    08A8                 5613           LR    R10,R8              END ADDRESS
004DE0    ECA0 0010            5614           SRL   R10,16              MOST SIG. BYTE OF ADDRESS
004DE4    C4A0 00FF            5615           NHI   R10,X'FF'           SAVE LAST BYTE
004DE8    24BA                 5616           LIS   R11,PASLTYP         PASLA TYPE
004DEA    74B4 0006            5617           TBT   R11,DTYPFLGS(DDBADR)
004DEE    2134     =004DF6     5618           BNZS  MDCBB1
004DF0    C6A0 FF00            5619           OHI   R10,X'FF00'         IF NOT PASLA, MASK X'FF'
```

SHARED DRIVER SUBROUTINES

```
004DF4    2303      =004DFA    5620           BS      MDCBB2
004DF6    C6A0 EF00            5621    MDCBB1 OHI     R10,X'EF00'         IF PASLA, MASK X'EF'
004DFA    95CC                 5622    MDCBB2 EPSR    R12,R12             CURRENT PSW
004DFC    C4C0 37FF            5623           NHI     R12,X'37FF'         UNINTERRUPTABLE
004E00    95BC                 5624           EPSR    R11,R12             NEW PSW
004E02    DE50 3456            5625           OC      R5,MAMPIQR          PIQ READ
004E06    9856                 5626           WHR     R5,R6               MAM RAM ADDRESS
004E08    985A                 5627           WHR     R5,R10              LOAD MASK & MS BYTE OF END ADDR
004E0A    9858                 5628           WHR     R5,R8               LOAD LEAST SIG 16 BITS OF FND ADDR
004E0C    DE50 3456            5629           OC      R5,MAMPIQR          RESET MAM PIQ READ
004E10    95CB                 5630           EPSR    R12,R11             RESTORE PSW
004E12    0309                 5631           BR      R9                  RETURN
                               5632    *
                               5633    *
                               5634    *MAMCK -- CHECKS THE MAM (EMAM) DEVICE PARAMETER VALUES
                               5635    *        THE ADDRESS OF THE FIRST COMMUNICATION DEVICE
                               5636    *        AND THE LAST DEVICE ARE DEFINED IN THE MAM
                               5637    *        DEVICE COMMAND "MAM".
                               5638    *        THE MAM (EMAM) MUST BE DEFINED BEFORE ANY
                               5539    *        COMMUNICATION DEVICE CAN BE DEFINED.
                               5640    *
                               5641    *
004E14    50E0 8230 =005048    5642    MAMCK  ST      R14,MAMSAV+4        SAVE REGISTER
004E18    4854 0008            5643           LH      R5,DEVADR(DDBADR)   MAM ADDRESS
004E1C    2133      =004F22    5644           BNZS    MAMCK1              USE SPECIFIED ADDRESS
004E1E    C850 0100            5645           LHI     R5,X'100'           ELSE DEVICE ADDR = X'100'
004E22    C450 03C0            5646    MAMCK1 NHI     R5,X'3C0'           FORCE TO MODULO 64
004E26    4054 0008            5647           STH     R5,DEVADR(DDBADR)
004E2A    4050 34B2            5648           STH     R5,MAMADR           MAM ADDRESS DEFINED
004E2E    48F4 0028            5649           LH      R15,MAMFDA(DDBADR)  FIRST DEVICE ADDRESS ON MAM
004E32    2135      =004E3C    5650           BNZS    MAMCK2              USE SPECIFIED VALUE
004E34    C8F5 0001            5651           LHI     R15,X'001'(R5)      ELSE USE DEVICE ADDR X'101'(R5)
004E38    40F4 0028            5652           STH     R15,MAMFDA(DDBADR)
004E3C    40F0 8200 =005040    5653    MAMCK2 STH     R15,MAMFDADR        FIRST DEVICE ADDRESS DEFINED
004E40    48F4 002A            5654           LH      R15,MAMLDA(DDBADR)  LAST DEVICE ADDRESS ON MAM
004E44    2135      =004E4E    5655           BNZS    MAMCK3              USE SPECIFIED ADDRESS
004E46    C8F5 00C0            5656           LHI     R15,X'0C0'(R5)      ELSE DEVICE ADDRESS = X'1C0'
004E4A    40F4 002A            5657           STH     R15,MAMLDA(DDBADR)
004E4E    40F0 81F0 =005042    5658    MAMCK3 STH     R15,MAMLDADR        LAST ADDRESS DEFINED
004E52    41C0 FE34 =004C8A    5659           BAL     R12,MAMIDLE         IDLE MAM (EMAM)
004E56    41C0 FE68 =004CC2    5660           BAL     R12,MAMCLRAM        CLEAR MAM (EMAM) RAM
004E5A    24F0                 5661           LIS     R15,0               CLEAR ERROR FLAG
004E5C    58E0 81E8 =005048    5662           L       R14,MAMSAV+4        RESTORE REGISTER
004E60    030E                 5663           BR      R14                 RETURN
                               5664    *
004E64                         5565           ALIGN   4
004E64    0000 7F74            5666    MAMDADR DC      A(MAMDDB)
```

SHARED DRIVER SUBROUTINES

```
                           5668  *MDCBQZX          UPDATES MAM DCB FOR THE TRANSMISSION SIDE OF THE
                           5669  *                 QSA (ZBID) PAIR.
                           5670  *
                           5671  *MDCBQZR          UPDATES MAM DCB FOR THE RECEIVER SIDE OF THE QSA (ZBID)
                           5672  *                 PAIR.
                           5673  *
                           5674  *                 THE QSA ZBID MODE OPERATION CONSISTS OF 5 SEQUENCE STEPS.
                           5675  *                 THE DATA REQUIRED TO UPDATE THE MAM DCB IS CONTAINED IN THE
                           5676  *                 TABLE "QZLLSEQ".
                           5677  *
                           5678  *        R5           FLAG FOR A TEST OF REASON CODE
                           5679  *                     R5 = 0 NOT PROPER CODE, R5 = 3 TERMINATE QSA
                           5680  *                     OTHERWISE OK
                           5681  *        R7           CONTAINS THE FIRST BYTE OF THE PIQ ENTRY
                           5682  *        R8           CONTAINS THE CURRENT SEQUENCE #0,1,2,3 OR 4
                           5683  *        R10          FLAG TO UPDATE BUFFER 0 OR 1 IN THE MAM
                           5684  *        R11          RETURN ADDR
                           5685  *
                           5686  *        PREVIOUS CONTENTS OF R5,R6,R7,R8,R9,R10,R12 & R13 DESTROYED
                           5687  *
004E68    0857             5688  MDCBQZX  LR    R5,R7             PIQ ENTRY
004E6A    C450 000F        5689           NHI   R5,X'F'           REASON CODE ONLY
004E6E    C550 0003        5690           CLHI  R5,3              REASON CODE AT 3
004E72    033B             5691           BER   R11               YES, EXIT
004E74    1184             5692           SLLS  R8,4              SEQ NO. BECOMES INDEX FOR QZLLSEQ
004E76    C370 0020        5693           THI   R7,X'20'          TEST FOR NEXT BUFFER
004E7A    2134    =004E82  5694           BNZS  MQZX1             BUFFER 0 NEXT
004E7C    24A0             5695           LIS   R10,0             ELSE BUFFER 1 NEXT
004E7E    4300 8030 =004FB2 5696          B     MQZ1              THEREFORE RESET BUFFER 0
004E82    24A8             5697  MQZX1     LIS   R10,8             BUFFER 0 NEXT
004E84    4300 802A =004FB2 5698          B     MQZ1              THEREFORE RESET BUFFER 1
                           5699  *
004E88    0857             5700  MDCBQZR  LR    R5,R7             PIQ ENTRY
004E8A    C450 000F        5701           NHI   R5,X'F'           REASON CODE ONLY
004E8E    1184             5702           SLLS  R8,4              SEQ NO. BECOMES INDEX FOR QZLLSEQ
004E90    2688             5703           AIS   R8,8              ADJUST INDEX FOR RECEIVER
004E92    C370 0020        5704           THI   R7,X'20'          TEST FOR NEXT BUFFER
004E96    2135    =004EA0  5705           BNZS  MQZR1             BUFFER 0 NEXT
004E98    24A0             5706           LIS   R10,0             ELSE BUFFER 1 NEXT
004E9A    5894 0040        5707           L     R9,RBUFF0E(DDBADR) END ADD OF BUFFER 0
004E9E    2304    =004EA6  5708           BS    MQZR2             AND RESET BUFFER 0
004EA0    24A8             5709  MQZR1     LIS   R10,8             BUFFER 1 NEXT
004EA2    5894 004C        5710           L     R9,RBUFF1E(DDBADR) BUFFER 0 NEXT. END ADDR OF BUFFER 1
004EA6    4098 80AA =004F54 5711 MQZR2    STH   R9,QZLLSEQ+4(R8)  LOAD LS 16 BITS OF ADDR
004EAA    EC90 0010        5712           SRL   R9,16             MS BYTE OF ADDR
004EAE    D298 80A1 =004F53 5713          STB   R9,QZLLSEQ+3(R8)  LOAD IT
                           5714  *
004EB2    D398 809A =004F50 5715 MQZ1     LB    R9,QZLLSEQ(R8)    EXPECTED REASON CODE
004EB6    C470 000F        5716           NHI   R7,X'F'           ACTUAL REASON CODE
004EBA    0579             5717           CLR   R7,R9             IF NOT EQUAL
004EBC    2333    =004EC2  5718           BES   MQZ10             ERROR
004EBE    2450             5719           LIS   R5,0              ERROR FLAG
004EC0    030B             5720           BR    R11               EXIT
```

SHARED DRIVER SUBROUTINES

```
                                    5721   *
004EC2     C380 0008                5722   MQZ10   THI   R8,8                     RECV FLAG
004EC6     4230 8024  =004FEE       5723           BNZ   MQZ2                     RECV
004ECA     4874 0028                5724           LH    R7,DVRWRK1(DDBADR)       ELSE XMIT PASS COUNT
004ECE     2671                     5725           AIS   R7,1
004ED0     4570 34DE                5726           CLH   R7,CCNT                  LAST PASS FOR XMIT
004ED4     4280 8042  =004F1A       5727           BL    MQZ3                     NO, CONTINUE
004ED8     2333       =004EDE       5728           BES   MQZ11
004EDA     4300 806C  =004F4A       5729           B     MQZY
004EDE     D374 002C                5730   MQZ11   LB    R7,DVRWRK2(DDBADR)       LAST SEQ NO.
004EE2     C570 0003                5731           CLHI  R7,3                     .
004EE6     4380 8060  =004F4A       5732           BNL   MQZY                     YES DON'T RESET BUFFER
004EEA     4300 802C  =004F1A       5733           B     MQZ3                     NO, CONTINUE
                                    5734   *
004EEE     4874 002A                5735   MQZ2    LH    R7,DVRWRK1+2(DDBADR)     RECV PASS COUNT
004EF2     2671                     5736           AIS   R7,1
004EF4     4570 34DE                5737           CLH   R7,CCNT                  LAST PASS FOR RECV
004EF8     4280 801E  =004F1A       5738           BL    MQZ3                     NO, CONTINUE
004EFC     2333       =004F02       5739           BES   MQZ22
004EFE     4300 8048  =004F4A       5740           B     MQZY
004F02     D374 002D                5741   MQZ22   LB    R7,DVRWRK2+1(DDBADR)     LAST SEQ NO.
004F06     C570 0003                5742           CLHI  R7,3
004F0A     2188       =004F1A       5743           BLS   MQZ3                     NO, THEN UPDATE DCB
004F0C     C550 000E                5744           CLHI  R5,X'E'                  TERMINATION
004F10     4330 8038  =004F4C       5745           BE    MQZZ
004F14     245A                     5746           LIS   R5,X'A'                  ELSE EXIT
004F16     4300 8032  =004F4C       5747           B     MQZZ
                                    5748   *
004F1A     4850 34B2                5749   MQZ3    LH    R5,MAMADR                MAM ADDRESS
004F1E     0862                     5750           LR    R6,DEV                   DEVICE ADDR
004F20     C460 003F                5751           NHI   R6,X'3F'                 ONLY LAST 6 BITS
004F24     1164                     5752           SLLS  R6,4                     X 16
004F26     2662                     5753           AIS   R6,2                     ADJUST DCB ENTRY
004F28     0A6A                     5754           AR    R6,R10                   SELECT BUFFER DATA TO BE MODIFIED
004F2A     9577                     5755           EPSR  R7,R7                    CURRENT PSW
004F2C     C470 00FF                5756           NHI   R7,X'00FF'               DISABLE EXTERNAL INTERRUPTS
004F30     9597                     5757           EPSR  R9,R7
004F32     DE50 3456                5758           OC    R5,MAMPIQR               READ PIQ COMMAND
004F36     9856                     5759           WHR   R5,R6                    WRITE DCB ADDRESS
004F38     D858 8016  =004F52       5760           WH    R5,QZLLSEQ+2(R8)         WRITE DATA TO THIS DCB LOCATION
004F3C     D858 8014  =004F54       5761           WH    R5,QZLLSEQ+4(R8)         AND THE NEXT 2 LOCATIONS
004F40     D858 8012  =004F56       5762           WH    R5,QZLLSEQ+6(R8)
004F44     DE50 3456                5763           OC    R5,MAMPIQR               RESET MAM PIQ READ MODE
004F48     9579                     5764           EPSR  R7,R9                    RESTORE OLD PSW
                                    5765   *
004F4A     245F                     5766   MQZY    LIS   R5,15
004F4C     030B                     5767   MQZZ    BR    R11                      RETURN
                                    5768   *
                                    5769   *
                                    5770   *      QSA ZBID TRANSMISSION SEQUENCE DCB'S
                                    5771   *
                                    5772   *
004F50                              5773           ALIGN 4
```

SHARED DRIVER SUBROUTINES

```
                              5774   *                 SEQUENCE   NO.  0
004F50        0B00            5775   QZLLSEQ  DC   X'0B00'        XMIT  EXPECTED REASON CODE
004F52        0200            5776            DC   X'0200'        CONTROL, CHAIN FRAME
004F54        6D7F            5777            DC   Z(QSAXBUFE)    END ADDR
004F56        FF81            5778            DC   X'FF81'        128 BYTES
                              5779   *                           RECV
004F58        0E00            5780            DC   X'0E00'        EXP RC
004F5A        9B00            5781            DC   X'9B00'        MASK
004F5C        0000            5782            DC   X'0000'        END ADDR
004F5E        FF81            5783            DC   X'FF81'        128 BYTES
                              5784   *
                              5785   *                 SEQUENCE NO.  1
004F60        0F00            5786            DC   X'0F00'        XMIT EXP RC
004F62        0000            5787            DC   X'0000'        CONTROL, NO CHAIN FRAME
004F64        6D90            5788            DC   Z(QSAXBUFE+1)  END ADDR OF BUFFER
004F66        FF80            5789            DC   X'FF80'        129 BYTES
                              5790   *                           RECV
004F68        0F00            5791            DC   X'0F00'        EXP RC
004F6A        9B00            5792            DC   X'9B00'        MASK
004F6C        0000            5793            DC   X'0000'        END ADDR
004F6E        FF7B            5794            DC   X'FF7B'        132 BYTES
                              5795   *
                              5796   *                 SEQUENCE NO.  2
004F70        0F00            5797            DC   X'0F00'        XMIT EXP RC
004F72        0100            5798            DC   X'0100'        CONTROL NO CHAIN FRAME, NO INSERT
004F74        6D93            5799            DC   Z(QSAIDLEE)    END ADDR
004F76        FFEF            5800            DC   X'FFEF'        16 BYTES
                              5801   *                           RECV
004F78        0F00            5802            DC   X'0F00'        EXP RC
004F7A        9B00            5803            DC   X'9B00'        MASK
004F7C        0000            5804            DC   X'0000'        END ADDR
004F7E        FF7B            5805            DC   X'FF7B'        132 BYTES
                              5806   *
                              5807   *                 SEQUENCE NO.  3
004F80        0B00            5808            DC   X'0B00'        XMIT EXP RC
004F82        0000            5809            DC   X'0000'        CONTROL, NO CHAIN FRAME
004F84        6D90            5810            DC   Z(QSAXBUFE+1)  END ADDR
004F86        FF80            5811            DC   X'FF80'        129 BYTES
                              5812   *                           RECV
004F88        0E00            5813            DC   X'0E00'        EXP RC
004F8A        9B00            5814            DC   X'9B00'        MASK
004F8C        0000            5815            DC   X'0000'        END ADDR
004F8E        FF7B            5816            DC   X'FF7B'        132 BYTES
                              5817   *
                              5818   *                 SEQUENCE NO.  4
004F90        0A00            5819            DC   X'0A00'        XMIT EXP RC
004F92        0200            5820            DC   X'0200'        CONTROL, CHAIN FRAME
004F94        6D7F            5821            DC   Z(QSAXBUFE)    END ADDR
004F96        FF81            5822            DC   X'FF81'        128 BYTES
                              5823   *                           RECV
004F98        0C00            5824            DC   X'0C00'        EXP RC
004F9A        9B00            5825            DC   X'9B00'        MASK
004F9C        0000            5826            DC   X'0000'        END ADDR
```

SHARED DRIVER SUBROUTINES

004F9E	FF81	5827		DC	X'FF81'	128 BYTES

```
                              5829  *
                              5830  *
                              5831  *      INIATIAL DCB'S FOR COMMUNICATION DEVICES
                              5832  *
                              5833  *
                              5834  *
                              5835  *          QSA BISYNC
                              5836  *
                              5837  *          TRANSMITTER
004FA0    0000                5838  MDCBQAX0 DC    X'0000'            DATA
004FA2    FF00                5839  MDCBQAX2 DC    X'FF00'            STATUS MASK & MS BYTES OF ADDR
004FA4    6D7F                5840  MDCBQAX4 DC    Z(QSAXBUFE)        LS 16 BITS OF END ADDR
004FA6    FF7B                5841  MDCBQAX6 DC    X'FF7B'            132 BYTE COUNT
004FA8    9180                5842  MDCBQAX8 DC    X'9180'            DCW NOR DATA TRAN,BUF 0,WR,UASCII
004FAA    FF00                5843  MDCBQAXA DC    X'FF00'            STATUS MASK, MS BYTE OF ADDR
004FAC    6D7F                5844  MDCBQAXC DC    Z(QSAXBUFE)        LS 16 BITS OF END ADDRESS
004FAE    FF81                5845  MDCBQAXE DC    X'FF81'            128 BYTE COUNT
                              5846  *
                              5847  *          RECEIVER
004FB0    0000                5848  MDCBQAR0 DC    X'0000'            DATA
004FB2    FF00                5849  MDCBQAR2 DC    X'FF00'            STATUS MASK & MS BYTE OF ADDR
004FB4    0000                5850  MDCBQAR4 DC    X'0000'            LS 16 BITS OF ADDR
004FB6    FF7B                5851  MDCBQAR6 DC    X'FF7B'            132 BYTE COUNT
004FB8    8180                5852  MDCBQAR8 DC    X'8180'            DCW NOR DATA TRAN, BUF 0,RD,USACII
004FBA    FF00                5853  MDCBQARA DC    X'FF00'            STATUS MASK & MS BYTE OF ADDR
004FBC    0000                5854  MDCBQARC DC    X'0000'            LS 16 BITS OF END ADDRESS
004FBE    FF81                5855  MDCBQARE DC    X'FF81'            128 BYTE COUNT
                              5856  *
                              5857  *          PASLA BISYNC
                              5858  *
                              5859  *          TRANSMITTER
004FC0    0000                5860  MDCBPSX0 DC    X'0000'            DATA
004FC2    4F00                5861  MDCBPSX2 DC    X'4F00'            STATUS MASK & MS BYTE OF ADDR
004FC4    6D7F                5862  MDCBPSX4 DC    Z(QSAXBUFE)        LS 16 BITS OF END ADDRESS
004FC6    FF7F                5863  MDCBPSX6 DC    X'FF7F'            130 BYTES
004FC8    9180                5864  MDCBPSX8 DC    X'9180'            DCW NOR DATA TRAN, BUF 0, WR, USACII
004FCA    4F00                5865  MDCBPSXA DC    X'4F00'            STATUS MASK & MS BYTE OF ADDR
004FCC    6D7F                5866  MDCBPSXC DC    Z(QSAXBUFE)        LS 16 BITS OF END ADDRESS
004FCE    FF81                5867  MDCBPSXE DC    X'FF81'            128 BYTE COUNT
                              5868  *
                              5869  *          RECEIVER
004FD0    0000                5870  MDCBPSR0 DC    X'0000'            DATA
004FD2    EF00                5871  MDCBPSR2 DC    X'EF00'            STATUS MASK & MS BYTE OF ADDR
004FD4    0000                5872  MDCBPSR4 DC    X'0000'            LS 16 BITS OF END ADDRESS
004FD6    FF7F                5873  MDCBPSR6 DC    X'FF7F'            130 BYTE COUNT
004FD8    A180                5874  MDCBPSR8 DC    X'A180'            DCW NOR DATA TRAN, BUF 1, RD, USACII
004FDA    EF00                5875  MDCBPSRA DC    X'EF00'            STATUS MASK & MS BYTE OF ADDR
004FDC    0000                5876  MDCBPSRC DC    X'0000'            LS 16 BITS OF END ADDRESS
004FDE    FF7F                5877  MDCBPSRE DC    X'FF7F'            130 BYTE COUNT
```

SHARED DRIVER SUBROUTINES

```
                                    5878  *
                                    5879  *            DSA BISYNC
                                    5880  *
                                    5881  *            TRANSMITTER
004FE0      0000                    5882  MDCBDSX0 DC  X'0000'          DATA
004FE2      D300                    5883  MDCBDSX2 DC  X'D300'          STATUS MASK & MS BYTE OF ADDR
004FE4      6D7F                    5884  MDCBDSX4 DC  Z(QSAXBUFE)      LS 16 BITS OF END ADDRESS
004FE6      FF7B                    5885  MDCBDSX6 DC  X'FF7B'          132 BYTE COUNT
004FE8      9180                    5886  MDCBDSX8 DC  X'9180'          DCW NOR DATA TRAN, BUF 0, WR, USACII
004FEA      D300                    5887  MDCBDSXA DC  X'D300'          STATUS MASK & MS BYTE OF ADDR
004FEC      6D7F                    5888  MDCBDSXC DC  Z(QSAXBUFE)      LS 16 BITS OF END ADDR
004FEE      FF81                    5889  MDCBDSXE DC  X'FF81'          128 BYTE COUNT
                                    5890  *
                                    5891  *            RECEIVER
004FF0      0000                    5892  MDCBDSR0 DC  X'0000'          DATA
004FF2      D300                    5893  MDCBDSR2 DC  X'D300'          STATUS MASK & MS BYTE OF ADDR
004FF4      0000                    5894  MDCBDSR4 DC  X'0000'          LS 16 BITS OF END ADDRESS
004FF6      FF7B                    5895  MDCBDSR6 DC  X'FF7B'          132 BYTE COUNT
004FF8      8180                    5896  MDCBDSR8 DC  X'8180'          DCW NOR DATA TRAN, BUF 0, RD, USACII
004FFA      D300                    5897  MDCBDSRA DC  X'D300'          STATUS MASK & MS BYTE OF ADDR
004FFC      0000                    5898  MDCBDSRC DC  X'0000'          LS 16 BITS OF END ADDRESS
004FFE      FF81                    5899  MDCBDSRE DC  X'FF81'          128 BYTE COUNT
                                    5900  *
                                    5901  *            QSZ ZBID
                                    5902  *
                                    5903  *            TRANSMITTER
005000      0000                    5904  MDCBQZX0 DC  X'0000'          DATA
005002      0000                    5905  MDCBQZX2 DC  X'0000'          CONTROL NO CHAIN FRAME
005004      6D80                    5906  MDCBQZX4 DC  Z(QSAXBUFE+1)    END ADDR OF BUF 0
005006      FF80                    5907  MDCBQZX6 DC  X'FF80'          129 BYTE COUNT
005008      9040                    5908  MDCBQZX8 DC  X'9040'          NOR DATE TRAN,BUF 0, ZBID XMIT
00500A      0200                    5909  MDCBQZXA DC  X'0200'          CONTROL, CHAIN FRAME
00500C      6D7F                    5910  MDCBQZXC DC  Z(QSAXBUFE)      END ADDR OF BUF 1
00500E      FF81                    5911  MDCBQZXE DC  X'FF81'          128 BYTE COUNT
                                    5912  *
                                    5913  *            RECEIVER
005010      0000                    5914  MDCBQZR0 DC  X'0000'          DATA
005012      9B00                    5915  MDCBQZR2 DC  X'9B00'          STATUS MASK & MS BYTE OF ADDR
005014      0000                    5916  MDCBQZR4 DC  X'0000'          LS 16 BITS OF END ADDR
005016      FF7D                    5917  MDCBQZR6 DC  X'FF7D'          132 BYTE COUNT
005018      8040                    5918  MDCBQZR8 DC  X'8040'          NOR. DATA TRAN, BUF 0, ZBID RECV
00501A      9B00                    5919  MDCBQZRA DC  X'9B00'          STATUS MASK & MS BYTE OF ADDR
00501C      0000                    5920  MDCBQZRC DC  X'0000'          LS 16 BITS OF END ADDRESS
00501E      FF81                    5921  MDCBQZRE DC  X'FF81'          128 BYTE COUNT
```

SHARED DRIVER SUBROUTINES

```
                                    5923  *
005020                              5924          ALIGN  4
                                    5925  *
                                    5926  *MAMPTR -- MAM (EMAM) DISPATCHER
                                    5927  *
005020    0000 5024                 5928  MAMPTR  DC     A(MAMPHO)
                                    5929  *
005024    4824 0008                 5930  MAMPHO  LH     DEV,DEVADR(DDBADR)   MAM ADR
005028    DE20 3456                 5931          OC     DEV,MAMPIQR          ENABLE, PIQ READ
00502C    9D23                      5932          SSR    DEV,STAT             STATUS
00502E    C330 0001                 5933          THI    STAT,1
005032    0330                      5934          BZR    R0                   CONTINUE
005034    41C0 FD1A =004D52         5935          BAL    R12,MAMBST1          LOG BAD STATUS INDICATION
005038    4300 1428                 5936          B      DISPATCH             RETURN TO DISPATCHER
                                    5937  *
                                    5938  *
                                    5939  *
                                    5940  *
00503C    0000                      5941  MAMIDCBO DC    X'0'                 BYTE COUNT
                                    5942  *
                                    5943  *
00503E    0000                      5944  MAMRAMST DC    X'0'
005040    0000                      5945  MAMFDADR DC    X'0'
005042    0000                      5946  MAMLDADR DC    X'0'
005044                              5947          ALIGN  4
005044                              5948  MAMSAV  DSH    4
00504C                              5949  MAMDCBS DS     X'400'
          0000 544E                 5950  MAMDCBE EQU    *-1
00544C                              5951          ALIGN  4
00544C    0030 0000                 5952  MAMPIQES DC    Y'300000'
005450                              5953          DS     196
          0000 5513                 5954  MAMPIQEE EQU   *-1
                                    5955          ENDC
```

TELETYPE DRIVER

```
                                  5957  *   BASIC DRIVER FOR TELETYPE INTERFACE,AND SPECIAL PHASES (2 & 3)      *
                                  5958  * FOR CONSOLE SUPPORT.                                                 *
                                  5959  *
                                  5960  * PRIMARY ENTRY AND PHASE DISPATCH
005514                            5961          ALIGN 4
005514      0000 552C             5962  TTYPTR  DC    A(TTYPH0)
005518      0000 552E             5963          DC    A(TTYPH1)
00551C      0000 5594             5964          DC    A(TTYPH2)          STATUS LOOP READ (CONSOLE SUPPORT)
005520      0000 55A2             5965          DC    A(TTYPH3)          STATUS LOOP WRITE (CONSOLE SUPPORT)
005524      0000 55B4             5966          DC    A(TTYPH4)
005528      0000 561A             5967          DC    A(TTYPH5)

00552C      0000                  5969  TTYPH0  DC    H'0'               ILLEGAL INSTRUCTION, PHASES NOT CODED
                                  5970  *
                                  5971  *   AUTO DRIVER CHANNEL START, WRITE (ACTIVITY AND ERROR PRINT)
                                  5972  *
00552E      C960 0010             5973  TTYPH1  LHI   R6,PHASE.4         SET NEXT PHASE = 4
005532      4056 0002             5974          STH   R6,PHASE(DDBADR)
005536      2467                  5975          LIS   R6,DEVCNTL2        SET ERROR IN PROGRESS FLAG
005538      7564 0000             5976          SBT   R6,DSPFLGS(DDBADR)
                                  5977  *  BUILD CCB
00553C      E654 0048             5978          LA    R5,CCB1ADR(DDBADR) ADDRESS CCB APPENDAGE TO DDB
005540      5864 0034             5979          L     R6,BUF1END(DDBADR) BUFFER END ADDRESS
005544      5065 0004             5980          ST    R6,BUFOEADR(R5)    FROM DDB TO CCB
005548      5874 0030             5981          L     R7,BUF1STRT(DDBADR)
00554C      0B76                  5982          SR    R7,R6              NEGATIVE BYTE COUNT
00554E      4075 0002             5983          STH   R7,BUFOCNT(R5)     INTO CCB
005552      E670 GFF8             5984          LA    R7,INTRUPT         FIRST LEVEL INTRUPT HANDLER
005556      4075 0014             5985          STH   R7,SUBADR(R5)      IS TERMINATION ROUTINE
00555A      C870 2585             5986          LHI   R7,X'2585'         MASK, FAST WRITE
00555E      4075 0000             5987          STH   R7,CCW(R5)         SET UP COMMAND WORD
005562      4824 0008             5988          LH    DEV,DEVADR(DDBADR) INDEX INTO INTERRUPT SERVICE TABLE
005566      D350 0A10             5989          LB    R6,CONTYP          TEST CONSOLE TYPE FLAG     R04
00556A      2761                  5990          SIS   R6,1               *                         R04
00556C      4330 811E =00568E     5991          BZ    PASP1L1            BRANCH IF NOT TTY          R04
005570      1121                  5992          SLLS  DEV,1
005572      E675 0001             5993          LA    R7,CCWFLGS(R5)     ADDRESS OF CCW FLAG FIELD
005576      4072 00D0             5994          STH   R7,X'D0'(DEV)      INTO SERVICE TABLE
00557A      1021                  5995          SRLS  DEV,1              PUT BACK DEVICE ADDRESS
                                  5996  *  PUT TTY IN WRITE MODE, FORCE INTERRUPT TO START
00557C      2461                  5997          LIS   R6,BUSY            SET BUSY FOR INTRUPT HANDLER
00557E      7564 0000             5998          SBT   R6,DSPFLGS(DDBADR)
005582      DE20 3437             5999          OC    DEV,TTYOUT         DON'T ALLOW QUEUED INTERRUPTS
005586      9D23                  6000          SSR   DEV,STAT           WAIT FOR BUSY TO GO AWAY
005588      2081     =000001      6001          BTBS  8,1
00558A      DE20 3439             6002          OC    DEV,TTYWTCMD       WRITE MODE
00558E      2470                  6003          LIS   R7,0               OUTPUT NULL TO START
005590      9A27                  6004          WDR   DEV,R7             A.D.C.
005592      0300                  6005          BR    R0                RETURN TO CALLER
                                  6006  *
                                  6007  *  CONSOLE SUPPORT STATUS LOOP READ WITH SUBROUTINE  RETURN
                                  6008  *
005594      DE20 3436             6009  TTYPH2  OC    DEV,TTYINCMD       DISARM,UNBLOCK,READ
```

TELETYPE DRIVER

```
005598      DD24 000A              6010  TTY2L1  SS     DEV,STATUS(DDBADR)  WAIT FOR A CHARACTER
00559C      2092       =005598     6011          BTBS   9,TTY2L1            B IF BUSY, DU
00559E      9825                   6012          RDR    DEV,R5             READ THE CHARACTER
0055A0      0300                   6013          BR     R0                 RETURN
                                   6014  *
                                   6015  *   CONSOLE SUPPORT STATUS LOOP WRITE WITH SUBROTUINE RETURN
                                   6016  *
0055A2      DE20 3437              6017  TTYPH3  OC     DEV,TTYOUT         WRITE MODE
0055A6      DD24 000A              6018  TTY3L1  SS     DEV,STATUS(DDBADR)  WAIT
0055AA      2092       =0055A6     6019          BTBS   9,TTY3L1
0055AC      9A25                   6020          WDR    DEV,R5             OUTPUT A CHARACTER
0055AE      9D23                   6021          SSR    DEV,STAT           ALLOW TO FINISH
0055B0      2091       =000001     6022          BTBS   9,1
0055B2      0300                   6023          BR     R0                 RETURN
                                   6024  *
                                   6025  *   AUTO DRIVER CHANNEL TERMINATION, WRITE.
                                   6026  *   START AUTO DRIVER CHANNEL READ (ECHO TEST).
                                   6027  *
0055B4      D234 000A              6028  TTYPH4  STB    STAT,STATUS(DDBADR) SAVE STATUS
0055B8      9576                   6029          EPSR   R7,R6              LOOK AT CONDITION CODES
0055BA      4330 802E  =0055FC     6030          BFC    3,TTY4L2           B IF EXECUTE CLEAR
0055BE      4220 8022  =0055F4     6031          BTC    2,TTY4L1           B IF BUFFER LIMIT
                                   6032  *   BAD STATUS INTERRUPT
0055C2      418C 1FFC              6033          BAL    R8,ERRGET
0055C6      C880 8021              6034          LHI    R8,X'8021'         BREAK KEY ERROR
0055CA      4087 0000              6035          STH    R8,0(R7)
0055CE      4027 0002              6036          STH    DEV,2(R7)          DEVICE ADDRESS
0055D2      4037 0004              6037          STH    STAT,4(R7)         STATUS
                                   6038  *   WAIT FOR BREAK TO GO AWAY
0055D6      9D23                   6039          SSR    DEV,STAT
0055D8      C330 0020              6040          THI    STAT,X'20'         TEST BREAK STATUS
0055DC      2033       =000003     6041          BTBS   3,3                B IF BREAK BIT SET
0055DE      4180 2034              6042          BAL    R8,ERRENQ          QUEUE ERROR FOR PRINT
0055E2      0000                   6043          DC     H'0'               SHOULDN'T RETURN FROM EPRQ ON CONSOL
0055E4      2468                   6044  TTY4L1  LIS    R6,EXECBIT         CLEAR EXECUTE
0055E6      7665 0000              6045          RBT    R6,CCW(R5)
0055EA      1800                   6046          LPSWR  OLDPSW             WAIT FOR LAST INTERRUPT
                                   6047  *   SET UP CCB FOR READ
0055EC      2467                   6048  TTY4L2  LIS    R6,DEVCNTL2        CLEAR ERROR PRINT FLAG
0055EE      7664 0000              6049          RBT    R6,DSPFLGS(DDBADR)
0055F2      C860 0014              6050          LHI    R6,PHASE.5         SET NEXT PHASE = 5
0055F6      4064 0002              6051          STH    R6,PHASE(DDBADR)
0055FA      5864 0040              6052          L      R6,BUF2END(DDBADR)  READ BUFFER END FROM
0055FE      5065 0004              6053          ST     R6,BUFOEADR(R5)    DDB TO CCB
005602      5874 003C              6054          L      R7,BUF2STRT(DDBADR)
005606      0B76                   6055          SR     R7,R6              NEGATIVE BYTE COUNT
005608      4075 0002              6056          STH    R7,BUFOCNT(R5)     INTO CCB
00560C      C870 A581              6057          LHI    R7,X'A581'         MASK, FAST READ
005610      4075 0000              6058          STH    R7,CCW(R5)         SET UP COMMAND WORD
005614      DF20 3438              6059          OC     DEV,TTYRDCMD       GO TO READ MODE
005618      1800                   6060          LPSWR  OLDPSW             WAIT FOR READ TO FINISH
                                   6061  *
                                   6062  *   AUTO DRIVER CHANNEL TERMINATION, READ.
```

TELETYPE DRIVER

```
                                  6063   *   START AUTO DRIVER CHANNEL WRITE (ECHO TEST).
                                  6064   *
00561A      D234 000A             6065   TTYPH5   STB    STAT,STATUS(DDBADR) SAVE STATUS
00561E      9576                   6066            EPSR   R7,R6               LOOK AT CONDITION CODES
005620      4220 8022 =005646     6067            BTC    2,TTY5L1            B IF BUFFER LIMIT
                                  6068   *   NON BUFFER LIMIT TERMINATIONS ARE ABNORMAL
005624      4180 1FFC             6069            BAL    R8,ERRGET
005628      C860 8021             6070            LHI    R8,X'8021'          BREAK KEY ERROR
00562C      4087 0000             6071            STH    R8,0(R7)
005630      4027 0002             6072            STH    DEV,2(R7)           DEVICE ADDRESS
005634      4037 0004             6073            STH    STAT,4(R7)          STATUS
                                  6074   *   WAIT FOR BREAK TO GO AWAY
005638      9D23                   6075            SSR    DEV,STAT
00563A      C330 0020             6076            THI    STAT,X'20'          TEST BREAK STATUS
00563E      2033      =000003     6077            BTBS   3,3                 B IF BREAK BIT SET
005640      4180 2034             6078            BAL    R8,ERRENQ           QUEUE ERROR FOR PRINT
005644      0000                   6079            DC     H'0'               NO RETURN FROM CONSOLE ERROR
                                  6080   *   SET UP CCB TO ECHO WHAT WAS READ
005646      C860 0010             6081   TTY5L1   LHI    R6,PHASE.4          SET NEXT PHASE =4
00564A      4064 0002             6082            STH    R6,PHASE(DDBADR)
00564E      5864 0040             6083            L      R6,BUF2END(DDBADR)
005652      5874 003C             6084            L      R7,BUF2STRT(DDBADR)
005656      0B76                   6085            SR     R7,R6               NEGATIVE BYTE COUNT
005658      4075 0002             6086            STH    R7,BUF0CNT(R5)      INTO CCB
00565C      C870 2585             6087            LHI    R7,X'2585'          MASK, FAST WRITE
005660      4075 0000             6088            STH    R7,CCW(R5)          SET UP COMMAND WORD
005664      DE20 3437             6089            OC     DEV,TTYOUT          DON'T ALLOW QUEUED INTERRUPTS
005668      DE20 3439             6090            OC     DEV,TTYWTCMD        WRITE MODE
00566C      2470                   6091            LIS    R7,0                OUTPUT NULL TO START
00566E      9A27                   6092            WDR    DEV,R7              A.D.C.
005670      1800                   6093            LPSWR  OLDPSW              WAIT FOR WRITE TO FINISH
```

PASLA DRIVER

```
                                    6095  *  BASIC DRIVER FOR PASLA INTERFACE, AND SPECIAL PHASES (2 & 3)      *
                                    6096  * FOR CONSOLE SUPPORT.                                               *
                                    6097  *                                                                    *
                                    6098  *ASSUMPTIONS:                                                        *
                                    6099  *   1) PASLA IS STRAPPED FOR FULL DUPLEX.                            *
                                    6100  *OPTIONS SELECTED:  (MODIFY 'PASCMND2' TO CHANGE THESE OPTIONS)      *
                                    6101  *   1) CLKB                                                          *
                                    6102  *   2) 7 DATA BITS                                                   *
                                    6103  *   3) 1 STOP BIT                                                    *
                                    6104  *   4) EVEN PARITY                                                   *
                                    6105  *
                                    6106  *  PRIMARY ENTRY AND PHASE DISPATCH
005674                              6107         ALIGN  4
005674     0000 568C                6108  PASPTR  DC     A(PASPH0)
005678     0000 552E                6109          DC     A(PASPH1)           A.D.C. START, WRITE
00567C     0000 56B2                6110          DC     A(PASPH2)           STATUS LOOP READ (CONSOLE)
005680     0000 56C6                6111          DC     A(PASPH3)           STATUS LOOP WRITE (CONSOLE)
005684     0000 56E4                6112          DC     A(PASPH4)           A.D.C. END, WRITE; START READ
005688     0000 5754                6113          DC     A(PASPH5)           A.D.C. END, READ; START WRITE

00568C     0000                     6115  PASPH0  DC     H'0'                NOT CODED
                                    6116  *
                                    6117  *  AUTO DRIVER CHANNEL START, WRITE (ACTIVITY  AND ERROR PRINT)       *
                                    6118  *                                                                    *
           0000 552E                6119  PASPH1  EQU    TTYPH1              COMMON CODE
00568E     C620 0001                6120  PASP1L1 OHI    DEV,1               SELECT TRANSMITTER ADDRESS
005692     1121                     6121          SLLS   DEV,1               HALFWORD INDEX
005694     E675 0001                6122          LA     R7,CCWFLGS(R5)      ADDRESS OF CCW FLAG FIELD
005698     4072 00D0                6123          STH    R7,X'D0'(DEV)       INTO SERVICE TABLE
00569C     4042 28D8                6124          STH    DDBADR,DDBLKUP(DEV) XMITTER INTO LOOKUP TABLE
0056A0     1021                     6125          SRLS   DEV,1               PUT BACK ADDRESS
                                    6126  *  WRITE MODE, FORCE INTERRUPT TO START
0056A2     2461                     6127          LIS    R6,BUSY             SET BUSY FOR INTRUPT HANDLER
0056A4     7564 0000                6128          SBT    R6,DSPFLGS(DDBADR)
0056A8     DE20 346C                6129          OC     DEV,PASWTCMD        ENABLE,WRITE
0056AC     2470                     6130          LIS    R7,0                OUTPUT NULL TO START
0056AE     9A27                     6131          WDR    DEV,R7              QUEUE INTERRUPT
0056B0     0300                     6132          BR     R0                  RETURN TO CALLER
                                    6133  *                                                                    *
                                    6134  *  CONSOLE SUPPORT STATUS LOOP READ                                  *
                                    6135  *                                                                    *
0056B2     DE20 3467                6136  PASPH2  OC     DEV,PASINCMD        DISARM, READ
0056B6     9B25                     6137          RDR    DEV,R5              DUMMY
0056B8     DE20 3468                6138          OC     DEV,PASRQ2S
0056BC     DD24 000A                6139  PAS2L1  SS     DEV,STATUS(DDBADR)  WAIT FOR A CHARACTER
0056C0     2082       =0056BC       6140          BTBS   8,PAS2L1            B IF BUSY
0056C2     9B25                     6141          RDR    DEV,R5              READ THE CHARACTER
0056C4     0300                     6142          BR     R0                  RETURN
                                    6143  *                                                                    *
                                    6144  *  CONSOLE SUPPORT STATUS LOOP WRITE                                 *
                                    6145  *                                                                    *
0056C6     DE20 3469                6146  PASPH3  OC     DEV,PASCMND2        SELECT PROGRAMMABLE OPTIONS
0056CA     C620 0001                6147          OHI    DEV,1               USE TRANSMITTER ADDRESS
```

PASLA DRIVER

```
0056CE     DE20 346A           6148          OC    DEV,PASOUT         WRITE
0056D2     DD24 000A           6149  PAS3L1  SS    DEV,STATUS(DDBADR) WAIT
0056D6     2082      =0056D2   6150          BTBS  8,PAS3L1
0056D8     9A25                6151          WDR   DEV,R5             OUTPUT A CHARACTER
0056DA     9D23                6152          SSR   DEV,STAT           ALLOW TO FINISH
0056DC     2081      =0000C01  6153          BTBS  8,1
0056DE     C420 FFFE           6154          NHI   DEV,-2             PUT BACK DEVICE ADDRESS
0056E2     0300                6155          BR    R0                 RETURN
                               6156  *
                               6157  *    AUTO DRIVER CHANNEL TERMINATION, WRITE.              *
                               6158  *    START A.D.C. READ (ECHO TEST).                       *
                               6159  *                                                         *
0056E4     4924 0008           6160  PASPH4  CH    DEV,DEVADR(DDBADR) XMITTER?
0056E8     4330 8068 =005754   6161          BE    PASPH5             B IF NO
0056EC     D234 000A           6162          STB   STAT,STATUS(DDBADR) SAVE STATUS
0056F0     9576                6163          EPSR  R7,R6              LOOK AT CONDITION CODES
0056F2     233B      =005708   6164          BFCS  3,PAS4L2           B IF EXECUTE CLEAR
0056F4     2126      =005700   6165          BTCS  2,PAS4L1           B IF BUFFER LIMIT
                               6166  * BAD STATUS TERMINATION.   WHAT DO WE DO NOW????
0056F6     DE20 346D           6167          OC    DEV,PASDSARM       NO INTRUPTS FROM XMITTER
0056FA     41B0 EDCC =0044CA   6168          BAL   R11,BSTATERR       BAD STATUS ERROR
0056FE     0000                6169          DC    H'0'               SHOULDN'T RETURN
                               6170  * BUFFER LIMIT
005700     2469                6171  PAS4L1  LIS   R6,EXECBIT         CLEAR EXECUTE
005702     7665 0000           6172          RBT   R6,CCW(R5)
005706     1800                6173          LPSWR OLDPSW             WAIT FOR LAST INTERRUPT
                               6174  * SET UP CCB FOR READ (ECHO TEST)
005708     DE20 346A           6175  PAS4L2  OC    DEV,PASOUT         DISARM WRITE              POR
00570C     2467                6176          LIS   R6,DEVCNTL2        CLEAR ERROR PRINT FLAG
00570E     7664 0000           6177          RBT   R6,DSPFLGS(DDBADR)
005712     C420 FFFE           6178          NHI   DEV,-2             GET RECEIVER ADDRESS
005716     C860 0014           6179          LHI   R6,PHASE.5         SET NEXT PHASE = 5
00571A     4064 0002           6180          STH   R6,PHASE(DDBADR)
00571E     E654 0064           6181          LA    R5,CCB2ADR(DDBADR) ADDRESS RECEIVER CCB
005722     5864 0040           6182          L     R6,BUF2END(DDBADR) READ BUFFER FROM
005726     5065 0004           6183          ST    R6,BUFOEADR(R5)    DDB TO CCB
00572A     5874 C03C           6184          L     R7,BUF2STRT(DDBADR)
00572E     0B76                6185          SR    R7,R6              NEGATIVE BYTE COUNT
005730     4075 0002           6186          STH   R7,BUFOCNT(R5)     INTO CCB
005734     C870 A581           6187          LHI   R7,X'A581'         MASK, FAST READ
005738     4075 0000           6188          STH   R7,CCW(R5)         SET UP COMMAND WORD
00573C     E670 0FF8           6189          LA    R7,INTRUPT         FIRST LEVEL INTRUPT HANDLER
005740     4075 0014           6190          STH   R7,SUBADR(R5)      IS TERMINATION ROUTINE
005744     E675 0001           6191          LA    R7,CCWFLGS(R5)     ADDRESS OF CCW FLAG FIELD
005748     4072 4200 00DC      6192          STH   R7,X'D0'(DEV,DEV)  INTO SERVICE TABLE
00574E     DE20 346B           6193          OC    DEV,PASRDCMD       GO TO READ MODE
005752     1800                6194          LPSWR OLDPSW             RETURN
                               6195  *
                               6196  *  AUTO DRIVER CHANNEL TERMINATION, READ.              *
                               6197  *  START A.D.C. WRITE (ECHO TEST).                     *
                               6198  *                                                      *
                               6199  *  BECAUSE OF QUEUED INTERRUPTS, MAY ENTER HERE (VIA PHASE 4) FOR
                               6200  *  NON AUTO DRIVER CHANNEL INTERRUPTS.      BEWARE !!!!!
```

PASLA DRIVER

```
005754    D234 000A            6201  PASPH5   STB     STAT,STATUS(DDBADR)  SAVE STATUS
005758    9576                 6202           EPSR    R7,R6                LOOD AT CONDITION CODES
00575A    4220 8026 =005784    6203           BTC     2,PAS5L1             P IF BUFFER LIMIT
                               6204  *  NON BUF LIMIT MAY BE BREAK
00575E    9828                 6205           RDR     DEV,R8               GET CHAR WHICH CAUSED TERMINATION
005760    0888                 6206           LR      R8,R8                NULL = ZERO = BREAK
005762    4230 801E =005784    6207           BNZ     PAS5L1               B IF NOT BREAK
005766    4180 1FFC            6208           BAL     R8,ERRGET
00576A    C880 8021            6209           LHI     R8,X'8021'           BREAK KEY ERROR
00576E    4087 0000            6210           STH     R8,0(R7)
005772    4027 0002            6211           STH     DEV,2(R7)            DEVICE ADDRESS
005776    4037 0004            6212           STH     STAT,4(R7)           STATUS
00577A    9D23                 6213           SSR     DEV,STAT             WAIT FOR BREAK TO GO AWAY
00577C    2281      =000001    6214           BFBS    8,1
00577E    4180 2034            6215           BAL     R8,ERRENQ            QUEUE ERROR FOR PRINT
005782    0000                 6216           DC      H'0'                 NO RETURN FROM CONSOLE ERROR
                               6217  *  SET UP TO ECHO WHAT WAS READ
005784    C860 0010            6218  PAS5L1   LHI     R6,PHASE.4           SET NEXT PHASE = 4
005788    4064 0002            6219           STH     R6,PHASE(DDBADR)     *
00578C    2467                 6220           LIS     R6,DEVCNTL2          *                    R04
00578E    7664 0000            6221           RBT     R6,DSPFLGS(DDBADR)   *                    R04
005792    1800                 6222           LPSWR   OLDPSW               *                    R04
005794                         6223           IFNZ    PAPRTAPE
```

PAPER TAPE READER/PUNCH DRIVER

```
                                        6225  *    HIGH SPEED PAPER TAPE READER AND PUNCH DRIVER.  INCLUDES LOGIC   *
                                        6226  * FOR READER ONLY, PUNCH ONLY, AND BOTH READER AND PUNCH TOGETHER.    *
                                        6227  *
                                        6228  *    PRIMARY ENTRY AND PHASE DISPATCH
005794                                  6229         ALIGN 4
005794      0000 57B0                   6230  PTRPPTR DC    A(PTRPPH0)           INITIALIZE, WAIT DU
005798      0000 57F8                   6231         DC    A(PTRPPH1)           START PUNCH IF SELECTED
00579C      0000 582A                   6232         DC    A(PTRPPH2)           PUNCH INTERRUPTS
0057A0      0000 5876                   6233         DC    A(PTRPPH3)           LAST PUNCH INTERRUPT
0057A4      0000 589C                   6234         DC    A(PTRPPH4)           START READER IF SELECTED
0057A8      0000 58E2                   6235         DC    A(PTRPPH5)           READER INTERRUPTS
0057AC      0000 5950                   6236         DC    A(PTRPPH6)           COMPARE
                                        6237  *
                                        6238  *    INITIALIZATION, WAIT FOR DU STATUS TO CLEAR                       *
                                        6239  *
0057B0      4824 0008                   6240  PTRPPH0 LH    DEV,DEVADR(DDBADR)
0057B4      2454                         6241         LIS   R5,PHASE.1
0057B6      4054 0002                   6242         STH   R5,PHASE(DDBADR)     NEXT PHASE IS ONE UNLESS ERROR
0057BA      2466                         6243         LIS   R6,DEVCNTL1          TEST READER SELECT
0057BC      7454 0000                   6244         TBT   R6,DSPFLGS(DDBADR)
0057C0      233C      =0057D8           6245         BZS   PTRPOL1              B IF NOT SELECTED
0057C2      DE20 343A                   6246         OC    DEV,PTRSTOP          STOP, READER SELECTED
0057C6      9D23                         6247         SSR   DEV,STAT
0057C8      D234 000A                   6248         STB   STAT,STATUS(DDBADR)  SAVE STATUS FOR USER
0057CC      2316      =0057D8           6249         BFCS  1,PTRPOL1            B IF DU CLEAR
0057CE      41B0 ECF8 =0044CA           6250         BAL   R11,BSTATERR         BAD STATUS ERROR
0057D2      2450                         6251         LIS   R5,0                 HANG IN PHASE ZERO
0057D4      4054 0002                   6252         STH   R5,PHASE(DDBADR)
0057D8      2467                         6253  PTRPOL1 LIS   R6,DEVCNTL2          TEST PUNCH SELECT
0057DA      7464 0000                   6254         TBT   R6,DSPFLGS(DDBADR)
0057DE      233C      =0057F6           6255         BZS   PTRPOL2              B IF NOT SELECTED
0057E0      DE20 343C                   6256         OC    DEV,PTPSTOP          STOP, PUNCH SELECTED
0057E4      9D23                         6257         SSR   DEV,STAT
0057E6      D234 000A                   6258         STB   STAT,STATUS(DDBADR)  SAVE STATUS FOR USER
0057EA      2316      =0057F6           6259         BFCS  1,PTRPOL2            B IF DU CLEAR
0057EC      41B0 ECDA =0044CA           6260         BAL   R11,BSTATERR         BAD STATUS ERROR
0057F0      2450                         6261         LIS   R5,0                 HANG IN PHASE ZERO
0057F2      4054 0002                   6262         STH   R5,PHASE(DDBADR)
0057F6      0300                         6263  PTRPOL2 BR    R0                   RETURN
                                        6264  *
                                        6265  *    START PUNCH IF SELECTED, ELSE GO TO PHASE 4
                                        6266  *
0057F8      4824 0008                   6267  PTRPPH1 LH    DEV,DEVADR(DDBADR)
0057FC      2457                         6268         LIS   R5,DEVCNTL2          IS PUNCH SELECTED?
0057FE      7454 0000                   6269         TBT   R5,DSPFLGS(DDBADR)
*005802     2136      =00580E           6270         BNZ   PTRP1L1              B IF YES
005804      C850 0010                   6271         LHI   R5,PHASE.4           NO PUNCH, NEXT PHASE IS 4
005808      4054 0002                   6272         STH   R5,PHASE(DDBADR)
00580C      0300                         6273         BR    R0                   RETURN
00580E      5854 0030                   6274  PTRP1L1 L     R5,BUF1STRT(DDBADR)  START BYTE IS
005812      5054 0038                   6275         ST    R5,BUF1NEXT(DDBADR)  NEXT BYTE
005816      C850 001E                   6276         LHI   R5,30                LEADER REPEAT COUNT, FIRST BYTE
00581A      5054 0028                   6277         ST    R5,DVRWRK1(DDBADR)
```

PAPER TAPE READER/PUNCH DRIVER

```
00581E      2458                    6278          LIS  R5,PHASE.2          NEXT PHASE IS 2, PUNCH INTERRUPTS
005820      D360 343D               6279          LB   R6,PTPON            START PUNCH
005824      41B0 ECBC  =0044F4      6280          BAL  R11,STARTIO
005828      0300                    6281          BR   R0                  RETURN
                                    6282   *
                                    6283   *  PUNCH INTERRUPT HANDLER
                                    6284   *
00582A      2450                    6285   PTRPPH2 LIS  R5,0               GOT INTERRUPT,
00582C      5054 0014               6286          ST   R5,CURWAIT(DDBADR)  CLEAR COUNT
005830      D234 000A               6287          STB  STAT,STATUS(DDBADR) SAVE STATUS
005834      C330 0001               6288          THI  STAT,X'1'           TEST DU
005838      2334       =00584C      6289          BZS  PTRP2L1             B IF ALL OK
00583A      2450                    6290          LIS  R5,0                HANG IN PHASE ZERO FOR DU
00583C      4054 0002               6291          STH  R5,PHASE(DDBADR)
005840      2451                    6292          LIS  R5,BUSY             CLEAR BUSY
005842      7654 0000               6293          RBT  R5,DSPFLGS(DDBADR)
005846      DE20 343C               6294          OC   DEV,PTPSTOP         STOP PUNCH
00584A      1800                    6295          LPSWR OLDPSW             RETURN
00584C      5864 0038               6296   PTRP2L1 L    R6,BUF1NEXT(DDBADR) SEND NEXT BYTE TO PUNCH
005850      DA26 0000               6297          WD   DEV,0(R6)
005854      5874 0028               6298          L    R7,DVRWRK1(DDBADR)  DOING LEADER?
005858      2123       =00586E      6299          BPS  PTRP2L2             B IF YES
00585A      2661                    6300          AIS  R6,1                INCREMENT BUF POINTER
00585C      5064 0038               6301          ST   R6,BUF1NEXT(DDBADR)
005860      5964 0034               6302          C    R6,BUF1END(DDBADR)  AT END OF BUFFER?
005864      2328       =005874      6303          BNPS PTRP2L3             B IF NO
005866      245C                    6304          LIS  R5,PHASE.3          PHASE THREE HANDLES LAST INTERRUPT
005868      4054 0002               6305          STH  R5,PHASE(DDBADR)
00586C      2304       =005874      6306          BS   PTRP2L3
00586E      2771                    6307   PTRP2L2 SIS  R7,1               COUNT ANOTHER BYTE
005870      5074 0028               6308          ST   R7,DVRWRK1(DDBADR)
005874      1800                    6309   PTRP2L3 LPSWR OLDPSW            RETURN
                                    6310   *
                                    6311   *  LAST PUNCH INTERRUPT
                                    6312   *
005876      2450                    6313   PTRPPH3 LIS  R5,0               GOT INTERRUPT,
005878      5054 0014               6314          ST   R5,CURWAIT(DDBADR)  CLEAR COUNT
00587C      D234 000A               6315          STB  STAT,STATUS(DDBADR) SAVE STATUS
005880      C850 0010               6316          LHI  R5,PHASE.4          NEXT PHASE IS 4 IF ALL OK
005884      C330 0001               6317          THI  STAT,X'1'           TEST DU
005888      2332       =00588C      6318          BZS  PTRP3L1             B IF ALL OK
00588A      2450                    6319          LIS  R5,0                HANG IN PHASE ZERO FOR DU
00588C      4054 0002               6320   PTRP3L1 STH  R5,PHASE(DDBADR)   SET PHASE ACCORDING TO ABOVE
005890      2451                    6321          LIS  R6,BUSY             CLEAR BUSY
005892      7654 0000               6322          RBT  R6,DSPFLGS(DDBADR)
005896      DE20 343C               6323          OC   DEV,PTPSTOP         STOP PUNCH
00589A      1800                    6324          LPSWR OLDPSW             RETURN
                                    6325   *
                                    6326   *  START READER IF SELECTED, ELSE GO TO PHASE 1
                                    6327   *
00589C      4824 0008               6328   PTRPPH4 LH   DEV,DEVADR(DDBADR)
0058A0      2456                    6329          LIS  R5,DEVCNTL1         IS READER SELECTED
0058A2      7454 0000               6330          TBT  R5,DSPFLGS(DDBADR)
```

PAPER TAPE READER/PUNCH DRIVER

```
0058A6    2135      =0058BC    6331           BNZS  PTRP4L1           B IF YES
0058A9    2454                 6332           LIS   R5,PHASE.1
0058AA    4054 0002            6333           STH   R5,PHASE(DDBADR)  NO READER, NEXT PHASE IS ONE
0058AE    0300                 6334           BR    R0                RETURN
0058B0    5854 003C            6335  PTRP4L1  L     R5,BUF2STRT(DDBADR) START
0058B4    2461                 6336           LIS   R6,1              BY 1
0058B6    5874 0040            6337           L     R7,BUF2END(DDBADR)  TO END
0058BA    2480                 6338           LIS   R8,0
0058BC    D285 0000            6339  PTRP4L2  STB   R8,0(R5)          CLEAR READ DATA BUFFER
0058C0    C150 FFF8 =0058BC    6340           BXLE  R5,PTRP4L2
0058C4    5854 003C            6341           L     R5,BUF2STRT(DDBADR) FIRST BYTE IS
0058C8    2651                 6342           AIS   R5,1              ONE PAST START SINCE
0058CA    5054 0044            6343           ST    R5,BUF2NEXT(DDBADR) ZERO SLOT IS LEADER
0058CE    2551                 6344           LCS   R5,1              CLEAR LEADER FLAG
0058D0    5054 0028            6345           ST    R5,DVRWRK1(DDBADR)
0058D4    C850 0014            6346           LHI   R5,PHASE.5        NEXT PHASE IS 5, READER INTERRUPTS
0058D8    D360 343B            6347           LB    R6,PTRON          START READER
0058DC    4130 EC04 =0044F4    6348           BAL   R11,STARTIO
0058E0    0300                 6349           BR    R0                RETURN
                              6350     *
                              6351     *  PAPER TAPE READER INTERRUPT HANDLER
                              6352     *
0058E2    2450                 6353  PTRPPH5  LIS   R5,0              GOT INTERRUPT,
0058E4    5054 0014            6354           ST    R5,CURWAIT(DDBADR) CLEAR COUNT
0058E8    D234 000A            6355           STB   STAT,STATUS(DDBADR) SAVE STATUS
0058EC    C330 0001            6356           THI   STAT,X'1'         CHECK DU
0058F0    233A      =005904    6357           BZS   PTRP5L1           B IF STATUS OK
0058F2    2450                 6358           LIS   R5,0              HANG IN PHASE 0 IF DU
0058F4    4054 0002            6359           STH   R5,PHASE(DDBADR)
0058F8    2451                 6360           LIS   R5,BUSY           CLEAR BUSY
0058FA    7654 0000            6361           RBT   R5,DSPFLGS(DDBADR)
0058FE    DE20 343A            6362           OC    DEV,PTRSTOP       STOP READER
005902    1800                 6363           LPSWR OLDPSW            RETURN
005904    9B25                 6364  PTRP5L1  RDR   DEV,R5            READ A BYTE
005906    5864 0028            6365           L     R6,DVRWRK1(DDBADR) TEST LEADER FLAG
00590A    2317      =005918    6366           BNMS  PTRP5L1B          AT OR PASS LEADER
00590C    0855                 6367           LR    R5,R5             WAIT FOR LEADER
00590E    2134      =005916    6368           BNZS  PTRP5L1A
005910    2450                 6369           LIS   R5,0              CLEAR LEADER FLAG
005912    5054 0028            6370           ST    R5,DVRWRK1(DDBADR)
005916    1800                 6371  PTRP5L1A LPSWR OLDPSW            EXIT
005918    2124      =005920    6372  PTRP5L1B BPS   PTRP5L2
00591A    0855                 6373           LR    R5,R5
00591C    2132      =005920    6374           BNZS  PTRP5L2
00591E    1800                 6375           LPSWR OLDPSW
005920    2661                 6376  PTRP5L2  AIS   R6,1
005922    5064 0028            6377           ST    R6,DVRWRK1(DDBADR) BUMP LEADER FLAG, BYTE COUNT
005926    5864 0044            6378           L     R6,BUF2NEXT(DDBADR)
00592A    D256 0000            6379           STB   R5,0(R6)          PUT BYTE INTO BUFFER
00592E    2661                 6380           AIS   R6,1              INCREMENT POINTER
005930    5064 0044            6381           ST    R6,BUF2NEXT(DDBADR)
005934    5964 0040            6382           C     R6,BUF2END(DDBADR) IS BUFFER FULL?
005938    2122      =00593C    6383           BPS   PTRP5L3           B IF YES
```

PAPER TAPE READER/PUNCH DRIVER

```
00593A      1800              6384           LPSWR OLDPSW                RETURN, WAIT MORE DATA
00593C      DE20 343A         6385  PTRP5L3  OC    DEV,PTRSTOP          STOP READER
005940      2451              6386           LIS   R5,BUSY             CLEAR BUSY
005942      7654 0000         6387           RBT   R5,DSPFLGS(DDBADR)
005946      C850 0018         6388           LHI   R5,PHASE.6          NEXT PHASE=6, COMPARE DATA
00594A      4054 0002         6389           STH   R5,PHASE(DDBADR)
00594E      1800              6390           LPSWR OLDPSW                RETURN
                              6391  *
                              6392  *  COMPARE DATA
                              6393  *
005950      4110 EC78 =0045CC 6394  PTRPPH6  BAL   R1,COMPARE
005954      2464              6395           LIS   R6,PHASE.1
005956      4064 0002         6396           STH   R6,PHASE(DDBADR)    NEXT PHASE IS ONE
00595A      0300              6397           BR    R0
                              6398  *
                              6399  *CKPTRP -- CHECK PAPER TAPE READ/PUNCH PARAMETERS              *
                              6400  *                                                             *
                              6401  *   CALLED BY PARM DECODE AFTER ALL PARMS HAVE BEEN INPUT. SUPPLIES *
                              6402  * DEFAULT ADDRESS 13 IF DEVADR=0.  CHECKS MNEMONIC AND SETS FLAGS   *
                              6403  * FOR READ ONLY, PUNCH ONLY, AND BOTH.                         *
                              6404  *                                                             *
00595C      4824 0008         6405  CKPTRP   LH    DEV,DEVADR(DDBADR)  DID USER SPECIFY AN ADDRESS?
005960      2135      =00596A 6406           BNZS  CKPTRP1             B IF YES
005962      C820 0013         6407           LHI   DEV,X'13'           DEFAULT ADDRESS
005966      4024 0008         6408           STH   DEV,DEVADR(DDBADR)
00596A      24B6              6409  CKPTRP1  LIS   R11,DEVCNTL1        TURN ON READER BIT
00596C      75B4 0000         6410           SBT   R11,DSPFLGS(DDBADR)
005970      24C7              6411           LIS   R12,DEVCNTL2        TURN ON PUNCH BIT
005972      75C4 0000         6412           SBT   R12,DSPFLGS(DDBADR)
005976      F9A0 5054 5020    6413           CI    R10,C'PTP '         PUNCH ONLY?
00597C      2134      =005984 6414           BNES  CKPTRP2             B IF NO
00597E      76B4 0000         6415           RBT   R11,DSPFLGS(DDBADR) TURN OFF READER BIT
005982      2307      =005990 6416           BS    CKPTRP3             EXIT
005984      F9A0 5054 5220    6417  CKPTRP2  CI    R10,C'PTR '         READER ONLY?
00598A      2133      =005990 6418           BNES  CKPTRP3             B IF NO
00598C      76C4 0000         6419           RBT   R12,DSPFLGS(DDBADR) TURN OFF PUNCH BIT
005990      07FF              6420  CKPTRP3  XR    R15,R15             RETURN CODE = 0, ALL OK
005992      030E              6421           BR    R14                 RETURN
                              6422           ENDC
005994                        6423           IFNZ  CASSETTE
                              6424           TITLE CASSETTE TAPE DRIVER
                              6425  *   INTERTAPE CASSETTE TAPE DRIVER.                            *
                              6426  *                                                             *
                              6427  *   PRIMARY ENTRY AND PHASE DISPATCH
                              6428           ALIGN 4
                              6429  CASPTR   DC    A(CASPH0)           INITIALIZATION, CLEAR
                              6430           DC    A(CASPH1)           WAIT NO MOTION, WRITE FILE MARK
                              6431           DC    A(CASPH2)           INTERRUPT AFTER FILE MARK
                              6432           DC    A(CASPH3)           START WRITE
                              6433           DC    A(CASPH4)           WRITE DATA INTERRUPTS
                              6434           DC    A(CASPH5)           EOM INTERRUPT AFTER WRITE
                              6435           DC    A(CASPH6)           BACK SPACE
                              6436           DC    A(CASPH7)           EOM INTERRUPT AFTER BACKSPACE
```

PAPER TAPE READER/PUNCH DRIVER

```
6437              DC    A(CASPH8)           START READ
6438              DC    A(CASPH9)           READ DATA INTERRUPTS, FOM INTERRUPT
6439              DC    A(CASPHA)           COMPARE DATA
6440              DC    A(CASPHB)           CLEAR, DISARMED REWIND
6441     *
6442     *  INITIALIZATION, CLEAR, WAIT FOR DU STATUS TO CLEAR
6443     *
6444     CASPH0   LH    DEV,DEVADR(DDBADR)
6445     *  COMPUTE ADDRESS OF "EXCLUSIVE" DEVICE
6446              LR    R5,DEV
6447              NHI   R5,X'3EF'           CLEAR LEAST SIGNIFICANT BIT OF
6448     *                                  SECOND HEX DIGIT (DRIVE SELECT).
6449              ST    R5,DVRWRK1(DDBADR)  SAVE FOR OTHER PHASES
6450              BAL   R8,TESTLOCK         CHECK INTERLOCK
6451              OC    DEV,CASCLEAR        OTHER DRIVE NOT BUSY, CLEAR THIS ONE
6452              SSR   DEV,STAT
6453              STB   STAT,STATUS(DDBADR) SAVE STATUS
6454              BFCS  1,CASOL1            B IF DU CLEAR
6455              BAL   R11,BSTATERR        BAD STATUS ERROR
6456              BR    R0                  RETURN, HANG IN PHASE ZERO
6457     CASOL1   LIS   R5,PHASE.1          NEXT PHASE IS ONE
6458              STH   R5,PHASE(DDBADR)
6459              LIS   R5,BADSTAT          CLEAR BAD STATUS
6460              RBT   R5,DSPFLGS(DDBADR)
6461              LIS   R5,NOTCOUNT         CLEAR NOT COUNTING
6462              RBT   R5,DSPFLGS(DDBADR)
6463              BR    R0                  RETURN
6464     *
6465     *  WRITE FILE MARK, CHECK WRITE PROTECT
6466     *
6467     CASPH1   L     R5,DVRWRK1(DDBADR)
6468              BAL   R8,TESTLOCK         CHECK INTERLOCK
6469              LH    DEV,DEVADR(DDBADR)
6470              SSR   DEV,STAT
6471              STB   STAT,STATUS(DDBADR) SAVE STATUS
6472              THI   STAT,X'10'          MOTION?
6473              BNZS  CAS1L1              B IF NO
6474              LIS   R5,NOTCOUNT         SET NOT COUNTING WHILE WE WAIT
6475              SBT   R5,DSPFLGS(DDBADR)  FOR MOTION TO GO AWAY
6476              BR    R0                  RETURN, HANG IN PHASE ONE
6477     CAS1L1   OC    DEV,CASEOF          WRITE EOF AND QUEUE INTERRUPT
6478              SSR   DEV,STAT
6479              STB   STAT,STATUS(DDBADR) SAVE STATUS
6480              BFCS  1,CAS1L2            B IF DU CLEAR
6481              LIS   R5,0
6482              STH   R5,PHASE(DDBADR)    HANG IN ZERO FOR DU
6483              BS    CAS1L3
6484     CAS1L2   THI   STAT,X'10'          MOTION?
6485              BZS   CAS1L4              B IF YES
6486              BAL   R11,BSTATERR        BAD STATUS ERROR
6487     CAS1L3   OC    DEV,DISARM          NO INTERRUPTS, WAIT GOOD STATUS
6488              BR    R0                  RETURN
6489     *  WRITE EOF STARTED OK
```

PAPER TAPE READER/PUNCH DRIVER

```
6490   CAS1L4   L      R5,DVRWRK1(DDBADR)
6491            SBT    R5,INTRLOCK           SET INTERLOCK
6492            LIS    R5,PHASE.2            PHASE TWO FOR EOM INTERRUPT
6493            LB     R6,ENABLE            ALLOW EOM INTERRUPT
6494            BAL    R11,STARTIO
6495            BR     RO                    RETURN
6496   *
6497   *   EOM AND NO MOTION INTERRUPTS AFTER END OF FILE
6498   *
6499   CASPH2   BAL    R6,MAGSTAT            CHECK INTERRUPT STATUS
6500            LB     R5,CAS2NXT(R5)       USE RC TO GET NEXT PHASE
6501            STH    R5,PHASE(DDBADR)     SET PHASE ACCORDING TO STATUS
6502            LPSWR  OLDPSW
6503   CAS2NXT  DB     PHASE.3              OK
6504            DB     PHASE.0              DU
6505            DB     PHASE.2              MOTION
6506            DB     PHASE.B              EOT
6507            DB     PHASE.3              ERR
6508            DB     *
6509   *
6510   *   START WRITE
6511   *
6512   CASPH3   L      R5,DVRWRK1(DDBADR)
6513            BAL    R8,TESTLOCK          CHECK INTERLOCK
6514            BAL    R7,MOVEBUF           MOVE BUFFER
6515            LH     DEV,DEVADR(DDBADR)
6516            SSR    DEV,STAT
6517            STB    STAT,STATUS(DDBADR)  SAVE STATUS
6518            BFCS   1,CAS3L1             B IF DU CLEAR
6519            LIS    R5,0
6520            STH    R5,PHASE(DDBADR)     HANG IN ZERO FOR DU
6521            BR     RO                    RETURN
6522   CAS3L1   L      R6,BUF1STRT(DDBADR)  FIRST BYTE IS
6523            ST     R6,BUF1NEXT(DDBADR)  NEXT BYTE
6524            L      R5,DVRWRK1(DDBADR)
6525            SBT    R5,INTRLOCK          SET INTERLOCK
6526            LHI    R5,PHASE.4           PHASE 4 FOR DATA INTERRUPTS
6527            LB     R6,CASWRT
6528            BAL    R11,STARTIO
6529            BR     RO                    RETURN
6530   *
6531   *   WRITE DATA INTERRUPTS
6532   *
6533   CASPH4   LIS    R5,0                 GOT INTERRUPT, CLEAR COUNT
6534            ST     R5,CURWAIT(DDBADR)
6535            STB    STAT,STATUS(DDBADR)  SAVE STATUS
6536            THI    STAT,X'ED'           POSSIBLE ERROR?
6537            BNZ    CAS4L1               B IF YES
6538            L      R5,BUF1NEXT(DDBADR)
6539            WD     DEV,0(R5)            SEND OUT NEXT BYTE
6540            AIS    R5,1                 ADVANCE POINTER
6541            ST     R5,BUF1NEXT(DDBADR)  AND SAVE
6542            C      R5,BUF1END(DDBADR)   AT END OF BUFFER?
```

PAPER TAPE READER/PUNCH DRIVER

```
5543                BNPS   CAS4L3              B IF NO
5544                LHI    R5,PHASE.5
5545                STH    R5,PHASE(DDBADR)    PHASE 5 FOR EOM AND NMTN
6546   CAS4L3       LPSWR  OLDPSW              RETURN
6547   CAS4L1       BAL    R6,MAGSTAT          CHECK INTERRUPT STATUS
6548                LB     R5,CAS4NXT(R5)      USE PC TO GET NEXT PHASE
6549                STH    R5,PHASE(DDBADR)    NEXT PHASE ACCORDING TO STATUS
6550                LPSWR  OLDPSW              RETURN
6551   CAS4NXT      DB     PHASE.0             OK ?? SHOULD NEVER OCCUR HERE
6552                DB     PHASE.0             DU
6553                DB     PHASE.5             MOTION
6554                DB     PHASE.B             EOT
6555                DB     PHASE.3             ERR
6556                DB     *
6557   *
6558   *   EOM AND NO MOTION INTERRUPTS AFTER WRITE
6559   *
6560   CASPH5       BAL    R6,MAGSTAT          CHECK INTERRUPT STATUS
6561                LB     R5,CAS5NXT(R5)      USE PC TO GET NEXT PHASE
6562                STH    R5,PHASE(DDBADR)    NEXT PHASE ACCORDING TO STATUS
6563                LPSWR  OLDPSW              RETURN
6564   CAS5NXT      DB     PHASE.6             OK
5565                DB     PHASE.0             DU
6566                DB     PHASE.5             MOTION
6567                DB     PHASE.B             EOT
6568                DB     PHASE.3             ERR
5569                DB     *
6570   *
6571   *   BACKSPACE ONE RECORD
6572   *
6573   CASPH6       L      R5,DVRWRK1(DDBADR)
6574                BAL    R8,TESTLOCK         CHECK INTERLOCK
6575                LH     DEV,DEVADR(DDBADR)
6576                SSR    DEV,STAT
6577                STB    STAT,STATUS(DDBADR) SAVE STATUS
6578                BFCS   1,CAS6L1            B IF DU CLEAR
6579                LIS    R5,0
6580                STH    R5,PHASE(DDBADR)    HANG ZERO FOR DU
6581                BR     R0                  RETURN
6582   CAS6L1       L      R5,DVRWRK1(DDBADR)
6583                SBT    R5,INTRLOCK         SET INTERLOCK
6584                LHI    R5,PHASE.7          PHASE 7 FOR EOM INTERRUPTS
6585                LB     R6,CASBKSPC
6586                BAL    R11,STARTIO
6587                BR     R0                  WAIT
6588   *
6589   *   EOM AND NO MOTION INTERRUPTS AFTER BACKSPACE
6590   *
6591   CASPH7       BAL    R6,MAGSTAT          CHECK INTERRUPT STATUS
6592                LB     R5,CAS7NXT(R5)      USE PC TO GET NEXT PHASE
6593                STH    R5,PHASE(DDBADR)    NEXT PHASE ACCORDING TO STATUS
6594                LPSWR  OLDPSW              RETURN
6595   CAS7NXT      DB     PHASE.8             OK
```

```
6596                DB      PHASE.0                 DU
6597        .       DB      PHASE.7                 MOTION
6598                DB      PHASE.B                 EOT
6599                DB      PHASE.8                 ERR
6600                DB      *
6601        *
6602        *   START READ
6603        *
6604    CASPH8      L       R5,DVRWRK1(DDBADR)
6605                BAL     R8,TFSTLOCK             CHECK INTERLOCK
6606                LH      DEV,DEVADR(DDBADR)
6607                SSR     DEV,STAT
6608                STB     STAT,STATUS(DDBADR)     SAVE STATUS
6609                BFCS    1,CAS8L1                B IF DU CLEAR
6610                LIS     R5,0
6611                STH     R5,PHASE(DDBADR)        HANG IN ZERO FOR DU
6612                BR      R0                      RETURN
6613    CAS8L1      L       R5,DVRWRK1(DDBADR)
6614                SBT     R5,INTRLOCK             SET INTERLOCK
6615                LHI     R5,PHASE.9              SET PHASE 9 FOR READ INTERRUPTS
6616                LB      R6,CASREAD
6617                BAL     R11,STARTIO
6618                BR      R0                      RETURN
6619        *
6620        *   READ DATA INTERRUPTS
6621        *
6622    CASPH9      STB     STAT,STATUS(DDBADR)     SAVE STATUS
6623                THI     STAT,X'ED'              POSSIBLE ERROR?
6624                BNZ     CAS9L1                  B IF YES
6625                L       R6,BUF2NEXT(DDBADR)     POINTER TO NEXT BUFFER POSITION
6626                C       R6,BUF2END(DDBADR)      LAST ADDRESS OF BUFFER
6627                BPS     CAS9L1                  AT END OF BUFFER
6628                RD      DEV,0(R6)               READ DATA INOT BUFFER
6629                AIS     R6,1                    INCREMENT BY 1
6630                ST      R6,BUF2NFXT(DDBADR)
6631                LIS     R5,0                    GOT INTERRUPT, CLEAR COUNT
6632                ST      R5,CURWAIT(DDBADR)
6633                LPSWR   OLDPSW                  WAIT FOR MORE DATA
6634    CAS9L1      BAL     R6,MAGSTAT              CHECK INTERRUPT STATUS
6635                LB      R5,CAS9NXT(R5)          USE RC TO GET NEXT PHASE
6636                STH     R5,PHASE(DDBADR)        NEXT PHASE ACCORDING TO STATUS
6637                LPSWR   OLDPSW                  RETURN
6638    CAS9NXT     DB      PHASE.A                 OK
6639                DB      PHASE.A                 DU
6640                DB      PHASE.9                 MOTION
6641                DB      PHASE.B                 EOT
6642                DB      PHASE.3                 ERR
6643                DB      *
6644        *
6645        *   COMPARE DATA
6646        *
6647    CASPHA      BAL     R1,COMPARE
6648                BAL     R11,MBUFCLR             CLEAR MOVED BUFFER
```

PAPER TAPE READER/PUNCH DRIVER

```
              6649              LIS     R6,PHASE.3          NEXT PHASE IF 3, WRITE
              6650              STH     R6,PHASE(DDBADR)
              6651              BR      R0                  RETURN
              6652      *
              6653      *  EOT HANDLER, DISARMED REWIND
              6654      *
              6655      CASPHB   L      R5,DVRWRK1(DDBADR)
              6656               BAL    R8,TESTLOCK         CHECK INTERLOCK
              6657               LH     DEV,DEVADR(DDBADR)
              6658               OC     DEV,CASCLEAR        RESET INTERFACE
              6659               LIS    R5,PHASE.1          PHASE ONE WAITS NO MOTION
              6660               STH    R5,PHASE(DDBADR)
              6661               OC     DEV,CASREWND        DISARMED REWIND
              6662               BR     R0                  RETURN
              6663               SPACE 2
              6664      *CKCAS -- CHECK CASSETTE TAPE PARAMETERS                              *
              6665      *                                                                    *
              6666      *    CALLED BY PARM DECODE.  SUPPLIES DEFAULT ADDRESS 45 IF           *
              6667      * DEVADR = 0.                                                         *
              6668      *                                                                    *
              6669      CKCAS    XR     R15,R15             RETURN CODE = 0, ALL OK
              6670               LH     DEV,DEVADR(DDBADR)  DID USER GIVE ADDRESS?
              6671               BNZR   R14                 B IF YES, RETURN
              6672               LHI    DEV,X'45'           DEFAULT ADDRESS
              6673               STH    DEV,DEVADR(DDBADR)  INTO DDB
              6674               BR     R14                 RETURN
              6675               ENDC
005994        6676               IFNZ   DISCS+DSK40MB
```

```
                                6678  *     DISC DRIVER FOR 2.5, 10 AND 40 MEGA BYTE DISC SYSTEMS.        *
                                6679  *  THE DEVCNTL1 FLAG IS USED TO INDICATE A 40 MEGA BYTE DISC.       *
                                6680  * THE 2.5 AND 10 MEGA BYTE SYSTEMS ARE PROGRAMED THE SAME, EXCEPT   *
                                6681  * FOR THE 10 MEGA BYTE SYSTEM TRACKS 0 AND 1 ARE USED TO TEST THE    *
                                6682  * REMOVABLE CARTRIDGE; TRACKS 2 AND 3 ARE USED TO TEST THE FIXED     *
                                6683  * DISC AT DEVICE ADDRESS DEVADR+1.  ALL RANGES OF TRACKS ARE VALID,  *
                                6684  * SO BOTH DRIVES MAY BE TESTED AT THE SAME TIME.                    *
                                6585  *
                                6686  *   PRIMARY ENTRY AND PHASE DISPATCH                                *
005994                          6687        ALIGN 4
005994    0000 59EC             6688  DSCPTR  DC    A(DSCPH00)          INITIALIZE, WAIT ON DU & WRT PROT
005998    0000 5A90             6689        DC    A(DSCPH01)          COMPUTE NEXT SCTR, HEAD, CYL ADDRESS
00599C    0000 5AE0             6690        DC    A(DSCPH02)          RESTORE
0059A0    0000 5B00             6691        DC    A(DSCPH03)          FILE INTERRUPT
0059A4    0000 5B28             6692        DC    A(DSCPH04)          FILE STATUS CHECK
0059A8    0000 5B3A             6693        DC    A(DSCPH05)          SEEK
0059AC    0000 5B00             6694        DC    A(DSCPH06)          FILE INTERRUPT
0059B0    0000 5B5A             6695        DC    A(DSCPH07)          FILE STATUS CHECK
0059B4    0000 5B6C             6696        DC    A(DSCPH08)          SET UP WRITE
0059B8    0000 5BB6             6697        DC    A(DSCPH09)          SELCH INTERRUPT
0059BC    0000 5C2C             6698        DC    A(DSCPH0A)          CONTROLLER INTERRUPT
0059C0    0000 5AE0             6699        DC    A(DSCPH0B)          RESTORE
0059C4    0000 5B00             6700        DC    A(DSCPH0C)          FILE INTERRUPT
0059C8    0000 5C40             6701        DC    A(DSCPH0D)          FILE STATUS CHECK
0059CC    0000 5B3A             6702        DC    A(DSCPH0E)          SEEK
0059D0    0000 5B00             6703        DC    A(DSCPH0F)          FILE INTERRUPT
0059D4    0000 5C52             6704        DC    A(DSCPH10)          FILE STATUS CHECK
0059D8    0000 5C64             6705        DC    A(DSCPH11)          SET UP READ
0059DC    0000 5C9A             6706        DC    A(DSCPH12)          SELCH INTERRUPT
0059E0    0000 5CC4             6707        DC    A(DSCPH13)          CONTROLLER INTERRUPT
0059E4    0000 5CD8             6708        DC    A(DSCPH14)          COMPARE DATA
0059E8    0000 5CEE             6709        DC    A(DSCPH15)          CONTROLLER RESET
                                6710  *                                                                   *
                                6711  *   INITIALIZATION, WAIT FOR DU TO CLEAR                            *
                                6712  *                                                                   *
0059EC    4854 0048             6713  DSCPH00 LH    R5,SELCHADR(DDBADR) TEST SELCH INTERLOCK
0059F0    4180 EB0C  =004500    6714        BAL   R8,TESTLOCK
0059F4    4854 004A             6715        LH    R5,CONTADR(DDBADR)  CHECK CONTROLLER INTERLOCK
0059F8    4180 EB04  =004500    6716        BAL   R8,TESTLOCK
                                6717  * HANG HERE UNTIL ALL FILE ARE DONE SEEKING
0059FC    41B0 F258  =004C58    6718        BAL   R11,WAITSEEK
                                6719  * STOP SELCH
005A00    4854 0048             6720        LH    R5,SELCHADR(DDBADR) SELCH ADDRESS
005A04    DE50 3449             6721        OC    R5,STOPCMND         STOP COMMAND
                                6722  * NOBODY BUSY, RESET CONTROLLER
005A08    2450                  6723        LIS   R5,0                CLEAR
005A0A    4054 005E             6724        STH   R5,WPROTFLG(DDBADR) CLEAR FLAG
005A0E    4854 004A             6725        LH    R5,CONTADR(DDBADR)  CONTROLLER ADDR
005A12    DE50 345C             6726        OC    R5,DSCRESET
005A16    9D53                  6727        SSR   R5,STAT             WAIT FOR CONTROLLER IDLE     R09
005A18    2221       =000001    6728        BFBS  2,1                 *                            R09
005A1A    DE50 3434             6729        OC    R5,DISARM           DISARM CONTROLLER            R09
005A1E    9D53                  6730        SSR   R5,STAT             WAIT FOR IDLE                R09
```

DISC DRIVER

```
005A20    2221      =000001    6731         BFBS   2,1                *                        P09
005A22    4824 0008            6732         LH     DEV,DEVADR(DDBADR)  GET DRIVE ADDRESS
005A26    DE20 3434            6733         OC     DEV,DISARM          DISARM THE DRIVE          R09
005A2A    9553                 6734         SSR    R5,STAT             WAIT CONTROLLER IDLE      R09
005A2C    2221      =000001    6735         BFBS   2,1                *                        R09
005A2E    9523                 6736         SSR    DEV,STAT
005A30    D234 000A            6737         STB    STAT,STATUS(DDBADR) SAVE STATUS
005A34    C330 0001            6738         THI    STAT,X'01'          DU ?
005A38    2136      =005A44    6739         BNZS   DSC00L4             ERROR
005A3A    C330 0080            6740         THI    STAT,X'80'          WTITE PROTECT??
005A3E    4230 8040 =005A82    6741         BNZ    DSC00L3             YES, CHECK FLAG
005A42    2304      =005A4A    6742         BS     DSC00L1             NOT ERROR
005A44    41B0 EA82 =0044CA    6743 DSC00L4 BAL    R11,BSTATERR        BAD STATUS ERROR
005A48    0300                 6744         BR     R0                  RETURN, HANG IN PHASE ZERO
005A4A    2459                 6745 DSC00L1 LIS    R5,PHASE.2          NEXT PHASE IS TWO, SKIP ONE
005A4C    4054 0002            6746         STH    R5,PHASE(DDBADR)
005A50    2453                 6747         LIS    R5,BADSTAT          CLEAR BAD STATUS
005A52    7654 0000            6748         RBT    R5,DSPFLGS(DDBADR)
005A56    2452                 6749         LIS    R5,NOTCOUNT         CLEAR NOT COUNTING
005A58    7654 0000            6750         RBT    R5,DSPFLGS(DDBADR)
                               6751  * SET INITIAL DISK ADDRESSES
005A5C    2457                 6752         LIS    R5,DEVCNTL2         GET DEVICE TYPE
005A5E    7454 0000            6753         TBT    R5,DSPFLGS(DDBADR)  MSM ?
005A62    2333      =005A68    6754         BZS    DSC00L2             NO
005A64    DE20 3461            6755         OC     DEV,MSMCLFLT        CLEAR FAULT
005A68    4854 004C            6756 DSC00L2 LH     R5,CYLLOW(DDBADR)   CYLINDER
005A6C    4054 0058            6757         STH    R5,CYLCUR(DDBADR)
005A70    4854 0050            6758         LH     R5,HEADLOW(DDBADR)  HEAD
005A74    4054 005A            6759         STH    R5,HEADCUR(DDBADR)
005A78    4864 0054            6760         LH     R6,SCTRLOW(DDBADR)  SECTOR
005A7C    4064 005C            6761         STH    R6,SCTRCUR(DDBADR)
005A80    0300                 6762         BR     R0                  RETURN
005A82    245F                 6763 DSC00L3 LIS    R5,15               SET FLAG
005A84    4054 005E            6764         STH    R5,WPROTFLG(DDBADR) STORE
005A88    41B0 EA3E =0044CA    6765         BAL    R11,BSTATERR        REPORT ERROR
005A8C    4300 FFBA =005A4A    6766         B      DSC00L1             CONTINUE TO NEXT PHASE
                               6767  *
                               6768  *   COMPUTE NEXT SECTOR, HEAD, CYLINDER ADDRESS          *
                               6769  *                                                         *
005A90    4854 005C            6770 DSCPH01 LH     R5,SCTRCUR(DDBADR)                           *
005A94    4864 005A            6771         LH     R6,HEADCUR(DDBADR)
005A98    4874 0058            6772         LH     R7,CYLCUR(DDBADR)
005A9C    2651                 6773         AIS    R5,1                INCREMENT TO NEXT SECTOR
005A9E    4954 0056            6774         CH     R5,SCTRHIGH(DDBADR) REACHED END?
005AA2    4320 8024 =005ACA    6775         BNP    DSC01L3             B IF NO
005AA6    4854 0054            6776         LH     R5,SCTRLOW(DDBADR)  RESET TO LOW LIMIT
005AAA    2661                 6777         AIS    R6,1                INCREMENT TO NEXT HEAD
005AAC    4964 0052            6778         CH     R6,HEADHIGH(DDBADR) REACHED END?
005AB0    2325      =005AC6    6779         BNPS   DSC01L2             B IF NO
005AB2    4864 0050            6780         LH     R6,HEADLOW(DDBADR)  RESET TO LOW LIMIT
005AB6    2671                 6781         AIS    R7,1                INCREMENT TO NEXT CYLINDER
005AB8    4974 004E            6782         CH     R7,CYLHIGH(DDBADR)  REACHED END?
005ABC    2323      =005AC2    6783         BNPS   DSC01L1             B IF NO
```

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005ABE      4874 004C           6784          LH     R7,CYLLOW(DDBADR)     RESET TO LOW LIMIT
                                6785   *  SAVE UPDATED ADDRESSES
005AC2      4074 0058           6786   DSC01L1  STH   R7,CYLCUR(DDBADR)    NEW CYLINDER
005AC6      4064 005A           6787   DSC01L2  STH   R6,HEADCUR(DDBADR)   NEW HEAD
005ACA      4054 005C           6788   DSC01L3  STH   R5,SCTRCUR(DDBADR)   NEW SECTOR
005ACE      5894 0028           6789          L      R9,DVRWRK1(DDBADR)    BIT TO BLINK
005AD2      4180 EACA =0045AC   6790          BAL    R8,BLINK              GO BLINK DISPLAY
005AD6      C850 0014           6791          LHI    R5,PHASE.5            SKIP RESTORE (PHASE 2 FOR RESTORE)
005ADA      4054 0002           6792          STH    R5,PHASE(DDBADR)
005ADE      0300                6793          BR     R0                    RETURN
                                6794   *                                                              *
                                6795   *  RESTORE COMMON CODE.  NEXT PHASE IS CURRENT PHASE+1 UNLESS ERROR. *
                                6796   *                                                              *
            0000 5AE0           6797   DSCPH02  EQU   *
005AE0      41B0 EFEC =004AD0   6798   DSCPH0B  BAL   R11,FILESET          SET UP FILE FOR SEEK, RESTORE
005AE4      4884 0008           6799          LH     R8,DEVADR(DDBADR)     ORIGINAL DEVICE ADDRESS
005AE8      7580 EA24 =004510   6800          SBT    R8,INTRLOCK           SET FILE INTRLOCK INDICATING SEEK
005AEC      4854 0002           6801          LH     R5,PHASE(DDBADR)      CURRENT PHASE
005AF0      2654                6802          AIS    R5,ONE               PLUS ONE IS NEXT PHASE
005AF2      D360 3458           6803          LB     R6,RESTORE           SEND RESTORE COMMAND
005AF6      41B0 E9EA =0044E4   6804          BAL    R11,STARTIO          START THE RESTORE
005AFA      9DC8                6805          SSR    R12,R8               WAIT FOR CONTROLLER IDLE
005AFC      2221      =000001   6806          BFBS   2,1                  B IF NOT IDLE TO SENSE STATUS
005AFE      0300                6807          BR     R0                   RETURN, WAIT FILE INTERRUPT
                                6808   *                                                              *
                                6809   *  FILE INTERRUPT COMMON CODE.  NEXT PHASE IS CURRENT PHASE+1.        *
                                6810   *                                                              *
            0000 5B00           6811   DSCPH03  EQU   *
            0000 5B00           6812   DSCPH06  EQU   *
            0000 5B00           6813   DSCPH0C  EQU   *
005B00      2454                6814   DSCPH0F  LIS   R5,ONE
005B02      6154 0002           6815          AHM    R5,PHASE(DDBADR)      INCREMENT TO NEXT PHASE
005B06      2451                6816          LIS    R5,BUSY              CLEAR BUSY
005B08      7654 0000           6817          RBT    R5,DSPFLGS(DDBADR)
005B0C      7620 FA00 =004510   6818          RBT    DEV,INTRLOCK         CLEAR FILE INTRLOCK, SEEK DONE
005B10      2456                6819          LIS    R5,DEVCNTL1
005B12      7454 0000           6820          TBT    R5,DSPFLGS(DDBADR)   40 M. OR MSM DISC
005B16      2132      =005B1A   6821          BNZS   DSC03L1              B IF YES
005B18      1800                6822          LPSWR  OLDPSW               RETURN
005B1A      DE20 345D           6823   DSC03L1  OC    DEV,D40REATN         RESET ATTENTION
005B1E      4854 004A           6824          LH     R5,CONTADR(DDBADR)
005B22      9D56                6825          SSR    R5,R6                WAIT CONTROLLER IDLE
005B24      2221      =000001   6826          BFBS   2,1
005B26      1800                6827          LPSWR  OLDPSW
                                6828   *                                                              *
                                6829   *  FILE STATUS CHECK                                           *
                                6830   *                                                      ##      *
005B28      4160 F022 =004B4F   6831   DSCPH04  BAL   R6,FILESTAT          CHECK FILE STATUS
005B2C      D355 8006 =005B36   6832          LB     R5,DSC04NXT(R5)      NEXT PHASE ACCORDING TO STATUS
005B30      4054 0002           6833          STH    R5,PHASE(DDBADR)
005B34      0300                6834          BR     R0                   RETURN
005B36      14                  6835   DSC04NXT DB    PHASE.5              OK
005B37      00                  6836          DB     PHASE.0              DU
```

005B38	04		6837	DB	PHASE.1	ILL ADR OR SEEK INC
005B39	54		6838	DB	PHASE.15	WRT CHK
005B3A			6839	DB	*	
			6840	*		
			6841	* SEEK COMMON CODE. NEXT PHASE IS CURRENT PHASE+1 IF NO ERROR.		*
			6842	*		
005B3A	0000 5B3A		6843	DSCPH05	EQU	*
005B3E	41B0 EF92	=004AD0	6844	DSCPH0E	BAL	R11,FILESET	SET UP FILE FOR SEEK, RESTORE
005B42	4884 0008		6845		LH	R8,DEVADR(DDBADR)	ORIGINAL DEVICE ADDRESS
005B46	7580 E9CA	=004510	6846		SBT	R8,INTRLOCK	SET FILE INTRLOCK INDICATING SEEK
005B4A	4854 0002		6847		LH	R5,PHASE(DDBADR)	CURRENT PHASE
005B4C	2654		6848		AIS	R5,ONE	PLUS ONE IS NEXT PHASE
005B50	D360 3459		6849		LB	R6,DSCSEEK	SEND SEEK COMMAND
005B54	41B0 E990	=0044E4	6850		BAL	R11,STARTIO	
005B56	9DC8		6851		SSR	R12,R8	WAIT FOR CONTROLLER IDLE
005B58	2221	=000001	6852		BFBS	2,1	B IF NOT IDLE TO SENSE STATUS
	0300		6853		BR	R0	RETURN, WAIT FILE INTERRUPT
			6854	*		
			6855	* FILE STATUS CHECK		*
			6856	*		*
005B5A	4160 EFF0	=004B4F	6857	DSCPH07	BAL	R6,FILESTAT	CHECK FILE STATUS
005B5E	D355 8006	=005E68	6858		LB	R5,DSC07NXT(R5)	NEXT PHASE ACCORDING TO STATUS
005B62	4054 0002		6859		STH	R5,PHASE(DDBADR)	
005B66	0300		6860		BR	R0	RETURN
005B68	20		6861	DSC07NXT	DB	PHASE.8	OK
005B69	00		6862		DB	PHASE.0	DU
005B6A	04		6863		DB	PHASE.1	ILL ADR OR SEEK INC
005B6B	54		6864		DB	PHASE.15	WRT CHK
005B6C			6865		DB	*	
			6866	*		
			6867	* START WRITE		*
			6868	*		*
005B6C	4884 005E		6869	DSCPH08	LH	R8,WPROTFLG(DDBADR)	GET FLAG
005B70	2336	=00557C	6870		BZS	DSC08L1	NOT SET, BRANCH
005B72	C880 0044		6871		LHI	R8,PHASE.11	NEXT PHASE = 11 IF WRITE PROTECT
005B76	4084 0002		6872		STH	R8,PHASE(DDBADR)	STORE
005B7A	0300		6873		BR	R0	RETURN
005B7C	4180 EA10	=004590	6874	DSC08L1	BAL	R8,SLCHLOCK	TEST FOR SELCH BUSY
005B80	4170 EAEE	=004672	6875		BAL	R7,MOVEBUF	
005B84	41B0 EF48	=004AD0	6876		BAL	R11,FILESET	STATUS CHECK, SET UP FILE
005B88	75C0 E984	=004510	6877		SBT	R12,INTRLOCK	SET CONTROLLER INTRLOCK
005B8C	C850 0024		6878		LHI	R5,PHASE.9	NEXT PHASE 9, SELCH INTERRUPT
005B90	D360 3434		6879		LB	R6,DISARM	DISARM FILE
005B94	41B0 E94C	=0044E4	6880		BAL	R11,STARTIO	SET UP DDB
005B98	9DC5		6881		SSR	R12,R5	WAIT CONTROLLER IDLE
005B9A	2221	=000001	6882		BFBS	2,1	
005B9C	E684 0030		6883		LA	R8,BUF1STRT(DDBADR)	POINTER TO BUFFER LIMITS
005BA0	4130 EECA	=004A6F	6884		BAL	R11,SELCHSET	SET UP SELCH (RETURN UNINTERRUPTABL)
005BA4	9D23		6885		SSR	DEV,STAT	ADDRESS FILE
005BA6	41B0 EFEC	=004E96	6886		BAL	R11,CONTSET	SET UP CONTROLLER
005BAA	DEC0 345A		6887		OC	R12,DSCWRT	WRITE DATA
005BAE	DE70 344A		6888		OC	R7,SELCHGO	START SELCH
005BB2	959A		6889		EPSR	R9,R10	RESTORE STATUS (SAVED BY SELCHSET)

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```
005BB4       0300           6890          BR    R0                    RETURN
                            6891  *                                                               *
                            6892  *  SELCH INTERRUPT AFTER WRITE                                  *
                            6893  *                                                               *
                            6894  *     * * * * * * * * * * * * * * * * * * * * * * * * * * *      *
                            6895  *     *                                         *              *
                            6896  *     * NOTE: THIS PHASE MAY BRANCH TO PHASE DSCPHOA FOR  *     *
                            6897  *     *       CONTROLLER STATUS CHECK ON OVERRUN.         *     *
                            6898  *     *                                         *              *
                            6899  *     * * * * * * * * * * * * * * * * * * * * * * * * * * *      *
                            6900  *
005BB6       24C6           6901  DSCPH09 LIS   R12,DEVCNTL1
005BB8       74C4 0000      6902          TBT   R12,DSPFLGS(DDBADR) 40 M. OR MSM
005BBC       2334  =005BC4  6903          BZS   DSC09L4               NO
005BBE       24C0           6904          LIS   R12,0                 IF 40 M. OR MSM
005BC0       40C0 34C0      6905          STH   R12,SELCHBSY          CLEAR SELCH BUSY
005BC4       08C4           6906  DSC09L4 LR    R12,DDBADR            SAVE OWNER DDB
005BC6       DE20 3449      6907          OC    DEV,STOPCMND          STOP SELCH
005BCA       7620 E942 =004510  6908      RBT   DEV,INTRLOCK          CLEAR SELCH INTERLOCK
005BCE       1121           6909          SLLS  DEV,1                 INDEX INTO LOOKUP TABLE
005BD0       7342 28D8      6910          LHL   DDBADR,DDBLKUP(DEV) GET SELCH DDB
005BD4       1021           6911          SRLS  DEV,1                 PUT BACK SELCH ADDRESS
005BD6       D234 000A      6912          STB   STAT,STATUS(DDBADR) SAVE STATUS
005BDA       2480           6913          LIS   R8,IGNORE             SET IGNORE IN SELCH DDB
005BDC       7584 0000      6914          SBT   R8,DSPFLGS(DDBADR)
005BE0       084C           6915          LR    DDBADR,R12            RESTORE OWNER DDB
005BE2       4824 0008      6916          LH    DEV,DEVADR(DDBADR)    GET DEVICE ADDRESS
005BE6       9D23           6917          SSR   DEV,STAT              SENSE STATUS
005BE8       D234 000A      6918          STB   STAT,STATUS(DDBADR) SAVE STATUS
005BEC       4824 0048      6919          LH    DEV,SELCHADR(DDBADR) GET SELCH ADDRESS
005BF0       C330 0080      6920          THI   STAT,X'80'            WRITE PROTECT??
005BF4       2337  =005C02  6921          BZS   DSC09L3               NO, CONTINUE PHASE
005BF6       245F           6922          LIS   R5,X'F'               SET FLAG
005BF8       4054 005E      6923          STH   R5,WPROTFLG(DDBADR)   STORE
005BFC       4180 E8CA =0044CA 6924       BAL   R11,BSTATERR          REPORT ERROR
005C00       2305  =005C0A  6925          BS    DSC09L2               CONTINUE PHASE
005C02       E654 0034      6926  DSC09L3 LA    R5,BUF1END(DDBADR)    POINTER TO BUF LIMITS
005C06       4150 EDD2 =0049DC 6927       BAL   R6,SLCHENDW           STOP SELCH, CHECK ADDRESSES WRITE
005C0A       4824 004A      6928  DSC09L2 LH    DEV,CONTADR(DDBADR) GET CONTROLLER ADDRESS
005C0E       2456           6929          LIS   R5,DEVCNTL1
005C10       7454 0000      6930          TBT   R5,DSPFLGS(DDBADR)   40 M. OR MSM DISC
005C14       2135  =005C1E  6931          BNZS  DSC09L1               B IF YES, NO OVERRUN CHECK
005C16       9D23           6932          SSR   DEV,STAT              GET CONTROLLER STATUS
005C18       C330 0080      6933          THI   STAT,X'80'            OVERRUN?
005C1C       2138  =005C2C  6934          BNZS  DSCPHOA               B IF YES        *** SEE NOTE ***
005C1E       2454           6935  DSC09L1 LIS   R5,ONE                NEXT PHASE IS CURRENT PHASE
005C20       6154 0002      6936          AHM   R5,PHASE(DDBADR)      PLUS 1 FOR CONTROLLER INTERRUPT
005C24       1121           6937          SLLS  DEV,1                 INDEX INTO LOOKUP TABLE
005C26       4042 28D8      6938          STH   DDBADR,DDBLKUP(DEV) SET UP FOR CONTROLLER INTRUPT
005C2A       1800           6939          LPSWR OLDPSW               RETURN
                            6940  *                                                               *
                            6941  *  CONTROLLER INTERRUPT AFTER WRITE                             *
                            6942  *                                                               *
```

```
                                    6943  *         * * * * * * * * * * * * * * * * * * * * * * * * * * * * *         *
                                    6944  *         *                                                        *         *
                                    6945  *         * NOTE: THIS PHASE MAY BE ENTERED FROM PHASE            *         *
                                    6946  *         *     DSCPH09 ON OVERRUN.                                *         *
                                    6947  *         *                                                        *         *
                                    6948  *         * * * * * * * * * * * * * * * * * * * * * * * * * * * * *         *
                                    6949  *                                                                            *
005C2C     4160 EFB6 =004BF6        6950  DSCPH0A  BAL    R6,CONTSTAT           CHECK CONTROLLER STATUS
005C30     D355 8006 =005C3A        6951           LB     R5,DSCOANXT(R5)       GET NEXT PHASE ACCORDING TO STATUS
005C34     4054 C002                6952           STH    R5,PHASE(DDBADR)
005C38     1800                     6953           LPSWR  OLDPSW                RETURN
005C3A     38                       6954  DSCOANXT DB     PHASE.E               OK, SKIP RESTORE ('B' FOR RESTORE)
005C3B     00                       6955           DB     PHASE.0               DU
005C3C     28                       6956           DB     PHASE.A               CONT NOT IDLE (ERROR)
005C3D     54                       6957           DB     PHASE.15              EXAMINE
005C3E     04                       6958           DB     PHASE.1               DATA TRANSFER ERROR
005C3F     00                       6959           DB     *
                                    6960  *    FILE STATUS CHECK                                                      *
                                    6961  *                                                                          *
                                    6962  *                                                                          *
005C40     4160 EF0A =004B4E        6963  DSCPH0D  BAL    R6,FILESTAT           CHECK FILE STATUS
005C44     D355 8006 =005C4E        6964           LB     R5,DSCODNXT(R5)       NEXT PHASE ACCORDING TO STATUS
005C48     4054 0002                6965           STH    R5,PHASE(DDBADR)
005C4C     0300                     6966           BR     R0                    RETURN
005C4E     38                       6967  DSCODNXT DB     PHASE.E               OK
005C4F     00                       6968           DB     PHASE.0               DU
005C50     04                       6969           DB     PHASE.1               ILL ADR OR SEEK INC
005C51     54                       6970           DB     PHASE.15              WRT CHK
005C52                              6971           DB     *
                                    6972  *                                                                          *
                                    6973  *    FILE STATUS CHECK                                                      *
                                    6974  *                                                                          *
005C52     4160 EEF8 =004B4E        6975  DSCPH10  BAL    R6,FILESTAT           CHECK FILE STATUS
005C56     D355 8006 =005C60        6976           LB     R5,DSC10NXT(R5)       NEXT PHASE ACCORDING TO STATUS
005C5A     4054 0002                6977           STH    R5,PHASE(DDBADR)
005C5E     0300                     6978           BR     R0                    RETURN
005C60     44                       6979  DSC10NXT DB     PHASE.11              OK
005C61     00                       6980           DB     PHASE.0               DU
005C62     04                       6981           DB     PHASE.1               ILL ADR OR SEEK INC
005C63     54                       6982           DB     PHASE.15              WRT CHK
005C64                              6983           DB     *
                                    6984  *                                                                          *
                                    6985  *    START READ                                                            *
                                    6986  *                                                                          *
005C64     4180 E928 =004590        6987  DSCPH11  BAL    R8,SLCHLOCK           TEST FOR SELCH BUSY
005C68     41B0 E564 =004AD0        6988           BAL    R11,FILESET           STATUS CHECK, SET UP FILE
005C6C     75C0 EBA0 =004510        6989           SET    R12,INTRLOCK          SET CONTROLLER INTRLOCK
005C70     C850 0048                6990           LHI    R5,PHASE.12           NEXT PHASE 12 FOR SELCH INTERRUPT
005C74     D360 3434                6991           LB     R6,DISARM             DISARM FILE
005C78     41B0 E968 =0044F4        6992           BAL    R11,STRTIO            SET UP DDB
005C7C     9DC5                     6993           SSR    R12,R5                WAIT CONTROLLER IDLE
005C7E     2221      =000001        6994           BFBS   2,1
005C80     E684 003C                6995           LA     R8,BUF2STRT(DDBADR)   POINTER TO BUFFER LIMITS
```

DISC DRIVER

```
005C84      41B0 EDE6 =004A6E      6996              BAL   R11,SELCHSET           SET UP SELCH (RETURN UNINTERRUPTABL)
005C88      9D23                   6997              SSR   DEV,STAT               ADDRESS FILE
005C8A      41B0 EF08 =004F96      6998              BAL   R11,CONTSET            SET UP CONTROLLER
005C8E      DEC0 345B              6999              OC    R12,DSCREAD            READ DATA
005C92      DE70 344B              7000              OC    R7,SLCHREAD            START SELCH
005C96      959A                   7001              EPSR  R9,R10                 RESTORE STATUS (SAVED BY SELCHSET)
005C98      0300                   7002              BR    R0                     RETURN                               *
                                   7003    *                                                                          *
                                   7004    *  SELCH INTERRUPT AFTER READ                                              *
                                   7005    *                                                                          *
                                   7006    *      * * * * * * * * * * * * * * * * * * * * * * * * * *                 *
                                   7007    *      *                                           *                       *
                                   7008    *      * NOTE: THIS PHASE MAY BRANCH TO PHASE DSCPH13 FOR  *               *
                                   7009    *      *       CONTROLLER STATUS CHECK ON OVERRUN.         *               *
                                   7010    *      *                                           *                       *
                                   7011    *      * * * * * * * * * * * * * * * * * * * * * * * * * *                 *
                                   7012    *
005C9A      E654 0040              7013    DSCPH12   LA    R5,BUF2END(DDBADR)     POINTER TO BUF LIMITS
005C9E      4160 ED34 =0049D6      7014              BAL   R6,SLCHENDR            STOP SELCH, CHECK ADDRESSES READ
005CA2      4824 004A              7015              LH    DEV,CONTADR(DDBADR)    GET CONTROLLER ADDRESS
005CA6      2456                   7016              LIS   R5,DEVCNTL1
005CA8      7454 0000              7017              TBT   R5,DSPFLGS(DDBADR)     40 M. OR MSM DISC
005CAC      2135      =005CB6      7018              BNZS  DSC12L1                B IF YES, NO OVERRUN CHECK
005CAE      9D23                   7019              SSR   DEV,STAT               GET CONTROLLER STATUS
005CB0      C330 0080              7020              THI   STAT,X'80'             OVERRUN?
005CB4      2138      =005CC4      7021              BNZS  DSCPH13                B IF YES         *** SEE NOTE ***
005CB6      2454                   7022    DSC12L1   LIS   R5,ONE                 NEXT PHASE IS CURRENT PHASE
005CB8      6154 0002              7023              AHM   R5,PHASE(DDBADR)       PLUS 1 FOR CONTROLLER INTERRUPT
005CBC      1121                   7024              SLLS  DEV,1                  INDEX INTO LOOKUP TABLE
005CBE      4042 28D8              7025              STH   DDBADR,DDBLKUP(DEV)    SET UP FOR CONTROLLER INTRUPT
005CC2      1800                   7026              LPSWR OLDPSW                 RETURN
                                   7027    *                                                                          *
                                   7028    *  CONTROLLER INTERRUPT AFTER READ                                        *
                                   7029    *                                                                          *
                                   7030    *      * * * * * * * * * * * * * * * * * * * * * * * * * *                 *
                                   7031    *      *                                           *                       *
                                   7032    *      * NOTE: THIS PHASE MAY BE ENTERED FROM PHASE       *               *
                                   7033    *      *       DSCPH12 ON OVERRUN.                        *               *
                                   7034    *      *                                           *                       *
                                   7035    *      * * * * * * * * * * * * * * * * * * * * * * * * * *                 *
                                   7036    *
005CC4      4160 EF1E =004BE6      7037    DSCPH13   BAL   R6,CONTSTAT            CHECK CONTROLLER STATUS
005CC8      D355 8006 =005CD2      7038              LB    R5,DSC13NXT(R5)        SET NEXT PHASE ACCORDING TO STATUS
005CCC      4054 0002              7039              STH   R5,PHASE(DDBADR)
005CD0      1800                   7040              LPSWR OLDPSW                 RETURN
005CD2      50                     7041    DSC13NXT  DB    PHASE.14               OK
005CD3      00                     7042              DB    PHASE.0                DU
005CD4      4C                     7043              DB    PHASE.13               CONT NOT IDLE (ERROR)
005CD5      54                     7044              DB    PHASE.15               EXAMINE
005CD6      04                     7045              DB    PHASE.1                DATA TRANSFER ERROR
005CD7      00                     7046              DB    *
                                   7047    *                                                                          *
                                   7048    *  COMPARE DATA                                                           *
```

DISC DRIVER

```
                                   7049  *                                                           *
005CD8        4814 005E            7050  DSCPH14   LH    R1,WPROTFLG(DDBADR) GET FLAG
005CDC        2133      =005CE2    7051            BNZS  DSCPH14A            SET, SKIP COMPARE
005CDE        4110 E8EA =0045CC    7052            BAL   R1,COMPARE
005CE2        41B0 EB3C =004822    7053  DSCPH14A  BAL   R11,MBUFCLR
005CE6        2464               7054            LIS   R6,PHASE.1          NEXT PHASE IS ONE, NEXT SECTOR
005CE8        4064 0002            7055            STH   R6,PHASE(DDBADR)
005CEC        0300               7056            BR    R0                  RETURN
                                   7057  *                                                           *
                                   7058  *   CONTROLLER RESET                                        *
                                   7059  *                                                           *
005CEE        4854 0048            7060  DSCPH15   LH    R5,SELCHADR(DDBADR) CHECK SELCH INTRLOCK
005CF2        4180 E80A =004500    7061            BAL   R8,TESTLOCK
005CF6        4854 004A            7062            LH    R5,CONTADR(DDBADR)  CHECK CONTROLLER INTRLOCK
005CFA        4180 E802 =004500    7063            BAL   R8,TESTLOCK
                                   7064  *  HANG HERE UNTIL ALL FILE ARE DONE SEEKING
005CFE        41B0 EF56 =004C58    7065            BAL   R11,WAITSEEK
                                   7066  *  NOBODY BUSY, RESET CONTROLLER
005D02        DE50 345C            7067            OC    R5,DSCRESET
005D06        2464               7068            LIS   R6,PHASE.1          NEXT PHASE IS ONE, NEXT SECTOR
005D08        4064 0002            7069            STH   R6,PHASE(DDBADR)
005D0C        0300               7070            BR    R0                  RETURN
005D0E                             7071            IFNZ  DISCS
                                   7072  *                                                           *
                                   7073  *   SUPPLIES DEFAULT DISC ADDRESS X'0C6',DEFAULT CONTROLLER  *
                                   7074  *   ADDRESS X'0B6', DEFAULT SELCH ADDRESS X'0F0'            *
                                   7075  *                                                           *
005D0E        4824 0008            7076  CKDSC     LH    DEV,DEVADR(DDBADR)  DID USER GIVE DEVICE ADDRESS?
005D12        2135      =005D1C    7077            BNZS  CKDSC1              B IF YES
005D14        C820 00C6            7078            LHI   DEV,X'0C6'          DEFAULT
005D18        4024 0008            7079            STH   DEV,DEVADR(DDBADR)  INTO DDB
005D1C        4854 004A            7080  CKDSC1    LH    R5,CONTADR(DDBADR)  CONTROLLER ADDRESS?
005D20        2135      =005D2A    7081            BNZS  CKDSC2              B IF YES
005D22        C850 00B6            7082            LHI   R5,X'0B6'           DEFAULT
005D26        4054 004A            7083            STH   R5,CONTADR(DDBADR)  INTO DDB
005D2A        4864 0048            7084  CKDSC2    LH    R6,SELCHADR(DDBADR) SELCH ADDRESS?
005D2E        2135      =005D38    7085            BNZS  CKDSC3              B IF YES
005D30        C860 00F0            7086            LHI   R6,X'0F0'           DEFAULT
005D34        4064 0048            7087            STH   R6,SELCHADR(DDBADR) INTO DDB
005D38        07FF               7088  CKDSC3    XR    R15,R15
005D3A        030E               7089            BR    R14                 RETURN
                                   7090            ENDC
005D3C                             7091            IFNZ  DSK40MB
                                   7092  *                                                           *
                                   7093  *   40 MEGA BYTE DISC DEFAULTS.  FILE ADDRESS=X'FC', CONTROLLER *
                                   7094  *   ADDRESS=X'FB', SELCH ADDRESS=X'F0'                      *
                                   7095  *                                                           *
005D3C        4824 0008            7096  CKDSC40   LH    DEV,DEVADR(DDBADR)  DID USER GIVE ADDRESS?
005D40        2135      =005D4A    7097            BNZS  CK40L1              B IF YES
005D42        C820 00FC            7098            LHI   DEV,X'FC'           DEFAULT
005D46        4024 0008            7099            STH   DEV,DEVADR(DDBADR)  INTO DDB
005D4A        4854 004A            7100  CK40L1    LH    R5,CONTADR(DDBADR)  CONTROLLER ADDRESS?
005D4E        2135      =005D58    7101            BNZS  CK40L2              B IF YES
```

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```
005D50      C850 00FB              7102           LHI   R5,X'FB'            DEFAULT
005D54      4054 004A              7103           STH   R5,CONTADR(DDBADR)  INTO DDB
005D58      4864 0048              7104  CK40L2    LH    R6,SELCHADR(DDBADR) SELCH ADDRESS?
005D5C      2135       =005D66     7105           BNZS  CK40L3              B IF YES
005D5E      C860 00F0              7106           LHI   R6,X'F0'            DEFAULT
005D62      4064 0048              7107           STH   R6,SELCHADR(DDBADR) INTO DDB
005D66      07FF                   7108  CK40L3    XR    R15,R15
005D68      030E                   7109           BR    R14                 RETURN
                                   7110           ENDC
                                   7111           ENDC
005D6A                             7112           IFNZ  MAGTAPE
```

```
                                      7114   *   MAGNETIC TAPE DRIVER FOR 800 AND 1600 BPI TAPE SYSTEMS.
                                      7115   *                                                                        *
                                      7116   * PRIMARY ENTRY AND PHASE DISPATCH                                       *
005D6C                                7117           ALIGN  4
005D6C     0000 5DA0                  7118   MAGPTR  DC     A(MAGPH0)            INITIALIZE, CLEAR, WAIT ON DU
005D70     0000 5DE0                  7119           DC     A(MAGPH1)            WAIT NO MOTION, WRITE FILE MARK
005D74     0000 5E40                  7120           DC     A(MAGPH2)            NMTN INTERRUPT
005D78     0000 5E54                  7121           DC     A(MAGPH3)            START WRITE
005D7C     0000 5EA2                  7122           DC     A(MAGPH4)            SELCH INTERRUPT
005D80     0000 5EBC                  7123           DC     A(MAGPH5)            NMTN INTERRUPT
005D84     0000 5ED0                  7124           DC     A(MAGPH6)            BACKSPACE
005D88     0000 5F06                  7125           DC     A(MAGPH7)            NMTN INTERRUPT
005D8C     0000 5F1A                  7126           DC     A(MAGPH8)            START READ
005D90     0000 5F66                  7127           DC     A(MAGPH9)            SELCH INTERRUPT
005D94     0000 5F80                  7128           DC     A(MAGPHA)            NMTN INTERRUPT
005D98     0000 5F94                  7129           DC     A(MAGPHB)            COMPARE DATA
005D9C     0000 5FA4                  7130           DC     A(MAGPHC)            DISARMED REWIND
                                      7131   *
                                      7132   *  INITIALIZATION, CLEAR, WAIT FOR DU STATUS TO CLEAR                    *
                                      7133   *                                                                        *
005DA0     4824 0008                  7134   MAGPH0  LH     DEV,DEVADR(DDBADR)                                        *
005DA4     0852                       7135           LR     R5,DEV               COMPUTE CONFLICT HASH VALUE
005DA6     C450 03CF                  7136           NHI    R5,X'3CF'            CLEAR TRANSPORT SELECT BITS
005DAA     5054 0028                  7137           ST     R5,DVRWRK1(DDBADR)   SAVE FOR OTHER PHASES
005DAE     4180 E745   =004500        7138           BAL    R8,TESTLOCK          CHECK INTERLOCK
005DB2     4854 0048                  7139           LH     R5,SELCHADR(DDBADR)
005DB6     4180 E746   =004500        7140           BAL    R8,TESTLOCK          TEST SELCH INTERLOCK
005DBA     DE20 3450                  7141           OC     DEV,MAGCLEAR         CLEAR CONTROLLER
005DBE     9D23                       7142           SSR    DEV,STAT
005DC0     D234 000A                  7143           STB    STAT,STATUS(DDBADR)  SAVE STATUS
005DC4     2314       =005DCC         7144           BFCS   1,MAGOL1             B IF DU CLEAR
005DC6     41B0 E700   =0044CA        7145           BAL    R11,BSTATERR         BAD STATUS ERROR
005DCA     0300                       7146           BR     R0                   RETURN, HANG IN PHASE ZERO
005DCC     2454                       7147   MAGOL1  LIS    R5,PHASE.1           NEXT PHASE IS ONE
005DCE     4054 0002                  7148           STH    R5,PHASE(DDBADR)
005DD2     2453                       7149           LIS    R5,BADSTAT           CLEAR BAD STATUS
005DD4     7654 0000                  7150           RBT    R5,DSFFLGS(DDBADR)
005DD8     2452                       7151           LIS    R5,NOTCOUNT          CLEAR NOT COUNTING
005DDA     7654 0000                  7152           RBT    R5,DSFFLGS(DDBADR)
005DDE     0300                       7153           BR     R0                   RETURN
                                      7154   *
                                      7155   *  WRITE FILE MARK, CHECK WRITE PROTECT                                  *
                                      7156   *                                                                        *
005DE0     5854 0028                  7157   MAGPH1  L      R5,DVRWRK1(DDBADR)                                        *
005DE4     4180 E718   =004500        7158           BAL    R8,TESTLOCK          CHECK INTERLOCK
005DE8     4854 0048                  7159           LH     R5,SELCHADR(DDBADR)
005DEC     4180 E710   =004500        7160           BAL    R8,TESTLOCK          TEST SELCH INTERLOCK
005DF0     4824 0008                  7161           LH     DEV,DEVADR(DDBADR)
005DF4     9D23                       7162           SSR    DEV,STAT
005DF6     D234 000A                  7163           STB    STAT,STATUS(DDBADR)  SAVE STATUS
005DFA     C330 0010                  7164           THI    STAT,X'10'           MOTION
005DFE     2135       =005E08         7165           BNZS   MAG1L1               B IF NO
005E00     2452                       7166           LIS    R5,NOTCOUNT          SET NOT COUNTING WHILE WE WAIT
```

MAGNETIC TAPE DRIVER

```
005E02    7554 0000              7167            SBT   R5,DSPFLGS(DDBADR)   FOR MOTION TO GO AWAY
005E06    0300                   7168            BR    R0                   RETURN, HANG IN PHASE ONE
005E08    DE20 344F              7169    MAG1L1  OC    DEV,MAGEOF           WRITE EOF, QUEUE INTERRUPT
005E0C    9D23                   7170            SSR   DEV,STAT
005E0E    D234 000A              7171            STB   STAT,STATUS(DDBADR)  SAVE STATUS
005E12    2315        =005E1C    7172            BFCS  1,MAG1L2             B IF DU CLEAR
005E14    2450                   7173            LIS   R5,0
005E16    4054 0002              7174            STH   R5,PHASE(DDBADR)     HANG IN ZERO FOR DU
005E1A    2304        =005F22    7175            BS    MAG1L3
005E1C    C330 0010              7176    MAG1L2  THI   STAT,X'10'           MOTION?
005E20    2336        =005E2C    7177            BZS   MAG1L4               B IF YES
005E22    DE20 3434              7178    MAG1L3  OC    DEV,DISARM
005E26    41B0 E6A0   =0044CA    7179            BAL   R11,BSTATERR         BAD STATUS ERROR
005E2A    0300                   7180            BR    R0                   WAIT GOOD STATUS
                                 7181    *  WRITE EOF STARTED OK
005E2C    5854 0028              7182    MAG1L4  L     R5,DVRWRK1(DDBADR)   SET INTERLOCK
005E30    7550 E6DC   =004510    7183            SBT   R5,INTRLOCK
005E34    2458                   7184            LIS   R5,PHASE.2           PHASE TWO FOR EOM INTERRUPT
005E36    D360 3435              7185            LB    R6,ENABLE            ALLOW EOM INTERRUPT
005E3A    41B0 E6A6   =0044E4    7186            BAL   R11,STARTIO
005E3E    0300                   7187            BR    R0                   RETURN
                                 7188    *
                                 7189    *  EOM AND NO MOTION INTERRUPTS AFTER END OF FILE
                                 7190    *
005E40    4160 EB52   =004996    7191    MAGPH2  BAL   R6,MAGSTAT           CHECK INTERRUPT STATUS
005E44    D355 8006   =005F4E    7192            LB    R5,MAG2NXT(R5)       USE RC TO GET NEXT PHASE
005E48    4054 0002              7193            STH   R5,PHASE(DDBADR)     SET PHASE ACCORDING TO STATUS
005E4C    1800                   7194            LPSWR OLDPSW
005E4E    0C                     7195    MAG2NXT DB    PHASE.3              OK
005E4F    00                     7196            DB    PHASE.0              DU
005E50    08                     7197            DB    PHASE.2              MOTION
005E51    30                     7198            DB    PHASE.C              EOT
005E52    0C                     7199            DB    PHASE.3              ERR
005E53    00                     7200            DB    *
                                 7201    *
                                 7202    *  START WRITE
                                 7203    *
005E54    4170 E81A   =004672    7204    MAGPH3  BAL   R7,MOVEBUF
005E58    5854 0028              7205            L     R5,DVRWRK1(DDBADR)
005E5C    4180 E6A0   =004500    7206            BAL   R8,TESTLOCK          CHECK INTERLOCK
005E60    4854 0048              7207            LH    R5,SELCHADR(DDBADR)
005E64    4180 E698   =004500    7208            BAL   R8,TESTLOCK          TEST SELCH INTERLOCK
005E68    0875                   7209            LR    R7,R5                SAVE SELCH ADDRESS
005E6A    4824 0008              7210            LH    DEV,DEVADR(DDBADR)
005E6E    9D23                   7211            SSR   DEV,STAT
005E70    D234 000A              7212            STB   STAT,STATUS(DDBADR)  SAVE STATUS
005E74    2315        =005E7E    7213            BFCS  1,MAG3L1             B IF DU CLEAR
005E76    2460                   7214            LIS   R6,0
005E78    4064 0002              7215            STH   R6,PHASE(DDBADR)     HANG IN ZERO FOR DU
005E7C    0300                   7216            BR    R0                   RETURN
005E7E    5864 0028              7217    MAG3L1  L     R6,DVRWRK1(DDBADR)   SET MAG TAPE INTERLOCK
005E82    7560 E68A   =004510    7218            SBT   R6,INTRLOCK
005E86    E684 0030              7219            LA    R8,BUF1STRT(DDBADR)  POINTER TO BUFFER LIMITS
```

MAGNETIC TAPE DRIVER

```
005E8A    4130 EBE0 =004A6E   7220           BAL    R11,SELCHSET        SET UP SELCH
005E8E    C850 0010           7221           LHI    R5,PHASE.4          PHASE FOUR FOR SELCH INTERRUPT
005E92    D360 3451           7222           LB     R6,MAGWRT           DISARMED WRITE
005E96    4130 E64A =0044F4   7223           BAL    R11,STARTIO
005E9A    DE70 344A           7224           OC     R7,SELCHGO          START SELCH
005E9E    959A                7225           EPSR   R9,R10              RESTORE STATUS SAVED BY SELCHSET
005EA0    0300                7226           BR     R0                  RETURN
                              7227  *                                                                        *
                              7228  *   SELCH INTERRUPT                                                      *
                              7229  *                                                                        *
005EA2    E654 0034           7230  MAGPH4   LA     R5,BUF1END(DDBADR)  POINTER BUF LIMITS
005EA6    4160 EB32 =0049DC   7231           BAL    R6,SLCHENDW         STOP SELCH, CHECK ADDRESSES WRITE
005EAA    4824 0008           7232           LH     DEV,DEVADR(DDBADR)
005EAE    C850 0014           7233           LHI    R5,PHASE.5          PHASE 5 FOR NO MOTION
005EB2    D360 3435           7234           LB     R6,ENABLE           ALLOW NMTN INTERRUPT
005EB6    4130 E62A =0044F4   7235           BAL    R11,STARTIO
005EBA    1800                7236           LPSWR  OLDPSW
                              7237  *                                                                        *
                              7238  *   NO MOTION INTERRUPT AFTER WRITE                                      *
                              7239  *                                                                        *
005EBC    4160 EAD6 =004996   7240  MAGPH5   BAL    R6,MAGSTAT          CHECK INTERRUPT STATUS
005EC0    D355 6006 =005ECA   7241           LB     R5,MAG5NXT(R5)      USE RC TO GET NEXT PHASE
005EC4    4054 0002           7242           STH    R5,PHASE(DDBADR)    NEXT PHASE ACCORDING TO STATUS
005EC8    1800                7243           LPSWR  OLDPSW
005ECA    18                  7244  MAG5NXT  DB     PHASE.6             OK
005ECB    00                  7245           DB     PHASE.0             DU
005ECC    14                  7246           DB     PHASE.5             MOTION
005ECD    30                  7247           DB     PHASE.C             EOT
005ECE    0C                  7248           DB     PHASE.3             ERR
005ECF    00                  7249           DB     *
                              7250  *                                                                        *
                              7251  *   BACK SPACE ONE RECORD                                                *
                              7252  *                                                                        *
005ED0    4854 0048           7253  MAGPH6   LH     R5,SELCHADR(DDBADR)
005ED4    4180 E628 =004500   7254           BAL    R8,TESTLOCK         TEST SELCH INTERLOCK
005ED8    5854 0028           7255           L      R5,DVRWRK1(DDBADR)
005EDC    4180 E620 =0045C0   7256           BAL    R8,TESTLOCK         CHECK INTERLOCK
005EE0    4824 0008           7257           LH     DEV,DEVADR(DDBADR)
005EE4    9D23                7258           SSR    DEV,STAT
005EE6    D234 000A           7259           STB    STAT,STATUS(DDBADR) SAVE STATUS
005EEA    2315      =005EF4   7260           BFCS   1,MAG6L1            B IF DU CLEAR
005EEC    246C                7261           LIS    R6,0
005EEE    4064 0002           7262           STH    R6,PHASE(DDBADR)    HANG ZERO FOR DU
005EF2    0300                7263           BR     R0                  RETURN
005EF4    7550 E618 =004510   7264  MAG6L1   SBT    R5,INTRLOCK         SET MAG TAPE INTERLOCK
005EF8    C850 001C           7265           LHI    R5,PHASE.7          PHASE 7 FOR EOM INTERRUPTS
005EFC    D360 3452           7266           LB     R6,MAGBKSPC         BACKSPACE
005F00    4130 E5E0 =0044F4   7267           BAL    R11,STARTIO
005F04    0300                7268           BR     R0                  WAIT
                              7269  *                                                                        *
                              7270  *   EOM AND NO MOTION INTERRUPTS AFTER BACKSPACE                         *
                              7271  *                                                                        *
005F06    4160 EA8C =004996   7272  MAGPH7   BAL    R6,MAGSTAT          CHECK INTERRUPT STATUS
```

MAGNETIC TAPE DRIVER

```
005F0A      D355 8006  =005F14    7273            LB    R5,MAG7NXT(R5)       USE RC TO GET NEXT PHASE
005F0E      4054 0002             7274            STH   R5,PHASE(DDBADR)     NEXT PHASE ACCORDING TO STATUS
005F12      1800                  7275            LPSWR OLDPSW               RETURN
005F14      20                    7276   MAG7NXT  DB    PHASE.8             OK
005F15      00                    7277            DB    PHASE.0             DU
005F16      1C                    7278            DB    PHASE.7             MOTION
005F17      30                    7279            DB    PHASE.C             EOT
005F18      0C                    7280            DB    PHASE.3             FRR
005F19      00                    7281            DB    *
                                  7282   *                                                                     *
                                  7283   *   START READ                                                        *
                                  7284   *                                                                     *
005F1A      5854 0028             7285   MAGPH8   L     R5,DVRWRK1(DDBADR)
005F1E      4180 E5DE  =004500    7286            BAL   R8,TESTLOCK          CHECK INTERLOCK
005F22      4854 0048             7287            LH    R5,SELCHADR(DDBADR)
005F26      4180 E5D6  =004500    7288            BAL   R8,TESTLOCK          TEST SELCH INTERLOCK
005F2A      4824 0008             7289            LH    DEV,DEVADR(DDBADR)
005F2E      9D23                  7290            SSR   DEV,STAT
005F30      D234 000A             7291            STB   STAT,STATUS(DDBADR)  SAVE STATUS
005F34      2315       =005F3E    7292            BFCS  1,MAG8L1             B IF DU CLEAR
005F36      2460                  7293            LIS   R6,0
005F38      4054 0002             7294            STH   R6,PHASE(DDBADR)     HANG IN ZERO FOR DU
005F3C      0300                  7295            BR    R0                   RETURN
005F3E      5864 0028             7296   MAG8L1   L     R6,DVRWRK1(DDBADR)   SET MAG TAPE INTERLOCK
005F42      7560 E5CA  =004510    7297            SBT   R6,INTRLOCK
005F46      4874 0048             7298            LH    R7,SELCHADR(DDBADR)  GET SELCH ADDRESS
005F4A      E684 003C             7299            LA    R8,BUF2STRT(DDBADR)  POINTER TO BUFFER LIMITS
005F4E      41B0 EB1C  =004A6E    7300            BAL   R11,SELCHSET         SET UP SELCH
005F52      C850 0024             7301            LHI   R5,PHASE.9           PHASE NINE FOR SELCH INTERRUPT
005F56      D360 3453             7302            LB    R6,MAGREAD           DISARMED READ
005F5A      41B0 E586  =0044E4    7303            BAL   R11,STARTIO
005F5E      DE70 344B             7304            OC    R7,SLCHREAD          START SELCH
005F62      959A                  7305            EPSR  R9,R10               RESTORE STATUS SAVED BY SELCHSET
005F64      0300                  7306            BR    R0                   RETURN
                                  7307   *                                                                     *
                                  7308   *   SELCH INTERRUPT                                                   *
                                  7309   *                                                                     *
005F66      E654 0040             7310   MAGPH9   LA    R5,BUF2END(DDBADR)   POINTER TO BUF LIMITS
005F6A      4160 EA68  =0049D6    7311            BAL   R6,SLCHENDP          STOP SELCH, CHECK ADDRESSES READ
005F6E      4824 0008             7312            LH    DEV,DEVADR(DDBADR)
005F72      C850 0028             7313            LHI   R5,PHASE.A           PHASE A  FOR NO MOTION
005F76      D360 3435             7314            LB    R6,ENABLE            ALLOW NMTN INTERRUPT
005F7A      41B0 E566  =0044E4    7315            BAL   R11,STARTIO
005F7E      1800                  7316            LPSWR OLDPSW
                                  7317   *                                                                     *
                                  7318   *   NO MOTION INTERRUPT AFTER READ                                    *
                                  7319   *                                                                     *
005F80      4160 EA12  =004996    7320   MAGPHA   BAL   R6,MAGSTAT           CHECK INTERRUPT STATUS
005F84      D355 8006  =005F8F    7321            LB    R5,MAGANXT(R5)       USE RC TO GET NEXT PHASE
005F88      4054 0002             7322            STH   R5,PHASE(DDBADR)     NEXT PHASE ACCORDING TO STATUS
005F8C      1800                  7323            LPSWR OLDPSW               RETURN
005F8E      2C                    7324   MAGANXT  DB    PHASE.B             OK
005F8F      00                    7325            DB    PHASE.0             DU
```

MAGNETIC TAPE DRIVER

```
005F90    28                          7326          DB    PHASE.A           MOTION
005F91    30                          7327          DB    PHASE.C           EOT
005F92    0C                          7328          DB    PHASE.3           ERR
005F93    00                          7329          DB    *
                                      7330    *                                                          *
                                      7331    *  COMPARE DATA                                            *
                                      7332    *                                                          *
005F94    4110 E634 =0045CC           7333  MAGPHB   BAL   R1,COMPARE
005F98    41B0 E886 =004822           7334          BAL   R11,MBUFCLR
*005F9C   246C                        7335          LHI   R6,PHASE.3        NEXT PHASE IS 3, START WRITE
005F9E    4064 0002                   7336          STH   R6,PHASE(DDBADR)
005FA2    0300                        7337          BR    R0                RETURN
                                      7338    *                                                          *
                                      7339    *  EOT HANDLER, DISARMED REWIND                            *
                                      7340    *  ENTERED DIRECTLY FROM MAGSTAT                       R04  *
                                      7341    *                                                     R04
                                      7342    *  DRIVE INTERLOCK IS CLEAR                           R04
                                      7343    *  SELCH INTERLOCK IS CLEAR                           R04
                                      7344    *                                                     R04
005FA4    DE20 3454                   7345  MAGPHC   OC    DEV,MAGREWND      DISARMED REWIND          R04
005FA8    2454                        7346          LIS   R5,PHASE.1        PHASE ONE WAITS NO MOTION
005FAA    4054 0002                   7347          STH   R5,PHASE(DDBADR)
005FAE    9D23                        7348  MAGPHCL1 SSR   DEV,STAT          SENSE STATUS             R04
005FB0    C330 0020                   7349          THI   STAT,X'20'        STILL EOT??              R04
005FB4    2033      =005FAF           7350          BNZS  MAGPHCL1          YES, WAIT                R04
005FB6    1800                        7351          LPSWR OLDPSW            RETURN                   R04
                                      7352    *                                                          *
                                      7353  *CKMAG -- CHECK MAGNETIC TAPE PARAMETERS                     *
                                      7354    *                                                          *
                                      7355    *    CALLED BY PARM DECODE.  SUPPLIES DEFAULT ADDRESS 85 IF  *
                                      7356    * DEVADR = 0.  SUPPLIES SELCH ADDRESS F0 IF SELCHADR = 0     *
                                      7357    *                                                          *
005FB8    5894 0028                   7358  CKMAG    L     R9,DVRWRK1(DDBADR)
005FBC    07FF                        7359          XR    R15,R15           RETURN CODE = 0, ALL OK
005FBE    4824 0008                   7360          LH    DEV,DEVADR(DDBADR) DID USER GIVE ADDRESS?
005FC2    2135      =005FCC           7361          BNZS  CKMAG1            B IF YES
005FC4    C820 0085                   7362          LHI   DEV,X'85'         DEFAULT ADDRESS
005FC8    4024 0008                   7363          STH   DEV,DEVADR(DDBADR) INTO DDB
005FCC    4854 0048                   7364  CKMAG1   LH    R5,SELCHADR(DDBADR) DID USER GIVE SELCH?
005FD0    023E                        7365          BNZR  R14               B IF YES, RETURN
005FD2    C850 00F0                   7366          LHI   R5,X'F0'          DEFAULT SELCH ADDRESS
005FD6    4054 0048                   7367          STH   R5,SELCHADR(DDBADR) INTO DDB
005FDA    030E                        7368          BR    R14               RETURN
                                      7369          ENDC
005FDC                                7370          IFNZ  FLOPPY
```

FLOPPY DISK DRIVER

```
                                  7372  *
                                  7373  *
                                  7374  *                     FLOPPY DISC DRIVER
                                  7375  *
                                  7376  *
                                  7377  *
                                  7378  *FMDPTR -- FLOPPY DISC PHASE DISPATCHER
                                  7379  *
005FDC                            7380          ALIGN 4
005FDC       0000 5FFC            7381  FMDPTR   DC    A(FMDPH0)
005FE0       0000 6036            7382           DC    A(FMDPH1)
005FE4       0000 605A            7383           DC    A(FMDPH2)
005FE8       0000 60C2            7384           DC    A(FMDPH3)
005FEC       0000 6122            7385           DC    A(FMDPH4)
005FF0       0000 6130            7386           DC    A(FMDPH5)
005FF4       0000 515E            7387           DC    A(FMDPH6)
005FF8       0000 6198            7388           DC    A(FMDPH7)
                                  7389  *
                                  7390  * PHASE 0     RESET FLOPPY
                                  7391  *
                                  7392  *
005FFC       4824 0008            7393  FMDPH0   LH    DEV,DEVADR(DDBADR)   DEVICE #ADDRESS
006000       0852                 7394           LR    R5,DEV               TEST
006002       4180 E4FA =004F00    7395           BAL   R8,TESTLOCK          DEVICE INTERLOCK
006006       4884 002E            7396           LH    R8,DVRWRK2+2(DDBADR) FLOPPY DRIVE NUMBER
00600A       DE28 3490            7397           OC    DEV,FMDDSTOP(R8)     DISARM STOP THIS DRIVE
00600E       9D23                 7398           SSR   DEV,STAT             SENSE STATUS
006010       D234 000A            7399           STB   STAT,STATUS(DDBADR)  SAVE IT
006014       C330 0081            7400           THI   STAT,X'81'           WRITE PROTECT OR FAULT
006018       2334      =006020    7401           BZS   FMDOL1               NO
00601A       41B0 E4AC =0044CA    7402           BAL   R11,BSTATERR         ELSE BAD STATUS ERROR
00601E       0300                 7403           BR    R0                   RETURN TO DISPATCHER
                                  7404  *
006020       2458                 7405  FMDOL1   LIS   R5,PHASE.2
006022       4054 0002            7406           STH   R5,PHASE(DDBADR)     PHASE TWO NEXT
006026       2452                 7407           LIS   R5,NOTCOUNT
006028       7654 0000            7408           RBT   R5,DSPFLGS(DDBADR)   CLEAR NOT COUNTING
00602C       4854 004C            7409           LH    R5,LRNLOW(DDBADR)
006030       4054 0058            7410           STH   R5,LRNCUR(DDBADR)    SET LRN TO LOW VALUE
006034       0300                 7411           BR    R0                   RETURN TO DISPATCHER
                                  7412  *
                                  7413  *       PHASE ONE     INCREMENT THE LOGICAL RECORD NUMBER (LRN)
                                  7414  *
                                  7415  *
006036       4854 0058            7416  FMDPH1   LH    R5,LRNCUR(DDBADR)    CURRENT LRN
00603A       2651                 7417           AIS   R5,1                 INCREMENT BY ONE
00603C       4554 004E            7418           CLH   R5,LRNHIGH(DDBADR)   EXCEEDS HIGH VALUE
006040       2323      =006046    7419           BNPS  FMDP1L1              NO
006042       4854 004C            7420           LH    R5,LRNLOW(DDBADR)    ELSE RESET LRN TO LOW VALUE
006046       4054 0058            7421  FMDP1L1  STH   R5,LRNCUR(DDBADR)    NEW CURRENT LRN
00604A       5894 0028            7422           L     R9,DVRWRK1(DDBADR)   FLOPPY DRIVE NUMBER
00604E       4180 E54E =0045AC    7423           BAL   R8,BLINK             DISPLAY DRIVE ON PANEL
006052       2458                 7424           LIS   R5,PHASE.2
```

FLOPPY DISK DRIVER

```
006054      4054 0002          7425            STH     R5,PHASE(DDBADR)     PHASE TWO NEXT
006058      0300              7426            PR      R0                   RETURN TO DISPATCHER
                              7427    *
                              7428    *       PHASE TWO       WRITE DATA TO LOGICAL RECORD
                              7429    *
                              7430    *
                              7431    *
00605A      4854 0008          7432    FMDPH2  LH      R5,DEVADR(DDBADR)    DEVICE ADDRESS
00605E      4180 E49E =004500   7433            BAL     R8,TESTLOCK          TEST DEVICE INTERLOCK
006062      0825              7434            LR      DEV,R5               DEVICE ADDRESS
006064      C880 6000          7435            LHI     R8,X'6000'           TIME CONSTANT
006068      9D23              7436    FMDP2L0  SSR     DEV,STAT             SENSE STATUS
00606A      2781              7437            SIS     R8,1                 DECREMENT TIMER
00606C      233A     =006080   7438            BZS     FMDP2L1              ERROR IF TIMED OUT
00606E      D234 000A          7439            STB     STAT,STATUS(DDBADR)  SAVE STATUS
006072      C330 0081          7440            THI     STAT,X'81'           WRITE PROTECT OR FAULT
006076      2135     =006080   7441            BNZS    FMDP2L1              IF PRESENT ERROR
006078      C330 0002          7442            THI     STAT,2               IDLE STATUS
00607C      2138     =00608C   7443            BNZS    FMDP2L2
00607E      220B     =006068   7444            BS      FMDP2L0              WAIT FOR IDLE
006080      41B0 E446 =0044CA   7445    FMDP2L1  BAL     R11,BSTATERR         BAD STATUS ERROR
006084      2450              7446            LIS     R5,0
006086      4054 0002          7447            STH     R5,PHASE(DDBADR)     NEXT PHASE ZERO
00608A      0300              7448            PR      R0                   RETURN TO DISPATCHER
                              7449    *
00608C      0882              7450    FMDP2L2  LR      R8,DEV               DEVICE ADDRESS
00608E      7580 E47E =004510   7451            SBT     R8,INTRLOCK          SET DEVICE INTERLOCK
006092      D824 0058          7452            WH      DEV,LRNCUR(DDBADR)   WRITE LRN
006096      4884 002E          7453            LH      R8,DVRWRK2+2(DDBADR) FLOPPY DRIVE NUMBER
00609A      DE28 3484          7454            OC      DEV,FMDWRT(R8)       ISSUE WRITE COMMAND TO DRIVE
00609E      9D23              7455            SSR     DEV,STAT             STATUS (DISARM)
0060A0      2081     =000001   7456            BTBS    8,1                  WAIT FOR NOT BUSY
0060A2      5854 0030          7457            L       R5,BUF1STRT(DDBADR)  START OF BUFFER
0060A6      D825 0000          7458    FMDP2L3  WH      DEV,0(R5)            WRITE DATA
0060AA      2652              7459            AIS     R5,2                 HALFWORD
0060AC      5954 0034          7460            C       R5,BUF1END(DDBADR)   END OF BUFFER
0060B0      2225     =0060A6   7461            BFBS    2,FMDP2L3            WRITE ENTIRE LR
0060B2      245C              7462            LIS     R5,PHASE.3           PHASE THREE NEXT
0060B4      4884 002E          7463            LH      R8,DVRWRK2+2(DDBADR) FLOPPY DRIVE NUMBER
0060B8      D368 3488          7464            LB      R6,FFDSTOP(R8)       STOP COMMAND ENABLE INT.
0060BC      41B0 E424 =0044E4   7465            BAL     R11,STARTIO          START I-O COMMAND
0060C0      0300              7466            BR      R0                   WAIT FOR INTERRUPT
                              7467    *
                              7468    *       PHASE THREE      INTERRUPT AFTER STOP COMMAND
                              7469    *
                              7470    *
0060C2      4884 002E          7471    FMDPH3  LH      R8,DVRWRK2+2(DDBADR) FLOPPY DRIVE
0060C6      D378 3488          7472            LB      R7,FMDSTOP(R8)       STOP COMMAND
0060CA      C670 00C0          7473            OHI     R7,X'C0'             DISARM IT
0060CE      9E27              7474            OCR     DEV,R7               ISSUE COMMAND
0060D0      9D23              7475            SSR     DEV,STAT             SENSE STATUS
0060D2      C330 0085          7476    FMDP3L0  THI     STAT,X'85'           WRITE PROTECT,EXAMINE OR FAULT
0060D6      4330 8026 =006100   7477            BZ      FMDP3L3              NO
```

FLOPPY DISK DRIVER

```
                                  7478   *                                      
0060DA    41B0 E3EC =0044CA      7479                BAL   R11,BSTATERR         ELSE BAD STATUS ERROR
0060DE    D334 000A              7480                LB    STAT,STATUS(DDBADR)  STATUS
0060E2    C330 0081              7481                THI   STAT,X'81'           WRITE PROTECT AND FAULT
0060E6    2338      =0060F6      7482                BZS   FMDP3L2              NO
                                  7483   *
0060E8    2450                   7484                LIS   R5,0                 ELSE PHASE ZERO
0060EA    4054 0002              7485   FMDP3L1      STH   R5,PHASE(DDBADR)     NEXT
0060EE    2451                   7486                LIS   R5,BUSY              CLEAR BUSY
0060F0    7654 0000              7487                RBT   R5,DSPFLGS(DDBADR)
0060F4    1800                   7488                LPSWR OLDPSW
                                  7489   *
0060F6    C330 0040              7490   FMDP3L2      THI   STAT,X'40'           DEFECTIVE TRACK
0060FA    2333      =006100      7491                BZS   FMDP3L3              NO
0060FC    2454                   7492                LIS   R5,PHASE.1           ELSE PHASE ONE
0060FE    220A      =0060EA      7493                BS    FMDP3L1              NEXT
                                  7494   *
006100    9D23                   7495   FMDP3L3      SSR   DEV,STAT             SENSE STATUS
006102    D234 000A              7496                STB   STAT,STATUS(DDBADR)  SAVE STATUS
006106    4320 FFC8 =0060D2      7497                BFC   2,FMDP3L0            WAIT FOR IDLE
00610A    D824 0058              7498                WH    DEV,LRNCUR(DDBADR)   WRITE LRN TO FLOPPY FOR READ
00610E    7520 E3FE =004510      7499                SBT   DEV,INTRLOCK        SET DEVICE INTERLOCK
006112    C850 0010              7500                LHI   R5,PHASE.4
006116    4054 0002              7501                STH   R5,PHASE(DDBADR)     PHASE FOUR NEXT
00611A    2451                   7502                LIS   R5,BUSY              CLEAR BUSY FLAG
00611C    7654 0000              7503                RBT   R5,DSPFLGS(DDBADR)
006120    1800                   7504                LPSWR OLDPSW              RETURN
                                  7505   *
                                  7506   *     PHASE FOUR       CLEAR READ BUFFER
                                  7507   *
                                  7508   *
006122    41B0 E522 =004648      7509   FMDPH4      BAL   R11,BUFCLEAR         CLEAR READ BUFFER
006126    C850 0014              7510                LHI   R5,PHASE.5
00612A    4054 0002              7511                STH   R5,PHASE(DDBADR)     PHASE FIVE NEXT
00612E    0300                   7512                BR    R0                   RETURN TO DISPATCHER
                                  7513   *
                                  7514   *     PHASE FIVE       READ DATA FROM LOGICAL RECORD
                                  7515   *
                                  7516   *
006130    4824 0008              7517   FMDPH5      LH    DEV,DEVADR(DDBADR)   DEVICE ADDRESS
006134    4884 002E              7518                LH    R8,DVRWRK2+2(DDBADR) AND DRIVE NUMBER
006138    DE28 348C              7519                OC    DEV,FMDREAD(R8)      READ COMMAND
00613C    9D23                   7520                SSR   DEV,STAT             SENSE STATUS
00613E    2081      =000001      7521                BTBS  8,1                  WAIT UNTIL NOT BUSY
006140    5854 003C              7522                L     R5,BUF2STRT(DDBADR)  START ADDRESS OF READ BUFFER
006144    D925 0000              7523   FMDP5L0     RH    DEV,0(R5)            READ DATA
006148    2652                   7524                AIS   R5,2                 HALFWORD OF DATA
00614A    5954 0040              7525                C     R5,BUF2END(DDBADR)   END OF BUFFER
00614E    2225      =006144      7526                BFBS  2,FMDP5L0            READ ENTIRE BUFFER
006150    C850 0018              7527                LHI   R5,PHASE.6           PHASE SIX NEXT
006154    D368 3488              7528                LB    R6,FMDSTOP(R8)       STOP COMMAND (ENABLE)
006158    41B0 E388 =0044E4      7529                BAL   R11,STARTIO          ISSUE I-O COMMAND
00615C    0300                   7530                BR    R0                   WAIT FOR INTERRUPT
```

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FLOPPY DISK DRIVER

```
                                        7531  *
                                        7532  *          PHASE SIX      INTERRUPT AFTER STOP COMMAND
                                        7533  *
                                        7534  *
                                        7535  *
00615E        4824 0008                 7536  FMDPH6   LH      DEV,DEVADR(DDBADR)    DEVICE ADDRESS
006162        9D23                       7537  FMDP6LO  SSR     DEV,STAT              SENSE STATUS
006164        C330 0081                  7538           THI     STAT,X'81'            WRITE PROTECT OR FAULT
006168        2135        =006172        7539           BNZS    FMDP6L1               YES, BAD STATUS
                                        7540  *
00616A        C330 0002                  7541           THI     STAT,2                IDLE FLOPPY
00616E        2236        =006162        7542           BZS     FMDP6LO               WAIT FOR IDLE
006170        2303        =006176        7543           BS      FMDP6L2               ELSE CONTINUE
                                        7544  *
006172        4130 E354   =0044CA        7545  FMDP6L1  BAL     R11,BSTATERR          BAD STATUS ERROR
                                        7546  *
006176        4884 002E                  7547  FMDP6L2  LH      R8,DVRWRK2+2(DDBADR)  FLOPPY DRIVE NUMBER
00617A        D378 3488                  7548           LB      R7,FMDSTOP(R8)        STOP COMMAND
00617E        C670 00C0                  7549           OHI     R7,X'C0'              DISARM IT
006182        9F27                       7550           OCR     DEV,R7                ISSUE COMMAND
006184        7620 E388   =004510        7551           RBT     DEV,INTRLOCK          CLEAR DEVICE INTERLOCK
006188        C850 001C                  7552           LHI     R5,PHASE.7
00618C        4054 0002                  7553           STH     R5,PHASE(DDBADR)      PHASE SEVEN NEXT
006190        2451                       7554           LIS     R5,BUSY               CLEAR BUSY FLAG
006192        7654 0000                  7555           RBT     R5,DSPFLGS(DDBADR)
006196        1300                       7556           LPSWR   OLDPSW
                                        7557  *
                                        7558  *          PHASE SEVEN     TEST THE READ BUFFER DATA AND SWITCH TO ANOTHE
                                        7559  *                     FLOPPY DRIVE.
                                        7560  *
                                        7561  *
006198        4110 E430   =0045CC        7562  FMDPH7   BAL     R1,COMPARE            TEST READ BUFFER DATA
00619C        24F4                       7563           LIS     R15,PHASE.1
00619E        40F4 0002                  7564           STH     R15,PHASE(DDBADR)     PHASE ONE NEXT
0061A2        D350 3498                  7565  FMDP7L1  LB      R5,FMDRIVE            CURRENT DRIVE NUMBER
0061A6        2551                       7566           AIS     R5,1                  NEXT DRIVE
0061A8        C550 0004                  7567           CLHI    R5,4                  NO MORE THAN FOUR
0061AC        2182        =0061B0        7568           BLS     FMDP7L2
                                        7569  *
0061AE        2450                       7570           LIS     R5,0                  RESET DRIVE NUMBER TO ZERO
0061B0        D250 3498                  7571  FMDP7L2  STB     R5,FMDRIVE            NEW DRIVE NUMBER
0061B4        2461                       7572  FMDSELS  LIS     R6,1                  ARRAY BIT
0061B6        CD65 0000                  7573           SLHL    R6,0(R5)              SET BIT IN ARRAY
0061BA        4460 3498                  7574           NH      R6,FMDRIVE            DRIVE NUMBER
0061BE        223E        =0061A2        7575           BZS     FMDP7L1               IF ZERO, ANOTHER DRIVE
0061C0        0300                       7576           BR      RO                    RETURN TO DISPATCHER
                                        7577  *
                                        7578  *CKFMD -- CHECK FLOPPY DISC PARAMETERS
                                        7579  *
                                        7580  *          DEFAULT ADDRESS "C1", LOW LRN = 1, HIGH LRN = 1
                                        7581  *          MAX LRN = 7D2
                                        7582  *
                                        7583  *
```

FLOPPY DISK DRIVER

```
0061C2    936A                7584  CKFMD   LBR   R6,R10              FLOPPY NUMBER IN ASCII
0061C4    CB60 0031           7585          SHI   R6,X'31'            CONVERT TO HEX
0061C8    2451                7586          LIS   R5,1                BIT FOR FLOPPY ARRAY
0061CA    CD56 0000           7587          SLHL  R5,0(R6)            SET BIT IN ARRAY
0061CE    4650 3498           7588          OH    R5,FMDRIVE
0061D2    4050 3498           7589          STH   R5,FMDRIVE          SET DRIVE NUMBER
0061D6    4854 004C           7590          LH    R5,LRNLOW(DDBADR)   LOW LRN
0061DA    2134      =0061E2   7591          BNZS  CKFMD1              OK IF NOT ZERO
0061DC    2451                7592          LIS   R5,1                LRN OF ONE
0061DE    4054 004C           7593          STH   R5,LRNLOW(DDBADR)
0061E2    4554 004E           7594  CKFMD1  CLH   R5,LRNHIGH(DDBADR)  HIGH LRN
0061E6    2183      =0061EC   7595          BLS   CKFMD2              IF LESS THAN HIGH VALUE, OK
0061E8    4054 004E           7596          STH   R5,LRNHIGH(DDBADR)  ELSE HIGH LRN = LOW LRN
0061EC    4854 004E           7597  CKFMD2  LH    R5,LRNHIGH(DDBADR)  HIGH LRN
0061F0    C550 07D2           7598          CLHI  R5,X'07D2'          HIGH LRN = 7D2
0061F4    2327      =006202   7599          BNPS  CKFMD3              NOT EXCEEDED
0061F6    C850 07D2           7600          LHI   R5,X'07D2'          MAX VALUE IS 7D2
0061FA    4054 004E           7601          STH   R5,LRNHIGH(DDBADR)
0061FE    4054 004C           7602          STH   R5,LRNLOW(DDBADR)
006202    24F0                7603  CKFMD3  LIS   R15,0               CLEAR FLAG
006204    4824 0008           7604          LH    DEV,DEVADR(DDBADR)  DEVICE ADDRESS
006208    023E                7605          BNZR  R14                 USE THIS VALUE
00620A    C820 00C1           7606          LHI   DEV,X'C1'           ELSE DEVICE ADDRESS C1
00620E    4024 0008           7607          STH   DEV,DEVADR(DDBADR)
006212    030E                7608          BR    R14                 RETURN
                              7609          ENDC
006214                        7610          IFNZ  SELCHTST
```

```
                                    7612  *
                                    7613  *
                                    7614  *
                                    7615  *         SELCH TESTER DRIVER
                                    7616  *
                                    7617  *
                                    7618  *
                                    7619  *
006214                              7620           ALIGN 4
006214      0000 622C               7621  SLCHPTR  DC     A(SLCHPH0)            PHASE 0 INIT, CLEAR
006218      0000 625A               7622           DC     A(SLCHPH1)            PHASE 1 START WRITE
00621C      0000 62A4               7623           DC     A(SLCHPH2)            PHASE 2 SELCH INTERRUPT
006220      0000 62BA               7624           DC     A(SLCHPH3)            PHASE 3 START READ
006224      0000 62F8               7625           DC     A(SLCHPH4)            PHASE 4 SELCH INTERRUPT
006228      0000 631C               7626           DC     A(SLCHPH5)            PHASE 5 COMPARE
                                    7627  *
                                    7628  *PHASE0           INITIALIZATION, CLEAR
                                    7629  *
00622C      4824 0008               7630  SLCHPH0  LH     DEV,DEVADR(DDBADR)    DEVICE ADDRESS
006230      4854 0048               7631           LH     R5,SELCHADR(DDBADR)   SELCH ADDR
006234      4180 E2C8    =004500    7632           BAL    R8,TESTLOCK           TEST INTERLOCK
006238      9D23                    7633           SSR    DEV,STAT
00623A      D234 000A               7634           STB    STAT,STATUS(DDBADR)   STATUS
00623E      2314        =006246     7635           BFCS   1,SLCHOL2
006240      4180 E286    =0044CA    7636           BAL    R11,ESTATERR          ERROR IF DEVICE UNAVAILABLE
006244      0300                    7637           BR     R0
                                    7638  *
                                    7639  *
006246      2454                    7640  SLCHOL2  LIS    R5,PHASE.1            PHASE 1 NEXT
006248      4054 0002               7641           STH    R5,PHASE(DDBADR)
00624C      2453                    7642           LIS    R5,BADSTAT            CLEAR FLAGS
00624E      7654 0000               7643           RBT    R5,DSPFLGS(DDBADR)
006252      2452                    7644           LIS    R5,NOTCOUNT
006254      7654 0000               7645           RBT    R5,DSPFLGS(DDBADR)
006258      0300                    7646           BR     R0
                                    7647  *
                                    7648  *PHASE 1          START WRITE
                                    7649  *
00625A      4824 0008               7650  SLCHPH1  LH     DEV,DEVADR(DDBADR)    SELCH TESTER ADDR
00625E      4854 0048               7651           LH     R5,SELCHADR(DDBADR)   SELCH ADDR
006262      4180 E29A    =004500    7652           BAL    R8,TESTLOCK           TEST THIS INTERLOCK
006266      4170 E408    =004672    7653           BAL    R7,MOVEBUF            MOVE BUFFER
00626A      2497                    7654           LIS    R9,7                  SELCH TESTER DISPLAY CODE
00626C      4180 E330    =0045A0    7655           BAL    R8,BLINK              DISPLAY IT
006270      9D23                    7656           SSR    DEV,STAT
006272      D234 000A               7657           STB    STAT,STATUS(DDBADR)   STATUS
006276      2315        =006280     7658           BFCS   1,SLCH1L1
006278      2450                    7659  SLCH1L00 LIS    R5,0                  PHASE 0 IF DEVICE UNAVAILABLE
00627A      4054 0002               7660           STH    R5,PHASE(DDBADR)
00627E      0300                    7661           BR     R0
                                    7662  *
006280      DE20 344C               7663  SLCH1L1  OC     DEV,SLCHCLR           CLEAR SELCH TESTER
006284      D820 34CC               7664           WH     DEV,ZERO              CLEAR SELCH TESTER COUNTER
```

SELCH TESTER DRIVER

```
006288    E684 0030          7665         LA    R8,BUF1STRT(DDBADR) START ADDR OF DATA PATTERN
00628C    0875               7666         LR    R7,R5               SELCH ADDR
00628E    41B0 E7DC =004A6E   7667         BAL   R11,SELCHSET        SET SELCH
006292    2458               7668         LIS   R5,PHASE.2          PHASE 2 NEXT
006294    D360 344D          7669         LB    R6,SLCHINCR         WRITE
006298    41B0 E248 =0044E4   7670         BAL   R11,STARTIO
00629C    DE70 344A          7671         OC    R7,SELCHGO          WRITE COMMAND
0062A0    959A               7672         EPSR  R9,R10              ENABLE INTERRUPT
0062A2    0300               7673  *      BR    R0
                             7674  *
                             7675  *PHASE 2        SELCH INTERRUPT AFTER WRITE
                             7676  *
0062A4    E654 0034          7677  SLCHPH2 LA   R5,BUF1END(DDBADR)  EXPECTED END ADDRESS OF BUFFER
0062A8    4160 E730 =0049DC   7678         BAL   R6,SLCHENDW         TEST SELCH WRITE TERMINATION
0062AC    245C               7679         LIS   R5,PHASE.3          PHASE 3
0062AE    4054 0002          7680         STH   R5,PHASE(DDBADR)    NEXT
0062B2    2451               7681         LIS   R5,BUSY             CLEAR BUSY
0062B4    7654 0000          7682         RBT   R5,DSPFLGS(DDBADR)
0062B8    1800               7683         LPSWR OLDPSW
                             7684  *
                             7685  *PHASE 3
                             7686  *
0062BA    4824 0008          7687  SLCHPH3 LH   DEV,DEVADR(DDBADR)  SELCH TESTER ADDR
0062BE    4854 0048          7688         LH    R5,SELCHADR(DDBADR) AND
0062C2    4180 E23A =004500   7689         BAL   R8,TESTLOCK         SELCH INTERLOCK
0062C6    DE20 344C          7690         OC    DEV,SLCHCLR         CLEAR TESTER
0062CA    D820 34CC          7691         WH    DEV,ZERO            SET SELCH TESTER DATA TO ZERO
0062CE    9D23               7692         SSR   DEV,STAT
0062D0    D234 000A          7693         STB   STAT,STATUS(DDBADR) STATUS
0062D4    4210 FFA0 =006278   7694         BTC   1,SLCH1L00          PHASE 0 IF DEVICE UNAVAILABLE
0062D8    4874 0048          7695         LH    R7,SELCHADR(DDBADR)  SELCH ADDR
0062DC    E684 003C          7696         LA    R8,BUF2STRT(DDBADR)  START ADDR OF BUFFER 2 (READ)
0062E0    41B0 E78A =004A6E   7697         BAL   R11,SELCHSET        SET SELCH ADDR
0062E4    C850 0010          7698         LHI   R5,PHASE.4          PHASE 4 NEXT
0062E8    D360 344D          7699         LB    R6,SLCHINCR
0062EC    41B0 E1F4 =0044E4   7700         BAL   R11,STARTIO         SELCH TESTER READ
0062F0    DE70 344B          7701         OC    R7,SLCHREAD         SELCH READ
0062F4    959A               7702         EPSR  R9,R10              ENABLE INTERRUPTS
0062F6    0300               7703  *      BR    R0
                             7704  *
                             7705  *PHASE 4        SELCH INTERRUPT AFTER READ
                             7706  *
0062F8    E654 0040          7707  SLCHPH4 LA   R5,BUF2END(DDBADR)  END ADDR OF BUFFER 2 (READ)
0062FC    4160 E6D6 =0049D6   7708         BAL   R6,SLCHENDR         TEST SELCH TERMINATION
006300    C850 0014          7709         LHI   R5,PHASE.5          PHASE 5
006304    4054 0002          7710         STH   R5,PHASE(DDBADR)    NEXT
006308    2451               7711         LIS   R5,BUSY             CLEAR BUSY
00630A    7654 0000          7712         RBT   R5,DSPFLGS(DDBADR)
00630E    1800               7713         LPSWR OLDPSW
                             7714  *
                             7715  *PHASE 5        COMPARE DATA
                             7716  *
006310    4110 E2B8 =0045CC   7717  SLCHPH5 BAL  R1,COMPARE          COMPARE
```

SELCH TESTER DRIVER

```
006314      41B0 E50A =004822   7718          BAL    R11,MBUFCLR         CLEAR MOVE BUFFER
006318      2454               7719          LIS    R5,PHASE.1          PHASE 1 NEXT
00631A      4054 0002          7720          STH    R5,PHASE(DDBADR)
00631E      0300               7721          BR     R0
                               7722    *
                               7723    *
                               7724    *
                               7725    *
006320      4854 0048          7726  CKSLCH   LH     R5,SELCHADR(DDBADR) SELCH ADDR
006324      2135       =00632E 7727          BNZS   CKSLCH1
006326      C850 00F0          7728          LHI    R5,X'F0'            DEFAULT ADDR  F0
00632A      4054 0048          7729          STH    R5,SELCHADR(DDBADR)
00632E      4854 0008          7730  CKSLCH1  LH     R5,DEVADR(DDBADR)   SELCH TESTER ADDR
006332      2135       =00633C 7731          BNZS   CKSLCH2
006334      C850 00D0          7732          LHI    R5,X'D0'            DEFAULT ADDR  D0
006338      4054 0008          7733          STH    R5,DEVADR(DDBADR)
00633C      24F0               7734  CKSLCH2  LIS    R15,0               OK
00633E      030E               7735          BR     R14                 RETURN
                               7736    *
                               7737    *
                               7738    *
                               7739          ENDC
006340                         7740          IFNZ   EIGHTINT
```

```
                                    7742  *
                                    7743  *
                                    7744  *                    EIGHT LINE INTERRUPT DRIVER
                                    7745  *
                                    7746  *
                                    7747  *INT8PTR      EIGHT LINE PHASE DISPATCHER
                                    7748  *
006340                              7749         ALIGN 4
006340       0000 634C              7750  INT8PTR  DC    A(INT8PH0)
006344       0000 635E              7751         DC    A(INT8PH1)
006348       0000 639A              7752         DC    A(INT8PH2)
                                    7753  *
                                    7754  *
                                    7755  *        PHASE ZERO    CLEAR LINE NUMBER AND LINE ARRAY
                                    7756  *
                                    7757  *
00634C       2450                   7758  INT8PH0  LIS   R5,0              ZERO
00634E       5054 0028              7759         ST    R5,DVRWRK1(DDBADR)  CLEAR LINE NUMBER
006352       5054 002C              7760         ST    R5,DVRWRK2(DDBADR)  CLEAR LINE ARRAY
006356       2454                   7761         LIS   R5,PHASE.1
006358       4054 0002              7762         STH   R5,PHASE(DDBADR)    PHASE ONE NEXT
00635C       0300                   7763         BR    R0                RETURN TO DISPATCHER
                                    7764  *
                                    7765  *
                                    7766  *        PHASE ONE      WRITE DATA BYTE ON THIS LINE
                                    7767  *
                                    7768  *
00635E       4824 0008              7769  INT8PH1  LH    DEV,DEVADR(DDBADR)  DEVICE ADDRESS
006362       4854 002A              7770         LH    R5,DVRWRK1+2(DDBADR)  LINE NUMBER
006366       C450 0007              7771         NHI   R5,7              ONLY EIGHT LINES PERMITTED
00636A       4054 002A              7772         STH   R5,DVRWRK1+2(DDBADR)  SAVE LINE NUMBER
00636E       C870 0080              7773         LHI   R7,X'80'          ARRAY BIT
006372       CC75 0000              7774         SRHL  R7,0(R5)          SET BIT IN ARRAY
006376       4074 002E              7775         STH   R7,DVRWRK2+2(DDBADR)  SAVE ARRAY
00637A       DE20 3474              7776         OC    DEV,INT8DSBL      DISABLE DEVICE
00637E       9A27                   7777         WDR   DEV,R7            WRITE DATA, NO INTERRUPT
006380       DE20 3475              7778         OC    DEV,INT8CLR       CLEAR DEVICE
006384       C890 0014              7779         LHI   R9,20             DISPLAY CODE
006388       4180 E214 =0045A0      7780         BAL   R8,BLINK          DISPLAY IT
00638C       2458                   7781         LIS   R5,PHASE.2        PHASE TWO NEXT
00638E       C860 0050              7782         LHI   R6,X'50'          ENABLE AND SET COMMAND
006392       41B0 E14E =0044F4      7783         BAL   R11,STARTIO       ISSUE I-O COMMAND
006396       9A27                   7784         WDR   DEV,R7            WRITE DATA BYTE
006398       0300                   7785         BR    R0                WAIT FOR INTERRUPT
                                    7786  *
                                    7787  *
                                    7788  *        PHASE TWO      INTERRUPT AFTER WRITE BYTE
                                    7789  *
                                    7790  *
00639A       4854 002A              7791  INT8PH2  LH    R5,DVRWRK1+2(DDBADR)  CURRENT LINE NUMBER
00639E       0862                   7792         LR    R6,DEV            DEVICE & LINE THAT INTERRUPTED
0063A0       C460 0007              7793         NHI   R6,7              GET LINE NUMBER ONLY
0063A4       0565                   7794         CLR   R6,R5             EXPECTED LINE NUMBER
```

8 LINE INTERRUPT

```
006346      4230 10C4            7795          BNE    INTRUPT4          NO, UNEXPECTED INTERRUPT ERROR
0063AA      DE20 3476            7796          OC     DEV,INT8REST      RESET MODECE
0063AE      DA24 002F            7797          WD     DEV,DVRWRK2+3(DDBADR) SELECTS A NEW LINE
0063B2      2651                 7798          AIS    R5,1              NEXT LINE
0063B4      4054 002A            7799          STH    R5,DVRWRK1+2(DDBADR) TO BE USED
0063B8      2454                 7800          LIS    R5,PHASE.1
0063BA      4054 0002            7801          STH    R5,PHASE(DDBADR)  PHASE ONE NEXT
0063BE      2451                 7802          LIS    R5,BUSY           RESET BUSY
0063C0      7654 0000            7803          RBT    R5,DSPFLGS(DDBADR)
0063C4      1800                 7804          LPSWR  OLDPSW
                                 7805   *
                                 7806   *CKINT8 -- CHECKS EIGHT LINE INTERRUPT PARAMETER VALUES
                                 7807   *
                                 7808   *
0063C6      24F0                 7809   CKINT8 LIS    R15,0             CLEAR FLAG
0063C8      4324 0008            7810          LH     DEV,DEVADR(DDBADR) DEVICE ADDRESS
0063CC      2135      =0063D6    7811          BNZS   CK80              USE THE ADDRESS SPECIFIED
0063CE      C820 0020            7812          LHI    DEV,X'20'         ELSE USE DEFAULT ADDRESS OF X'20'
0063D2      4024 0008            7813          STH    DEV,DEVADR(DDBADR) SAVE IT
0063D6      4020 34B4            7814   CK80   STH    DEV,INT8ADR       STORE ADDRESS HERE TOO
0063DA      030E                 7815          BR     R14               CONTINUE
                                 7816   *
                                 7817   *
                                 7818          ENDC
0063DC                           7819          IFNZ   ULI
```

```
                             7821  *
                             7822  *
                             7823  *                    UNIVERSAL LOGIC INTERFACE DRIVER
                             7824  *
                             7825  *
                             7826  *
                             7827  *
                             7828  *ULIPTR -- ULI PHASE DISPATCHER
                             7829  *
                             7830  *
0063DC                       7831          ALIGN  4
0063DC     0000 63EC         7832  ULIPTR   DC     A(ULIPH0)
0063E0     0000 6424         7833           DC     A(ULIPH1)
0063E4     0000 643C         7834           DC     A(ULIPH2)
0063E8     0000 6492         7835           DC     A(ULIPH3)
                             7836  *
                             7837  *
                             7838  *          PHASE ZERO      CREATE INTERRUPT (ISSUE ZERO COMMAND)
                             7839  *
                             7840  *
0063EC     4824 0008         7841  ULIPH0   LH     DEV,DEVADR(DDBADR)   DEVICE ADDRESS
0063F0     2460              7842           LIS    R6,0                RESET
0063F2     4060 8132 =006528 7843           STH    R6,ULISTRAP         STRAP OPTION FLAG
0063F6     5064 0028         7844           ST     R6,DVRWRK1(DDBADR)  CLEAR WORK AREA
0063FA     2454              7845           LIS    R5,PHASE.1
0063FC     4054 0002         7846           STH    R5,PHASE(DDBADR)    PHASE ONE NEXT
006400     2451              7847           LIS    R5,BUSY
006402     7554 0000         7848           SBT    R5,DSPFLGS(DDBADR)  SET BUSY
006406     2452              7849           LIS    R5,NOTCOUNT
006408     7654 0000         7850           RBT    R5,DSPFLGS(DDBADR)  SET COUNTING
00640C     DE20 3432         7851           OC     DEV,DISABLE         *                              R09
006410     DE20 3477         7852           OC     DEV,ULIEBL          *                              R09
006414     0340              7853           BFCR   4,R0                *                              R09
                             7854  *
006416     9D23              7855  ULIOL1   SSR    DEV,STAT            DEVICE STATUS
006418     41B0 E0AE =0044CA 7856           BAL    R11,BSTATERR        BAD STATUS ERROR
00641C     2450              7857           LIS    R5,0
00641E     4054 0002         7858           STH    R5,PHASE(DDBADR)    PHASE ZERO NEXT
006422     0300              7859           BR     R0                  RETURN TO DISPATCHER
                             7860  *
                             7861  *
                             7862  *          PHASE ONE      INTERRUPT
                             7863  *
                             7864  *
006424     2451              7865  ULIPH1   LIS    R5,BUSY
006426     7654 0000         7866           RBT    R5,DSPFLGS(DDBADR)  CLEAR BUSY
00642A     2453              7867           LIS    R5,BADSTAT          CLEAR BAD STATUS
00642C     7654 0000         7868           RBT    R5,DSPFLGS(DDBADR)
006430     DE20 3478         7869           OC     DEV,ULIHW           ISSUE DISARM HW MODE COMMAND
006434     2458              7870           LIS    R5,PHASE.2
006436     4054 0002         7871           STH    R5,PHASE(DDBADR)    PHASE TWO NEXT
00643A     1800              7872           LPSWR  OLDPSW
                             7873  *
```

```
                                    7874  *
                                    7875  *        PHASE TWO     WRITE AND READ DATA IN HALF WORD MODE
                                    7876  *
                                    7877  *
006430     4824 0008                7878  ULIPH2  LH    DEV,DEVADR(DDBADR)   DEVICE ADDRESS
006440     D824 0028                7879          WH    DEV,DVRWRK1(DDBADR)  WRITE THIS TO DEVICE
006444     9926                     7880          RHR   DEV,R6               READ FROM THE DEVICE
006446     7354 0028                7881          LHL   R5,DVRWRK1(DDBADR)   KNOWN DATA
00644A     0565                     7882          CLR   R6,R5                EXPECTED DATA
00644C     4330 8026 =006476        7883          BE    ULIP2L1              YES
                                    7884  *
006450     C850 B034                7885          LHI   R5,X'B034'           ELSE ERROR 34
006454     9D23                     7886          SSR   DEV,STAT             SENSE STATUS
006456     4180 1FFC                7887          BAL   R8,ERRGET
00645A     4057 0000                7888          STH   R5,0(R7)
00645E     4027 0002                7889          STH   DEV,2(R7)
006462     4037 0004                7890          STH   STAT,4(R7)
006466     5067 0008                7891          ST    R6,8(R7)             ACTUAL DATA
00646A     4864 0028                7892          LH    R6,DVRWRK1(DDBADR)   EXPECTED
00646E     5067 000C                7893          ST    R6,12(R7)            DATA
006472     4180 2034                7894          BAL   R8,ERRENQ            ERROR ON QUEUE
                                    7895  *
006476     4854 0028                7896  ULIP2L1 LH    R5,DVRWRK1(DDBADR)   EXPECTED DATA
00647A     1151                     7897          SLLS  R5,1                 DOUBLE IT
00647C     2651                     7898          AIS   R5,1                 INCREMENT BY ONE
00647E     4054 0028                7899          STH   R5,DVRWRK1(DDBADR)   NEW DATA
006482     2651                     7900          AIS   R5,1                 NEXT DATA BYTE
006484     0230                     7901          BNZR  R0                   ##          MORE DATA TO WRITE
                                    7902  *
006486     DE20 3479                7903          OC    DEV,ULIB             ISSUE DISARM BYTE MODE COMMAND
00648A     245C                     7904          LIS   R5,PHASE.3
00648C     4054 0002                7905          STH   R5,PHASE(DDBADR)     PHASE THREE NEXT
006490     0300                     7906          BR    R0                   RETURN TO DISPATCHER
                                    7907  *
                                    7908  *        PHASE THREE     WRITE AND READ DATA IN BYTE MODE
                                    7909  *
                                    7910  *
006492     4824 0008                7911  ULIPH3  LH    DEV,DEVADR(DDBADR)   DEVICE ADDRESS
006496     4850 808E =006528        7912          LH    R5,ULISTRAP          TEST ULI STRAP OPTION
00649A     4230 8044 =0064F2        7913          BNZ   ULIP3L3              OPTION
00649E     DA24 002A                7914          WD    DEV,DVRWRK1+2(DDBADR) WRITE BYTE TO DEVICE
0064A2     9B26                     7915          RDR   DEV,R6               READ THIS BYTE FROM THE DEVICE
0064A4     D464 002A                7916          CLB   R6,DVRWRK1+2(DDBADR) EXPECTED BYTE
0064A8     4330 804A =0064F6        7917          BE    ULIP3L4              YES
0064AC     C560 00FF                7918          CLHI  R6,X'FF'             ELSE CHECK LAST BYTE
0064B0     4330 8028 =0064DC        7919          BE    ULIP3L2              IF X'FF' USE STRAP OPITON
                                    7920  *
0064B4     C850 B035                7921  ULIP3L1 LHI   R5,X'B035'           ELSE ERROR 35
0064B8     9D23                     7922          SSR   DEV,STAT
0064BA     4180 1FFC                7923          BAL   R8,ERRGET
0064BE     4057 0000                7924          STH   R5,0(R7)
0064C2     4027 0002                7925          STH   DEV,2(R7)
0064C6     4037 0004                7926          STH   STAT,4(R7)
```

UNIVERSAL LOGIC INTERFACE

```
0064CA      5057 0008         7927          ST    R6,8(R7)           ACTUAL DATA
0064CE      4864 002A         7928          LH    R6,DVRWRK1+2(DDBADR) EXPECTED
0064D2      5067 000C         7929          ST    R6,12(R7)          DATA
0064D6      4180 2034         7930          BAL   R8,ERRENQ          ERROR QUEUE
0064DA      230E     =0064F6  7931          BS    ULIP3L4            CONTINUE
                              7932    *
0064DC      2451              7933  ULIP3L2 LIS   R5,1               SET
0064DE      4050 8046 =006528 7934          STH   R5,ULISTRAP        ULI STRAP OPTION
0064E2      DA24 002A         7935  ULIP3L3 WD    DEV,DVRWRK1+2(DDBADR) WRITE FIRST BYTE
0064E6      DA24 002B         7936          WD    DEV,DVRWRK1+3(DDBADR) WRITE SECOND BYTE
0064EA      9926              7937          RHR   DEV,R6             READ HW
0064EC      7354 002A         7938          LHL   R5,DVRWRK1+2(DDBADR) ACTUAL DATA
0064F0      0556              7939          CLR   R5,R6              EXPECTED  RESULTS
0064F2      4230 FFBE =0064B4 7940          BNE   ULIP3L1            NO ERROR
                              7941    *
0064F6      4854 002A         7942  ULIP3L4 LH    R5,DVRWRK1+2(DDBADR) CURRENT DATA
0064FA      1151              7943          SLLS  R5,1               DOUBLE IT
0064FC      2651              7944          AIS   R5,1               AND INCREMENT IT
0064FE      4054 002A         7945          STH   R5,DVRWRK1+2(DDBADR) NEW DATA
006502      2651              7946          AIS   R5,1               NEXT DATA BYTE
006504      0230              7947          BNZR  R0                 MORE DATA TO TRANSFER
                              7948    *
006506      2450              7949          LIS   R5,0
006508      4054 0002         7950          STH   R5,PHASE(DDBADR)   PHASE ZERO NEXT
00650C      C890 0015         7951          LHI   R9,21              DISPLAY CODE
006510      4180 E08C =0045A0 7952          BAL   R8,BLINK           DISPLAY IT
006514      0300              7953          BR    R0                 RETURN TO DISPATCHER
                              7954    *
                              7955  *CKULI -- CHECKS UNIVERSAL LOGIC INTERFACE PARAMETER VALUES
                              7956    *
                              7957    *
006516      24F0              7958  CKULI   LIS   R15,0              CLEAR FAULT FLAG
006518      4824 0008         7959          LH    DEV,DEVADR(DDBADR) SPECIFIED DEVICE ADDRESS
00651C      023E              7960          BNZR  R14                USE IT
00651E      C850 008B         7961          LHI   R5,X'8B'           ELSE USE DEFAULT  VALUE OF Y'8B'
006522      4054 0008         7962          STH   R5,DEVADR(DDBADR)  FOR THE DEVICE ADDRESS
006526      030E              7963          BR    R14                RETURN
                              7964    *
006528                        7965  ULISTRAP DS   2                  ULI STRAP OPTION FLAG
                              7966          ENDC
```

COMMUNICATION DEVICE DRIVER

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                                  7968  *
                                  7969  *           COMMUNICATION DEVICE DRIVER
                                  7970  *
                                  7971  *QSAPTR -- COMMUNICATION DEVICE PHASE DISPATCHER
                                  7972  *
                                  7973  *
00652C                            7974          ALIGN 4
00652C    0000 654C               7975  QSAPTR  DC      A(QSAPH0)
006530    0000 6666               7976          DC      A(QSAPH1)
006534    0000 6688               7977          DC      A(QSAPH2)            *******
006538    0000 66F8               7978          DC      A(QSAPH3)            ********
00653C    0000 6740               7979          DC      A(QSAPH4)
006540    0000 6926               7980          DC      A(QSAPH5)
006544    0000 6B56               7981          DC      A(QSAPH6)
006548    0000 6C08               7982          DC      A(QSAPH7)
                                  7983  *
                                  7984  *
                                  7985  *     PHASE ZERO      INITIALIZE TRANSMITTER - RECEIVER PAIR
                                  7986  *
                                  7987  *
00654C    4890 34DC               7988  QSAPH0  LH      R9,LLBACK
006550    4824 0008               7989          LH      XDEV,XDEVADR(DDBADR) XMIT ADDR
006554    4854 0038               7990          LH      RDEV,RDEVADR(DDBADR) RECV ADDR
006558    2489                    7991          LIS     R8,DSATYP
00655A    7484 0006               7992          TBT     R8,DTYPFLGS(DDBADR)
00655E    4230 806C  =0065CE      7993          BNZ     QSA0L1              DSA TYPE
                                  7994  *
006562    248A                    7995          LIS     R8,PASLTYP
006564    7484 0006               7996          TBT     R8,DTYPFLGS(DDBADR)
006568    4230 8076  =0065E2      7997          BNZ     QSA0L2              PASLA TYPE
                                  7998  *
00656C    2488                    7999          LIS     R8,QSATYP           QSA BISYNC
00656E    7484 0006               8000          TBT     R8,DTYPFLGS(DDBADR)
006572    4230 803C  =0065B2      8001          BNZ     QSA0L0
                                  8002  *
006576    DE20 34A8               8003          OC      XDEV,QZBID          XMIT 8 BIT CHAR ZBID
00657A    DE50 34A8               8004          OC      RDEV,QZBID          RECV 8 BIT CHAR ZBID
00657E    95BB                    8005          EPSR    R11,R11             CURRENT PSW
006580    C4B0 00FF               8006          NHI     R11,X'00FF'         DISABLE INTERRUPTS
006584    95CB                    8007          EPSR    R12,R11             NEW PSW
006586    C5E0 0FA0               8008          LHI     R14,4000            QSA ZBID
00658A    DE59 34A2               8009          OC      RDEV,QRDSSR(R9)     RDEV:DISARM,SYNSCH,DTR
00658E    4240 80A0  =006632      8010          BTC     4,QSA0LX00          RECV FALSE SYNC
006592    DA20 34EA               8011          WD      XDEV,FOXS           WRITE DATA X'FF'
006596    DE29 34A0               8012          OC      XDEV,QXDRRC(R9)     XMIT:DISARM,RESET,DTR,WRITE
00659A    4240 80A0  =00663E      8013          BTC     4,QSA0LX10          XMIT FALSE SYNC
00659E    95BC                    8014          EPSR    R11,R12             RESTORE PSW
0065A0    9D56                    8015  QSA0L00 SSR     RDEV,RSTAT          RECV SENSE STATUS
0065A2    27E1                    8016          SIS     R14,1               DECREMENT TIMER
0065A4    4330 80AE  =006656      8017          BZ      QSA0LX3             TIME OUT ERROR
0065A8    C360 0040               8018          THI     RSTAT,X'40'         TEST FOR TERM CHAR
0065AC    2036       =0065A0      8019          BNZS    QSA0L00             WAIT
0065AE    4300 8078  =00662A      8020          B       QSA0L3              NEXT PHASE
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COMMUNICATION DEVICE DRIVER

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                                      8021  *                                      ELSE QSA DEVICE
0065B2        DE59 349C               8022  QSAOLO    CC    RDEV,QIDLEE(R9)         RECV:DISARM,READY
0065B6        4240 807A =006634       8023            BTC   4,QSAOLX0              FALSE RECV SYNC ON MAM
0065BA        DE29 349C               8024            CC    XDEV,QIDLEE(R9)         XMIT:DISARM,READY
0065BE        4240 807E =006640       8025            BTC   4,QSAOLX1             FALSE XMIT SYNC ON MAM
0065C2        DE20 34B0               8026            OC    XDEV,COMMONX           XMIT 8 BIT CHAR BISYNC
0065C6        DE50 34B0               8027            OC    RDEV,COMMONX           RECV 8 BIT CHAR BISYNC
0065CA        4300 805C =00662A       8028            B     QSAOL3                 CONTINUE
                                      8029  *
                                      8030  *                                      DSA DEVICE
0065CE        DE50 3444               8031  QSAOL1    OC    RDEV,DSAIDLE           RECV IDLE
0065D2        4240 805F =006634       8032            BTC   4,QSAOLX0             FALSE RECV SYNC ON MAM
0065D6        DE20 3444               8033            OC    XDEV,DSAIDLE           XMIT IDLE
0065DA        4240 8062 =006640       8034            BTC   4,QSAOLX1             FALSE XMIT SYNC ON MAM
0065DE        4300 8048 =00662A       8035            B     QSAOL3                 CONTINUE
                                      8036  *
                                      8037  *                                      PASLA DEVICE
0065E2        2480                    8038  QSAOL2    LIS   R8,0                   CLEAR
0065E4        4080 34B8               8039            STH   R8,PASCNT              PASLA COUNT
0065E8        0882                    8040            LR    R8,XDEV                XMIT ADDRESS
0065EA        DE50 3470               8041            OC    RDEV,PASDDR            RECV DISABLE, DTR & RCT
0065EE        4240 8042 =006634       8042            BTC   4,QSAOLX0             FALSE RECV SYNC ON MAM
0065F2        08E5                    8043            LR    R14,PDEV               RECV ADDRESS
0065F4        26E1                    8044            AIS   R14,1                  ADJACENT XMIT ADDRESS
0065F6        DEE0 346A               8045            OC    R14,PASOUT             ADJ. XMIT DISABLE, DTR & RCT
0065FA        DE20 346A               8046            OC    XDEV,PASOUT            XMIT DISABLE, DTR & RCT
0065FE        4240 803E =006640       8047            BTC   4,QSAOLX1             FALSE SYNC ON MAM
006602        C8E0 2000               8048            LHI   R14,X'2000'            TIME CONSTANT
006606        9D56                    8049  QSAOL20   SSR   RDEV,RSTAT             SENSE STATUS OF RECV
006608        D264 003A               8050            STB   RSTAT,RSTATUS(DDBADR)  SAVE IT
00660C        27E1                    8051            SIS   R14,1                  DECREMENT TIMER
00660E        4330 8044 =006656       8052            BZ    QSAOLX3                TIME OUT
006612        C360 0002               8053            THI   RSTAT,X'02'            RECV WAIT FOR CARRIER
006616        2038      =006606       8054            BNZS  QSAOL20
                                      8055  *
006618        9D23                    8056  QSAOL21   SSR   XDEV,XSTAT             XMIT SENSE STATUS
00661A        D234 000A               8057            STB   XSTAT,XSTATUS(DDBADR)  SAVE STATUS
00661E        27F1                    8058            SIS   R14,1                  DECREMENT TIMER
006620        4330 8024 =006648       8059            BZ    QSAOLX2                TIME OUT ERROR
006624        C330 0040               8060            THI   XSTAT,X'40'            XMIT WAIT FOR CLEAR TO SEND
006628        2038      =006618       8061            BNZS  QSAOL21
                                      8062  *
00662A        2484                    8063  QSAOL3    LIS   R8,PHASE.1
00662C        4084 0002               8064            STH   R8,PHASE(DDBADR)       PHASE ONE NEXT
006630        0300                    8065            BR    R0                     RETURN TO DISPATCHER
                                      8066  *
                                      8067  *
                                      8068  *         FALSE SYNC FROM RECEIVER, SET DEVICE BUSY
006632        95BC                    8069  QSAOLX00  EPSR  R11,R12                RESTORE PSW
006634        0825                    8070  QSAOLX0   LR    DEV,RDEV               RECV ADDRESS
006636        9D23                    8071            SSR   DEV,STAT               SENSE RECV STATUS
006638        41B0 DE52 =00448E       8072            BAL   R11,BSTATEO            BAD STATUS ERROR
00663C        0300                    8073            BR    R0                     RETURN
```

COMMUNICATION DEVICE DRIVER

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                                8074  *          FALSE SYNC FROM TRANSMIT, SET DEVICE BUSY
00663E      95BC                8075  QSAOLX10 EPSR  R11,R12             RESTORE PSW
006640      9D23                8076  QSAOLX1  SSR   DEV,STAT            SENSE STATUS AGAIN
006642      41B0 DE48 =00448F   8077           BAL   R11,BSTATER0        BAD STATUS ERROR
006646      0300                8078           BR    R0                  RETURN
                                8079  *
006648      9D23                8080  QSAOLX2  SSR   DEV,STAT            SENSE STATUS AGAIN
00664A      2480                8081           LIS   R8,0                PHASE ZERO NEXT
00664C      4084 0002           8082           STH   R8,PHASE(DDBADR)
006650      41B0 DE76 =0064CA   8083           BAL   R11,BSTATERR        BAD STATUS ERROR
006654      0300                8084           BR    R0                  RETURN
                                8085  *
006656      0825                8086  QSAOLX3  LR    DEV,RDEV            RECV ADDRESS
006658      9D23                8087           SSR   DEV,STAT            SENSE RECV STATUS
00665A      2480                8088           LIS   R8,0                PHASE ZERO NEXT
00665C      4084 0002           8089           STH   R8,PHASE(DDBADR)
006660      41B0 DE66 =0064CA   8090           BAL   R11,BSTATERR        BAD STATUS ERROR
006664      0300                8091           BR    R0                  RETURN
                                8092  *
                                8093  *
                                8094  *          PHASE ONE     CLEAR COUNTERS
                                8095  *
                                8096  *
006666      2480                8097  QSAPH1   LIS   R8,0                CLEAR
006668      4080 34BC           8098           STH   R8,QSZCNT           COUNTERS
00666C      4080 34BE           8099           STH   R8,QSZCNT1
006670      5084 0028           8100           ST    R8,DVRWRK1(DDBADR)  COUNTERS
006674      5084 002C           8101           ST    R8,DVRWRK2(DDBADR)
006678      4080 34C2           8102           STH   R8,QSADISP          CLEAR DISPLAY FLAG
00667C      4080 34C4           8103           STH   R8,QSADISP+2
006680      2488                8104           LIS   R8,PHASE.2
006682      4084 0002           8105           STH   R8,PHASE(DDBADR)    PHASE TWO NEXT
006686      0300                8106           BR    R0                  RETURN TO DISPATCHER
                                8107  *
                                8108  *
                                8109  *          PHASE TWO     LOAD MAM (EMAM) WITH INITIAL RECEIVER DCB
                                8110  *
                                8111  *
006688      4824 0038           8112  QSAPH2   LH    DEV,PDEVADR(DDBADR) RECV ADDR
00668C      2490                8113           LIS   R9,0                ZERO
00668E      2474                8114           LIS   R7,4                FULL WORD
006690      5864 003C           8115           L     R6,RBUFF0S(DDBADR)  STARTING ADDR OF RECV BUF 0
006694      5884 004C           8116           L     R8,RBUFF1E(DDBADR)  END ADDR OF RECV BUF 1
006698      5096 0000           8117  QSA2L00  ST    R9,0(R6)            CLEAR RECEIVER BUFFERS
00669C      C160 FFF8 =006698   8118           BXLE  R6,QSA2L00
                                8119  *
0066A0      246B                8120           LIS   R6,QSZTYP
0066A2      7464 0006           8121           TBT   R6,DTYPFLGS(DDBADR)
0066A6      4230 8022 =0066C8   8122           BNZ   QSA2L2              QSA ZBID TYPE
                                8123  *
0066AA      2469                8124           LIS   R6,DSATYP
0066AC      7464 0006           8125           TBT   R6,DTYPFLGS(DDBADR)
0066B0      213B      =0066C6   8126           BNZS  QSA2L1              DSA TYPE
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                                  8127  *
0066B2    246A                    8128         LIS    R6,PASLTYP
0066B4    7464 0006               8129         TBT    R6,DTYPFLGS(DDBADR)
0066B8    2134       =0066C0      8130         BNZS   QSA2L0            PASLA TYPE
                                  8131  *
0066BA    E660 E8F2 =004FB0       8132         LA     R6,MDCBQAR0       RECV QSA BISYNC DCB ADDR
0066BE    2309       =0066D0      8133         BS     QSA2L3
                                  8134  *
0066C0    E660 E90C =004FD0       8135  QSA2L0  LA     R6,MDCBPSR0       RECV PASLA DCB ADDR
0066C4    2306       =0066D0      8136         BS     QSA2L3
                                  8137  *
0066C6    E660 E926 =004FF0       8138  QSA2L1  LA     R6,MDCBDSR0       RECV DSA DCB ADDR
0066CA    2303       =0066D0      8139         BS     QSA2L3
                                  8140  *
0066CC    E660 E940 =00501C       8141  QSA2L2  LA     R6,MDCBQZR0       QSA ZBID DCB ADDR
                                  8142  *                               MODIFY RECV DCB END ADDRESSES
0066D0    4086 000C               8143  QSA2L3  STH    R8,12(R6)         END ADDR OF RECV BUF 1
0066D4    EC80 0010               8144         SRL    R8,16             MS BYTE OF THIS ADDRESS
0066D8    D286 000B               8145         STB    R8,11(R6)
0066DC    5884 0040               8146         L      R8,RBUFFOE(DDBADR) END ADDRESS OF RECV BUFFER 2
0066E0    4086 0004               8147         STH    R8,4(R6)
0066E4    EC80 0010               8148         SRL    R8,16             MS BYTE OF THIS ADDRESS
0066E8    D286 0003               8149         STB    R8,3(R6)
0066EC    4190 E688 =004D78       8150         BAL    R9,MAMFDCB        LOAD MAM WITH THIS DCB
0066F0    246C                    8151         LIS    R6,PHASE.3        ************
0066F2    4064 0002               8152         STH    R6,PHASE(DDBADR)  PHASE THREE NEXT
0066F6    0300                    8153         BR     R0                RETURN TO DISPACTHER
                                  8154  *
                                  8155  *       PHASE THREE   LOAD MAM (EMAM) WITH INITIAL TRANSMITTER DCB
                                  8156  *
                                  8157  *
0066F8    4824 0008               8158  QSAPH3  LH     DEV,XDEVADR(DDBADR) XMIT ADDRESS
0066FC    246B                    8159         LIS    R6,QSZTYP
0066FE    7464 0006               8160         TBT    R6,DTYPFLGS(DDBADR)
006702    4230 8022 =006728       8161         BNZ    QSA3L2            QSA ZBID MODE TYPE
                                  8162  *
006706    2469                    8163         LIS    R6,DSATYP
006708    7464 0006               8164         TBT    R6,DTYPFLGS(DDBADR)
*00670C    213B       =006722      8165         BNZ    QSA3L1            DSA TYPE
                                  8166  *
00670E    246A                    8167         LIS    R6,PASLTYP
006710    7464 0006               8168         TBT    R6,DTYPFLGS(DDBADR)
006714    2134       =00671C      8169         BNZS   QSA3L0            PASLA TYPE
                                  8170  *
006716    E660 E886 =004FA0       8171         LA     R6,MDCBQAX0       XMIT QSA BISYNC DCB ADDR
00671A    230C       =006732      8172         BS     QSA3LZ
                                  8173  *
00671C    E660 E8A0 =004FC0       8174  QSA3L0  LA     R6,MDCBPSX0       XMIT PASLA DCB ADDR
006720    2309       =006732      8175         BS     QSA3LZ
                                  8176  *
006722    E660 E8BA =004FE0       8177  QSA3L1  LA     R6,MDCBDSX0       XMIT DSA DCB ADDR
006726    2306       =006732      8178         BS     QSA3LZ
                                  8179  *
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006728      E660 E8D4 =005000    8180  QSA3L2   LA    R6,MDCBQZX0           XMIT QSA ZBID DCB ADDR
00672C      2491                 8181           LIS   R9,1                 INCREMENT
00672E      6190 34BE            8182           AHM   R9,QSZCNT1           QSZ 1 COUNTER
                                 8183  *
006732      4190 E642 =004D78    8184  QSA3LZ   BAL   R9,MAMFDCB           LOAD MAM WITH THIS DCB
006736      C860 0010            8185           LHI   R6,PHASE.4           *************
00673A      40F4 0002            8186           STH   R6,PHASE(DDBADR)     PHASE FOUR NEXT
00673E      0300                 8187           BR    R0                   RETURN TO DISPATCHER
                                 8188  *
                                 8189  *
                                 8190  *        PHASE FOUR    TRANSMITTER - RECEIVER START UP
                                 8191  *
                                 8192  *
006740      4824 0008            8193  QSAPH4   LH    XDEV,XDEVADR(DDBADR) TRANSMITTER ADDRESS
006744      4854 0038            8194           LH    RDEV,RDEVADR(DDBADR) RECEIVER ADDRESS
006748      4890 34DC            8195           LH    R9,LLBACK
00674C      24A9                 8196           LIS   R10,DSATYP
00674E      74A4 0006            8197           TBT   R10,DTYPFLGS(DDBADR)
006752      4230 80C2 =006818    8198           BNZ   DSA4L00              DSA TYPE
                                 8199  *
006756      24AA                 8200           LIS   R10,PASLTYP
006758      74A4 0006            8201           TBT   R10,DTYPFLGS(DDBADR)
00675C      4230 8116 =006876    8202           BNZ   PAS4L00              PASLA TYPE
                                 8203  *
006760      24AB                 8204           LIS   R10,QSZTYP
006762      74A4 0006            8205           TBT   R10,DTYPFLGS(DDBADR)
*006766     213F      =006784    8206           BNZ   QSA4L1               QSA ZBID TYPE
                                 8207  *
006768      48A0 34C2            8208           LH    R10,QSADISP          DISPLAY CODE
*00676C     213A      =006780    8209           BNZ   QSA4L00              DON'T DISPLAY
00676E      08A9                 8210           LR    R10,R9               SAVE LLB FLAG
006770      C390 0016            8211           LHI   R9,22                DISPLAY CODE FOR QSA BISYNC
006774      4180 DE28 =0045A0    8212           BAL   R8,BLINK             DISPLAY CODE
006778      089A                 8213           LR    R9,R10               RESTORE LLB FLAG
00677A      24A1                 8214           LIS   R10,1
00677C      40A0 34C2            8215           STH   R10,QSADISP
006780      4300 8040 =0067C4    8216  QSA4L00  B     QSA4L2               QSA BISYNC MODE CONTINUE
                                 8217  *                                  QSA ZBID DEVICE
006784      48A0 34C4            8218  QSA4L1   LH    R10,QSADISP+2        DISPLAY FLAG
006788      213A      =00679C    8219           BNZS  QSA4L100             DON'T DISPLAY
00678A      08A9                 8220           LR    R10,R9               SAVE LLB FLAG
00678C      C390 0017            8221           LHI   R9,23                DISPLAY CODE FOR QSA ZBID
006790      4180 DE0C =0045A0    8222           BAL   R8,BLINK             DISPLAY IT
006794      089A                 8223           LR    R9,R10               RESTORE LLB FLAG
006796      24A1                 8224           LIS   R10,1                LOCK OUT DISPLAY FLAG
006798      40A0 34C4            8225           STH   R10,QSADISP+2
00679C      95CC                 8226  QSA4L100 EPSR  R12,R12
00679E      C4C0 00FF            8227           NHI   R12,X'00FF'
0067A2      95BC                 8228           EPSR  R11,R12
0067A4      DE59 349E            8229           OC    RDEV,QIDLEZ(R9)      RECV:DISARM,SYNSCH,DTR
0067A8      DA20 34EA            8230           WD    XDEV,FOXS            XMIT WRITE X'FF' BYTE
0067AC      DE29 34A0            8231           OC    XDEV,QXDRRQ(R9)      XMIT DISARM, RDM, DTR & WRITE
0067B0      95CB                 8232           EPSR  R12,R11
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```
0067B2    C880 2000      8233       LHI    R8,X'2000'         TIME CONSTANT
0067B6    9D56           8234 QSA4L10 SSR   RDEV,RSTAT         RECV SENSE STATUS
0067B8    2781           8235       SIS    R8,1               DECREMENT TIMER
0067BA    4330 FE9E =006656 8236    BZ     QSAOLX3            TIME OUT ERROR
0067BE    C360 0040      8237       THI    RSTAT,X'40'        RECV ABORT CONDITION
0067C2    2036     =0067B6 8238     BNZS   QSA4L10            WAIT TO CLEAR
          8239 *
          8240 *                                              QSA BISYNC AND ZBID
0067C4    DE29 34AC      8241 QSA4L2  OC    XDEV,QXDRRQ(R9)    XMIT DISARM,RESET DW, READY, RQ2S
0067C8    DA50 344E      8242       WD     RDEV,SYNC          SYNC CHARACTER
0067CC    DE59 34A2      8243       OC     RDEV,QRDSSR(R9)    REC. DISARM, SYNC SEARCH & READY
0067D0    DE29 34A9      8244       OC     XDEV,QXDRRQ(R9)    XMIT:DISARM,RESET,READY,RQ2S
0067D4    C8A0 1000      8245       LHI    R10,X'1000'        TIME CONSTANT
0067D8    9D56           8246 QSA4L3  SSR   RDEV,RSTAT         RECV SENSE STATUS
0067DA    27A1           8247       SIS    R10,1              DECREMENT
0067DC    4330 FE7E =006656 8248    BZ     QSAOLX3            TIME OUT ERROR
0067E0    C360 0002      8249       THI    RSTAT,2            WAIT FOR CARRIER OFF TO RESET
0067E4    2036     =0067D8 8250     BNZS   QSA4L3
          8251 *
          8252 *
0067E6    C880 0014      8253       LHI    R8,PHASE.5         PHASE FIVE NEXT
0067EA    4084 00C2      8254       STH    R8,PHASE(DDBADR)
0067EE    2481           8255       LIS    R8,BUSY
0067F0    7584 0000      8256       SBT    R8,DSPFLGS(DDBADR)  SET BUSY
0067F4    2483           8257       LIS    R8,BADSTAT         CLEAR BAD STATUS
0067F6    7684 0000      8258       RBT    R8,DSPFLGS(DDBADR)
0067FA    2482           8259       LIS    R8,NOTCOUNT        CLEAR NOT COUNTING
0067FC    7684 0000      8260       RBT    R8,DSPFLGS(DDBADR)
006800    DE59 34AA      8261       OC     RDEV,QRESSR(R9)    REC. ENABLE, SYNC SER & READY
006804    9D23           8262 QSA4L4  SSR   XDEV,XSTAT         XMIT STATUS
006806    27A1           8263       SIS    R10,1              DECREMENT TIMER
006808    4330 FE3C =006648 8264    BZ     QSAOLX2            TIME OUT ERROR
00680C    C330 0008      8265       THI    XSTAT,8            WAIT FOR BUSY TO RESET
006810    2036     =006804 8266     BNZS   QSA4L4
006812    DE29 34AE      8267       OC     XDEV,QZERRW(R9)    XMIT:ENABLE,RESET,READY,WRITE
006816    0300           8268       BR     R0                 WAIT FOR INTERRUPT
          8269 *
          8270 *
          8271 *                                              DSA DEVICE
006818    48A0 34C2      8272 DSA4L00 LH    R10,QSADISP        DISPLAY FLAG
00681C    2138     =00682C 8273     BNZS   DSA4LOA            DON'T DISPLAY
00681E    C890 0018      8274       LHI    R9,24              DISPLAY CODE FOR DSA BISYNC
006822    4180 DD7A =0045A0 8275    BAL    R8,BLINK           DISPLAY IT
006826    24A1           8276       LIS    R10,1              LOCK OUT DISPLAY
006828    40A0 34C2      8277       STH    R10,QSADISP
00682C    DE50 344E      8278 DSA4LOA OC    RDEV,DSADSRR       RECV DISARM, SYNSCH, DTR & READ
006830    DA20 34EA      8279       WD     XDEV,FOXS          XMIT WRITE X'FF' DATA BYTE
006834    DE20 344E      8280       CC     XDEV,DSADRW        XMIT DISARM, DTR & WRITE
006838    C8A0 1000      8281       LHI    R10,X'1000'        TIME CONSTANT
00683C    9D56           8282 DSA4L01 SSR   RDEV,RSTAT         RECV SENSE STATUS
00683E    27A1           8283       SIS    R10,1              DECREMENT
006840    4330 FE12 =006656 8284    BZ     QSAOLX3            TIME OUT ERROR
006844    C360 0003      8285       THI    RSTAT,3            RECV CARRIER OFF OR D W
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006848      2036    =0066C     8286           BNZS   DSA4L01        WAIT TO CLEAR
                               8287    *
00684A      DE50 3447          8288           OC     RDEV,DSAESRR   RECV ENABLE, SYNSCH, DTR & READ
00684E      9D23               8289   DSA4L2  SSR    XDEV,XSTAT     XMIT SENSE STATUS
006850      C330 0080          8290           THI    XSTAT,X'80'    XMIT OVERFLOW
006854      2334    =00685C    8291           BZS    DSA4L02        NO
006856      DE20 3446          8292           OC     XDEV,DSADRW    ELSE XMIT DISARM, DTR & WRITE
00685A      2206    =00684E    8293           BS     DSA4L2         WAIT FOR OVERFLOW TO CLEAR
                               8294    *
00685C      C850 0014          8295   DSA4L02 LHI    R5,PHASE.5     PHASE FIVE NEXT
006860      D360 3448          8296           LB     R6,DSAERW      XMIT ENABLE, DTR & WRITE
006864      41B0 DC7C =0044E4  8297           BAL    R11,STARTIO    ISSUE COMMAND
006868      9D23               8298           SSR    XDEV,XSTAT     XMIT SENSE STATUS
00686A      C330 0008          8299           THI    XSTAT,X'08'    XMIT BUSY
00686E      0230               8300           BNZR   R0             YES
006870      DA20 34EA          8301           WD     XDEV,FOXS      XMIT WRITE X'FF' DATA BYTE
006874      0300               8302           BR     R0             WAIT FOR INTERRUPT
                               8303    *
                               8304    *
                               8305    *                           PASLA DEVICE
006876      48A0 34C2          8306   PAS4L00 LH     R10,QSADISP    DISPLAY FLAG
00687A      2138    =00688A    8307           BNZS   PAS4LOA        DON'T DISPLAY
00687C      C890 0019          8308           LHI    R9,25          DISPLAY CODE FOR PASLA BISYNC
006880      4180 DD1C =0045A0  8309           BAL    R8,BLINK       DISPLAY IT
006884      24A1               8310           LIS    R10,1          LOCK OUT FLAG
006886      40A0 34C2          8311           STH    R10,QSADISP
00688A      08F5               8312   PAS4LOA LR     R14,RDEV       RECV ADDRESS
00688C      26E1               8313           AIS    R14,1          ADJACENT XMIT ADDRESS
00688E      DE50 346F          8314           OC     RDEV,PASCOM    RECV HB, 8 BIT DATA & NO PARITY
006892      DE20 346E          8315           OC     XDEV,PASCOM    XMIT HB, 8 BIT DATA & NO PARITY
006896      9D56               8316           SSR    RDEV,RSTAT     RECV SENSE STATUS
006898      C360 0080          8317           THI    RSTAT,X'80'    RECV OVERFLOW
00689C      2332    =0068A0    8318           BZS    PAS4L01        NO
00689E      9B56               8319           RDR    RDEV,R6        ELSE RECV READ DATA BYTE
0068A0      C880 0014          8320   PAS4L01 LHI    R8,20          SHORT TIME CONSTANT
0068A4      9D23               8321   PAS4L02 SSR    XDEV,XSTAT     XMIT SENSE STATUS
0068A6      2781               8322           SIS    R8,1           DECREMENT TIMER
0068A8      4330 FD9C =006648  8323           BZ     QSAOLX2        TIME OUT ERROR
0068AC      C330 0008          8324           THI    XSTAT,8        XMIT BUSY
0068B0      2036    =0068A4    8325           BNZS   PAS4L02        WAIT FOR BUSY TO CLEAR
                               8326    *
0068B2      95AA               8327           EPSR   R10,R10        CURRENT PSW
0068B4      C4A0 37FF          8328           NHI    R10,X'37FF'    NO IMMEDIATE INTERRUPT MASK
0068B8      958A               8329           EPSR   R8,R10         NEW PSW
0068BA      DE50 3473          8330           OC     RDEV,PASFDRR   RECV. ENABLE, DTR & RCT
0068BE      DEE0 3471          8331           OC     R14,PASNDRW    ADJ XMIT DTR, RCT & VRT
0068C2      95A8               8332           EPSR   R10,R8         RESTORE PSW
0068C4      C870 00C8          8333           LHI    R7,200         EXPECT MAM INTERRUPT
0068C8      2496               8334           LIS    R9,DEVCNTL1    WITH BAD STATUS FROM PASLA
0068CA      7494 0000          8335   PAS4L03 TBT    R9,DSPFLGS(DDBADR) CHECK FOR THIS CONDITION
0068CE      2135    =0068D6    8336           BNZS   PAS4L04        PROPER CONDITION
0068D0      2771               8337           SIS    R7,1           DECREMENT TIMER
0068D2      4330 802E =006904  8338           BZ     PAS4LX         TIME OUT ERROR
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0068D6      2206        =0068CA     8339              BS      PAS4L03           WAIT FOR MAM INTERRUPT
                                    8340    *
0068D8      7694 0000               8341   PAS4L04    RBT     R9,DSPFLGS(DDBADR) CLEAR PASLA INTERR. CONDITION
0068DC      0832                    8342              LR      R3,DEV
0068DE      0825                    8343              LR      DEV,RDEV
0068E0      247A                    8344              LIS     R7,10             MUST RESET BUFFER 1
0068E2      5884 004C               8345              L       R8,RBUFF1E(DDBADR) ADDRESS
0068E6      4190 E4E6   =004DD0     8346              BAL     R9,MAMDCBAD       IN MAM DCB
0068EA      247E                    8347              LIS     R7,14             AND
0068EC      4880 34EC               8348              LH      R8,CM128          BYTE COUNT
0068F0      4190 E4B6   =004DAA     8349              BAL     R9,MAMDCBBC       IN MAM DCB
0068F4      C850 0014               8350              LHI     R5,PHASE.5        PHASE FIVE NEXT
0068F8      D360 3472               8351              LB      R6,PASEDRW        XMIT ENABLE, DTR, RCT & WRITE
0068FC      0823                    8352              LR      DEV,R3
0068FE      41B0 DBE2   =0044F4     8353              BAL     R11,STARTIO       ISSUE COMMAND
006902      0300                    8354              BR      R0                WAIT FOR INTERRUPT
                                    8355    *
006904      C880 0018               8356   PAS4LX     LHI     R8,PHASE.6
006908      4084 0002               8357              STH     R8,PHASF(DDBADR)  PHASE SIX NEXT
00690C      2483                    8358              LIS     R8,BADSTAT        BAD STATUS BIT
00690E      7484 0000               8359              TBT     R8,DSPFLGS(DDBADR) TEST THIS BIT
006912      2337        =006920     8360              BZS     PAS4LXX           ALREDY SET
006914      2481                    8361              LIS     R8,1              INCREMENT
006916      6180 34B8               8362              AHM     R8,PASCNT         PASLA COUNT
00691A      2486                    8363              LIS     R8,DEVCNTL1       AND CLEAR
00691C      7684 0000               8364              RBT     R8,DSPFLGS(DDBADR) PASLA TERMINATION
006920      41B0 DBA6   =0044CA     8365   PAS4LXX    BAL     R11,BSTATERR      BAD STATUS
006924      0300                    8366              BR      R0
                                    8367    *
                                    8368    *
                                    8369    *      PHASE FIVE       RESET ALTERNATE BUFFER
                                    8370    *
                                    8371    *
006926      24B0                    8372   QSAPH5     LIS     R11,0
006928      50B4 0014               8373              ST      R11,CURWAIT(DDBADR) CLEAR WAIT COUNTER
00692C      087A                    8374              LR      R7,R10              GET MAM PIQ
00692E      24BB                    8375              LIS     R11,QSZTYP
006930      74B4 0006               8376              TBT     R11,DTYPFLGS(DDBADR)
006934      4230 8122   =006A5A     8377              BNZ     QSZPH5              QAS ZBID TYPE
                                    8378    *
                                    8379    *        QSA, DSA AND PASLA DEVICES (BISYNC ONLY)
                                    8380    *
006938      C470 0F00               8381              NHI     R7,X'F00'          REASON CODE
00693C      C570 0300               8382              CLHI    R7,X'300'          REASON CODE = 3
006940      4330 80AE   =0069F2     8383              BE      QSA5L7             BUFFER NOT AVAILABLE
                                    8384    *
006944      C570 0700               8385              CLHI    R7,X'700'          REASON CODE = 7
006948      4330 80C0   =006A0C     8386              BE      QSA5L8             SPECIAL CHAR TERMINATION
                                    8387    *
00694C      C570 0600               8388              CLHI    R7,X'600'          REASON CODE = 6
006950      4330 80D0   =006A24     8389              BE      QSA5L9             FIRST BAD STATUS FROM DEVICE
                                    8390    *
                                    8391    *                                   ELSE REASON CODE = F
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                                    8392  *                            NORMAL (BUFFER FULL) TERMINATION
006954      4524 0038               8393        CLH   DEV,RDEVADR(DDBADR) DEVICE ADDRESS
006958      4330 804A =0069A6       8394        BE    QSA5L3            RECEIVER
                                    8395  *
                                    8396  *                            TRANSMITTER
                                    8397  *
00695C      4884 002C               8398  QSA5L0  LH    R8,DVRWRK2(DDBADR) XMIT BUFFER LINK COUNT
006960      2681                     8399        AIS   R8,1             INCREMENT IT
006962      4084 002C               8400        STH   R8,DVRWRK2(DDBADR)
006966      4580 34DE               8401        CLH   R8,CCNT          MAXIMUM COUNT
00696A      2184     =006972        8402        BLS   QSA5L00          UPDATE DCB
00696C      4330 8020 =006990       8403        BE    QSA5L2           LAST BUFFER TRANSFER
006970      1800                     8404        LPSWR OLDPSW           ELSE EXIT
006972      C380 0001               8405  QSA5L00 THI   R8,1             BUFFER 0 OR 1
006976      2337     =006984        8406        BZS   QSA5L1           RESET BUFF 1
                                    8407  *
                                    8408  *                            RESET BUFF 0 IF SWITCHED TO BUFF 1
006978      2476                     8409        LIS   R7,6             DCB INDEX
00697A      4880 34EC               8410        LH    R8,CM128         BYTE COUNT
00697E      4190 E428 =004DAA       8411        BAL   R9,MAMDCBBC      MODFIY DCB
006982      1800                     8412        LPSWR OLDPSW
                                    8413  *
                                    8414  *                            RESET BUFF 1 IF SWITCHED TO BUFF 0
006984      247E                     8415  QSA5L1  LIS   R7,14            DCB INDEX
006986      4880 34EC               8416        LH    R8,CM128         BYTE COUNT
00698A      4190 E41C =004DAA       8417        BAL   R9,MAMDCBBC      MODIFY DCB
00698E      1800                     8418        LPSWR OLDPSW           RETURN
                                    8419  *
                                    8420  *                            SEND LAST BUFFER; END OF COUNT
006990      2472                     8421  QSA5L2  LIS   R7,2             DCB INDEX
006992      E680 83ED =006D83       8422        LA    R8,QSAEOTE       END ADDRESS (EOT)
006996      4190 E436 =004DD0       8423        BAL   R9,MAMDCBAD      MODIFY DCB
00699A      2476                     8424        LIS   R7,6             DCB INDEX
00699C      4890 34EF               8425        LH    R8,CM132         132 BYTE BUFFER
0069A0      4190 E406 =004DAA       8426        BAL   R9,MAMDCBBC      MODIFY DCB
0069A4      1800                     8427        LPSWR OLDPSW           RETURN
                                    8428  *
                                    8429  *                            RECEIVER
                                    8430  *
0069A6      4884 002E               8431  QSA5L3  LH    R8,DVRWRK2+2(DDBADR) RECV BUFFER LINK COUNT
0069AA      2581                     8432        AIS   R8,1             INCREMENT IT
0069AC      4084 002E               8433        STH   R8,DVRWRK2+2(DDBADR)
0069B0      4580 34DE               8434        CLH   R8,CCNT          MAXIMUM COUNT
0069B4      2184     =0069BC        8435        BLS   QSA5L30          UPDATE DCB
0069B6      4330 802C =0069E6       8436        BE    QSA5L6           OR LAST BUFFER TRANSFER
0069BA      1800                     8437        LPSWR OLDPSW           ELSE EXIT
0069BC      C380 0001               8438  QSA5L30 THI   R8,1             SWITCHED TO BUFFER 0 OR 1
0069C0      233A     =0069D4        8439        BZS   QSA5L5           RESET BUFFER 1
                                    8440  *
                                    8441  *                            RESET BUFF 0 IF SWITTCHED TO BUFF 1
0069C2      2476                     8442  QSA5L4  LIS   R7,6             DCB INDEX
0069C4      4880 34EC               8443        LH    R8,CM128         128 BYTES
0069C8      4190 E3DE =004DAA       8444        BAL   R9,MAMDCBBC      MODIFY DCB
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0069CC    2480            8445            LIS   R8,0                  BUFFER 0 INDEX
0069CE    4130 DE5C =00482E 8446            BAL   R3,QSACOMP            TEST BUFFER 0 AND CLEAR IT
0069D2    1800            8447  QSA5L40   LPSWR OLDPSW                RETURN
                          8448  *
                          8449  *                                    RESET BUFF 1 IF SWITCHED TO BUFF 0
0069D4    247E            8450  QSA5L5    LIS   R7,14                 DCB INDEX
0069D6    4880 34EC       8451            LH    R8,CM128              128 BYTES
0069DA    4190 E3CC =004DAA 8452            BAL   R9,MAMDCBBC           MODIFY DCB
0069DE    248C            8453            LIS   R8,IRBUF              RECEIVER INDEX
0069E0    4130 DE4A =00482E 8454            BAL   R3,QSACOMP            TEST BUFFER 1 AND CLEAR IT
0069E4    1800            8455  QSA5L50   LPSWR OLDPSW                RETURN
                          8456  *
                          8457  *                                    RECEIVE LAST BUFFER, END OF COUNT
0069E6    2476            8458  QSA5L6    LIS   R7,6                  DCB INDEX
0069E8    4880 34EE       8459            LH    R8,CM132              132 BYTE BUFFER
0069EC    4190 E3BA =004DAA 8460            BAL   R9,MAMDCBBC           MODIFY DCB
0069F0    1800            8461            LPSWR OLDPSW                RETURN
                          8462  *
                          8463  *                                    TERMINATE TRANSMISSION
                          8464  *
                          8465  *                                    RC = 3, BUFFER NOT AVAILABLE
0069F2    4524 0008       8466  QSA5L7    CLH   DEV,XDEVADR(DDBADR)   XMIT ADDRESS
0069F6    4230 802A =006A24 8467            BNE   QSA5L9                IF NOT ERROR
0069FA    4024 0028       8468            STH   DEV,DVRWRK1(DDBADR)   SET XMIT FLAG
0069FE    4894 002A       8469            LH    R9,DVRWRK1+2(DDBADR)
006A02    4594 0038       8470            CLH   R9,RDEVADR(DDBADR)    IF RECV FLAG SET
006A06    4330 802A =006A34 8471            BE    QSA5LZ                TERMINATE TRANSMISSION
006A0A    1800            8472            LPSWR OLDPSW                ELSE WAIT
                          8473  *
                          8474  *                                    RC = 7, SPECIAL CHAR TERMINATION
006A0C    4524 0038       8475  QSA5L8    CLH   DEV,RDEVADR(DDBADR)   RECV ADDRESS
006A10    4230 803E =006A52 8476            BNE   QSA5LX                IF NOT, ERROR
006A14    4024 002A       8477            STH   DEV,DVRWRK1+2(DDBADR) SET RECV FLAG
006A18    4894 0028       8478            LH    R9,DVRWRK1(DDBADR)
006A1C    4594 0008       8479            CLH   R9,XDEVADR(DDBADR)    IF XMIT FLAG SET
006A20    233A     =006A34 8480            BES   QSA5LZ                TERMINATE TRANSMISSION
006A22    1800            8481            LPSWR OLDPSW                ELSE WAIT
                          8482  *
                          8483  *                                    RC = 6,FIRST BAD STATUS FROM DEVICE
006A24    245A            8484  QSA5L9    LIS   R5,PASLTYP            PASLA TYPE
006A26    7454 0006       8485            TBT   R5,DTYPFLGS(DDBADR)
006A2A    4330 8024 =006A52 8486            BZ    QSA5LX                IF NOT ERROR
006A2E    2456            8487            LIS   R5,DEVCNTL1           ELSE SET PASLA TERM FLAG
006A30    7554 0000       8488            SBT   R5,DSPFLGS(DDBADR)
                          8489  *                                    EXIT
006A34    2451            8490  QSA5LZ    LIS   R5,BUSY
006A36    7654 0000       8491            RBT   R5,DSPFLGS(DDBADR)    RESET BUSY FLAG
006A3A    245A            8492            LIS   R5,PASLTYP            PASLA TYPE
006A3C    7454 0006       8493            TBT   R5,DTYPFLGS(DDBADR)
006A40    2334     =006A48 8494            BZS   QSA5LZ0               NO
006A42    2451            8495            LIS   R5,1                  IF PASLA
006A44    6150 34B8       8496            AHM   R5,PASCNT             COUNT DEVICES FINISHED
006A48    C850 0018       8497  QSA5LZ0   LHI   R5,PHASE.6
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006A4C    4054 0002           8498              STH   R5,PHASE(DDBADR)      PHASE SIX NEXT
006A50    1800                8499              LPSWR OLDPSW               RETURN
                              8500      *
006A52    C850 A082           8501    QSA5LX    LHI   R5,X'A082'            ERROR 82 IMPROPER RC
006A56    4300 80C0 =006B1A   8502              B     QSZ5LXX
                              8503      *
                              8504      *       QSA (ZBID) RESET ALTERNATE BUFFER
                              8505      *
006A5A    4890 34DC           8506    QSZPH5    LH    R9,LLBACK
006A5E    C470 FF00           8507              NHI   R7,X'FF00'            MOST BYTE OF PIQ ENTRY
006A62    1078                8508              SRLS  R7,8
006A64    4524 0038           8509              CLH   DEV,RDEVADR(DDBADR)
006A68    4330 8032 =006A9E   8510              BE    QSZ5L2                RECIEVER
                              8511      *
                              8512      *                                  TRANSMITTER
                              8513      *
006A6C    D394 002C           8514              LB    R9,DVRWRK2(DDBADR)    SEQUENCE COUNT
006A70    0889                8515              LR    R8,R9                 SAVE IT
006A72    2691                8516              AIS   R9,1                  INCREMENT
006A74    C590 0005           8517              CLHI  R9,5                  END OF SEQUENCE
006A78    2187      =006A86   8518              BLS   QSZ5L1                NO
006A7A    2490                8519              LIS   R9,0                  ELSE RESET SEQ COUNT
006A7C    48A4 0028           8520              LH    R10,DVRWRK1(DDBADR)   AND
006A80    26A1                8521              AIS   R10,1                 INCREMENT
006A82    40A4 0028           8522              STH   R10,DVRWRK1(DDBADR)   PASS COUNT
                              8523      *
006A86    D294 002C           8524    QSZ5L1    STB   R9,DVRWRK2(DDBADR)    CURRENT SEQ COUNT
006A8A    41B0 E3DA =004E68   8525              BAL   R11,MDCBQZX           UPDATE MAM DCB
006A8E    0855                8526              LR    R5,R5                 TEST REASON CODE OF PIQ ENTRY
006A90    4330 8082 =006B1E   8527              BZ    QSZ5LX                ERROR IF IMPROPER REASON CODE
006A94    C550 0003           8528              CLHI  R5,3                  TERMINATE IF RC = 3
006A98    4330 804C =006AE8   8529              BE    QSZ5LZA
006A9C    1800                8530              LPSWR OLDPSW               ELSE RETURN
                              8531      *
                              8532      *                                  RECEIVER
                              8533      *
006A9E    D394 002D           8534    QSZ5L2    LB    R9,DVRWRK2+1(DDBADR)  SEQUENCE COUNT
006AA2    0889                8535              LR    R8,R9                 SAVE IT
006AA4    2691                8536              AIS   R9,1                  INCREMENT
006AA6    C590 0005           8537              CLHI  R9,5                  END OF SEQUENCE
006AAA    2187      =006AB8   8538              BLS   QSZ5L3                NO
006AAC    2490                8539              LIS   R9,0                  ELSE RESET SEQ COUNT
006AAE    48A4 002A           8540              LH    R10,DVRWRK1+2(DDBADR) AND
006AB2    26A1                8541              AIS   R10,1                 INCREMENT
006AB4    40A4 002A           8542              STH   R10,DVRWRK1+2(DDBADR) PASS COUNT
006AB8    D294 002D           8543    QSZ5L3    STB   R9,DVRWRK2+1(DDBADR)
006ABC    41B0 E3C8 =004F8E   8544              BAL   R11,MDCBQZR           UPDATE MAM DCB
006AC0    0855                8545              LR    R5,R5                 TEST REASON CODE OF PIQ ENTRY
006AC2    4330 8050 =006B16   8546              BZ    QSZ5LX                ERROR IF IMPROPER RC
006AC6    C550 000E           8547              CLHI  R5,X'E'               IF REASON CODE = E
006ACA    4330 8026 =006AF4   8548              BE    QSZ5LZB               TERIMATE TRANSMISSION
006ACE    C550 000A           8549              CLHI  R5,X'A'               IF "A"
006AD2    2336      =006ADE   8550              BES   QSZ5L33               JUST EXIT
```

COMMUNICATION DEVICE DRIVER

```
006AD4      08AA                    8551              LR    R10,R10          RESET BUFFER FLAG
006AD6      2335        =006AE0     8552              BZS   QSZ5L4           RESET BUFFER 0
006AD8      248C                    8553              LIS   R8,IRBUF         ELSE BUFFER 1
006ADA      4130 DD50   =00482E     8554              BAL   R3,QSACOMP       TEST DATA IN BUFFER 1 AND CLEAR IT
006ADE      1800                    8555    QSZ5L33   LPSWR OLDPSW           RETURN
                                    8556    *
006AE0      2480                    8557    QSZ5L4    LIS   R8,0
006AE2      4130 DD48   =00482F     8558              BAL   R3,QSACOMP       TEST DATA IN BUFFER 0 AND CLEAR IT
006AE6      1800                    8559              LPSWR OLDPSW           RETURN
                                    8560    *
006AE8      4854 002E               8561    QSZ5LZA   LH    R5,DVRWRK2+2(DDBADR)
006AEC      213A        =006B00     8562              BNZS  QSZ5LZ
006AEE      4024 002E               8563              STH   R2,DVRWRK2+2(DDBADR)
006AF2      1800                    8564              LPSWR OLDPSW
                                    8565    *
006AF4      4854 002E               8566    QSZ5LZB   LH    R5,DVRWRK2+2(DDBADR)
006AF8      2134        =006F00     8567              BNZS  QSZ5LZ
006AFA      4024 002E               8568              STH   R2,DVRWRK2+2(DDBADR)
006AFE      1800                    8569              LPSWR OLDPSW
                                    8570    *
                                    8571    *                               TERMINATE TRANSMISSION
006B00      2451                    8572    QSZ5LZ    LIS   R5,BUSY          RESET BUSY
006B02      7654 0000               8573              RBT   R5,DSPFLGS(DDBADR)
006B06      C850 0018               8574              LHI   R5,PHASE.6
006B0A      4054 0002               8575              STH   R5,PHASE(DDBADR) PHASE SIX NEXT
006B0E      2451                    8576              LIS   R5,1
006B10      6150 34BC               8577              AHM   R5,QSZCNT        INCREMENT QSA ZBID COUNT
006B14      1800                    8578              LPSWR OLDPSW           RETURN
                                    8579    *
                                    8580    *
006B16      C850 A082               8581    QSZ5LX    LHI   R5,X'A082'       ERROR 82
006B1A      2481                    8582    QSZ5LXX   LIS   R8,BUSY          RESET BUSY
006B1C      7684 0000               8583              RBT   R8,DSPFLGS(DDBADR)
006B20      C880 0018               8584              LHI   R8,PHASE.6
006B24      4084 0002               8585              STH   R8,PHASE(DDBADR) PHASE SIX NEXT
006B28      2483                    8586              LIS   R8,BADSTAT       BAD STSTUS BIT
006B2A      7484 0000               8587              TBT   R8,DSPFLGS(DDBADR) TEST THIS BIT
006B2E      2134        =006B36     8588              BNZS  QSZ5LX0          ALREADY SET
006B30      2481                    8589              LIS   R8,1             ELSE
006B32      6180 34BC               8590              AHM   R8,QSZCNT        INCREMENT QSA ZBID COUNT
006B36      4180 1FFC               8591    QSZ5LX0   BAL   R8,ERRGET
006B3A      4057 0000               8592              STH   R5,0(R7)
006B3E      9D23                    8593              SSR   DEV,STAT         SENSE PRESENT STATUS
006B40      4027 0002               8594              STH   DEV,2(R7)
006B44      4037 0004               8595              STH   STAT,4(R7)
006B48      73B0 1228               8596              LHL   R11,LASTPIQ      LATEST PIQ ENTRY
006B4C      50B7 0008               8597              ST    R11,8(R7)
006B50      4180 2034               8598              BAL   R8,ERRENQ
006B54      1800                    8599              LPSWR OLDPSW           RETURN
                                    8600    *
                                    8601    *
                                    8602    *         PHASE SIX   IDLE RECEIVER  AND TRANSMITTER
                                    8603    *
```

COMMUNICATION DEVICE DRIVER

```
                                     8604  *
006B56      4890 34DC                8605  QSAPH6   LH    R9,LLBACK
006B5A      4824 0008                8606           LH    XDEV,XDEVADR(DDBADR) TRANSMITTER ADDRESS
006B5E      4854 0038                8607           LH    RDEV,RDEVADR(DDBADR) RECEIVER ADDRESS
006B62      2489                     8608           LIS   R8,DSATYP
006B64      7484 0006                8609           TBT   R8,DTYPFLGS(DDBADR)
006B68      4230 8020 =006B8C        8610           BNZ   QSA6L1              DSA TYPE
                                     8611  *
006B6C      248A                     8612           LIS   R8,PASLTYP
006B6E      7484 0006                8613           TBT   R8,DTYPFLGS(DDBADR)
006B72      4230 8022 =006B98        8614           BNZ   QSA6L2              PASLA TYPE
                                     8615  *
006B76      248B                     8616           LIS   R8,QSZTYP
006B78      7484 0006                8617           TBT   R8,DTYPFLGS(DDBADR)
006B7C      4230 802E =006BAE        8618           BNZ   QSA6L3              QSA ZBID TYPE
                                     8619  *
                                     8620  *                                 ELSE QSA BISYNC
006B80      DE59 349C                8621           OC    RDEV,QIDLEE(R9)     RECV DISARM & SYNSCH
006B84      DE29 349C                8622           OC    XDEV,QIDLEE(R9)     XMIT DISARM & RDM
006B88      4300 8056 =006BE2        8623           B     QSA6LZ
                                     8624  *                                 DSA DEVICE
006B8C      DE50 3444                8625  QSA6L1   OC    RDEV,DSAIDLE        RECV DISARM & SYNSCH
006B90      DE20 3444                8626           OC    XDEV,DSAIDLE        XMIT DISARM & SYNSCH
006B94      4300 804A =006BE2        8627           B     QSA6LZ
                                     8628  *                                 PASLA DEVICE
006B98      4880 34B8                8629  QSA6L2   LH    R8,PASCNT           NUMBER OF PASLAS TERM
006B9C      4580 34B6                8630           CLH   R8,PASRCNT          NUMBER OF PASLA DEFINED
006BA0      0230                     8631           BNER  R0                  IF ALL PASLAS NOT TERM., WAIT
006BA2      DE50 3470                8632           OC    RDEV,PASDDR         ELSE RECV DISABLE & RCT
006BA6      DE20 346F                8633           OC    XDEV,PASDR          XMIT DISABLE & RCT
006BAA      4300 8034 =006BE2        8634           B     QSA6LZ
                                     8635  *                                 QSA ZBID DEVICE
006BAE      48C0 34BC                8636  QSA6L3   LH    R12,QSZCNT          QSA ZBID COUNT
006BB2      45C0 34BA                8637           CLH   R12,QSZRCNT         COMPARE TO ACTUAL COUNT
006BB6      0230                     8638           BNER  R0                  WAIT FOR ALL TO FINISH
006BB8      95CC                     8639           EPSR  R12,R12             PSW
006BBA      C4C0 00FF                8640           NHI   R12,X'00FF'         DISABLE EXTERNAL INTERRUPTS
006BBE      95BC                     8641           EPSR  R11,R12             NEW PSW
006BC0      DA20 34EA                8642           WD    XDEV,FOXS           XMIT WRITE X'FF' DATA BYTE
006BC4      DE29 34A0                8643           OC    XDEV,QXDRRQ(R9)     XMIT DISARM, RDM, DTR & WRITE
006BC8      DE59 349E                8644           OC    RDEV,QIDLEZ(R9)     RECV:DISARM,SYNSCH,DTR
006BCC      95CB                     8645           EPSR  R12,R11             RESTORE PSW
006BCE      C880 1F40                8646           LHI   R8,8000            TIME CONSTANT
006BD2      9D56                     8647  QSA6L4   SSR   RDEV,RSTAT          RECV SENSE STATUS
006BD4      2781                     8648           SIS   R8,1                DECRMENT TIME
006BD6      4330 801E =006BF8        8649           BZ    QSA6LX              TIME OUT ERROR
006BDA      C360 0040                8650           THI   RSTAT,X'40'         RECV TERM CHAR
006BDE      2036      =006BD2        8651           BNZS  QSA6L4              WAIT FOR CLEAR TERM
006BE0      2307      =006BFE        8652           BS    QSA6LZ0
                                     8653  *
006BE2      2453                     8654  QSA6LZ   LIS   R5,BADSTAT          CHECK FOR BAD STATUS
006BE4      7454 0000                8655           TBT   R5,DSPFLGS(DDBADR)
006BE8      2333      =006BEE        8656           BZS   QSA6LZ0             STATUS OK
```

COMMUNICATION DEVICE DRIVER

```
006BEA    2450                8657  QSA6LZZ  LIS  R5,0                IF NOT
006BEC    2303     =006BF2    8658           BS   QSA6LZ1             PHASE ZERO NEXT
                             8659  *
006BEE    C850 001C           8660  QSA6LZO  LHI  R5,PHASE.7          PHASE SEVEN
006BF2    4054 0002           8661  QSA6LZ1  STH  R5,PHASE(DDBADR)    NEXT PHASE
006BF6    0300                8662           BR   R0                  RETURN TO DISPATCHER
                             8663  *
006BF8    2480                8664  QSA6LX   LIS  R8,0                ERROR
006BFA    4084 0002           8665           STH  R8,PHASE(DDBADR)    PHASE ZERO NEXT
006BFE    0825                8666           LR   DEV,RDEV            RECEIVER ADDRESS
006C00    0836                8667           LR   STAT,RSTAT          RECV STATUUS
006C02    41B0 D8C4 =0044CA   8668           BAL  R11,BSTATERR        BAD STATUS ERROR
006C06    0300                8669           BR   R0                  RETURN TO DISPATCHER
                             8670  *
                             8671  *
                             8672  *       PHASE SEVEN    TRANSMISSION TERMINATED
                             8673  *
                             8674  *
006C08    4890 34DC           8675  QSAPH7   LH   R9,LLBACK
006C0C    4870 34DE           8676           LH   R7,CCNT             COUNT
006C10    248B                8677           LIS  R8,QSZTYP
006C12    7484 0006           8678           TBT  R8,DTYPFLGS(DDBADR)
006C16    2336     =006C22    8679           BZS  QSA7L1              NOT QSA ZBID TYPE
                             8680  *                                 QSA ZBID DEVICE
006C18    4574 0028           8681           CLH  R7,DVRWRK1(DDBADR)  LAST PASS OF XMIT
006C1C    2138     =006C2C    8682           BNES QSA7L2              NO, ERROR
006C1E    4300 8042 =006C64   8683           B    QSA7L5             ALL QSA ZBID DEVICE TERMINATED
                             8684  *
006C22    2671                8685  QSA7L1   AIS  R7,1                ADJUST BUFFER LINK COUNT
006C24    4574 002C           8686           CLH  R7,DVRWRK2(DDBADR)
006C28    4330 8020 =006C4C   8687           BE   QSA7L3              PROPER COUNT
                             8688  *
006C2C    4824 0008           8689  QSA7L2   LH   XDEV,XDEVADR(DDBADR) ELSE ERROR, XMIT ADDR
006C30    9D23                8690           SSR  XDEV,XSTAT          XMIT ADDR
006C32    C850 8081           8691           LHI  R5,X'8081'          ERROR 81
006C36    4180 1FFC           8692           BAL  R8,ERRGET
006C3A    4057 0000           8693           STH  R5,0(R7)
006C3E    4027 0002           8694           STH  XDEV,2(R7)
006C42    4037 0004           8695           STH  XSTAT,4(R7)
006C46    4180 2034           8696           BAL  R8,ERRENQ
006C4A    2309     =006C5C    8697           BS   QSA7L4
                             8698  *
                             8699  *                                 QSA, DSA & PASLA (BISYNC)
006C4C    4824 0038           8700  QSA7L3   LH   DEV,RDEVADR(DDBADR) RECEIVER ADDRESS
006C50    2480                8701           LIS  R8,0                BUFFER INDEX
006C52    4130 DBD8 =00482F   8702           BAL  R3,QSACOMP          TEST DATA IN BUFFER 0 AND CLEAR IT
006C56    248C                8703           LIS  R8,IRBUF            BUFFER 1 INDEX
006C58    4130 DBD2 =00482E   8704           BAL  R3,QSACOMP          TEST DATA IN BUFFER 1 AND CLEAR IT
006C5C    245A                8705  QSA7L4   LIS  R5,PASLTYP
006C5E    7454 0006           8706           TBT  R5,DTYPFLGS(DDBADR)
006C62    2133     =006C68    8707           BNZS QSA7L6              PASLA DEVICE
                             8708  *
006C64    2454                8709  QSA7L5   LIS  R5,PHASE.1          IF NOT PASLA
```

COMMUNICATION DEVICE DRIVER

```
006C66      2302        =006C6A    8710           BS    QSA7LZ              PHASE ONE NEXT
006C68      2450                   8711  QSA7L6   LIS   R5,0                ELSE PHASE ZERO NEXT FOR PASLA
                                   8712  *                                 EXIT
006C6A      4054 0002              8713  QSA7LZ   STH   R5,PHASE(DDBADR)    NEXT PHASE
006C6E      0300                   8714           BR    R0                  RETURN TO DISPATCHER
                                   8715  *
                                   8716  *
                                   8717  *
                                   8718  *CKQSA -- DEFINES THE COMMUNICATION DEVICE TYPE.
                                   8719  *
                                   8720  *          THE FIRST TWO ASCII CHARACTERS OF THE DEVICE COMMAND
                                   8721  *          ARE USED TO SET THE PARTICULAR  DEVICE TYPE FLAG.
                                   8722  *
                                   8723  *          "QS"   QSA BISYNC DEVICE     BIT 8
                                   8724  *          "DS"   DSA BISYNC DEVICE     BIT 9
                                   8725  *          "PS"   PASLA BISYNC DEVICE   BIT 10
                                   8726  *          "QZ"   QSA ZBID DEVICE       BIT 11
                                   8727  *
                                   8728  *     NOTE:
                                   8729  *     THE MAM OR EMAM DEVICE MUST BE DEFINED BEFORE ANY
                                   8730  *     COMMUNICATION DEVICE CAN BE DEFINED.
                                   8731  *     THERE ARE NO DEFAULT ADDRESSES FOR THE TRANSMITTER OR
                                   8732  *     RECEIVER. IF THESE ADDRESSES ARE NOT SPECIFIED, THE
                                   8733  *     DEVICE WILL NOT BE ADDED TO THE DEVICE LIST.
                                   8734  *
                                   8735  *
                                   8736  *
006C70      4850 34B2              8737  CKQSA    LH    R6,MAMADR           MAM (EMAM) ADDRESS
006C74      2139        =006C86    8738           BNZS  CKQSA0              EXISTS
                                   8739  *                                 NO, ERROR MESSAGE
006C76      08AE                   8740           LR    R10,R14             TRANSFER RETURN REG
006C78      E6D0 338C              8741           LA    R13,ERRGMESS        "SPECIFY MAM ADDR"
006C7C      E6E0 339D              8742           LA    R14,ERRGMESE
006C80      41F0 232E              8743           BAL   R15,CONPPINT        SEND MESSAGE
006C84      030A                   8744           BR    R10                 RETURN
                                   8745  *
006C86      48F0 34DE              8746  CKQSA0   LH    R15,CCNT
006C8A      C4F0 FFFE              8747           NHI   R15,X'FFFE'         ONLY EVEN VALUES
006C8E      40F0 34DE              8748           STH   R15,CCNT            FOR COUNT
006C92      4874 0005              8749           LH    R7,DTYPFLGS(DDBADR) DEVICE TYPE
006C96      C470 FF0F              8750           NHI   R7,X'FF0F'          ZERO FLAGS FOR QSA,DSA & PASLA
006C9A      4074 0005              8751           STH   R7,DTYPFLGS(DDBADR)
006C9E      086A                   8752           LR    R6,R10
006CA0      EC60 0010              8753           SRL   R6,16
006CA4      C560 5153              8754           CLHI  R6,C'QS'            QSA BISYNC
006CA8      2136        =006CB4    8755           BNES  CKQSA01             NO
006CAA      2468                   8756           LIS   R6,QSATYP           YES
006CAC      7564 0006              8757           SBT   R6,DTYPFLGS(DDBADR) SET QSA BISYNC FLAG
006CB0      4300 8022  =006CD6     8758           B     CKQSA04
006CB4      C560 4453              8759  CKQSA01  CLHI  R6,C'DS'            DSA DEVICE
006CB8      2135        =006CC2    8760           BNES  CKQSA02             NO
006CBA      2469                   8761           LIS   R6,DSATYP           YES
006CBC      7564 0006              8762           SBT   R6,DTYPFLGS(DDBADR) SET DSA FLAG
```

COMMUNICATION DEVICE DRIVER

```
006CC0       230B       =006CD6    8763           BS    CKQSA04
006CC2       C560 5053             8764   CKQSA02  CLHI  R6,C'PS'              PASLA TYPE
006CC6       2135       =006CDC    8765           BNES  CKQSA03              NO
006CC8       246A                  8766           LIS   R6,PASLTYP           YES
006CCA       7564 0006             8767           SBT   R6,DTYPFLGS(DDBADR)  SET PASLA FLAG
006CCE       2304       =006CDE    8768           BS    CKQSA04
006CD0       246B                  8769   CKQSA03  LIS   R6,QSZTYP           ELSE QSA ZBID MODE
006CD2       7564 0006             8770           SBT   R6,DTYPFLGS(DDBADR)  SET QSA ZBID MODE FLAG
006CD6       4824 0038             8771   CKQSA04  LH    DEV,RDEVADR(DDBADR)  TRANSMIT ADDR
006CDA       2336       =006CE6    8772           BZS   CKQSAX              ERROR IF NONE SPECIFIED
006CDC       48F4 0008             8773   CKQSA5   LH    R15,XDEVADR(DDBADR)  RECEIVER ADDRESS
006CE0       2333       =006CE6    8774           BZS   CKQSAX              ERROR IF NONE SPECIFIED
006CE2       24F0                  8775   CKQSAZ   LIS   R15,0               CLEAR ERROR FLAG
006CE4       030E                  8776           BR    R14                 RETURN
                                   8777   *
                                   8778   *
006CE6       08AE                  8779   CKQSAX   LR    R10,R14             TRANSFER RETURN REGISTER
006CE8       E6D0 339E             8780           LA    R13,ERRHMESS         SPECIFY XMIT-RECV ADDR
006CEC       E6E0 33B5             8781           LA    R14,ERRHMESE
006CF0       41F0 232E             8782           BAL   R15,CONPRINT         SEND MESSAGE
006CF4       24F1                  8783           LIS   R15,1               SET ERROR FLAG
006CF6       030A                  8784           BR    R10                 RETURN
                                   8785   *
                                   8786   *
006CF8                             8787           ALIGN 4
006CF8       1616 1616             8788   QSABYSNC DC    Y'16161616'
006CFC       1616 1502             8789           DC    Y'16161602'
006D00       8081 8283             8790   QSAXBUFS DCY   80818283,84858687,88898A8B,8C8D8E8F
006D04       8485 8687
006D08       8889 8A8B
006D0C       8C8D 8E8F
006D10       9091 9293             8791           DCY   90919293,94959697,98999A9B,9C9D9E9F
006D14       9495 9697
006D18       9899 9A9B
006D1C       9C9D 9E9F
006D20       A0A1 A2A3             8792           DCY   A0A1A2A3,A4A5A6A7,A8A9AAAB,ACADAEAF
006D24       A4A5 A6A7
006D28       A8A9 AAAB
006D2C       ACAD AEAF
006D30       B0B1 B2B3             8793           DCY   B0B1B2B3,B4B5B6B7,B8B9BABB,BCBDBEBF
006D34       B4B5 B6B7
006D38       B8B9 BABB
006D3C       BCBD BEBF
006D40       C0C1 C2C3             8794           DCY   C0C1C2C3,C4C5C6C7,C8C9CACB,CCCDCECF
006D44       C4C5 C6C7
006D48       C8C9 CACB
006D4C       CCCD CECF
006D50       D0D1 D2D3             8795           DCY   D0D1D2D3,D4D5D6D7,D8D9DADB,DCDDDEDF
006D54       D4D5 D6D7
006D58       D8D9 DADB
006D5C       DCDD DEDF
006D60       E0E1 E2E3             8796           DCY   E0E1E2E3,E4E5E6E7,E8E9EAEB,ECEDEEEF
006D64       E4E5 E6E7
```

COMMUNICATION DEVICE DRIVER

```
006D68      E8E9 EAEB
006D6C      ECED EEEF
006D70      F0F1 F2F3            8797            DCY     F0F1F2F3,F4F5F6F7,F8F9FAFB,FCFDFEFF
006D74      F4F5 F6F7
006D78      F8F9 FAFB
006D7C      FCFD FEFF
            0000 6D7F            8798  QSAXBUFE  EQU     *-1
006D80      03FF FFFF           8799  QSAEOT    DC      Y'03FFFFFF'
            0000 6D83           8800  QSAEOTE   EQU     *-1
006D84      FFFF FFFF           8801  QSAIDLED  DCY     FFFFFFFF,FFFFFFFF,FFFFFFFF,FFFFFFFF
006D88      FFFF FFFF
006D8C      FFFF FFFF
006D90      FFFF FFFF
            0000 6D93           8802  QSAIDLEE  EQU     *-1
006D94                          8803            IFNZ    PRINTERS
```

```
                                    8805  *  HIGH SPEED LINE PRINTER DRIVER                                    *
                                    8806  *                                                                     *
006D94                              8807  *PRIMARY ENTRY AND PHASE DISPATCH                                     *
006D94      0000 6DA0               8808        ALIGN  4                                                        *
006D98      0000 6DCE               8809  LNPPTR  DC     A(LNPPH0)         STATUS CHECK, WAIT DU, OUTPUT CHAR
006D9C      0000 6E0A               8810          DC     A(LNPPH1)         DATA INTERRUPTS
                                    8811          DC     A(LNPPH2)         LAST CHARACTER INTERRUPT
                                    8812  *                                                                     *
                                    8813  *  STATUS CHECK, WAIT DU TO CLEAR                                     *
                                    8814  *                                                                     *
006DA0      4824 0008               8815  LNPPH0  LH     DEV,DEVADR(DDBADR) GET DEVICE ADDRESS
006DA4      9D23                    8816          SSR    DEV,STAT          AND STATUS
006DA6      D234 000A               8817          STB    STAT,STATUS(DDBADR) SAVE STATUS
006DAA      C330 0055               8818          THI    STAT,X'55'        ANY ERRORS ?
006DAE      2334        =006DB6     8819          BZS    LNPOL1            B IF NO
006DB0      41B0 D716   =0044CA     8820          BAL    R11,BSTATERR      BAD STATUS ERROR
006DB4      0300                    8821          BR     R0                STAY IN PHASE ZERO
006DB6      5874 0030               8822  LNPOL1  L      R7,BUF1STRT(DDBADR) FIRST BYTE
006DBA      5074 0038               8823          ST     R7,BUF1NEXT(DDBADR) IS NEXT BYTE
006DBE      2454                    8824          LIS    R5,PHASE.1        NEXT PHASE IS ONE, DATA INTERRUPTS
006DC0      D360 3435               8825          LB     R6,ENABLE         ALLOW INTERRUPTS
006DC4      41B0 D71C   =0044E4     8826          BAL    R11,STARTIO
006DC8      2470                    8827          LIS    R7,0              OUTPUT A NULL TO START
006DCA      9A27                    8828          WDR    DEV,R7
006DCC      0300                    8829          BR     R0                RETURN, WAIT INTERRUPTS
                                    8830  *                                                                     *
                                    8831  *  DATA INTERRUPTS, OUTPUT A LINE                                     *
                                    8832  *                                                                     *
006DCE      2450                    8833  LNPPH1  LIS    R5,0              GOT INTERRUPT, CLEAR WAIT
006DD0      5054 0014               8834          ST     R5,CURWAIT(DDBADR)
006DD4      C330 0055               8835          THI    STAT,X'55'        POSSIBLE ERROR ?
006DD8      213C        =006DF0     8836          BNZS   LNP1L1            B IF YES
006DDA      5854 0038               8837          L      R5,BUF1NEXT(DDBADR)
006DDE      DA25 0000               8838          WD     DEV,0(R5)         SEND NEXT CHARACTER
006DE2      2651                    8839          AIS    R5,1              UPDATE BUFFER POINTER
006DE4      5054 0038               8840          ST     R5,BUF1NEXT(DDBADR) AND SAVE POINTER
006DE8      5954 0034               8841          C      R5,BUF1END(DDBADR) AT END OF BUFFER ?
006DEC      212B        =006F02     8842          BPS    LNP1L2            B IF YES
006DEE      1900                    8843          LPSWR  OLDPSW            RETURN
006DF0      D234 000A               8844  LNP1L1  STB    STAT,STATUS(DDBADR) SAVE STATUS                     R09
006DF4      DE20 3434               8845          OC     DEV,DISARM        NO MORE INTERRUPTS                 R09
006DF8      2451                    8846          LIS    R5,BUSY           CLEAR BUSY                         R09
006DFA      7654 0000               8847          RBT    R5,DSPFLGS(DDBADR)
006DFE      2450                    8848          LIS    R5,0              NEXT PHASE ZERO, CHECK STATUS
006E00      2302        =006E04     8849          BS     LNP1L3
006E02      2458                    8850  LNP1L2  LIS    R5,PHASE.2        NEXT PHASE TWO, LAST INTERRUPT
006E04      4054 0002               8851  LNP1L3  STH    R5,PHASE(DDBADR)  NEXT PHASE FROM ABOVE
006E08      1800                    8852          LPSWR  OLDPSW            RETURN
                                    8853  *                                                                     *
                                    8854  *  LAST DATA INTERRUPT                                                *
                                    8855  *                                                                     *
006E0A      D234 000A               8856  LNPPH2  STB    STAT,STATUS(DDBADR)
006E0E      2451                    8857          LIS    R5,BUSY           NOT EXPECTING ANY MORE INTERRUPTS
```

LINE PRINTER DRIVER

```
.006E10    7654 0000        8858         RBT   R5,DSPFLGS(DDBADR)
 006E14    DE20 3434        8859         OC    DEV,DISARM
 006E18    2450             8860         LIS   R5,0                 NEXT PHASE ZERO, CHECK STATUS
 006E1A    4054 0002        8861         STH   R5,PHASE(DDBADR)
 006E1E    1800             8862         LPSWR OLDPSW               RETURN
                            8863  *                                                                *
                            8864  *  SUPPLIES DEFAULT ADDRESS X'62'                                *
                            8865  *                                                                *
 006E20    07FF             8866  CKLNP  XR    R15,R15              RC=0, ALL OK
 006E22    4824 0008        8867         LH    DEV,DEVADR(DDBADR)   DID USER GIVE ADDRESS?
 006E26    023E             8868         BNZR  R14                  B IF YES, RETURN
 006E28    C820 0062        8869         LHI   DEV,X'62'            DEFAULT ADDRESS
 006E2C    4024 0008        8870         STH   DEV,DEVADR(DDBADR)   INTO DDB
 006E30    030E             8871         BR    R14                  RETURN
                            8872         ENDC
 006E32                     8873         IFNZ  CARDRDR
```

CARD READER DRIVER

```
                                  8875  *  CARD READER DRIVER                                                *
                                  8876  *                                                                    *
                                  8877  *PRIMARY ENTRY AND PHASE DISPATCH                                    *
006E34                            8878         ALIGN  4
006E34       0000 6E40            8879  CRDPTR  DC     A(CRDPH0)              CLEAR, WAIT HE, TBL,DU,FEED CARD
006E38       0000 6E84            8880          DC     A(CRDPH1)             READ 80 COLUMNS
006E3C       0000 6EE4            8881          DC     A(CRDPH2)             COMPARE DATA
                                  8882  *                                                                    *
                                  8883  *   INTIIALIZATION, WAIT HE, TBL,DU TO CLEAR, NMTN TO SET, FEED CARD *
                                  8884  *                                                                    *
006E40       4824 0008            8885  CRDPH0  LH     DEV,DEVADR(DDBADR)
006E44       DE20 3462            8886          OC     DEV,CRDCLEAR          DISARM, CLEAR
006E48       9D23                 8887          SSR    DEV,STAT
006E4A       D234 000A            8888          STB    STAT,STATUS(DDBADR)   SAVE STATUS
006E4E       C330 0061            8889          THI    STAT,X'61'            DU TBL OR HE?
006E52       2134      =006E5A    8890          BNZS   CRD0L1                B IF YES
006E54       C330 0010            8891          THI    STAT,X'10'            MOTION?
006E58       2134      =006F60    8892          BNZS   CRD0L2                B IF NO
006E5A       4180 D66C =0044CA    8893  CRD0L1  BAL    R11,BSTATERR          BAD STATUS ERROR
006E5E       0300                 8894          BR     R0                    RETURN, HANG  PHASE ZERO
                                  8895  *  CLEAR READ DATA BUFFER
006E60       5854 003C            8896  CRD0L2  L      R5,BUF2STRT(DDBADR)   START OF BUFFER
006E64       5054 0044            8897          ST     R5,BUF2NEXT(DDBADR)   IS NEXT BYTE
006E68       2462                 8898          LIS    R6,2                  BY 2 BYTES PER COLUMN
006E6A       5874 0040            8899          L      R7,BUF2END(DDBADR)    TO END OF BUFFER
006E6E       2480                 8900          LIS    R8,0
006E70       4085 0000            8901  CRD0L3  STH    R8,0(R5)              CLEAR BUFFER
006E74       C150 FFF8 =006F70    8902          BXLE   R5,CRD0L3
006E78       2454                 8903          LIS    R5,PHASE.1            NEXT PHASE IS ONE, DATA INTERRUPTS
006E7A       D360 3463            8904          LB     R6,CRDFEED            FEED A CARD
006E7E       41B0 D652 =0044E4    8905          BAL    R11,STARTIO
006E82       0300                 8906          BR     R0                    RETURN, WAIT INTERRUPTS
                                  8907  *                                                                    *
                                  8908  *  CARD READER DATA INTERRUPTS                                       *
                                  8909  *                                                                    *
006E84       D234 000A            8910  CRDPH1  STB    STAT,STATUS(DDBADR)   SAVE STATUS
006E88       0833                 8911          LR     STAT,STAT             EXAMINE OR DU OR EOM?
006E8A       4230 8038 =006EC6    8912          BNZ    CRD1L2                B IF YES
006E8E       5864 0044            8913          L      R6,BUF2NEXT(DDBADR)   CURRENT BUFFER POINTER
006E92       5964 0040            8914          C      R6,BUF2END(DDBADR)    AT END OF BUFFER?
006E96       2127      =006EA4    8915          BPS    CRD1L1                B IF YES
006E98       D926 0000            8916          RH     DEV,0(R6)             READ COLUMN INTO BUFFER
006E9C       2662                 8917          AIS    R6,2                  UPDATE POINTER
006E9E       5054 0044            8918          ST     R6,BUF2NEXT(DDBADR)   SAVE FOR NEXT COLUMN
006EA2       1800                 8919          LPSWR  OLDPSW                RETURN
006EA4       4180 1FFC            8920  CRD1L1  BAL    R8,ERRGET
006EA8       C880 B032            8921          LHI    R8,X'B032'            UNEXPECTED INTERRUPT
006EAC       4087 0000            8922          STH    R8,0(R7)
006EB0       4027 0002            8923          STH    DEV,2(R7)             DEVICE
006EB4       4037 0004            8924          STH    STAT,4(R7)            STATUS
006EB8       5007 0008            8925          ST     R0,8(R7)              OLD PSW STATUS
006EBC       5017 000C            8926          ST     R1,12(R7)             OLD PSW LOC
006EC0       4180 2034            8927          BAL    R8,ERRENQ             QUEUE MESSAGE
```

CARD READER DRIVER

```
006EC4      1800                  8928          LPSWR OLDPSW          RETURN
006EC6      DE20 3434             8929  CRD1L2   OC    DEV,DISARM
006ECA      2451                  8930          LIS   R5,BUSY         CLEAR BUSY, NOT EXPECTING
006ECC      7654 0000             8931          RBT   R5,DSPFLGS(DDBADR)
006ED0      2458                  8932          LIS   R5,PHASE.2      NEXT PHASE IS TWO IF EOM
006ED2      C330 0002             8933          THI   STAT,X'2'       EOM?
006ED6      2134       =006EDE    8934          BNZS  CRD1L3          B IF YES
006ED8      2450                  8935          LIS   R5,0            PHASE ZERO, BAD STATUS
006EDA      41B0 D5EC =0044CA     8936          BAL   R11,BSTATERR    BAD STATUS ERROR
006EDE      4054 0002             8937  CRD1L3   STH   R5,PHASE(DDBADR) NEXT PHASE ACCORDING TO STATUS
006EE2      1800                  8938          LPSWR OLDPSW          RETURN
                                  8939   *
                                  8940   *   COMPARE DATA
                                  8941   *
006EE4      4110 D6E4 =0045CC     8942  CRDPH2   BAL   R1,COMPARE
006EE8      2450                  8943          LIS   R5,0            PHASE ZERO TO CHECK STATUS
006EEA      4054 0002             8944          STH   R5,PHASE(DDBADR)
006EEE      0300                  8945          BR    R0             RETURN
                                  8946   *
                                  8947   *CKCRD -- CHECK CARD READER PARAMETERS              *
                                  8948   *                                                   *
                                  8949   * SUPPLIES DEFAULT ADDRESS X'04'                    *
                                  8950   *                                                   *
006EF0      07FF                  8951  CKCRD    XR    R15,R15         RC=0, ALWAYS OK        *
006EF2      4824 0008             8952          LH    DEV,DEVADR(DDBADR) DID USER GIVE ADDRESS?
006EF6      023E                  8953          BNZR  R14             B IF YES, RETURN
006EF8      2424                  8954          LIS   DEV,X'04'       GIVE DEFAULT
006EFA      4024 0008             8955          STH   DEV,DEVADR(DDBADR)
006EFE      030E                  8956          BR    R14            RETURN
                                  8957          ENDC
006F00                            8958          IFNZ  CLOCK
```

AC LINE CLOCK DRIVER

```
                              8960  * A.C. LINE CLOCK DRIVER                                        *
                              8961  *                                                               *
                              8962  *PRIMARY ENTRY AND PHASE DISPATCH                               *
006F00                        8963          ALIGN 4                                                 *
006F00      0000 6F08         8964  ACLPTR  DC    A(ACLPH0)        START CLOCK, BLINK DISPLAY
006F04      0000 6F26         8965          DC    A(ACLPH1)        COUNT 60 TICS, STOP CLOCK
                              8966  *
                              8967  * INITIALIZE, BLINK DISPLAY, START CLOCK                        *
                              8968  *                                                               *
006F08      4824 0008         8969  ACLPH0  LH    DEV,DEVADR(DDBADR)   GET DEVICE ADDRESS
006F0C      C850 003C         8970          LHI   R5,60            CLOCK TIC COUNTER
006F10      5054 0028         8971          ST    R5,DVRWRK1(DDBADR)
006F14      2495              8972          LIS   R9,5             BLINK BIT 13
006F16      4180 D686 =0045A0 8973          BAL   R8,BLINK
006F1A      2454              8974          LIS   R5,PHASE.1       NEXT PHASE IS ONE FOR INTERRUPTS
006F1C      D360 3435         8975          LB    R6,ENABLE        ENABLE CLOCK
006F20      41B0 D5C0 =0044E4 8976          BAL   R11,STARTIO
006F24      0300              8977          BR    R0               RETURN
                              8978  *
                              8979  * ACL CLOCK TIC INTERRUPT HANDLER                               *
                              8980  *                                                               *
006F26      2450              8981  ACLPH1  LIS   R5,0             GOT INTERRUPT, CLEAR COUNT
006F28      5054 0014         8982          ST    R5,CURWAIT(DDBADR)
006F2C      5854 0028         8983          L     R5,DVRWRK1(DDBADR)   CURRENT TIC COUNTER
006F30      2751              8984          SIS   R5,1             COUNT ANOTHER
006F32      5054 0028         8985          ST    R5,DVRWRK1(DDBADR)   SAVE COUNTER
006F36      2322      =006F3A 8986          BNPS  ACL1L1           B IF DONE ENOUGH
006F38      1800              8987          LPSWR OLDPSW
006F3A      2451              8988  ACL1L1  LIS   R5,BUSY          CLEAR BUSY
006F3C      7654 0000         8989          RBT   R5,DSPFLGS(DDBADR)
006F40      DE20 3434         8990          OC    DEV,DISARM       STOP CLOCK
006F44      2450              8991          LIS   R5,0
006F46      4054 0002         8992          STH   R5,PHASE(DDBADR) NEXT PHASE IS ZERO
006F4A      1800              8993          LPSWR OLDPSW           RETURN
                              8994  *
                              8995  *   SUPPLIES DEFAULT ADDRESS X'6D'                              *
                              8996  *                                                               *
006F4C      07FF              8997  CKACL   XR    R15,R15          RC=0, ALL OK
006F4E      4824 0008         8998          LH    DEV,DEVADR(DDBADR)   DID USER GIVE ADDRESS?
006F52      023E              8999          BNZR  R14              B IF YES, RETURN
006F54      C820 006D         9000          LHI   DEV,X'6D'        DEFAULT
006F58      4024 0008         9001          STH   DEV,DEVADR(DDBADR)   INTO DDB
006F5C      030E              9002          BR    R14              RETURN
```

```
                                    9004  *   PRECISION INTERVAL CLOCK DRIVER                                    *
                                    9005  *                                                                      *
                                    9006  *PRIMARY ENTRY AND PHASE DISPATCH                                      *
006F60                              9007          ALIGN 4
006F60    0000 6F6C                 9008  PICPTR  DC    A(PICPH0)            INITIALIZE, BLINK DISPLAY
006F64    0000 6F86                 9009          DC    A(PICPH1)            SET RESOLUTION AND INTERVAL
006F68    0000 6FA8                 9010          DC    A(PICPH2)            INTERRUPT, STOP CLOCK
                                    9011  *
                                    9012  *   INITIALIZE, BLINK DISPLAY                                          *
                                    9013  *                                                                      *
006F6C    4824 0008                 9014  PICPH0  LH    DEV,DEVADR(DDBADR)   GET DEVICE ADDRESS
006F70    2454                       9015          LIS   R5,PHASE.1           NEXT PHASE IS ONE
006F72    4054 0002                 9016          STH   R5,PHASE(DDBADR)
006F76    2496                       9017          LIS   R9,6                 BIT TO BLINK
006F78    4180 D624  =0045A0        9018          BAL   R8,BLINK
006F7C    5864 0030                 9019          L     R6,BUF1STRT(DDBADR)  FIRST RESOLUTION AND INTERVAL
006F80    5064 0038                 9020          ST    R6,BUF1NEXT(DDBADR)  IS NEXT
006F84    0300                       9021          BR    R0                   RETURN
                                    9022  *
                                    9023  *   SET RESOLUTION AND INTERVAL                                        *
                                    9024  *                                                                      *
006F86    4824 0008                 9025  PICPH1  LH    DEV,DEVADR(DDBADR)
006F8A    5874 0038                 9026          L     R7,BUF1NEXT(DDBADR)  GET BUFFER POINTER
006F8E    D827 0000                 9027          WH    DEV,0(R7)            SEND NEXT RES. AND INTERVAL
006F92    2672                       9028          AIS   R7,2                 UPDATE BUF POINTER
006F94    5074 0038                 9029          ST    R7,BUF1NEXT(DDBADR)  SAVE POINTER
006F98    2458                       9030          LIS   R5,PHASE.2           NEXT PHASE IS TWO
006F9A    D360 3466                 9031          LB    R6,PICSTART          START CLOCK
006F9E    41B0 D542  =0044F4        9032          BAL   R11,STARTIO
006FA2    DE20 3435                 9033          OC    DEV,ENABLE           ALLOW INTERRUPTS
006FA6    0300                       9034          BR    R0                   RETURN
                                    9035  *
                                    9036  *   PIC INTERRUPT HANDLER, STOP CLOCK                                  *
                                    9037  *                                                                      *
006FA8    DE20 3434                 9038  PICPH2  OC    DEV,DISARM           STOP CLOCK
006FAC    2454                       9039          LIS   R5,PHASE.1           NEXT PHASE UNLESS AT END OF BUFFER
006FAE    5874 0038                 9040          L     R7,BUF1NEXT(DDBADR)
006FB2    5974 0034                 9041          C     R7,BUF1END(DDBADR)   REACHED END OF BUFFER?
006FB6    2322       =006FBA        9042          BNPS  PIC2L1               B IF NO
006FB8    2450                       9043          LIS   R5,0                 NEXT PHASE IS ZERO
006FBA    4054 0002                 9044  PIC2L1  STH   R5,PHASE(DDBADR)     SET PHASE
006FBE    2461                       9045          LIS   R6,BUSY              CLEAR BUSY
006FC0    7664 0000                 9046          RBT   R6,DSPFLGS(DDBADR)
006FC4    1800                       9047          LPSWR OLDPSW               RETURN
                                    9048  *
                                    9049  *   SUPPLY DEFAULT ADDRESS X'6C'                                       *
                                    9050  *                                                                      *
006FC6    07FF                       9051  CKPIC   XR    R15,R15              RC=0, ALL OK
006FC8    4824 0008                 9052          LH    DEV,DEVADR(DDBADR)   DID USER GIVE ADDRESS?
006FCC    023E                       9053          BNZR  R14                  B IF YES, RETURN
006FCE    C820 006C                 9054          LHI   DEV,X'6C'            DEFAULT
006FD2    4024 0008                 9055          STH   DEV,DEVADR(DDBADR)   INTO DDB
006FD6    030E                       9056          BR    R14                  RETURN
```

                        9057   ENDC

```
                                    9059  *    MEMORY TEST DRIVER                                        *
                                    9060  *                                                              *
                                    9061  *    MEMORY TESTING IS DONE IN  BLOCKS.  THE DATA PATTERN IS STORED. *
                                    9062  * RELOADED, AND THEN COMPARED.  NEXT THE COMPLEMENT OF THE DATA *
                                    9063  * PATTERN IS STORED, RELOADED AND COMPARED.. THIS IS REPEATED FOR *
                                    9064  * EACH WORD IN THE  BLOCK.   THE DRIVER THEN RETURNS, ALLOWING  *
                                    9065  * MORE DEVICES TO BE DISPATCHED.  THE NEXT TIME THE MEMORY TEST IS *
                                    9066  * ENTERED IT CONTINUES WHERE IT LEFT OFF, AND CONTINUES THIS CYCLE *
                                    9067  * TO THE HIGH LIMIT.  THE CYCLE IS THEN RESTARTED AT THE LOW LIMIT. *
                                    9068  *    TO ALLOW TESTING NON-CONTIGUOUS MEMORY, A MEMORY MAP IS BUILT *
                                    9069  * WHEN THE EXERCISER IS STARTED AT X'A00'.  THE MAP HAS ONE BIT FOR *
                                    9070  * EACH 16K. IF THE BIT IS SET, THE CORRESPONDING MEMORY IS TESTED. *
                                    9071  * USE THE MAP COMMAND TO PRINT THE MEMORY MAP.                 *
                                    9072  *                                                              *
                                    9073  *PRIMARY ENTRY AND PHASE DISPATCH                              *
006FD8                              9074          ALIGN 4                       ALIGNMENT FOR ADDRESS INDEX
006FD8     0000 6FE8               9075  MEMPTR   DC    A(MEMPH0)               PHASE ZERO; NEW BUFFER
006FDC     0000 7014               9076          DC    A(MEMPH1)               PHASE ONE; TEST BUFFER
006FE0     0000 70AA               9077          DC    A(MEMPH2)               PHASE TWO; CLEAR BUFFER
006FE4     0000 70C2               9078          DC    A(MEMPH3)               PHASE THREE; WAIT FOR OTHER DEVICES
                                    9079  *
                                    9080  *
                                    9081  *      PHASE ZERO      NEXT BUFFER
                                    9082  *
                                    9083  *
006FE8     2453                     9084  MEMPH0   LIS   R5,BADSTAT              CLEAR BAD STATUS
006FEA     7654 0000               9085          RBT   R5,DSPFLGS(DDBADR)
006FEE     2452                     9086          LIS   R5,NOTCOUNT             CLEAR NOT COUNTING
006FF0     7654 0000               9087          RBT   R5,DSPFLGS(DDBADR)
006FF4     4170 D67A =004672       9088          BAL   R7,MOVEBUF              ASSIGN NEXT BUFFER
006FF8     5854 0030               9089          L     R5,BUF1STRT(DDBADR)
006FFC     5554 0030               9090          CL    R5,MEMLOW(DDBADR)
007000     0280                     9091          BLR   R0                      NO TEST IF BELOW LIMIT
007002     5854 0034               9092          L     R5,MEMHIGH(DDBADR)
007006     5554 0040               9093          CL    R5,BUF2END(DDBADR)
00700A     0380                     9094          BNLR  R0                      NO TEST IF OVER LIMIT          R09
00700C     2454                     9095          LIS   R5,PHASE.1              PHASE ONE
00700E     4054 0002               9096          STH   R5,PHASE(DDBADR)        NEXT PHASE
007012     0300                     9097          BR    R0                      DISPATCH NEXT DEVICE
                                    9098  *
                                    9099  *
                                    9100  *      PHASE ONE     TEST BUFFER
                                    9101  *
                                    9102  *
007014     5814 0030               9103  MEMPH1   L     R1,BUF1STRT(DDBADR)     STARTING ADDRESS OF BUFFER
007018     2424                     9104          LIS   R2,4                    FULL WORD INCREMENTS
00701A     5834 0040               9105          L     R3,BUF2END(DDBADR)      LAST ADDRESS OF BUFFER
00701E     F630 AAAA AAAA          9106          LI    R11,Y'AAAAAAAA'         FIRST PATTERN " AAAAAAAA "
007024     25C1                     9107          LCS   R12,1                   " FFFFFFFF "
007026     07CB                     9108          XR    R12,R11                 SECOND PATTERN " 55555555 "
                                    9109  *
                                    9110  * ACTUAL TEST
007028     5851 0000               9111          L     R5,0(R1)                SAVE OLD CONTENTS
```

MEMORY TEST DRIVER

00702C	2460		9112		LIS	R6,0	CLEAR
00702E	4061 0000		9113		STH	R6,0(R1)	FIRST HALFWORD OF BUFFER
007032	E001 0000		9114		TS	0(R1)	TEST & SET FIRST BIT OF THIS LOC.
007036	4210 804C	=007086	9115		BTC	1,MEM1L8	ERROR 62 IF ALREADY SET
00703A	7461 0000		9116		TBT	R6,0(R1)	TEST FIRST BIT OF THIS LOC.
00703E	4330 8044	=007086	9117		BZ	MEM1L8	ERROR 62 IF NOT SET
007042	5051 0000		9118		ST	R5,0(R1)	RESTORE THIS LOACTION
007046	5851 0000		9119	MEM1L5	L	R5,0(R1)	SAVE LOCATION CONTENTS AGAIN
00704A	50B1 0000		9120		ST	R11,0(R1)	STORE PATTERN
00704E	5861 0000		9121		L	R6,0(R1)	READ BACK PATTERN
007052	09B6		9122		CR	R11,R6	EQUAL?
007054	2333	=00705A	9123		BES	MEM1L6	YES CONTINUE, ELSE ERROR 61
007056	08CB		9124		LR	R12,R11	TRANSFER DATA
007058	2308	=007068	9125		BS	MEM1L7	FOR ERROR MESSAGE
00705A	50C1 0000		9126	MEM1L6	ST	R12,0(R1)	STORE PATTERN COMPLEMENT
00705E	5861 0C00		9127		L	R6,0(R1)	READ BACK PATTERN
007062	09C6		9128		CR	R12,R6	EQUAL?
007064	4330 8032	=00709A	9129		BE	MEM1L9	YES CONTINUE, ELSE ERROR
007068	4180 1FFC		9130	MEM1L7	BAL	R8,ERRGET	ERROR 61
00706C	C880 3861		9131		LHI	R8,X'3861'	MEMORY PATTERN ERROR
007070	4087 0000		9132		STH	R8,0(R7)	
007074	50C7 0008		9133		ST	R12,8(R7)	EXPECTED
007078	5067 000C		9134		ST	R6,12(R7)	ACTUAL
00707C	5017 0010		9135		ST	R1,16(R7)	ADDRESS
007080	4180 2034		9136		BAL	R8,ERRENQ	PLACE ERROR ON QUEUE
007084	230B	=00709A	9137		BS	MEM1L9	CONTINUE
007086	4180 1FFC		9138	MEM1L8	BAL	R8,ERRGET	ERROR 62
00708A	C880 0862		9139		LHI	R8,X'0862'	ERROR MESSAGE PARAMETERS
00708E	4087 0000		9140		STH	R8,0(R7)	STORE THESE PARAMETERS
007092	5017 0010		9141		ST	R1,16(R7)	ADDRESS OF ERROR
007096	4180 2034		9142		BAL	R8,ERRENQ	PLACE ERROR ON QUEUE
00709A	5051 0000		9143	MEM1L9	ST	R5,0(R1)	RESTORE OLD CONTENTS
00709E	C110 FFA4	=007046	9144		BXLE	R1,MEM1L5	ENTIRE BUFFER
0070A2	2458		9145		LIS	R5,PHASE.2	PHASE TWO
0070A4	4054 0002		9146		STH	R5,PHASE(DDBADR)	NEXT PHASE
0070A8	0300		9147		BR	R0	RETURN TO DISPATCH NEXT DEVICE
			9148	*			
			9149	*			
			9150	*		PHASE TWO CLEAR BUFFER AND DISPLAY DEVICE CODE	
			9151	*			
			9152	*			
0070AA	41B0 D774	=004822	9153	MEMPH2	BAL	R11,MBUFCLR	CLEAR BUFFER
0070AE	2490		9154		LIS	R9,0	CLEAR COUNTER
0070B0	5094 0028		9155		ST	R9,DVRWRK1(DDBADR)	
0070B4	2494		9156		LIS	R9,4	DISPLAY CODE
0070B6	4180 D4E6	=0045A0	9157		BAL	R8,BLINK	DISPLAY MEMORY ACTIVITY
0070BA	245C		9158		LIS	R5,PHASE.3	PHASE THREE
0070BC	4054 0002		9159		STH	R5,PHASE(DDBADR)	NEXT PHASE
0070C0	0300		9160		BR	R0	RETURN TO DISPATCH NEXT DEVICE
			9161	*			
			9162	*			
			9163	*		PHASE THREE WAIT 32 CYCLES	
			9164	*			

MEMORY TEST DRIVER

```
0070C2    5894 0028         9165  MEMPH3  L     R9,DVRWRK1(DDBADR)  TEST PHASE COUNTER
0070C6    2691              9166          AIS   R9,1                INCREMENT PHASE COUNT
0070C8    5094 0028         9167          ST    R9,DVRWRK1(DDBADR)
0070CC    C590 0020         9168          CLHI  R9,32               PHASE COUNT AT 32
0070D0    0230              9169          BNER  R0                  NO, WAIT IN THIS PHASE
0070D2    2450              9170          LIS   R5,0                NEXT PHASE ZERO
0070D4    4054 0002         9171          STH   R5,PHASE(DDBADR)    RESTART CYCLE
0070D8    0300              9172          BR    R0                  RETURN
                           9173  *
                           9174  *   CHECK MEMORY LIMITS
                           9175  *
0070DA    5850 25B4         9176  CKMEM   L     R5,MEMSTART         GET TOP OF EXERCISER
0070DE    5954 0030         9177          C     R5,MEMLOW(DDBADR)   LOW LIMIT < TOP OF EXERCISER?
0070E2    2323      =0070E8 9178          BNPS  CKMEM1              B IF NO
0070E4    5054 0030         9179          ST    R5,MEMLOW(DDBADR)   USE TOP OF EXERCISER
0070E8    5854 0034         9180  CKMEM1  L     R5,MEMHIGH(DDBADR)  HIGH LIMIT
0070EC    5954 0030         9181          C     R5,MEMLOW(DDBADR)   LESS THAN LOW LIMIT?
0070F0    2125      =0070FA 9182          BPS   CKMEM2              B IF NO
0070F2    5850 25B8         9183          L     R5,MEMTOP
0070F6    5054 0034         9184          ST    R5,MEMHIGH(DDBADR)  USE TOP OF MEMORY
0070FA    07FF              9185  CKMEM2  XR    R15,R15             RC=0
0070FC    030E              9186          BR    R14                 RETURN
```

DDB'S AND BUFFERS

```
                                  9188   *SELECTOR CHANNEL DDB'S.                                         *
                                  9189   *                                                                *
                                  9190   *   TO EXPAND THE NUMBER OF SELECTOR CHANNELS WHICH CAN BE TESTED *
                                  9191   *  SIMULTANEOUSLY, ADD A DDB (ACCORDING TO THE FOLLOWING FORMAT) FOR *
                                  9192   *  THE SELCH, AND ADD ITS ADDRESS TO THE TABLE AT SLCHLIST.       *
                                  9193   *                                                                *
007100                            9194            ALIGN 4
007100      0000 0000             9195   SLCH1DDB DC      F'0'           DSPCHFLGS,PRIORITY,PHASE
007104      0000                  9196            DC      H'0'           NO PARAMETER FLAGS
007106      8000                  9197            DC      X'8000'        DEVICE TYPE IS SELCH
007108      0000                  9198            DC      H'0',H'0'      ADDRESS, STATUS
00710A      0000
00710C      0000 0000             9199            DC      F'0'           OWNER DIRVER ENTRY
007110      0000 7F80             9200            DC      Y'7F80'        MAX WAIT COUNT
007114      0000 0000             9201            DC      F'0'           CURRENT WAIT COUNT
007118      0000 0000             9202            DC      F'0'           ERROR COUNT
00711C      0000 0000             9203            DC      F'0'           MAX DISPATCH COUNT
007120      0000 0000             9204            DC      F'0'           CURRENT DISPATCH COUNT
007124                            9205            IFP     SELCHS-1

007124      0000 0000             9207   SLCH2DDB DC      F'0'
007128      0000                  9208            DC      H'0',X'8000'
00712A      8000
00712C      0000                  9209            DC      H'0',H'0'
00712E      0000
007130      0000 0000             9210            DC      F'0',Y'7F80'
007134      0000 7F80
007138      0000 0000             9211            DC      F'0',F'0'
00713C      0000 0000
007140      0000 0000             9212            DC      F'0'           MAX DISPATCH COUNT
007144      0000 0000             9213            DC      F'0'           CURRENT DISPATCH COUNT
007148                            9214            IFP     SELCHS-2

007148      0000 0000             9216   SLCH3DDB DC      F'0'
00714C      0000                  9217            DC      H'0',X'8000'
00714E      8000
007150      0000                  9218            DC      H'0',H'0'
007152      0000
007154      0000 0000             9219            DC      F'0',Y'7F80'
007158      0000 7F80
00715C      0000 0000             9220            DC      F'0',F'0'
007160      0000 0000
007164      0000 0000             9221            DC      F'0'           MAX DISPATCH COUNT
007168      0000 0000             9222            DC      F'0'           CURRENT DISPATCH COUNT
00716C                            9223            IFP     SELCHS-3

00716C      0000 0000             9225   SLCH4DDB DC      F'0'
007170      0000                  9226            DC      H'0',X'8000'
007172      8000
007174      0000                  9227            DC      H'0',H'0'
```

DDB'S AND BUFFERS

```
007176      0000
007178      0000 0000        9228            DC      F'0',Y'7F80'
00717C      0000 7F80
007180      0000 0000        9229            DC      F'0',F'0'
007184      0000 0000
007188      0000 0000        9230            DC      F'0'                MAX DISPATCH COUNT
00718C      0000 0000        9231            DC      F'0'                CURRENT DISPATCH COUNT
                            9232            ENDC
                            9233            ENDC
                            9234            ENDC
007190                      9235    .       IFNZ    CARDRDR


                            9237    *CARD READER DDB
                            9238    *
007190                      9239            ALIGN   4
007190      0000 0000        9240    CRDDDB  DC      F'0'                DSPCHFLGS,PRIORITY,PHASE
007194      9800            9241            DC      X'9800'             PARM FLAGS
007196      0002            9242            DC      X'0002'             DEVICE TYPE
007198      0000            9243            DC      H'0',H'0'           ADDRESS, STATUS
00719A      0000
00719C      0000 6E34        9244            DC      A(CRDPTR)           DRIVER ENTRY
0071A0      0000 FF80        9245            DC      Y'FF80'             MAX WAIT COUNT
0071A4      0000 0000        9246            DC      F'0'                CURRENT WAIT COUNT
0071A8      0000 0000        9247            DC      F'0'                ERROR COUNT
0071AC      0000 0000        9248            DC      F'0'                MAX DISPATCH COUNT
0071B0      0000 0000        9249            DC      F'0'                CURRENT DISPATCH COUNT
0071B4      0000 6EF0        9250            DC      A(CKCRD)            PARM CHECK SUBROUTINE
0071B8      0000 0000        9251            DC      F'0'                DRIVER WORK 1
0071BC      0000 0000        9252            DC      F'0'                DRIVER WORK 2
0071C0      0000 71D8        9253            DC      A(CRDDATA)          BUF 1 START, EXPECTED DATA
0071C4      0000 7277        9254            DC      A(CRDDATAE)         BUF 1 END
0071C8      0000 71D8        9255            DC      A(CRDDATA)          BUF 1 NEXT
0071CC      0000 7278        9256            DC      A(CRDBUF)           BUF 2 START, READ BUFFER
0071D0      0000 7317        9257            DC      A(CRDBUFE)          BUF 2 END
0071D4      0000 7278        9258            DC      A(CRDBUF)           BUF 2 NEXT
            0000 71D8        9259    CRDDATA EQU     *                   DATA BASE EXPECTED FROM CARD READER
0071D8      2000            9260            DC      X'2000'             &
0071DA      1000            9261            DC      X'1000'             -
0071DC      0800            9262            DC      X'0800'             0
0071DE      0400            9263            DC      X'0400'             1                           ##
0071E0      0200            9264            DC      X'0200'             2
0071E2      0100            9265            DC      X'0100'             3
0071E4      0020            9266            DC      X'0020'             4
0071E6      0010            9267            DC      X'0010'             5
0071E8      0008            9268            DC      X'0008'             6
0071EA      0004            9269            DC      X'0004'             7
0071EC      0002            9270            DC      X'0002'             8
0071EE      0001            9271            DC      X'0001'             9
0071F0      2400            9272            DC      X'2400'             A
0071F2      2200            9273            DC      X'2200'             B
0071F4      2100            9274            DC      X'2100'             C
0071F6      2020            9275            DC      X'2020'             D
```

DDB'S AND BUFFERS

```
0071F8     2010          9276      DC     X'2010'           F
0071FA     2008          9277      DC     X'2008'           F
0071FC     2004          9278      DC     X'2004'           G
0071FE     2002          9279      DC     X'2002'           H
007200     2001          9280      DC     X'2001'           I
007202     1400          9281      DC     X'1400'           J
007204     1200          9282      DC     X'1200'           K
007206     1100          9283      DC     X'1100'           L
007208     1020          9284      DC     X'1020'           M
00720A     1010          9285      DC     X'1010'           N
00720C     1008          9286      DC     X'1008'           O
00720E     1004          9287      DC     X'1004'           P
007210     1002          9288      DC     X'1002'           Q
007212     1001          9289      DC     X'1001'           R
007214     0C00          9290      DC     X'0C00'           /
007216     0A00          9291      DC     X'0A00'           S
007218     0900          9292      DC     X'0900'           T
00721A     0820          9293      DC     X'0820'           U
00721C     0810          9294      DC     X'0810'           V
00721E     0808          9295      DC     X'0808'           W
007220     0804          9296      DC     X'0804'           X
007222     0802          9297      DC     X'0802'           Y
007224     0801          9298      DC     X'0801'           Z
007226     0202          9299      DC     X'0202'           :
007228     0102          9300      DC     X'0102'           #
00722A     0022          9301      DC     X'0022'           a
00722C     0012          9302      DC     X'0012'           '
00722E     000A          9303      DC     X'000A'           =
007230     0006          9304      DC     X'0006'           "
007232     2202          9305      DC     X'2202'           [
007234     2102          9306      DC     X'2102'           .
007236     2022          9307      DC     X'2022'           <
007238     2012          9308      DC     X'2012'           (
00723A     200A          9309      DC     X'200A'           +
00723C     2006          9310      DC     X'2006'           ]
00723E     1202          9311      DC     X'1202'           !
007240     1102          9312      DC     X'1102'           $
007242     1022          9313      DC     X'1022'           *
007244     1012          9314      DC     X'1012'           )
007246     100A          9315      DC     X'100A'           ;
007248     1006          9316      DC     X'1006'           ^
00724A     0A02          9317      DC     X'0A02'           SPACE
00724C     0902          9318      DC     X'0902'           ,
00724E     0822          9319      DC     X'0822'           %
007250     0812          9320      DC     X'0812'           _
007252     080A          9321      DC     X'080A'           >
007254     0806          9322      DC     X'0806'           ?
007256     0000          9323      DC     X'0000'           BLANK
007258     3F3F          9324      DC     X'3F3F'           ALL ROWS PUNCHED
00725A     0000          9325      DC     X'0000'           BLANK
00725C     3F3F          9326      DC     X'3F3F'           ALL ROWS PUNCHED
00725E     0000          9327      DC     X'0000'           BLANK
007260     3F3F          9328      DC     X'3F3F'           ALL ROWS PUNCHED
```

DDB'S AND BUFFERS

```
007262      0000          9329           DC    X'0000'          BLANK
007264      3F3F          9330           DC    X'3F3F'          ALL ROWS PUNCHED
007266      0000          9331           DC    X'0000'          BLANK
007268      2A2A          9332           DC    X'2A2A'          ROWS 12,0,2,4,6,8 PUNCHED
00726A      1515          9333           DC    X'1515'          ROWS 11,1,3,5,7,9 PUNCHED
00726C      2A2A          9334           DC    X'2A2A'
00726E      1515          9335           DC    X'1515'
007270      2A2A          9336           DC    X'2A2A'
007272      1515          9337           DC    X'1515'
007274      2A2A          9338           DC    X'2A2A'
007276      1515          9339           DC    X'1515'
            0000 7277     9340   CRDDATAE EQU   *-1
007278                    9341   CRDBUF   DS    160
            0000 7317     9342   CRDBUFE  EQU   *-1
                          9343           ENDC
007318                    9344           IFNZ  PRINTERS


                          9346   *   LINE PRINTER DDB
                          9347   *
007318                    9348           ALIGN 4
007318      0000 0000     9349   LNPDDB1  DC    F'0'             DSPCHFLGS,PRIORITY, PHASE
00731C      9800          9350           DC    X'9800'          PARM FLAGS
00731E      0001          9351           DC    X'0001'          DEVICE TYPE
007320      0000          9352           DC    H'0',H'0'        ADDRESS, STATUS
007322      0000
007324      0000 6D94     9353           DC    A(LNPPTR)        DRIVER ENTRY
007328      0007 FF80     9354           DC    Y'7FF80'         MAX WAIT COUNT
00732C      0000 0000     9355           DC    F'0'             CURRENT WAIT COUNT
007330      0000 0000     9356           DC    F'0'             ERROR COUNT
007334      0000 0000     9357           DC    F'0'             MAX DISPATCH COUNT
007338      0000 0000     9358           DC    F'0'             CURRENT DISPATCH COUNT
00733C      0000 6E20     9359           DC    A(CKLNP)         PARM CHECK SUBROUTINE
007340      0000 0000     9360           DC    F'0'             DRIVER WORK 1
007344      0000 0000     9361           DC    F'0'             DRIVER WORK 2
007348      0000 7390     9362           DC    A(LNPDATA)       BUF 1 START, WRITE DATA
00734C      0000 73D1     9363           DC    A(LNPDATAE)      BUF 1 END
007350      0000 7390     9364           DC    A(LNPDATA)       BUF 1 NEXT
007354                    9365           IFP   PRINTERS-1


                          9367   *   LINE PRINTER DDB
                          9368   *
007354                    9369           ALIGN 4
007354      0000 0000     9370   LNPDDB2  DC    F'0'             DSPCHFLGS,PRIORITY, PHASE
007358      9800          9371           DC    X'9800'          PARM FLAGS
00735A      0001          9372           DC    X'0001'          DEVICE TYPE
00735C      0000          9373           DC    H'0',H'0'        ADDRESS, STATUS
00735E      0000
007360      0000 6D94     9374           DC    A(LNPPTR)        DRIVER ENTRY
007364      0007 FF80     9375           DC    Y'7FF80'         MAX WAIT COUNT
007368      0000 0000     9376           DC    F'0'             CURRENT WAIT COUNT
00736C      0000 0000     9377           DC    F'0'             ERROR COUNT
```

DDB'S AND BUFFERS

```
007370      0000 0000     9378            DC    F'0'                MAX DISPATCH COUNT
007374      0000 0000     9379            DC    F'0'                CURRENT DISPATCH COUNT
007378      0000 6E20     9380            DC    A(CKLNP)            PARM CHECK SUBROUTINE
00737C      0000 0000     9381            DC    F'0'                DRIVER WORK 1
007380      0000 0000     9382            DC    F'0'                DRIVER WORK 2
007384      0000 7390     9383            DC    A(LNPDATA)          BUF 1 START, WRITE DATA
007388      0000 73D1     9384            DC    A(LNPDATAE)         BUF 1 END
00738C      0000 7390     9385            DC    A(LNPDATA)          BUF 1 NEXT
                          9386            ENDC
            0000 7390     9387   LNPDATA  EQU   *                   LINE PRINTER DATA BASE
007390      0001 20       9388            DB    X'0D',X'01',X'20'   CR  1  LF SPACE
007393      2122 23       9389            DB    X'21',X'22',X'23'   !   "   #
007396      2425 26       9390            DB    X'24',X'25',X'26'   $   %   &
007399      2728 29       9391            DB    X'27',X'28',X'29'   '   (   )
00739C      2A2B 2C       9392            DB    X'2A',X'2B',X'2C'   *   +   ,
00739F      2D2E 2F       9393            DB    X'2D',X'2E',X'2F'   -   .   /
0073A2      3031 32       9394            DB    X'30',X'31',X'32'   0   1   2
0073A5      3334 35       9395            DB    X'33',X'34',X'35'   3   4   5
0073A8      3637 38       9396            DB    X'36',X'37',X'38'   6   7   8
0073AB      393A 3B       9397            DB    X'39',X'3A',X'3B'   9   :   ;
0073AE      3C3D 3E       9398            DB    X'3C',X'3D',X'3E'   <   =   >
0073B1      3F40 41       9399            DB    X'3F',X'40',X'41'   ?   @   A
0073B4      4243 44       9400            DB    X'42',X'43',X'44'   B   C   D
0073B7      4546 47       9401            DB    X'45',X'46',X'47'   E   F   G
0073BA      4849 4A       9402            DB    X'48',X'49',X'4A'   H   I   J
0073BD      4B4C 4D       9403            DB    X'4B',X'4C',X'4D'   K   L   M
0073C0      4E4F 50       9404            DB    X'4E',X'4F',X'50'   N   O   P
0073C3      5152 53       9405            DB    X'51',X'52',X'53'   Q   R   S
0073C6      5455 56       9406            DB    X'54',X'55',X'56'   T   U   V
0073C9      5758 59       9407            DB    X'57',X'58',X'59'   W   X   Y
0073CC      5A5B 5C       9408            DB    X'5A',X'5B',X'5C'   Z   [   \
0073CF      5D5E 5F       9409            DB    X'5D',X'5E',X'5F'   ]
            0000 73D1     9410   LNPDATAE EQU   *-1
0073D2      2061          9411            DCX   2061,6263,6465,6667 LOWER CASE LETTERS
0073D4      6263
0073D6      6465
0073D8      6667
0073DA      6869          9412            DCX   6869,6A6B,6C6D,6E6F
0073DC      6A6B
0073DE      6C6D
0073E0      6E6F
0073E2      7071          9413            DCX   7071,7273,7475,7677
0073E4      7273
0073E6      7475
0073E8      7677
0073EA      7879          9414            DCX   7879,7A20
0073EC      7A20
                          9415            ENDC
0073EE                    9416            IFNZ  PAPRTAPE

                          9418   *PAPER TAPE READER/PUNCH DDB
                          9419   *
```

DDB'S AND BUFFERS

```
0073F0                      9420          ALIGN  4
0073F0    0000 0000         9421  PTRPDDB DC     F'0'                 DSPCHFLAGS,PRIORITY,PHASE
0073F4    9800              9422          DC     X'9800'              PARM FLAGS
0073F6    0002              9423          DC     X'0002'              DEVICE TYPE
0073F8    0000              9424          DC     H'0',H'0'            ADDRESS, STATUS
0073FA    0000
0073FC    0000 5794         9425          DC     A(PTRPPTR)           DRIVER ENTRY
007400    0000 1F80         9426          DC     Y'1F80'              MAX WAIT COUNT
007404    0000 0000         9427          DC     F'0'                 CURRENT WAIT COUNT
007408    0000 0000         9428          DC     F'0'                 ERROR COUNT
00740C    0000 0000         9429          DC     F'0'                 MAX DISPATCH COUNT
007410    0000 0000         9430          DC     F'0'                 CURRENT DISPATCH COUNT
007414    0000 595C         9431          DC     A(CKPTRP)            PARAMETER CHECK SUBROUTINE
007418    0000 0000         9432          DC     F'0'                 DRIVER WORK 1
00741C    0000 0000         9433          DC     F'0'                 DRIVER WORK 2
007420    0000 8AC0         9434          DC     A(DATAPTRN)          BUF 1 START, WRITE BUFFER
007424    0000 8BBF         9435          DC     A(DPTRNEND)          BUF 1 END
007428    0000 8AC0         9436          DC     A(DATAPTRN)          BUF 1 NEXT
00742C    0000 7438         9437          DC     A(PTRBUF)            BUF 2 START, READ BUFFER
007430    0000 7537         9438          DC     A(PTRBUFE)           BUF 2 END
007434    0000 7438         9439          DC     A(PTRBUF)            BUF 2 NEXT
007438                      9440  PTRBUF  DS     256
          0000 7537         9441  PTRBUFE EQU    *-1
                            9442          ENDC
007538                      9443          IFNZ   CLOCK


                            9445  * A.C. LINE CLOCK DDB
                            9446  *
007538                      9447          ALIGN  4
007538    0000 0000         9448  ACLDDB  DC     F'0'                 DSPCHFLGS,PRIORITY,PHASE
00753C    9800              9449          DC     X'9800'              PARM FLAGS
00753E    0000              9450          DC     X'0000'              DEVICE TYPE
007540    0000              9451          DC     H'0',H'0'            ADDRESS, STATUS
007542    0000
007544    0000 6F00         9452          DC     A(ACLPTR)            DRIVER ENTRY
007548    0000 2780         9453          DC     Y'2780'              MAX WAIT COUNT
00754C    0000 0000         9454          DC     F'0'                 CURRENT WAIT COUNT
007550    0000 0000         9455          DC     F'0'                 ERROR COUNT
007554    0000 0000         9456          DC     F'0'                 MAX DISPATCH COUNT
007558    0000 0000         9457          DC     F'0'                 CURRENT DISPATCH COUNT
00755C    0000 6F4C         9458          DC     A(CKACL)             PARM CHECK ROUTINE
007560    0000 0000         9459          DC     F'0'                 DRIVER WORK 1
007564    0000 0000         9460          DC     F'0'                 DRIVER WORK 2


                            9462  * PRECISION INTERVAL CLOCK DDB
                            9463  *
007568                      9464          ALIGN  4
007568    0000 0000         9465  PICDDB  DC     F'0'                 DSPCHFLGS, PRIORITY, PHASE
00756C    9800              9466          DC     X'9800'              PARM FLAGS
00756E    0001              9467          DC     X'0001'              DEVICE TYPE
007570    0000              9468          DC     H'0',H'0'            ADDRESS, STATUS
```

DDB'S AND BUFFERS

```
007572      0000
007574      0000 6F60      9469            DC      A(PICPTR)       DRIVER ENTRY
007578      0002 7F80      9470            DC      Y'27F80'        MAX WAIT COUNT
00757C      0000 0000      9471            DC      F'0'            CURRENT WAIT COUNT
007580      0000 0000      9472            DC      F'0'            ERROR COUNT
007584      0000 0000      9473            DC      F'0'            MAX DISPATCH COUNT
007588      0000 0000      9474            DC      F'0'            CURRENT DISPATCH COUNT
00758C      0000 6FC6      9475            DC      A(CKPIC)        PARM CHECK
007590      0000 0000      9476            DC      F'0'            DRIVER WORK 1
007594      0000 0000      9477            DC      F'0'            DRIVER WORK 2
007598      0000 75A4      9478            DC      A(PICBUF)       BUF 1 START, RES AND INTERVALS
00759C      0000 75AA      9479            DC      A(PICBUFE)      BUF 1 END
0075A0      0000 75A4      9480            DC      A(PICBUF)       BUF 1 NEXT
            0000 75A4      9481    PICBUF  EQU     *               MSEC.
0075A4      2F3C           9482            DC      X'2F3C'         39.
0075A6      8134           9483            DC      X'8134'         308.
0075A8      43FF           9484            DC      X'43FF'         102.3
0075AA      1400           9485            DC      X'1400'         1.024
            0000 75AA      9486    PICBUFE EQU     *-2
                           9487            ENDC
0075AC                     9488            IFNZ    CASSETTE
                           9489            SPACE   2
                           9490    *CASSETTE TAPE DDB
                           9491    *
                           9492            ALIGN   4
                           9493    CASDDB1 DC      F'0'            DSPCHFLGS,PRIORITY,PHASE
                           9494            DC      X'9800'         PARM FLAGS
                           9495          . DC      X'0006'         DEVICE TYPE
                           9496            DC      H'0',H'0'       ADDRESS,STATUS
                           9497            DC      A(CASPTR)       DRIVER ENTRY
                           9498            DC      Y'7FF80'        MAX WAIT COUNT
                           9499            DC      F'0'            CURRENT WAIT COUNT
                           9500            DC      F'0'            ERROR COUNT
                           9501            DC      F'0'            MAX DISPATCH COUNT
                           9502            DC      F'0'            CURRENT DISPATCH COUNT
                           9503            DC      A(CKCAS)        PARM CHECK SUBROUTINE
                           9504            DC      F'0'            DRIVER WORK 1
                           9505            DC      F'0'            DRIVER WORK 2
                           9506            DC      EXER0S          BUF 1 START, WRITE BUFFER
                           9507            DC      EXER0E          BUF 1 END
                           9508            DC      EXER0E          BUF 1 NEXT
                           9509            DC      EXER1S          BUF 2 START, READ BUFFER
                           9510            DC      EXER1E          BUF 2 END
                           9511            DC      EXER1N          BUF 2 NEXT
                           9512            IFP     CASSETTE-1
                           9513            SPACE   2
                           9514    *CASSETTE TAPE DDB
                           9515    *
                           9516            ALIGN   4
                           9517    CASDDB2 DC      F'0'            DSPCHFLGS,PRIORITY,PHASE
                           9518            DC      X'9800'         PARM FLAGS
                           9519            DC      X'0006'         DEVICE TYPE
                           9520            DC      H'0',H'0'       ADDRESS,STATUS
```

```
9521                 DC     A(CASPTR)            DRIVER ENTRY
9522                 DC     Y'7FF80'             MAX WAIT COUNT
9523                 DC     F'0'                 CURRENT WAIT COUNT
9524                 DC     F'0'                 ERROR COUNT
9525                 DC     F'0'                 MAX DISPATCH COUNT
9526                 DC     F'0'                 CURRENT DISPATCH COUNT
9527                 DC     A(CKCAS)             PARM CHECK SUBROUTINE
9528                 DC     F'0'                 DRIVER WORK 1
9529                 DC     F'0'                 DRIVER WORK 2
9530                 DC     EXER0S               BUF 1 START, WRITE BUFFER
9531                 DC     EXER0E               BUF 1 END
9532                 DC     EXER0E               BUF 1 NEXT
9533                 DC     EXER1S
9534                 DC     EXER1E
9535                 DC     EXER1N
9536                 IFP    CASSETTE-2
9537                 SPACE  2
9538       *CASSETTE TAPE DDB
9539       *
9540                 ALIGN  4
9541       CASDDB3   DC     F'0'                 DSPCHFLGS,PRIORITY,PHASE
9542                 DC     X'9800'              PARM FLAGS
9543                 DC     X'0006'              DEVICE TYPE
9544                 DC     H'0',H'0'            ADDRESS,STATUS
9545                 DC     A(CASPTR)            DRIVER ENTRY
9546                 DC     Y'7FF80'             MAX WAIT COUNT
9547                 DC     F'0'                 CURRENT WAIT COUNT
9548                 DC     F'0'                 ERROR COUNT
9549                 DC     F'0'                 MAX DISPATCH COUNT
9550                 DC     F'0'                 CURRENT DISPATCH COUNT
9551                 DC     A(CKCAS)             PARM CHECK SUBROUTINE
9552                 DC     F'0'                 DRIVER WORK 1
9553                 DC     F'0'                 DRIVER WORK 2
9554                 DC     EXER0S               BUF 1 START, WRITE BUFFER
9555                 DC     EXER0E               BUF 1 END
9556                 DC     EXER0E               BUF 1 NEXT
9557                 DC     EXER1S
9558                 DC     EXER1E
9559                 DC     EXER1N
9560                 IFP    CASSETTE-3
9561                 SPACE  2
9562       *CASSETTE TAPE DDB
9563       *
9564                 ALIGN  4
9565       CASDDB4   DC     F'0'                 DSPCHFLGS,PRIORITY,PHASE
9566                 DC     X'9800'              PARM FLAGS
9567                 DC     X'0006'              DEVICE TYPE
9568                 DC     H'0',H'0'            ADDRESS,STATUS
9569                 DC     A(CASPTR)            DRIVER ENTRY
9570                 DC     Y'7FF80'             MAX WAIT COUNT
9571                 DC     F'0'                 CURRENT WAIT COUNT
9572                 DC     F'0'                 ERROR COUNT
9573                 DC     F'0'                 MAX DISPATCH COUNT
```

DDB'S AND BUFFERS

```
                              9574          DC    F'0'                CURRENT DISPATCH COUNT
                              9575          DC    A(CKCAS)            PARM CHECK SUBROUTINE
                              9576          DC    F'0'                DRIVER WORK 1
                              9577          DC    F'0'                DRIVER WORK 2
                              9578          DC    EXER0S              BUF 1 START, WRITE BUFFER
                              9579          DC    EXER0E              BUF 1 END
                              9580          DC    EXER0E              BUF 1 NEXT
                              9581          DC    EXER1S
                              9582          DC    EXER1E
                              9583          DC    EXER1N
                              9584          ENDC
                              9585          ENDC
                              9586          ENDC
                              9587          ENDC
0075AC                        9588          IFNZ  MAGTAPE


                              9590   *MAGNETIC TAPE DDB
                              9591   *
0075AC                        9592          ALIGN 4
0075AC    0000 0000           9593   MAGDDB1 DC   F'0'                DSPCHFLGS,PRIORITY,PHASE
0075B0    B800                9594          DC    X'B800'             PARM FLAGS
0075B2    2002                9595          DC    X'2002'             DEVICE TYPE
0075B4    0000                9596          DC    H'0',H'0'           ADDRESS, STATUS
0075B6    0000
0075B8    0000 5D6C           9597          DC    A(MAGPTR)           DRIVER ENTRY
0075BC    0000 FF80           9598          DC    Y'FF80'             MAX WAIT COUNT
0075C0    0000 0000           9599          DC    F'0'                CURRENT WAIT COUNT
0075C4    0000 0000           9600          DC    F'0'                ERROR COUNT
0075C8    0000 0000           9601          DC    F'0'                MAX DISPATCH COUNT
0075CC    0000 0000           9602          DC    F'0'                CURRENT DISPATCH COUNT
0075D0    0000 5FB8           9603          DC    A(CKMAG)            PARM CHECK SUBROUTINE
0075D4    0000 0000           9604          DC    F'0'                DRIVER WORK 1
0075D8    0000 0000           9605          DC    F'0'                DRIVER WORK 2
0075DC    0000 9580           9606          DC    EXER0S              BUF 1 START, WRITE BUFFER
0075E0    0000 967C           9607          DC    EXER0E              BUF 1 END
0075E4    0000 967C           9608          DC    EXER0E              BUF 1 NEXT
0075E8    0000 9680           9609          DC    EXER1S              BUF 2 START, READ BUFFER
0075EC    0000 977C           9610          DC    EXER1E              BUF 2 END
0075F0    0000 9780           9611          DC    EXER1N              BUF 2 NEXT
0075F4    0000                9612          DC    H'0'                SELCH ADDRESS
0075F6                        9613          IFP   MAGTAPE-1


                              9615   *MAGNETIC TAPE DDB
                              9616   *
0075F8                        9617          ALIGN 4
0075F8    0000 0000           9618   MAGDDB2 DC   F'0'                DSPCHFLGS,PRIORITY,PHASE
0075FC    B800                9619          DC    X'B800'             PARM FLAGS
0075FE    2002                9620          DC    X'2002'             DEVICE TYPE
007600    0000                9621          DC    H'0',H'0'           ADDRESS, STATUS
007602    0000
007604    0000 5D6C           9622          DC    A(MAGPTR)           DRIVER ENTRY
```

DDB'S AND BUFFERS

```
007608      0000 FF80        9623          DC      Y'FF80'         MAX WAIT COUNT
00760C      0000 0000        9624          DC      F'0'            CURRENT WAIT COUNT
007610      0000 0000        9625          DC      F'0'            ERROR COUNT
007614      0000 0000        9626          DC      F'0'            MAX DISPATCH COUNT
007618      0000 0000        9627          DC      F'0'            CURRENT DISPATCH COUNT
00761C      0000 5FB8        9628          DC      A(CKMAG)        PARM CHECK SUBROUTINE
007620      0000 0000        9629          DC      F'0'            DRIVER WORK 1
007624      0000 0000        9630          DC      F'0'            DRIVER WORK 2
007628      0000 9580        9631          DC      EXER0S          BUF 1 START, WRITE BUFFER
00762C      0000 967C        9632          DC      EXER0E          BUF 1 END
007630      0000 967C        9633          DC      EXER0E          BUF 1 NEXT
007634      0000 9680        9634          DC      EXER1S          BUF 2 START, READ BUFFER
007638      0000 977C        9635          DC      EXER1E          BUF 2 END
00763C      0000 9780        9636          DC      EXER1N          BUF 2 NEXT
007640      0000             9637          DC      H'0'            SELCH ADDRESS
007642                       9638          IFP     MAGTAPE-2


                             9640   *MAGNETIC TAPE DDB
                             9641   *
007644                       9642          ALIGN   4
007644      0000 0000        9643   MAGDDB3 DC     F'0'            DSPCHFLGS,PRIORITY,PHASE
007648      B800             9644          DC      X'B800'         PARM FLAGS
00764A      2002             9645          DC      X'2002'         DEVICE TYPE
00764C      0000             9646          DC      H'0',H'0'       ADDRESS, STATUS
00764E      0000
007650      0000 5D6C        9647          DC      A(MAGPTR)       DRIVER ENTRY
007654      0000 FF80        9648          DC      Y'FF80'         MAX WAIT COUNT
007658      0000 0000        9649          DC      F'0'            CURRENT WAIT COUNT
00765C      0000 0000        9650          DC      F'0'            ERROR COUNT
007660      0000 0000        9651          DC      F'0'            MAX DISPATCH COUNT
007664      0000 0000        9652          DC      F'0'            CURRENT DISPATCH COUNT
007668      0000 5FB8        9653          DC      A(CKMAG)        PARM CHECK SUBROUTINE
00766C      0000 0000        9654          DC      F'0'            DRIVER WORK 1
007670      0000 0000        9655          DC      F'0'            DRIVER WORK 2
007674      0000 9580        9656          DC      EXER0S          BUF 1 START, WRITE BUFFER
007678      0000 967C        9657          DC      EXER0E          BUF 1 END
00767C      0000 967C        9658          DC      EXER0E          BUF 1 NEXT
007680      0000 9680        9659          DC      EXER1S          BUF 2 START,READ BUFFER
007684      0000 977C        9660          DC      EXER1E          BUF 2 END
007688      0000 9780        9661          DC      EXER1N          BUF 2 NEXT
00768C      0000             9662          DC      H'0'            SELCH ADDRESS
00768E                       9663          IFP     MAGTAPE-3


                             9665   *MAGNETIC TAPE DDB
                             9666   *
007690                       9667          ALIGN   4
007690      0000 0000        9668   MAGDDB4 DC     F'0'            DSPCHFLGS,PRIORITY,PHASE
007694      3800             9669          DC      X'B800'         PARM FLAGS
007696      2002             9670          DC      X'2002'         DEVICE TYPE
007698      0000             9671          DC      H'0',H'0'       ADDRESS, STATUS
00769A      0000
```

DDB'S AND BUFFERS

00769C	0000 5D6C		9672	DC	A(MAGPTR)	DRIVER ENTRY
0076A0	0000 FF80		9673	DC	Y'FF80'	MAX WAIT COUNT
0076A4	0000 0000		9674	DC	F'0'	CURRENT WAIT COUNT
0076A8	0000 0000		9675	DC	F'0'	ERROR COUNT
0076AC	0000 0000		9676	DC	F'0'	MAX DISPATCH COUNT
0076B0	0000 0000		9677	DC	F'0'	CURRENT DISPATCH COUNT
0076B4	0000 5FB8		9678	DC	A(CKMAG)	PARM CHECK SUBROUTINE
0076B8	0000 0000		9679	DC	F'0'	DRIVER WORK 1
0076BC	0000 0000		9680	DC	F'0'	DRIVER WORK 2
0076C0	0000 9580		9681	DC	EXEROS	BUF 1 START, WRITE BUFFER
0076C4	0000 967C		9682	DC	EXEROE	BUF 1 END
0076C8	0000 967C		9683	DC	EXEROE	BUF 1 NEXT
0076CC	0000 9680		9684	DC	EXER1S	BUF 2 START, READ BUFFER
0076D0	0000 977C		9685	DC	EXER1E	BUF 2 END
0076D4	0000 9780		9686	DC	EXER1N	BUF 2 NEXT
0076D8	0000		9687	DC	H'0'	SELCH ADDRESS
			9688	ENDC		
			9689	ENDC		
			9690	ENDC		
			9691	ENDC		
0076DA			9692	IFNZ	DISCS	
			9694	*DISC DDB	(2.5 OR 10 MEGA BYTE)	
			9695	*		
0076DC			9696		ALIGN 4	
0076DC	0000 0000		9697	DSCDDB1 DC	F'0'	DSPCHFLGS,PRIORITY,PHASE
0076E0	FF00		9698	DC	X'FFC0'	PARM FLAGS
0076E2	3002		9699	DC	X'3002'	DEVICE TYPE
0076E4	0000		9700	DC	H'0',H'0'	ADDRESS,STATUS
0076E6	0000					
0076E8	0000 5994		9701	DC	A(DSCPTR)	DRIVER ENTRY
0076EC	0007 FF80		9702	DC	Y'7FF80'	MAX WAIT COUNT
0076F0	0000 0000		9703	DC	F'0'	CURRENT WAIT COUNT
0076F4	0000 0000		9704	DC	F'0'	ERROR COUNT
0076F8	0000 0000		9705	DC	F'0'	MAX DISPATCH COUNT
0076FC	0000 0000		9706	DC	F'0'	CURRENT DISPATCH COUNT
007700	0000 5D0E		9707	DC	A(CKDSC)	PARM CHECK SUBROUTINE
007704	0000 0008		9708	DC	Y'0008'	DRIVER WORK 1
007708	0000 0000		9709	DC	F'0'	DRIVER WORK 2
00770C	0000 9580		9710	DC	EXEROS	BUF 1 START, WRITE BUF
007710	0000 967C		9711	DC	EXEROE	BUF 1 END
007714	0000 967C		9712	DC	EXEROE	BUF 1 NEXT
007718	0000 9680		9713	DC	EXER1S	BUF 2 START, READ BUFFER
00771C	0000 977C		9714	DC	EXER1E	BUF 2 END
007720	0000 9780		9715	DC	EXER1N	BUF 2 NEXT
007724	0000		9716	DC	H'0',H'0'	SELCH, CONTROLLER ADDRESS
007726	0000					
007728	0000		9717	DC	H'0',H'0'	CYL LOW, CLY HIGH
00772A	0000					
00772C	0000		9718	DC	H'0',H'0'	HEAD LOW, HEAD HIGH
00772E	0000					
007730	0000		9719	DC	H'0',H'0'	SECTOR LOW, SECTOR HIGH

DDB'S AND BUFFERS

```
007732    0000
007734    0000            9720          DC    H'0'              CYL CURRENT
007736    0000            9721          DC    H'0'              HEAD CURRENT
007738    0000            9722          DC    H'0'              SECTOR CURRENT
00773A    0000            9723          DC    H'0'              WRITE PROTECT FLAG
00773C                    9724          IFP   DISCS-1


                         9726    *DISC DDB  (2.5 OR 10 MEGA BYTE)
                         9727    *
00773C                    9728          ALIGN 4
00773C    0000 0000       9729  DSCDDB2  DC   F'0'              DSPCHFLGS,PRIORITY,PHASE
007740    FF00            9730          DC    X'FF00'           PARM FLAGS
007742    3002            9731          DC    X'3002'           DEVICE TYPE
007744    0000            9732          DC    H'0',H'0'         ADDRESS,STATUS
007746    0000
007748    0000 5994       9733          DC    A(DSCPTR)         DRIVER ENTRY
00774C    0007 FF80       9734          DC    X'7FF80'          MAX WAIT COUNT
007750    0000 0000       9735          DC    F'0'              CURRENT WAIT COUNT
007754    0000 0000       9736          DC    F'0'              ERROR COUNT
007758    0000 0000       9737          DC    F'0'              MAX DISPATCH COUNT
00775C    0000 0000       9738          DC    F'0'              CURRENT DISPATCH COUNT
007760    0000 5D0E       9739          DC    A(CKDSC)          PARM CHECK SUBROUTINE
007764    0000 0009       9740          DC    X'0009'           DRIVER WORK 1
007768    0000 0000       9741          DC    F'0'              DRIVER WORK 2
00776C    0000 9580       9742          DC    EXER0S            BUF 1 START, WRITE BUF
007770    0000 967C       9743          DC    EXER0E            BUF 1 END
007774    0000 967C       9744          DC    EXER0E            BUF 1 NEXT
007778    0000 9680       9745          DC    EXER1S            BUF 2 START, READ BUFFER
00777C    0000 977C       9746          DC    EXER1E            BUF 2 END
007780    0000 9780       9747          DC    EXER1N            BUF 2 NEXT
007784    0000            9748          DC    H'0',H'0'         SELCH, CONTROLLER ADDRESS
007786    0000
007788    0000            9749          DC    H'0',H'0'         CYL LOW, CLY HIGH
00778A    0000
00778C    0000            9750          DC    H'0',H'0'         HEAD LOW, HEAD HIGH
00778E    0000
007790    0000            9751          DC    H'0',H'0'         SECTOR LOW, SECTOR HIGH
007792    0000
007794    0000            9752          DC    H'0'              CYL CURRENT
007796    0000            9753          DC    H'0'              HEAD CURRENT
007798    0000            9754          DC    H'0'              SECTOR CURRENT
00779A    0000            9755          DC    H'0'              WRITE PROTECT FLAG
00779C                    9756          IFP   DISCS-2


                         9758    *DISC DDB  (2.5 OR 10 MEGA BYTE)
                         9759    *
00779C                    9760          ALIGN 4
00779C    0000 0000       9761  DSCDDB3  DC   F'0'              DSPCHFLGS,PRIORITY,PHASE
0077A0    FF00            9762          DC    X'FF00'           PARM FLAGS
0077A2    3002            9763          DC    X'3002'           DEVICE TYPE
0077A4    0000            9764          DC    H'0',H'0'         ADDRESS,STATUS
```

DDB'S AND BUFFERS

```
0077A6      0000
0077A8      0000 5994        9765       DC    A(DSCPTR)        DRIVER ENTRY
0077AC      0007 FF80        9766       DC    Y'7FF80'         MAX WAIT COUNT
0077B0      0000 0000        9767       DC    F'0'             CURRENT WAIT COUNT
0077B4      0000 0000        9768       DC    F'0'             ERROR COUNT
0077B8      0000 0000        9769       DC    F'0'             MAX DISPATCH COUNT
0077BC      0000 0000        9770       DC    F'0'             CURRENT DISPATCH COUNT
0077C0      0000 5D0E        9771       DC    A(CKDSC)         PARM CHECK SUBROUTINE
0077C4      0000 000A        9772       DC    Y'000A'          DRIVER WORK 1
0077C8      0000 0000        9773       DC    F'0'             DRIVER WORK 2
0077CC      0000 9580        9774       DC    EXER0S           BUF 1 START, WRITE BUF
0077D0      0000 967C        9775       DC    EXER0E           BUF 1 END
0077D4      0000 967C        9776       DC    EXER0E           BUF 1 NEXT
0077D8      0000 9680        9777       DC    EXER1S           BUF 2 START, READ BUFFER
0077DC      0000 977C        9778       DC    EXER1E           BUF 2 END
0077E0      0000 9780        9779       DC    EXER1N           BUF 2 NEXT
0077E4      0000             9780       DC    H'0',H'0'        SELCH, CONTROLLER ADDRESS
0077E6      0000
0077E8      0000             9781       DC    H'0',H'0'        CYL LOW, CLY HIGH
0077EA      0000
0077EC      0000             9782       DC    H'0',H'0'        HEAD LOW, HEAD HIGH
0077EE      0000
0077F0      0000             9783       DC    H'0',H'0'        SECTOR LOW, SECTOR HIGH
0077F2      0000
0077F4      0000             9784       DC    H'0'             CYL CURRENT
0077F6      0000             9785       DC    H'0'             HEAD CURRENT
0077F8      0000             9786       DC    H'0'             SECTOR CURRENT
0077FA      0000             9787       DC    H'0'             WRITE PROTECT FLAG
0077FC                       9788       IFP   DISCS-3

                             9790   *DISC DDB  (2.5 OR 10 MEGA BYTE)
                             9791   *
0077FC                       9792         ALIGN 4
0077FC      0000 0000        9793 DSCDDB4 DC   F'0'             DSPCHFLGS,PRIORITY,PHASE
007800      FF00             9794       DC    X'FF00'          PARM FLAGS
007802      3002             9795       DC    X'3002'          DEVICE TYPE
007804      0000             9796       DC    H'0',H'0'        ADDRESS,STATUS
007806      0000
007808      0000 5994        9797       DC    A(DSCPTR)        DRIVER ENTRY
00780C      0007 FF80        9798       DC    Y'7FF80'         MAX WAIT COUNT
007810      0000 0000        9799       DC    F'0'             CURRENT WAIT COUNT
007814      0000 0000        9800       DC    F'0'             ERROR COUNT
007818      0000 0000        9801       DC    F'0'             MAX DISPATCH COUNT
00781C      0000 0000        9802       DC    F'0'             CURRENT DISPATCH COUNT
007820      0000 5D0F        9803       DC    A(CKDSC)         PARM CHECK SUBROUTINE
007824      0000 000B        9804       DC    Y'000B'          DRIVER WORK 1
007828      0000 0000        9805       DC    F'0'             DRIVER WORK 2
00782C      0000 9580        9806       DC    EXER0S           BUF 1 START, WRITE BUF
007830      0000 967C        9807       DC    EXER0E           BUF 1 END
007834      0000 967C        9808       DC    EXER0E           BUF 1 NEXT
007838      0000 9680        9809       DC    EXER1S           BUF 2 START, READ BUFFER
00783C      0000 977C        9810       DC    EXER1E           BUF 2 END
```

DDB'S AND BUFFERS

```
007840      0000 9780        9811        DC      EXER1N              BUF 2 NEXT
007844      0000             9812        DC      H'0',H'0'           SELCH, CONTROLLER ADDRESS
007846      0000
007848      0000             9813        DC      H'0',H'0'           CYL LOW, CLY HIGH
00784A      0000
00784C      0000             9814        DC      H'0',H'0'           HEAD LOW, HEAD HIGH
00784E      0000
007850      0000             9815        DC      H'0',H'0'           SECTOR LOW, SECTOR HIGH
007852      0000
007854      0000             9816        DC      H'0'                CYL CURRENT
007856      0000             9817        DC      H'0'                HEAD CURRENT
007858      0000             9818        DC      H'0'                SECTOR CURRENT
00785A      0000             9819        DC      H'0'                WRITE PROTECT FLAG
                             9820        ENDC
                             9821        ENDC
                             9822        ENDC
                             9823        ENDC
00785C                       9824        IFNZ    DSK40MB


                             9826     * DISC DDB  (40 MEGA BYTE)
                             9827     *
00785C                       9828            ALIGN 4
00785C      0200 0000        9829  DSCDDBA  DC    Y'02000000'         DSPCHFLGS,PRIORITY,PHASE
007860      FF00             9830        DC      X'FF00'             PARM FLAGS
007862      3002             9831        DC      X'3002'             DEVICE TYPE
007864      0000             9832        DC      H'0',H'0'           ADDRESS, STATUS
007866      0000
007868      0000 5994        9833        DC      A(DSCPTR)           DRIVER ENTRY
00786C      0007 FF80        9834        DC      Y'7FF80'            MAX WAIT COUNT
007870      0000 0000        9835        DC      F'0'                CURRENT WAIT COUNT
007874      0000 0000        9836        DC      F'0'                ERROR COUNT
007878      0000 0000        9837        DC      F'0'                MAX DISPATCH COUNT
00787C      0000 0000        9838        DC      F'0'                CURRENT DISPATCH COUNT
007880      0000 5D3C        9839        DC      A(CKDSC40)          PARM CHECK SUBROUTINE
007884      0000 000C        9840        DC      Y'000C'             DRIVER WORK 1
007888      0000 0000        9841        DC      F'0'                DRIVER WORK 2
00788C      0000 9580        9842        DC      EXEROS              BUF 1 START, WRITE BUF
007890      0000 967C        9843        DC      EXEROE              BUF 1 END
007894      0000 967C        9844        DC      EXEROE              BUF 1 NEXT
007898      0000 9680        9845        DC      EXER1S              BUF 2 START, READ BUF
00789C      0000 977C        9846        DC      EXER1E              BUF 2 END
0078A0      0000 9780        9847        DC      EXER1N              BUF 2 NEXT
0078A4      0000             9848        DC      H'0',H'0'           SELCH, CONTROLLER ADDRESS
0078A6      0000
0078A8      0000             9849        DC      H'0',H'0'           CYL LOW, CYL HIGH
0078AA      0000
0078AC      0000             9850        DC      H'0',H'0'           HEAD LOW, HEAD HIGH
0078AE      0000
0078B0      0000             9851        DC      H'0',H'0'           SECTOR LOW, SECTOR HIGH
0078B2      0000
0078B4      0000             9852        DC      H'0'                CYL CURRENT
0078B6      0000             9853        DC      H'0'                HEAD CURRENT
```

DDB'S AND BUFFERS

0078B8	0000	9854	DC	H'0'	SECTOR CURRENT
0078BA	0000	9855	DC	H'0'	WRITE PROTECT FLAG
0078BC		9856	IFP	DSK40MB-1	

		9858	*	DISC DDB	(40 MEGA BYTE)	
		9859	*			
0078BC		9860		ALIGN	4	
0078BC	0200 0000	9861	DSCDDBB	DC	Y'02000000'	DSPCHFLGS,PRIORITY,PHASE
0078C0	FF00	9862		DC	X'FF00'	PARM FLAGS
0078C2	3002	9863		DC	X'3002'	DEVICE TYPE
0078C4	0000	9864		DC	H'0',H'0'	ADDRESS, STATUS
0078C6	0000					
0078C8	0000 5994	9865		DC	A(DSCPTR)	DRIVER ENTRY
0078CC	0007 FF80	9866		DC	Y'7FF80'	MAX WAIT COUNT
0078D0	0000 0000	9867		DC	F'0'	CURRENT WAIT COUNT
0078D4	0000 0000	9868		DC	F'0'	ERROR COUNT
0078D8	0000 0000	9869		DC	F'0'	MAX DISPATCH COUNT
0078DC	0000 0000	9870		DC	F'0'	CURRENT DISPATCH COUNT
0078E0	0000 5D3C	9871		DC	A(CKDSC40)	PARM CHECK SUBROUTINE
0078E4	0000 000D	9872		DC	Y'000D'	DRIVER WORK 1
0078E8	0000 0000	9873		DC	F'0'	DRIVER WORK 2
0078EC	0000 9580	9874		DC	EXER0S	BUF 1 START, WRITE BUF
0078F0	0000 967C	9875		DC	EXER0E	BUF 1 END
0078F4	0000 957C	9876		DC	EXER0F	BUF 1 NEXT
0078F8	0000 9680	9877		DC	EXER1S	BUF 2 START, READ BUF
0078FC	0000 977C	9878		DC	EXER1E	BUF 2 END
007900	0000 9780	9879		DC	EXER1N	BUF 2 NEXT
007904	0000	9880		DC	H'0',H'0'	SELCH, CONTROLLER ADDRESS
007906	0000					
007908	0000	9881		DC	H'0',H'0'	CYL LOW, CYL HIGH
00790A	0000					
00790C	0000	9882		DC	H'0',H'0'	HEAD LOW, HEAD HIGH
00790E	0000					
007910	0000	9883		DC	H'0',H'0'	SECTOR LOW, SECTOR HIGH
007912	0000					
007914	0000	9884		DC	H'0'	CYL CURRENT
007916	0000	9885		DC	H'0'	HEAD CURRENT
007918	0000	9886		DC	H'0'	SECTOR CURRENT
00791A	0000	9887		DC	H'0'	WRITE PROTECT FLAG
00791C		9888		IFP	DSK40MB-2	

		9890	*	DISC DDB	(40 MEGA BYTE)	
		9891	*			
00791C		9892		ALIGN	4	
00791C	0200 0000	9893	DSCDDBC	DC	Y'02000000'	DSPCHFLGS,PRIORITY,PHASE
007920	FF00	9894		DC	X'FF00'	PARM FLAGS
007922	3002	9895		DC	X'3002'	DEVICE TYPE
007924	0000	9896		DC	H'0',H'0'	ADDRESS, STATUS
007926	0000					
007928	0000 5994	9897		DC	A(DSCPTR)	DRIVER ENTRY
00792C	0007 FF80	9898		DC	Y'7FF80'	MAX WAIT COUNT

DDB'S AND BUFFERS

```
007930    0000 0000    9899   DC    F'0'              CURRENT WAIT COUNT
00793A    0000 0000    9900   DC    F'0'              ERROR COUNT
007938    0000 0000    9901   DC    F'0'              MAX DISPATCH COUNT
00793C    0000 0000    9902   DC    F'0'              CURRENT DISPATCH COUNT
007940    0000 5D3C    9903   DC    A(CKDSC40)        PARM CHECK SUBROUTINE
007944    0000 000E    9904   DC    Y'000E'           DRIVER WORK 1
007948    0000 0000    9905   DC    F'0'              DRIVER WORK 2
00794C    0000 9580    9906   DC    EXER0S            BUF 1 START, WRITE BUF
007950    0000 967C    9907   DC    EXER0E            BUF 1 END
007954    0000 967C    9908   DC    EXER0E            BUF 1 NEXT
007958    0000 9680    9909   DC    EXER1S            BUF 2 START, READ BUF
00795C    0000 977C    9910   DC    EXER1E            BUF 2 END
007960    0000 9780    9911   DC    EXER1N            BUF 2 NEXT
007964    0000         9912   DC    H'0',H'0'         SELCH, CONTROLLER ADDRESS
007966    0000
007968    0000         9913   DC    H'0',H'0'         CYL LOW, CYL HIGH
00796A    0000
00796C    0000         9914   DC    H'0',H'0'         HEAD LOW, HEAD HIGH
00796E    0000
007970    0000         9915   DC    H'0',H'0'         SECTOR LOW, SECTOR HIGH
007972    0000
007974    0000         9916   DC    H'0'              CYL CURRENT
007976    0000         9917   DC    H'0'              HEAD CURRENT
007978    0000         9918   DC    H'0'              SECTOR CURRENT
00797A    0000         9919   DC    H'0'              WRITE PROTECT FLAG
00797C                 9920   IFP   DSK40MB-3

                       9922   * DISC DDB  (40 MEGA BYTE)
                       9923   *
00797C                 9924         ALIGN 4
00797C    0200 0000    9925   DSCDDBD DC  Y'02000000'      DSPCHFLGS,PRIORITY,PHASE
007980    FF00         9926   DC    X'FF00'           PARM FLAGS
007982    3002         9927   DC    X'3002'           DEVICE TYPE
007984    0000         9928   DC    H'0',H'0'         ADDRESS, STATUS
007986    0000
007988    0000 5994    9929   DC    A(DSCPTR)         DRIVER ENTRY
00798C    0007 FF80    9930   DC    Y'7FF80'          MAX WAIT COUNT
007990    0000 0000    9931   DC    F'0'              CURRENT WAIT COUNT
007994    0000 0000    9932   DC    F'0'              ERROR COUNT
007998    0000 0000    9933   DC    F'0'              MAX DISPATCH COUNT
00799C    0000 0000    9934   DC    F'0'              CURRENT DISPATCH COUNT
0079A0    0000 5D3C    9935   DC    A(CKDSC40)        PARM CHECK SUBROUTINE
0079A4    0000 000F    9936   DC    Y'000F'           DRIVER WORK 1
0079A8    0000 0000    9937   DC    F'0'              DRIVER WORK 2
0079AC    0000 9580    9938   DC    EXER0S            BUF 1 START, WRITE BUF
0079B0    0000 967C    9939   DC    EXER0E            BUF 1 END
0079B4    0000 967C    9940   DC    EXER0E            BUF 1 NEXT
0079B8    0000 9680    9941   DC    EXER1S            BUF 2 START, READ BUF
0079BC    0000 977C    9942   DC    EXER1E            BUF 2 END
0079C0    0000 9780    9943   DC    EXER1N            BUF 2 NEXT
0079C4    0000         9944   DC    H'0',H'0'         SELCH, CONTROLLER ADDRESS
0079C6    0000
```

DDB'S AND BUFFERS

0079C8	0000	9945	DC	H'0',H'0'	CYL LOW, CYL HIGH
0079CA	0000				
0079CC	0000	9946	DC	H'0',H'0'	HEAD LOW, HEAD HIGH
0079CE	0000				
0079D0	0000	9947	DC	H'0',H'0'	SECTOR LOW, SECTOR HIGH
0079D2	0000				
0079D4	0000	9948	DC	H'0'	CYL CURRENT
0079D6	0000	9949	DC	H'0'	HEAD CURRENT
0079D8	0000	9950	DC	H'0'	SECTOR CURRENT
0079DA	0000	9951	DC	H'0'	WRITE PROTECT FLAG
		9952	ENDC		
		9953	ENDC		
		9954	ENDC		
		9955	ENDC		
0079DC		9956	IFNZ	MSMDISC	
		9958	* MSM DIAC DDB (67 OR 300 MEGA BYTE)		
		9959	*		
0079DC		9960	ALIGN	4	
0079DC	0300 0000	9961	MSMDDB1 DC	Y'0300000C'	DSPCHFLGS,PRIORITY,PHASE
0079E0	FF00	9962	DC	X'FF00'	PARM FLAGS
0079E2	3002	9963	DC	X'3002'	DEVICE TYPE
0079E4	0000	9964	DC	H'0',H'0'	ADDRESS, STATUS
0079E6	0000				
0079E8	0000 5994	9965	DC	A(DSCPTR)	DRIVER ENTRY
0079EC	0007 FF80	9966	DC	Y'7FF80'	MAX WAIT COUNT
0079F0	0000 0000	9967	DC	F'0'	CURRENT WAIT COUNT
0079F4	0000 0000	9968	DC	F'0'	ERROR COUNT
0079F8	0000 0000	9969	DC	F'0'	MAX DISPATCH COUNT
0079FC	0000 0000	9970	DC	F'0'	CURRENT DISPATCH COUNT
007A00	0000 5D3C	9971	DC	A(CKDSC40)	PARM CHECK SUBROUTINE
007A04	0000 000C	9972	DC	Y'000C'	DRIVER WORK 1
007A08	0000 0000	9973	DC	F'0'	DRIVER WORK 2
007A0C	0000 9580	9974	DC	EXER0S	BUF 1 START, WRITE BUF
007A10	0000 967C	9975	DC	EXER0E	BUF 1 END
007A14	0000 967C	9976	DC	EXER0E	BUF 1 NEXT
007A18	0000 9680	9977	DC	EXER1S	BUF 2 START, READ BUF
007A1C	0000 977C	9978	DC	EXER1E	BUF 2 END
007A20	0000 9780	9979	DC	EXER1N	BUF 2 NEXT
007A24	0000	9980	DC	H'0',H'0'	SELCH, CONTROLLER ADDRESS
007A26	0000				
007A28	0000	9981	DC	H'0',H'0'	CYL LOW, CYL HIGH
007A2A	0000				
007A2C	0000	9982	DC	H'0',H'0'	HEAD LOW, HEAD HIGH
007A2E	0000				
007A30	0000	9983	DC	H'0',H'0'	SECTOR LOW, SECTOR HIGH
007A32	0000				
007A34	0000	9984	DC	H'0'	CYL CURRENT
007A36	0000	9985	DC	H'0'	HEAD CURRENT
007A38	0000	9986	DC	H'0'	SECTOR CURRENT
007A3A	0000	9987	DC	H'0'	WRITE PROTECT FLAG
007A3C		9988	IFP	MSMDISC-1	

DDB'S AND BUFFERS

```
                          9990  * MSM DISC DDB (67 OR 300 MEGA BYTE)
                          9991  *
007A3C                    9992          ALIGN 4
007A3C   0300 0000        9993  MSMDDB2 DC    Y'03000000'      DSPCHFLGS,PRIORITY,PHASE
007A40   FF00             9994          DC    X'FF00'          PARM FLAGS
007A42   3002             9995          DC    X'3002'          DEVICE TYPE
007A44   0000             9996          DC    H'0',H'0'        ADDRESS, STATUS
007A46   0000
007A48   0000 5994        9997          DC    A(DSCPTR)        DRIVER ENTRY
007A4C   0007 FF80        9998          DC    Y'7FF80'         MAX WAIT COUNT
007A50   0000 0000        9999          DC    F'0'             CURRENT WAIT COUNT
007A54   0000 0000        10000         DC    F'0'             ERROR COUNT
007A58   0000 0000        10001         DC    F'0'             MAX DISPATCH COUNT
007A5C   0000 0000        10002         DC    F'0'             CURRENT DISPATCH COUNT
007A60   0000 5D3C        10003         DC    A(CKDSC40)       PARM CHECK SUBROUTINE
007A64   0000 000D        10004         DC    Y'000D'          DRIVER WORK 1
007A68   0000 0000        10005         DC    F'0'             DRIVER WORK 2
007A6C   0000 9580        10006         DC    EXER0S           BUF 1 START, WRITE BUF
007A70   0000 967C        10007         DC    EXER0E           BUF 1 END
007A74   0000 967C        10008         DC    EXER0E           BUF 1 NEXT
007A78   0000 9680        10009         DC    EXER1S           BUF 2 START, READ BUF
007A7C   0000 977C        10010         DC    EXER1E           BUF 2 END
007A80   0000 9780        10011         DC    EXER1N           BUF 2 NEXT
007A84   0000             10012         DC    H'0',H'0'        SELCH, CONTROLLER ADDRESS
007A86   0000
007A88   0000             10013         DC    H'0',H'0'        CYL LOW, CYL HIGH
007A8A   0000
007A8C   0000             10014         DC    H'0',H'0'        HEAD LOW, HEAD HIGH
007A8E   0000
007A90   0000             10015         DC    H'0',H'0'        SECTOR LOW, SECTOR HIGH
007A92   0000
007A94   0000             10016         DC    H'0'             CYL CURRENT
007A96   0000             10017         DC    H'0'             HEAD CURRENT
007A98   0000             10018         DC    H'0'             SECTOR CURRENT
007A9A   0000             10019         DC    H'0'             WRITE PROTECT FLAG
007A9C                    10020         IFP   MSMDISC-2


                          10022 * MSM DISC DDB (67 OR 300 MEGA BYTE)
                          10023 *
007A9C                    10024         ALIGN 4
007A9C   0300 0000        10025 MSMDDB3 DC    Y'03000000'      DSPCHFLGS,PRIORITY,PHASE
007AA0   FF00             10026         DC    X'FF00'          PARM FLAGS
007AA2   3002             10027         DC    X'3002'          DEVICE TYPE
007AA4   0000             10028         DC    H'0',H'0'        ADDRESS, STATUS
007AA6   0000
007AA8   0000 5994        10029         DC    A(DSCPTR)        DRIVER ENTRY
007AAC   0007 FF80        10030         DC    Y'7FF80'         MAX WAIT COUNT
007AB0   0000 0000        10031         DC    F'0'             CURRENT WAIT COUNT
007AB4   0000 0000        10032         DC    F'0'             ERROR COUNT
007AB8   0000 0000        10033         DC    F'0'             MAX DISPATCH COUNT
007ABC   0000 0000        10034         DC    F'0'             CURRENT DISPATCH COUNT
007AC0   0000 5D3C        10035         DC    A(CKDSC40)       PARM CHECK SUBROUTINE
```

DDB'S AND BUFFERS

007AC4	0000 000E		10036		DC	Y'000E'	DRIVER WORK 1
007AC8	0000 0000		10037		DC	F'0'	DRIVER WORK 2
007ACC	0000 9580		10038		DC	EXER0S	BUF 1 START, WRITE BUF
007AD0	0000 967C		10039		DC	EXER0E	BUF 1 END
007AD4	0000 967C		10040		DC	EXER0E	BUF 1 NEXT
007AD8	0000 9680		10041		DC	EXER1S	BUF 2 START, READ BUF
007ADC	0000 977C		10042		DC	EXER1E	BUF 2 END
007AE0	0000 9780		10043		DC	EXER1N	BUF 2 NEXT
007AE4	0000		10044		DC	H'0',H'0'	SELCH, CONTROLLER ADDRESS
007AE6	0000						
007AE8	0000		10045		DC	H'0',H'0'	CYL LOW, CYL HIGH
007AEA	0000						
007AEC	0000		10046		DC	H'0',H'0'	HEAD LOW, HEAD HIGH
007AEE	0000						
007AF0	0000		10047		DC	H'0',H'0'	SECTOR LOW, SECTOR HIGH
007AF2	0000						
007AF4	0000		10048		DC	H'0'	CYL CURRENT
007AF6	0000		10049		DC	H'0'	HEAD CURRENT
007AF8	0000		10050		DC	H'0'	SECTOR CURRENT
007AFA	0000		10051		DC	H'0'	WRITE PROTECT FLAG
007AFC			10052		IFP	MSMDISC-3	

```
                            10054  * MSM DISC DDB (67 OR 300 MEGA BYTE DISC)
                            10055  *
007AFC                      10056           ALIGN 4
007AFC   0300 0000          10057  MSMDDB4  DC    Y'03000000'      DSPCHFLGS,PRIORITY,PHASE
007B00   FF00               10058           DC    X'FF00'          PARM FLAGS
007B02   3002               10059           DC    X'3002'          DEVICE TYPE
007B04   0000               10060           DC    H'0',H'0'        ADDRESS, STATUS
007B06   0000
007B08   0000 5994          10061           DC    A(DSCPTR)        DRIVER ENTRY
007B0C   0007 FF80          10062           DC    Y'7FF80'         MAX WAIT COUNT
007B10   0000 0000          10063           DC    F'0'             CURRENT WAIT COUNT
007B14   0000 0000          10064           DC    F'0'             ERROR COUNT
007B18   0000 0000          10065           DC    F'0'             MAX DISPATCH COUNT
007B1C   0000 0000          10066           DC    F'0'             CURRENT DISPATCH COUNT
007B20   0000 5D3C          10067           DC    A(CKDSC40)       PARM CHECK SUBROUTINE
007B24   0000 000F          10068           DC    Y'000F'          DRIVER WORK 1
007B28   0000 0000          10069           DC    F'0'             DRIVER WORK 2
007B2C   0000 9580          10070           DC    EXER0S           BUF 1 START, WRITE BUF
007B30   0000 967C          10071           DC    EXER0E           BUF 1 END
007B34   0000 967C          10072           DC    EXER0E           BUF 1 NEXT
007B38   0000 9680          10073           DC    EXER1S           BUF 2 START, READ BUF
007B3C   0000 977C          10074           DC    EXER1E           BUF 2 END
007B40   0000 9780          10075           DC    EXER1N           BUF 2 NEXT
007B44   0000               10076           DC    H'0',H'0'        SELCH, CONTROLLER ADDRESS
007B46   0000
007B48   0000               10077           DC    H'0',H'0'        CYL LOW, CYL HIGH
007B4A   0000
007B4C   0000               10078           DC    H'0',H'0'        HEAD LOW, HEAD HIGH
007B4E   0000
007B50   0000               10079           DC    H'0',H'0'        SECTOR LOW, SECTOR HIGH
```

DDB'S AND BUFFERS

```
007B52          0000
007B54          0000              10080         DC    H'0'              CYL CURRENT
007B56          0000              10081         DC    H'0'              HEAD CURRENT
007B58          0000              10082         DC    H'0'              SECTOR CURRENT
007B5A          0000              10083         DC    H'0'              WRITE PROTECT FLAG
                                  10084         ENDC
                                  10085         ENDC
                                  10086         ENDC
                                  10087         ENDC
007B5C                            10088         IFNZ  FLOPPY


007B5C                            10090         ALIGN 4
007B5C          0000 0000         10091 FMDDDB1 DC    Y'00000000'
007B60          9C00              10092         DC    X'9C00'
007B62          0202              10093         DC    X'0202'
007B64          0000 0000         10094         DC    Y'0'
007B68          0000 5FDC         10095         DC    A(FMDPTR)
007B6C          0007 FF80         10096         DC    Y'7FF80'
007B70          0000 0000         10097         DC    F'0'
007B74          0000 0000         10098         DC    F'0'
007B78          0000 0000         10099         DC    F'0'
007B7C          0000 0000         10100         DC    F'0'
007B80          0000 61C2         10101         DC    A(CKFMD)
007B84          0000 0010         10102         DC    Y'0010'
007B88          0000 0000         10103         DC    Y'0'
007B8C          0000 8AC0         10104         DC    A(DATAPTRN)
007B90          0000 8BBF         10105         DC    A(DPTRNEND)
007B94          0000 8AC0         10106         DC    A(DATAPTRN)
007B98          0000 7BB6         10107         DC    A(FDM1BUF)
007B9C          0000 7C35         10108         DC    A(FDM1BUFE)
007BA0          0000 7BB6         10109         DC    A(FDM1BUF)
007BA4          0000              10110         DC    H'0',H'0',H'1'
007BA6          0000
007BA8          0001
007BAA          07D2              10111         DC    X'7D2'
007BAC          0000              10112         DC    H'0',H'0',H'0',H'0'
007BAE          0000
007BB0          0000
007BB2          0000
007BB4          0000              10113         DC    H'0'
007BB6                            10114 FDM1BUF  DS    128
                0000 7C35         10115 FDM1BUFE EQU   *-1
007C36                            10116         IFP   FLOPPY-1


007C38                            10118         ALIGN 4
007C38          0000 0000         10119 FMDDDB2 DC    Y'00000000'
007C3C          9C00              10120         DC    X'9C00'
007C3E          0202              10121         DC    X'0202'
007C40          0000 0000         10122         DC    Y'0'
007C44          0000 5FDC         10123         DC    A(FMDPTR)
007C48          0007 FF80         10124         DC    Y'7FF80'
```

DDB'S AND BUFFERS

```
007C4C       0000 0000              10125             DC      F'0'
007C50       0000 0000              10126             DC      F'0'
007C54       0000 0000              10127             DC      F'0'
007C58       0000 0000              10128             DC      F'0'
007C5C       0000 61C2              10129             DC      A(CKFMD)
007C60       0000 0011              10130             DC      Y'0011'
007C64       0000 0001              10131             DC      Y'01'
007C68       0000 8AC0              10132             DC      A(DATAPTRN)
007C6C       0000 8BBF              10133             DC      A(DPTRNEND)
007C70       0000 8AC0              10134             DC      A(DATAPTRN)
007C74       0000 7C92              10135             DC      A(FDM2BUF)
007C78       0000 7D11              10136             DC      A(FDM2BUFE)
007C7C       0000 7C92              10137             DC      A(FDM2BUF)
007C80       0000                   10138             DC      H'0',H'0',H'1'
007C82       0000
007C84       0001
007C86       07D2                   10139             DC      X'7D2'
007C88       0000 0000              10140             DC      F'0',F'0',H'0'
007C8C       0000 0000
007C90       0000
007C92                              10141   FDM2BUF   DS      128
             0000 7D11              10142   FDM2BUFE  EQU     *-1
007D12                              10143             IFP     FLOPPY-2


007D14                              10145             ALIGN   4
007D14       0000 0000              10146   FMDDDB3   DC      Y'00000000'
007D18       9C00                   10147             DC      X'9C00'
007D1A       0202                   10148             DC      X'0202'
007D1C       0000 0000              10149             DC      Y'0'
007D20       0000 5FDC              10150             DC      A(FMDPTR)
007D24       0007 FF80              10151             DC      Y'7FF80'
007D28       0000 0000              10152             DC      F'0'
007D2C       0000 0000              10153             DC      F'0'
007D30       0000 0000              10154             DC      F'0'
007D34       0000 0000              10155             DC      F'0'
007D38       0000 61C2              10156             DC      A(CKFMD)
007D3C       0000 0012              10157             DC      Y'0012'
007D40       0000 0002              10158             DC      Y'2'
007D44       0000 8AC0              10159             DC      A(DATAPTRN)
007D48       0000 8BBF              10160             DC      A(DPTRNEND)
007D4C       0000 8AC0              10161             DC      A(DATAPTRN)
007D50       0000 7D6E              10162             DC      A(FDM3BUF)
007D54       0000 7DED              10163             DC      A(FDM3BUFE)
007D58       0000 7D6E              10164             DC      A(FDM3BUF)
007D5C       0000                   10165             DC      H'0',H'0',H'1'
007D5E       0000
007D60       0001
007D62       07D2                   10166             DC      X'7D2'
007D64       0000 0000              10167             DC      F'0',F'0',H'0'
007D68       0000 0000
007D6C       0000
007D6E                              10168   FDM3BUF   DS      128
```

DDB'S AND BUFFERS

```
                    0000 7DED            10169 FDM3BUFE EQU    *-1
         007DEE                          10170          IFP    FLOPPY-3


         007DF0                          10172          ALIGN  4
         007DF0     0000 0000            10173 FMDDDB4  DC     Y'00000000'
         007DF4     9C00                 10174          DC     X'9C00'
         007DF6     0202                 10175          DC     X'0202'
         007DF8     0000 0000            10176          DC     Y'0'
         007DFC     0000 5FDC            10177          DC     A(FMDPTR)
         007E00     0007 FF80            10178          DC     Y'7FF80'
         007E04     0000 0000            10179          DC     F'0'
         007E08     0000 0000            10180          DC     F'0'
         007E0C     0000 0000            10181          DC     F'0'
         007E10     0000 0000            10182          DC     F'0'
         007E14     0000 61C2            10183          DC     A(CKFMD)
         007E18     0000 0013            10184          DC     Y'0013'
         007E1C     0000 0003            10185          DC     Y'3'
         007E20     0000 8AC0            10186          DC     A(DATAPTRN)
         007E24     0000 8BBF            10187          DC     A(DPTRNEND)
         007E28     0000 8AC0            10188          DC     A(DATAPTRN)
         007E2C     0000 7E4A            10189          DC     A(FDM4BUF)
         007E30     0000 7EC9            10190          DC     A(FDM4BUFE)
         007E34     0000 7E4A            10191          DC     A(FDM4BUF)
         007E38     0000                 10192          DC     H'0',H'0',H'1'
         007E3A     0000
         007E3C     0001
         007E3E     07D2                 10193          DC     X'7D2'
         007E40     0000 0000            10194          DC     F'0',F'0',H'0'
         007E44     0000 0000
         007E48     0000
         007E4A                          10195 FDM4BUF  DS     128
                    0000 7EC9            10196 FDM4BUFE EQU    *-1
                                         10197          ENDC
                                         10198          ENDC
                                         10199          ENDC
                                         10200          ENDC


         007ECA                          10202          IFNZ   EIGHTINT


         007ECC                          10204          ALIGN  4
         007ECC     0000 0000            10205 INT8DDB  DC     F'0'
         007ED0     9800                 10206          DC     X'9800'
         007ED2     0000                 10207          DC     H'0'
         007ED4     0000 0000            10208          DC     F'0'
         007ED8     0000 6340            10209          DC     A(INT8PTR)
         007EDC     0007 FF80            10210          DC     Y'7FF80'
         007EE0     0000 0000            10211          DC     F'0'
         007EE4     0000 0000            10212          DC     F'0'
         007EE8     0000 0000            10213          DC     F'0'
         007EEC     0000 0000            10214          DC     F'0'
```

DDB'S AND BUFFERS

007EF0	0000 63C6	10215		DC	A(CKINT8)
007EF4	0000 0000	10216		DC	F'0'
007EF8	0000 0000	10217		DC	F'0'
		10218		ENDC	
007FFC		10219		IFNZ	ULI
007EFC		10221		ALIGN	4
007EFC	0000 0000	10222	ULIDDB	DC	F'0'
007F00	9800	10223		DC	X'9800'
007F02	0000	10224		DC	H'0'
007F04	0000 0000	10225		DC	F'0'
007F08	0000 63DC	10226		DC	A(ULIPTR)
007F0C	0007 FF80	10227		DC	Y'7FF80'
007F10	0000 0000	10228		DC	F'0'
007F14	0000 0000	10229		DC	F'0'
007F18	0000 0000	10230		DC	F'0'
007F1C	0000 0000	10231		DC	F'0'
007F20	0000 6516	10232		DC	A(CKULI)
007F24	0000 0000	10233		DC	F'0'
		10234		ENDC	
007F28		10235		IFNZ	SELCHTST
007F28		10236		ALIGN	4
007F28	0000	10237	SLCHTDDB	DC	X'0'	DSPCHFLAGS,PRIORITY
007F2A	0000	10238		DC	X'0'	PHASE
007F2C	B800	10239		DC	X'B800'	PARM TYPE	P09
007F2E	2004	10240		DC	X'2004'	DEVICE TYPE
007F30	0000	10241		DC	X'0'	ADDRESS
007F32	0000	10242		DC	X'0'	STATUS
007F34	0000 6214	10243		DC	A(SLCHPTR)	DRIVER ENTRY
007F38	0007 FF80	10244		DC	Y'7FF80'	MAX WAIT COUNTER
007F3C	0000 0000	10245		DC	F'0'	CURRENT WAIT COUNTER
007F40	0000 0000	10246		DC	F'0'	ERROR COUNT
007F44	0000 0000	10247		DC	F'0'	MAX DISPATCH COUNT
007F48	0000 0000	10248		DC	F'0'	CURRENT DISPATCH COUNT
007F4C	0000 6320	10249		DC	A(CKSLCH)	PARM CHECK SUBROUTINE
007F50	0000 0000	10250		DC	F'0'	WORK 1
007F54	0000 0000	10251		DC	F'0'	WORK 2
007F58	0000 9580	10252		DC	EXEROS	BUFFER 1 START
007F5C	0000 967C	10253		DC	EXEROE	BUFFER 1 END
007F60	0000 967C	10254		DC	EXEROE	BUFFER 1 CURRENT
007F64	0000 9680	10255		DC	EXER1S	BUFFER 2 START
007F68	0000 977C	10256		DC	EXER1E	BUFFER 2 END
007F6C	0000 9780	10257		DC	EXER1N	BUFFER 2 CURRENT
007F70	0000 0000	10258		DC	F'0'	SELCH ADDRESS
		10259		ENDC	
		10260	*		
		10261	*		
		10262	*		
007F74		10263		IFNZ	MAN
		10265	*		

DDB'S AND BUFFERS

```
                              10266  * MAM DDB
                              10267  *
007F74                        10268          ALIGN  4
007F74    0000                10269  MAMDDB   DC     X'0'         DSPCHFLAGS,PRIORITY
007F76    0000                10270          DC     X'0'         PHASE
007F78    9020                10271          DC     X'9020'      PARM TYPE
007F7A    0100                10272          DC     X'0100'      DEVICE TYPE
007F7C    0000                10273          DC     H'0'         ADDRESS
007F7E    0000                10274          DC     H'0'         STATUS
007F80    0000 5020           10275          DC     A(MAMPTR)    DRIVER ENTRY
007F84    0007 FF80           10276          DC     Y'7FF80'     MAX WAIT COUNT
007F88    0000 0000           10277          DC     F'0'         CURRENT WAIT COUNT
007F8C    0000 0000           10278          DC     F'0'         ERROR COUNT
007F90    0000 0000           10279          DC     F'0'         MAX DISPATCH COUNT
007F94    0000 0000           10280          DC     F'0'         CURRENT DISPATCH COUNT
007F98    0000 4E14           10281          DC     A(MAMCK)     PARM CHECK SUBROUTINE
007F9C    0000 0000           10282          DC     F'0'
                              10283          ENDC
007FA0                        10284          IFNZ   QSA


                              10286  *
                              10287  *COMMUNICATION DDB'S QSA,DSA,PASLA (BISYNC) AND QSA (ZBID)
                              10288  *
007FA0                        10289          ALIGN  4
          0000 7FA0           10290  QSADD01  EQU    *            TRANSMITTER PARAMETERS
007FA0    0000                10291          DC     X'0'         DSPCHFLGS,PRIORITY
007FA2    0000                10292          DC     X'0'         PHASE
007FA4    8040                10293          DC     X'8040'      PARM TYPE
007FA6    0000                10294          DC     X'0000'      DEVICE TYPE
007FA8    0000                10295          DC     H'0'         ADDRESS
007FAA    0000                10296          DC     H'0'         STATUS
007FAC    0000 652C           10297          DC     A(QSAPTR)    DRIVER ENTRY
007FB0    0007 FF80           10298          DC     Y'7FF80'     MAX WAIT COUNT
007FB4    0000 0000           10299          DC     F'0'         CURRENT WAIT COUNT
007FB8    0000 0000           10300          DC     F'0'         ERROR COUNT
007FBC    0000 0000           10301          DC     F'0'         MAX DISPATCH COUNT
007FC0    0000 0000           10302          DC     F'0'         CURRENT DISPATCH COUNT
007FC4    0000 6C70           10303          DC     A(CKQSA)     PARM CHECK SUBROUTINE
007FC8    0000 0000           10304          DC     F'0'         DRIVER WORK 1
007FCC    0000 0000           10305          DC     F'0'         DRIVER WORK 2


          0000 7FD0           10307  QSADD01A EQU    *            RECEIVER PARAMETERS
007FD0    0000                10308          DC     X'0'         DSPCHFLGS,PRIORITY
007FD2    0000                10309          DC     X'0'         PHASE
007FD4    8000                10310          DC     X'8000'      PARM TYPE
007FD6    0008                10311          DC     X'0008'      DEVICE TYPE
007FD8    0000                10312          DC     H'0'         ADDRESS
007FDA    0000                10313          DC     H'0'         STATUS
007FDC    0000 7FF4           10314          DC     A(QS01RB0)   BUFFER 0 START
007FE0    0000 8079           10315          DC     A(QS01RB0E)  BUFFER 0 END
007FE4    0000 7FF4           10316          DC     A(QS01RB0)   BUFFER 0 NEXT
```

DDB'S AND BUFFERS

```
007FE8      0000 807C          10317              DC      A(QS01RB1)          BUFFER 1 START
007FEC      0000 8101          10318              DC      A(QS01RB1E)         BUFFER 1 END
007FF0      0000 807C          10319              DC      A(QS01RB1)          BUFFER 1 NEXT
007FF4                         10320              ALIGN   4
007FF4                         10321   QS01RB0    DS      134                 BUFFER 0
            0000 8079          10322   QS01RB0E   EQU     *-1
00807C                         10323              ALIGN   4
00807C                         10324   QS01RB1    DS      134                 BUFFER 1
            0000 8101          10325   QS01RB1E   EQU     *-1
                               10326   *
                               10327   *
                               10328   *
008104                         10329              ALIGN   4
            0000 8104          10330   QSADD02    EQU     *                   TRANSMITTER PARAMETERS
008104      0000               10331              DC      X'0'                DSPCHFLGS,PRIORITY
008106      0000               10332              DC      X'0'                PHASE
008108      8040               10333              DC      X'8040'             PARM TYPE
00810A      0000               10334              DC      X'0000'             DEVICE TYPE
00810C      0000               10335              DC      H'0'                ADDRESS
00810E      0000               10336              DC      H'0'                STATUS
008110      0000 652C          10337              DC      A(QSAPTR)           DRIVER ENTRY
008114      0007 FF80          10338              DC      Y'7FF80'            MAX WAIT COUNT
008118      0000 0000          10339              DC      F'0'                CURRENT WAIT COUNT
00811C      0000 0000          10340              DC      F'0'                ERROR COUNT
008120      0000 0000          10341              DC      F'0'                MAX DISPATCH COUNT
008124      0000 0000          10342              DC      F'0'                CURRENT DISPATCH COUNT
008128      0000 6C70          10343              DC      A(CKQSA)            PARM CHECK SUBROUTINE
00812C      0000 0000          10344              DC      F'0'                DRIVER WORK 1
008130      0000 0000          10345              DC      F'0'                DRIVER WORK 2


            0000 8134          10347   QSADD02A   EQU     *                   RECEIVER PARAMETERS
008134      0000               10348              DC      X'0'                DSPCHFLGS,PRIORITY
008136      0000               10349              DC      X'0'                PHASE
008138      8000               10350              DC      X'8000'             PARM TYPE
00813A      0008               10351              DC      X'0008'             DEVICE TYPE
00813C      0000               10352              DC      H'0'                ADDRESS
00813E      0000               10353              DC      H'0'                STATUS
008140      0000 8158          10354              DC      A(QS02RB0)          BUFFER 0 START
008144      0000 81DD          10355              DC      A(QS02RB0E)         BUFFER 0 END
008148      0000 8158          10356              DC      A(QS02RB0)          BUFFER 0 NEXT
00814C      0000 81E0          10357              DC      A(QS02RB1)          BUFFER 1 START
008150      0000 8265          10358              DC      A(QS02RB1E)         BUFFER 1 END
008154      0000 81E0          10359              DC      A(QS02RB1)          BUFFER 1 NEXT
008158                         10360              ALIGN   4
008158                         10361   QS02RB0    DS      134                 BUFFER 0
            0000 81DD          10362   QS02RB0E   EQU     *-1
0081E0                         10363              ALIGN   4
0081E0                         10364   QS02RB1    DS      134                 BUFFER 1
            0000 8265          10365   QS02RB1E   EQU     *-1
                               10366   *
                               10367   *
                               10368   *
```

DDB'S AND BUFFERS

```
008268                          10369           ALIGN  4
              0000 8268         10370 QSADD03   EQU    *           TRANSMITTER PARAMETERS
008268        0000              10371           DC     X'0'        DSPCHFLGS,PRIORITY
00826A        0000              10372           DC     X'0'        PHASE
00826C        8040              10373           DC     X'8040'     PARM TYPE
00826E        0000              10374           DC     X'0000'     DEVICE TYPE
008270        0000              10375           DC     H'0'        ADDRESS
008272        0000              10376           DC     H'0'        STATUS
008274        0000 652C         10377           DC     A(QSAPTR)   DRIVER ENTRY
008278        0007 FF80         10378           DC     Y'7FF80'    MAX WAIT COUNT
00827C        0000 0000         10379           DC     F'0'        CURRENT WAIT COUNT
008280        0000 0000         10380           DC     F'0'        ERROR COUNT
008284        0000 0000         10381           DC     F'0'        MAX DISPATCH COUNT
008288        0000 0000         10382           DC     F'0'        CURRENT DISPATCH COUNT
00828C        0000 6C70         10383           DC     A(CKQSA)    PARM CHECK SUBROUTINE
008290        0000 0000         10384           DC     F'0'        DRIVER WORK 1
008294        0000 0000         10385           DC     F'0'        DRIVER WORK 2


              0000 8298         10387 QSADD03A  EQU    *           RECEIVER PARAMETERS
008298        0000              10388           DC     X'0'        DSPCHFLGS,PRIORITY
00829A        0000              10389           DC     X'0'        PHASE
00829C        8000              10390           DC     X'8000'     PARM TYPE
00829E        0008              10391           DC     X'0008'     DEVICE TYPE
0082A0        0000              10392           DC     H'0'        ADDRESS
0082A2        0000              10393           DC     H'0'        STATUS
0082A4        0000 82BC         10394           DC     A(QS03RB0)  BUFFER 0 START
0082A8        0000 8341         10395           DC     A(QS03RB0E) BUFFER 0 END
0082AC        0000 82BC         10396           DC     A(QS03RB0)  BUFFER 0 NEXT
0082B0        0000 8344         10397           DC     A(QS03RB1)  BUFFER 1 START
0082B4        0000 83C9         10398           DC     A(QS03RB1E) BUFFER 1 END
0082B8        0000 8344         10399           DC     A(QS03RB1)  BUFFER 1 NEXT
0082BC                          10400           ALIGN  4
0082BC                          10401 QS03RB0   DS     134         BUFFER 0
              0000 8341         10402 QS03RB0E  EQU    *-1
008344                          10403           ALIGN  4
008344                          10404 QS03RB1   DS     134         BUFFER 1
              0000 83C9         10405 QS03RB1E  EQU    *-1
                                10406 *
                                10407 *
                                10408 *
0083CC                          10409           ALIGN  4
              0000 83CC         10410 QSADD04   EQU    *           TRANSMITTER PARAMETERS
0083CC        0000              10411           DC     X'0'        DSPCHFLGS,PRIORITY
0083CE        0000              10412           DC     X'0'        PHASE
0083D0        8040              10413           DC     X'8040'     PARM TYPE
0083D2        0000              10414           DC     X'0000'     DEVICE TYPE
0083D4        0000              10415           DC     H'0'        ADDRESS
0083D6        0000              10416           DC     H'0'        STATUS
0083D8        0000 652C         10417           DC     A(QSAPTR)   DRIVER ENTRY
0083DC        0007 FF80         10418           DC     Y'7FF80'    MAX WAIT COUNT
0083E0        0000 0000         10419           DC     F'0'        CURRENT WAIT COUNT
0083E4        0000 0000         10420           DC     F'0'        ERROR COUNT
```

DDB'S AND BUFFERS

0083E8	0000 0000		10421		DC	F'0'	MAX DISPATCH COUNT
0083EC	0000 0000		10422		DC	F'0'	CURRENT DISPATCH COUNT
0083F0	0000 6C70		10423		DC	A(CKQSA)	PARM CHECK SUBROUTINE
0083F4	0000 0000		10424		DC	F'0'	DRIVER WORK 1
0083F8	0000 0000		10425		DC	F'0'	DRIVER WORK 2
	0000 83FC		10427	QSADD04A	EQU	*	RECEIVER PARAMETERS
0083FC	0000		10428		DC	X'0'	DSPCHFLGS,PRIORITY
0083FE	0000		10429		DC	X'0'	PHASE
008400	8000		10430		DC	X'8000'	PARM TYPE
008402	0008		10431		DC	X'0008'	DEVICE TYPE
008404	0000		10432		DC	H'0'	ADDRESS
008406	0000		10433		DC	H'0'	STATUS
008408	0000 8420		10434		DC	A(QSO4RB0)	BUFFER 0 START
00840C	0000 84A5		10435		DC	A(QSO4RB0E)	BUFFER 0 END
008410	0000 8420		10436		DC	A(QSO4RB0)	BUFFER 0 NEXT
008414	0000 84A8		10437		DC	A(QSO4RB1)	BUFFER 1 START
008418	0000 852D		10438		DC	A(QSO4RB1E)	BUFFER 1 END
00841C	0000 84A8		10439		DC	A(QSO4RB1)	BUFFER 1 NEXT
008420			10440		ALIGN	4	
008420			10441	QSO4RB0	DS	134	BUFFER 0
	0000 84A5		10442	QSO4RB0E	EQU	*-1	
0084A8			10443		ALIGN	4	
0084A8			10444	QSO4RB1	DS	134	BUFFER 1
	0000 852D		10445	QSO4RB1E	EQU	*-1	
			10446	*			
			10447	*			
			10448	*			
008530			10449		ALIGN	4	
	0000 8530		10450	QSADD05	EQU	*	TRANSMITTER PARAMETERS
008530	0000		10451		DC	X'0'	DSPCHFLGS,PRIORITY
008532	0000		10452		DC	X'0'	PHASE
008534	8040		10453		DC	X'8040'	PARM TYPE
008536	0000		10454		DC	X'0000'	DEVICE TYPE
008538	0000		10455		DC	H'0'	ADDRESS
00853A	0000		10456		DC	H'0'	STATUS
00853C	0000 652C		10457		DC	A(QSAPTR)	DRIVER ENTRY
008540	0007 FF80		10458		DC	Y'7FF80'	MAX WAIT COUNT
008544	0000 0000		10459		DC	F'0'	CURRENT WAIT COUNT
008548	0000 0000		10460		DC	F'0'	ERROR COUNT
00854C	0000 0000		10461		DC	F'0'	MAX DISPATCH COUNT
008550	0000 0000		10462		DC	F'0'	CURRENT DISPATCH COUNT
008554	0000 6C70		10463		DC	A(CKQSA)	PARM CHECK SUBROUTINE
008558	0000 0000		10464		DC	F'0'	DRIVER WORK 1
00855C	0000 0000		10465		DC	F'0'	DRIVER WORK 2
	0000 8560		10467	QSADD05A	EQU	*	RECEIVER PARAMETERS
008560	0000		10468		DC	X'0'	DSPCHFLGS,PRIORITY
008562	0000		10469		DC	X'0'	PHASE
008564	8000		10470		DC	X'8000'	PARM TYPE
008566	0008		10471		DC	X'0008'	DEVICE TYPE

DDB'S AND BUFFERS

```
008568      0000                  10472             DC    H'0'              ADDRESS
00656A      0000                  10473             DC    H'0'              STATUS
00856C      0000 8584             10474             DC    A(QS05RB0)        BUFFER 0 START
008570      0000 8609             10475             DC    A(QS05RB0E)       BUFFER 0 END
008574      0000 8584             10476             DC    A(QS05RB0)        BUFFER 0 NEXT
008578      0000 860C             10477             DC    A(QS05RB1)        BUFFER 1 START
00857C      0000 8691             10478             DC    A(QS05RB1E)       BUFFER 1 END
008580      0000 860C             10479             DC    A(QS05RB1)        BUFFER 1 NEXT
008584                            10480             ALIGN 4
008584                            10481   QS05RB0   DS    134               BUFFER 0
            0000 8609             10482   QS05RB0E  EQU   *-1
00860C                            10483             ALIGN 4
00860C                            10484   QS05RB1   DS    134               BUFFER 1
            0000 8691             10485   QS05RB1E  EQU   *-1
                                  10486   *
                                  10487   *
                                  10488   *
008694                            10489             ALIGN 4
            0000 8694             10490   QSADD06   EQU   *                 TRANSMITTER PARAMETERS
008694      0000                  10491             DC    X'0'              DSPCHFLGS,PRIORITY
008696      0000                  10492             DC    X'0'              PHASE
008698      8040                  10493             DC    X'8040'           PARM TYPE
00869A      0000                  10494             DC    X'0000'           DEVICE TYPE
00869C      0000                  10495             DC    H'0'              ADDRESS
00869E      0000                  10496             DC    H'0'              STATUS
0086A0      0000 652C             10497             DC    A(QSAPTR)         DRIVER ENTRY
0086A4      0007 FF80             10498             DC    Y'7FF80'          MAX WAIT COUNT
0086A8      0000 0000             10499             DC    F'0'              CURRENT WAIT COUNT
0086AC      0000 0000             10500             DC    F'0'              ERROR COUNT
0086B0      0000 0000             10501             DC    F'0'              MAX DISPATCH COUNT
0086B4      0000 0000             10502             DC    F'0'              CURRENT DISPATCH COUNT
0086B8      0000 6C70             10503             DC    A(CKQSA)          PARM CHECK SUBROUTINE
0086BC      0000 0000             10504             DC    F'0'              DRIVER WORK 1
0086C0      0000 0000             10505             DC    F'0'              DRIVER WORK 2


            0000 86C4             10507   QSADD06A  EQU   *                 RECEIVER PARAMETERS
0086C4      0000                  10508             DC    X'0'              DSPCHFLGS,PRIORITY
0086C6      0000                  10509             DC    X'0'              PHASE
0086C8      8000                  10510             DC    X'8000'           PARM TYPE
0086CA      0008                  10511             DC    X'0008'           DEVICE TYPE
0086CC      0000                  10512             DC    H'0'              ADDRESS
0086CE      0000                  10513             DC    H'0'              STATUS
0086D0      0000 86E8             10514             DC    A(QS06RB0)        BUFFER 0 START
0086D4      0000 876D             10515             DC    A(QS06RB0E)       BUFFER 0 END
0086D8      0000 86E8             10516             DC    A(QS06RB0)        BUFFER 0 NEXT
0086DC      0000 8770             10517             DC    A(QS06RB1)        BUFFER 1 START
0086E0      0000 87F5             10518             DC    A(QS06RB1E)       BUFFER 1 END
0086E4      0000 8770             10519             DC    A(QS06RB1)        BUFFER 1 NEXT
0086E8                            10520             ALIGN 4
0086E8                            10521   QS06RB0   DS    134               BUFFER 0
            0000 876D             10522   QS06RB0E  EQU   *-1
008770                            10523             ALIGN 4
```

DDB'S AND BUFFERS

008770		10524	QSC6RB1	DS	134	BUFFER 1
	0000 87F5	10525	QSO6RB1E	EQU	*-1	
		10526	*			
		10527	*			
		10528	*			
0087F8		10529		ALIGN	4	
	0000 87F8	10530	QSADD07	EQU	*	TRANSMITTER PARAMETERS
0087F8	0000	10531		DC	X'0'	DSPCHFLGS,PRIORITY
0087FA	0000	10532		DC	X'0'	PHASE
0087FC	8040	10533		DC	X'8040'	PARM TYPE
0087FE	0000	10534		DC	X'0000'	DEVICE TYPE
008800	0000	10535		DC	H'0'	ADDRESS
008802	0000	10536		DC	H'0'	STATUS
008804	0000 652C	10537		DC	A(QSAPTR)	DRIVER ENTRY
008808	0007 FF80	10538		DC	Y'7FF80'	MAX WAIT COUNT
00880C	0000 0000	10539		DC	F'0'	CURRENT WAIT COUNT
008810	0000 0000	10540		DC	F'0'	ERROR COUNT
008814	0000 0000	10541		DC	F'0'	MAX DISPATCH COUNT
008818	0000 0000	10542		DC	F'0'	CURRENT DISPATCH COUNT
00881C	0000 6C70	10543		DC	A(CKQSA)	PARM CHECK SUBROUTINE
008820	0000 0000	10544		DC	F'0'	DRIVER WORK 1
008824	0000 0000	10545		DC	F'0'	DRIVER WORK 2
	0000 8828	10547	QSADD07A	EQU	*	RECEIVER PARAMETERS
008828	0000	10548		DC	X'0'	DSPCHFLGS,PRIORITY
00882A	0000	10549		DC	X'0'	PHASE
00882C	8000	10550		DC	X'8000'	PARM TYPE
00882E	0008	10551		DC	X'0008'	DEVICE TYPE
008830	0000	10552		DC	H'0'	ADDRESS
008832	0000	10553		DC	H'0'	STATUS
008834	0000 884C	10554		DC	A(QS07RB0)	BUFFER 0 START
008838	0000 88D1	10555		DC	A(QS07RB0E)	BUFFER 0 END
00883C	0000 884C	10556		DC	A(QS07RB0)	BUFFER 0 NEXT
008840	0000 88D4	10557		DC	A(QS07RB1)	BUFFER 1 START
008844	0000 8959	10558		DC	A(QS07RB1E)	BUFFER 1 END
008848	0000 88D4	10559		DC	A(QS07RB1)	BUFFER 1 NEXT
00884C		10560		ALIGN	4	
00884C		10561	QS07RB0	DS	134	BUFFER 0
	0000 88D1	10562	QS07RB0E	EQU	*-1	
0088D4		10563		ALIGN	4	
0088D4		10564	QS07RB1	DS	134	BUFFER 1
	0000 8959	10565	QS07RB1E	EQU	*-1	
		10566	*			
		10567	*			
		10568	*			
00895C		10569		ALIGN	4	
	0000 895C	10570	QSADD08	EQU	*	TRANSMITTER PARAMETERS
00895C	0000	10571		DC	X'0'	DSPCHFLGS,PRIORITY
00895E	0000	10572		DC	X'0'	PHASE
008960	8040	10573		DC	X'8040'	PARM TYPE
008962	0000	10574		DC	X'0000'	DEVICE TYPE
008964	0000	10575		DC	H'0'	ADDRESS

DDB'S AND BUFFERS

008966	0000	10576		DC	H'0'	STATUS
008968	0000 652C	10577		DC	A(QSAPTR)	DRIVER ENTRY
00896C	0007 FF80	10578		DC	Y'7FF80'	MAX WAIT COUNT
008970	0000 0000	10579		DC	F'0'	CURRENT WAIT COUNT
008974	0000 0000	10580		DC	F'0'	ERROR COUNT
008978	0000 0000	10581		DC	F'0'	MAX DISPATCH COUNT
00897C	0000 0000	10582		DC	F'0'	CURRENT DISPATCH COUNT
008980	0000 5C70	10583		DC	A(CKQSA)	PARM CHECK SUBROUTINE
008984	0000 0000	10584		DC	F'0'	DRIVER WORK 1
008988	0000 0000	10585		DC	F'0'	DRIVER WORK 2
	0000 898C	10587	QSADD08A	EQU	*	RECEIVER PARAMETERS
00898C	0000	10588		DC	X'0'	DSPCHFLGS,PRIORITY
00898E	0000	10589		DC	X'0'	PHASE
008990	8000	10590		DC	X'8000'	PARM TYPE
008992	0008	10591		DC	X'0008'	DEVICE TYPE
008994	0000	10592		DC	H'0'	ADDRESS
008996	0000	10593		DC	H'0'	STATUS
008998	0000 89B0	10594		DC	A(QS08RB0)	BUFFER 0 START
00899C	0000 8A35	10595		DC	A(QS08RB0E)	BUFFER 0 END
0089A0	0000 89B0	10596		DC	A(QS08RB0)	BUFFER 0 NEXT
0089A4	0000 8A38	10597		DC	A(QS08RB1)	BUFFER 1 START
0089A8	0000 8ABD	10598		DC	A(QS08RB1E)	BUFFER 1 END
0089AC	0000 8A38	10599		DC	A(QS08RB1)	BUFFER 1 NEXT
0089B0		10600		ALIGN	4	
0089B0		10601	QS08RB0	DS	134	BUFFER 0
	0000 8A35	10602	QS08RB0E	EQU	*-1	
008A38		10603		ALIGN	4	
008A38		10604	QS08RB1	DS	134	BUFFER 1
	0000 8ABD	10605	QS08RB1E	EQU	*-1	
008AC0		10606		ALIGN	4	
		10607		ENDC		
008AC0	0001 0203	10609	DATAPTRN	DCY	00010203,04050607,08090A0B,0C0D0E0F
008AC4	0405 0607					
008AC8	0809 0A0B					
008ACC	0C0D 0E0F					
008AD0	1011 1213	10610		DCY	10111213,14151617,18191A1B,1C1D1E1F
008AD4	1415 1617					
008AD8	1819 1A1B					
008ADC	1C1D 1E1F					
008AE0	2021 2223	10611		DCY	20212223,24252627,28292A2B,2C2D2E2F
008AE4	2425 2627					
008AE8	2829 2A2B					
008AEC	2C2D 2E2F					
008AF0	3031 3233	10612		DCY	30313233,34353637,38393A3B,3C3D3E3F
008AF4	3435 3637					
008AF8	3839 3A3B					
008AFC	3C3D 3E3F					
008B00	4041 4243	10613		DCY	40414243,44454647,48494A4B,4C4D4E4F
008B04	4445 4647					

DDB'S AND BUFFERS

```
008B08      4849 4A4B
008B0C      4C4D 4E4F
008B10      5051 5253         10614          DCY     50515253,54555657,58595A5B,5C5D5E5F
008B14      5455 5657
008B18      5859 5A5B
008B1C      5C5D 5E5F
008B20      6061 6263         10615          DCY     60616263,64656667,68696A6B,6C6D6E6F
008B24      6465 6667
008B28      6869 6A6B
008B2C      6C6D 6E6F
008B30      7071 7273         10616          DCY     70717273,74757677,78797A7B,7C7D7E7F
008B34      7475 7677
008B38      7879 7A7B
008B3C      7C7D 7E7F
008B40      8081 8283         10617          DCY     80818283,84858687,88898A8B,8C8D8E8F
008B44      8485 8687
008B48      8889 8A8B
008B4C      8C8D 8E8F
008B50      9091 9293         10618          DCY     90919293,94959697,98999A9B,9C9D9E9F
008B54      9495 9697
008B58      9899 9A9B
008B5C      9C9D 9E9F
008B60      A0A1 A2A3         10619          DCY     A0A1A2A3,A4A5A6A7,A8A9AAAB,ACADAEAF
008B64      A4A5 A6A7
008B68      A8A9 AAAB
008B6C      ACAD AEAF
008B70      B0B1 B2B3         10620          DCY     B0B1B2B3,B4B5B6B7,B8B9BABB,BCBDBEBF
008B74      B4B5 B6B7
008B78      B8B9 BABB
008B7C      BCBD BEBF
008B80      C0C1 C2C3         10621          DCY     C0C1C2C3,C4C5C6C7,C8C9CACB,CCCDCECF
008B84      C4C5 C6C7
008B88      C8C9 CACB
008B8C      CCCD CECF
008B90      D0D1 D2D3         10622          DCY     D0D1D2D3,D4D5D6D7,D8D9DADB,DCDDDEDF
008B94      D4D5 D6D7
008B98      D8D9 DADB
008B9C      DCDD DEDF
008BA0      E0E1 E2E3         10623          DCY     E0E1E2E3,E4E5E6E7,E8E9EAEB,ECEDEEEF
008BA4      E4E5 E6E7
008BA8      E8E9 EAEB
008BAC      ECED EEEF
008BB0      F0F1 F2F3         10624          DCY     F0F1F2F3,F4F5F6F7,F8F9FAFB,FCFDFEFF
008BB4      F4F5 F6F7
008BB8      F8F9 FAFB
008BBC      FCFD FEFF
            0000 8BBF         10625  DPTRNEND EQU     *-1
                              10626  *    MEMORY TEST DDB
                              10627  *
008BC0                        10628          ALIGN  4
008BC0      0000 0000         10629  MEMDDB  DC      F'0'         DSPCHFLGS,PRIORITY,PHASE
008BC4      0880              10630          DC      X'0880'      PARM FLAGS
008BC6      4000              10631          DC      X'4000'      DEVICE TYPE
```

DDB'S AND BUFFERS

008BC8	0000	10632		DC	H'0',H'0'	ADDRESS, STATUS
008BCA	0000					
008BCC	0000 6FD8	10633		DC	A(BEFPTR)	DRIVER ENTRY
008BD0	0000 0000	10634		DC	F'0'	MAX WAIT COUNT
008BD4	0000 0000	10635		DC	F'0'	CURRENT WAIT COUNT
008BD8	0000 0000	10636		DC	F'0'	ERROR COUNT
008BDC	0000 0000	10637		DC	F'0'	MAX DISPATCH
008BE0	0000 0000	10638		DC	F'0'	CURRNET DISPATCH
008BE4	0000 70DA	10639		DC	A(CKMEM)	PARM CHECK
008BE8	0000 0000	10640		DC	F'0'	DRIVER WORK 1
008BEC	0000 0000	10541		DC	F'0'	DRIVER WORK 2
008BF0	0000 9580	10642		DC	EXEROS	MEM LOW LIMIT
008BF4	0000 967C	10543		DC	EXEROE	MEM HIGH LIMIT
008BF8	0000 967C	10644		DC	EXEROE	
008BFC	0000 9680	10545		DC	EXER1S	
008C00	0000 977C	10546		DC	EXER1E	
008C04	0000 9780	10547		DC	EXER1N	
	0000 8C07	10648	LNZB	EQU	*-1	LAST NON ZERO BYTE
008C08		10649	PATCH	DS	256	PATCH SPACE
	0000 8D80	10650	PSTSTART	EQU	PATCH+383&Y'FFFF80'	
	0000 8D80	10651	PST	EQU	PSTSTART	
	0000 957F	10552	PSTEND	EQU	PSTSTART+2047	
	0000 9580	10553	EXEREND	EQU	PSTEND+1	FIRST MEMORY AVAILABLE FOR TESTING

SYMBOL TABLE

008D08   10555   END

SYMBOL TABLE & CROSS REFERENCE LIST

ASSEMBLED BY CAL/32 03-338R00-00

START OPTIONS: T=32,ERLST

    NO CAL ERRORS
    NO CAL WARNINGS
    7 PASSES

    TABLE SPACE USED :   37K   DISC SECTORS :   0

ABACK	0000 1968	1479	1488*									
ABORT	0000 0CE4	553*	655	668	1816	1864	1884	1919	1963	2106	2165	5099
ABSTOP	0000 8D08											
ACL1L1	0000 6F3A	8986	8988*									
ACLDDB	0000 7538	2981	9448*									
ACLPH0	0000 6F08	8964	8969*									
ACLPH1	0000 6F26	8965	8981*									
ACLPTR	0000 6F00	8964*	9452									
ACMNDEND	0000 35BC	834	2954*									
ACMNDTBL	0000 34F4	832	2923*									
ACTIVITE	0000 3C3F	3527	3548*									
ACTIVITY	0000 3C26	496	3526	3547*	4560	4566						
ADC	0000 0004											
ADDSLCH	0000 0BF8	465*	467									
AFLT1	0000 1D8A	1827	1833*									
AFLT2	0000 1D94	1829	1834	1838*								
AFLT3	0000 1D9A	1840*	1848									
AFLT4	0000 1D9E	1839	1843*									
AFLT5	0000 1DB0	1846	1849*									
AFLT6	0000 1DB6	1851*	1856									
AFLT7	0000 1DC0	1850	1855*									
AFLT9	0000 1DC6	1844	1852	1857*								
APSSTD	0000 3C40	1634	1635	1656	1658	1685	1709	1733	1754	1775	1796	3523	3524
		3549*										
ARITH	0000 1652	1220	1230*									
ARITH1	0000 165E	1233	1235*									
ARITHFLT	0000 1D7E	342	1827*									
BACKCHND	0000 43AC	2952	4336*									
BACKGRND	0000 1588	1085	1164*									
BADSTAT	0000 0003	267*	763	2145	3337	3538	4439	4618	5135	5429	5464	5488	5499
		6747	7149	7642	7867	8257	8358	8586	8654	9084		
BCKSWTCH	0000 0003	283*	472	1164	4336							
BKSAVE	0000 2448	1277	1278	1280	1288	1299	1303	1314	1366	1367	1369	1377	1378
		1456	1458	1460	1463	1465	1471	1472	2599*			
BLINK	0000 45A0	1248	1336	1489	1620	4556*	6790	7423	7655	7780	7952	8212	8222
		8275	8309	8973	9018	9157						
BLINKY	0000 45AA	1080	1081	1082	1083	3467	3468	4557	4559*			
BLINKYSV	0000 347C	2845*	4556	4567								
BSTAT00	0000 44C0	4444	4452*									
BSTAT1	0000 44D2	4460*										
BSTATER0	0000 448E	4435*	8072	8077								
BSTATERR	0000 44CA	4441	4447	4451	4458*	5024	5071	5252	5357	6168	6250	6260	6743
		6765	6924	7145	7179	7402	7445	7479	7545	7636	7856	8083	8090

SYMBOL TABLE & CROSS REFERENCE LIST

```
                                8365    8668    8820    8893    8936
BUF0CNT    0000 0002    253*    2007    5983    6056    6086    6186
BUF0EADR   0000 0004    254*    2006    5980    6053    6183
BUF1CNT    0000 000A    256*
BUF1EADR   0000 000C    257*
BUF1END    0000 0034    207*    1056    1998    3408    4737    4750    5979    6302    5926    7230    7460    7677
                        8841    9041
BUF1NEXT   0000 0038    209*    1057    1991    3406    4736    4749    6275    6296    5301    8823    8837    8840
                        9020    9026    9029    9040
BUF1STRT   0000 003C    205*    1055    3405    3528    3537    4592    4715    4735    4748    5981    6274    6893
                        7219    7457    7665    8822    9019    9089    9103
BUF2END    0000 0040    211*    3384    3391    3419    4614    4642    4724    4746    4794    4799    4831    6052
                        6083    6192    6337    6382    7013    7310    7525    7707    8899    8914    9093    9105
BUF2NEXT   0000 0044    212*    3385    3393    3417    4640    4722    4743    4790    4798    4833    6343    6378
                        6381    8897    8913    8918
BUF2STRT   0000 003C    210*    3416    3531    4593    4639    4742    4789    4797    6054    6084    6184    6335
                        6341    6995    7299    7522    7696    8896
BUFAREA    0000 2748    537    2696*
BUFBIT     0000 000C    273*
BUFCL0     0000 4658    4636    4639*
BUFCL1     0000 4668    4644*   4545
BUFCLEAR   0000 4648    4634*   7509
BUFLEN     0000 0014    113*    539    568    2697
BUFNEXT    0000 481C    3221    3398    3421    4184    4670    4688    4705    4729    4787    4806    4810    4814*
BUFPOOL    0000 265C    533    534    535    538    1058    2035    2096    2153    2695*
BUFSIZE    0000 34D4    2882*   3400    3411    4086    4169    4671    4726    4732    4744    4788    4792    4807
BUSY       0000 0001    265*    625    759    1101    3335    4437    5017    5139    5340    5997    6127    6292
                        6321    6360    6386    6816    7486    7502    7554    7681    7711    7802    7847    7865
                        8255    8490    8572    8582    8846    8857    8930    8988    9045
CARDRDR    0000 0001    52*    2971    8873    9235
CASBKSPC   0000 3441    2786*
CASCLEAR   0000 343E    2783*
CASEOF     0000 343F    2784*
CASREAD    0000 3442    2787*
CASREWND   0000 3443    2788*
CASSETTE   0000 0000    61*    2984    4991    6423    9488
CASTYP     0000 000D    294*
CASWRT     0000 3440    2785*
CBLINK1    0000 45BE    4562    4565*
CBLINK2    0000 45C2    4564    4566*
CCB        0000 0016    248*    260
CCB1ADR    0000 0048    213*    2002    5978
CCB2ADR    0000 0064    233*    6181
CCNT       0000 34DE    2886*   4050    5726    5737    8401    8434    8676    8746    8748
CCNT1      0000 4170    4048    4050*
CCNTCMND   0000 4152    2944    4045*
CCW        0000 0000    250*    5987    6045    6058    6088    6172    6188
CCWFLGS    0000 0001    252*    5993    6122    6191
CELL.CNT   0000 30D8    2705*   3587    3606    3608    3619
CHCKBIT    0000 000B    272*
CHECK      0000 0008    255*
CK40L1     0000 5D4A    7097    7100*
CK40L2     0000 5D58    7101    7104*
```

SYMBOL TABLE & CROSS REFERENCE LIST

```
CK40L3    0000 5D66      7105     7108*
CK80      0000 63D6      7811     7814*
CKACL     0000 6F4C      8997*    9458
CKCRD     0000 6EF0      8951*    9250
CKDSC     0000 5D0E      7076*    9707     9739     9771     9803
CKDSC1    0000 5D1C      7077     7080*
CKDSC2    0000 5D2A      7081     7084*
CKDSC3    0000 5D38      7085     7088*
CKDSC40   0000 5D3C      7096*    9839     9871     9903     9935     9971     10003    10035    10067
CKFMD     0000 61C2      7584*    10101    10129    10156    10183
CKFMD1    0000 61E2      7591     7594*
CKFMD2    0000 61EC      7595     7597*
CKFMD3    0000 6202      7599     7603*
CKINT8    0000 63C6      7809*    10215
CKLNP     0000 6E20      8866*    9359     9380
CKMAG     0000 5FB8      7358*    9603     9628     9653     9678
CKMAG1    0000 5FCC      7361     7364*
CKMEM     0000 70DA      9176*    10639
CKMEM1    0000 70E8      9178     9180*
CKMEM2    0000 70FA      9182     9185*
CKPIC     0000 6FC6      9051*    9475
CKPTRP    0000 595C      6405*    9431
CKPTRP1   0000 596A      6406     6409*
CKPTRP2   0000 5984      6414     6417*
CKPTRP3   0000 5990      6416     6418     6420*
CKQSA     0000 6C70      8737*    10303    10343    10383    10423    10463    10503    10543    10583
CKQSA0    0000 6C86      8738     8746*
CKQSA01   0000 6CB4      8755     8759*
CKQSA02   0000 6CC2      8760     8764*
CKQSA03   0000 6CD0      8765     8769*
CKQSA04   0000 6CD6      8758     8763     8768     8771*
CKQSA5    0000 6CDC      8773*
CKQSAX    0000 6CF6      8772     8774     8779*
CKQSAZ    0000 6CE2      8775*
CKSLCH    0000 6320      7726*    10249
CKSLCH1   0000 632E      7727     7730*
CKSLCH2   0000 633C      7731     7734*
CKULI     0000 6516      7958*    10232
CLOCK     0000 0001        58*    2980     8958     9443
CM128     0000 34FC      2893*    8348     8410     8416     8443     8451
CM132     0000 34EE      2894*    8425     8459
CM134     0000 34F0      2895*
CMND00    0000 1244       811      814*
CMND01    0000 1274       824      827*
CMND04    0000 1276       826      832*
CMND05    0000 1280       835*     837
CMND06    0000 128C       836      839*
CMND07    0000 1296       838      845*
CMND08    0000 129E       847*     849
CMND09    0000 12B8       848      854*
CMND10    0000 12E0       858      866*
CMND11    0000 12FC       861      873*
CMND12    0000 13DC       983      988*
```

SYMBOL TABLE & CROSS REFERENCE LIST

```
CMNDBUFE  0000 312B        815    2709*
CMNDBUFS  0000 30DC        814    2708*  3529
CMNDERR1  0000 1408       1010    1014*
CMNDERR2  0000 141B       1011    1019*
CMNDPROC  0000 122E        550     807*   841    853    865    869    985    990    994   1017   1022   3427
                          3436
CMNDPSW   0000 0CCC        548     550*
CMNDZ     0000 42BE       4057    4093   4113   4192   4219*
CONCMND   0000 41F6       4034    4107*  4132   4153
COMMONX   0000 34B0       2864*   8026   8027
COMN      0000 0C36        481     494*
COMN0     0000 0C3F        496*    498
COMN2     0000 0C74        517*    520
COMN3     0000 0C9E        525*    526
COMN4     0000 0CB8        538*    541
COMPARE   0000 45CC       4585*   6394   7052   7333   7562   7717   8942
COMPARE0  0000 45DC       4587    4590*
COMPARE1  0000 45EC       4594*   4615
COMPARE2  0000 460E       4599    4604*
COMPARE3  0000 462E       4597    4603   4612*
COMADR    0000 0A12        305*    450
CONCMNDS  0000 0001        106*   2929   3652
CONDDB    0000 25BC        444    1041   2001   2159   2499   2532   2673*  3287   3525
CONDEBUG  0000 0001        109*   2925   3579
CONPRINT  0000 232E        480     490    809    852    864    872    993   1016   1021   2011   2019   2029
                          2036    2105   2498*  3273   3279   3322   3369   3426   3435   3574   3618   3658
                          3692    3710   3748   3911   3966   4005   4016   4227   4236   4241   4250   4276
                          4368    4404   4417   5498   8743   8782
CONPRITY  0000 0A14        306*    447
CONPRNT1  0000 2344       2505*   2507
CONRD21   0000 2388       2543    2545*
CONRD21A  0000 2394       2546    2549*
CONRD22   0000 23A8       2548    2555*
CONREAD   0000 235C        819    2531*
CONREAD1  0000 2368       2534*   2583
CONREAD2  0000 2376       2540*   2554   2563
CONREAD3  0000 23CC       2551    2551   2567*
CONREAD4  0000 23D4       2557    2570*
CONREAD5  0000 23DC       2559    2573*
CONREAD6  0000 23E0       2566    2569   2572   2575*
CONSAV    0000 264C       2498    2510   2531   2585   2586   2692*
CONT1     0000 4BEA       5331*   5335
CONT2     0000 4C22       5351*   5353
CONT3     0000 4C2A       5354*   5370
CONT4     0000 4C4C       5349    5367*
CONTADR   0000 004A        215*    889   3790   5176   5239   5330   6715   6725   6814   6928   7015   7062
                          7080    7083   7100   7103
CONTBL    0000 0A08        301*    454
CONTSET   0000 4B96       5275*   6886   6998
CONTSET1  0000 4BB4       5277    5285*
CONTSTAT  0000 4BF6       5330*   6950   7037
CONTYP    0000 0A10        304*    452   1048   5989
CPUCMND   0000 3C44       2935    3558*
```

SYMBOL TABLE & CROSS REFERENCE LIST

CPUCMD0	0000 3C56	3561	3564*									
CPUCMD1	0000 3C6A	3565	3569	3572*								
CPUCMD2	0000 3C78	3563	3567	3571	3576*							
CPUCMDA	0000 3C60	3560	3568*									
CPUSWTCH	0000 2640	475	1107	2685*	3577							
CPUTABLE	0000 2642	474	2687*	3576								
CRD0L1	0000 6E5A	8890	8893*									
CRD0L2	0000 6E60	8892	8896*									
CRD0L3	0000 6E70	8901*	8902									
CRD1L1	0000 6EA4	8915	8920*									
CRD1L2	0000 6EC6	8912	8929*									
CRD1L3	0000 6EDE	8934	8937*									
CRDBUF	0000 7278	9256	9258	9341*								
CRDBUFE	0000 7317	9257	9342*									
CRDCLEAR	0000 3462	2819*	8886									
CRDDATA	0000 71D8	9253	9255	9259*								
CRDDATAE	0000 7277	9254	9340*									
CRDDDB	0000 7190	2972	9240*									
CRDFEED	0000 3463	2820*	8904									
CRDPH0	0000 6E40	8879	8885*									
CRDPH1	0000 6E84	8880	8910*									
CRDPH2	0000 6EE4	8881	8942*									
CRDPTR	0000 6E34	8879*	9244									
CRTBLINK	0000 45AE	4558	4560*									
CURDSPCE	0000 0020	200*	1131	1134	3346							
CURWAIT	0000 0014	197*	1108	1109	1126	5132	6286	6314	6354	8373	8834	8982
CYLCUR	0000 0058	222*	229	5198	5213	5278	5293	6757	6772	6786		
CYLHIGH	0000 004E	217*	230	923	3832	6782						
CYLLOW	0000 004C	216*	228	918	3827	6756	6784					
D40CYL	0000 345F	2816*	5214									
D40HEAD	0000 3460	2817*	5210									
D40READ	0000 345D	2814*	5200	5285	6823							
D40RESD	0000 345E	2815*	5206									
DATAPTRN	0000 8AC0	9434	9436	10104	10106	10132	10134	10159	10161	10186	10188	10609*
DDB	0000 007A	184*	235									
DDBADR	0000 0004	127*	444	446	449	451	455	465	517	518	519	610	614
		617	621	623	626	629	631	631	632	633	659	672	705
		709	718	728	740	742	746	751	760	762	764	767	772
		776	855	877	882	889	896	904	911	918	923	930	935
		942	947	954	956	964	971	973	980	1041	1043	1055	1056
		1057	1065	1084	1084	1089	1093	1096	1099	1102	1105	1108	1109
		1110	1116	1118	1126	1128	1131	1132	1134	1138	1142	1144	1154
		1155	1410	1410	1431	1431	1809	1809	1857	1857	1877	1877	1928
		1928	1985	1986	1989	1991	1992	1998	2001	2002	2004	2060	2062
		2064	2139	2139	2142	2144	2146	2159	2401	2422	2451	2463	2469
		2499	2500	2502	2532	2533	2535	2576	3210	3211	3212	3217	3228
		3231	3234	3236	3237	3265	3287	3288	3290	3294	3295	3298	3301
		3307	3310	3318	3326	3328	3330	3334	3336	3338	3340	3342	3344
		3346	3347	3350	3353	3355	3357	3360	3376	3379	3381	3384	3386
		3391	3393	3405	3406	3408	3416	3417	3419	3438	3441	3445	3450
		3456	3460	3525	3528	3531	3534	3537	3539	3541	3669	3673	3675
		3680	3687	3703	3736	3740	3743	3750	3779	3781	3788	3790	3797
		3799	3806	3808	3816	3818	3825	3827	3832	3839	3841	3846	3853

SYMBOL TABLE & CROSS REFERENCE LIST

3855	3860	3867	3869	3874	3882	3884	3891	3893	3898	4436	4438
4440	4443	4446	4479	4480	4483	4484	4507	4538	4585	4590	4591
4592	4593	4614	4617	4619	4634	4639	4640	4642	4664	4720	4735
4736	4737	4738	4742	4743	4746	4748	4749	4750	4755	4758	4789
4790	4794	4797	4798	4799	4831	4833	4870	4872	4900	4903	4923
5012	5018	5019	5057	5062	5066	5068	5073	5100	5122	5141	5176
5179	5182	5184	5186	5190	5194	5196	5198	5209	5213	5217	5237
5239	5241	5243	5246	5276	5278	5279	5281	5291	5293	5302	5305
5307	5330	5336	5341	5348	5350	5359	5388	5617	5643	5647	5649
5652	5654	5657	5707	5710	5724	5730	5735	5741	5930	5974	5976
5978	5979	5981	5988	5998	6010	6018	6028	6049	6051	6052	6054
6065	6082	6083	6084	6124	6128	6139	6149	6160	6162	6177	6180
6181	6182	6184	6201	6219	6221	6240	6242	6244	6248	6252	6254
6258	6262	6267	6269	6272	6274	6275	6277	6286	6287	6291	6293
6296	6298	6301	6302	6305	6308	6314	6315	6320	6322	6328	6330
6333	6335	6337	6341	6343	6345	6354	6355	6359	6361	6365	6370
6377	6378	6381	6382	6387	6389	6396	6405	6408	6410	6412	6415
6419	6713	6715	6720	6724	6725	6732	6737	6746	6748	6750	6753
6756	6757	6758	6759	6760	6764	6770	6771	6772	6774	6776
6778	6780	6782	6784	6786	6787	6788	6789	6792	6799	6801	6815
6817	6820	6824	6833	6845	6847	6859	6869	6872	6883	6902	6906
6910	6912	6914	6915	6916	6918	6919	6923	6926	6928	6930	6936
6938	6952	6965	6977	6995	7013	7015	7017	7023	7025	7039	7050
7055	7060	7062	7069	7076	7079	7080	7083	7084	7087	7096	7099
7100	7103	7104	7107	7134	7137	7139	7143	7148	7150	7152	7157
7159	7161	7163	7167	7171	7174	7182	7193	7205	7207	7210	7212
7215	7217	7219	7230	7232	7242	7253	7255	7257	7259	7262	7274
7285	7287	7289	7291	7294	7296	7298	7299	7310	7312	7322	7336
7347	7358	7360	7363	7364	7367	7393	7396	7399	7406	7408	7409
7410	7416	7418	7420	7421	7422	7425	7432	7439	7447	7452	7453
7457	7460	7463	7471	7480	7485	7487	7496	7498	7501	7503	7511
7517	7518	7522	7525	7536	7547	7553	7555	7564	7590	7593	7594
7596	7597	7601	7602	7604	7607	7630	7631	7634	7641	7643	7645
7650	7651	7657	7660	7665	7677	7680	7682	7687	7688	7693	7695
7696	7707	7710	7712	7720	7726	7729	7730	7733	7759	7760	7762
7769	7770	7772	7775	7791	7797	7799	7801	7803	7810	7813	7841
7844	7846	7848	7850	7858	7866	7868	7871	7878	7879	7881	7892
7896	7899	7905	7911	7914	7916	7928	7935	7936	7938	7942	7945
7950	7959	7962	7989	7990	7992	7996	8000	8050	8057	8064	8082
8089	8100	8101	8105	8112	8115	8116	8121	8125	8129	8146	8152
8158	8160	8164	8168	8186	8193	8194	8197	8201	8205	8254	8256
8258	8260	8335	8341	8345	8357	8359	8364	8373	8376	8393	8398
8400	8431	8433	8466	8468	8469	8470	8475	8477	8478	8479	8485
8498	8491	8493	8498	8509	8514	8520	8522	8524	8534	8540	8542
8543	8561	8563	8566	8568	8575	8583	8585	8587	8606	8607
8609	8613	8617	8655	8661	8665	8678	8681	8685	8689	8700	8706
8713	8749	8751	8757	8762	8767	8770	8771	8773	8815	8817	8822
8823	8834	8837	8840	8841	8844	8847	8851	8856	8858	8861	8867
8870	8885	8888	8896	8897	8899	8910	8913	8914	8918	8931	8937
8944	8952	8955	8969	8971	8982	8983	8985	8989	8992	8998	9001
9014	9016	9019	9020	9025	9026	9029	9040	9041	9044	9046	9052
9055	9085	9087	9089	9090	9092	9093	9096	9103	9105	9146	9155
9159	9165	9167	9171	9177	9179	9180	9181	9184			

SYMBOL TABLE & CROSS REFERENCE LIST

Symbol	Addr											
DDBLKUP	0000 28D8	522	610	705	718	2703*	3290	3304	3332	3334	5066	5130	5345
		6124	6910	6938	7025								
DDBLKUPE	0000 30D6	524	2704*										
DEV	0000 0002	121*	606	608	638	638	641	645	650	662	683	697	698
		703	714	715	716	742	785	1077	1078	1079	1080	1081	1082
		1083	1194	1195	1197	1198	1199	1200	1205	1206	1215	1216	1494
		1506	1510	1542	1546	1578	1581	1596	1597	1616	1617	1625	1992
		1993	1996	2500	2533	4461	4485	4590	4607	4981	4983	5016	5063
		5064	5065	5066	5067	5075	5077	5091	5182	5188	5189	5198	5200
		5203	5206	5209	5210	5213	5214	5217	5241	5242	5278	5285	5307
		5330	5331	5333	5342	5344	5345	5346	5542	5578	5609	5750	5930
		5931	5932	5988	5992	5994	5995	5999	6000	6002	6004	6009	6010
		6012	6017	6018	6020	6021	6036	6039	6059	6072	6075	6089	6090
		6092	6120	6121	6123	6124	6125	6129	6131	6136	6137	6138	6139
		6141	6146	6147	6148	6149	6151	6152	6154	6160	6167	6175	6178
		6192	6192	6193	6205	6211	6213	6240	6246	6247	6256	6257	6267
		6294	6297	6323	6328	6362	6364	6385	6405	6407	6408	6732	6733
		6736	6755	6818	6823	6885	6907	6908	6909	6910	6911	6916	6917
		6919	6928	6932	6937	6938	6997	7015	7019	7024	7025	7076	7078
		7079	7096	7098	7099	7134	7135	7141	7142	7161	7162	7169	7170
		7178	7210	7211	7232	7257	7258	7289	7290	7312	7345	7348	7350
		7362	7363	7393	7394	7397	7398	7434	7436	7450	7452	7454	7455
		7458	7474	7475	7495	7498	7499	7517	7519	7520	7523	7536	7537
		7550	7551	7604	7606	7607	7630	7633	7650	7656	7663	7664	7687
		7690	7691	7692	7769	7776	7777	7778	7784	7792	7796	7797	7810
		7812	7813	7814	7841	7851	7852	7855	7869	7878	7879	7880	7896
		7889	7903	7911	7914	7915	7922	7925	7935	7936	7937	7959	8070
		8071	8076	8080	8086	8087	8112	8158	8342	8343	8352	8393	8466
		8468	8475	8477	8509	8593	8594	8666	8700	8771	8815	8816	8828
		8838	8845	8859	8867	8869	8870	8885	8886	8887	8916	8923	8929
		8952	8954	8955	8969	8990	8998	9000	9001	9014	9025	9027	9033
		9038	9052	9054	9055								
DEV2DDB	0000 35C4	845	2965*	3660	3684	3742							
DEV2DDBE	0000 37BC	846	3165*	3686	3732								
DEVADR	0000 0008	192*	451	882	1116	1142	1992	2064	2500	2533	3212	3243	3245
		3250	3265	3288	3295	3318	3328	3355	3673	3781	4590	5088	5182
		5241	5350	5359	5643	5647	5930	5988	6160	6240	6267	6328	6405
		6408	6732	6799	6845	6916	7076	7079	7096	7099	7134	7161	7210
		7232	7257	7289	7312	7360	7363	7393	7432	7517	7536	7604	7607
		7630	7650	7687	7730	7733	7769	7810	7813	7841	7878	7911	7959
		7962	8815	8867	8870	8885	8952	8955	8969	8998	9001	9014	9025
		9052	9055										
DEVCNTL1	0000 0006	268*	750	771	3440	4537	5056	5121	5183	5275	5347	5387	6243
		6329	6409	6819	6901	6929	7016	8334	8363	8487			
DEVCNTL2	0000 0007	269*	1042	2003	5304	5975	6048	6176	6220	6253	6268	6411	6752
DFLOAT	0000 178C	1246	1293	1321	1331*								
DFLTTEST	0000 1732	1344*	1389	1838	1855								
DFR10	0000 000A	156*	1373	1374	1379	1400							
DFR12	0000 000C	157*											
DFR14	0000 000E	158*	1369	1398									
DFR2	0000 0002	152*	1337	1339	1340	1344	1347	1349	1350	1354	1356	1394	1396
		1398	1400	1405									
DFR4	0000 0004	153*	1338	1339	1343	1344	1348	1349	1353	1355	1356	1394	

SYMBOL TABLE & CROSS REFERENCE LIST

DFR6	0000 0006	154*	1360	1361	1362	1365	1366	1367	1396		
DFR8	0000 0008	155*									
DFTCMND	0000 43A8	2953	4331*								
DFTSWTCH	0000 0004	284*	1331	4331							
DISABLE	0000 3432	570	2771*	7851							
DISARM	0000 3434	2773*	5016	6729	6733	6879	6991	7178	8845	8859	8929 8990 9038
DISCS	0000 0004	70*	3008	3010	3012	3014	5154	6676	7071	9592	9724 9756 9788
DISPATCH	0000 1428	552	1040*	1097	1100	1106	1111	1121	1147	1152	5936
DPAT1	0000 3490	1453	1473	1483	2903*						
DPTRNEND	0000 8BBF	9435	10105	10133	10160	10187	10625*				
DRIVER	0000 157A	1066	1151	1154*	2506	2509	2540	2577	2579	2581	3542
DSA	0000 0008	97*	3092	3094	3096	3098	3100	3102	3104	3106	
DSA4L00	0000 6818	8198	8272*								
DSA4L01	0000 683C	8282*	8286								
DSA4L02	0000 685C	8291	8295*								
DSA4L0A	0000 682C	8273	8278*								
DSA4L2	0000 684E	8289*	8293								
DSADRW	0000 3446	2791*	8280	8292							
DSADSRR	0000 3445	2790*	8278								
DSAERW	0000 3448	2793*	8296								
DSAESRR	0000 3447	2792*	8288								
DSAIDLE	0000 3444	2789*	8031	8033	8625	8625					
DSATYP	0000 0009	290*	4899	7991	8124	8163	8196	8608	8761		
DSC00L1	0000 5A4A	6742	6745*	6766							
DSC00L2	0000 5A68	6754	6756*								
DSC00L3	0000 5A82	6741	6763*								
DSC00L4	0000 5A44	6739	6743*								
DSC01L1	0000 5AC2	6783	6786*								
DSC01L2	0000 5AC6	6779	6787*								
DSC01L3	0000 5ACA	6775	6788*								
DSC03L1	0000 5B1A	6821	6823*								
DSC04NXT	0000 5B36	6832	6835*								
DSC07NXT	0000 5B68	6858	6861*								
DSC08L1	0000 5B7C	6870	6874*								
DSC09L1	0000 5C1E	6931	6935*								
DSC09L2	0000 5C0A	6925	6928*								
DSC09L3	0000 5C02	6921	6926*								
DSC09L4	0000 5BC4	6903	6906*								
DSC0ANXT	0000 5C3A	6951	6954*								
DSC0DNXT	0000 5C4E	6964	6967*								
DSC10NXT	0000 5C60	6976	6979*								
DSC12L1	0000 5CB6	7018	7022*								
DSC13NXT	0000 5CD2	7038	7041*								
DSCDDB1	0000 76DC	3009	9697*								
DSCDDB2	0000 773C	3011	9729*								
DSCDDB3	0000 779C	3013	9761*								
DSCDDB4	0000 77FC	3015	9793*								
DSCDDBA	0000 785C	3021	9829*								
DSCDDBB	0000 78BC	3023	9861*								
DSCDDBC	0000 791C	3025	9893*								
DSCDDBD	0000 797C	3027	9925*								
DSCPH00	0000 59EC	6688	6713*								
DSCPH01	0000 5A90	6689	6770*								

SYMBOL TABLE & CROSS REFERENCE LIST

```
DSCPH02    0000 5AE0      6690    6797*
DSCPH03    0000 5B00      6691    6811*
DSCPH04    0000 5B28      6692    6831*
DSCPH05    0000 5B3A      6693    6843*
DSCPH06    0000 5B00      6694    6912*
DSCPH07    0000 5B5A      6695    6857*
DSCPH08    0000 5B6C      6696    6869*
DSCPH09    0000 5BB6      6697    6901*
DSCPH0A    0000 5C2C      6698    6934    6950*
DSCPH0B    0000 5AE0      6699    6798*
DSCPH0C    0000 5B00      6700    6813*
DSCPH0D    0000 5C40      6701    6963*
DSCPH0E    0000 5B3A      6702    6844*
DSCPH0F    0000 5B00      6703    6814*
DSCPH10    0000 5C52      6704    6975*
DSCPH11    0000 5C64      6705    6987*
DSCPH12    0000 5C9A      6706    7013*
DSCPH13    0000 5CC4      6707    7021    7037*
DSCPH14    0000 5CD8      6708    7050*
DSCPH14A   0000 5CE2      7051    7053*
DSCPH15    0000 5CEE      6709    7060*
DSCPTR     0000 5994      6688*   9701    9733    9765    9797    9833    9865    9897    9929    9965    9997    10029
                          10061
DSCREAD    0000 345B      2812*   6999
DSCRESET   0000 345C      2813*   6726    7067
DSCSEEK    0000 3459      2810*   6849
DSCWRT     0000 345A      2811*   6887
DSK40MB    0000 0004        73*   3020    3022    3024    3026    5154    6676    7091    9824    9856    9888    9920
DSPCH001   0000 144C      1047    1053*
DSPCH01    0000 147A      1044    1051    1071*
DSPCH02    0000 14A8      1084*
DSPCH03    0000 14AE      1073    1089*
DSPCH03A   0000 14CC      1094    1098*
DSPCH04    0000 1522      1103    1125*
DSPCH05    0000 1572      1129    1133    1135    1151*
DSPCHCNT   0000 268C      1078    2693*   3469
DSPCHER    0000 0CDC       552*   1622    3470    3477    3544
DSPFLGS    0000 0000       186*    446     518     519     623     626     751     760     764     772    1043    1099
                          1102    1105    1128    1138    2004    2144    2146    3336    3338    3340    3379    3441
                          3539    4439    4440    4480    4483    4507    4538    4617    4619    5018    5057    5073
                          5122    5134    5136    5138    5140    5184    5196    5246    5276    5305    5341    5348
                          5388    5976    5998    6049    6128    6177    6221    6244    6254    6269    6293    6322
                          6330    6361    6387    6410    6412    6415    6419    6748    6750    6753    6817    6820
                          6902    6914    6930    7017    7150    7152    7167    7408    7487    7503    7555    7643
                          7645    7682    7712    7803    7848    7850    7866    7868    8255    8258    8260    8335
                          8341    8359    8364    8488    8491    8573    8583    8587    8655    8847    8858    8931
                          8989    9046    9085    9087
DSPLYINC   0000 3465      1079    2822*
DSPLYMOD   0000 3464      2821*
DST        0000 21E8       457    1074    2057    2373*   2378    2379    2419    2453    3214    3291    3464    3664
                          3727    4708
DSTADD     0000 227C       466     988    2395*
DSTADD1    0000 228C      2398    2401*
```

SYMBOL TABLE & CROSS REFERENCE LIST

```
DSTCMND    0000 3E2A     2930   3727*
DSTCMND1   0000 3E40     3733*  3741   3749   3912
DSTCMND2   0000 3E60     3743*  3745
DSTCMND3   0000 3E66     3745*  3759   3764   3768
DSTCMND4   0000 3E7A     3744   3750*
DSTCMND5   0000 3EA0     3756   3760*
DSTCMND6   0000 3EB0     3761   3765*
DSTCMNDZ   0000 3EBE     3752   3758   3763   3766   3770*
DSTEND     0000 2264     2376*  2397
DSTFIND    0000 2298      856   2418*
DSTFIND1   0000 22A6     2422*  2424
DSTFIND2   0000 22B2     2423   2426*
DSTLAST    0000 2264      460   1072   2059   2378*  2395   2402   2421   2449   2460   3216   3667   3734
                         4710
DSTNEXT    0000 2268      458   1071   1075   1091   2379*  3465   3665   3666   3671   3728   3733   3738
DSTPRM0    0000 3ED0     3778*
DSTPRM1    0000 3EE8     3780   3787*
DSTPRM2    0000 3F00     3789   3796*
DSTPRM3    0000 3F18     3798   3805*
DSTPRM4    0000 3F32     3807   3815*
DSTPRM5    0000 3F4A     3817   3824*
DSTPRM6    0000 3F74     3826   3838*
DSTPRM7    0000 3F9E     3840   3852*
DSTPRM8    0000 3FC8     3854   3866*
DSTPRM9    0000 3FF2     3868   3881*
DSTPRMA    0000 400A     3883   3890*
DSTPRMG    0000 4034     3892   3904*
DSTREM1    0000 22E0     2457*  2459
DSTREM2    0000 22EC     2454   2456   2460*
DSTREM3    0000 2304     2452   2464   2468*
DSTREM4    0000 2324     2467   2470   2478*
DSTREMOV   0000 22C0      866   2446*
DSTSAV12   0000 226C     2380*  2418   2427   2446   2479
DSTSAV15   0000 2278     2381*  2426   2428   2478
DTYPFLGS   0000 0006      191*   617    629    672    728    740    767    776   1093   2062   2463   2469
                         3228   3231   3234   3298   3301   3307   3326   3344   3350   3353   3360   3376
                         3381   3438   3456   3675   3680   3740   3750   4443   4446   4585   4634   4664
                         4712   4738   4755   4872   4900   5617   7992   7996   8000   8121   8125   8129
                         8160   8164   8168   8197   8201   8205   8376   8485   8493   8609   8613   8617
                         8678   8706   8749   8751   8757   8762   8767   8770
DUMMY      0000 0FE8      509    570*
DVRENTRY   0000 000C      195*   455    631    633   1154   3534   5141
DVRWRK1    0000 0028      202*   231    232   1989   5019   5724   5735   6277   6298   6308   6345   6365
                         6370   6377   6789   7137   7157   7182   7205   7217   7255   7285   7296   7358
                         7422   7759   7770   7772   7791   7799   7844   7879   7881   7892   7896   7899
                         7914   7916   7928   7935   7936   7938   7942   7945   8100   8468   8469   8477
                         8478   8520   8522   8540   8542   8681   8971   8983   8985   9155   9165   9167
DVRWRK2    0000 002C      203*   746   1096   3310   4903   4923   5730   5741   7396   7453   7463   7471
                         7518   7547   7760   7775   7797   8101   8398   8400   8431   8433   8514   8524
                         8534   8543   8561   8563   8566   8568   8686
EDFLOAT0   0000 184A     1357   1394*
EDFLOAT1   0000 184E     1363   1368   1396*
EDFLOAT3   0000 1852     1370   1398*
```

SYMBOL TABLE & CROSS REFERENCE LIST

```
EDFLOAT4   0000 1856      1375   1337   1400*
EDFLOATX   0000 1828      1345   1351*
EDFLOATZ   0000 1858      1341   1351   1395   1397   1399   1402*
EFLOAT0    0000 171C      1254   1295*
EFLOAT1    0000 1722      1274   1297*
EFLOAT2    0000 172A      1300*
EFLOAT3    0000 1730      1281   1302*
EFLOAT4    0000 1738      1286   1292   1305*
EFLOAT5    0000 173E      1263   1307*
EFLOAT6    0000 1744      1269   1309*
EFLOAT7    0000 174C      1279   1313*
EFLOATX    0000 176E      1257   1322*
EFLOATZ    0000 1752      1249   1315*
EIGHTINT   0000 0001        82*  3055   7740   10202
EINDEX0    0000 1946      1474   1473*
EINDEX1    0000 194C      1476   1480*
ENABLE     0000 3435      2774*  7195   7234   7314   8825   8975   9033
ENTRFLAG   0000 0A18       310*   323    484    1894   1897
ERR1MESE   0000 3201      1015   2726*
ERR1MESS   0000 31E6      1014   2725*
ERR2MESE   0000 3217      1020   2728*
ERR2MESS   0000 3202      1019   2727*
ERR3MESE   0000 3237       851   2730*
ERR3MESS   0000 3218       850   2729*
ERR4MESE   0000 324F       863   2732*
ERR4MESS   0000 3238       862   2731*
ERR5MESE   0000 326B       871   2734*
ERR5MESS   0000 3250       870   2733*
ERR6MESE   0000 328D       992   2736*
ERR6MESS   0000 326C       991   2735*
ERR7MESE   0000 32A7      2104   2738*
ERR7MESS   0000 328E      2103   2737*
ERR8MESE   0000 32BB      2018   2740*
ERR8MESS   0000 32A8      2017   2739*
ERR9MESE   0000 32DB      2027   2742*
ERR9MESS   0000 32BC      2026   2741*
ERRAMESE   0000 3309      2745*  3272
ERRAMESS   0000 32DC      2743*  3255
ERRBMESE   0000 3321      2747*  3278
ERRBMESS   0000 330A      2746*  3277
ERRCMESE   0000 3337      2749*  3321
ERRCMESS   0000 3322      2748*  3315
ERRCMND    0000 3D58      2931   3655*
ERRCMND1   0000 3D7A      3666*  3675   3711
ERRCMND2   0000 3DB6      3676   3681   3684*
ERRCMND3   0000 3DC0      3687*  3689
ERRCMND4   0000 3DDE      3688   3695*
ERRCMND5   0000 3DE2      3683   3694   3696*
ERRDMESE   0000 3347      2751*  3369   5497
ERRDMESS   0000 3338      2750*  3363   5492
ERREMESE   0000 336B      2753*  3691   3747
ERREMESS   0000 3348      2752*  3690   3746
ERRENQ     0000 2034       654    657    687    788   1120   1146   1177   1192   1212   1228   1242   1320
```

SYMBOL TABLE & CROSS REFERENCE LIST

```
                              1329   1391   1406   1426   1447   1486   1525   1537   1561   1573   1612   1651
                              1674   1703   1727   1748   1769   1790   1815   1863   1883   1953   1962   2139*
                              4463   4611   4988   5096   5524   6042   6078   6215   7894   7930   8598   8696
                              8927   9136   9142
ERRENQ00   0000 204C          2140   2148*
ERRENQ01   0000 205A          2147   2150   2153*
ERRENQ02   0000 205E          2152   2154*
ERRENQ03   0000 2C74          2155   2158   2160   2165*
ERRFMESE   0000 338B          2755*  3573
ERRFMESS   0000 336C          2754*  3572
ERRGET     0000 1FFC           648    660    681    783   1113   1139   1170   1186   1202   1221   1235   1315
                              1322   1384   1402   1417   1438   1480   1519   1529   1555   1565   1606   1645
                              1668   1697   1721   1742   1763   1784   1810   1858   1878   1947   1955   1970
                              2093*  4458   4604   4979   5086   5515   5519   6033   6069   6208   7887   7923
                              8591   8692   8920   9130   9138
ERRGET01   0000 2028          2097   2110*
ERRGET02   0000 2030          2098   2116*
ERRGMESE   0000 339D          2757*  3434   8742
ERRGMESS   0000 338C          2756*  3433   8741
ERRHMESE   0000 33BD          2759*  8781
ERRHMESS   0000 339E          2758*  8780
ERRJMESE   0000 33CF          2761*  3425   4235
ERRJMESS   0000 33B6          2760*  3424   4234
ERRKMESE   0000 33EF          2763*  4240
ERRKMESS   0000 33D0          2762*  4239
ERRLMESE   0000 3411          2767*  4415
ERRLMESS   0000 33F2          2766*  4415
ERRMMESE   0000 3431          2769*  4403
ERRMMESS   0000 3412          2768*  4402
ERRORCNT   0000 0018           198*  2142   3347   3703
ERRORQ     0000 2690           530    531    532   1046   1907   2031   2151   2694*
ERRSUM     0000 31D4          2723*  3656
ERRSUME    0000 31E5          2724*  3657
EXASAVE1   0000 3D4C          3648*
EXASAVE2   0000 3D50          3649*
EXASAVE3   0000 3D54          3603   3617   3622   3650*
EXECBIT    0000 0008           271*  5044   6171
EXER0E     0000 967C          2899*  9607   9608   9632   9633   9657   9658   9682   9683   9711   9712   9743
                              9744   9775   9776   9807   9808   9843   9844   9875   9876   9907   9908   9939
                              9940   9975   9976  10007  10008  10039  10040  10071  10072  10253  10254  10643
                             10644
EXER0S     0000 9580          2898*  9606   9631   9656   9681   9710   9742   9774   9806   9842   9874   9906
                              9938   9974  10006  10038  10070  10252  10642
EXER1E     0000 977C          2901*  9610   9635   9660   9685   9714   9746   9778   9810   9846   9878   9910
                              9942   9978  10010  10042  10074  10256  10646
EXER1N     0000 9780          2902*  9611   9636   9661   9686   9715   9747   9779   9811   9847   9879   9911
                              9943   9979  10011  10043  10075  10257  10647
EXER1S     0000 9680          2900*  9609   9634   9659   9684   9713   9745   9777   9809   9845   9877   9909
                              9941   9977  10009  10041  10073  10255  10645
EXEREND    0000 9580          2665   2881   2898   2899   2900   2901   2902   3220   3403   3414   4073   4166
                              4174   4194   4232   4814  10653*
FASTBIT    0000 000F           276*
FDM1BUF    0000 73B6         10107  10109  10114*
```

SYMBOL TABLE & CROSS REFERENCE LIST

FDM1BUFE	0000 7C35	10108	10115*						
FDM2BUF	0000 7C92	10135	10137	10141*					
FDM2BUFE	0000 7D11	10136	10142*						
FDM3BUF	0000 7D6E	10162	10164	10168*					
FDM3BUFE	0000 7DED	10163	10169*						
FDM4BUF	0000 7E4A	10189	10191	10195*					
FDM4BUFE	0000 7EC9	10190	10196*						
FILESET	0000 4AD0	5176*	6798	6844	6876	6988			
FILESET1	0000 4AF8	5185	5189*						
FILESET2	0000 4B0C	5192	5196*						
FILESET3	0000 4B18	5197	5200*						
FILESTA1	0000 4B78	5247	5250*						
FILESTA2	0000 4B7C	5249	5251*						
FILESTAT	0000 4B4E	5237*	6831	6857	6963	6975			
FILL	0000 0AEA	369*	370						
FIXTEST	0000 1656	1232*	1240	1828	1845				
FLAG3200	0000 0A16	307*	313	333	350	388	1843	1935	3715
FLOAT	0000 167C	1234	1244*						
FLOAT1	0000 16A2	1255*							
FLOPPY	0000 0004	79*	2056	3044	3046	3048	3050	7370	10088 10116 10143 10170
FLOPTYP	0000 0006	287*	616	1092	2061	2468	3306		
FLP0	0000 2410	1260	1262	1307	1348	1350	2592*		
FLP00	0000 2408	1259	1347	2591*					
FLP1	0000 2418	1250	1251	1265	1300	1337	1338	1353	2593*
FLP2	0000 2420	1253	1266	1295	1340	1354	1365	2594*	
FLP3	0000 2428	1255	1276	1343	2595*				
FLP4	0000 2430	1267	1271	1285	1305	1355	1360	1374	2596*
FLP5	0000 2438	1272	1361	2597*					
FLP6	0000 2440	1273	1298	1362	2598*				
FLTCMD	0000 43A4	2951	4325*						
FLTSWTCH	0000 0002	282*	1244	4326					
FLTTEST1	0000 1698	1252*							
FLTTEST2	0000 16A6	1256*	1327	1833	1849				
FMAT01	0000 208E	2189*	2190						
FMAT02	0000 20C8	2199	2209*						
FMAT03	0000 20DE	2211	2217*						
FMAT04	0000 20F4	2219	2225*						
FMAT05	0000 210A	2227	2233*						
FMAT06	0000 2120	2235	2240*						
FMATERR	0000 2078	1054	2034	2183*					
FMDOL1	0000 6020	7401	7405*						
FMDDDB1	0000 7B5C	3045	10091*						
FMDDDB2	0000 7C38	3047	10119*						
FMDDDB3	0000 7D14	3049	10146*						
FMDDDB4	0000 7DF0	3051	10173*						
FMDDSTOP	0000 3490	2065	2066	2067	2068	2850*	2903	7397	
FMDP1L1	0000 6046	7419	7421*						
FMDP2L0	0000 6068	7436*	7444						
FMDP2L1	0000 6080	7438	7441	7445*					
FMDP2L2	0000 608C	7443	7450*						
FMDP2L3	0000 60A6	7458*	7461						
FMDP3L0	0000 60D2	7476*	7497						
FMDP3L1	0000 60EA	7485*	7493						

SYMBOL TABLE & CROSS REFERENCE LIST

```
FMDP3L2    0000 60F6      7482   7490*
FMDP3L3    0000 6100      7477   7491   7495*
FMDP5L0    0000 6144      7523*  7526
FMDP6L0    0000 6152      7537*  7542
FMDP6L1    0000 6172      7539   7545*
FMDP6L2    0000 6176      7543   7547*
FMDP7L1    0000 61A2      7565*  7575
FMDP7L2    0000 61BC      7568   7571*
FMDPH0     0000 5FFC      7381   7393*
FMDPH1     0000 6036      7382   7416*
FMDPH2     0000 605A      7383   7432*
FMDPH3     0000 60C2      7384   7471*
FMDPH4     0000 6122      7385   7509*
FMDPH5     0000 6130      7386   7517*
FMDPH6     0000 615E      7387   7536*
FMDPH7     0000 6198      7388   7562*
FMDPTR     0000 5FDC      7381* 10095  10123  10150  10177
FMDREAD    0000 348C      2849*  7519
FMDRESET   0000 3490      2846*
FMDRIVE    0000 3498      619    1095   2476   2477   2852*  3478   3481   7565   7571   7574   7588   7589
FMDSEL     0000 3694      621    3044*
FMDSELS    0000 61B4      3483   7572*
FMDSTOP    0000 3488      2848*  3311   7464   7472   7528   7548
FMDWRT     0000 3484      2847*  7454
FORFAULT   0000 1EFC      371    1969*
FOXS       0000 34EA      2892*  8011   8230   8279   8301   8642
FR10       0000 000A      147*
FR12       0000 000C      148*   1280   1302
FR14       0000 000E      149*
FR2        0000 0002      143*   1250   1252   1253   1256   1259   1261   1262   1266   1268   1276   1277
                          1284   1285   1290   1297   1302   1309   1310   1313   1319
FR4        0000 0004      144*   1251   1252   1255   1256   1260   1261   1265   1267   1268   1278   1295
                          1298   1300   1303   1305   1307   1310   1311   1313   1314   1318
FR6        0000 0006      145*   1271   1272   1273   1297   1309   1311
FR8        0000 0008      146*
FSTC       0000 34E0      2887*  4131   4868
FSTCCMND   0000 420E      2945   4129*
FSTS       0000 34E2      2888*  4152   4588   4637   4753
FSTSCMND   0000 421E      2946   4150*
FULLWRD    0000 0A36      314    322*
HALTCMD1   0000 3E26      3716   3719*
HALTCMND   0000 3E1A      2938   3715*
HEADCUR    0000 005A      223*   5186   5209   5217   5279   5291   5307   6759   6771   6787
HEADHIGH   0000 0052      219*   935    3846   6778
HEADLOW    0000 0050      218*   930    3841   6758   6780
HEXASC1    0000 21BC      2356*  2364
HEXASCII   0000 21B4      2195   2203   2207   2215   2223   2231   2239   2352*  3259   3263   3267   3271
                          3320   3367   3596   3602   3700   3705   3783   3792   3801   3811   3820   3829
                          3834   3843   3848   3857   3862   3871   3876   3886   3895   3900   3948   3955
                          3996   4220   4265   4354   5496
HEXATBL    0000 21D6      2361   2365*
HLTCMD     0000 439C      2949   4316*
HLTSWTCH   0000 0000      280*   2156   4316
```

SYMBOL TABLE & CROSS REFERENCE LIST

```
IDMESS      0000 3194        478    2717*   4254    4274
IDMESSE     0000 31BF        479    2720*
IGNORE      0000 0000        264*    516     622    1098    1137    3378    5072    5133    6913
ILG1        0000 159A       1168    1170*
ILLEGAL     0000 1592       1167*   1175    1804
ILLEGINS    0000 1D46        334    1804*
ILLOK       0000 1D74       1805    1807    1818*
IMAGE       0000 34DA       2884*   4208    4770
IMGCMND     0000 42A2       2942    4207*
IMPTOP      0000 0000:I
INDEXRR     0000 18F8       1453*
INDEXRR1    0000 1932       1471*   1475
INIT1A      0000 0A62        329     334*
INIT1B      0000 0AAC        351     353*
INT8ADR     0000 34B4        640    2866*   7814
INT8CLR     0000 3475       2838*   7778
INT8DDB     0000 7ECC       3057   10205*
INT8DSBL    0000 3474       2837*   7776
INT8PH0     0000 634C       7750    7758*
INT8PH1     0000 635E       7751    7769*
INT8PH2     0000 639A       7752    7791*
INT8PTR     0000 6340       7750*  10209
INT8REST    0000 3476       2839*   7796
INTA1       0000 1116        700     703*
INTA2       0000 1190        729     739*
INTA3       0000 11B4        745     750*
INTA33      0000 11BC        743     754*
INTA4       0000 11C4        738     741     756*
INTA5       0000 11CC        747     749     759*
INTA6       0000 11FA        768     775*
INTA7       0000 1208        765     773     777     781*
INTFILL     0000 0C60        510*    511
INTR20      0000 1074        639     642     647*
INTR40      0000 10DA        673     675     680*
INTRLOCK    0000 4510       3486    4504    4518*   5020    5064    5120    5342    5393    5396    5399    5402    6800
                            6818    6877    6908    6989    7183    7218    7264    7297    7451    7499    7551
INTRUPT     0000 0FF8        571     604*   3201    5984    6189
INTRUPT0    0000 1030        618     622*    724     726     731     733     735     737     755     757
INTRUPT1    0000 1050        630     632*
INTRUPT2    0000 105E        611     638*    706     719
INTRUPT3    0000 1098        615     658*    710
INTRUPT4    0000 10C4        624     627     671*    795
INTRUPTA    0000 10FC        607     692*
INTRUPTB    0000 1006        609*    646
INTRUPTM    0000 1004        608*    793
INTRUPTX    0000 1010        612*
IRBUF       0000 000C       2896*   8453    8553    8703
LADC        0000 0002
LASTPIQ     0000 1228        712     790*   4982    8596
LLBACK      0000 34DC       2885*   4033    7988    8195    8506    8605    8675
LLBCMND     0000 4152       2943    4031*
LMTST1      0000 2470       1408    1414    1507    1545    1594    2602*
LMTST2      0000 24B0       1429    1435    1509    1527    1532    1543    1563    1568    2604*
```

SYMBOL TABLE & CROSS REFERENCE LIST

LNPOL1	0000 6DB6	8819	8822*									
LNP1L1	0000 6DF0	8836	8844*									
LNP1L2	0000 6E02	8842	8850*									
LNP1L3	0000 6E04	8849	6851*									
LNPDATA	0000 7390	9362	9364	9383	9385	9387*						
LNPDATAE	0000 73D1	9363	9384	9410*								
LNPDDB1	0000 7318	2975	9349*									
LNPDDB2	0000 7354	2977	9370*									
LNPPH0	0000 6DA0	8809	8815*									
LNPPH1	0000 6DCE	8810	8833*									
LNPPH2	0000 6E0A	8811	8856*									
LNPPTR	0000 6D94	8809*	9353	9374								
LNZB	0000 8C07	10648*										
LOGCMND	0000 43A0	2950	4321*									
LOGSWTCH	0000 0001	281*	470	2148	4321							
LRNCUR	0000 0058	229*	7410	7416	7421	7452	7498					
LRNHIGH	0000 004E	230*	7418	7594	7596	7597	7601					
LRNLOW	0000 004C	228*	7409	7420	7590	7593	7602					
MACADR	0000 34E4	476	1494	1910	1932	2889*	3473	3498	4384	4397	4413	4419
MACBUF	0000 1AB4	1508	1516	1526	1544	1552	1562	1579	1587	1589*	1595	1603	1739
		1760	1781									
MACCMND	0000 440E	2947	4380*									
MACCMND1	0000 4420	4382	4387*									
MACCMND2	0000 442C	4389	4391*									
MACCMND3	0000 4428	4390*	4396									
MACCMND4	0000 443E	4392	4394	4397*								
MACINT	0000 1E70	358	1928*									
MACINT0	0000 1E92	1936	1938*									
MACINT1	0000 1ECF	1946	1954*									
MACINT2	0000 1ED0	1933	1941	1955*								
MACINT3	0000 1ED8	1957*	1972									
MACREGS	0000 24F0	1615	1913	1915	2608*	3500	3502					
MACRETRN	0000 1AB8	1513	1518	1549	1554	1584	1590*	1600	1605	1637	1644	1660	1667
		1687	1696	1713	1720	1735	1741	1756	1762	1777	1783	1940	1943
MACSTAT	0000 1ABC	1515	1551	1586	1591*	1602	1639	1662	1689	1715	1737	1758	1779
		1945	1950									
MACTEST	0000 196E	1166	1494*									
MACTST1	0000 19B8	1516*	1523	1535								
MACTST2	0000 19DE	1512	1526*									
MACTST3	0000 1A0E	1528	1540*									
MACTST4	0000 1A38	1552*	1559	1571								
MACTST5	0000 1A5E	1546	1562*									
MACTST6	0000 1A8E	1564	1576*									
MACTST7	0000 1ABF	1583	1594*									
MACTST8	0000 1ADE	1603*	1610									
MACTST9	0000 1B04	1599	1615*									
MAG0L1	0000 5DCC	7144	7147*									
MAG1L1	0000 5E08	7165	7169*									
MAG1L2	0000 5E1C	7172	7176*									
MAG1L3	0000 5E22	7175	7178*									
MAG1L4	0000 5E2C	7177	7182*									
MAG2NXT	0000 5E4E	7192	7195*									
MAG3L1	0000 5E7E	7213	7217*									

SYMBOL TABLE & CROSS REFERENCE LIST

```
MAG5NIT     0000 5ECA       7241    7244*
MAG6L1      0000 5EF4       7250    7264*
MAG7NIT     0000 5F14       7273    7276*
MAG8L1      0000 5F3E       7292    7296*
MAGANIT     0000 5F8E       7321    7324*
MAGBKSPC    0000 3452       2803*   7266
MAGCLEAR    0000 3450       2801*   7141
MAGDDB1     0000 75AC       2997    9593*
MAGDDB2     0000 75F8       2999    9618*
MAGDDB3     0000 7644       3001    9643*
MAGDDB4     0000 7690       3003    9668*
MAGEOF      0000 344F       2800*   7169
MAGPH0      0000 5DA0       7118    7134*
MAGPH1      0000 5DE0       7119    7157*
MAGPH2      0000 5E40       7120    7191*
MAGPH3      0000 5E54       7121    7204*
MAGPH4      0000 5EA2       7122    7230*
MAGPH5      0000 5EBC       7123    7240*
MAGPH6      0000 5ED0       7124    7253*
MAGPH7      0000 5F06       7125    7272*
MAGPH8      0000 5F1A       7126    7285*
MAGPH9      0000 5F66       7127    7310*
MAGPHA      0000 5F80       7128    7320*
MAGPHB      0000 5F94       4598    7129    7333*
MAGPHC      0000 5FA4       5030    7130    7345*
MAGPHCL1    0000 5FAE       7348*   7350
MAGPTR      0000 5D6C       7118*   9597    9622    9647    9672
MAGREAD     0000 3453       2804*   7302
MAGREWND    0000 3454       2805*   7345
MAGSTAT     0000 4996       5012*   7191    7240    7272    7320
MAGTAPE     0000 0004         67*   2996    2998    3000    3002    4991    7112    9588    9613    9638    9663
MAGWRT      0000 3451       2802*   7222
MALBUF      0000 0FD4        568*   1899
MALF1       0000 1E24       1895    1899*
MALFUNC1    0000 1E6C       1911    1919*
MALFUNCT    0000 1E12        337    1893*
MALPSW      0000 0CD4        551*   3719
MAM         0000 0001         91*    693    2039    3065    3930    3986    5406   10263
MAMADR      0000 34B2        436     606     810    2040    2466    2865*   3431    3931    3987    5422    5449    5545
                            5577    5608    5648    5749    8737
MAMBST1     0000 4D52       5428    5453    5515*   5935
MAMBST2     0000 4D5C       5463    5519*
MAMBSTAT    0000 4D64       5517    5521*
MAMCK       0000 4E14       5642*  10281
MAMCK1      0000 4E22       5644    5646*
MAMCK2      0000 4E3C       5650    5653*
MAMCK3      0000 4E4E       5655    5658*
MAMCLR1     0000 4CE0       5458*   5459
MAMCLR3     0000 4D0C       5471*   5472
MAMCLRAM    0000 4CC2       3373    5449*   5660
MAMDADR     0000 4E64       5430    5465    5489    5500    5666*
MAMDCBAD    0000 4DD0       5608*   8346    8423
MAMDCBBC    0000 4DAA       5577*   8349    8411    8417    8426    8444    8452    8460
```

SYMBOL TABLE & CROSS REFERENCE LIST

```
MAMDCBE    0000 544B      5950*
MAMDCBS    0000 504C      5949*
MAMDDB     0000 7F74      3066    5666   10269*
MAMDKILL   0000 3457      2043    2808*
MAMF1      0000 4D94      5552*   5556
MAMFDA     0000 0028       231*    971    3893    5649    5652
MAMFDADR   0000 5040      5433    5653    5945*
MAMFDCB    0000 4D78      5542*   8150    8184
MAMFSYC    0000 4D16      5426    5487*
MAMFSYZ    0000 4D4A      5491    5502*
MAMID1     0000 4CB8      5435*   5436
MAMIDCB0   0000 503C      5458    5941*
MAMIDLE    0000 4C8A       812    3372    5422*   5659
MAMKILL    0000 3455      2806*   3933    3970    3989    4008    5423    5450    5460
MAMLDA     0000 002A       232*    973    3898    5654    5657
MAMLDADR   0000 5042      5434    5658    5946*
MAMPHO     0000 5024      5928    5930*
MAMPIQEF   0000 5513      5470    5954*
MAMPIQES   0000 544C       699    701     702    2050    2052    2053    3991    5468    5952*
MAMPIQR    0000 3456       697    2807*   5550    5557    5585    5588    5625    5629    5758    5763    5931
MAMPTR     0000 5020      5928*  10275
MAMRAMST   0000 503E      5457    5944*
MAMSAV     0000 5044      5487    5503    5642    5662    5948*
MAMTYP     0000 0007       288*   2462    3352
MAPCMND    0000 43C4      2934    4350*
MAPCMND0   0000 43C6      4351*   4371
MAPCMND1   0000 43CA      4352*   4360
MATCMND    0000 445C      2948    4407*
MATCMND1   0000 445E      4409    4413*
MATCMND2   0000 4486      4414    4420*
MATEND     0000 1D32      1776    1794*
MATEXT     0000 1B10      1618*   1797
MATFLAG    0000 34E6      1625    1930    2890*   3474    3506    4398    4401    4411    4421
MATINT     0000 1EF4      1931    1965*
MATINT0    0000 1E98      1940*   1967
MATTEST    0000 1B1C      1495    1624*
MATTST0    0000 1B44      1641*   1649
MATTST1    0000 1B8E      1664*   1672
MATTST1X   0000 1B6C      1636    1655*
MATTST2    0000 1BEC      1678    1693*   1701
MATTST2X   0000 1BB4      1659    1678*
MATTST3    0000 1C3A      1717*   1725    1746
MATTST3X   0000 1C12      1686    1707*
MATTST4    0000 1C80      1739*
MATTST4X   0000 1C60      1712    1731*
MATTST5    0000 1CC6      1760*   1767
MATTST5X   0000 1CA6      1734    1752*
MATTST6    0000 1D0C      1781*   1788
MATTST6X   0000 1CEC      1755    1773*
MAXDDB     0000 001E       114*
MAXDEV     0000 03FF       115*    508     508    2703    3199
MAXDSPCH   0000 001C       199*    911    1132    3818
MAXWAIT    0000 0010       196*   1110
```

SYMBOL TABLE & CROSS REFERENCE LIST

```
MB00      0000 4688      4671*  4689
MB000     0000 4684      4666   4670*
MB001     0000 46A8      4679   4685*
MB01      0000 46BA      4676   4691*
MB02      0000 46BE      4693*  4701
MB03      0000 46D0      4694   4703*
MB04      0000 46DC      4699   4708*
MB05      0000 46E6      4711*  4717
MB055     0000 46FA      4714   4717*  4721   4725
MB06      0000 4702      4716   4720*
MB07      0000 4722      4718   4732*
MB070     0000 4768      4740   4752*
MB07A     0000 475A      4668   4748*
MB07B     0000 47A0      4760   4770*
MB07C     0000 4786      4757   4762*  4767
MB07D     0000 4798      4765   4767*
MB08      0000 47A8      4774*  4779
MB09      0000 47BA      4777   4779*
MB10      0000 47C0      4771   4782*  4783
MB11      0000 47C8      4754   4759   4768   4780   4785*
MB110     0000 47EE      4786   4797*
MB11A     0000 47FA      4795   4800*
MB12      0000 47FC      4801*  4802
MB13      0000 4804      4747   4803*
MBUF      0000 34D8      2883*  3395   4106   4667   4785   4803
MBUFCLR   0000 4822      4831*  7053   7334   7718   9153
MBUFCWND  0000 41FA      2941   4104*
MDCB1     0000 4062      3936*  3969
MDCB2     0000 4064      3937*  3941
MDCB3     0000 4092      3953*  3961
MDCB4     0000 40C2      3943   3967*
MDCBB1    0000 4DF6      5618   5621*
MDCBB2    0000 4DFA      5620   5622*
MDCBCWND  0000 4052      2936   3930*
MDCBDSR0  0000 4FF0      5892*  8138
MDCBDSR2  0000 4FF2      5893*
MDCBDSR4  0000 4FF4      5894*
MDCBDSR6  0000 4FF6      5895*
MDCBDSR8  0000 4FF8      5896*
MDCBDSRA  0000 4FFA      5897*
MDCBDSRC  0000 4FFC      5898*
MDCBDSRE  0000 4FFE      5899*
MDCBDSX0  0000 4FE0      5882*  8177
MDCBDSX2  0000 4FE2      5883*
MDCBDSX4  0000 4FE4      5884*
MDCBDSX6  0000 4FE6      5885*
MDCBDSX8  0000 4FE8      5886*
MDCBDSXA  0000 4FEA      5887*
MDCBDSXC  0000 4FEC      5888*
MDCBDSXE  0000 4FEE      5889*
MDCBPSR0  0000 4FD0      5870*  8135
MDCBPSR2  0000 4FD2      5871*
MDCBPSR4  0000 4FD4      5872*
```

SYMBOL TABLE & CROSS REFERENCE LIST

```
MDCBPSR6   0000 4FD6        5873*
MDCBPSR8   0000 4FD8        5874*
MDCBPSRA   0000 4FDA        5875*
MDCBPSRC   0000 4FDC        5876*
MDCBPSRE   0000 4FDE        5877*
MDCBPSX0   00C0 4FC0        5860*    8174
MDCBPSX2   0000 4FC2        5861*
MDCBPSX4   0000 4FC4        5862*
MDCBPSX6   0000 4FC6        5863*
MDCBPSX8   0000 4FC8        5864*
MDCBPSXA   0000 4FCA        5865*
MDCBPSXC   0000 4FCC        5866*
MDCBPSXE   0000 4FCE        5867*
MDCBQAR0   0000 4FB0        5848*    8132
MDCBQAR2   0000 4FB2        5849*
MDCBQAR4   0000 4FB4        5850*
MDCBQAR6   0000 4FB6        5851*
MDCBQAR8   0000 4FB8        5852*
MDCBQARA   0000 4FBA        5853*
MDCBQARC   0000 4FBC        5854*
MDCBQARE   0000 4FBE        5855*
MDCBQAX0   0000 4FA0        5838*    8171
MDCBQAX2   0000 4FA2        5839*
MDCBQAX4   0000 4FA4        5840*
MDCBQAX6   0000 4FA6        5841*
MDCBQAX8   0000 4FA8        5842*
MDCBQAXA   0000 4FAA        5843*
MDCBQAXC   0000 4FAC        5844*
MDCBQAXE   0000 4FAE        5845*
MDCBQZR    0000 4E88        5700*    8544
MDCBQZR0   0000 5010        5914*    8141
MDCBQZR2   0000 5012        5915*
MDCBQZR4   0000 5014        5916*
MDCBQZR6   0000 5016        5917*
MDCBQZR8   0000 5018        5918*
MDCBQZRA   0000 501A        5919*
MDCBQZRC   0000 501C        5920*
MDCBQZRE   0000 501E        5921*
MDCBQZX    0000 4E68        5688*    8525
MDCBQZX0   0000 5000        5904*    8180
MDCBQZX2   0000 5002        5905*
MDCBQZX4   0000 5004        5906*
MDCBQZX6   0000 5006        5907*
MDCBQZX8   0000 5008        5908*
MDCBQZXA   0000 500A        5909*
MDCBQZXC   0000 500C        5910*
MDCBQZXE   0000 500E        5911*
MDCBSAVE   0000 40D4        3938     3942    3953    3974*
MDCBZ      0000 40D2        3932     3971*
MEM1L5     0000 7046        9119*    9144
MEM1L6     0000 705A        9123     9126*
MEM1L7     0000 7068        9125     9130*
MEM1L8     0000 7086        9115     9117    9138*
```

SYMBOL TABLE & CROSS REFERENCE LIST

```
MEM1L9      0000 709A        9129    9137    9143*
MEMDDB      0000 8BC0        3164   10629*
MEMHIGH     0000 0034         206*    956    3874    9092    9180    9184
MEMLOW      0000 0030         204*    954    3869    9090    9177    9179    9181
MEMMAP      0000 0038         208*
MEMMAPE     0000 25B0        2661*   2663
MEMPH0      0000 6FE8        9075    9084*
MEMPH1      0000 7014        9076    9103*
MEMPH2      0000 70AA        9077    9153*
MEMPH3      0000 70C2        9078    9165*
MEMPTR      0000 6FD8        9075*  10633
MEMBYMAP    0000 2530         379     391     403     409     415    2629*   2663    4078    4179    4352    4693
MEMSIZE     0000 25B0         386    2663*
MEMSTART    0000 25B4         376     431    2665*   9176
MEMTOP      0000 25B8         428     433    2667*   3401    3412    4071    4172    4675    9183
MNEMONIC    0000 3494        2851*
MOVEBUF     0000 4672        4664*   4706    4730    6875    7204    7653    9088
MPIQ3       0000 40F4        3991*   4006
MPIQ4       0000 4114        3998    4001*
MPIQ5       0000 4118        4000    4002*
MPIQ6       0000 412C        3992    4008*
MPIQCMND    0000 40E6        2937    3985*
MPIQZ       0000 414E        3988    4010    4018*
MQZ1        0000 4EB2        5696    5698    5715*
MQZ10       0000 4EC2        5718    5722*
MQZ11       0000 4EDE        5728    5730*
MQZ2        0000 4EEE        5723    5735*
MQZ22       0000 4F02        5739    5741*
MQZ3        0000 4F1A        5727    5733    5738    5743    5749*
MQZR1       0000 4EA0        5705    5709*
MQZR2       0000 4EA6        5708    5711*
MQZX1       0000 4E82        5694    5697*
MQZY        0000 4F4A        5729    5732    5740    5766*
MQZZ        0000 4F4C        5745    5747    5767*
MSEARCH     0000 4820        4678    4682    4686    4815*
MSIZ0       0000 41B8        4078*   4082
MSIZ1       0000 41CE        4084    4086*
MSIZCMND    0000 418C        2940    4065*
MSCLFLT     0000 3461        2818*   6755
MSMDDB1     0000 79DC        3033    9961*
MSMDDB2     0000 7A3C        3035    9993*
MSMDDB3     0000 7A9C        3037   10025*
MSMDDB4     0000 7AFC        3039   10057*
MSMDISC     0000 0004          76*   3032    3034    3036    3038    5154    9956    9988   10020   10052
MSTART      0000 34D0        2881*   3218    4067    4185    4195    4233    4261    4263    4687
MSTR0       0000 4268        4179*   4183
MSTR1       0000 4296        4165    4194*
MSTRCMND    0000 422E        2939    4163*
MSTRX       0000 42EA        4072    4074    4167    4234*
MSTRX1      0000 42E0        4173    4175    4232*
MSTRXX      0000 42F8        4079    4180    4239*
MEXTPARM    0000 13F6         881     888     895     902     910     917     922     929     934     941     946     953
                              955     963     970     972    1006*   3558    3583    3633    4031    4046    4065    4104
```

SYMBOL TABLE & CROSS REFERENCE LIST

			4129	4150	4163	4207	4387					
NOMAC	0000	1B18	1621*	1626								
NOTCOUNT	0000	0002	266*	1104	1127	2143	3339	4506	4616	5137	6749	7151	7166	7407
			7644	7849	8259	9086							
NULL	0000	3433	2772*	5203	5288								
NXTPRME	0000	1406	1008	1009	1012*								
OLDPSW	0000	0000	118*	678	688	752	789	6046	6060	6093	6173	6194	6222	6295
			6309	6324	6363	6371	6375	6384	6390	6822	6827	6939	6953	7026
			7040	7194	7236	7243	7275	7316	7323	7351	7488	7504	7556	7683
			7713	7804	7872	8404	8412	8418	8427	8437	8447	8455	8461	8472
			8481	8499	8530	8555	8559	8564	8569	8578	8599	8843	8852	8862
			8919	8928	8938	8987	8993	9047						
ONE	0000	0004	162*	6802	6814	6848	6935	7022						
OPENCELL	0000	2638	2682*	3585	3594	3605	3627	3635	3639	3642				
OPNCMND	0000	3C84	2926	3583*										
OPTBUF	0000	317C	2712*	4248										
OPTBUF1	0000	3184	2713*	4249										
OPTBUF2	0000	3188	2715*	4253										
OPTBUF3	0000	318E	2716*	4267										
OPTC1	0000	431E	4255*	4286	4299									
OPTC10	0000	4380	4280	4291*										
OPTC11	0000	4382	4290	4292*										
OPTC12	0000	438C	4294	4296*										
OPTC2	0000	4336	4260	4263*										
OPTC3	0000	433A	4262	4264*										
OPTC4	0000	4344	4268*	4275										
OPTC5	0000	435E	4270	4276*										
OPTC7	0000	4374	4283	4285*										
OPTC8	0000	4376	4286*											
OPTC9	0000	437A	4279	4288*										
OPTCMND	0000	4306	2932	4248*										
OPTNLST	0000	354C	2939*	4256										
OUTBUF	0000	312C	1053	2033	2710*	3593	3616	3623	3625	3672	3709	3770	3910	3945
			3965	3994	4004	4011	4014	4051	4087	4107	4186	4209	4226	4351
			4366											
OUTBUFE	0000	317B	2711*											
PAPRTAPE	0000	0001	49*	2966	6223	9416								
PARM.ERR	0000	13FA	1007*	3589	3638									
PARMCHCK	0000	0024	201*	980										
PARMFLG0	0000	12FC	877*											
PARMFLG1	0000	130E	880	886*										
PARMFLG2	0000	131A	887	893*										
PARMFLG3	0000	1326	894	900*										
PARMFLG4	0000	1334	901	908*										
PARMFLG5	0000	1340	909	915*										
PARMFLG6	0000	135E	916	927*										
PARMFLG7	0000	137C	928	939*										
PARMFLG8	0000	139A	940	951*										
PARMFLG9	0000	13AE	952	961*										
PARMFLGA	0000	13BA	962	968*										
PARMFLGG	0000	13CE	969	977*										
PARMFLGS	0000	0004	190*	877	3779	3788	3797	3806	3816	3825	3839	3853	3867	3882
			3891											

SYMBOL TABLE & CROSS REFERENCE LIST

```
PARMSCAN   0000 2134      1006    2283*   3586    3636    3643
PAS2L1     0000 56BC      6139*   6140
PAS3L1     0000 56D2      6149*   6150
PAS4L00    0000 6876      8202    8306*
PAS4L01    0000 68A0      8318    8320*
PAS4L02    0000 68A4      8321*   8325
PAS4L03    0000 68CA      8335*   8339
PAS4L04    0000 68D8      8336    8341*
PAS4L0A    0000 688A      8307    8312*
PAS4L1     0000 5700      6165    6171*
PAS4L2     0000 5708      6164    6175*
PAS4LX     0000 6904      8338    8356*
PAS4LXX    0000 6920      8360    8365*
PAS5L1     0000 5784      6203    6207    6218*
PASCMND2   0000 3469      2826*   6146
PASCNT     0000 34B8       674     677     770    2868*   3223    3444    8039    8362    8496    8629
PASCOM     0000 346E      2831*   8314    8315
PASDDR     0000 3470      2833*   8041    8632
PASDR      0000 346F      2832*   8633
PASDSARM   0000 346D      2830*   3446    3448    3451    3453    6167
PASEDRR    0000 3473      2836*   8330
PASEDRW    0000 3472      2835*   8351
PASINCMD   0000 3467      2824*
PASLA      0000 0008       100*   3116    3118    3120    3122    3124    3126    3128    3130
PASLTYP    0000 000A       291*    671     739     766    3437    4442    5616    7995    8128    8167    8200    8484
                          8492    8612    8705    8766
PASNDRW    0000 3471      2834*   8331
PASOUT     0000 346A      2827*   6148    6175    8045    8046
PASP1L1    0000 568E      5991    5120*
PASPH0     0000 568C      6108    6115*
PASPH1     0000 552E      6109    6119*
PASPH2     0000 56B2      6110    6136*
PASPH3     0000 56C6      6111    6146*
PASPH4     0000 56E4      6112    6160*
PASP45     0000 5754      6113    6161    6201*
PASPTR     0000 5674       302    3535    6108*
PASRCNT    0000 34B6      2867*   3224    3443    4452    4454    8630
PASRDCMD   0000 346B      2828*   6193
PASRQ2S    0000 3468      2825*   6138
PASWTCMD   0000 346C      2829*   6129
PATCH      0000 8C08     10649*  10650
PFLG5L1    0000 135A       921     923*
PFLG6L1    0000 1378       933     935*
PFLG7L1    0000 1396       945     947*
PHASE      0000 0002       189*    632     762    1065    1155    1986    2502    2535    2576    3342    3541    4436
                          4479    4484    5194    5974    6051    6082    6180    6219    6242    6252    6262    6272
                          6291    6305    6320    6333    6359    6389    6396    6746    6792    6801    6815    6833
                          6847    6859    6872    6936    6952    6965    6977    7023    7039    7055    7069    7148
                          7174    7193    7215    7242    7262    7274    7294    7322    7336    7347    7406    7425
                          7447    7485    7501    7511    7553    7564    7641    7660    7680    7710    7720    7762
                          7801    7846    7858    7871    7905    7950    8064    8082    8089    8105    8152    8186
                          8254    8357    8498    8575    8585    8661    8665    8713    8851    8861    8937    8944
                          8992    9016    9044    9096    9146    9159    9171
```

SYMBOL TABLE & CROSS REFERENCE LIST

```
PHASE.0   0000 0000        160*    6836    6862    6955    6968    6980    7042    7196    7245    7277    7325
PHASE.1   0000 0004        161*    1059    3540    6241    6332    6395    6837    6863    6958    6969    6981    7045
                           7054    7068    7147    7346    7492    7563    7640    7719    7761    7800    7845    8063
                           8709    8824    8903    8974    9015    9039    9095
PHASE.10  0000 0040        177*
PHASE.11  0000 0044        178*    6871    6979
PHASE.12  0000 0048        179*    6990
PHASE.13  0000 004C        180*    7043
PHASE.14  0000 0050        181*    7041
PHASE.15  0000 0054        182*    5838    6864    6957    6970    6982    7044
PHASE.2   0000 0008        163*    1987    2534    6278    6745    7184    7197    7405    7424    7668    7781    7870
                           8104    8850    8932    9030    9145
PHASE.3   0000 000C        164*    2501    2575    6304    7195    7199    7248    7280    7328    7335    7462    7679
                           7904    8151    9158
PHASE.4   0000 0010        165*    5973    6081    6218    6271    6316    7221    7500    7698    8185
PHASE.5   0000 0014        166*    6050    6179    6346    6791    6835    7233    7246    7510    7709    8253    8295
                           8350
PHASE.6   0000 0018        167*     761    6388    7244    7527    8356    8497    8574    8584
PHASE.7   0000 001C        168*    7265    7278    7552    8660
PHASE.8   0000 0020        169*    6861    7276
PHASE.9   0000 0024        170*    6878    7301
PHASE.A   0000 0028        171*    6956    7313    7326
PHASE.B   0000 002C        172*    7324
PHASE.C   0000 0030        173*    7198    7247    7279    7327
PHASE.D   0000 0034        174*
PHASE.E   0000 0038        175*    6954    6967
PHASE.F   0000 003C        176*
PIC2L1    0000 6FBA        9042    9044*
PICBUF    0000 75A4        9478    9480    9481*
PICBUFE   0000 75AA        9479    9486*
PICDDB    0000 7568        2982    9465*
PICPH0    0000 6F6C        9008    9014*
PICPH1    0000 6F86        9009    9025*
PICPH2    0000 6FA8        9010    9038*
PICPTR    0000 6F60        9008*   9469
PICSTART  0000 3466        2823*   9031
PRINTERS  0000 0002          55*   2974    2976    8803    9344    9365
PRIORITY  0000 0001         187*    449     614     659     709     904    3211    3237    3245    3252    3257    3808
PRMSCN1   0000 2160        2298*
PRMSCN2   0000 2162        2299*   2320
PRMSCN3   0000 2190        2310    2316*
PRMSCN9   0000 219E        2290    2293    2297    2299    2304    2308    2312    2314    2323*
PRNTCEL1  0000 3CAE        3597*   3628
PRNTCEL2  0000 3CDA        3610*   3626
PRNTCEL3  0000 3CFC        3609    3622*
PRNTCELL  0000 3CA0        3593*   3624
PROMPTE   0000 33F0         808    2765*
PROMPTS   0000 33F0         807    2764*
PSCNSAV   0000 21AC        2283    2284    2324    2325    2328*
PST       0000 8D80        1657    1684    1708    1732    1753    1774    1795    3514    3520   10651*
PSTEND    0000 957F       10652*  10653
PSTSTART  0000 8D80       10650*  10651   10652
PSWSAV    0000 0CEC         348     554*
```

SYMBOL TABLE & CROSS REFERENCE LIST

```
PTPON      0000 343D       2782*  6279
PTPSTAT    0000 1F26       1993*  1995   1999
PTPSTOP    0000 343C       2781*  6256   6294   6323
PTBBUF     0000 7438       9437   9439   9440*
PTBBUFE    0000 7537       9438   9441*
PTBON      0000 343B       2780*  6347
PTBPOL1    0000 57D8       6245   6249   6253*
PTBPOL2    0000 57F6       6255   6259   6263*
PTBP1L1    0000 580E       6270   6274*
PTBP2L1    0000 584C       6289   6296*
PTBP2L2    0000 586E       6299   6307*
PTBP2L3    0000 5874       6303   6306   6309*
PTBP3L1    0000 588C       6318   6320*
PTBP4L1    0000 58B0       6331   6335*
PTBP4L2    0000 58BC       6339*  6340
PTBP5L1    0000 5904       6357   6364*
PTBP5L1A   0000 5916       6368   6371*
PTBP5L1B   0000 5918       6366   6372*
PTBP5L2    0000 5920       6372   6374   6376*
PTBP5L3    0000 593C       6383   6385*
PTBPDDB    0000 73F0       1985   2967   2968   2969   9421*
PTBPPH0    0000 57B0       6230   6240*
PTBPPH1    0000 57F8       6231   6267*
PTBPPH2    0000 582A       6232   6285*
PTBPPH3    0000 5876       6233   6313*
PTBPPH4    0000 589C       6234   6328*
PTBPPH5    0000 58E2       6235   6353*
PTBPPH6    0000 5950       6236   6394*
PTBPPTR    0000 5794       6230*  9425
PTBSTOP    0000 343A       2779*  6246   6362   6385
PTBETOP    0000 0000:P
QFULL      0000 263C        543   2015   2111   2154   2683*
QIDLE      0000 349A       2853*  5435
QIDLEE     0000 349C       2854*  8022   8024   8621   8622
QIDLEZ     0000 349E       2855*  8229   8644
QFDSSB     0000 34A2       2857*  8009   8243
QEESSB     0000 34A4       2858*  8261
QS01RB0    0000 7FF4      10314  10316  10321*
QS01RB0E   0000 8079      10315  10322*
QS01RB1    0000 807C      10317  10319  10324*
QS01RB1E   0000 8101      10318  10325*
QS02RB0    0000 8158      10354  10356  10361*
QS02RB0E   0000 81DD      10355  10362*
QS02RB1    0000 81E0      10357  10359  10364*
QS02RB1E   0000 8265      10358  10365*
QS03RB0    0000 82BC      10394  10396  10401*
QS03RB0E   0000 8341      10395  10402*
QS03RB1    0000 8344      10397  10399  10404*
QS03RB1E   0000 83C9      10398  10405*
QS04RB0    0000 8420      10434  10436  10441*
QS04RB0E   0000 84A5      10435  10442*
QS04RB1    0000 84A8      10437  10439  10444*
QS04RB1E   0000 852D      10438  10445*
```

SYMBOL TABLE & CROSS REFERENCE LIST

```
QS05RB0      0000 8584       10474   10476   10481*
QS05RB0E     0000 8609       10475   10482*
QS05RB1      0000 860C       10477   10479   10484*
QS05RB1E     0000 8691       10478   10485*
QS06RB0      0000 86E8       10514   10516   10521*
QS06RB0E     0000 876D       10515   10522*
QS06RB1      0000 8770       10517   10519   10524*
QS06RB1E     0000 87F5       10518   10525*
QS07RB0      0000 884C       10554   10556   10561*
QS07RB0E     0000 88D1       10555   10562*
QS07RB1      0000 88D4       10557   10559   10564*
QS07RB1E     0000 8959       10558   10565*
QS08RB0      0000 89B0       10594   10596   10601*
QS08RB0E     0000 8A35       10595   10602*
QS08RB1      0000 8A38       10597   10599   10604*
QS08RB1E     0000 8ABD       10598   10605*
QSA          0000 0008          94*   3068    3070    3072    3074    3076    3078    3080    3082    4835   10284
QSA0L0       0000 65B2        8001    8022*
QSA0L00      0000 65A0        8015*   8019
QSA0L1       0000 65CE        7993    8031*
QSA0L2       0000 65E2        7997    8038*
QSA0L20      0000 6606        8049*   8054
QSA0L21      0000 6618        8056*   8061
QSA0L3       0000 662A        8020    8028    8035    8063*
QSA0LX0      0000 6634        8023    8032    8042    8070*
QSA0LX00     0000 6632        8010    8069*
QSA0LX1      0000 6640        8025    8034    8047    8076*
QSA0LX10     0000 663E        8013    8075*
QSA0LX2      0000 6648        8059    8080*   8264    8323
QSA0LX3      0000 6656        8017    8052    8086*   8236    8248    8284
QSA2L0       0000 66C0        8130    8135*
QSA2L00      0000 6698        8117*   8118
QSA2L1       0000 66C6        8126    8138*
QSA2L2       0000 66CC        8122    8141*
QSA2L3       0000 66D0        8133    8136    8139    8143*
QSA3L0       0000 671C        8169    8174*
QSA3L1       0000 6722        8165    8177*
QSA3L2       0000 6728        8161    8180*
QSA3LZ       0000 6732        8172    8175    8178    8184*
QSA4L00      0000 6780        8209    8216*
QSA4L1       0000 6784        8206    8218*
QSA4L10      0000 6786        8234*   8238
QSA4L100     0000 679C        8219    8226*
QSA4L2       0000 67C4        8216    8241*
QSA4L3       0000 67D8        8246*   8250
QSA4L4       0000 6804        8262*   8266
QSA5L0       0000 695C        8398*
QSA5L00      0000 6972        8402    8405*
QSA5L1       0000 6984        8406    8415*
QSA5L2       0000 6990        8403    8421*
QSA5L3       0000 69A6        8394    8431*
QSA5L30      0000 69BC        8435    8438*
QSA5L4       0000 69C2        8442*
```

SYMBOL TABLE & CROSS REFERENCE LIST

```
QSA5L40    0000 69D2      8447*
QSA5L5     0000 69D4      8439    8450*
QSA5L50    0000 69E4      8455*
QSA5L6     0000 69E6      8436    8458*
QSA5L7     0000 69F2      8383    8466*
QSA5L8     0000 6A0C      8386    8475*
QSA5L9     0000 6A24      8389    8467    8484*
QSA5LX     0000 6A52      8476    8486    8501*
QSA5LZ     0000 6A34      8471    8480    8490*
QSA5LZ0    0000 6A48      8494    8497*
QSA6L1     0000 6B8C      8610    8625*
QSA6L2     0000 6B98      8614    8629*
QSA6L3     0000 6BAE      8618    8636*
QSA6L4     0000 6BD2      8647*   8651
QSA6LX     0000 6BF8      8649    8664*
QSA6LZ     0000 6BE2      8623    8627    8634    8654*
QSA6LZ0    0000 6BEE      8652    3656    8660*
QSA6LZ1    0000 6BF2      8658    8661*
QSA6LZZ    0000 6BEA      8657*
QSA7L1     0000 6C22      8679    8685*
QSA7L2     0000 6C2C      8682    8689*
QSA7L3     0000 6C4C      8687    8700*
QSA7L4     0000 6C5C      8697    8705*
QSA7L5     0000 6C64      8683    8709*
QSA7L6     0000 6C68      8707    9711*
QSA7LZ     0000 6C6A      8710    8713*
QSABYSNC   0000 6CF8      8788*
QSAC1      0000 4854      4879*   4886
QSAC2      0000 485E      4882*   4969
QSAC3      0000 486A      4884    4886*   4908    4965    4967
QSAC4      0000 486E      4887*   4933    4939    4960
QSAC5      0000 487A      4892*   4893
QSACOMP    0000 482E      4868*   8446    8454    8554    8558    8702    8704
QSADATX    0000 494E      4912    4973*
QSADD01    0000 7FA0      2897    3069    3093    3117    3141    10290*
QSADD01A   0000 7FD0      2897    10307*
QSADD02    0000 8104      3071    3095    3119    3143    10330*
QSADD02A   0000 8134      10347*
QSADD03    0000 8268      3073    3097    3121    3145    10370*
QSADD03A   0000 8298      10387*
QSADD04    0000 83CC      3075    3099    3123    3147    10410*
QSADD04A   0000 83FC      10427*
QSADD05    0000 8530      3077    3101    3125    3149    10450*
QSADD05A   0000 8560      10467*
QSADD06    0000 8694      3079    3103    3127    3151    10490*
QSADD06A   0000 86C4      10507*
QSADD07    0000 87F8      3081    3105    3129    3153    10530*
QSADD07A   0000 8828      10547*
QSADD08    0000 895C      3083    3131    3155    10570*
QSADD08A   0000 898C      10587*
QSADISP    0000 34C2      2873*   8102    8103    8208    8215    8218    8225    8272    9277    8306    8311
QSAEOT     0000 6D80      8799*
QSAEOTE    0000 6D83      8422    8800*
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SYMBOL TABLE & CROSS REFERENCE LIST

```
QSAIDLED   0000 6D84        8801*
QSAIDLEE   0000 6D93        5799    8802*
QSAPH0     0000 654C        7975    7988*
QSAPH1     0000 6666        7976    8097*
QSAPH2     0000 6688        7977    8112*
QSAPH3     0000 66F8        7978    8158*
QSAPH4     0000 6740        7979    8193*
QSAPH5     0000 6926        7980    9372*
QSAPH6     0000 6B56        7981    8605*
QSAPH7     0000 6C08        7982    8675*
QSAPTR     0000 652C        7975*   10297   10337   10377   10417   10457   10497   10537   10577
QSATYP     0000 0008         289*   7999    8756
QSAX1      0000 48A0        4901    4904    4906    4911*
QSAX2      0000 4938        4913    4964*
QSAXBUFE   0000 6D7F        5777    5788    5810    5821    5840    5844    5862    5866    5884    5888    5906    5910
                            8798*
QSAXBUFS   0000 6D00        8790*
QSAXX      0000 4884        4881    4899*   4915
QSAZ       0000 0008         103*   3140    3142    3144    3146    3148    3150    3152    3154
QSAZZ      0000 4964        4916    4937    4940    4947    4950    4953    4957    4961    4976*
QSZ5L1     0000 6A86        8518    8524*
QSZ5L2     0000 6A9E        8510    8534*
QSZ5L3     0000 6AB8        8538    8543*
QSZ5L33    0000 6ADE        8550    8555*
QSZ5L4     0000 6AE0        8552    8557*
QSZ5LX     0000 6B16        8527    8546    8581*
QSZ5LX0    0000 6B36        8588    8591*
QSZ5LXX    0000 6B1A        8502    8582*
QSZ5LZ     0000 6B00        8562    8567    8572*
QSZ5LZA    0000 6AE8        8529    8561*
QSZ5LZB    0000 6AF4        8548    8566*
QSZC1      0000 48B4        4873    4920*
QSZC2      0000 48CA        4928*   4932
QSZC3      0000 48D6        4932*   4949
QSZC4      0000 48DE        4925    4935*
QSZCNT     0000 34BC         779    2870*   3226    8098    8577    8590    8636
QSZCNT1    0000 34BE        2871*   8099    8182
QSZPH5     0000 6A5A        8377    8506*
QSZRCNT    0000 34BA        2869*   3225    3459    4448    4450    8637
QSZTYP     0000 000B         292*    727     775    3455    4445    4871    8120    8159    8204    8375    8616    8677
                            8769
QSZX1      0000 4912        4944    4952*
QSZX2      0000 4928        4955    4958*
QSZXX      0000 48F8        4930    4943*
QUESIZ     0000 0014         112*    529    2023    2694    2695    2697
QXDRRQ     0000 34A0        2856*   8012    8231    8241    8244    8643
QXERRQ     0000 34A6        2859*
QZBID      0000 34A8        2860*   8003    8004
QZDRR      0000 34AA        2861*
QZERRW     0000 34AE        2863*   8267
QZESR      0000 34AC        2862*
QZLLSEQ    0000 4F50        5711    5713    5715    5760    5761    5762    5775*
R0         0000 0000         117*    312     313     315     316     317     322     323     324     325     326     327
```

SYMBOL TABLE & CROSS REFERENCE LIST

```
                    328    336    339    340    341    357    360    369    389    390    393    398
                    445    446    469    476    483    486    495    496    499    500    505    518
                    525    531    532    534    535    543    573    652    664    685    840   1040
                   1066   1151   1214   1408   1409   1429   1430   1496   1496   1510   1518   1546
                   1554   1579   1581   1597   1605   1617   1633   1634   1644   1657   1667   1696
                   1720   1741   1762   1783   2100   2498   2506   2509   2510   2531   2540   2577
                   2579   2581   2586   3198   3274   3280   3323   3370   3482   3483   3484   3495
                   3495   3532   3533   3542   3578   3620   3645   3668   3735   3971   3976   4018
                   4020   4196   4228   4237   4242   4300   4342   4344   4372   4385   4399   4405
                   4412   4422   4508   4542   4683   5195   5502   5525   5934   6005   6013   6023
                   6132   6142   6155   6263   6273   6281   6334   6349   6397   6744   6762   6793
                   6807   6834   6853   6860   6873   6890   6966   6978   7002   7056   7070   7146
                   7153   7168   7180   7187   7216   7226   7263   7268   7295   7306   7337   7403
                   7411   7426   7448   7466   7512   7530   7576   7637   7646   7661   7673   7703
                   7721   7763   7785   7853   7859   7901   7906   7947   7953   8065   8073   8078
                   8084   8091   8106   8153   8187   8268   8300   8302   8354   8366   8631   8638
                   8662   8669   8714   8821   8829   8894   8906   8925   8945   8977   9021   9034
                   9091   9094   9097   9147   9160   9169   9172
R1       0000 0001  119*   314    318    329    330    332    333    334    335    337    338    342
                    343    344    345    346    347    348    349    352    353    354    355    356
                    358    359    362    365    366    369    370    371    372    447    448    449
                    450    451    452    453    454    457    458    459    460    462    465    467
                    470    471    472    473    474    475    484    486    494    496    497    506
                    510    511    513    517    520    522    525    526    529    530    533    536
                    540    653    665    686   1154   1155   1156   1156   1157   1214   1655   1656
                   1678   1679   1680   1681   1683   1690   1691   1693   1707   1708   1731   1732
                   1752   1753   1755   1756   1773   1774   1776   1777   1781   1794   1795   1910
                   1914   1916   1918   2501   2502   3214   3217   3282   3291   3294   3462   3498
                   3501   3503   3505   3506   3509   3510   3516   3519   3522   3523   3684   3697
                   3689   3695   3742   3743   3745   3753   3771   4589   4598   4622   6394   7050
                   7052   7333   7562   7717   8926   8942   9103   9111   9113   9114   9116   9118
                   9119   9120   9121   9126   9127   9135   9141   9143   9144
R10      0000 000A  135*   640    641    643    644    645    698    699    702    711    720    782
                    820    827    835    847   1064   1067   1454   1456   1458   1459   1460   1461
                   1463   1464   1465   1470   2057   2060   2069   2093   2093   2094   2095   2101
                   2102   2110   2111   2116   2187   2194   2202   2206   2214   2222   2230   2238
                   2283   2285   2289   2291   2299   2301   2323   2324   2352   2353   2355   2356
                   2471   2537   2549   2550   2553   2555   2563   2570   2573   2584   2585   3242
                   3243   3245   3246   3250   3252   3257   3258   3262   3266   3270   3319   3366
                   3595   3601   3699   3704   3782   3791   3800   3810   3819   3828   3833   3842
                   3847   3856   3861   3870   3875   3885   3894   3899   3947   3954   3995   4052
                   4056   4088   4092   4108   4112   4187   4191   4210   4214   4264   4268   4269
                   4271   4272   4292   4295   4296   4353   4642   4691   4692   4693   4698   4700
                   4703   4704   4705   4708   4711   4717   4732   4733   4734   4737   4741   4742
                   4743   4744   4745   4746   4750   4751   4791   4792   4793   4794   4799   4887
                   4892   5131   5132   5133   5134   5135   5136   5137   5138   5139   5140   5144
                   5464   5466   5467   5471   5495   5546   5554   5555   5613   5614   5615   5619
                   5621   5627   5695   5697   5706   5709   5754   6413   6417   6889   7001   7225
                   7305   7584   7672   7702   8196   8197   8200   8201   8204   8205   8208   8210
                   8213   8214   8215   8218   8220   8223   8224   8225   8245   8247   8263   8272
                   8276   8277   8281   8283   8306   8310   8311   8327   8327   8328   8329   8332
                   8374   8520   8521   8522   8540   8541   8542   8551   8551   8740   8744   8752
                   8779   8784
```

SYMBOL TABLE & CROSS REFERENCE LIST

R11	0000 000B											
		136*	782	787	821	822	825	859	867	919	931	943	1411
		1414	1415	1420	1424	1427	1432	1435	1436	1441	1445	1448	1467
		1472	1499	1540	1576	1596	2058	2188	2189	2192	2200	2204	2212
		2220	2228	2236	2241	2285	2286	2323	2362	2363	2538	2570	2573
		3243	3256	3260	3264	3268	3317	3364	3593	3598	3599	3603	3611
		3613	3614	3615	3619	3622	3623	3625	3672	3696	3697	3698	3701
		3702	3706	3707	3708	3770	3772	3773	3774	3784	3785	3793	3794
		3802	3803	3812	3813	3821	3822	3830	3831	3835	3836	3844	3845
		3849	3850	3858	3859	3863	3864	3872	3873	3877	3878	3887	3888
		3896	3897	3901	3902	3906	3908	3909	3945	3950	3951	3958	3959
		3963	3964	3994	4002	4003	4011	4013	4015	4051	4052	4054	4055
		4087	4088	4090	4091	4107	4108	4110	4111	4186	4187	4189	4190
		4209	4210	4212	4213	4222	4224	4225	4255	4257	4258	4339	4351
		4356	4357	4362	4364	4367	4381	4408	4464	4486	4537	4538	4541
		4594	4596	4600	4602	4609	4638	4646	4696	4697	4698	4709	4753
		4755	4756	4758	4762	4763	4764	4766	4770	4773	4774	4775	4776
		4778	4782	4800	4801	4834	4879	4880	4912	4928	4929	4935	4936
		4938	4948	4948	4958	4959	4964	4966	4968	4976	4986	5024	5071
		5152	5199	5218	5252	5284	5306	5308	5357	5404	5493	5549	5558
		5584	5589	5616	5617	5624	5630	5691	5720	5767	6168	6250	6260
		6280	6348	6409	6410	6415	6718	6743	6765	6798	6804	6844	6850
		6875	6880	6884	6886	6924	6988	6992	6996	6998	7053	7065	7145
		7179	7186	7220	7223	7235	7267	7300	7303	7315	7334	7402	7445
		7465	7479	7509	7529	7545	7636	7667	7670	7697	7700	7718	7783
		7856	9005	8005	8006	8007	8014	8069	8072	8075	8077	8083	8090
		8228	8232	8297	8353	8365	8372	8373	8375	8376	8525	8544	8596
		8597	8641	8645	8668	8820	8826	8893	8905	8936	8976	9032	9106
		9108	9120	9122	9124	9153							
R12	0000 000C	137*	812	1412	1433	1497	1516	1552	1587	1603	2052	2059	2195
		2203	2207	2215	2223	2231	2239	2289	2357	2418	2427	2446	2457
		2458	2479	2503	2505	2507	2539	3259	3263	3267	3271	3320	3367
		3372	3373	3596	3602	3700	3705	3783	3792	3801	3811	3820	3829
		3834	3843	3848	3857	3862	3871	3876	3886	3895	3900	3948	3955
		3996	4220	4265	4267	4268	4272	4273	4274	4354	4595	4596	4601
		4602	4610	4664	4665	4710	4738	4739	4831	4832	4833	4878	4905
		4907	4911	4912	4914	4914	4926	4945	4946	4982	4985	5056	5057
		5060	5061	5062	5088	5100	5178	5201	5204	5207	5211	5215	5283
		5286	5288	5289	5302	5303	5437	5473	5487	5489	5490	5496	5500
		5501	5503	5504	5526	5547	5547	5548	5549	5558	5582	5582	5593
		5584	5589	5622	5622	5623	5624	5630	5659	5660	5935	6411	6412
		6419	6805	6851	6877	6881	6887	6901	6902	6904	6905	6906	6915
		6989	6993	6999	8007	8014	8069	8075	8226	8226	8227	8228	8232
		8636	8637	8639	8639	8640	8641	8645	9107	9108	9124	9126	9128
		9133											
R13	0000 000D	138*	478	488	807	814	817	818	820	821	850	862	870
		882	889	896	903	904	911	918	923	930	935	942	947
		954	956	964	971	973	991	1014	1019	1053	1055	1057	1062
		1063	1064	1413	1434	1526	1527	1534	1562	1563	1570	1847	1847
		1851	1873	1937	1965	1969	2007	2009	2010	2017	2026	2033	2042
		2047	2051	2062	2064	2065	2066	2067	2068	2103	2183	2185	2192
		2200	2204	2212	2220	2228	2236	2287	2287	2317	2318	2419	2424
		2425	2425	2426	2447	2455	2457	2458	2459	2462	2463	2465	2466
		2468	2469	2471	2472	2474	2503	2504	2537	2550	3255	3256	3260

SYMBOL TABLE & CROSS REFERENCE LIST

```
                        3264   3268   3277   3316   3317   3363   3364   3424   3433   3559   3562   3564
                        3566   3568   3570   3572   3575   3575   3576   3576   3584   3585   3587   3604
                        3605   3606   3607   3608   3616   3617   3634   3635   3640   3656   3690   3709
                        3746   3910   3965   4004   4014   4032   4033   4047   4049   4050   4066   4068
                        4083   4083   4085   4086   4105   4106   4130   4131   4151   4152   4164   4166
                        4168   4184   4185   4194   4195   4208   4219   4226   4232   4233   4234   4239
                        4248   4253   4255   4350   4352   4358   4359   4365   4366   4369   4370   4388
                        4388   4390   4391   4393   4395   4397   4402   4415   4643   4644   4711   4712
                        4715   4720   4722   4724   4978   4980   5053   5055   5085   5087   5097   5454
                        5459   5498   5490   5492   5493   5499   5501   8741   8780
R14       0000 000E      139*   466    479    489    808    815    851    856    863    866    871    981
                        988    992    1006   1015   1020   1056   1061   1061   1062   1067   1813   1819
                        1820   1831   1836   1841   1854   1861   1876   1881   1913   1914   1944   1954
                        1960   2006   2009   2018   2027   2044   2045   2049   2050   2053   2104   2241
                        2243   2245   2246   2284   2291   2292   2296   2301   2303   2307   2309   2311
                        2313   2315   2316   2318   2325   2326   2400   2404   2420   2429   2448   2450
                        2461   2461   2478   2480   2539   3272   3278   3321   3368   3425   3434   3500
                        3501   3526   3528   3529   3530   3531   3533   3537   3573   3586   3615   3636
                        3643   3657   3691   3708   3747   3909   3964   4003   4015   4225   4235   4240
                        4249   4254   4367   4403   4416   5455   5497   5642   5662   5663   6421   7089
                        7109   7365   7368   7605   7608   7735   7815   7960   7963   8008   8016   8043
                        8044   8045   8048   8051   8058   8312   8313   8331   8740   8742   8776   8779
                        8781   9868   8871   8953   8956   8999   9002   9053   9056   9186
R15       0000 000F      140*   480    490    809    810    819    852    857    857    864    872    980
                        981    982    982    989    989    993    1007   1016   1021   1054   1804   1806
                        1814   1818   1828   1830   1833   1835   1838   1840   1845   1849   1853   1855
                        1862   1871   1875   1882   1942   1961   2011   2019   2028   2034   2036   2040
                        2043   2044   2049   2105   2247   2288   2294   2298   2306   2319   2319   2395
                        2396   2397   2399   2401   2402   2403   2403   2421   2428   2447   2449   2450
                        2453   2455   2460   2511   2587   3273   3279   3322   3369   3426   3435   3527
                        3530   3574   3588   3618   3637   3644   3658   3692   3710   3748   3911   3966
                        4005   4016   4227   4236   4241   4250   4276   4368   4404   4417   4977   4989
                        5456   5498   5649   5651   5652   5653   5654   5656   5657   5658   5661   6420
                        6420   7088   7088   7108   7108   7359   7359   7563   7564   7603   7734   7809
                        7958   8743   8746   8747   8748   8773   8775   8782   8783   8866   8866   8951
                        8951   8997   8997   9051   9051   9185   9185
R2        0000 0002      120*   350    363    367    397    398    400    406    408    424    425    426
                        427    428    454    455    463    507    514    523    537    538    539    539
                        570    572    572    1636   1637   1638   1639   1641   1659   1660   1661   1662
                        1682   1683   1684   1693   1739   1915   1916   1917   1918   3215   3502   3503
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                        3933   3935   3937   3970   3987   3989   4008   8563   8568   9104
R3        0000 0003      123*   364    368    378    379    380    383    391    403    404    409    410
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                        1712   1713   1714   1715   1734   1735   1736   1737   1757   1758   1778   1779
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                        8446   8454   8554   8558   8702   8704   9105
R4        0000 0004      126*   361    365    376    377    378    382    383    384    392    393    396
                        397    402    405    406    408    411    414    417    419    425    509    510
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       1379  1380  1414  1415  1423  1435  1436  1444  1453  1456  1458  1460
       1463  1465  1471  1473  1485  1500  1500  1501  1504  1511  1517  1547
       1553  1582  1598  1604  1618  1630  1630  1631  1632  1640  1643  1663
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       1908  1909  1930  1932  1934  1939  1986  1987  1989  1991  1996  1997
       1998  2002  2006  2007  2505  2508  2534  2535  2541  2542  2544  2545
       2547  2552  2553  2555  2556  2558  2560  2565  2568  2571  2574  2578
       2578  2580  3209  3211  3212  3218  3220  3221  3222  3223  3224  3225
       3226  3227  3228  3230  3231  3233  3234  3236  3245  3247  3250  3261
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       3332  3334  3335  3336  3337  3338  3339  3340  3341  3342  3346  3347
       3349  3350  3352  3353  3355  3356  3365  3375  3376  3378  3379  3381
       3382  3389  3395  3398  3399  3405  3406  3410  3416  3417  3429  3431
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       5018  5019  5020  5021  5025  5028  5033  5076  5078  5079  5080  5092
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SYMBOL TABLE & CROSS REFERENCE LIST

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		7207	7209	7221	7230	7233	7241	7241	7242	7253	7255	7264	7265
		7273	7273	7274	7285	7287	7301	7310	7313	7321	7321	7322	7346
		7347	7364	7366	7367	7394	7405	7406	7407	7408	7409	7410	7415
		7417	7418	7420	7421	7424	7425	7432	7434	7446	7447	7457	7458
		7459	7460	7462	7484	7485	7486	7487	7492	7500	7501	7502	7503
		7510	7511	7522	7523	7524	7525	7527	7552	7553	7554	7555	7565
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		7594	7596	7597	7598	7600	7601	7602	7631	7640	7641	7642	7643
		7644	7645	7651	7659	7660	7665	7668	7677	7679	7680	7681	7682
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		7781	7791	7794	7798	7799	7800	7801	7802	7803	7845	7846	7847
		7848	7849	7850	7857	7858	7865	7866	7867	7868	7870	7871	7881
		7882	7885	7888	7896	7897	7898	7899	7900	7904	7905	7912	7921
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		7961	7962	8295	8350	8484	8485	8487	8488	8490	8491	8492	8493
		8495	8496	8497	8498	8501	8526	8526	8528	8545	8545	8547	8549
		8561	8566	8572	8573	8574	8575	8576	8577	8581	8592	8654	8655
		8657	8660	8661	8691	8693	8705	8706	8709	8711	8713	8824	8833
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		9146	9158	9159	9170	9171	9176	9177	9179	9180	9181	9183	9184
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		900	908	908	915	915	927	927	939	939	951	951	951
		961	968	968	1071	1072	1074	1075	1089	1090	1091	1095	1096
		1107	1108	1125	1126	1130	1131	1179	1179	1180	1181	1182	1197
		1216	1231	1232	1232	1504	1511	1517	1522	1547	1553	1558	1582
		1598	1604	1609	1618	1632	1640	1643	1648	1663	1666	1671	1692
		1695	1700	1710	1738	1740	1745	1759	1761	1766	1780	1782	1787
		1893	1893	1906	1909	1935	1938	1939	1943	1958	1966	2003	2004
		2015	2023	2024	2473	2474	2475	2476	2477	2575	2576	3237	3245
		3252	3269	3297	3298	3300	3301	3304	3306	3307	3310	3311	3311
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		3360	3361	3384	3385	3386	3391	3392	3393	3399	3400	3401	3403
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		3938	3939	3940	3952	3953	3956	3960	3990	3993	3997	4009	4068
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		5023	5027	5034	5101	5251	5255	5258	5260	5339	5356	5361	5364
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		5579	5580	5581	5586	5609	5610	5611	5612	5626	5750	5751	5752
		5753	5754	5759	5973	5974	5975	5976	5979	5980	5982	5989	5990
		5997	5998	6029	6044	6045	6048	6049	6050	6051	6052	6053	6055
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SYMBOL TABLE & CROSS REFERENCE LIST

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                  6365   6376   6377   6378   6379   6380   6381   6382   6395   6395   6760   6761
                  6771   6777  ·6778   6780   6787   6803   6825   6831   6849   6857   6879   6927
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                  7087   7104   7106   7107   7185   7191   7214   7215   7217   7218   7222   7231
                  7234   7240   7261   7262   7266   7272   7293   7294   7296   7297   7302   7311
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                 1557   1558   1560   1567   1569   1570   1572   1583   1584   1585   1586   1599
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                 1786   1787   1789   1812   1813   1814   1860   1861   1862   1880   1881   1882
                 1899   1901   1903   1905   1906   1907   1940   1942   1949   1951   1952   1957
                 1958   1959   1960   1961   2031   2035   2096   2151   2153   2193   2198   2201
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                 4984   4985   4986   4987   5087   5089   5090   5091   5093   5095   5120   5128
                 5145   5146   5147   5148   5149   5150   5151   5181   5245   5246   5360   5386
                 5390   5392   5395   5398   5401   5430   5431   5433   5435   5436   5465   5466
                 5468   5471   5472   5521   5522   5523   5542   5543   5544   5551   5581   5612
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                 6087   6088   6091   6092   6122   6123   6130   6131   6161   6184   6185   6186
                 6187   6188   6189   6190   6191   6192   6202   6210   6211   6212   6298   6307
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SYMBOL TABLE & CROSS REFERENCE LIST

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		9141											
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		1139	1140	1141	1142	1143	1144	1145	1146	1170	1171	1172	1173
		1173	1174	1175	1176	1177	1186	1187	1188	1190	1191	1192	1202
		1203	1204	1208	1208	1209	1210	1211	1212	1221	1222	1223	1224
		1224	1225	1226	1227	1228	1235	1236	1237	1238	1238	1239	1240
		1241	1242	1248	1249	1296	1299	1301	1304	1306	1308	1312	1315
		1316	1317	1320	1322	1323	1324	1325	1325	1326	1327	1328	1329
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		1439	1440	1441	1442	1443	1445	1446	1447	1455	1456	1457	1458
		1460	1462	1463	1465	1468	1471	1472	1475	1478	1480	1481	1482
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		1768	1769	1784	1785	1786	1788	1789	1790	1810	1811	1812	1815
		1843	1858	1859	1860	1863	1878	1879	1880	1883	1894	1896	1897
		1900	1901	1902	1903	1904	1905	1947	1948	1949	1950	1951	1953
		1955	1956	1957	1962	1970	1971	2112	2117	2161	2183	2187	2189
		2190	2197	2198	2209	2210	2217	2218	2225	2226	2233	2234	2242
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		3666	3667	3669	3670	3671	3674	3675	3679	3680	3682	3693	3695
		3696	3715	3739	3740	3753	3754	3755	3760	3765	3771	3772	3905
		3906	3907	3907	3908	4221	4222	4223	4223	4224	4255	4257	4316
		4321	4326	4331	4336	4341	4343	4355	4356	4361	4362	4363	4363
		4364	4458	4459	4460	4463	4505	4506	4507	4539	4543	4556	4560
		4561	4563	4565	4566	4567	4568	4604	4605	4606	4611	4634	4635
		4637	4639	4640	4644	4645	4667	4670	4674	4678	4681	4682	4685
		4686	4687	4688	4691	4715	4728	4729	4733	4735	4736	4748	4749
		4762	4767	4774	4779	4782	4783	4785	4787	4788	4789	4790	4791
		4797	4798	4801	4802	4803	4806	4809	4810	4870	4899	4900	4902
		4903	4923	4924	4924	4954	4956	4979	4988	5072	5073	5075	5076
		5077	5078	5079	5080	5083	5086	5088	5089	5092	5093	5094	5095
		5096	5146	5147	5148	5149	5150	5151	5177	5180	5186	5187	5188
		5238	5240	5332	5332	5350	5351	5359	5360	5429	5431	5432	5469
		5515	5516	5519	5520	5521	5524	5545	5550	5551	5552	5557	5587
		5613	5628	5692	5702	5703	5711	5713	5715	5722	5760	5761	5762
		6033	6034	6035	6042	6069	6070	6071	6078	6205	6206	6206	6208
		6209	6210	6215	6338	6339	6714	6716	6790	6799	6800	6805	6845
		6846	6851	6869	6871	6872	6874	6883	6913	6914	6987	6995	7061
		7063	7138	7140	7158	7160	7206	7208	7219	7254	7256	7286	7288

SYMBOL TABLE & CROSS REFERENCE LIST

```
                        7299  7395  7396  7397  7423  7433  7435  7437  7450  7451  7453  7454
                        7463  7464  7471  7472  7518  7519  7528  7547  7548  7632  7652  7655
                        7665  7689  7696  7780  7887  7894  7923  7930  7952  7991  7992  7995
                        7996  7999  8000  8038  8039  8040  8063  8064  8081  8082  8088  8089
                        8097  8098  8099  8100  8101  8102  8103  8104  8105  8116  8143  8144
                        8145  8146  8147  8148  8149  8212  8222  8233  8235  8253  8254  8255
                        8256  8257  8258  8259  8260  8275  8309  8320  8322  8329  8332  8345
                        8348  8356  8357  8358  8359  8361  8362  8363  8364  8398  8399  8400
                        8401  8405  8410  8416  8422  8425  8431  8432  8433  8434  8438  8443
                        8445  8451  8453  8459  8515  8535  8553  8557  8582  8583  8584  8585
                        8586  8587  8589  8590  8591  8598  8608  8609  8612  8613  8616  8617
                        8629  8630  8646  8648  8664  8665  8677  8678  8692  8696  8701  8703
                        8900  8901  8920  8921  8922  8927  8973  9018  9130  9131  9132  9136
                        9138  9139  9140  9142  9157

R9        0000 0009      134*  608   609   610   612   613   614   616   617   622   623   625
                         626   628   629   643   701   703   704   705   707   708   709   711
                         712   713   714   716   717   718   720   721   722   723   725   730
                         732   734   736   744   748   754   756   816   817   818   827   881
                         888   895   902   910   917   922   929   934   941   946   953   955
                         963   970   972   1012  1247  1335  1469  1488  1619  2095  2102  2116
                         2141  2142  2143  2144  2145  2146  2148  2149  2154  2156  2157  2184
                         2185  2186  2193  2201  2205  2213  2221  2229  2237  2353  2358  2359
                         2536  2536  2567  2582  2582  3208  3241  3257  3261  3265  3269  3318
                         3365  3558  3583  3594  3600  3600  3627  3633  3639  3640  3641  3642
                         3673  3677  3677  3703  3750  3751  3757  3762  3767  3781  3790  3799
                         3808  3809  3818  3827  3832  3841  3846  3855  3860  3869  3874  3884
                         3893  3898  3946  3953  3991  4031  4046  4065  4104  4129  4150  4163
                         4207  4219  4261  4263  4352  4365  4369  4387  4557  4560  4563  4566
                         4641  4671  4672  4673  4674  4675  4696  4712  4713  4722  4723  4724
                         4726  4727  4728  4752  4807  4808  4809  4877  4880  4882  4883  4885
                         4927  4929  4931  4943  4952  4968  5121  5122  5125  5126  5128  5129
                         5130  5130  5132  5134  5136  5138  5140  5141  5142  5142  5143  5144
                         5434  5470  5494  5559  5590  5631  5707  5710  5711  5712  5713  5715
                         5717  5757  5764  6789  6889  7001  7225  7305  7358  7422  7654  7672
                         7702  7779  7951  7988  8009  8012  8022  8024  8113  8117  8150  8181
                         8182  8184  8195  8210  8211  8213  8220  8221  8223  8229  8231  8241
                         8243  8244  8261  8267  8274  8308  8334  8335  8341  8346  8349  8411
                         8417  8423  8426  8444  8452  8460  8469  8470  8478  8479  8506  8514
                         8515  8516  8517  8519  8524  8534  8535  8536  8537  8539  8543  8605
                         9167  9168

RBUFFOE   0000 0040      243*  4870  5707  8146
RBUFFOS   0000 003C      245*  2896  8115
RBUFF1E   0000 004C      244*  5710  8116  8345
RBUFF1S   0000 0048      246*  2896
RDEV      0000 0005      129*  7990  8004  8009  8015  8022  8027  8031  8041  8043  8049  8070
                         8086  8194  8229  8234  8242  8243  8246  8261  8278  8282  8288  8312
                         8314  8316  8319  8330  8343  8607  8621  8625  8632  8644  8647  8666
RDEVADR   0000 0038      238*  742   964   3450  3884  7990  8112  8194  8393  8470  8475  8500
                         8607  8700  8771
RDSPFLGS  0000 0030      242*
RDWTBIT   0000 000D      274*
RECEIVER  0000 0030      2897* 3331  3460
```

SYMBOL TABLE & CROSS REFERENCE LIST

```
RECVTYP     0000 000C        293*    3325    3343
REGISTER    0000 186C       1333    1382    1392    1408*
REGSAV      0000 0CF4        346     555*   1409    1415    1424    1430    1436    1445    2100
REGTST1     0000 187E       1414*   1427
REGTST2     0000 18AE       1416    1427*
REGTST3     0000 18C4       1435*   1448
REGTST4     0000 18F4       1437    1448*
REMESS      0000 31C0        488    2721*
REMESSE     0000 31D3        489    2722*
REPCMND     0000 3D18       2927    3633*
REPCMND1    0000 3D28       3637*   3646
RESTART     0000 0C1E        299     355     483*   2071    3496    3718
RESTORE     0000 3450       2809*   6803
RSTAT       0000 0006        131*   8015    8018    8049    8050    8053    8234    8237    8246    8249    8282    8285
                            8316    8317    8647    8650    8667
RSTATUS     0000 003A        240*   8050
RUN00       0000 37F4       3210*   3213
RUN01       0000 380E       3217*   3282
RUN01A      0000 381E       3219    3221*
RUN02       0000 3866       3242*   3276
RUN03       0000 3880       3244    3250*
RUN04       0000 38D2       3251    3276*
RUN05       0000 38E4       3229    3232    3235   -3248    3253    3282*
RUN06       0000 38FA       3294*   3461    3462
RUN06A      0000 3918       3296    3303*
RUN06A.1    0000 3940       3308    3316*
RUN06B      0000 3960       3305    3325*
RUN07       0000 397A       3315    3327    3334*
RUN07A      0000 397E       3302    3333    3335*
RUN07AA     0000 39BA       3345    3355*
RUN07B      0000 39D8       3363*   3449    3454
RUN07C      0000 39F6       3354    3372*
RUN08       0000 39FE       3351    3359    3362    3375*
RUN09       0000 3A0C       3299    3377    3381*
RUN090      0000 3AC6       3432    3437*
RUN0900     0000 3AA8       3387    3390    3429*
RUN090A     0000 3A24       3383    3389*
RUN090X     0000 3A98       3402    3404    3413    3415    3424*
RUN09A      0000 3B4E       3475    3477*
RUN09AA     0000 3B1A       3324    3371    3396    3422    3430    3462*
RUN09AB     0000 3B04       3439    3455*
RUN09AC     0000 3B12       3457    3450*
RUN09B      0000 3B68       3480    3486*
RUN10       0000 3B74       3490*   3491
RUN10A      0000 3B9E       3499    3506*
RUN10B      0000 3BE2       1050    3507    3525*
RUN10C      0000 3C10       3536    3538*
RUNCMND     0000 37D4       2924    3198*
RUNLOOP1    0000 37E0       3202*   3204
RUNMAT      0000 3BAA       3510*   3518
SCTRCUR     0000 005C        224*   5281    5302    6761    6770    6788
SCTRHIGH    0000 0056        221*    947    3860    6774
SCTRLOW     0000 0054        220*    942    3855    6760    6776
```

SYMBOL TABLE & CROSS REFERENCE LIST

```
SELCHADR  0000 0048      214*     896    3236    3799    5179    5237    6713    6720    6919    7060    7084    7087
                        7104    7107    7139    7159    7207    7253    7287    7298    7364    7367    7631    7651
                        7688    7695    7726    7729
SELCHBSY  0000 34C0     2872*   3227    4541    5061    5126    6905
SELCHGO   0000 344A     2795*   6888    7224    7671
SELCHS    0000 0004       64*   3168    3170    3172    9205    9214    9223
SELCHSET  0000 4A6E     5120*   6884    6996    7220    7300    7667    7697
SELCHTST  0000 0001       88*   3062    7610   10235
SIMINT    0000 1622     1196    1214*
SIMULATE  0000 15E2     1184    1194*
SINT1     0000 15F4     1200*   1210
SINT2     0000 1624     1213    1215*
SLCH0L2   0000 6246     7635    7640*
SLCH1DDB  0000 7100     3167    5083    9195*
SLCH1L00  0000 6278     7659*   7694
SLCH1L1   0000 6280     7658    7663*
SLCH2DDB  0000 7124     3169    9207*
SLCH3DDB  0000 7148     3171    9216*
SLCH4DDB  0000 716C     3173    9225*
SLCHCLR   0000 344C     2797*   7663    7690
SLCHEND   0000 49E0     5054    5056*
SLCHEND0  0000 49EE     5058    5062*
SLCHEND1  0000 4A0C     5070    5072*
SLCHEND2  0000 4A34     5084    5086*
SLCHEND3  0000 4A6A     5081    5098    5100*
SLCHENDR  0000 49D6     5053*   7014    7311    7708
SLCHENDW  0000 49DC     5055*   6927    7231    7678
SLCHINCR  0000 344D     2798*   7669    7699
SLCHLEND  0000 37D0      464     515    3177*   3208    3241
SLCHLIST  0000 37C4      462     513    3167*   3206    3239
SLCHLOCK  0000 4590     4537*   6874    6987
SLCHPH0   0000 622C     7621    7630*
SLCHPH1   0000 625A     7622    7650*
SLCHPH2   0000 62A4     7623    7677*
SLCHPH3   0000 62BA     7624    7687*
SLCHPH4   0000 62F8     7625    7707*
SLCHPH5   0000 6310     7626    7717*
SLCHPTR   0000 6214     7621*  10243
SLCHREAD  0000 344B     2796*   7000    7304    7701
SLCHTDDB  0000 7F28     3063   10237*
SLSET1    0000 4A80     5123    5128*
START     0000 0A1A      297     312*     485
STARTIO   0000 44E4     4479*   6280    6348    6804    6850    6880    6992    7186    7223    7235    7267    7303
                        7315    7465    7529    7670    7700    7783    8297    8353    8826    8905    8976    9032
STAT      0000 0003      124*     651     663     684     715     786    1206    1207    1929    1934    1937    1945
                        1952    1959    1965    1969    1993    4462    4591    4608    4981    4984    5012    5014
                        5022    5026    5029    5068    5069    5069    5090    5189    519)    5191    5201    5204
                        5207    5211    5215    5242    5243    5248    5250    5254    525/    5286    5289    5331
                        5334    5336    5338    5355    5363    5368    5932    5933    6000    6021    6028    6037
                        6039    6040    6065    6073    6075    6076    6152    6162    6201    6212    6213    6247
                        6248    6257    6258    6287    6288    6315    6317    6355    6356    6727    6730    6734
                        6736    6737    6738    6740    6885    6912    6917    6918    6920    6932    6933    6907
                        7019    7020    7142    7143    7162    7163    7164    7170    7171    7176    7211    7212
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                                7258    7259    7290    7291    7348    7349    7398    7399    7400    7436    7439    7440
                                7442    7455    7475    7476    7480    7481    7490    7495    7496    7520    7537    7538
                                7541    7633    7634    7656    7657    7692    7693    7855    7886    7890    7922    7926
                                8071    8076    8080    8087    8593    8595    8667    8816    8817    8818    8835    8844
                                8856    8887    8888    8889    8891    8910    8911    8911    8924    8933
STATMASK    0000 0000           251*
STATUS      0000 000A           193*    1118    1144    3357    4591    5012    5068    5190    5243    5336    6010    6018
                                6028    6065    6139    6149    6162    6201    6248    6258    6287    6315    6355    6737
                                6912    6918    7143    7163    7171    7212    7259    7291    7399    7439    7480    7496
                                7634    7657    7693    8817    8844    8856    8888    8910
STOPO2      0000 1F5A           2005    2008    2015*
STOPO3      0000 1F6C           2016    2023*
STOPO4      0000 1F70           2024*   2037
STOPO5      0000 1F82           2025    2031*
STOPCMND    0000 3449           2794*   3247    5063    5145    6721    6907
STOPEX1     0000 1FAC           2044*   2051    2054
STOPEX2     0000 1FD4           2060*   2069
STOPEX3     0000 1FF4           2063    2069*
STOPEXIT    0000 1F9C           2029    2032    2039*
STOPTEST    0000 1F0A           551     553     1985*
STOPTST1    0000 1F38           1988    1990    1994    2001*
STOPZ       0000 1FCA           2041    2046    2048    2056*
STOPZZ      0000 1FF8           2071*
SUBADR      0000 0014           259*    5985    6190
SVCERR      0000 1DE4           361     1871*
SVCERR1     0000 1DF4           1872    1874    1877*
SVCFILL     0000 0ADC           365*    366
SVCTEST     0000 162E           1218    1219*   1226    1871    1873
SVCTST1     0000 1634           1219    1221*
SWITCHES    0000 263E           469     471     473     1165    1245    1332    2149    2157    2684*   4293    4341    4343
SWITCOM1    0000 43BE           4340    4343*
SWITCOMM    0000 43AE           4317    4322    4327    4332    4338*
SWSAVE      0000 34E8           2891*   4296
SYNC        0000 344E           2799*   8242
TESTLOCK    0000 4500           4504*   5177    5180    5238    5240    6714    6716    7061    7063    7138    7140    7159
                                7160    7206    7208    7254    7256    7286    7288    7395    7433    7632    7652    7689
TOM1        0000 0B02           379*    381
TOM2        0000 0B28           391*    405
TOM2A       0000 0B3C           395     397*
TOM3        0000 0B52           399     404*
TOM4        0000 0B5C           401     408*
TOM5        0000 0B5E           409*    411
TOM6        0000 0B68           407     413*
TOM7        0000 0B6C           415*    422
TOM8        0000 0B76           416     419*
TOM9        0000 0B78           418     420*
TRANADR     0000 0010           258*
TRANBIT     0000 000E           275*
TTY2L1      0000 5598           6010*   6011
TTY3L1      0000 55A6           6018*   6019
TTY4L1      0000 55D4           6031    6044*
TTY4L2      0000 55EC           6030    6048*
TTY5L1      0000 5646           6067    6081*
```

SYMBOL TABLE & CROSS REFERENCE LIST

TTYINCMD	0000 3436	2775*	6009								
TTYOUT	0000 3437	2776*	5999	6017	6089						
TTYPH0	0000 552C	5962	5969*								
TTYPH1	0000 552E	5963	5973*	6119							
TTYPH2	0000 5594	5964	6009*								
TTYPH3	0000 55A2	5965	6017*								
TTYPH4	0000 55B4	5966	6028*								
TTYPH5	0000 561A	5967	6065*								
TTYPTR	0000 5514	301	5962*								
TTYRDCMD	0000 3438	2777*	6059								
TTYWTCMD	0000 3439	2778*	6002	6090							
ULI	0000 0001	85*	3059	7819	10219						
ULIOL1	0000 6416	7855*									
ULIB	0000 3479	2842*	7903								
ULIDDB	0000 7EFC	3060	10222*								
ULIEBL	0000 3477	2840*	7852								
ULIHW	0000 3478	2841*	7869								
ULIP2L1	0000 6476	7883	7896*								
ULIP3L1	0000 64B4	7921*	7940								
ULIP3L2	0000 64DC	7919	7933*								
ULIP3L3	0000 64E2	7913	7935*								
ULIP3L4	0000 64F6	7917	7931	7942*							
ULIPH0	0000 63EC	7832	7841*								
ULIPH1	0000 6424	7833	7865*								
ULIPH2	0000 643C	7834	7878*								
ULIPH3	0000 6492	7835	7911*								
ULIPTR	0000 63DC	7832*	10226								
ULISTRAP	0000 6528	7843	7912	7934	7965*						
UNUSED	0000 0060	226*									
USER	0000 15B8	1169	1179*								
USER1	0000 15C6	1183	1186*								
USERMODE	0000 15C0	1182*	1190	1806							
USESELCH	0000 0002	286*									
WAITSEEK	0000 4C58	5386*	6718	7065							
WAITSEK1	0000 4C66	5389	5391*								
WAITSEK2	0000 4C6A	5393*	5394								
WAITSEK3	0000 4C72	5396*	5397								
WAITSEK4	0000 4C7A	5399*	5400								
WAITSEK5	0000 4C82	5402*	5403								
WPROTFLG	0000 005E	225*	4758	6724	6764	6869	6923	7050			
XDEV	0000 0002	122*	7989	8003	8011	8012	8024	8026	8033	8040	8045	8056	8193
		8230	8231	8241	8244	8262	8267	8279	8280	8289	8292	8298	8301
		8315	8321	8606	8622	8626	8633	8642	8643	8689	8690	8694
XDEVADR	0000 0008	237*	3445	7989	8158	8193	8466	8479	8606	8689	8773
XDSPFLGS	0000 0000	241*									
XSTAT	0000 0003	125*	8056	8057	8060	8262	8265	8289	8290	8298	8299	8321	8324
		8690	8695								
XSTATUS	0000 000A	239*	8057								
ZERO	0000 34CC	2878*	7664	7691							
ZEROES	0000 34C8	344	2877*								