7030 DPS

KA UA1
DCP

Preliminary

Operating Procedures

KA UA1

Diagnostic Control Program

February 27, 1962

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SECTION 1 -- INTRODUCTION

DCP, the Diagnostic Control Program, is an executive program designed to operate a library of programs on tape for systems test and maintenance. It provides for selection and read-in of the diagnostic program and exercises a limited control over execution of the program. It also contains helper routines required by the diagnostic program for sense switch options and output. Therefore, it is an integral part of each diagnostic program. DCP may also be loaded from cards. Program control may be maintained at the operator's console or maintenance console at operator's discretion. A limited utility system is included within DCP for generating, updating, and duplicating a master maintenance tape.

SECTION 2 -- PROGRAM CONSTRUCTION

2.1 Diagnostic Control Program

The control program may be separated into four distinct areas. These are control routines, helper routines, print routines, and utility routines. Communication is provided to these routines from the diagnostic program at the beginning of the program.

The control routines provide for reading in the diagnostic program and controlling the program flow. A continuity check is maintained while running the program to insure that proper program flow has been maintained. Checksumming is also performed to insure that program modification has not taken place because of a machine malfunction or programming error. The interrupt routine is also within the control area.

The helper routines provide for sense switch options, halts including manual intervention, error halt and loop decision, memory compare, zeroing the indicator register, and restoring the interrupt table. The error halt and loop decision routine provides for storing of print images and bypassing some loop options while controlled margins are applied. It also provides control and output for the 100 X loop option. The memory compare routine checks for program alteration. This is done in two cycles. The first transfers the defined area into upper memory for later comparison. The second cycle makes a location by location comparison of the area after it has operated. The output lists the address where alteration was found and the original and altered contents of the location.

The print routines provide a common output from all areas. Separate entries are provided to obtain desired register encoding for printing with comments.

2.2 The Diagnostic Program

The diagnostic program is divided into four logical blocks; the activation block, the test block, the analysis block, and the termination block. All blocks are required except the analysis block, which may be omitted if all analysis is done in the test block.

The activation block provides communication data necessary for DCP to operate the diagnostic program. Any preparation required, before testing can be started, will be done in this block.

2.2 The Diagnostic Program (Cont'd)

The test block is the principal part of the program. In it all tests are performed and normally most of the analysis is completed. The test block is composed of routines varying in size from a few instructions to several hundred. The test block is also divided into sub-blocks to implement the continuity test and checksum test. The sub-block will normally consist of not more than 1000 octal locations. It will consist of one or more routines, depending on the size of the routines. The first location of each sub-block will contain a control word defining the upper limit of the sub-block (continuity check address) and the starting location of the next sub-block.

The analysis block, when used, will generally be an analysis summation. This may take the form of a data reduction table. The analysis may also include a routine for restoring error indication tables in preparation for looping or the repeat function.

The termination block will terminate the running of a program under a given set of conditions. The diagnostic program will determine if it is to be repeated under different conditions; i.e., testing another channel for an I/O program. Diagnostic programs requiring the repeat function may request a manual intervention for proper set up before requesting repeat. The diagnostic program requests repeat by branching to the compool location EEDR in DCP. DCP returns control to the diagnostic program at the start of the test block when repeat is requested.

When the diagnostic program determines no more repeats are required, it will terminate the program by returning control to DCP at location EED. DCP will print "Program Finished" and prepare to run another program.

SECTION 3 -- DEFINITIONS

A few definitions are given below as an introduction to DCP terminology. It is anticipated that, with these definitions understood, the operating procedures (Section 4) will contain a degree of continuity.

3.1 Area of Control

Control of the DCP may be maintained from either of two areas: the maintenance console or the operator's console. When controlled from the maintenance console, the maintenance bits will be used for control information. The X register will be used to identify program halts. (These are explained in 3.2 below.) The lower boundary reg will be used as a pass counter, if available.

When control is maintained at the operator's console, the binary keys will be used for control information. The left six digits of the digital display will be used to identify control halts. The rightmost six digits will be used as a pass counter. It will display the number of program passes that have been completed.

The DCP always assumes control is initially at the maintenance console.

3.2 Program Halts

When an operator decision is required by either the DCP or the diagnostic program, DCP will "idle" the machine with the instruction counter at location (8) 4200. The halt will be identified by bits 0-17 of the X register or the left six digits of the digital display, depending on the area of control.

Halts will be identified by an address if a common halt or some octal number less than 40 if a DCP defined halt. (For DCP defined halts, see Table 1 below.) Common halts will be defined by a comment in the program listings at the address displayed.

Table 1

DCP Halt Indicators

Control Halts	1	Initial Control Halt (See Table 3 for Setup)
	2	Second Control Halt, equipment (Reference par 4.2)
	3	Third Control Halt, output and MC (See Table 4 for Setup)
	4	Single Step Halt (In lieu of halt 3 in any SS mode)
	5	Spare
	6	MC on Halt (Controlled Margins)
	7	MC off Halt (Controlled Margins)
	10	Error in Setup at Control Halt
Error Halts	11	Halt on error (after print)
	12	Time Delay Ran Out on I/O Operation
	13	Sequence error on load from cards
	14	Illegal Card or Illegal punch on C or P card
	15	Checksum error from cards
	16	Checksum error from Master Tape
	17	Spare
Utility Halts	20	Utility Control Halt
	21	Spare
	22	1st halt
	23	Tape update and change - 2nd halt
	24	Spare
	25	Spare
	26	Spare
	27	Spare
Halt Instead of Print	30	Normal Comment
	31	Composite Deposit
	32	Binary Word
	33	Octal Hex Dump
	34	Register Compare
	35	Spare
	36	Spare
MI Halt	37	Manual Intervention

3.3 System Identification

Internal to the DCP, there is a table of equipment available for each of the proposed 7030 systems. This is necessary because of the different I/O configurations possible. For the DCP to operate, it must know the system on which it is operating. Table 2 below shows the identification DCP has assigned to each system. (The manner in which this information is given to DCP will be explained later.)

Table 2 System Identification

Octal Number	7030/7950 EDPS
01	AEC
02	HARVEST
03	K1
04	K2
05	K3
06	K4
07	K5
10	K6
11	K7
12	K8

3.4 Manual Interventions

When the DCP or the diagnostic program requires information (or action) of some type from the operator, DCP will come to the Manual Intervention (indicator (8) 37) program halt. (The accompanying printout should tell the operator what is required of him.) On continuing from the Manual Intervention Halt, the diagnostic program may use bits 0-47 for its own control information or data. (See the diagnostic program writeup.) Bits 48-63 are defined by the DCP.

3.5 Appendix B

To facilitate the location of certain information after the operator has become somewhat familiarized with the DCP, all tables are reproduced and included in Appendix B.

SECTION 4 -- OPERATING PROCEDURE

4.1 Reading DCP Into Memory

DCP may be read into memory either from a DCP generated master tape or from cards. For the format of a DCP generated tape, see Section 5.2. The DCP card deck is a normal PUNNOR deck.

4.1.1 Loading from a Master Tape

1. Load the DCP generated Master Tape file (insure that it is file-protected) on any tape adapter unit available to the machine.
2. Place the unit selection on 0.
3. Place the maintenance mode and inhibit scan switches of the maintenance console in the "down" position.
4. Press the IPL button.
5. Press the signal button on the applicable tape adapter unit.

The DCP will be read into memory and checksummed. If it is found in error, the machine will "idle". At this point the operator may either start again by returning to step 1 above or continue by changing bit 63 of the maintenance console. Changing bit 63 says, in effect, to operate the DCP as it is in memory.

4.1.2 Loading Via the Card Reader

1. Place a current binary load program in the card reader hopper.
2. Place the DCP binary deck followed by the diagnostic program(s) after the loader.
3. Place the maintenance mode and inhibit scan switches of the maintenance console in the "down" position.

4. Press the IPL button.

5. Press the start button on the Card Reader.

The load program is read into memory. It, in turn, reads in the DCP and gives control to the DCP.

4.2 Initial Setup

After DCP is initially loaded, certain control information is required from the operator. This information includes a method of identifying the 7030 system, the mode of control and the method of program selection.

There are two methods by which the DCP may obtain this information from the operator. Location (8) 4160 of the DCP normally contains all zeros. If this location is not changed (i.e., it contains all zeros when the DCP begins to operate), the DCP will go through 3 control halts. At each control halt, the operator will enter information into the binary keys or the maintenance bits (depending on the area of control). These control halts are discussed in sections 4.2.1, 4.2.2, and 4.3.3.

The alternative method available to the operator is to enter this information by "C" cards and thereby bypass these three control halts. DCP will assume that the information in (8) 4160 (if not all zeros) is what the operator would have placed in the maintenance bits (or binary keys) at the first control halt. Location (8) 4161 will have the same relation to the second control halt. Location (8) 4162 will correspond to the third control halt. This method of entering necessary information is the most efficient and should be used whenever possible.

In order to bypass control halts when operating from cards, the operator should make up "C" cards that contain the desired information, and place them in front of the DCP branch control card. When operating from a master tape, the DCP already have enough information to bypass the control halts; this normally will be done.

4.2.1 The First Control Halt

The first control halt will be identified by a 1 in the X register on the maintenance console. (Remember, the DCP always assumes control is at the maintenance console initially.) The information should be entered into the maintenance bits as shown in Table 3 below.

Table 3

Inclusive Bits	Information
0-4	System Identification (Ref Table 1)
5-6	Mode of Control (for explanation, see Section 4.2.4) 00 = Maintenance 01 = Surveillance 10 = Autotest
7-11	Methods of program selection (for explanation, see Section 4.2.5) All Clear — Sequential 7 = 1 — Schedule 8 = 1 — Single Step from Tape 9 — Spare 10 = 1 — Single Step from Cards (PUNNOR) 11 = 1 — Single Step IPL (PUNFUL)
12-18	Master tape channel
19-21	Master tape drive
28-34	Scratch tape channel
35-37	Scratch tape drive
43	AEC Machine only - Printer Belt 0 = ECS — 1 = BCD
44-50	Output tape channel
51-53	Output tape drive
61	I/O Channels on machine 0 = 8 — 1 = 16
63	Reserved for continue from halts

If the operator wishes to transfer control to the operator's console at the first control halt, he should enter the first control halt setup in the binary keys and press the signal key of the operator's console. To continue from any subsequent halt, binary key 63 will be used.

4.2.2 The Second Control Halt

The second control halt provides an easy method of changing the DCP equipment available tables. A bit, when set, means the corresponding channel has been added or removed. (Example: bit 35 set means channel 35 has been deleted if it was originally part of the system. If it was not originally part of the system, bit 35 set means it has been added.) DCP will determine the change and correct the equipment available tables accordingly. For permanent changes to the equipment available, the operator should use "C" cards. For addresses of tables, refer to the DCP listing at the end of section F1A. If no changes are required at the second control halt, the operator may continue from the halt without varying the settings of bits 0-62 from that of the first control halt. Or, he may set bits 0-62 to the zero position.

4.2.3 The Third Control Halt

The third control halt (or single step halt if in a single step method of selection) provides output media, area of control, and marginal control information to the DCP. It also provides a program identity for program selection in a single step from tape. Sense switch selections may also be made at this time.

Table 4 Third Control and Single Step (SS) Setup

Bits	Description
0	1 = Printer not for output
1	1 = Typewriter not for output
2	1 = Use tape for output
3	1 = Halt instead of print (Ref. par 4.3.5)
4	1 = Suppress Output
5	Operating Area 0 = Ops Cnsl 1 = Maint Cnsl
6-7	Marginal Control 00 = Controlled Margins (Ref par 4.3.1.2) 01 = Non-Margins (Ref par 4.3.1.3) 10 and 11 = Uncontrolled Margins (ref par 4.3.1.1)
8-31	Program Identity (SS from tape only) (3 character 8 bit IQS coded program identity)
32-62	Sense Switch Settings
63	Reserved for continue from halts

On continuing from the third control or single step halt, DCP will read in the diagnostic program and operate it according to the information obtained at the initial setup.

It should be noted that bit 5 of the third control halt determines the operating area. It will override the operator's choice at the first control halt.

4.2.4 Modes of Control

Mode of control defines how DCP will control the running of the diagnostic program. Selection of mode will determine how detailed the tests will be. It will also determine the degree of control the operator may exercise over the running of the program (sense switch options and manual interventions). The three modes available are autotest, maintenance, and surveillance.

1. Autotest Mode

This mode provides a quick test of selected area of a system. Results of testing in this mode will give an indication of the condition of the tested area.

In this mode, the selected program is run omitting all manual interventions and routines that require a change from normal machine environment. Only one pass through the entire test will be made. This mode will normally be used only when a master high density tape file is available. The method of selection will be schedule or sequential. Requests for change of control (SSW 49) will be the only sense switch option available. This switch will only be sensed between programs. Marginal checking will not be performed.

2. Maintenance Mode

This mode provides the control necessary for preventive maintenance testing and is the normal mode of operation. Routines that test special features, such as pushbuttons, that are used during normal system operation may be bypassed in this mode. Routines to check out equipment after a change has been incorporated into the machine may also be bypassed. Routines requiring detailed manual setup and/or excessive run time may be bypassed at the programmer's discretion. This may require that an alternate routine, capable of running without a manual intervention, be operated to provide test coverage of the area involved.

In this mode, all sense switch options and marginal checking are available to the operator. Non-essential manual interventions will be bypassed.

3. Surveillance Mode

This mode provides operator with all the diagnostic capabilities of the program. All tests will be performed unless specifically bypassed by operator selection of a diagnostic program option.

In this mode, all sense switch options and marginal checking are available to the operator. All manual interventions will be honored.

4.2.5 Method of Program Selection

The method of program selection defines the I/O device that will be used to read in the diagnostic program and how the program will be selected.

Five methods are available to the operator. Two are from the card reader; one for PUNNOR binary card decks, the other from PUNFUL binary card decks. The other methods are from the master tape file. (This must be a DCP generated master tape.) Important: Whenever operating from the DCP generated master tape, control halts will be bypassed. The tape load routine always sets up the DCP to operate in the following manner:

Area of Control - Maint Console
Mode of Operation - Autotest
Method of Selection - Sequential
No typewriter output
No tape output

The DCP will always receive the correct channel of the master tape when operating from a master tape.

If any change is required from this set up, the operator should place bit 49 of the maintenance console in the "down" position. This will cause the DCP to: (1) initially bypass the control halts, (2) recognize bit 49 as the "Restart DCP" request, (3) return to the first control halt.

1. Sequential (Master Tape File)

The diagnostic programs are read in and operated in the same sequence they have been loaded on the master tape.

2. Schedule (Master Tape File)

Programs are read in and operated in the sequence they have been scheduled. To prepare a schedule, make up a schedule card for each program to be operated((reference Appendix B - Schedule Card Format). If the operator desires to run a program in a mode of control other than that specified at the first control halt, this may be scheduled as shown in Appendix B. Any time a blank appears in column 48 of the schedule card, the mode of control will revert back to the mode of control specified at the first control halt. The operator will arrange the schedule cards in the sequence he wants the programs operated. A TERM card will be added after the last card (see Appendix B). The operator will place the schedule cards in the card reader hopper, ready the reader, and set sense switch 53 before continuing from the third control halt. DCP will read in the schedule, reject any program that isn't on the tape file, and print the schedule that will be run. When read in of schedule cards is complete, the operator should clear sense switch 53.

3. Single Step from Tape

In single step from tape, the program identified in control bits 8-31 at the single step halt will be read in and operated. When the program is finished, DCP will return to the single step halt for a new program selection. In any single step selection, the single step halt indicator 4 replaces the third control halt indicator 3. The same control information is required plus the program identity when selecting programs from tape.

4. Single Step from Cards (PUNNOR)

Programs are read in one program at a time and operated. The binary decks must be PUNNOR and both C (correction) and P (patch) cards will be accepted by DCP. P cards must immediately precede the branch card. A branch card is required for terminating read in, but it is not checked for sequence number or used to establish a branch address.

5. Single Step, IPL (PUNFUL)

A PUNFUL binary deck of the object program will be read into memory through the card reader. The control word at the front of the PUNFUL deck is read into memory and the read operation is chained to this address. C and P card corrections may follow the PUNFUL deck but must be followed by a branch card to terminate the read.

NOTE: DCP will assume any cards left in the reader hopper when the reading of the PUNFUL deck is complete are C or P cards.

4.3 Controlling the Diagnostic Program

After the program is read in, DCP will print out the program heading followed by its own control information. An initial manual intervention may be performed before the diagnostic program receives control.

The interrupt table, interrupt address register, and boundary registers are conditioned before each new program is operated. All indicators are cleared and the mask from the diagnostic program communication registers is stored.

The diagnostic program (DP) activation block is run for any conditioning, establishing patterns, etc., that may be required before tests can start. Control is returned to DCP at EEA, and DCP now checksums the sub-blocks of the test logical block and establishes communication necessary to run.

The DCP will now return control to the DP after the first sub-block control word. The DCP will run the number of reliability passes required in the communication register, ADA (count field). Each pass consists of one run through the test block and the analysis block. (All analysis may be completed in the test block and the analysis block omitted.)

4.3.1 Running Margins

When the reliability passes are completed, margins will be run according to the setup at the third control (or single step) halt. This may be overridden by sense switch 51 (terminate margins). Two methods of running margins are available in DCP and the option of bypassing marginal testing if desired. These are described below.

1. Uncontrolled Margins

In this marginal mode, all sense switch options are available, printing is immediate, and decision for terminating a marginal pass rests with the operator. It is selectable by setting bit 6 at the third control or single step halt (irrespective of setting of bit 7).

2. Controlled Margins

In this marginal mode, normal loop options may be bypassed. The 100X loop is available but will proceed to the next routine after one cycle of looping (see par 4.3.2 below). All reliability passes required by the DP will be run first. When margins are ready to be applied DCP will halt on halt indicator 6. Marginal voltages will now be applied and the operator will continue. DCP will return control to the start of the test block and will continue looping on the test block until an error is detected. The error printout associated with the failure is stored and the present pass of the test block is completed. DCP now will halt to have margins removed (halt indicator 7) and on continue will print out the stored images. If the program runs without error to maximum marginal voltage, the pass may be terminated by setting sense switch 52.

Controlled marginal mode is the normal mode of operation for DCP and will be selected when bits 6 and 7 are left clear at the third control halt.

3. Reliability Only

The operator may choose to bypass marginal testing entirely. He may do this by setting bit 7 with bit 6 clear at the third control or single step halt. Margins are automatically bypassed in autotest mode.

4.3.2 Sense Switch Options

Bits 48-62 of the operating area are reserved for the use of the DCP (after the 3 control halts). Table 5 lists the definitions of each of the sense switches. It should be noted that the sense switches may be changed whenever the operator desires. When the DCP is going to give the operator the use of an option, it will, at that time, read the sense switches to determine the course of action.

Table 5 DCP Sense Switch Definitions

Sense Switch	Definition
48	Enter Utility System
49	Restart DCP (Change of Control requested)
50	Abandon program presently being run
51	Terminate marginal checking/Bypass marginal checking
52	Terminate present margin line/no failure to maximum voltage
53	Read in Schedule Cards
54	Spare
55	Halt on Error (After Error Print)
56	Loop 1 option (Routine or smaller area for scoping)
57	Loop 2 option (test sub-block - DCP controlled)
58	Loop 3 option (General Area of Test)
59	Loop 4 option (Entire Program - DCP controlled)
60	Loop on error
61	On error, loop 100 times and count errors
62	Spare
32-47	Defined by diagnostic program or utility system that is being run

Explanation of Sense Switches

SS 48 Enter Utility System

For explanation, see Section 5.

SS 49 Restart DCP

This will cause the DCP to return to the first control halt. When operating from the maintenance tape, if the operator wants to go through the three control halts, he should set this bit.

SS 50 Abandon program being run

This will cause the DCP to print "Present program being abandoned by operator decision" and then attempt to read in the next program.

SS 53 Read in Schedule Cards

When operating in the schedule method of program selection, this will cause the DCP to assume that what is in the card reader is schedule cards. DCP will read the schedule cards, print out the schedule, then continue as explained in Section 4.2.5 (2).

SS 55 Halt on error (afterprint)

When set, this will cause the DCP to print what was requested (by the diagnostic program) and then come to a program halt with the appropriate indicator (see Table 1 in Appendix B). On continue, DCP will continue to operate the program in the normal manner.

SS 56 Loop 1 Option

This is intended to allow the operator to loop on a small portion of a program for scoping. However, the diagnostic program controls the availability of this option to the operator. Therefore, the operator does not automatically get this option when it is selected.

SS 57 Loop 2 Option

This is a DCP controlled option and at various times DCP will check for this option. If selected, DCP will attempt to initiate a loop. In order to do this however, the diagnostic program must have programmed to allow this option. If it has not, no loop will be executed.

SS 58 Loop 3 Option

This is entirely under the diagnostic program's control. Since the diagnostic controls the availability of checking for this option, the operator does not automatically obtain this option when selected.

SS 59 Loop 4 Option

This is a DCP controlled option the operator will always obtain when selected. When the diagnostic returns to DCP after the analysis block, DCP checks this option. If selected, DCP will return control to the beginning of the diagnostic program's activation block.

SS 60 100 times loop option

When the option is selected, the 100 times loop will be initiated when an error is detected. The first error statement will be printed (stored if controlled marginal pass) and looping will be initiated. The next error print will be stored in memory. If it is a composite deposit print, DCP will maintain a running tally of all bits dropped and picked. A count of errors is maintained to be printed out at the end of the 100 X loop following the final error statement (stored on MC).

After the first looping of 100 times is completed, DCP will continue to the next routine if controlled margins are being run. If uncontrolled margins or reliability passes are in progress, DCP will continue the looping in blocks of 100 each until sense switch 61 is cleared.

4.4 DCP Printouts

The DCP printout formats are shown in Appendix C.

At times, it is desirable for the operator to have the capability of requesting DCP printouts. Those requests that are available are given below.

4.4.1 Octal Hex Dump of Memory from the Switches

This may be obtained in either of two ways, depending on the area of control.

1. Maintenance Console

The following information must be entered into the maintenance bits. Bits 0-31 will contain a branch to location (8) 4005. Bits 32-49 will contain the starting address of the area to be dumped. Bits 50-63 will contain the octal number of locations to be dumped. The operator should then start the clock, enter the instruction, then press program start.

2. Operators Console

The following information must be entered in the binary keys. In keys 0-18, (8) 4005. Bit 27 (the ship flag) must be set. Keys 32-49 must contain the starting address of the area to be dumped. Keys 50-63 must contain the octal number of locations to be dumped. The operator should then depress IPL, and press the signal key. This, in effect, will cause a branch to location (8) 4005.

4.4.2 Panel Dump

A print out of the contents of special storage and index storage is available when the DP is read in from cards. A patch (P) card will be used to obtain this dump. The patch address will be the location of the last instruction to be executed before the print is made. The information to be added is a SIC, 31.0;B, (8) 4061.0 that is, 000037.00 80 004061.10 00.

Also this dump may be obtained at any time by branching through maintenance bits to location 4061.0. The location counter address will be meaningless.

4.4.3 Output Media

The output media will be determined by the setup at the third (or single step) halt. The three media available are: (1) Printer, (2) Typewriter and, (3) an output tape for later off line print. Manual intervention statements and DCP error statements will be printed on the typewriter, if available. For all other printouts, the DCP will first check to see if a tape output was requested. If so, it will be used. Second priority for output is the printer. Lowest priority is the typewriter.

Options to halt instead of print or to suppress all output are also available at the third control halt. The halt indicators will show the type of print that was requested. The control word for the comment associated with the print will be displayed in the left accumulator. The right half accumulator will vary as indicated in Table 6 below.

Table 6 Print Information

Halt Instead of Print

Halt Indicator	Print Requested	Right Half Accumulator
(8) 30	Normal Comment	Blank
31	Composite Deposit	Control Word
32	Binary Word	Binary Register
33	Octal Hex Dump	Control Word for Dump
34	Register Compare	Control Word 1 for Print

SECTION 5 -- UTILITY SYSTEM

The DCP utility system provides the following functions; generating a master tape file, tape update and change, tape duplicate, and a DCP Caller which will initiate call of DCP from the master tape file.

These routines were integrated with DCP so a master tape could be generated by DCP, and the master tape file, once generated, would be capable of updating itself. It also has the full use of routines within DCP for output, halts, and conversion of card images read in through the reader.

5.1 Entering the Utility Control Routine

The utility system may be entered by setting sense switch 48 before continuing from the third control or single step halt. When the utility control routine takes control, DCP will come to a halt (indicator 20 octal). At this halt, the operator will select the function he desires by setting the appropriate sense switch and continuing. See table 7 for utility sense switch definitions. The tape requirements for the utility system must be taken care of at the first control halt. The tape load requires one tape unit. This is defined as the master channel and drive at the first control halt. The update and change routine and the tape duplicate routine require two tape drives; the master and the scratch channels and drives. The old master tape file will be on the channel and drive designated as the master. The reel that the new master tape file will be generated on will be the scratch tape.

Table 7 Utility Sense Switch Definitions

Sense Switch	Routine Selection
32	Update and Change
33	Tape Load (Generate)
34	Tape Duplicate
35-47	Spare

5.1 Entering the Utility Control Routine (Cont'd)

Before continuing from the utility control halt, the operator should insure that sense switch selection of the desired routine has been made, that cards required for the routine have been placed in the card reader and the reader readied. The operator should leave sense switch 48 set until all requirements for the utility section have been completed. This will cause DCP to return to the utility control halt after completing each function. This will permit the operator to physically change the selector on the tape drive so the master file can be duplicated.

5.2 Tape Load Routine

When preparing to generate a master tape file, the operator should insure the program decks are arranged in the order they are to be written on the tape. He should also be sure that if either KC BA2 or KA UA2 (DCP2) is one of the programs to be written on tape, the other is there also. KA UA2 must always immediately precede KC BA2.

A TERM card (Reference Appendix B) must follow the last program to be loaded.

The tape will be generated in the following manner, starting at load point:

1. DCP caller written (ODDNEC)
2. DCP (ODDECC, without checksum)
3. Erase long gap
4. Write end of file
5. Each program read from reader, checksummed and written on tape, ODD parity in ECC mode. A table is generated in DCP indicating program identity and relative position of each program on the tape.
6. When the TERM card is read, the tape is rewound, then spaced over caller.
7. DCP is checksummed and rewritten on the tape.
8. The tape is again rewound and checked. The caller is checked register for register and a positive printout of no errors should occur. All other programs will be checked using the generated checksums.
9. DCP will print the list of programs loaded on the master tape.

5.3 Update and Change Routine

To simplify the routine and procedure for updating and changing a tape, a table is generated in DCP using schedule cards. The schedule card format is outlined in Appendix B. The operator will have one card for each program to be placed on the new tape. He will arrange the cards in the sequence they are to be loaded on the tape, followed by a TERM card. This will permit the 4 changes; swapping, deletion, addition, and change. This schedule must be ready in the card reader before continuing from halt "20". After the schedule is read in and the table generated, DCP will come to a halt (indicator 22) to permit reloading the card reader with new and revised decks to go on the new tape file followed by a TERM card. These programs must be arranged in the same sequence they will be written on the tape. On continuing from halt "22", one card will be read (to obtain program identity) and saved until the program is required by the schedule. DCP will start with the identity of the first program scheduled and compare it to the identity of the first program in the card reader. If it doesn't compare, it will get the program from the old tape and transfer it to the new one. When the program in the card reader is required, it will be read in, checksummed, and added to the new tape. The first card of the next program will then be read and the schedule continued until the tape is completely written. The tape is then rewound, DCP is checksummed and re-written, and the entire tape checked. DCP will then print the list of programs as they are loaded on the new tape.

5.4 Tape Duplicate

The tape duplicate program is essentially a second entry point into the tape update and change routine. It transfers the sequence table in DCP to the update and change schedule table. It then proceeds to transfer each program in turn to the new tape. The tape is then rewound and checked and a list of programs on the tape are identified by a printout.

APPENDIX A

Schedule Card Format

Program File Number

Columns 41-47 (Hollerith)

Mode of Control (not used in tape update and change)

Column 48 (Hollerith)

Blank - As set at Control Halts

A - Autotest Mode

M - Maintenance Mode

S - Surveillance Mode

Example:

41	42	43	44	45	46	47	48
K	C		N	C	1		M

Termination Card Format

Column 1	6, 7, and 9 punch
Column 41-44	TERM (Hollerith)

APPENDIX B

For convenience, all tables used in the writeup are reproduced and included in this appendix.

Table 1

DCP Halt Indicators

	1	Initial Control Halt (see Table 3 for Setup)
	2	Second Control Halt, equipment (reference par 4.2)
	3	Third Control Halt, output and MC (see Table 4 for Setup)
Control	4	Single Step Halt (In lieu of halt 3 in any SS mode)
Halts	5	Spare
	6	MC on Halt (Controlled Margins)
	7	MC off Halt (Controlled Margins)
	10	Error in Setup at Control Halt
	11	Halt on error (after print)
	12	Time Delay Ran Out on I/O Operation
Error	13	Sequence error on load from cards
Halts	14	Illegal Card or Illegal punch on C or P card
	15	Checksum error from cards
	16	Checksum error from Master Tape
	17	Spare
	20	Utility Control Halt
	21	Spare
	22	1st halt
Utility	23	Tape update and change - 2nd halt
Halts	24	Spare
	25	Spare
	26	Spare
	27	Spare
	30	Normal Comment
Halt	31	Composite Deposit
Instead	32	Binary Word
of	33	Octal Hex Dump
Print	34	Register Compare
	35	Spare
	36	Spare
MI Halt	37	Manual Intervention

Table 2 System Identification

Octal Number	7030/7950 EDPS
01	AEC
02	HARVEST
03	K1
04	K2
05	K3
06	K4
07	K5
10	K6
11	K7
12	K8

Table 3

First Control Halt Setup

Inclusive Bits	Information
0-4	System Identification (Ref Table 1)
5-6	Mode of Control (for explanation, see Section 4.2.4) 00 = Maintenance 01 = Surveillance 10 = Autotest
7-11	Method of program selection (for explanation, see Section 4.2.5) All Clear — Sequential 7 = 1 — Schedule 8 = 1 — Single Step from Tape 9 — Spare 10 = 1 — Single Step from Cards (PUNNOR) 11 = 1 — Single Step IPL (PUNFUL)
12-18	Master tape channel
19-21	Master tape drive
28-34	Scratch tape channel
35-37	Scratch tape drive
43	AEC Machine only - Printer Belt 0 = ECS 1 = BCD
44-50	Output tape channel
51-53	Output tape drive
61	I/O Channels on machine 0 = 8 1 = 16
63	Reserved for continue from halts

Table 4 Third Control and Single Step (SS) Setup

Bits	Description
0	1 = Printer not for output
1	1 = Typewriter not for output
2	1 = Use tape for output
3	1 = Halt instead of print (Ref par 4. 3. 5)
4	1 = Suppress Output
5	Operating Area 0 = Ops Cnsl 1 = Maint Cnsl
6-7	Marginal Control 00 = Controlled Margins (Ref par 4. 3. 1. 2) 01 = Non-Margins (Ref par 4. 3. 1. 3) 10 and 11 = Uncontrolled Margins (Ref par 4. 3. 1. 1)
8-31	Program Identity (SS from tape only) (3 character 8 bit IQS coded program identity)
32-62	Sense Switch Settings
63	Reserved for continue from halts

Table 5 DCP Sense Switch Definitions

Sense Switch	Definition
48	Enter Utility System
49	Restart DCP (Change of Control requested)
50	Abandon program presently being run
51	Terminate marginal checking/Bypass marginal checking
52	Terminate present margin line/no failure to maximum voltage
53	Read in Schedule Cards
54	Spare
55	Halt on Error (After Error Print)
56	Loop 1 option (Routine or smaller area for scoping)
57	Loop 2 option (test sub-block - DCP controlled)
58	Loop 3 option (General Area of Test)
59	Loop 4 option (Entire Program - DCP controlled)
60	Loop on error
61	On error, loop 100 times and count errors
62	Spare
32-47	Defined by diagnostic program or utility system that is being run

Table 6 Print Information

Halt Instead of Print

Halt Indicator	Print Requested	Right Half Accumulator
(8) 30	Normal Comment	Blank
31	Composite Deposit	Control Word
32	Binary Word	Binary Register
33	Octal Hex Dump	Control Word for Dump
34	Register Compare	Control Word 1 for Print

Table 7 Utility Sense Switch Definitions

Sense Switch	Routine Selection
32	Update and Change
33	Tape Load (Generate)
34	Tape Duplicate
35-47	Spare

```
        KC AA1    CENINT 1  THIS IS AN EXAMPLE OF A PROGRAM HEADING.
KI Machine DCP  MOD O  AUT  SEQ  OC (DCP Controls)
```

THIS IS THE NORMAL COMMENT PRINT.

```
2     3          4
45678901234567890123456 7
00100010001000100010 0
```

THIS IS AN EXAMPLE OF THE BINARY WORD PRINT WITH THE ASSOCIATED HEADING PRINT AND COMMENT.

```
0          1          2          3
01234567890123456789012345678901
00000000100000000000000000000110      013546.4
00000000100000000100000000000110      014372.0
00000000100000001000000000000110      014400.4
00000000100000001100000000000110      014437.0
```

THIS IS AN EXAMPLE OF THE BINARY WORD PRINT BEING USED TO MAKE A TABLE. HEADINGS WILL BE BYPASSED IF HEADING FORMAT IS NOT CHANGED AND NO INTERVENING PRINTS HAVE OCCURRED. ANY COMMENT ASSOCIATED WITH REQUESTS 1, 2, OR 3 MUST NOT, WHEN ADDED TO BIT COUNT, EXCEED 120 CHARACTERS.

```
0          1          2          3          4
01234567890123456789012345678901234567890123456789012345
     0          1          *          0          *
```

THIS IS AN EXAMPLE OF THE COMPOSITE DEPOSIT PRINT. BIT 5 AND 28 ARE INDICATED AS LOST, BIT 13 IS PICKED, AND BITS 22 AND 37 ARE SPURIOUS.

THIS IS THE OCTAL HEX DUMP WITH COMMENT.

```
002604.0   002606.33  42  000216.40  80   000147.10  00  004000.01  0A
002606.0   000147.33  42  000216.40  80   000147.32  C2  002616.32  42

010660.0   000023.22  00  000023.01  10   000021.22  00  000023.01  10
```

THIS IS A SAMPLE OUTPUT FROM THE REGISTER COMPARE ROUTINE.

SAMPLE OUTPUTS FROM PRINT ROUTINES

LC SAP CODING FORM

TITLE: _____ PROGRAMMER: _____ SHEET _____ OF _____

USE THESE WHEN TAPE DIAG. IS RUN BY DCP, (in DCP Deck)
MAY BE USE AT OTHER TIMES IF DESIRE TO OPERATE FROM OP's CONSOLE.

SYMBOL LOCATION	OP.	ADDRESS, TAG, DECREMENT LHW	RHW	REMARKS	LABEL
C00734	4.4	016501.10 00			
CD16501	.0	007023.00 80	007020.10 00	007116.10 00 } allow tape selection to ADVANCE SIC 7023, B 7020	
C00515	1.0	201401.02 C0	211400.00 00	35 NOT USED. → Define TAPE CORRECTLY!	
C00416	0.0	064200.00 00	000000.00 00	→ K1 SURV SS CARDS 8 CHAN.	1ST HALT
C00416	1.0	064200.00 00	000000.00 00	→ " " " "	2ND HALT
C00416	2.0	002000.00 00	000000.00 00	→ OPERATE FROM OP'S CONSOLE.	3rd HALT.
C00416	2.	012000.00 00	0 00000 0000 0	operate from Maint Console.	3rd Halt.

RL-2160 (Rev. 11/60)

PRINID,KA UA1,HANNIGAN

YOUR UNDEFINED SYMBOLS , WHICH HAVE MODE N , AND THEIR LOCATIONS ARE -

```
X6              16501.00
F1BH2           16502.00
F1BH3           16503.00
F2BI5           16504.00
H6BCON          16505.00
```

12 18

```
          SLC,%8¤4000,0                                                                                   004000.00

          PUNID,KA UA1                                                   KA UA1

                    @FEB 26,1962

                                        @KA UA1


                              @DIAGNOSTIC CONTROL PROGRAM

                               @FOR 7030/7950 EDP SYSTEM


                                         @BY

                                    @J.C. HANNIGAN

          PRNS
          SEM,6
EDCP1     BD,F1               @START DCP                        4374.04 00                      004000.00
          BD,F1NORD                                             5250.04 00                      004000.40
EDCP2     %IQSZ¤DD%BU,64,8¤,     UA1Z                                                           004001.00
EDCP3     DD%BU,64,8¤,0                                           0000000000000000000000        004002.00
                              @RESTART FROM SWITCHES
EDCP4     BD,F1B              @READ IN NEXT PROGRAM             5252.04 00                      004003.00
          NOP                                                      0.30 00                      004003.40
EDCP5     BD,F1C              @OPERATE PROGRAM IN MEMORY        6604.44 00                      004004.00
          B,F1B2A4            @FOR DCP2 ACTIVATION              6167.10 00                      004004.40
EDCP6     BD,H4B              @OCTAL HEX DUMP FROM SWITCHES    14005.44 00                      004005.00
          B,F1B2A8            @RETURN ENTRY FROM DCP2           6226.50 00                      004005.40

                              @CONTROL REGISTERS
ECTL1     DD%BU,64,8¤,0                                           0000000000000000000000        004006.00
                         @ 0 AUTOTEST        EBAUTO
                         @ 1 MAINTENANCE     EBMAIN
                         @ 2 SURVEILLANCE    EBSURV
                         @ 3 DCP             EBDCP
                         @ 4 M.C. ON         EBMCON
                         @ 5 UNCONTROLLED MC
                         @ 32-45 ZEROES
                         @ 46-52 CONTROL BLANKS BEFORE IMAGE
                         @ 53-63 ZEROES
```

```
ECTL2   DD%BU,64,8¤,0                                  00000000000000000000   004007.00
          @ 0-4 MACHINE NUMBER    EMACH
          @ 5 AUTOTEST
          @ 6 SURVEILLANCE
          @ 7-11 SELECTION-ALL CLEAR IS SEQUENTIAL
          @ 7  SCHEDULE
          @ 8  SINGLE STEP-TAPE
          @ 10 SINGLE STEP-CARDS
          @ 11 SINGLE STEP-IPL
          @ 12-18 MASTER TAPE CHANNEL     ETAPCM
          @ 19-21 MASTER TAPE DRIVE       ETAPDM
          @ 28-34 SCRATCH TAPE CHANNEL    ETAPCS
          @ 35-37 SCRATCH TAPE DRIVE      ETAPDS
          @ 38 NO PRINTER
          @ 39 NO TYPEWRITER
          @ 40 NO TAPE
          @ 41 HALT INSTEAD OF PRINT
          @ 42 SUPPRESS OUTPUT
          @ 43 BCD CHAIN PRINTER
          @ 44-50 OUTPUT TAPE CHANNEL     ETAPCO
          @ 51-53 OUTPUT TAPE DRIVE       ETAPDO
          @ 61 16-CHANNEL I/O
          @ 62 CONTROL FROM MAINTENANCE CONSOLE

ECTL3   DD%BU,64,8¤,0                                  00000000000000000000   004010.00
          @ 0 NOT FIRST PASS
          @ 1 IMAGE STORAGE FULL
          @ 2 100X LOOP IN PROGRESS
          @ 3 TIME CLOCK DISABLED
          @ 4 SNGL STEP SELECTION
          @ 5 FIRST SCHEDULE CARD
          @ 6 INTERVENING PRINT
          @ 7 SUPPRESS TW SPACE
          @ 8 PROGRAM HDG BEING PRINTED
          @ 9 POST SPACING SUPPRESSED
          @ 10 PRINT PASS NUMBER
          @ 11 SUPPRESS SPACE FILE OF MASTER
          @ 12 ENTRY TO G3B FROM EH & LD
          @ 13 ZERO SELECTED INDICATORS
          @ 14 M.C. PASS
          @ 15 RUN WITH M.C.
          @ 16 UNCONTROLLED M.C.
          @ 17 DOUBLE SPACE
          @ 18 OPS CONSOLE PROGRAM
          @19 NON-ZERO REG ENCOUNTERED IN O H DUMP
          @ 32-56 DIAG PROG STARTING LOC    EDPLOC
```

32 40
33 41
34 42
35 43

```
ECTL4    DD%BU,64,8¤,0                                    00000000000000000000    004011.00
                    @ 1-8 MACHINE IDENTITY
                    @ 1 AEC
                    @ 2 HARVEST
                    @ 3 K1
                    @ 4 K2
                    @ 5 K3
                    @ 6 K4
                    @ 7 K5
                    @ 8 K6
                    @ 40-63 PROG ID-SINGLE STEP
                        @EQUIPMENT AVAILABLE REGISTERS
                        @MAKE CHANGES TO TABLES F1AA1-F1AA5
EQAV1    DD%BU,64,8¤,0                                    00000000000000000000    004012.00
EQAV2    DD%BU,64,8¤,0                                    00000000000000000000    004013.00
EQAV3    DD%BU,64,8¤,0                                    00000000000000000000    004014.00
EQAV4    DD%BU,64,8¤,0                                    00000000000000000000    004015.00
EQAV5    DD%BU,64,8¤,0                                    00000000000000000000    004016.00
EQAV6    DD%BU,64,8¤,0                                    00000000000000000000    004017.00
EQAV7    DD%BU,64,8¤,0                                    00000000000000000000    004020.00
EQAV8    DD%BU,64,8¤,0                                    00000000000000000000    004021.00
EQAV9    DD%BU,64,8¤,0                                    00000000000000000000    004022.00
EQAV10   DD%BU,64,8¤,0                                    00000000000000000000    004023.00
EQAV11   DD%BU,64,8¤,0                                    00000000000000000000    004024.00
EQAV12   DD%BU,64,8¤,0                                    00000000000000000000    004025.00
         DD%BU,64,8¤,0      @SPARE                        00000000000000000000    004026.00
         DD%BU,64,8¤,0      @SPARE                        00000000000000000000    004027.00
         DD%BU,64,8¤,0      @SPARE                        00000000000000000000    004030.00
EPCW     XW,H1AH            @VF FOR WRITE CW    13410.00 00 000000.00 00          004031.00
```

```
                                @COMMUNICATION REGISTERS
                                @RETURN FROM LOGICAL BLOCKS
EEIPL    BD,F1F                                  1ST Entry after IPL Deck.      6712.04 00    004032.00
EEA      BD,F2B                                  TO Start 1st Pass Between      6776.04 00    004032.40
EEB      BD,F3A                                                                 7032.04 00    004033.00
EEBS     BD,F3B  From test Success                                              7101.44 00    004033.40
EEBF     BD,F3C    "    " Failure                                               7123.44 00    004034.00
EEC      BD,F4A                                                                 7641.04 00    004034.40
EED      BD,F5A                                                                 7714.44 00    004035.00
EEDR     BD,F5B                                                                 7734.44 00    004035.40
EETERM   BD,F5C                                                                 7735.04 00    004036.00
         NOP                    @SPARE                                          0.30 00      004036.40
         DD%BU,64,8□,0          @SPARE                                          000000000000000000000      004037.00

                                @HELPER ROUTINES
ELUP1    BD,G1A                                                                 10237.44 00   004040.00
         BD,$                        @ILLEGAL ENTRY LOCATION                    4040.44 00    004040.40
ELUP3    BD,G1C                                                                 10245.44 00   004041.00
         BD,$                        @ILLEGAL ENTRY LOCATION                    4041.44 00    004041.40
ELUPF    BD,G1F                                                                 10253.44 00   004042.00
         BD,$                        @ILLEGAL ENTRY LOCATION                    4042.44 00    004042.40
EHLTC    BD,G2A                                                                 10355.04 00   004043.00
EHLTF    BD,G1G                                                                 10261.44 00   004043.40
ESSW     BD,G1H                                                                 10265.44 00   004044.00
EMIR     BD,G3A                                                                 10703.04 00   004044.40
ECHECK   BD,F3D  Between Blocks chain                                           7126.04 00    004045.00
ECS      BD,G4                                                                  10740.04 00   004045.40
ECF1     BD,G4B                                                                 11065.04 00   004046.00
ECF2     BD,G4C                                                                 11113.44 00   004046.40
ECF3     BD,G4D                                                                 11144.44 00   004047.00
ECF4     BD,G4E                                                                 11175.44 00   004047.40
EMEMCI   BD,G5A                                                                 12577.04 00   004050.00
EMEMCR   BD,G5B                                                                 12612.44 00   004050.40
EINDZ    BD,G6A                                                                 12716.44 00   004051.00
ERINT    BD,G6B                                                                 12741.04 00   004051.40
ECF5     BD,G4F                                                                 11226.04 00   004052.00
         NOP                    @SPARE                                          0.30 00      004052.40
         DD%BU,64,8□,0          @SPARE                                          000000000000000000000      004053.00

                                @PRINT ROUTINES
EPNC     BD,H1A                                                                 12747.04 00   004054.00
EPCD     BD,H2A                                                                 13571.04 00   004054.40
EPCDD    BD,H2B                                                                 13613.44 00   004055.00
EPBW     BD,H3A                                                                 13712.04 00   004055.40
EPBWD    BD,H3B                                                                 13742.04 00   004056.00
EPOH     BD,H4A                                                                 13763.04 00   004056.40
         BD,H4B                 @OCTAL HEX DUMP FROM SWITCHES                   14005.44 00   004057.00
EPRC     BD,H5A                                                                 14151.44 00   004057.40
EPBDC    BD,H6D                                                                 14414.04 00   004060.00
EPADD    BD,H6B4                                                                14277.04 00   004060.40
EPPD     BD,H7A                                                                 14460.04 00   004061.00
         NOP                    @SPARE                                          0.30 00      004061.40
```

```
                        @CONTROL REGISTERS FOR DIAG PGM
ESSS    DD%BU,64,8□,0   @STORED SENSE SWITCHES                  000000000000000000000   004062.00
FSMI    DD%BU,64,8□,0   @STORED MI DATA                        000000000000000000000   004063.00
ETINT   DD%BU,64,8□,0   @STORED INTERRUPT INFO                 000000000000000000000   004064.00
        DD%BU,64,8□,0   @SPARE                                  000000000000000000000   004065.00

                        @PRINT ENCODE TABLES
EPTBLB  DR%BU,64,8□,8   @BW AND CD DECODE AREA                      10.00               004066.00
EXLUP   DD%BU□,0                                                    000000000000000000000   004076.00
        DD%BU,64,8□,0   @SPARE                                      000000000000000000000   004077.00

                        @INTERRUPTION TABLE OPERATING AREA
EINT    DR%BU,64,8□,48                                          60.00                   004100.00
ESSSX   DRZ%BU,64□,3    @C CARDS TO BYPASS CTL HLT               3.00                   004160.00
        DRZ%BU,64□,8    @SPARE                                  10.00                   004163.00
F1TAPO  DD%BU□,0        @TAPE POSITION                              000000000000000000000   004173.00
F1SQPO  DD%BU□,0        @SEQ POSITION                               000000000000000000000   004174.00
F1SCPO  DD%BU□,0        @SCHEDULE POSITION                          000000000000000000000   004175.00
F1PGID  DD%BU□,0        @PROGRAM IDENTITY                           000000000000000000000   004176.00
        NOP             @SPARE                                      0.30 00                 004177.00

                        @COMMON HALT OPERATING AREA
G2A1    LCI,$X0,%8□100000                                   100000.01 02                    004177.40
        SV,$X0,$X0                                             20.01 30                     004200.00
        CB,$X0,$-.32                                         4200.00 48                     004200.40
        B,G2A2                                              10376.50 00                     004201.00
                        @
        DRZ%BU,32,8□,5  @SPARE                                      2.40                    004201.40

ESEQTB  DRZ%BU,64,8□,60 @TABLE OF PROGRAMS ON MASTER TAPE           74.00                   004204.00

ESCHTB  DRZ%BU,64,8□,60 @TABLE OF SCHEDULED RUNS                    74.00                   004300.00
```

```
                              @
                              @ENTRY TO START DCP
                              @
F1      RD,$&1                      @DISABLE INRPT SYST                  4374.44 00                      004374.00
        BB1, ECTL3.11, $&1.         @CARD LOADED BYPASSES TAPE SPFL      4010.13 80 004375.74 0E         004374.40
F1A     Z,$X0                                                              20.22 00                      004375.40
        TI,15,$X0,$X1               CLEAR ADDRESSES 0-31                 20.00 80 000021.36 A0           004376.00
        TI,14,$X0,2.0                                                    20.00 80 000002.34 A0           004377.00
        ST%BU¤,0                                                          0.00 80 000000.20 D0           004400.00
        SV,$X1,1.0                                                        1.03 30                        004401.00
        L%BU,32,8¤,4.32             @LOAD MAINT BITS FOR INITIAL SETTING  4.40 80 040000.20 50           004401.40
        ST%BU¤,ESSS                 @OF PROGRAM INTERROGATION BITS       4062.00 80 000000.20 D0         004402.40
        BB1,ECTL2&.62,$&1.0  @SET BIT FOR INITIAL CTL FROM MAINT CNSL    4007.76 80 004404.74 0E         004403.40
        B,F1A2                                                           4411.50 00                      004404.40
             @ENTRY TO RESTART DCP
        CNOP
F1A1    SIC,31.0                                                          37.00 80                       004405.00
                B,H1A1A2                                                12754.10 00                      004405.40
        XW,F1AI1,44,0                                                    5171.00 00 001300.00 00         004406.00
        Z,ESSSX                     @CLEAR C CARD AREA                   4160.22 00                      004407.00
        TI,2,ESSSX,ESSSX&1.0  @TO NOT BYPASS HALTS                       4160.00 80 004161.04 A0         004407.40
        CM0000%BU,1,8¤,J2AD1&.04  @CLEAR BIT TO BYPASS HLTS              15247.04 80 001000.00 F0        004410.40
F1A2    LX,$X1,G2D&1.0              @LOAD 1ST CONTROL HALT INDICATOR     10454.02 10                     004411.40
        SX,$X1,G2D1                                                      10513.03 10                     004412.00
        SIC,$X15                                                            37.00 80                     004412.40
                B,G6A               @GO CLEAR IND                        12716.50 00                     004413.00
        L%BU,5¤,ESSSX               @LOAD MACH NO.-FIRST C CARD           4160.00 80 005000.20 50        004413.40
        BRZ,F1A2X                   @IF ZERO-GO THRU CTL HLT              4420.74 C2                     004414.40
        L,ESSSX                                                           4160.00 80 000000.20 50        004415.00
        ST,G1J6 —                   @STORE WHAT CAME FROM C CARD         10351.00 80 000000.20 D0        004416.00
        CM1111%BU,1,8¤,J2AD1&.04  @SET BIT TO BYPASS HLTS                15247.04 80 001000.36 F0        004417.00
        B,F1A2X1                                                          4423.50 00                     004420.00
F1A2X   SIC,$X15                                                            37.00 80                     004420.40
                B,G2A.32            @INITIAL HALT                        10355.50 00                     004421.00
RETURN FROM INITIAL HALT
        L%BU¤,G1J6                  @SAVE INFO NEC TO GEN TAPE           10351.00 80 000000.20 50        004421.40
        ST%BU¤,ESSSX                                                      4160.00 80 000000.20 D0        004422.40
F1A2X1  L%BU¤,FECTL2                TAPE CHANNEL ASSIGNMENTS              4745.00 80 000000.20 50        004423.40
        ST%BU,62¤,ECTL2,2                                                 4007.00 80 076001.20 D0        004424.40
F1A2A   L%BU¤,G1J6                        @SWITCHES                      10351.00 80 000000.20 50        004425.40
        BB,ESSS.62,F1A7                   @PRINT PROGRAM TABLE            4062.76 80 005064.74 02        004426.40
        ST%BU,12¤,ECTL2,52                                                4007.00 80 014032.20 D0        004427.40
        CM0101%BU,1¤,ECTL2.43,20  SET BCD PRINTER BIT IN CTL WORD 2       4007.53 80 001012.12 F0        004430.40
        CM0101%BU,1¤,ECTL2.61,2   SET 16 CHAN I/O BIT IN CTL WORD 2       4007.75 80 001001.12 F0        004431.40
        CT0101%BU,10¤,$,42  @MASTER TAPE                                  4432.40 80 012025.13 70        004432.40
        BRZ,$&1.32                                                        4435.34 C2                     004433.40
        SF%BU,10¤,ECTL2.12,42                                             4007.14 80 012025.12 F0        004434.00
        CT0101%BU,10¤,$,26  @SCRATCH TAPE                                 4435.00 80 012015.13 70        004435.00
        BRZ,$&1.32                                                        4437.74 C2                     004436.00
        SF%BU,10¤,ECTL2.28,26                                             4007.34 80 012015.12 F0        004436.40
        CT0101%BU,10¤,$,10  @OUTPUT TAPE                                  4437.40 80 012005.13 70        004437.40
        BRZ,$&1.32                                                        4442.34 C2                     004440.40
        SF%BU,10¤,ECTL2.44,10                                             4007.54 80 012005.12 F0        004441.00
        BBN,$R&.63,$&1.0                                                    11.77 80 004443.34 0A        004442.00
        ST%BU,63,8¤,F1AB,1                                                5126.00 80 077000.60 D0        004443.00
        Z,$X1                       @FIND MACH NUMBER                       21.22 00                   004444.00
        SF%BU,3¤,$X1&.15,59                                                 21.17 80 003035.52 F0      004444.40
        SX,$X1,$X1                                                          21.03 10                   004445.40
        BZXVZ,$&3.0                                                       4451.31 40                     004446.00
        TI,1,G2D&8.,G2D1            @NO MACH NUMBR SET                   10463.00 80 010513.02 A0        004446.40
        SIC,$X15                                                            37.00 80                     004447.40
                B,G2A,32            @COMMON HALT                         10355.50 00                     004450.00
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          B,F1A2A                                                  4425.50 00                      004450.40
          LX,$X2,F1AA-1.%$X1¤      @EQUIP AVAIL TBLS               5116.04 11                      004451.00
          KVI,$X1,2.               @&PRINT CODES                      2.03 04                      004451.40
          BXE,$&4.                 @HVST                           4456.32 C2                      004452.00
          BXH,$&2.32               @K1                             4455.33 42                      004452.40
          BB,ECTL2.43,$&2.         @BCD PRINTR                     4007.53 80 004455.34 02         004453.00
          NOP                                                         0.30 00                      004454.00
          NOP                                                         0.30 00                      004454.40
          LV,$X3,H1V&5.            @BCD PRNT                      13374.06 30                      004455.00
          B,$&1.0                                                  4456.50 00                      004455.40
          LV,$X3,H1V&6.            @HVST                          13375.06 30                      004456.00
          V&I,$X3,H1AT             @CHAR CONV TBL                 13471.07 05                      004456.40
          SVA,$X3,H1BA             @CHAR CONV RTNE                13155.07 D0                      004457.00
          Z,ECTL4            @SET BIT FOR PROPER MACHINE          4011.22 00                      004457.40
          Z,$X3                                                      23.22 00                      004460.00
          ST%BU,5¤,$X3.19,59       @BIT POSIT                        23.23 80 005035.60 D0         004460.40
          BB1,ECTL4%$X3¤,$&1.      @SET MACH DESIGNATOR            4011.00 83 004462.74 0E         004461.40
                             @
                             @SETUP OF EQUIPMENT AVAIL TABLE FOR
                             @APPLICABLE MACHINE
          Z,EQAV1                                                  4012.22 00                      004462.40
          TI,14,FQAV1,FQAV2                                        4012.00 80 004013.34 A0         004463.00
          T,$X2,0.0%$X2¤,FQAV1                                        0.00 82 004012.04 20         004464.00
                             @
                             @SET UP FOR HEADING PRINT
          KVI,$X1,2.0                                                2.03 04                      004465.00
          BZXH,F1A3                @NOT K1                         4471.73 40                      004465.40
          V&I,$X1,46.0                                              56.03 05                      004466.00
          L%BU,8¤,$X1&.11                                           21.13 80 010000.20 50         004466.40
          ST%BU,8,8¤,F1AI8&.16     @SET K MACHINE NUMBER            5200.40 80 010000.20 D0         004467.40
          LX,$X1,F1AC6                                             5243.02 10                      004470.40
          B,$&2.32                                                 4473.50 00                      004471.00
F1A3      BXL,$&1.32               @AEC MACHINE                    4473.32 42                      004471.40
          LX,$X1,F1AC5             @HARVEST MACHINE                5242.02 10                      004472.00
          B,$&1.0                                                  4473.50 00                      004472.40
          LX,$X1,F1AC4                                             5241.02 10                      004473.00
          SX,$X1,F1C4                                              6650.03 10                      004473.40
          7,ECTL1                                                  4006.22 00                      004474.00
          BB,ECTL2.5,F1A3B         @AUTO TEST                      4007.05 80 004511.34 02         004474.40
          BB,ECTL2.6,$&2.          @SURVEILLANCE                   4007.06 80 004477.74 02         004475.40
          BZB1,ECTL1.1,$&2.        @MAINTENANCE                    4006.01 80 004500.74 0C         004476.40
          BB1,ECTL1.2,$&1.         @SURV                           4006.02 80 004500.74 0E         004477.40
F1A3A     BB1,ECTL1.3,$&1.         @DCP                            4006.03 80 004501.74 0E         004500.40
          BB,ECTL2.7,F1A3D         @SCHEDULE                       4007.07 80 004517.74 02         004501.40
          BB,ECTL2.8,F1A3D&1.      @SNGL STEP-TAPE                 4007.10 80 004520.74 02         004502.40
          BBZ,ECTL2.9,$&1.         @-SPARE-                        4007.11 80 004504.74 06         004503.40
          BB,ECTL2.10,F1A3D&5.     @SNGL STEP-CARDS                4007.12 80 004524.74 02         004504.40
          BB,ECTL2&.11,F1A4  @IPL FROM CARDS                       4007.13 80 004543.34 02         004505.40
          L%BU,7,7¤,ETAPCM   @SEQUENTIAL MODE                      4007.14 80 007700.20 50         004506.40
          BRZ,F1A3F                                                4533.34 C2                      004507.40
          B,F1A3G            @GO SPACE OVER EOF                    4535.10 00                      004510.00
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                                @CHECK FOR CONFLICT ON MODE OF OPERATION
         CNOP                                                          0.30 00                        004510.40
F1A3B    BB1,ECTL1,$&1.              @AUTOTEST                      4006.00 80 004512.34 0E           004511.00
         BZB,ECTL2.6,F1A3A           @NOT SURVEILLANCE              4007.06 80 004500.74 00           004512.00
         SIC,31.0                                                     37.00 80                        004513.00
                  B,H1A1A    @ERROR, CONFLICT IN MODE OF OPERATION  12767.50 00                        004513.40
         XW,F1AI10,31,F1AC11,4                                      5201.50 40 000760.12 A5           004514.00
         TI,1,G2D&8.0,G2D1                                         10463.00 80 010513.02 A0           004515.00
         SIC,31.0                                                     37.00 80                        004516.00
                  B,G2A&.32                                        10355.50 00                        004516.40
         B,F1A2A                                                    4425.50 00                        004517.00
                                @
                                @
                                @ONE SELECTION, CHECK IF MORE SELECTIONS
F1A3D    BB,ECTL2.8,F1A3E            @SNGL STEP-TAPE                4007.10 80 004526.34 02           004517.40
         BBZ,ECTL2.9,$&1.            @-SPARE-                       4007.11 80 004521.74 06           004520.40
         L%BU,7,7¤,ETAPCM                                           4007.14 80 007700.20 50           004521.40
         BRZ,F1A3F                                                  4533.34 C2                        004522.40
         B,F1A3G                @GO SPACE OVER EOF                  4535.10 00                        004523.00
         BB,ECTL2.10,F1A3F           @SNGL STEP-CARDS               4007.12 80 004526.34 02           004523.40
         BB,ECTL2.11,F1A3E           @SNGL STEP-IPL                 4007.13 80 004526.34 02           004524.40
         B,F1A4                                                     4543.10 00                        004525.40
                  CNOP
                                @
                                @
                                @MORE THAN ONE MODE OF SELECTION IN SETUP
F1A3E    SIC,31.0                                                     37.00 80                        004526.00
                  B,H1A1A                                           12767.50 00                        004526.40
         XW,F1AI12,41,F1AC11,4                                      5205.40 40 001220.12 A5           004527.00
         TI,1,G2D&8.0,G2D1                                         10463.00 80 010513.02 A0           004530.00
         SIC,31.0                                                     37.00 80                        004531.00
                  B,G2A&.32                                        10355.50 00                        004531.40
         B,F1A2A                                                    4425.50 00                        004532.00
                  CNOP                                              0.30 00                        004532.40
                                @
                                @FAILED TO SPECIFY CHANNEL FOR MASTER TAPE
F1A3F    L%BU,7,7¤,EQTAP1       @LOAD STANDARD CHANNEL              4017.00 80 007700.20 50           004533.00
         ST%BU,7,7¤,ETAPCM                                          4007.14 80 007700.20 D0           004534.00
                                @
                                @SPACE OVER EOF ON HI DENSITY OP
F1A3G    BB,ECTL2.9,F1A3D&4.         @-SPARE-                       4007.11 80 004523.74 02           004535.00
         BB1,ECTL3&.11,F1A3D&4.0     @PERMIT ONLY ONE SPACE FOR IPL 4010.13 80 004523.74 0E           004536.00
         SIC,$X15                                                     37.00 80                        004537.00
                  B,F1B6             @LOC-REL-HD-ODD ECC-TAPE       6435.50 00                        004537.40
         SPFL%SEOP¤,0%$X10¤                                            0.00 8A 000077.15 00           004540.00
         SIC,F1B3C3                                                 6356.00 80                        004541.00
                  B,F1B3C            @WAIT & RELEASE                6350.10 00                        004541.40
         Z,F1TAPO                     @CLR TAPE POSIT COUNTE       4173.22 00                        004542.00
         B,F1A3D&4.0                                                4523.50 00                        004542.40
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                                @
                                @PREPARE FOR 2ND CONTROL HALT
                                @ROUTINE TO ALTER EQUIPMENT AVAILABLE
F1A4    IX,$X1,G2D&2.0                                  10455.02 10                    004543.00
        SX,$X1,G2D1                  @SET DISPLAY TO 2  10513.03 10                    004543.40
        BZR,J2AD1.04,F1A4X  @IF ZERO-GO TO HALT         15247.04 80 004547.74 00      004544.00
        L%BU,63¤,ESSSX&1.0  @SET UP TO CHANGE            4161.00 80 077000.20 50      004545.00
        ST%BU,63¤,G1J6      @EQUIP AVAIL ACCORDING TO C CARD 10351.00 80 077000.20 D0  004546.00
        B,F1A4X&1.0         @BYPASS HLT                  4550.50 00                    004547.00
F1A4X   SIC,$X15                                           37.00 80                    004547.40
              B,G2A.32      @MAN INTV                    10355.50 00                    004550.00
        L%BU,63,8¤,G1J6,1                                10351.00 80 077000.60 50      004550.40
        BRZ,F1A4A           @NO EQUIP CHNGE              4554.34 C2                    004551.40
        K%BU¤,F1AB          @ORIGINAL SWTCH SETTNG       5126.00 80 000000.21 10       004552.00
        BZAF,F1A4A                                       4554.36 C0                    004553.00
        Z,$R                @SWTCHS NOT CHNGD              11.22 00                    004553.40
F1A4A   ST%BU¤,F1AB                                      5126.00 80 000000.20 D0       004554.00
        Z,$X1                                              21.22 00                    004555.00
        Z,$X2                                              22.22 00                    004555.40
                                @
                                @CHECK HI SPEED CHANNELS
        LCI,$X1,32                                         40.03 02                    004556.00
F1A4A1  L%BU,32,8¤,F1AB                                  5126.00 80 040000.20 50       004556.40
        BRZ,F1A4C                                        4607.34 C2                    004557.40
        BBZ,F1AB%$X2¤,$&2.32                             5126.00 82 004562.74 06       004560.00
        V&,$X2,H1V&1.0                                  13370.04 B0                    004561.00
        CBH,$X1,$-1.32                                   4560.02 C8                    004561.40
        B,$                 @MACHINE BUG                 4562.10 00                    004562.00
                                @
                                @CHECK CHANNEL
        LCI,$X3,256000                                 764000.07 02                    004562.40
        REL%SEOP¤,0%$X1¤                                    0.00 81 000000.33 00       004563.00
        BUK,$               @INSTRUCTION RECEIVED WITH PARITY ERROR 4564.05 42         004564.00
        BUNRJZ,$&2.32       @UNIT NOT READY              4567.03 C6                    004564.40
        BEKJZ,$&2.0         @INOPERATIVE CHANNEL ADDRESS 4567.03 46                    004565.00
        BCBJZ,F1A4B         @UNIT BUSY BUT OPERATIVE     4575.44 46                    004565.40
        CB,$X3,$-1.32                                    4564.46 48                    004566.00
        B,F1A4B             @UNIT OPERATIVE              4575.50 00                    004566.40
                                @
                                @CHANNEL NOT AVAILABLE
                                @IS IT IN TABLE
        Z,$X3                                              23.22 00                    004567.00
        LCI,$X3,4                                           4.07 02                    004567.40
        L%BU,7,7¤,EQDIS1%$X3¤                            4016.00 83 007700.20 50       004570.00
        KF%BU,7,7¤,$X1&.12                                 21.14 80 007700.23 10       004571.00
        BAE,$&2.0                                        4574.36 C2                    004572.00
        V&,$X3,H1V&5.0                                  13374.06 B0                    004572.40
        CB,$X3,$-3.0                                     4570.06 48                    004573.00
        B,$&1.0                                          4574.50 00                    004573.40
        CM1111%BU,7,7¤,EQDIS1%$X3¤  @YES, DELETE         4016.00 83 007700.36 F0       004574.00
        B,F1A4A1            @RETURN TO CHECK SAME CHANNEL 4556.50 00                   004575.00
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                                @
                                @CHANNEL AVAILABLE
                                @MAKE CERTAIN IT IS IN TABLE
F1A4B   LX,$X3,F1AX                                          4741.06 10                      004575.40
        L%BU,7,7¤,$X1&.12                                      21.14 80 007700.20 50         004576.00
        KF%BU,7,7¤,EQDIS1%$X3¤                               4016.00 83 007700.23 10         004577.00
        BAE,F1A4A1              @ALREADY IN, CONTINUE        4556.76 C2                      004600.00
        V&,$X3,H1V&5.0                                      13374.06 B0                      004600.40
        CB,$X3,F1A4B&2.0                                     4577.46 48                      004601.00
        Z,$X3                                                  23.22 00                      004601.40
        C1111%BU,7,7¤,0,64                                      0.00 80 007740.36 70         004602.00
        KF%BU,7,7¤,EQDIS1%$X3¤,64                            4016.00 83 007740.23 10         004603.00
        BAE,$&1.32                                           4605.76 C2                      004604.00
        V&,$X3,H1V&5.0                                      13374.06 B0                      004604.40
        B,$-2.0                                              4603.10 00                      004605.00
        ST%BU,7,7¤,EQDIS1%$X3¤                               4016.00 83 007700.20 D0         004605.40
        B,F1A4A1                                             4556.50 00                      004606.40
                                @
                                @SHIFT TABLE
F1A4C   LX,$X3,F1AX                                          4741.06 10                      004607.00
        Z,$X4                                                  24.22 00                      004607.40
F1A4D   L%BU,7,7¤,EQDIS1%$X3¤                                4016.00 83 007700.20 50         004610.00
        KF%BU,7,7¤,F1AX&.57                                  4741.71 80 007700.23 10         004611.00
        BAE,$&2.0                                            4614.36 C2                      004612.00
        ST%BU,7,7¤,EQDIS1%$X4¤                               4016.00 84 007700.20 D0         004612.40
        V&,$X4,H1V&5.0                                      13374.10 B0                      004613.40
        V&,$X3,H1V&5.0                                      13374.06 B0                      004614.00
        CB,$X3,F1A4D                                         4610.06 48                      004614.40
                                @
                                @
                                @CHECK LO SPEED CHANNELS
        LCI,$X1,31                                             37.03 02                      004615.00
        LVI,$X1,16.0                                           20.03 01                      004615.40
        LV,$X2,H1V&1.0                                      13370.04 30                      004616.00
F1A4E   L%BU,32,8¤,F1AB&.32                                  5126.40 80 040000.20 50         004616.40
        BBZ,F1A4P                                            4746.34 C2                      004617.40
        BBZ,F1AB&.31%$X2¤,$&2.32                             5126.37 82 004622.74 06         004620.00
        V&,$X2,H1V&1.0                                      13370.04 B0                      004621.00
        CBH,$X1,$-1.32                                       4620.02 C8                      004621.40
        B,$                     @PROGRAM OR MACHINE BUG      4622.10 00                      004622.00
        REL%SEOP¤,0%$X1¤                                        0.00 81 000000.33 00         004622.40
        CCW,0%$X1¤,F1AX1                                        0.00 81 004742.21 00         004623.40
        BB,F1AX1&.24,$&2.32                                  4742.30 80 004627.34 02         004624.40
        BB,F1AX1&.18,$&1.32                                  4742.22 80 004627.34 02         004625.40
        B,F1A4N                 @NOT AVAILABLE, DELETE FROM TABLE  4713.10 00                004626.40
```

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                        @
                        @CHANNEL AVAILABLE, WHAT TYPE
        BEPGKZ,$&.32    @CLEAR IND                          4627.44 C6                      004627.00
        Z,$X3                                               23.22 00                        004627.40
        Z,$X4                                               24.22 00                        004630.00
        CCW,0%$X1¤,F1AX1                                     0.00 81 004742.21 00           004630.40
        BB,F1AX1&.24,$-1.0  @WAIT TIL SEOP CLEAR            4742.30 80 004630.74 02        004631.40
        LOC%SEOP¤,0%$X1¤,0%$X3¤                              0.00 81 000000.17 03           004632.40
        BEPGKZ,F1A4H        @NOT TAPE CHANNEL               4655.04 C6                      004633.40

        SX,$X1,$X5          @TAPE, WHAT UNITS ARE AVAILABLE   25.03 10                        004634.00
        LCI,$X3,8                                           10.07 02                        004634.40
F1A4F   CCW,0%$X1¤,F1AX1                                     0.00 81 004742.21 00           004635.00
        BB,F1AX1&.24,$-1.0                                 4742.30 80 004635.34 02          004636.00
        BZB,F1AX1&.18,$&2.0                                4742.22 80 004641.34 00          004637.00
        BB1,$X5&.20%$X4¤,$&1.0                               25.24 84 004641.34 0E          004640.00
        V&,$X4,H1V&1.0                                     13370.10 B0                      004641.00
        CBZ&,$X3,$&2.0      @COMPLETE                       4643.47 4A                      004641.40
        LOC%SFOP¤,0%$X1¤,0%$X3¤                              0.00 81 000000.17 03           004642.00
        B,F1A4F                                            4635.10 00                       004643.00
                        @
                        @STORE IN EQUIPMENT REGISTER
        L%BU,16,8¤,$X5&.12                                  25.14 80 020000.20 50          004643.40
        Z,$X3                                               23.22 00                       004644.40
        LCI,$X3,8                                           10.07 02                       004645.00
        KF%BU,7,7¤,FQTAP1%$X3¤,9                          4017.00 83 007704.63 10          004645.40
        BAE,F1A4G                                         4653.76 C2                       004646.40
        V&,$X3,H1V&5.0                                    13374.06 B0                      004647.00
        CB,$X3,$-2.0                                       4645.46 48                      004647.40
                        @
                        @NOT IN TABLE, STORE IN 1ST VACANCY
        Z,$X3                                               23.22 00                       004650.00
        LCI,$X3,8                                           10.07 02                       004650.40
        KF%BU,7,7¤,EQTAP1%$X3¤,64                         4017.00 83 007740.23 10          004651.00
        BAE,F1A4G                                         4653.76 C2                       004652.00
        V&,$X3,H1V&5.0                                    13374.06 B0                      004652.40
        CB,$X3,$-2.0                                       4651.06 48                      004653.00
F1A4G   ST%BU,16,8¤,EQTAP1%$X3¤                           4017.00 83 020000.20 D0          004653.40
        B,F1A4N1                                          4715.10 00                       004654.40
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                                @
                                @IS CHANNEL FOR PRINTER
F1A4H   REL%SEOP¤,0%$X1¤                                                0.00 81 000000.33 00      004655.00
        CCW,0%$X1¤,F1AX1                                                0.00 81 004742.21 00      004656.00
        BB,F1AX1&.24,$-1.0                                           4742.30 80 004656.34 02      004657.00
        RD%SEOP¤,0%$X1¤,F1AX2                                           0.00 81 004743.11 00      004660.00
        BEPGKZ,$&1.0            @PRIPTER                             4662.04 C6                   004661.00

        BEPGKZ,$&1.0            @PRINTER                             4662.04 C6                   004661.00
        B,F1A4J                 @OPS CNSL, PUNCH, OR READER          4664.50 00                   004661.40
        LX,$X3,F1AX                                                  4741.06 10                   004662.00
        V&I,$X3,3.0                                                     3.07 05                   004662.40
        LX,$X4,$X3                                                     23.10 10                   004663.00
        LVI,$X14,F1A4N5                                              4730.75 01                   004663.40
        B,F1A4M                                                      4703.10 00                   004664.00
                                @
                                @IS CHANNEL FOR OPS CONSOLE
F1A4J   CCW,0%$X1¤,F1AX1                                                0.00 81 004742.21 00      004664.40
        BB,F1AX1&.24,$-1.0                                           4742.30 80 004664.74 02      004665.40
        GONG%SEOP¤,0%$X1¤                                               0.00 81 000177.15 00      004666.40
        BEPGKZ,F1A4K            @PUNCH OR READER                     4672.44 C6                   004667.40
        LX,$X3,F1AX             @OPS CNSL                            4741.06 10                   004670.00
        V&I,$X3,2.0                                                     2.07 05                   004670.40
        LX,$X4,$X3                                                     23.10 10                   004671.00
        LVI,$X14,F1A4N4                                              4724.75 01                   004671.40
        B,F1A4M                                                      4703.10 00                   004672.00
                                @
                                @IS CHANNEL FOR PUNCH
F1A4K   REL%SEOP¤,0%$X1¤                                                0.00 81 000000.33 00      004672.40
        CCW,0%$X1¤,F1AX1                                                0.00 81 004742.21 00      004673.40
        BB,F1AX1&.24,$-1.0                                           4742.30 80 004673.74 02      004674.40
        CRDRUN%SEOP¤,0%$X1¤                                             0.00 81 000056.15 00      004675.40
        BEPGKZ,F1A4L            @READER                              4701.44 C6                   004676.40
        LX,$X3,F1AX             @PUNCH                               4741.06 10                   004677.00
        V&I,$X3,1.0                                                     1.07 05                   004677.40
        LX,$X4,$X3                                                     23.10 10                   004700.00
        LVI,$X14,F1A4N3                                              4720.75 01                   004700.40
        B,F1A4M                                                      4703.10 00                   004701.00
                                @
                                @READER CHANNEL
F1A4L   LX,$X3,F1AX                                                  4741.06 10                   004701.40
        LX,$X4,$X3                                                     23.10 10                   004702.00
        LVI,$X14,F1A4N2                                              4716.75 01                   004702.40
                                @
                                @CONDITION APPLICABLE TABLE
F1A4M   L%BU,7,7¤,$X1&.12                                               21.14 80 007700.20 50     004703.00
        KF%BU,7,7¤,EQRDR1%$X3¤                                       4012.00 83 007700.23 10      004704.00
        BAE,F1A4E               @IN TABLE ALREADY                    4616.76 C2                   004705.00
        V&,$X3,H1V&5.0                                              13374.06 B0                   004705.40
        CB,$X3,$-2.0                                                 4704.06 48                   004706.00
        KF%BU,7,7¤,EQRDR1%$X4¤,64  @NOT IN TABLE, ADD TO FIRST VACANCY  4012.00 84 007740.23 10      004706.40
        BAE,$&2.0                                                    4711.76 C2                   004707.40
        V&,$X4,H1V&5.0                                              13374.10 B0                   004710.00
        CB,$X4,$-2.0                                                 4706.50 48                   004710.40
        B,$                     @TABLE CAPACITY EXCEEDED             4711.10 00                   004711.00
        ST%BU,7,7¤,EQRDR1%$X4¤                                       4012.00 84 007700.20 D0      004711.40
        B,0%$X14¤                                                       0.10 0E                   004712.40
                                @
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                                    @
                                    @CHANNEL NOT AVAILABLE,DELETE IF IN TABLES
F1A4N    LVI,$X3,FQRDR1                                  4012.07 01          004713.00
         LCI,$X3,16                                        20.07 02          004713.40
         LVI,$X14,F1A4N6                                 4732.75 01          004714.00
         B,F1A4N7                                        4734.10 00          004714.40
                                    @
                                    @
                                    @DELETE SAME CHANNEL ON OTHER TABLES
F1A4N1   LVI,$X3,FQRDR1             @TAPE ENTRY         4012.07 01          004715.00
         LCI,$X3,16                                        20.07 02          004715.40
         B,F1A4N7-.32                                    4733.50 00          004716.00
F1A4N2   LVI,$X3,FQPUN1             @READER ENTRY       4013.07 01          004716.40
         LCI,$X3,12                                        14.07 02          004717.00
         LVI,$X14,F1A4N6                                 4732.75 01          004717.40
         B,F1A4N7                                        4734.10 00          004720.00
F1A4N3   LVI,$X3,FQRDR1             @PUNCH ENTRY        4012.07 01          004720.40
         LCI,$X3,4                                          4.07 02          004721.00
         SIC,30,0                                          36.00 80          004721.40
                  B,F1A4N7                               4734.10 00          004722.00
         LVI,$X3,FQTYP1                                  4014.07 01          004722.40
         LCI,$X3,8                                         10.07 02          004723.00
         LVI,$X14,F1A4N6                                 4732.75 01          004723.40
         B,F1A4N7                                        4734.10 00          004724.00
F1A4N4   LVI,$X3,FQRDR1             @OPS CONSOLE ENTRY  4012.07 01          004724.40
         LCI,$X3,8                                         10.07 02          004725.00
         SIC,30,0                                          36.00 80          004725.40
                  B,F1A4N7                               4734.10 00          004726.00
         LVI,$X3,FQPTR1                                  4015.07 01          004726.40
         LCI,$X3,4                                          4.07 02          004727.00
         LVI,$X14,F1A4N6                                 4732.75 01          004727.40
         B,F1A4N7                                        4734.10 00          004730.00
F1A4N5   LVI,$X3,FQRDR1             @PRINTER ENTRY      4012.07 01          004730.40
         LCI,$X3,12                                        14.07 02          004731.00
         LVI,$X14,F1A4N6                                 4732.75 01          004731.40
         B,F1A4N7                                        4734.10 00          004732.00
F1A4N6   LVI,$X3,FQTAP1             @CHECK TAPES        4017.07 01          004732.40
         LCI,$X3,8                                         10.07 02          004733.00
         LVI,$X14,F1A4F                                  4616.75 01          004733.40
F1A4N7   L%BU,7,7¤,$X1&.12                                 21.14 80 007700.20 50 004734.00
         KF%BU,7,7¤,0%$X3¤                                  0.00 83 007700.23 10 004735.00
         BZAE,$&1.32                                     4737.76 C0          004736.00
         ST%BU,7,7¤,0%$X3¤,64  @CLEAR ON COMPARE            0.00 83 007740.20 D0 004736.40
         V&,$X3,H1V&5.0                                 13374.06 B0          004737.40
         CB,$X3,F1A4N7&1.0                               4735.06 48          004740.00
         B,0%$X14¤                                          0.10 0E          004740.40
                                    @
F1AX     XW,0,4,%8¤177                                      0.00 00 000100.00 7F 004741.00
F1AX1    XW,0,0,0            @CCW AREA                      0.00 00 000000.00 00 004742.00
F1AX2    XW,F1AX3,1,0                                   4744.00 00 000020.00 00 004743.00
F1AX3    XW,0,0,0            @READ AREA                     0.00 00 000000.00 00 004744.00
FECTL2   DD%BU,12¤,0                                                      0000 004745.00
         DD%BU,7¤,32         @MASTER TAPE CHANNEL                          040 004745.14
         DD%BU,3¤,0          @DRIVE                                          0 004745.23
         DD%BU,6¤,0                                                         00 004745.26
         DD%BU,7¤,33         @SCRATCH TAPE CHANNEL                         041 004745.34
         DD%BU,3¤,1          @DRIVE                                          1 004745.43
         DD%BU,6¤,0                                                         00 004745.46
         DD%BU,7¤,33         @OUTPUT TAPE CHANNEL                          041 004745.54
         DD%BU,3¤,0          @DRIVE                                          0 004745.63
```

```
                                    @
                                    @SHIFT LO SPEED TABLES
F1A4P   SIC,31.0                                                    37.00 80                    004746.00
              B,F1A4P1                                            4752.50 00                    004746.40
        LVI,$X3,5.0                                                5.07 01                    004747.00
        LCI,$X3,8                                                 10.07 02                    004747.40
        LVI,$X4,5.0                                                5.11 01                    004750.00
        LCI,$X4,1                                                  1.11 02                    004750.40
        SIC,31.0                                                  37.00 80                    004751.00
              B,F1A4P2                                            4754.50 00                    004751.40
        B,F1A4Q             @COMPLETE, CONTINUE                   4762.10 00                    004752.00
                            @
F1A4P1  Z,$X3                                                     23.22 00                    004752.40
        Z,$X4                                                     24.22 00                    004753.00
        LCI,$X4,4                                                  4.11 02                    004753.40
        LCI,$X3,4                                                  4.07 02                    004754.00
F1A4P2  L%BU,7,7¤,EQRDR1%$X3¤                                     4012.00 83 007700.20 50      004754.40
        BRZ,$&2.0                                                 4757.74 C2                    004755.40
        ST%BU,7,7¤,EQRDR1%$X4¤                                    4012.00 84 007700.20 D0      004756.00
        V&,$X4,H1V&5.0                                           13374.10 B0                    004757.00
        V&,$X3,H1V&5.0                                           13374.06 B0                    004757.40
        CB,$X3,F1A4P2                                             4754.46 48                    004760.00
        LV,$X4,$X3                                                23.10 30                    004760.40
        CB,$X4,F1A4P2-.32                                         4754.10 48                    004761.00
        B,0%$X15¤                                                    0.10 0F                    004761.40
                                    @
                                    @
                                    @CHANNEL ENTERED IN PROPER TABLE
                                    @
                                         @ROUTINE TO DETERMINE UPPER
                                    @MEMORY LIMITS
F1A4Q   BADZ,$&.32                                                4762.50 46                    004762.00
        LVI,$X1,EDCP1&2048.0                                     10000.03 01                    004762.40
        V&I,$X1,%8¤10000.0                                       10000.03 05                    004763.00
        LR,$X1,0%$X1¤                                                0.02 71                    004763.40
        BZAD,$-1.0                                                4763.10 40                    004764.00
F1A4R   V-I,$X1,1.0                                                  1.03 0D                    004764.40
        BADZ,$&.32                                                4765.50 46                    004765.00
        LR,$X1,0%$X1¤                                                0.02 71                    004765.40
        BAD,F1A4R                                                 4764.50 42                    004766.00
        L%BU,18¤,$X1                                                21.00 80 022000.20 50      004766.40
        ST%BU,18¤,EQMEM                                           4025.00 80 022000.20 D0      004767.40
```

```
                                @PREPARE FOR 3RD CONTROL HALT
F1A5    L%BU,4,4¤,ECTL2&.08                                      4007.10 80 004400.20 50      004770.40
        BRZ,F1A5A                    @NOT SNGL STEP              4774.34 C2                   004771.40
        BB1,ECTL3&.04,$&1.0                                      4010.04 80 004773.34 0E      004772.00
        LX,$X1,G2D&4.                @SET HALT 4                10457.02 10                   004773.00
        B,F1A5A&1.32                                             4775.50 00                   004773.40
F1A5A   BRZ,ECTL3&.04,$&1.0                                      4010.04 80 004775.34 06      004774.00
        LX,$X1,G2D&3.                @SET HALT 3                10456.02 10                   004775.00
        SX,$X1,G2D1                                              10513.03 10                   004775.40
        BZB,J2AD1.04,F1A5X   @IF ZERO-GO TO HLT                  15247.04 80 005001.74 00      004776.00
        L,ESSSX&2.           @SET UP TO STORE C                   4162.00 80 000000.20 50      004777.00
        ST,G1J6              @CARDS CORRECTLY                    10351.00 80 000000.20 D0      005000.00
        B,F1A5X&1.0          @BYPASS HLT                          5002.50 00                   005001.00
F1A5X   SIC,$X15                                                    37.00 80                   005001.40
              B,G2A.32       @MANL INTV                          10355.50 00                   005002.00
        L%BU¤,G1J6                   @STORE SWITCH SETTINGS      10351.00 80 000000.20 50      005002.40
        SF%BU,5¤,ECTL2&.38,59                                    4007.46 80 005035.52 F0      005003.40
        SF%BU,1¤,ECTL2&.62,58                                    4007.76 80 001035.12 F0      005004.40
F1A5A1  LVI,$X1,39                   @SET CONSOLE CHAN NO.         23.43 01                   005005.40
        BRZ,$&2.                     @OP AREA IS MAINT CNSL      5010.34 C2                   005006.00
        CTL%SEOP¤,%$X1¤,%8¤17.       @OP AR IS OPS CNSL             0.00 81 000017.15 00      005006.40
        B,$&1.32                     @TURN ON RSVD LITE          5011.10 00                   005007.40
        CTL%SEOP¤,%$X1¤,%8¤16.       @TURN OFF RSVD LITE            0.00 81 000016.15 00      005010.00
        SF%BU,1¤,ECTL1&.05,57                                    4006.05 80 001034.52 F0      005011.00
        SF%BU,24¤,ECTL4&.40,32                                   4011.50 80 030020.12 F0      005012.00
        BB,EBAUTO,$&3.32                                         4006.00 80 005016.74 02      005013.00
        BB,G1J6&.07,$&2.32   @CHECK REL PASSES ONLY             10351.07 80 005016.74 02      005014.00
        BB1,ECTL3&.15,$&1.0   @SET MC                            4010.17 80 005016.34 0E      005015.00
        B,$&1.32                                                 5017.50 00                   005016.00
        BBZ,ECTL3&.15,$&1.0   @CLEAR MC                          4010.17 80 005017.74 06      005016.40
                              @
                              @
                              @CHECK FOR OUTPUT MEDIA CONFLICTS
        BB,ECTL2&.40,F1A5B                                       4007.50 80 005022.34 02      005017.40
        BB,ECTL2&.41,F1A5B&1.0                                   4007.51 80 005023.34 02      005020.40
        B,F1A5B&2.0                                              5024.10 00                   005021.40
F1A5B   BB,ECTL2&.41,F1A5C                                       4007.51 80 005031.34 02      005022.00
        BB,ECTL2&.42,F1A5C                                       4007.52 80 005031.34 02      005023.00
        Z,F1SOPO                                                 4174.22 00                   005024.00
        Z,F1SCPO                                                 4175.22 00                   005024.40
        SIC,$X15                                                    37.00 80                   005025.00
              B,F1A5D          @SET EQUIP CHAN NMBRS             5035.50 00                   005025.40
        SIC,G1J1                                                10277.00 80                   005026.00
              B,G1J&1.         @READ SWITCHS                     10270.10 00                   005026.40
        BB,ESSS&.48,J1A      @GO TO UTILITY SECTION              4062.60 80 014755.34 02      005027.00
        B,F1B-.32                                                5251.50 00                   005030.00
        CNOP                                                        0.30 00                   005030.40
                              @
                              @
                              @PRINT OUTPUT MEDIA CONFLICTS
F1A5C   SIC,31.0                                                    37.00 80                   005031.00
              B,H1A1A                                           12767.50 00                   005031.40
        XW,F1AI16,65,F1AC13                                      5223.20 00 002020.12 A7      005032.00
        TI,1,G2D&8.0,G2D1                                       10463.00 80 010513.02 A0      005033.00
        SIC,31.0                                                    37.00 80                   005034.00
              B,G2A&.32                                         10355.50 00                   005034.40
        B,F1A5                                                   4770.50 00                   005035.00
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                        @STORE I/O CHAN NUMBERS IN INSTRUCTIONS
F1A5D   L%BU,7,7¤,FQPTR1                                    4015.00 80 007700.20 50      005035.40
        BZRZ,$&1.32                                         5040.34 C0                   005036.40
        BB1,ECTL2&.38,F1A5E                                 4007.46 80 005041.34 0E      005037.00
        ST%BU,7,7¤,H1C2&.12                                13235.14 80 007700.20 D0      005040.00
F1A5E   L%BU,7,7¤,FQTYP1                                    4014.00 80 007700.20 50      005041.00
        BZRZ,$&3.0                                          5045.34 C0                   005042.00
        BB1,ECTL2&.39,$&1.0                                 4007.47 80 005043.74 0E      005042.40
        BZB1,ECTL2&.62,F1A6                                 4007.76 80 005051.74 0C      005043.40
        B,F1A5F                                             5051.10 00                   005044.40
        ST%BU,7,7¤,G1J1A&.44                               10302.54 80 007700.20 D0      005045.00
        ST%BU,7,7¤,G2A8&.12                                10441.14 80 007700.20 D0      005046.00
        ST%BU,7,7¤,H1A6B&.12                               13116.14 80 007700.20 D0      005047.00
        ST%BU,7¤,F1A5A1.12      @TYPEWR CHAN CODE           5005.54 80 007000.20 D0      005050.00
F1A5F   B,0%$X15¤                                             0.10 0F                    005051.00
                        @
                        @
                        @PRINT OPS CNSL NOT AVAILABLE
                        @RETURNING CONTROL TO MAINT CNSL
F1A6    SVA,$X15,F1A6A                                      5054.37 D0                   005051.40
        CNOP
        SIC,31.0                                              37.00 80                   005052.00
              B,H1A1A2                                     12754.10 00                   005052.40
        XW,F1A6I,62,0                                       5054.40 00 001740.00 00      005053.00
F1A6A   $B,0                                                  0.10 00                    005054.00
                        @
F1A6I   %IQSZ¤DD%BU¤,OPS CNSL NOT AVAILABLE. RETURNING CNTL TO Z                           005054.40
        %IQSZ¤DD%BU¤,MAINTENANCE CONSOLE.Z                                                 005061.60

          @ROUTINE TO PRINT DCP PROGRAM TABLE
         @WITH OCTAL HEX ID
F1A7    LX,$X1,F1A7AA           @SEQ TBL START              5106.02 10                   005064.40
        LX,$X2,F1A7AB           @IMAGE STORE                5107.04 10                   005065.00
        LX,$X3,F1A7AC           @TEMP STORE                 5110.06 10                   005065.40
        SIC,$X15                                              37.00 80                   005066.00
        B,H1A1A                 @PRINT HEADING             12767.50 00                   005066.40
        XW,F1A7AD,%.48¤F1A7AE-F1A7AD,F1A7A4                 5111.00 00 000420.12 45      005067.00
F1A7A   L%V&I¤%BU,32¤,.32%$X1¤  @NEXT TABLE POSIT              0.40 81 140000.20 50      005070.00
        BRZ,F1A7A2              @NO MORE                    5100.34 C2                   005071.00
        ST%V&I¤%BU,32¤,.48%$X2¤ @MNEMONIC                     0.60 82 140000.20 D0      005071.40
        ST,F1A7A3               @FOR OC/HX DECODE           5114.50 80 030000.20 D0      005072.40
F1A7A1  L%V&I¤%BU,4¤,.4%$X3¤,1  @FOUR BITS AT A TIME           0.04 83 104000.60 50      005073.40
        KFI%BU,4¤,9             @NUMERALS ARE ENCODED  440000.00 80 404000.23 10      005074.40
        BZAH,F1A7A2             @NOT NUMERAL                5100.37 40                   005075.40
        ST%BU,21¤,$X4,1         @SET 1X                       24.00 80 025000.60 D0      005076.00
        L%BU,8¤,F1A7AD-96%$X4¤  @IQS                        5107.40 84 010000.20 50      005077.00
F1A7A2  ST%V&ICR¤%BU,8¤,.8%$X2¤ @OCTAL HEX                    0.10 82 310000.20 D0      005100.00
        CBR,$X3,F1A7A1                                      5073.46 4C                   005101.00
        SIC,$X15                                              37.00 80                   005101.40
        B,H1A1A                 @PRINT LIST                12767.50 00                   005102.00
        XW,F1A7AF,12                                        5115.00 00 000300.00 00      005103.00
        CB,$X1,F1A7A                                        5070.02 48                   005104.00
        B,F1A2                  @INITIAL HALT               4411.50 00                   005104.40
F1A7A4  XW,F1A7AF,%.48¤F1A7AF-F1A7AE                        5113.10 00 000360.00 00      005105.00
F1A7AA  XW,ESFQTB,120                                       4204.00 00 003600.00 00      005106.00
F1A7AB  XW,F1A7AF,6,$                                       5115.00 00 000140.12 47      005107.00
F1A7AC  XW,F1A7A3,6,$                                       5114.50 00 000140.12 48      005110.00
F1A7AD  %IQS*¤DD%BU¤,DCP PROGRAM TABLE*                                                  005111.00
F1A7AE  %IQS*¤DD%BU¤,IDENT OCT-HX*                                                       005113.10
F1A7A3  DD%BU,24¤,0                                                    00000000          005114.50
F1A7AF  DR%BU¤,%1¤              @IMAGE STORE                    1.00                     005115.00
        DR%BU,32¤,%1¤                                           0.40                     005116.00
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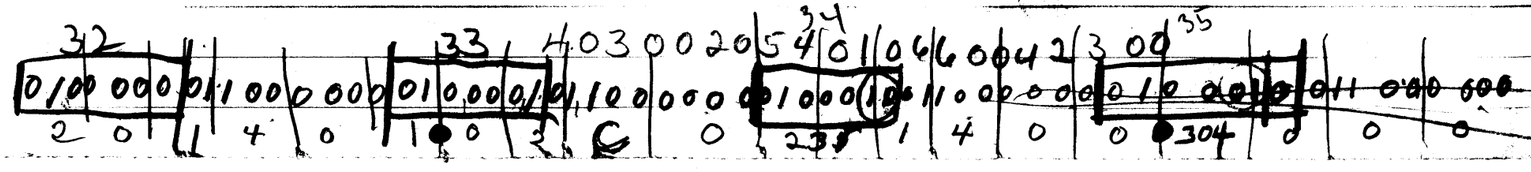
F1AA    XW,F1AA1,6,0          @AFC                                    5127.00 00 000140.00 00      005117.00
        XW,F1AA2,7,0          @HARVEST                                5135.00 00 000160.00 00      005120.00
        XW,F1AA3,7,0          @K1                                     5144.00 00 000160.00 00      005121.00
        XW,F1AA4,7,0          @K2                                     5153.00 00 000160.00 00      005122.00
        XW,F1AA5,7,0          @K3                                     5162.00 00 000160.00 00      005123.00
        XW,F1AA5,7,0          @K4                                     5162.00 00 000160.00 00      005124.00
        XW,F1AA5,7,0          @K5                                     5162.00 00 000160.00 00      005125.00
                              @

F1AB    DD%BU□,0                                                      000000000000000000000      005126.00
                              @
                              @TABLES OF STANDARD SETUP OF CHANNEL
                              @ADDRESSES BY INDIVIDUAL MACHINE
                              @CHANNEL ADDRESS CONSISTS OF 7 BITS
                              @STARTING AT BIT ADDRESS .00, .16, .32,
                              @AND .48.
                              @7 BITS OF ALL ZEROS INDICATES LS
                              @DEVICE NOT AVAILABLE.
                              @7 BITS OF ALL ONES INDICATES DISC
                              @IS NOT AVAILABLE.
                              @
                              @AFC MACHINE
F1AA1   DD%BU,16□,%.6□36,%.6□35,0,0          @READERS                                  044000      005127.00
                                                                                        043000      005127.20
                                                                                        000000      005127.40
                                                                                        000000      005127.60
        %8□DD%BU□,460000000000000000000      @PUNCHES                 046000000000000000000      005130.00
        %8□DD%BU□,470000000000000000000      @OPS CNSLS               047000000000000000000      005131.00
        %8□DD%BU□,450000000000000000000      @PRINTERS                045000000000000000000      005132.00
        %8□DD%BU□,777777777777777777        @DISC                    000777777777777777777      005133.00
        %8□DD%BU□,403602057010474000000  @TAPE ADAPTS                 040360205701047400000      005134.00
                              @
                              @HARVEST MACHINE
F1AA2   %8□DD%BU□,550000000000000000000      @READERS                 055000000000000000000      005135.00
        %8□DD%BU□,540000000000000000000      @PUNCHES                 054000000000000000000      005136.00
        %8□DD%BU□,530000000000000000000      @OPS CNSLS               053000000000000000000      005137.00
        %8□DD%BU□,520000000000000000000      @PRINTERS                052000000000000000000      005140.00
        %8□DD%BU□,177777777777777777777     @TRACTOR TAPES           177777777777777777777      005141.00
        %8□DD%BU□,403002054010460043300      @TAPE ADAPTS             040300205401046004330      005142.00
        %8□DD%BU□,443002254011460047300      @TAPE ADAPTS             044300225401146004730      005143.00
                              @
                              @K1 MACHINE
F1AA3   %8□DD%BU□,440000000000000000000      @READERS                 044000000000000000000      005144.00
        %8□DD%BU□,460000000000000000000      @PUNCHES                 046000000000000000000      005145.00
        %8□DD%BU□,470000000000000000000      @OPS CNSLS               047000000000000000000      005146.00
        %8□DD%BU□,450000000000000000000      @PRINTERS                045000000000000000000      005147.00
        %8□DD%BU□,377777777777777777        @ DISC                   000377777777777777777      005150.00
        %8□DD%BU□,403002054010660042300      @TAPE ADAPTS             040300205401066004230      005151.00
        %8□DD%BU□,0                          @TAPE ADAPTS             000000000000000000000      005152.00
                              @
                              @K2 MACHINE
F1AA4   %8□DD%BU□,440000000000000000000      @READERS                 044000000000000000000      005153.00
        %8□DD%BU□,460000000000000000000      @PUNCHES                 046000000000000000000      005154.00
        %8□DD%BU□,470000000000000000000      @OPS CNSLS               047000000000000000000      005155.00
        %8□DD%BU□,450000000000000000000      @PRINTERS                045000000000000000000      005156.00
        %8□DD%BU□,400004000030000            @DISC                    000000004000040000300      005157.00
        %8□DD%BU□,403002054010660042300      @TAPE ADAPTS             040300205401066004230      005160.00
        %8□DD%BU□,0                          @TAPE ADAPTS             000000000000000000000      005161.00
```



```
                                        @
                                        @K3-K5 MACHINES
F1AA5   %8¤DD%BU¤,4400000000000000000   @READERS          044000000000000000000   005162.00
        %8¤DD%BU¤,4600000000000000000   @PUNCHES          046000000000000000000   005163.00
        %8¤DD%BU¤,4700000000000000000   @OPS CNSLS        047000000000000000000   005164.00
        %8¤DD%BU¤,4500000000000000000   @PRINTERS         045000000000000000000   005165.00
        %8¤DD%BU¤,40000400003000        @DISC             000000004000040003000   005166.00
        %8¤DD%BU¤,403002054010660042300 @TAPE ADAPTS      040300205401066004230   005167.00
        %8¤DD%BU¤,0                     @TAPE ADAPTS      000000000000000000000   005170.00
                                        @
F1AI1   %IQSZ¤DD%BU,8,8¤,DCP RESTARTING, CHANGE OF CONTROL REQUESTED.Z                 005171.00
F1AI6   %IQSZ¤DD%BU,8,8¤, AFC Z                                                       005176.40
F1AI7   %IQSZ¤DD%BU,8,8¤, HARVEST Z                                                   005177.10
F1AI8   %IQSZ¤DD%BU,8,8¤, K  Z                                                        005200.20
F1AI9   %IQSZ¤DD%BU,8,8¤,MACHINEZ                                                     005200.60
F1AI10  %IQSZ¤DD%BU,8,8¤,**CONFLICT IN MODE OF OPERATIONZ                             005201.50
F1AI12  %IQSZ¤DD%BU,8,8¤,**MULTIPLE METHODS OF SELECTION SPECIFIEDZ                   005205.40
F1AI14  %IQSZ¤DD%BU,8,8¤,IN 1ST CONTROL HALT SETUP.Z                                 005212.50
F1AI15  %IQSZ¤DD%BU,8,8¤,REVISE 1ST CONTROL HALT SETUP AND CONTINUE.Z                 005215.70
F1AI16  %IQSZ¤DD%BU,8,8¤,**OUTPUT MEDIA CONFLICT, ONLY ONE OF BITSZ                   005223.20
        %IQSZ¤DD%BU,8,8¤,2, 3, & 4 SHOULD BE SET.Z                                    005230.30
F1AI17  %IQSZ¤DD%BU,8,8¤,REVISE 3RD CONTROL HALT SETUP AND CONTINUE.Z                 005233.30
                                        @
F1AC4   XW,F1AI6,5,F1AC7,4                                5176.40 40 000120.12 A4     005241.00
F1AC5   XW,F1AI7,9,F1AC7,4                                5177.10 40 000220.12 A4     005242.00
F1AC6   XW,F1AI8,4,F1AC7,4                                5200.20 40 000100.12 A4     005243.00
F1AC7   XW,F1AI9,7,F1CB,4                                 5200.60 40 000160.15 CE     005244.00
F1AC11  XW,F1AI14,26,F1AC12                               5212.50 00 000640.12 A6     005245.00
F1AC12  XW,F1AI15,43,0                                    5215.70 00 001260.00 00     005246.00
F1AC13  XW,F1AI17,43,0                                    5233.30 00 001260.00 00     005247.00

F1NORD  CM1111%BU,1¤,EPCW&.30  @SET BIT TO BYPASS CLR MEM 4031.36 80 001000.36 F0     005250.00
        B,F1A1&2.              @BR-GO THROUGH CTL HLTS    4407.10 00                  005251.00
```

```
                        @
                        @ENTRY TO READ IN DIAGNOSTIC PROGRAM
                        @CLEAR MEMORY ABOVE DCP
                        @DETERMINE MODE OF SELECTION
        B,$&1.32                                                    5253.10 00                      005251.40
F1B     BB,ECTL3&.04,F1A5A-1.0  @GO TO SS HALT IF SS SELECTION      4010.04 80 004773.34 02         005252.00
        BZBZ,ECTL3&.18,$&2.0  @IS CTL TO BE XFERRED TO OPS CNSL     4010.22 80 005255.34 04         005253.00
        BBZ,ECTL2&.62,$&1.0  @YES                                   4007.76 80 005255.34 06         005254.00
        SIC,31.0                                                      37.00 80                      005255.00
                B,G1K           @CHECK CHANGE OF CONTROL OPTION    10335.10 00                      005255.40
        BBZ,EPCW&.30,F1C    @BR-BYPASS READING PROGRAM              4031.36 80 006604.74 06         005256.00
        LV,$X1,EQMEM            @CLEAR DP AREA                      4025.02 30                      005257.00
        V-I,$X1,%8¤FDCP1&14000.                                    20000.03 0D                      005257.40
        LC,$X1,$X1                                                    21.02 50                      005260.00
        LVI,$X1,%8¤FDCP1&14000.0                                   20000.03 01                      005260.40
        Z,%8¤FDCP1&14000.0                                         20000.22 00                      005261.00
        T,$X1,0.0%$X1¤,1.0%$X1¤                                        0.00 81 000001.02 21         005261.40
        SIC,G1J1                                                   10277.00 80                      005262.40
                B,G1J           @READ SWITCHES                     10267.10 00                      005263.00
        BB,ESSS&.49,F1A1    @CHECK FOR RESTART OF DCP               4062.61 80 004405.34 02         005263.40
        L%BU,3,3¤,ECTL2&.09                                         4007.11 80 003300.20 50         005264.40
        BRZ,F1B2            @BRANCH IF HD TAPE                      6127.34 C2                      005265.40
                            @
                            @LOAD FROM CARDS
        BB,ECTL2&.10,F1B1   @SINGLE STEP PUNNOR                     4007.12 80 005302.74 02         005266.00
        SIC,F1B1A3                                                  5327.00 80                      005267.00
                B,F1B1A2  @IPL SINGLE STEP                          5313.10 00                      005267.40
        RD%SEOP¤,0%$X9¤,F1BH5                                          0.00 89 005643.11 00         005270.00
        CCW,0%$X9¤,F1BA                                                0.00 89 005613.21 00         005271.00
        BB,F1BA&.24,$-1.0                                           5613.30 80 005271.34 02         005272.00
        LC,$X1,%8¤17777.0                                          17777.02 50                      005273.00
        SC,$X1,EDPLOC                                               4010.43 50                      005273.40
        REL%SEOP¤,0%$X9¤                                               0.00 89 000000.33 00         005274.00
        CCW,0%$X9¤,F1BA                                                0.00 89 005613.21 00         005275.00
        BB,F1BA&.24,$-1.0                                           5613.30 80 005275.34 02         005276.00
        BZB,F1BA&.18,F1C                                            5613.22 80 006604.74 00         005277.00
        LX,$X1,%8¤17777.0                                          17777.02 10                      005300.00
        SC,$X1,$X2                                                    22.03 50                      005300.40
        V&,$X2,$X1                                                    21.04 B0                      005301.00
        SV,$X2,F1BD&.32                                             5623.45 30                      005301.40
        B,F1B1A1            @GO READ C CARDS                        5306.50 00                      005302.00
```

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                                    @
                                    @SINGLE STEP FROM CARDS
                                    @
F1B1    LI%BU,18¤,%8¤777777                                  777777.00 80 422000.20 50     005302.40
        ST%BU,18,8¤,EDPLOC                                     4010.40 80 022000.20 D0     005303.40
        SIC,F1B1A3                                             5327.00 80                  005304.40
                  B,F1B1A2                                     5313.10 00                  005305.00
        ST%BU,12¤,F1BC3,12  @ZERO SEQUENCE NUMBER            5616.24 80 014006.20 D0     005305.40
F1B1A1  RD%SEOP¤,0%$X9¤,F1BB                                       0.00 89 005614.11 00  005306.40
        CCW,0%$X9¤,F1BA                                            0.00 89 005613.21 00  005307.40
        BB,F1BA&.24,$-1.0                                    5613.30 80 005307.74 02     005310.40
        SIC,31.0                                               37.00 80                  005311.40
                B,F1B1B                                      5327.50 00                  005312.00
        B,F1B1A1                                             5306.50 00                  005312.40
                                    @
F1B1A2  L%BU,7¤,EQRDR1                                       4012.00 80 007000.20 50     005313.00
        BR7,$               @READER NOT AVAILABLE, MAKE DECISION 5314.34 C2              005314.00
        Z,$X9                                                  31.22 00                  005314.40
        ST%BU,7¤,$X9&.12                                       31.14 80 007000.20 D0     005315.00
F1B1A   REL%SEOP¤,0%$X9¤                                           0.00 89 000000.33 00  005316.00
        CCW,0%$X9¤,F1BA                                            0.00 89 005613.21 00  005317.00
        BB,F1BA&.24,$-1.0                                    5613.30 80 005317.34 02     005320.00
        BB,F1BA&.18,F1B1A3      @BR-UNIT RDY                 5613.22 80 005327.34 02     005321.00
        CCW,0%$X9¤,F1BA                                            0.00 89 005613.21 00  005322.00
        BZB,F1BA&.18,$-1.0      @BR-UNIT NOT RDY             5613.22 80 005322.34 00     005323.00
        REL%SEOP¤,0%$X9¤                                           0.00 89 000000.33 00  005324.00
        CCW,0%$X9¤,F1BA                                            0.00 89 005613.21 00  005325.00
        BB,F1BA&.24,$-1.                                     5613.30 80 005325.34 02     005326.00
F1B1A3  $B,0                                                       0.10 00               005327.00
                                    @
                                    @DETERMINE TYPE OF CARD
F1B1B   TI,16,16.0,FA1                                            20.00 80 007201.00 A0  005327.40
        L%BU,12,8¤,F1BI                                      5644.00 80 014000.20 50     005330.40
        K%BU,12,8¤,F1BC1                                     5615.00 80 014000.21 10     005331.40
        BAE,F1B1C           @ORIGIN CARD                     5366.36 C2                  005332.40
                            @
        K%BU,12,8¤,F1BC1&.12                                 5615.14 80 014000.21 10     005333.00
        BAE,F1B1D           @FLOW CARD                       5404.76 C2                  005334.00
                            @
        K%BU,12,8¤,F1BC1&.24                                 5615.30 80 014000.21 10     005334.40
        BAE,F1B1E1          @BRANCH CARD                     5412.36 C2                  005335.40
                            @
        K%BU,12,8¤,F1BC1&.36                                 5615.44 80 014000.21 10     005336.00
        BAE,F1B1F           @C CARD                          5416.36 C2                  005337.00
                            @
        K%BU,12,8¤,F1BC1&.48                                 5615.60 80 014000.21 10     005337.40
        BAE,F1B1G           @P CARD                          5436.36 C2                  005340.40
                            @
        K%BU,12,8¤,F1BC1&.60                                 5615.74 80 014000.21 10     005341.00
        BAE,F1B1H           @T CARD                          5512.76 C2                  005342.00
        K%BU,12,8¤,F1BC1&.72                                 5616.10 80 014000.21 10     005342.40
        BAE,F1B1R           @N CARD, BYPASS                  5611.36 C2                  005343.40
                            @
                            @ILLEGAL CARD
        LX,$X1,G2D&12.0                                     10467.02 10                  005344.00
        SX,$X1,G2D1                                         10513.03 10                  005344.40
        SIC,31.0                                               37.00 80                  005345.00
              B,G2A&.32     @HALT                          10355.50 00                  005345.40
        B,F1B1R             @CONTINUE, BYPASSING CARD        5611.10 00                 005346.00
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                                @
                                @ORIGIN CARD & FLOW CARD COMMON RTE
F1B1C1  M&1%BU,12¤,F1BC3                                    5616.24 80 014000.22 B0      005346.40
        L%BU,12,8¤,F1BI&.24                                 5644.30 80 014000.20 50      005347.40
        K%BU,12,8¤,F1BC3                                    5616.24 80 014000.21 10      005350.40
        SIC,F1B1J2                                          5522.40 80                   005351.40
                BZAE,F1B1J  @BRANCH ON SEQUENCE ERROR       5514.36 C0                   005352.00
        L%BU,12,8¤,F1BI&.36                                 5644.44 80 014000.20 50      005352.40
        BR7,F1B1C2                                          5365.74 C2                   005353.40
        KI%BU,12,8¤,%8¤7777                               777700.00 80 414000.21 10      005354.00
        BAE,F1B1C2          @BYPASS CHECKSUMMING            5365.76 C2                   005355.00
                            @
                            @CHECKSUM CARD
        LX,$X2,F1BE                                         5624.04 10                   005355.40
        L%BU,12,8¤,F1BI                                     5644.00 80 014000.20 50      005356.00
        &%BU,12,8¤,F1BI&.12                                 5644.14 80 014000.20 10      005357.00
        &%BU,12,8¤,F1BI&.24                                 5644.30 80 014000.20 10      005360.00
        &%V&IC¤%BU,12,8¤,.12%$X2¤                              0.14 82 214000.20 10      005361.00
        BZXCZ,$-1.0                                         5361.30 40                   005362.00
        &%BU,12,8¤,$R&.40                                     11.50 80 014000.20 10      005362.40
        KF%BU,12,8¤,F1BI&.36                                5644.44 80 014000.23 10      005363.40
        SIC,F1B1J2                                          5522.40 80                   005364.40
                BZAE,F1B1J1 @BRANCH ON CHECKSUM ERROR       5517.76 C0                   005365.00
F1B1C2  $R,0                                                   0.10 00                   005365.40
                            @
                            @ORIGIN CARD ENTRY
F1B1C   SIC,F1B1C2                                          5365.40 80                   005366.00
                B,F1B1C1                                    5346.50 00                   005366.40
        L%BU,24,8¤,F1BI&.60  @STORE NEW ORIGIN ADDRESS      5644.74 80 030000.20 50      005367.00
        ST%BU,24,8¤,F1BD                                    5623.00 80 030000.20 D0      005370.00
        KI%BU¤,%8¤1777677                                 17776.77 80 430000.21 10       005371.00
        BAH,$&3.                                            5375.37 42                   005372.00
        LX,$X6,G2D&14.                                     10471.14 10                   005372.40
        $X,$X6,G2D1                                        10513.15 10                   005373.00
        SIC,$X15                                               37.00 80                  005373.40
                B,G2A&.32       @GO TO CODED HALT          10355.50 00                   005374.00
        B,$&3.                  @BR-BYPASS $A TEST          5377.50 00                   005374.40
        KF%BU,24¤,EDPLOC                                    4010.40 80 030000.23 10      005375.00
        BAH,$&1.32              @BR-HIGHER THAN LOWEST ORGN 5377.77 42                   005376.00
        SF%BU,18,8¤,EDPLOC,6    @ST FOR STARTING ADDRS      4010.40 80 022003.12 F0      005376.40
        L%BU,24,8¤,F1BI&1.20                                5645.24 80 030000.20 50      005377.40
        BZR7,F1B1M                                          5523.34 C0                   005400.40
                            @
        SIC,31.0                                               37.00 80                  005401.00
                BRZZ,F1B1N                                  5533.74 C6                   005401.40
F1B1C3  LV,$X14,F1BD                                        5623.34 30                   005402.00
        KV,$X14,F1BD&.32                                    5623.74 90                   005402.40
        BXL,$&1.0                                           5404.32 42                   005403.00
        SV,$X14,F1BD&.32                                    5623.75 30                   005403.40
        B,F1B1R                                             5611.10 00                   005404.00
                            @
                            @FLOW CARD
                            @
F1B1D   SIC,F1B1C2                                          5365.40 80                   005404.40
                B,F1B1C1                                    5346.50 00                   005405.00
        LV,$X6,F1BD                                         5623.14 30                   005405.40
        LI%BU,18,8¤,800,18                                  1440.00 80 422011.20 50      005406.00
        &I%BU,24,8¤,F1BI&.52,40                             5644.64 80 430024.20 10      005407.00
        LX,$X7,$R                                             11.16 10                   005410.00
        SIC,31.0                                              37.00 80                   005410.40
                B,F1B1N1                                    5540.10 00                   005411.00
        B,F1B1C3                                            5402.10 00                   005411.40
```

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                                    @BRANCH CARD
                                    @
F1B1F1   LI%BU,8¤,%8¤377                                  776000.00 80 410000.20 50    005412.00
         KF%BU,8,8¤,FDPLOC&.10                              4010.52 80 010000.23 10    005413.00
         BZAE,$&1.32                                        5415.76 C0                 005414.00
         M&1%BU,18,8¤,FDPLOC                                4010.40 80 022000.22 B0    005414.40
F1B1E    B,F1C                      @LOADING COMPLETE, CONTINUE                        
                                                            6604.50 00                 005415.40
                                    @
                                    @
                                    @C CARD
                                    @
F1B1F    LI%BU,8¤,%16¤31            @C IMAGE              142000.00 80 410000.20 50    005416.00
         SIC,F1B1P3&1.0                                     5577.00 80                 005417.00
                         B,F1B1P                            5555.50 00                 005417.40
         LVI,$X7,H6CD                    @IMAGE STORAGE    14370.17 01                 005420.00
         L%BU,4,4¤,F1BC5&1.0%$X6¤                           5617.50 86 004400.20 50    005420.40
         KI%BU,4,4¤,%8¤17                                 740000.00 80 404400.21 10    005421.40
         BZAE,F1B1F1                @BRANCH IF NOT A PERIOD 5433.76 C0                 005422.40
                                    @STORE HALF WORD
         C0011%BU,24,4¤,F1BC5&.40%$X6¤                      5617.20 86 030400.06 70    005423.00
         CM0101%BU,18,3¤,$L&.32                               10.40 80 022300.12 F0    005424.00
         &%BU,3,3¤,F1BC5&1.05%$X6¤,75                       5617.55 86 003345.60 10    005425.00
         &%BU,3,3¤,F1BC5&1.09%$X6¤,72                       5617.61 86 003344.20 10    005426.00
         &%BU,8,8¤,F1BC5&1.16%$X6¤,64                       5617.70 86 010040.20 10    005427.00
         ST%BU,32,8¤,0%$X10¤,64                                0.00 8A 040040.20 D0    005430.00
         ST%V&I¤%BU,32¤,.32%$X7¤,64  @STORE FOR PRINT          0.40 87 140040.20 D0    005431.00
         V&I,$X10,.32                                          0.65 05                 005432.00
         CB&,$X6,F1B1F&2.32                                 5420.55 48                 005432.40
         B,$&1.0                                            5434.10 00                 005433.00
                                    @
F1B1F1   V&I,$X10,.32                                          0.65 05                 005433.40
         KV,$X10,F1BD&.32                                   5623.64 90                 005434.00
         BXL,$&1.0                                          5435.72 42                 005434.40
         SV,$X10,F1BD&.32                                   5623.65 30                 005435.00
         B,F1B1R1                        @PRINT CARDS       5610.50 00                 005435.40
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                                @
                                @P CARD
                                @
F1B1G   LI%BU,8¤,%16¤4B         @P IMAGE                226000.00 80 410000.20 50      005436.00
        SIC,F1B1P3&1.0                                    5577.00 80                     005437.00
                          B,F1B1P                         5555.50 00                     005437.40
        LVI,$X7,H6CD              @IMAGE STORAGE         14370.17 01                     005440.00
        L%BU¤,0%$X10¤                                        0.00 8A 000000.20 50      005440.40
        KFI%BU,4,4¤,8,36                                400000.00 80 404422.23 10      005441.40
        BAE,F1B1G1                                        5455.76 C2                     005442.40
                                @
        L%BU,32,8¤,0%$X10¤,32                                0.00 8A 040020.20 50      005443.00
        &%BU,18,8¤,F1BD&.32,14                            5623.40 80 022007.20 10      005444.00
        &I%BU,1,1¤,1,14                                 400000.00 80 401107.20 10      005445.00
        ST%BU,24,8¤,F1BD&.32,8                            5623.40 80 030004.20 D0      005446.00
        LV,$X11,$R&.32                                      11.66 30                     005447.00
        &I%BU,1,1¤,1,11                                 400000.00 80 401105.60 10      005447.40
        ST%BU,32,8¤,0%$X10¤                                  0.00 8A 040000.20 D0      005450.40
        ST%BU,32,8¤,0%$X11¤,32                               0.00 8B 040020.20 D0      005451.40
        V&I,$X11,.32                                         0.67 05                     005452.40
        M&1%BU,19,8¤,F1BD&.32                             5623.40 80 023000.22 B0      005453.00
        BBZ,F1BC4&.01,$&1.0                               5616.41 80 005455.34 06      005454.00
        B,F1B1G2                                          5470.50 00                     005455.00
                                @
F1B1G1  L%BU¤,0%$X10¤,64                                     0.00 8A 000040.20 50      005455.40
        &%BU,18,8¤,F1BD&.32,14                            5623.40 80 022007.20 10      005456.40
        &I%BU,1,1¤,1,14                                 400000.00 80 401107.20 10      005457.40
        ST%BU,24,8¤,F1BD&.32,8                            5623.40 80 030004.20 D0      005460.40
        LV,$X11,$R&.32                                      11.66 30                     005461.40
        &I%BU,1,1¤,1,11                                 400000.00 80 401105.60 10      005462.00
        &I%BU,3,3¤,6,42                                 600000.00 80 403325.20 10      005463.00
        ST%BU¤,0%$X10¤                                       0.00 8A 000000.20 D0      005464.00
        ST%BU¤,0%$X11¤,64                                    0.00 8B 000040.20 D0      005465.00
        V&I,$X11,1.0                                         1.27 05                     005466.00
        M&1%BU,18,8¤,F1BD&.32                             5623.40 80 022000.22 B0      005466.40
        BB1,F1BC4&.01,$&1.0                               5616.41 80 005470.74 0E      005467.40
                                @
F1B1G2  L%BU,4,4¤,F1BC5&1.0%$X6¤                          5617.50 86 004400.20 50      005470.40
        KI%BU,4,4¤,%8¤17                                740000.00 80 404400.21 10      005471.40
        B7AE,F1B1G3                                       5504.36 C0                     005472.40
        C0011%BU,24,4¤,F1BC5&.40%$X6¤                     5617.20 86 030400.06 70      005473.00
        CM0101%BU,18,3¤,$L&.32                              10.40 80 022300.12 F0      005474.00
        &%BU,3,3¤,F1BC5&1.05%$X6¤,75                      5617.55 86 003345.60 10      005475.00
        &%BU,3,3¤,F1BC5&1.09%$X6¤,72                      5617.61 86 003344.20 10      005476.00
        &%BU,8,8¤,F1BC5&1.16%$X6¤,64                      5617.70 86 010040.20 10      005477.00
        ST%BU,32,8¤,0%$X11¤,64                               0.00 8B 040040.20 D0      005500.00
        ST%V&I¤%BU,32¤,.32%$X7¤,64  @STORE FOR PRINT         0.40 87 140040.20 D0      005501.00
        M&1%BU,19,8¤,F1BD&.32                             5623.40 80 023000.22 B0      005502.00
        V&I,$X11,.32                                         0.67 05                     005503.00
        CB&,$X6,F1B1G2                                    5470.55 48                     005503.40
                                @
F1B1G3  BB,F1BC4&.01,$&2.0                                5616.41 80 005506.34 02      005504.00
        CBH,$X10,$&.32                                    5505.64 C8                     005505.00
        B,$&1.0                                           5506.50 00                     005505.40
        CB&,$X10,$&.32                                    5506.65 48                     005506.00
        SVA,$X10,F1BW                                     6126.25 D0                     005506.40
        L%BU,32,8¤,F1BW                                   6126.00 80 040000.20 50      005507.00
        ST%BU,32,8¤,0%$X11¤                                  0.00 8B 040000.20 D0      005510.00
        M&1%BU,19,8¤,F1BD&.32                             5623.40 80 023000.22 B0      005511.00
        B,F1B1R1                  @PRINT CARDS            5610.50 00                     005512.00
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```
                                @T CARD
                                @
F1B1H   BB1,F1BC4,$&1.0                                  5616.40 80 005513.74 0E     005512.40
        B,F1B1R                                          5611.10 00                  005513.40
                                @
                                @SEQUENCE ERROR
F1B1J   TI,1,G2D&11.0,G2D1                              10466.00 80 010513.02 A0     005514.00
        ST%BU,12,8¤,F1BC3                                5616.24 80 014000.20 D0     005515.00
        BBZ,F1BC4,F1B1J2                                 5616.40 80 005522.74 06     005516.00
        B,$&2.32                                         5521.50 00                  005517.00
                                @CHECKSUM ERROR FROM CARDS OR LD TAPE
F1B1J1  &%BU,12,8¤,F1BI&.36,64                           5644.44 80 014040.20 10     005517.40
        TI,1,G2D&13.0,G2D1                              10470.00 80 010513.02 A0     005520.40
        SIC,31.0                                           37.00 80                  005521.40
                B,G2A&.32                               10355.50 00                  005522.00
F1B1J2  $R,0                                                0.10 00                  005522.40
                                @
                                @RESULTS NOT ALL ZERO
F1B1M   BB,F1BI&.49,F1B1M1                               5644.61 80 005524.74 02     005523.00
        B,F1B1M2                                         5530.10 00                  005524.00
                                @
                                @SKIP AFTER LOADING CARD
F1B1M1  SIC,31.0                                           37.00 80                  005524.40
                B,F1B1N                                  5533.50 00                  005525.00
        L%BU,24,8¤,F1BI&1.20                             5645.24 80 030000.20 50     005525.40
        M&%BU,24,8¤,F1BD                                 5623.00 80 030000.20 90     005526.40
        B,F1B1C3                                         5402.10 00                  005527.40
                                @
                                @SKIP BEFORE LOADING CARD
F1B1M2  L%BU,24,8¤,F1BI&1.20                             5645.24 80 030000.20 50     005530.00
        M&%BU,24,8¤,F1BD                                 5623.00 80 030000.20 90     005531.00
        SIC,31.0                                           37.00 80                  005532.00
                B,F1B1N                                  5533.50 00                  005532.40
        B,F1B1C3                                         5402.10 00                  005533.00
                                @
                                @TRANSFER DATA
F1B1N   Z,$X6                                              26.22 00                  005533.40
        LV,$X6,F1BD                                      5623.14 30                  005534.00
        L%BU,10,8¤,F1BI&.50,18                           5644.62 80 012011.20 50     005534.40
        &I%BU,24,8¤,F1BI&1.52,40                         5645.64 80 430024.20 10     005535.40
        LX,$X7,$R                                          11.16 10                  005536.40
        KCI,$X7,64              @BIT COUNT                100.17 0A                  005537.00
        BXL,F1B1N2                                       5545.32 42                  005537.40
                                @
F1B1N1  L%BU¤,0%$X7¤                                        0.00 87 000000.20 50     005540.00
        ST%BU¤,0%$X6¤                                       0.00 86 000000.20 D0     005541.00
        V&I,$X6,1.0                                         1.15 05                  005542.00
        C-I,$X7,64                                        100.17 08                  005542.40
        V&I,$X7,1.0                                         1.17 05                  005543.00
        BXCZ,F1B1N3                                      5552.30 42                  005543.40
        KCI,$X7,64                                        100.17 0A                  005544.00
        BZXL,F1B1N1                                      5540.32 40                  005544.40
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                                    @
                                    @STORE ANY PARTS OF WORDS
F1B1N2  L%BU,6,6¤,$X7&.40                                          27.50 80 006600.20 50      005545.00
        ST%BU,6,6¤,$&2.35                                        5550.43 80 006600.20 D0      005546.00
        ST%BU,6,6¤,$&2.35                                        5551.43 80 006600.20 D0      005547.00
        L%BU¤,0%$X7¤                                                0.00 87 000000.20 50      005550.00
        ST%BU¤,0%$X6¤                                               0.00 86 000000.20 D0      005551.00
                                    @UPDATE F1BD
F1B1N3  L%BU,6,6¤,$X7&.40                                          27.50 80 006600.20 50      005552.00
        &%BU,24,8¤,$X6                                             26.00 80 030000.20 10      005553.00
        ST%BU,24,8¤,F1BD                                         5623.00 80 030000.20 D0      005554.00
        B,0%$X15¤                                                   0.10 0F                   005555.00
                                    @
                                    @
                                    @
                                    @HOLLERITH CARD DECODING
F1B1P   SF%BU,8¤,F1BI19                                          6103.30 80 010000.12 F0      005555.40
        LX,$X3,F1BF                                              5625.06 10                   005556.40
        LX,$X5,F1BF&2.0                                          5627.12 10                   005557.00
        LX,$X6,F1BF&3.0                                          5630.14 10                   005557.40
F1B1P1  LX,$X4,F1BF&1.0                                          5626.10 10                   005560.00
        L%V&IC¤%BU,12,8¤,.12%$X3¤                                   0.14 83 214000.20 50      005560.40
        K%V&IC¤%BU,12,8¤,.12%$X4¤                                   0.14 84 214000.21 10      005561.40
        BAE,F1B1P2                                               5565.76 C2                   005562.40
        BZXCZ,F1B1P1&1.32                                        5561.70 40                   005563.00
        LX,$X8,G2D&12.0                                         10467.20 10                   005563.40
        SX,$X8,G2D1                                             10513.21 10                   005564.00
        SIC,31.0                                                   37.00 80                   005564.40
                B,G2A&.32                                       10355.50 00                   005565.00
F1B1P2  L%BU,12,8¤,3.24%$X4¤                                        3.30 84 014000.20 50      005565.40
        ST%V&IC¤%BU,4,4¤,.04%$X5¤                                   0.04 85 204400.20 D0      005566.40
        BZXCZ,F1B1P1                                             5560.30 40                   005567.40
                                    @
        C0011%BU,24,4¤,F1BC5                                     5616.50 80 030400.06 70      005570.00
        CM0101%BU,18,3¤,$L                                         10.00 80 022300.12 F0      005571.00
        &%BU,1,1¤,F1BC5&.29,109                                  5617.05 80 001166.60 10      005572.00
        KI%BU¤,%8¤1777677                                       17776.77 80 430000.21 10      005573.00
        BAH,F1B1P3                                               5576.37 42                   005574.00
        SIC,31.0                                                   37.00 80                   005574.40
                B,G2A       @C OR P CARD ADDR TOO LOW           10355.10 00                   005575.00
        B,F1B1R             @BYPASS CARD                         5611.10 00                   005575.40
F1B1P3  LX,$X10,$L                                                 10.24 10                   005576.00
        SVA,$X10,H6B2       @SAVE ADDR                           14320.25 D0                   005576.40
        $B,0                                                       0.10 00                   005577.00
                                    @
                                    @CARD COMPLETE,RETURN FOR NEXT
F1B1RY  SIC,H6B1                                                14311.40 80                   005577.40
                B,H6B       CONVERT ADDR                        16505.10 00                   005600.00 Y**
        ST%BU¤,F1BI19&.08    @STORE                              6103.40 80 000000.20 D0      005600.40
        SIC,$X15                                                   37.00 80                   005601.40
        B,H6C                    @ENCODE STORED HALF WORDS      14325.10 00                   005602.00
        Z,$R                     @COMPUTE CHARACTER COUNT          11.22 00                   005602.40
        &I,15                                                      0.17 80 430000.20 10      005603.00 M
        V-I,$X6,1.                                                 1.15 0D                   005604.00
        BZXVZ,$-1.32                                            5603.31 40                   005604.40
        ST%BU,6¤,F1BF3.40        @TO CONTROL WORD COUNT         5631.50 80 006000.20 D0      005605.00
        CNOP
        SIC,$X15                                                   37.00 80                   005606.00
                B,H1A1A2         @PRIN                         12754.10 00                   005606.40
        XW,F1BI19,11,F1BF3,4                                     6103.30 40 000260.13 99      005607.00
        B,F1B1R                                                  5611.10 00                   005610.00
F1B1R1  NOP                 @INSERT BR TO F1B1RY TO PRINT C CARDS  0.30 00                   005610.40
F1B1R   TI,16,FA1,16.0                                           7201.00 80 000020.00 A0      005611.00
        B,0,0%$X15¤                                                0.10 0F                   005612.00
```

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                                  @
F1BA     XW,0,0,0                 @CCW REG                                    0.00 00 000000.00 00      005613.00
F1BB     CW,F1BI,15,F1BB          @CW                                      5644.00 00 000360.13 8C      005614.00
F1BC1    %8¤DD%BU,12¤,7,5,15,4100,2004,1100,2020                                                0007    005615.00
                                                                                                0005    005615.14
                                                                                                0015    005615.30
                                                                                                4100    005615.44
                                                                                                2004    005615.60
                                                                                                1100    005615.74
                                                                                                2020    005616.10
F1BC3    %8¤DD%BU,12¤,0           @SEQUENCE COUNT                                               0000    005616.24
F1BC4    DD%BU,8¤,0               @SEQUENCE TO BE CHANGED/P FULL WD/CORRECT                       000    005616.40
                                  @PG
F1BC5    DR%BU,4,4¤,%70¤                                                      4.30                      005616.50
F1BD     VF,0                                                                 0.00&                     005623.00
              VF,0                @ORIGIN ADDRESS/MODIFIED ADDRESS            0.00&                     005623.40
F1BE     XW,F1BI&.48,68,F1BE                                               5644.60 00 002100.13 94      005624.00
F1BF     XW,F1BI&.12,70,F1BF                                               5644.14 00 002140.13 95      005625.00
         XW,F1BT,19,F1BF&1.0                                               6114.60 00 000460.13 96      005626.00
         XW,F1BC5,70,F1BF&2.0                                              5616.50 00 002140.13 97      005627.00
         XW,0,4,F1BF&3.0                                                      0.00 00 000100.13 98      005630.00
F1BF3    XW,H6CI&.40                                                   14374.50 00 000000.00 00      005631.00
F1BG1    XW,F1BI3,21,0                                                  5677.20 00 000520.00 00      005632.00
F1BG2    XW,F1PGID,3,F1BG3,4                                            4176.00 40 000060.13 9C      005633.00
F1BG3    XW,F1BI8A,82,0                                                 5751.60 00 002440.00 00      005634.00
F1BG4    XW,F1BI9A,32,0                                                 5770.50 00 001000.00 00      005635.00
F1BH     XW,0,0,0                 @CW FOR READ                                0.00 00 000000.00 00      005636.00
F1BH1    CW,%8¤20000.0,%8¤40000,0                                      20000.00 01 000000.00 00      005637.00
F1B1H2   CW,%8¤104000.,%8¤14000,                                      104000.00 00 300000.00 00      005640.00
F1B1H3   CW,%8¤120000.,%8¤40000,                                      120000.00 01 000000.00 00      005641.00
F1BH4    CW,%8¤4000.0,%8¤14000,0                                        4000.00 00 300000.00 00      005642.00
F1BH5    CW%CCR¤,%8¤17777.0,1,%8¤17777                                 17777.00 40 000020.37 FF      005643.00
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F1BI    DR%BU¤,%15¤                                                    17.00          005644.00
F1BI1   %IQSZ¤DD%BU,8,8¤,**PROGRAM IDENTITY ENTERED AT SS HALT NOT Z                  005663.00
        %IQSZ¤DD%BU,8,8¤,ON MASTER TAPE.Z                                            005670.20
F1BI2   %IQSZ¤DD%BU,8,8¤,**NO PROGRAM IDENTIFY ENTERED AT SS HALT.Z                  005672.10
F1BI3   %IQSZ¤DD%BU,8,8¤,RETURNING TO SS HALT.Z                                     005677.20
F1BI4   %IQSZ¤DD%BU,8,8¤,END OF SEQUENTIAL RUN OF PROGRAMS ON MASTER Z              005701.70
        %IQSZ¤DD%BU,8,8¤,TAPE. RESTARTING SEQUENTIAL RUN IF CHANGE OF               005707.30
        %IQSZ¤DD%BU,8,8¤,CONTROL NOT SELECTED.Z                                     005715.00
F1BI5   %IQSZ¤DD%BU,8,8¤, UA2 BA2Z                                                  005717.50
F1BI6   %IQSZ¤DD%BU,8,8¤,**DCP HAD CHECKSUM ERROR ON THREE READ IN Z                005720.50
        %IQSZ¤DD%BU,8,8¤,ATTEMPTS. CONTINUE WILL OPERATE PROGRAM Z                  005725.70
        %IQSZ¤DD%BU,8,8¤,AS IS.Z                                                    005732.70
F1BI7   %IQSZ¤DD%BU,8,8¤,END OF SCHEDULED RUN OF PROGRAMS ON MASTER Z              005733.50
        %IQSZ¤DD%BU,8,8¤,TAPE. RESTARTING SCHEDULED RUN IF CHANGE OF Z             005741.00
        %IQSZ¤DD%BU,8,8¤,CONTROL NOT SELECTED.Z                                     005746.40
F1BI8   %IQSZ¤DD%BU,8,8¤,**PGMZ                                                     005751.10
F1BI8A  %IQSZ¤DD%BU,8,8¤,FAILED TO CHECKSUM ON THREE READ IN Z                      005751.60
        %IQSZ¤DD%BU,8,8¤,ATTEMPTS. CONTINUE WILL OPERATE PROGRAM Z                  005756.20
        %IQSZ¤DD%BU,8,8¤,AS IS.Z                                                    005763.20
F1BI9   %IQSZ¤DD%BU,8,8¤,**MASTER TAPE OUT OF SYNC AT PGM    .Z                    005764.00
F1BI9A  %IQSZ¤DD%BU,8,8¤,DCP MAKING AUTOMATIC CORRECTION.Z                          005770.50
F1BI10  %IQSZ¤DD%BU,8,8¤,**A TAPE OR MEMORY PROBLEM SEEMS TO EXIST.Z                005774.50
        %IQSZ¤DD%BU,8,8¤, ABOVE PROGRAM DOES NOT APPEAR IN IDENTITY Z               006001.70
        %IQSZ¤DD%BU,8,8¤,TABLE. CONTINUE WILL OPERATE PGM IN MEMORY.Z               006007.20
F1BI11  %IQSZ¤DD%BU,8,8¤,**OPERATOR SELECTED SCHEDULE MODE BUT Z                    006014.50
        %IQSZ¤DD%BU,8,8¤,FAILED TO ENTER A SCHEDULE. ENTER SCHEDULE Z               006021.30
        %IQSZ¤DD%BU,8,8¤,CARDS OR CHANGE CONTROL AND CONTINUE.Z                     006026.60
F1BI12  %IQSZ¤DD%BU,8,8¤,**        NOT ON MASTER TAPE.Z                         006033.30
F1BI13  %IQSZ¤DD%BU,8,8¤,**OPERATOR GOOFED. NO Z                                    006037.00
F1BI14  %IQSZ¤DD%BU,8,8¤,TERMINATION CARD.Z                                         006041.60
F1BI15  %IQSZ¤DD%BU,8,8¤,**ENTER SCHEDULE CARDS REQUESTED BUT CARDS Z               006043.70
        %IQSZ¤DD%BU,8,8¤,NOT IN READER. CONTINUING USING OLD SCHEDULE.              006051.20
F1BI16  %IQSZ¤DD%BU,8,8¤,**ILLEGAL CHARACTER ON SCHEDULE CARD SO CARD               006056.70
        %IQSZ¤DD%BU,8,8¤,IS BEING SKIPPED.Z                                         006064.40
F1BI17  %IQSZ¤DD%BU,8,8¤,**CARDS IN READER NOT SCHEDULE CARDS.Z                     006066.50
F1BI18  %IQSZ¤DD%BU,8,8¤,THE FOLLOWING SCHEDULE OF PROGRAMS WILL BE Z               006073.20
        %IQSZ¤DD%BU,8,8¤,RUN IN MODE SPECIFIED.Z                                    006100.50
F1BI19  DRZ%BU,8¤,%11¤          @ENCODED LOCATION                        1.30       006103.30
        CNOP
F1BJ    B,F1B2A5                                                    6173.50 00      006105.00
                NOP                                                    0.30 00      006105.40
F1BK    XW,0,0,0            @SAVE IX 15                                0.00 00 000000.00 00   006106.00
F1BQ1   DD%BU¤,0                                                       000000000000000000000000  006107.00
F1BQ    %IQSZ¤DD%BU,8,8¤,AJ 1BKS2CLT3DMU4ENV5FOW6GPX7HQY8IRZ9  0 Z                  006110.00
F1BQ2   %8¤DD%BU,8¤,102,200,0,0                                                     102  006114.20
                                                                                    200  006114.30
                                                                                    000  006114.40
                                                                                    000  006114.50
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F1BT     %8□DD%BU,12,8□,0,1000,400,200,100,40,20,10,4,2,1
                                                                    0000    006114.60
                                                                    1000    006114.74
                                                                    0400    006115.10
                                                                    0200    006115.24
                                                                    0100    006115.40
                                                                    0040    006115.54
                                                                    0020    006115.70
                                                                    0010    006116.04
                                                                    0004    006116.20
                                                                    0002    006116.34
                                                                    0001    006116.50
         %8□DD%BU,12,8□,4400,4200,4100,4040,4020,4010,4102,4502     4400    006116.64
                                                                    4200    006117.00
                                                                    4100    006117.14
                                                                    4040    006117.30
                                                                    4020    006117.44
                                                                    4010    006117.60
                                                                    4102    006117.74
                                                                    4502    006120.10
F1BT1    %8□DD%BU,12,8□,0,0,1,2,3,4,5,6,7,10,11,12,13,14,15,16,17,17,1
                                                                    0000    006120.24
                                                                    0000    006120.40
                                                                    0001    006120.54
                                                                    0002    006120.70
                                                                    0003    006121.04
                                                                    0004    006121.20
                                                                    0005    006121.34
                                                                    0006    006121.50
                                                                    0007    006121.64
                                                                    0010    006122.00
                                                                    0011    006122.14
                                                                    0012    006122.30
                                                                    0013    006122.44
                                                                    0014    006122.60
                                                                    0015    006122.74
                                                                    0016    006123.10
                                                                    0017    006123.24
                                                                    0017    006123.40
                                                                    0001    006123.54
F1BV1    VF,,12                                             0.14&       006124.00
              DD%BU,39,8□,40                                      0000000000050    006124.31
F1BV2    XW,0,0,0              @ID STORE CONTROL           0.00 00 000000.00 00    006125.00
F1BW     $B,0                                              0.10 00                 006126.00
              VF,0                                          0.00&                   006126.40
                   DD%BU,7,7□,0                                          000    006126.71
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                        @
                        @READ IN DIAGNOSTIC PROGRAM
                        @FROM HI DENSITY TAPE
                        @
F1B2    SIC,31.0                                                  37.00 80                    006127.00
              B,F1B6    @SET TAPE                               6435.50 00                    006127.40
        TI,1,F1BH1,F1BH @SET UP READ CW                         5637.00 80 005636.02 A0       006130.00
        LI%BU,18¤,J3DC1                                        20000.00 80 422000.20 50       006131.00
        ST%BU,18,8¤,EDPLOC                                      4010.40 80 022000.20 D0       006132.00
        BB,ECTL2&.08,F1B2C @BRANCH IF SS                        4007.10 80 006241.74 02       006133.00
        BB,ECTL2.7,F1B7         @SCHEDULE MODE                  4007.07 80 006455.74 02       006134.00
                        @
                        @SEQUENCIAL
        LX,$X1,F1SQPO           @SEQ POSITION                   4174.02 10                    006135.00
        L%BU,24¤,ESEQWB.8%$X1¤  @PROGRAM ID                     4204.10 81 030000.20 50       006135.40

        L%BU,24¤,FSEQTB.8%$X1¤  @PROGRAM ID                     4204.10 81 030000.20 50       006135.40
        BRZ,F1B2B               @REW & POSIT TAPE TO 0          6230.34 C2                    006136.40
        ST%BU,24,8¤,F1PGID                                      4176.00 80 030000.20 D0       006137.00
        KF%BU,24,8¤,F1BI5&.08                                   5717.60 80 030000.23 10       006140.00
        BAE,F1B2A2              @RUN MEMORY PGM KC BA2          6162.36 C2                    006141.00
        V&,$X1,$X1              @OBTAIN PGM TAPE POSITION         21.02 B0                    006141.40
        BB1,$X1&.24,$&1.0       @SET TO MINUS V                   21.30 80 006143.34 0E       006142.00
        V&,$X1,F1TAPO           @OBTAIN REPOSITIONING DATA      4173.02 B0                    006143.00
        BXVZ,$&1.32             @NONE NECESSARY                 6145.31 42                    006143.40
        SIC,31.0                                                  37.00 80                    006144.00
              B,F1B3    @GO REPOSITION TAPE                     6335.10 00                    006144.40
        SIC,31.0                                                  37.00 80                    006145.00
              B,F1B4    @READ IN PROGRAM                        6360.10 00                    006145.40
        LX,$X1,F1SQPO                                           4174.02 10                    006146.00
        V&I,$X1,.32                                                0.43 05                    006146.40
        SX,$X1,F1SQPO           @UPDATE SEQ TABLE POSITION      4174.03 10                    006147.00
        B,F1C                                                   6604.50 00                    006147.40
                        @
                        @
                        @RUN PROGRAM TO CHECK LOWER MEMORY
F1B2A   V&,$X1,$X1                                                21.02 B0                    006150.00
        BB1,$X1&.24,$&1.0                                         21.30 80 006151.74 0E       006150.40
        V&,$X1,F1TAPO                                           4173.02 B0                    006151.40
        BXV7,$&1.32                                             6153.71 42                    006152.00
        SIC,31.0                                                  37.00 80                    006152.40
              B,F1B3    @GO REPOSITION TAPE                     6335.10 00                    006153.00
        TI,1,F1BH2,F1BH                                        16502.00 80 005636.02 A0       006153.40 **
        SIC,31.0                                                  37.00 80                    006154.40
              B,F1B4    @READ IN DCP2                           6360.10 00                    006155.00
        L%BU,24,8¤,F1BI5&.40                                    5720.20 80 030000.20 50       006155.40
        ST%BU,24,8¤,F1PGID                                      4176.00 80 030000.20 D0       006156.40
        TI,1,F1BH3,F1BH                                        16503.00 80 005636.02 A0       006157.40 **
        SIC,31.0                                                  37.00 80                    006160.40
              B,F1B4    @READ IN KC BA2                         6360.10 00                    006161.00
F1B2A1  $R,0                                                       0.10 00                    006161.40
                        @
                        @ENTRY FROM SEQ RUN
F1B2A2  SIC,F1B2A1                                                6161.40 80                    006162.00
                B,F1B2A                                         6150.10 00                    006162.40
        LX,$X1,F1SQPO                                           4174.02 10                    006163.00
        V&I,$X1,1.              @STEP SEQ POSIT                   1.03 05                    006163.40
        SX,$X1,F1SQPO                                           4174.03 10                    006164.00
F1B2A3  TI,4,F1TAPO,F1TAPO&%8¤200000                            4173.00 80 204173.10 A0       006164.40
        TI,16,ECTL1,ECTL1&%8¤200000                             4006.00 80 204006.00 A0       006165.40
        B,%8¤204004.40                                         204004.50 00                   006166.40
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                                    @
                                    @ENTRY INTO DCP2 ASSEMBLY AT 100000
F1B2A4  SIC,$X15                                                    37.00 80                    006167.00
              B,F1A5D               @SET UP I/O INSTRUCTIONS      5035.50 00                    006167.40
        LVI,$X1,%8¤120000.                                        120000.03 01                  006170.00
        SV,$X1,EDPLOC                                               4010.43 30                  006170.40
        L%BU¤,F1BJ                  @B,F1B2A5                       6105.00 80 000000.20 50     006171.00
        ST%BU¤,F1B                  @ENTRY TO READ NXT DP           5252.00 80 000000.20 D0     006172.00
        B,F1C                                                       6604.50 00                  006173.00
                                    @
                                    @ENTRY FROM DCP2 TO RETURN TO DCP1
F1B2A5  SIC,31.0                                                    37.00 80                    006173.40
              B,F1B6        @SET TAPE                             6435.50 00                  006174.00
        LCI,$X2,3                                                    3.05 02                  006174.40
F1B2A6  REW%SEOP¤,0%$X10¤                                            0.00 8A 000136.15 00     006175.00
        SIC,F1B3C3                                                6356.00 80                    006176.00
                B,F1B3C             @WAIT & RELEASE               6350.10 00                  006176.40
        SP%SEOP¤,%$X10¤             @BYPASS CALLER                   0.00 8A 000076.15 00     006177.00
        SIC,F1B3C3                                                6356.00 80                    006200.00
                B,F1B3C2            @WAIT FOR SEOP                6354.10 00                  006200.40
        RD%SEOP¤,0%$X10¤,F1BH4                                       0.00 8A 005642.11 00     006201.00
        CCW,0%$X10¤,F1BA                                             0.00 8A 005613.21 00     006202.00
        BB,F1BA&.24,$-1.0                                         5613.30 80 006202.34 02     006203.00
        SPFL%SEOP¤,%$X10¤                                            0.00 8A 000077.15 00     006204.00
        SIC,F1B3C3                                                6356.00 80                    006205.00
        B,F1B3C                     @WAIT-REL-WA17                6350.10 00                  006205.40
        LX,$X1,%8¤4002.0                                            4002.02 10                  006206.00
        CB,$X1,$&.32                                                6207.02 48                  006206.40
        Z,$L                                                          10.22 00                  006207.00
        Z,$R                                                          11.22 00                  006207.40
        &%BU¤,1.0%$X1¤                                                1.00 81 000000.20 10      006210.00
        CB&,$X1,$-1.0                                               6210.03 48                  006211.00
        ST%BU¤,F1BK,64                                              6106.00 80 000040.20 D0     006211.40
        Z,$L                                                          10.22 00                  006212.40
        &%BU¤,F1BK                                                  6106.00 80 000000.20 10     006213.00
        KF%BU¤,%8¤4000.     @CHECKSUM                               4000.00 80 000000.23 10     006214.00
        BAE,F1B2A7                                                  6222.36 C2                  006215.00
        CB,$X2,F1B2A6                                               6175.04 48                  006215.40
                    CNOP
        SIC,31.0                                                      37.00 80                  006216.00
                B,H1A1A                                             12767.50 00                 006216.40
        XW,F1BI6,88,0                                                5720.50 00 002600.00 00    006217.00
        LX,$X1,G2D&14.0                                             10471.02 10                 006220.00
        SX,$X1,G2D1                                                 10513.03 10                 006220.40
        SIC,31.0                                                      37.00 80                  006221.00
                B,G2A&.32                                           10355.50 00                 006221.40
F1B2A7  LCI,$X1,60                                                    74.03 02                  006222.00
        T,$X1,ESCHTB,%8¤4300                                         4300.00 80 004300.02 20    006222.40
        TI,16,ECTL1,%8¤4006                                          4006.00 80 004006.00 A0    006223.40
        Z,F1TAPO                                                     4173.22 00                 006224.40
        TI,4,F1TAPO,%8¤4173                                          4173.00 80 004173.10 A0    006225.00
        B,%8¤4005.40                @B,F1B2A8                        4005.50 00                 006226.00
                                    @
                                    @REENTRY FROM DCP2
F1B2A8  SIC,$X15                                                    37.00 80                    006226.40
              B,F1A5D               @SET UP I/O INSTRUCTIONS      5035.50 00                    006227.00
        B,F1B                                                       5252.10 00                  006227.40
```

```
                                @
                                @SEQUENCIAL RUN COMPLETE
                                @RESTART IF CHANGE OF CONTROL NOT REQUESTE
          CNOP
F132B     SIC,31.0                                                                37.00 80                        006230.00
                B,H1A1A                                                       12767.50 00                       006230.40
          XW,F1BI4,110,0                                                       5701.70 00 003340.00 00          006231.00
          SIC,G1J1                                                            10277.00 80                       006232.00
                B,G1J                                                         10267.10 00                       006232.40
          BB,ESSS&.49,F1A1      @BRANCH IF CHANGE OF CONTROL REQUESTED         4062.61 80 004405.34 02          006233.00
          REW%SEOP¤,0%$X10¤                                                     0.00 8A 000136.15 00          006234.00
          SIC,F1B3C3                                                          6356.00 80                        006235.00
                B,F1B3C           @WAIT & RELEASE                           6350.10 00                        006235.40
          SPFL%SEOP¤,0%$X10¤    @REPOSITION TPE TO FIRST DP                     0.00 8A 000077.15 00          006236.00
          SIC,F1B3C3                                                          6356.00 80                        006237.00
          B,F1B3C               @WAIT AND RELEASE                         6350.10 00                        006237.40
          Z,F1TAPO                                                            4173.22 00                        006240.00
          Z,F1SOPO                                                            4174.22 00                        006240.40
          B,F1B                                                               5252.10 00                        006241.00
```

```
                        @
                        @SINGLE STEP FROM HI DENSITY TAPE
                        @
F1B2C   L%BU,24,8¤,ECTL4&.40                          4011.50 80 030000.20 50     006241.40
        BRZ,F1B2C2      @FAILED TO ENTER IDENTITY     6252.34 C2                  006242.40
        ST%BU,24,8¤,F1PGID                            4176.00 80 030000.20 D0     006243.00
        Z,$X1                @SEARCH PROGRAM TABLE      21.22 00                  006244.00
        LCI,$X1,120                                    170.03 02                  006244.40
F1B2C1  KF%BU,24,8¤,ESEQTB&.08%$X1¤                   4204.10 81 030000.23 10     006245.00
        BAE,F1B2C3                                    6254.76 C2                  006246.00
        CBH,$X1,F1B2C1                                6245.02 C8                  006246.40
                  CNOP
        SIC,31.0                                        37.00 80                  006247.00
              B,H1A1A   @ID NOT IN TABLE              12767.50 00                 006247.40
        XW,F1BI1,57,F1BG1,4                           5663.00 40 001620.13 9A     006250.00
        B,F1A5                                        4770.50 00                  006251.00
          CNOP          @RETURN TO SS HALT              0.30 00                   006251.40
                        @
F1B2C2  SIC,31.0                                        37.00 80                  006252.00
              B,H1A1A   @FAILED TO ENTER ID           12767.50 00                 006252.40
        XW,F1BI2,41,F1BG1,4                           5672.10 40 001220.13 9A     006253.00
        B,F1A5                                        4770.50 00                  006254.00
                        @
                        @IDENTITY IN TABLE - GO READ IT IN
F1B2C3  KF%BU,24,8¤,F1BI5&.40                         5720.20 80 030000.23 10     006254.40
        BAE,F1B2C4-.32          @BA2 SELECTED         6264.76 C2                  006255.40
        KF%BU,24,8¤,F1BI5&.08                         5717.60 80 030000.23 10     006256.00
        BAE,F1B2C4              @UA2 SELECTED         6265.36 C2                  006257.00
        V&,$X1,$X1              @GET PGM LOCATION ON TAPE  21.02 B0               006257.40
        BB1,$X1&.24,$&1.0       @SET TO MINUS V           21.30 80 006261.34 0E   006260.00
        V&,$X1,F1TAPO                                 4173.02 B0                  006261.00
        BXVZ,$&1.32                                   6263.31 42                  006261.40
        SIC,31.0                                        37.00 80                  006262.00
              B,F1B3    @REPOSITION TAPE              6335.10 00                  006262.40
        SIC,31.0                                        37.00 80                  006263.00
              B,F1B4    @READ IN DP                   6360.10 00                  006263.40
        B,F1C                                         6604.50 00                  006264.00
                        @
        V-I,$X1,.32             @BACK OFF 1 SELECTION    0.43 0D                006264.40
                                @READ UA2&BA2-MEM PROG
F1B2C4  L%BU,24,8¤,F1BI5&.08                          5717.60 80 030000.20 50     006265.00
        ST%BU,24,8¤,F1PGID                            4176.00 80 030000.20 D0     006266.00
        SIC,F1B2A1                                    6161.40 80                  006267.00
                  B,F1B2A                             6150.10 00                  006267.40
        B,F1B2A3                                      6164.50 00                  006270.00
```

```
                        @
                        @SCHEDULE RUN OF DP
                        @
F1B2D   IX,$X1,F1SCPO           @SCHEDULE POSITION                  4175.02 10                      006270.40
        L%BU,24,8¤,ESCHTB&.08%$X1¤                                  4300.10 81 030000.20 50         006271.00
        BRZ,F1B2D2                                                  6316.34 C2                      006272.00
        ST%BU,24,8¤,F1PGID                                          4176.00 80 030000.20 D0         006272.40
                        @
                        @SET UP SCHEDULED MODE OF OPERATION
        BZB,ESCHTB&.07%$X1¤,$&2.32  @NO SCHEDULED MODE              4300.07 81 006276.34 00         006273.40
        &%BU,2,2¤,ESCHTB&.02%$X1¤,42  @OBTAIN SCH MODE              4300.02 81 002225.20 10         006274.40
        B,$&1.32                                                    6277.10 00                      006275.40
        &%BU,2,2¤,ECTL2&.05,42  @OBTAIN MODE AT INIT SETUP          4007.05 80 002225.20 10         006276.00
        LV,$X2,$R                @0/4/10                              11.04 30                      006277.00
        &%BU,3¤,F1BQ2%$X2¤,61    @2/1/4                             6114.20 82 003036.60 10         006277.40
        SF%BU,3¤,ECTL1,61        @AUTST. MAINT. SURV                4006.00 80 003036.52 F0         006300.40
        Z,$X1                                                         21.22 00                      006301.40
        LCI,$X1,120                                                  170.03 02                      006302.00
F1B2D1  KF%BU,24,8¤,ESEQTB&.08%$X1¤                                 4204.10 81 030000.23 10         006302.40
        BAE,$&1.32                                                  6305.36 C2                      006303.40
        CBH,$X1,F1B2D1                                              6302.42 C8                      006304.00
        B,$                     @PROGRAM GOOF OR MACHINE MALF       6304.50 00                      006304.40
                        @
        M&1%BU,19¤,F1SCPO       @STEP SCHED POSIT CTR               4175.00 80 023000.22 B0         006305.00
                        @CHECK IF LOWER MEMORY PGM
        KF%BU,24¤,F1BI5.40      @BA2                                5720.20 80 030000.23 10         006306.00
        BAE,F1B2D3-.32          @YES                                6324.36 C2                      006307.00
        KF%BU,24¤,F1BI5.8       @UA2                                5717.60 80 030000.23 10         006307.40
        BAE,F1B2D3              @YES                                6324.76 C2                      006310.40
        V&,$X1,$X1                                                    21.02 B0                      006311.00
        BR1,$X1&.24,$&1.0                                             21.30 80 006312.74 0E         006311.40
        V&,$X1,F1TAPO                                               4173.02 B0                      006312.40
        BXVZ,$&1.32                                                 6314.71 42                      006313.00
        SIC,$X15                                                      37.00 80                      006313.40
        B,F1B3                  @REPOSIT TAPE                       6335.10 00                      006314.00
        SIC,$X15                                                      37.00 80                      006314.40
        B,F1B4                  @READ PROGRAM                       6360.10 00                      006315.00
        B,F1C                                                       6604.50 00                      006315.40
                        @
                        @SCHEDULED RUN COMPLETE
                        @CHECK FOR RESTART
                        @
F1B2D2  BXVZ,F1B7       @NO SCHEDULE ENTERED, OPERATOR GOOFED       6455.71 42                      006316.00
                        @CHECK IF CARDS ARE READY
        CNOP                                                          0.30 00                      006316.40
        SIC,$X15                                                     37.00 80                      006317.00
        B,H1A1A                 @PRINT                             12767.50 00                      006317.40
        XW,F1BI7,108            @END SCHED RUN                      5733.50 00 003300.00 00         006320.00
        SIC,G1J1                                                    10277.00 80                      006321.00
        B,G1J                   @READ SWITCHES                      10267.10 00                      006321.40
        BB,ESSS&.49,F1A1  @BRANCH IF CHANGE OF CONTROL REQUESTED    4062.61 80 004405.34 02         006322.00
        Z,F1SCPO                                                    4175.22 00                      006323.00
        B,F1B           @GO RESTART SCHEDULE                        5252.10 00                      006323.40
```

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                                @
                                @RUN DP TO CHECK LOWER MEMORY
                                @
          V-I,$X1,.32           @BACK OFF 1 STEP                  0.43 0D                        006324.00
F1B2D3    L%BU,24¤,F1BI5.8      @UA2                           5717.60 80 030000.20 50           006324.40
          ST%BU,24,8¤,F1PGID                                   4176.00 80 030000.20 D0           006325.40
          L%BU,24¤,ESCHTB.40%$X1¤ @NEXT SELECTION              4300.50 81 030000.20 50           006326.40
          KF%BU,24¤,F1BI5.40    @BA2                           5720.20 80 030000.23 10           006327.40
          BZAE,$&1.32                                          6332.36 C0                        006330.40
          M&1%BU,19¤,F1SCPO     @STEP OVER                     4175.00 80 023000.22 B0           006331.00
          SIC,F1B2A1                                           6161.40 80                        006332.00
          B,F1B2A               @READ UA2 & BA2                6150.10 00                        006332.40
          LCI,$X1,60                                             74.03 02                        006333.00
          T,$X1,ESCHTB,ESCHTB&%8¤14000                         4300.00 80 020300.02 20           006333.40
          B,F1B2A3                                             6164.50 00                        006334.40
                                @
                                @ROUTINE TO REPOSITION TAPE
                                @
F1B3      LX,$X2,F1TAPO                                        4173.04 10                        006335.00
          LC,$X1,$X1                                             21.02 50                        006335.40
          BXVGZ,F1B3B           @GO TO BACKSPACE               6343.71 C2                        006336.00
F1B3A     SP%SEOP¤,0%$X10¤      @SPACE FORWARD                    0.00 8A 000076.15 00           006336.40
          CCW,0%$X10¤,F1BA                                        0.00 8A 005613.21 00           006337.40
          BB,F1BA&.24,$-1.0                                    5613.30 80 006337.74 02           006340.40
          V&I,$X2,1.0                                            1.05 05                        006341.40
          CB,$X1,F1B3A                                         6336.42 48                        006342.00
F1B3A1    SX,$X2,F1TAPO                                        4173.05 10                        006342.40
          B,0%$X15¤             @RETURN AFTER REPOSITIONING       0.10 0F                        006343.00
                                @
                                @BACKSPACE BY RECORD
F1B3B     BS%SEOP¤,0%$X10¤                                        0.00 8A 000176.15 00           006343.40
          CCW,0%$X10¤,F1BA                                        0.00 8A 005613.21 00           006344.40
          BB,F1BA&.24,$-1.0                                    5613.30 80 006344.74 02           006345.40
          V-I,$X2,1.0                                            1.05 0D                        006346.40
          CB,$X1,F1B3B                                         6343.42 48                        006347.00
          B,F1B3A1                                             6342.50 00                        006347.40
                                @ROUTINE TO RELEASE TAPE
                                @& WAIT FOR SEOP
F1B3C     CCW,%$X10¤,F1B3C4     @WAIT & RELEASE ENTRY             0.00 8A 006357.21 00           006350.00
          BB,F1B3C4.24,F1B3C    @SEOP                          6357.30 80 006350.34 02           006351.00
          B7B,F1B3C4.18,F1B3C   @READY                          6357.22 80 006350.34 00           006352.00
F1B3C1    REL%SEOP¤,%$X10¤,     @RELEASE & WAIT ENTRY             0.00 8A 000000.33 00           006353.00
F1B3C2    CCW,%$X10¤,F1B3C4     @WAIT ONLY ENTRY                  0.00 8A 006357.21 00           006354.00
          BB,F1B3C4.24,F1B3C2   @SEOP                          6357.30 80 006354.34 02           006355.00
F1B3C3    $B,0                  @EXIT                             0.10 00                        006356.00
F1B3C4    CW,0                                                    0.00 00 000000.00 00           006357.00
```

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                                @
                                @READ IN THE SELECTED PROGRAM
                                @
F1B4    LCI,$X2,3               @                                    3.05 02                    006360.00
        SV,$X15,F1BK                                                6106.37 30                    006360.40
        LV,$X3,F1BH                                                 5636.06 30                    006361.00
        LI %BU,24¤, %8¤ 15247517     @IOS CODE ERR                152475.17 80 430000.20 50     006361.40
        ST %BU,24¤, 1.40 %$X3¤    @ TO READ IN AREA                  1.50 83 030000.20 D0     006362.40
        RD%SEOP¤,0%$X10¤,F1BH                                          0.00 8A 005636.11 00     006363.40
        CCW,0%$X10¤,F1BA                                               0.00 8A 005613.21 00     006364.40
        BB,F1BA&.24,$-1.0                                           5613.30 80 006364.74 02     006365.40
        L%BU,24,8¤,1.40%$X3¤                                           1.50 83 030000.20 50     006366.40
        KF%BU,24,8¤,F1PGID                                          4176.00 80 030000.23 10     006367.40
        BZAE,F1B5               @TAPE OUT OF SYNC, GO CORRECT       6412.36 C0                    006370.40
        LX,$X1,2.0%$X3¤                                                2.02 13                    006371.00
        CB&,$X1,$&.32                                               6372.03 48                    006371.40
        Z,$L                                                          10.22 00                    006372.00
        Z,$R                                                          11.22 00                    006372.40
        &%BU¤,0%$X1¤                                                   0.00 81 000000.20 10     006373.00
        CB&,$X1,$-1.0                                               6373.03 48                    006374.00
        &%BU¤,$L                                                      10.00 80 000000.20 10     006374.40
        KF%BU¤,0%$X3¤                                                  0.00 83 000000.23 10     006375.40
        BAE,F1B4A                                                   6404.36 C2                    006376.40
        CB,$X2,F1B4B            @BAD CKSM--TRY 3 TIMES              6406.44 48                    006377.00
        CNOP                                                          0.30 00                    006377.40
        SIC,31.0                                                     37.00 80                    006400.00
                B,H1A1A                                             12767.50 00                    006400.40
        XW,F1BI8,5,F1BG2,4                                           5751.10 40 000120.13 9B     006401.00
        LX,$X1,G2D&14.0                                             10471.02 10                    006402.00
        SX,$X1,G2D1                                                 10513.03 10                    006402.40
        SIC,31.0                                                     37.00 80                    006403.00
                B,G2A&.32                                           10355.50 00                    006403.40

F1B4A   LX,$X1,F1TAPO           @UPDATE TAPE POSITION               4173.02 10                    006404.00
        V&I,$X1,1.0                                                   1.03 05                    006404.40
        SX,$X1,F1TAPO                                               4173.03 10                    006405.00
        LV,$X15,F1BK                                                6106.36 30                    006405.40
        B,0%$X15¤               @RETURN                               0.10 0F                    006406.00
                                @
                                @BAD CHECKSUM, TRY AGAIN
F1B4B   BS%SEOP¤,0%$X10¤                                               0.00 8A 000176.15 00     006406.40
        CCW,0%$X10¤,F1BA                                               0.00 8A 005613.21 00     006407.40
        BB,F1BA&.24,$-1.0                                           5613.30 80 006407.74 02     006410.40
        B,F1B4&1.0                                                  6361.10 00                    006411.40
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                                @
                                @MASTER TAPE OUT OF SYNC
                                @
F1B5    ST%BU,24,8¤,F1BI9A-.32                                  5770.10 80 030000.20 D0      006412.00
                                    CNOP
        SIC,31.0                                                  37.00 80                    006413.00
                B,H1A1A                                        12767.50 00                    006413.40
        XW,F1BI9,37,F1BG4,4                                     5764.00 40 001120.13 9D      006414.00
        Z,$X1                       @FIND ID POSIT IN PROG TBL    21.22 00                    006415.00
        LCI,$X1,120                                             170.03 02                    006415.40
        KF%BU,24,8¤,ESEQTB&.08%$X1¤                             4204.10 81 030000.23 10      006416.00
        BAE,F1B5A                   @PGM IDENTITY FOUND, COMPUTE NEW TAPE PO  6425.76 C2     006417.00
        CBH,$X1,$-1.32                                          6416.02 C8                   006417.40
                    CNOP
        KF%BU,24,8¤,EDCP2&.40                                   4001.50 80 030000.23 10      006420.00
        BAE,F1B5B                   @BR-DCP IS WHAT WE GOT      6427.76 C2                   006421.00
        KFI%BU,24¤,%8¤15247517                                152475.17 80 430000.23 10      006421.40
        BAE,F1B5B                       @BR--UK ON READ FIRST WORD-ASSUME  6427.76 C2        006422.40
                                        @IT WAS DCP CALLER WE READ
        SIC,31.0                                                  37.00 80                   006423.00
                B,H1A1A         @TAPE OR MEMORY PROBLEM EXISTS 12767.50 00                   006423.40
        XW,F1BI10,128,0                                         5774.50 00 004000.00 00      006424.00
        B, F1B5B                    @REPOSIT TAPE               6427.50 00                   006425.00
                                @
                                @COMPUTE NEW TAPE POSITION
                                @A READ IN REQUESTED PROGRAM
F1B5A   V&,$X1,$X1              @COMPUTE POSITION OF PGM IN MEMORY  21.02 B0                 006425.40
        V&I,$X1,1.0             @ADD ONE FOR PRESENT TAPE POSITION  1.03 05                  006426.00
        SV,$X1,F1TAPO                                           4173.03 30                   006426.40
        B,F1B-.32               @RETURN TO DETERMINE METHOD OF SELECTION  5251.50 00         006427.00
                                @
                                @SPACE FORWARD ONE FILE
F1B5B   SIC,31.0                                                  37.00 80                   006427.40
                B,F1B6                                         6435.50 00                    006430.00
        REW%SEOP¤,0%$X10¤       @START OVER                       0.00 8A 000136.15 00       006430.40
        SIC,F1B3C3                                              6356.00 80                   006431.40
        B,F1B3C                 @WAIT & RELEASE                 6350.10 00                   006432.00
        SPFL%SEOP¤,0%$X10¤                                        0.00 8A 000077.15 00       006432.40
        SIC,F1B3C3                                              6356.00 80                   006433.40
                    B,F1B3C         @WAIT & RELEASE             6350.10 00                   006434.00
        Z,F1TAPO                                                4173.22 00                   006434.40
        B,F1B-.32                                               5251.50 00                   006435.00
                                @
                                @LOCATE,RELEASE,SET ECC,HI DENS
                                @
F1B6    L%BU,7,7¤,ETAPCM,45                                     4007.14 80 007726.60 50      006435.40
        LX,$X10,$R                                                11.24 10                   006436.40
        L%BU,3,3¤,ETAPDM                                        4007.23 80 003300.20 50      006437.00
        ST%BU,3,3¤,$&1.47                                       6441.57 80 003300.20 D0      006440.00
        LOC%SEOP¤,0%$X10¤,0                                       0.00 8A 000000.17 00       006441.00
        CCW,0%$X10¤,F1BA                                          0.00 8A 005613.21 00       006442.00
        BB,F1BA&.24,$-1.0                                       5613.30 80 006442.34 02      006443.00
        REL%SEOP¤,0%$X10¤                                         0.00 8A 000000.33 00       006444.00
        CCW,0%$X10¤,F1BA                                          0.00 8A 005613.21 00       006445.00
        BB,F1BA&.24,$-1.0                                       5613.30 80 006445.34 02      006446.00
        HD%SEOP¤,0%$X10¤                                          0.00 8A 000036.15 00       006447.00
        CCW,0%$X10¤,F1BA                                          0.00 8A 005613.21 00       006450.00
        BB,F1BA&.24,$-1.0                                       5613.30 80 006450.34 02      006451.00
        ECC%SEOP¤,0%$X10¤                                         0.00 8A 000057.15 00       006452.00
        CCW,0%$X10¤,F1BA                                          0.00 8A 005613.21 00       006453.00
        BB,F1BA&.24,$-1.0                                       5613.30 80 006453.34 02      006454.00
        B,0%$X15¤                                                 0.10 0F                    006455.00
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                                @
                                @READ IN SCHEDULE CARDS
F1B7    BB1,ECTL3&.05,$&1.0     @SET 1ST CARD BIT
        L%BU,7,7¤,FQRDR1,45
        LX,$X11,$R
        REL%SEOP¤,0%$X11¤
        CCW,0%$X11¤,F1BA
        BB,F1BA&.24,$-1.0
        BUNRJZ,$&.32
F1B7A   RD%SEOP¤,0%$X11¤,F1BB
        BUNRJZ,F1B7C            @OUT OF MATERIAL
        CCW,0%$X11¤,F1BA
        BB,F1BA&.24,$-1.0
                                @
        SIC,F1B7E7
        B,F1B7E6                @CONVERT IMAGE
        B,F1B7L
                                @CONVERT IMAGE
F1B7E6  Z,F1BQ1
        Z,$X1
        LCI,$X1,8
        Z,$X4
F1B7E   L%BU,12,8¤,F1BI&7.32%$X1¤
        BRZ,F1B7E5
        Z,$X2
        Z,$X3
        LCI,$X2,3
F1B7E1  BBZ,$R&.52%$X2¤,F1B7E2
        V&,$X2,H1V&1.0
        V&,$X3,H1V&4.0
        CR,$X2,F1B7E1
F1B7E2  Z,$X2
        LCI,$X2,9
F1B7E3  BBZ,$R&.55%$X2¤,F1B7E4
        V&,$X2,H1V&1.0
        V&I,$X3,.32
        CR,$X2,F1B7E3
F1B7E4  KF%BU,12,8¤,0.0
        BZAE,F1B7F
        L%BU,8,8¤,F1BQ%$X3¤
        ST%BU,8,8¤,F1BQ1%$X4¤
F1B7E5  V&,$X1,F1BV1
        V&,$X4,H1V&4.0
        CR,$X1,F1B7E
F1B7E7  B,$
                                @
                                @
                                @CHECK IDENTITY AND STORE
F1B7L   L%BU¤,F1BQ1
        BRZ,F1B7A               @BLANK CARD, READ IN NEXT
        KF%BU,32,8¤,F1BI14,32
        BAE,F1B7G               @TERM CARD
```

```
4010.05 80 006456.74 0E   006455.40
4012.00 80 007726.60 50   006456.40
  11.26 10                006457.40
   0.00 8B 000000.33 00   006460.00
   0.00 8B 005613.21 00   006461.00
5613.30 80 006461.34 02   006462.00
6463.43 C6                006463.00
   0.00 8B 005614.11 00   006463.40
6534.03 C6                006464.40
   0.00 8B 005613.21 00   006465.00
5613.30 80 006465.34 02   006466.00

6510.40 80                006467.00
6470.50 00                006467.40
6511.10 00                006470.00

6107.22 00                006470.40
  21.22 00                006471.00
  10.03 02                006471.40
  24.22 00                006472.00
5653.40 81 014000.20 50   006472.40
6507.34 C2                006473.40
  22.22 00                006474.00
  23.22 00                006474.40
   3.05 02                006475.00
  11.64 82 006500.34 06   006475.40
13370.04 B0               006476.40
13373.06 B0               006477.00
 6475.44 48               006477.40
  22.22 00                006500.00
  11.05 02                006500.40
  11.67 82 006503.74 06   006501.00
13370.04 B0               006502.00
   0.47 05                006502.40
6501.04 48                006503.00
   0.00 80 014000.23 10   006503.40
6543.76 C0                006504.40
6110.00 83 010000.20 50   006505.00
6107.00 84 010000.20 D0   006506.00
6124.02 B0                006507.00
13373.10 B0               006507.40
6472.42 48                006510.00
6510.50 00                006510.40

6107.00 80 000000.20 50   006511.00
6463.74 C2                006512.00
6041.60 80 040020.23 10   006512.40
6552.76 C2                006513.40
```

```
                Z,$X1                                                                    21.22 00                        006514.00
                LCI,$X1,120                                                             170.03 02                        006514.40
                KF%BU,24,8¤,ESEQTB&.08%$X1¤,16                                         4204.10 81 030010.23 10           006515.00
                BAF,F1B7J                                                              6522.76 C2                        006516.00
                CBH,$X1,$-1.32                                                         6515.02 C8                        006516.40
                        CNOP
                ST%BU,56,8¤,F1BI12&.16,8                                               6033.50 80 070004.20 D0           006517.00
                SIC,31.0                                                                 37.00 80                        006520.00
                        B,H1A1A     @ID NOT IN TABLE                                 12767.50 00                        006520.40
                XW,F1BI12,29,0                                                         6033.30 00 000720.00 00           006521.00
                B,F1B7A             @BYPASS                                            6463.50 00                        006522.00
F1B7J           BZBZ,ECTL3&.05,F1B7B                                                   4010.05 80 006526.34 04           006522.40
                LCI,$X1,59          @CLEAR SCHEDULE TABLE                                73.03 02                        006523.40
                Z,ESCHTB                                                               4300.22 00                        006524.00
                T,$X1,ESCHTB,ESCHTB&1.0                                                4300.00 80 004301.02 20           006524.40
                Z,F1BV2                                                                6125.22 00                        006525.40
F1B7B           LX,$X1,F1BV2        @GET TABLE POSITION                                6125.02 10                        006526.00
                ST%BU,24,8¤,ESCHTB&.08%$X1¤,16                                         4300.10 81 030010.20 D0           006526.40
                ST%BU,8,8¤,ESCHTB%$X1¤                                                 4300.00 81 010000.20 D0           006527.40
                V&I,$X1,.32                                                              0.43 05                        006530.40
                SX,$X1,F1BV2                                                           6125.03 10                        006531.00
                KVI,$X1,60.0                                                             74.03 04                        006531.40
                BXL,F1B7A           @MORE TABLE AREA AVAILABLE                         6463.72 42                        006532.00
                SIC,31.0                                                                 37.00 80                        006532.40
                        B,G2A       @TABLE FULL                                      10355.10 00                        006533.00
                B,F1B7H                                                                6554.10 00                        006533.40
                                    @
                                    @OUT OF MATERIAL, WHY
F1B7C           BB,ECTL3&.05,F1B7D                                                     4010.05 80 006537.74 02           006534.00
                CNOP                                                                     37.00 80                        006535.00
                SIC,31.0                                                               12767.50 00                       006535.40
                        B,H1A1A                                                         6037.00 00 001160.00 00          006536.00
                XW,F1BI13,39,0                                                         6554.10 00                        006537.00
                B,F1B7H                                                                4300.00 80 000000.20 50           006537.40
F1B7D           L%BU¤,ESCHTB                                                           6576.34 C2                        006540.40
                BRZ,F1B7K
                CNOP                                                                     37.00 80                        006541.00
                SIC,31.0                                                               12767.50 00                       006541.40
                        B,H1A1A                                                         6043.70 00 002600.00 00          006542.00
                XW,F1BI15,88,0                                                         6575.50 00                        006543.00
                B,F1B7I
                                    @
                                    @
                                    @FOUND ILLEGAL CHARACTER
                                    @DETERMINE COURSE OF ACTION
F1B7F           BB,ECTL3&.05,F1B7F1                                                    4010.05 80 006550.34 02           006543.40
                                    CNOP                                                 0.30 00                        006544.40
                SIC,31.0                                                                 37.00 80                        006545.00
                        B,H1A1A     @NOT FIRST CARD                                  12767.50 00                       006545.40
                XW,F1BI16,62,0                                                         6056.70 00 001740.00 00           006546.00
                B,F1B7A                                                                6463.50 00                        006547.00
                        NOP                                                              0.30 00                        006547.40
                CNOP
F1B7F1          SIC,31.0                                                                 37.00 80                        006550.00
                        B,H1A1A     @FIRST CARD                                      12767.50 00                       006550.40
                XW,F1BI17,37,0                                                         6066.50 00 001120.00 00           006551.00
                B,F1B7D             @IS OPERATOR DECISION REQUIRED                     6537.50 00                        006552.00
```

```
                                @
                                @LAST CARD A TERM CARD, PRINT SCHEDULE
F1B7G   L%BU¤,ESCHTB                                    4300.00 80 000000.20 50      006552.40
        BRZ,F1B7K               @NO SCHEDULE, OPERATOR DECISION  6576.34 C2           006553.40
F1B7H   Z,G4AC                                          11454.22 00                  006554.00
        LCI,$X1,120                                       170.03 02                  006554.40
        T,$X1,G4AC,G4AC&1.0                             11454.00 80 011455.02 20     006555.00
        Z,$X1                                             21.22 00                   006556.00
        Z,$X2                                             22.22 00                   006556.40
        LCI,$X2,60                                        74.05 02                   006557.00
F1B7H1  L%BU,32,8¤,ESCHTB%$X2¤                          4300.00 82 040000.20 50      006557.40
        BRZ,F1B7H2              @IMAGE COMPLETE          6564.34 C2                 006560.40
        ST%BU,24,8¤,G4AC%$X1¤                           11454.00 81 030000.20 D0     006561.00
        ST%BU,8,8¤,G4AC&.32%$X1¤,24                     11454.40 81 010014.20 D0     006562.00
        V&I,$X1,.32                                       0.43 05                    006563.00
        CRH,$X2,F1B7H1                                 6557.44 C8                    006563.40
F1B7H2  V&,$X1,$X1                                        21.02 B0                   006564.00
        V&,$X1,$X1                                        21.02 B0                   006564.40
        V&,$X1,$X1                                        21.02 B0                   006565.00
        LC,$X1,$X1                                        21.02 50                   006565.40
        LVI,$X1,G4AC                                    11454.03 01                  006566.00
        SX,$X1,F1B7H3                                  6572.03 10                    006566.40
                CNOP
        SIC,$X15                                          37.00 80                   006567.00
        B,H1A1A                 @PRINT-SCHED FOLLOWS   12767.50 00                 006567.40
        XW,F1BI18,65,0                                  6073.20 00 002020.00 00      006570.00
        SIC,31.0                                          37.00 80                   006571.00
                B,H1A1A                                12767.50 00                  006571.40
F1B7H3  XW,0,0,0                                          0.00 00 000000.00 00       006572.00
        Z,F1SCPO                                        4175.22 00                   006573.00
        Z,G4AC                                          11454.22 00                  006573.40
        LCI,$X1,120                                       170.03 02                  006574.00
        T,$X1,G4AC,G4AC&1.0                             11454.00 80 011455.02 20     006574.40
F1B7I   B,F1B2D                                          6270.50 00                  006575.40
                                @
        CNOP
F1B7K   SIC,$X15                                          37.00 80                   006576.00
        B,H1A1A                 @PRINT-NO SCHED ENTERD 12767.50 00                 006576.40
        XW,F1BI11,118,0                                 6014.50 00 003540.00 00      006577.00
        TI,1,G2D&8.0,G2D1                               10463.00 80 010513.02 A0     006600.00
        SIC,31.0                                          37.00 80                   006601.00
                B,G2A&.32                              10355.50 00                  006601.40
        BB,ESSS&.49,F1A1                                4062.61 80 004405.34 02      006602.00
        BB,ESSS&.53,F1B7                                4062.65 80 006455.74 02      006603.00
        B,F1B7K                 @FAILED TO MAKE DECISION 6576.10 00                 006604.00
```

```
                        @PROGRAM IN, SET UP FOR OPERATION
                        @
F1C     Z,F4AD          @CLR PASS COUNTER                          7746.22 00                      006604.40
        SIC,F4A5                                                   7714.00 80                      006605.00
                B,F4A3    @GO DISPLAY PASS CNTR                    7702.10 00                      006605.40
        LX,$X1,F1CA       TRANSMIT INTERRUPT TABLE TO LOC. 4100.0  6715.02 10                      006606.00
        T,$X1,F6T,0(*$X1)                                          7761.00 80 000000.02 21         006606.40
        SV,$X1,2.0      @SET INTERRUPT ADDRESS REGISTER              2.03 30                       006607.40
                        @
                        @SET UP MASK REGISTER
        LV,$X1,EDPLOC   STARTING ADDRESS OF DIAG. PROG.            4010.42 30                      006610.00
        L%BU□,ADD%$X1□  LOC OF MASK WORD                            13.00 81 000000.20 50          006610.40
        ST%BU□,12.0     MASK REG.                                   14.00 80 000000.20 D0          006611.40
                        @
        LI%BU,7,7□,100                                          620000.00 80 407700.20 50          006612.40
        ST%BU,7,7□,FXLUP                                          4076.00 80 007700.20 D0          006613.40
        CNOP                                                         0.30 00                       006614.40
        BZR,ADA&.46(*$X1□),$&5.0  @IS THIS THE OPS CNSL PGM         10.56 81 006622.34 00          006615.00
        BR1,ECTL2&.62,$&4.0  @YES, IS OPS CNSL CTL AREA           4007.76 80 006622.34 0E          006616.00
        BR1,ECTL3&.18,$&1.0  @YES, XFER CTL TO MAINT CNSL.        4010.22 80 006620.34 0E          006617.00
        SIC,31.0                                                    37.00 80                       006620.00
                B,H1A1A                                          12767.50 00                       006620.40
        XW,F1CI4,%.48□F1CJ-F1CI4,0                                6733.20 00 003240.00 00          006621.00
                        @
                        @PRINT PROGRAM HEADING
        BR,ECTL2&.38,$&3.0  CHECK FOR PRINTER AVAIL.              4007.46 80 006625.34 02          006622.00
        TI,1,F1CB4,H1AH     YES, SET PRINTER CONTROL WORD         6722.00 80 013410.02 A0          006623.00
        SIC,H1C2A                                                13241.40 80                       006624.00
                B,H1C2                                           13235.10 00                       006624.40
        LX,$X2,AIDNTA%$X1□                                          14.04 11                       006625.00
        SX,$X2,F1C1                                               6630.05 10                       006625.40
                CNOP
        BB1,ECTL3&.08,$&1.0                                       4010.10 80 006627.34 0E          006626.00
        SIC,31.0                                                    37.00 80                       006627.00
                B,H1A1A2                                         12754.10 00                       006627.40
F1C1    XW,0,0,0                                                     0.00 00 000000.00 00          006630.00
                        @
                        @SET UP DCP CONTROLS FOR PRINT
        LX,$X1,F1CB1                                              6717.02 10                       006631.00
        LVI,$X1,F1CI1                                             6724.03 01                       006631.40
        BR,ECTL1,F1C2                                             4006.00 80 006635.34 02          006632.00
        V&I,$X1,.32                                                  0.43 05                       006633.00
        BB,ECTL1&.01,F1C2                                         4006.01 80 006635.34 02          006633.40
        V&I,$X1,.32                                                  0.43 05                       006634.40
F1C2    SX,$X1,F1CB1                                              6717.03 10                       006635.00
        LX,$X1,F1CB2                                              6720.02 10                       006635.40
        LVI,$X1,F1CI2                                             6725.43 01                       006636.00
        Z,$X2                                                       22.22 00                       006636.40
        LCI,$X2,5                                                    5.05 02                       006637.00
        BR,ECTL2&.07%$X2□,F1C3                                    4007.07 82 006642.34 02          006637.40
        V&I,$X1,.32                                                  0.43 05                       006640.40
        V&,$X2,H1V&1.0                                           13370.04 B0                       006641.00
        CB,$X2,$-2.0                                              6637.44 48                       006641.40
F1C3    SX,$X1,F1CB2                                              6720.03 10                       006642.00
        LX,$X1,F1CB3                                              6721.02 10                       006642.40
        LVI,$X1,F1CI3                                             6730.43 01                       006643.00
        BB,ECTL2&.62,$&1.32                                       4007.76 80 006645.34 02          006643.40
        V&I,$X1,.32                                                  0.43 05                       006644.40
        SX,$X1,F1CB3                                              6721.03 10                       006645.00
        BB1,ECTL3&.08,$&1.0                                       4010.10 80 006646.74 0E          006645.40
        CNOP                                                         0.30 00                       006646.40
        SIC,31.0                                                    37.00 80                       006647.00
                B,H1A1A2                                         12754.10 00                       006647.40
```

```
F1C4     XW,0,0,0                                                    0.00 00 000000.00 00      006650.00

                                    @
         Z,$X1                           @SET TO CLEAR ALL CHANNELS  21.22 00                  006651.00
         LCI,$X1,16.                                                20.03 02                  006651.40
         BR,ECTL2.61,$&1.32              @16 CHAN SYSTEM          4007.75 80 006653.74 02      006652.00
         LCI,$X1,8.                                                 10.03 02                  006653.00
         REL%SEOP¤,32%$X1¤               @LOW SPEED ONLY            20.00 81 000000.33 00     006653.40
         CRH,$X1,$-1.                                             6653.42 C8                  006654.40
                                    @CLEAR INDICATOR REGISTER
         SIC,31.0                                                   37.00 80                  006655.00
                  B,G6A                                          12716.50 00                  006655.40
         SIC,F3A2B                                                7063.40 80                  006656.00
                  B,F3A2A                                         7060.50 00                  006656.40
         BR1,ECTL3&.17,$&1.0                                      4010.21 80 006660.34 0E     006657.00
                                    @
                                    @IS A MANUAL INTERVENTION REQUESTED
         Z,ESMI                                                   4063.22 00                  006660.00
         LV,$X1,EDPLOC                                            4010.42 30                  006660.40
         LX,$X2,ADR%$X1¤                                            11.04 11                  006661.00
         BXCZ,F1C9&1.0                                            6665.30 42                  006661.40
         SX,$X2,F1C9                                              6664.05 10                  006662.00
                  CNOP                                              0.30 00                  006662.40
         SIC,31.0                                                   37.00 80                  006663.00
                  B,G3A          @GO TO MI ROUTINE                10703.10 00                  006663.40
F1C9     XW,0,0,0                                                    0.00 00 000000.00 00     006664.00
         L,$TC                                                       1.34 80 044000.20 50     006665.00
         ST,F1CJ                         @SAVE CLOCK              6750.40 80 044000.20 D0     006666.00
         B,ACE%$X1¤             @GO TO ACTIVATION ROUTINE IN DP      4.10 01                  006667.00
                                    @
                                    @
                                    @ROUTINE TO CLEAR UNDESIRED BITS OF IX 15
                                    @AND INSURE SIC ON FULL WORD
                                    @
F1D      SVA,$X15,$&.32                                           6670.37 D0                  006667.40
         LVI,$X15,0.0                                                0.37 01                  006670.00
         BZB,$X15&.18,$&1.32                                        37.22 80 006672.34 00     006670.40
         V&I,$X15,.32                                                0.77 05                  006671.40
F1D1     $B,0                                                        0.10 00                  006672.00
                                    @
                                    @
                                    @DP DUMPED BY DCP DECISION
F1E      SIC,F1E3                                                 6711.40 80                  006672.40
                  B,F1E2                                          6677.50 00                  006673.00
         B,F1B                                                    5252.10 00                  006673.40
                                        @
                                        @DP ABANDONED BY OPERATOR DECISION
F1E1     SIC,F1E3                                                 6711.40 80                  006674.00
                  B,F1E2                                          6677.50 00                  006674.40
         CNOP
         SIC,31.0                                                   37.00 80                  006675.00
                  B,H1A1A                                        12767.50 00                  006675.40
         XW,F1EI,48,0                                             6755.44 00 001400.00 00     006676.00
         B,F1B                                                    5252.10 00                  006677.00
                                    @
F1E2     BZB,ERMCON,F1E3                                          4006.04 80 006711.74 00     006677.40
         TI,1,G2D&7.0,G2D1                                       10462.00 80 010513.02 A0     006700.40
         SIC,31.0                                                   37.00 80                  006701.40
                  B,G2A&.32                                      10355.50 00                  006702.00
         BBZ,ERMCON,$&1.0                                         4006.04 80 006703.74 06     006702.40
         LX,$X1,G4AA                                             11254.02 10                  006703.40
         BXV7,F1F3                                                6711.71 42                  006704.00
         L%BU¤,F1EA                                               6714.00 80 000000.20 50     006704.40
         LX,$X1,G4AE                                             12554.02 10                  006705.40
         ST%BU¤,0%$X1¤                                               0.00 81 000000.20 D0     006706.00
```

```
                    CNOP
                    SIC,31.0
                            B,H1A
                    XW,F1EI1,83,0
                    B,G4AA
F1E3                $B,0
                                                @
```

```
37.00 80                                    006707.00
12747.10 00                                 006707.40
6763.44 00 002460.00 00                     006710.00
11254.10 00                                 006711.00
0.10 00                                     006711.40
```

```
                                @ENTRY AFTER READ IN FROM IPL MODE
                                @
F1F      V-I,$X15,1.32            SUBTRACT 1½ FROM LOC CTR VALUE AT TIME OF       1.77 OD                    006712.00
         SV,$X15,EDPLOC           EXIT FROM DIAGNOSTIC PROGRAM                 4010.77 30                    006712.40
         B,F1C                                                                 6604.50 00                    006713.00
                                @
                                @                 4010.00
         CNOP                                                                     0.30 00                    006713.40
F1FA     B,F1E3                                                                6711.50 00                    006714.00
                 NOP                                                              0.30 00                    006714.40
                                @
F1CA     XW,FINT,48,0           @TRANSMIT CW                                   4100.00 00 001400.00 00       006715.00
F1CB     XW,F1CI,14,F1CB1,4                                                    6731.40 40 000340.15 CF       006716.00
F1CB1    XW,F1CI1,4,F1CB2,4                                                    6724.00 40 000100.15 D0       006717.00
F1CB2    XW,F1CI2,4,F1CB3,4                                                    6725.40 40 000100.15 D1       006720.00
F1CB3    XW,F1CI3,4,0                                                          6730.40 00 000100.00 00       006721.00
F1CB4    XW,F1CH,1,0                                                           6723.00 00 000020.00 00       006722.00
F1CH     DD%BU,8¤,241,0,0,0,0,0,0,0                                                                 361      006723.00
                                                                                                    000      006723.10
                                                                                                    000      006723.20
                                                                                                    000      006723.30
                                                                                                    000      006723.40
                                                                                                    000      006723.50
                                                                                                    000      006723.60
                                                                                                    000      006723.70
F1CI1    %IQSZ¤DD%BU,8,8¤,AUT Z                                                                              006724.00
         %IQSZ¤DD%BU,8,8¤,MAI Z                                                                              006724.40
         %IQSZ¤DD%BU,8,8¤,SUR Z                                                                              006725.00
F1CI2    %IQSZ¤DD%BU,8,8¤, SCHZ                                                                              006725.40
         %IQSZ¤DD%BU,8,8¤, SSHZ                                                                              006726.00
         %IQSZ¤DD%BU,8,8¤, SSLZ                                                                              006726.40
         %IQSZ¤DD%BU,8,8¤, SSCZ                                                                              006727.00
         %IQSZ¤DD%BU,8,8¤, IPLZ                                                                              006727.40
         %IQSZ¤DD%BU,8,8¤, SE@Z                                                                              006730.00
F1CI3    %IQSZ¤DD%BU,8,8¤,  MCZ                                                                              006730.40
         %IQSZ¤DD%BU,8,8¤,  OCZ                                                                              006731.00
F1CI     %IQSZ¤DD%BU,8,8¤,  DCP1 MOD 0  Z                                                                    006731.40
F1CI4    %IQSZ¤DD%BU¤,OPERATOR CONSOLE IS BEING TESTED. DCP Z                                                006733.20
         %IQSZ¤DD%BU¤,TRANSFERRING CONTROL TO MAINTENANCE Z                                                  006740.00
         %IQSZ¤DD%BU¤,CONSOLE UNTIL TEST IS COMPLETED.Z                                                      006744.40
F1CJ     DD%BU,36¤,0                  @CLOCK STORAGE                                          000000000000   006750.40
F1CJ1    %IQS*¤DD%BU,,8¤,ELAPSED CLOCK STEPPINGS *                                                           006751.04
F1CJ2    %IQS*¤DD%BU,,8¤,000000000000*                                                                       006754.04
F1FI     %IQSZ¤DD%BU,8,8¤,**PROGRAM IS BEING ABANDON BY OPERATOR Z                                           006755.44
         %IQSZ¤DD%BU,8,8¤,DECISION.Z                                                                         006762.34
F1FI1    %IQSZ¤DD%BU,8,8¤,THE FOLLOWING FAILURE PRINTS WERE OBTAINEDZ                                        006763.44
         %IQSZ¤DD%BU,8,8¤, DURING MC PASSES BEFORE PGM ABANDONMENT.Z                                         006770.64
```

```
                        @CHECKSUM GENERATION ROUTINE
                        @
F2B     SIC,F2C1                                                  7023.00 80                006776.00
            B,F2C                                                 7020.10 00                006776.40
        Z,F3DC                                                    7233.22 00                006777.00
        LCI,$X5,199                                                307.13 02                006777.40
        T,$X5,F3DC,F3DC&1.0                                       7233.00 80 007234.12 20   007000.00
        LV,$X3,EDPLOC                                             4010.46 30                007001.00
        LX,$X2,ACF%$X3¤                                              5.04 13                007001.40
        LV,$X4,0%$X2¤                                                0.10 32                007002.00
        SV,$X4,F3DA                                               7177.11 30                007002.40
        Z,$X1                                                       21.22 00                007003.00
        LR,$X1,$X2              @LOAD STARTING ADDRESS              22.02 70                007003.40
        SX,$X1,F3DB                                               7200.03 10                007004.00
F2B1    SVA,$X2,$&2.0                                             7006.45 D0                007004.40
        LX,$X3,0.0%$X2¤                                              0.06 12                007005.00
        SX,$X3,F3DD%$X1¤                                          7377.07 11                007005.40
        SC,$X3,F2B3                                               7031.07 50                007006.00
        V-I,$X3,0.0                                                  0.07 0D                007006.40
        LC,$X2,$X3                                                  23.04 50                007007.00
        Z,$L                                                        10.22 00                007007.40
        Z,$R                                                        11.22 00                007010.00
        &%BU,64,8¤,0.0%$X2¤                                          0.00 82 000000.20 10   007010.40
        CB&,$X2,$-1.0                                             7010.45 48                007011.40
        ST%BU,64,8¤,F3DC%$X1¤                                     7233.00 81 000000.20 D0   007012.00
        LV,$X2,F2B3                                               7031.04 30                007013.00
        BXVZ,F2B2               @CHECK GENERATION COMPLETE        7015.31 42                007013.40
        V&I,$X1,1.0                                                  1.03 05                007014.00
        B,F2B1                                                    7004.50 00                007014.40
                        @
                        @SET UP FOR PASS ID PRINT
F2B2    TI,2,F4AA,F4AB                                            7743.00 80 007744.04 A0   007015.00
        Z,F4AD                                                    7746.22 00                007016.00
        BB1,ECTL3&.10,$&1.0  @SET BIT FOR PRINT OF PASS IDENT     4010.12 80 007017.74 0E   007016.40
        B,F3D3                                                    7157.50 00                007017.40
                        @
                        @CHECK FOR SAVE OF MUL REG,K2 & ABOVE
F2C     TI,9,7.0,FA1                                                 7.00 80 007201.22 A0   007020.00
        SVA,$X15,$&.32                                            7021.77 D0                007021.00
        LVI,$X15,0.0                                                 0.37 01                007021.40
        TI,16,16.0,FA1&9.0                                          20.00 80 007212.00 A0   007022.00
F2C1    $B,0                                                         0.10 00                007023.00
                        @
                        @CHECK FOR RESTORE OF MUL R,K2 & ABOVE
F2D     L%BU,3,3¤,ECTL2                                           4007.00 80 003300.20 50   007023.40
        L%BU,20,8¤,FA1&4.0,44                                     7205.00 80 024026.20 50   007024.40
        SIC,G6A5                                                 12730.00 80                007025.40
            B,G6A1                                               12712.50 00                007026.00
        TI,9,FA1,7.0                                              7201.00 80 000007.22 A0   007026.40
        TI,16,FA1&9.0,16.0                                        7212.00 80 000020.00 A0   007027.40
F2D1    $B,0                                                         0.10 00                007030.40
F2B3    XW,0.0,0,0                                                   0.00 00 000000.00 00   007031.00
```

```
                                @ENTRY FROM DP TEST BLOCK
                                @
F3A     SIC,F2C1                                                7023.00 80                      007032.00
                B,F2C                                           7020.10 00                      007032.40
        BZB,EBMCON,F3A3         @BRANCH IF MARGINS OFF          4006.04 80 007064.34 00         007033.00
        LX,$X1,G4AA                                            11254.02 10                      007034.00
        BXVZ,F3B1               @BRANCH IF NO ERROR             7103.71 42                      007034.40
                                @
                                @ERROR INDICATED, GO TO MC OFF HALT
                                @CHECK CONTINUITY
F3A1    KV,$X15,F3DA                                            7177.36 90                      007035.00
        BXE,F3A1A                                               7043.32 C2                      007035.40
        BZB,$X15&.18,$&2.32                                       37.22 80 007040.74 00         007036.00
        V&I,$X15,.32                                               0.77 05                      007037.00
        KV,$X15,F3DA                                            7177.36 90                      007037.40
        BXE,F3A1A                                               7043.32 C2                      007040.00
        LV,$X1,EDPLOC                                           4010.42 30                      007040.40
        BB,ADA&.25%$X1□,F3A1A  @BYPASS BIT SET                    10.31 81 007043.34 02         007041.00
        SIC,F3D1A                                               7552.00 80                      007042.00
                B,F3D1          @GO TO PRINT FAILURE            7543.10 00                      007042.40
F3A1A   TI,1,G2D&7.0,G2D1                                       10462.00 80 010513.02 A0        007043.00
        SIC,31.0                                                  37.00 80                      007044.00
                B,G2A&.32                                       10355.50 00                     007044.40
                                @
                                @MARGINS ARE OFF
        BRZ,EBMCON,$&1.0                                        4006.04 80 007046.34 06         007045.00
        LX,$X1,G4AA                                            11254.02 10                      007046.00
        BXVZ,F3A2                                               7052.31 42                      007046.40
        LX,$X1,G4AE                                            12554.02 10                      007047.00
        L%BU□,F3AA                                              7742.40 80 000000.20 50         007047.40
        ST%BU□,0%$X1□                                              0.00 81 000000.20 D0         007050.40
        B,G4AA                                                 11254.10 00                      007051.40
                                @
                                @CLEAR STORAGE OF REQUESTS
F3A2    SIC,F3A2B                                               7063.40 80                      007052.00
                B,F3A2A                                         7060.50 00                      007052.40
        L%BU□,ETINT                                             4064.00 80 000000.20 50         007053.00
        BRZ,F3A2A-.32                                           7060.34 C2                      007054.00
                CNOP                                               0.30 00                      007054.40
        SIC,31.0                                                  37.00 80                      007055.00
                B,H3A3                                         13717.10 00                      007055.40
        XW,ETINT,48,0                                           4064.00 00 001400.00 00         007056.00
        XW,F3AI,39,0                                            7565.00 00 001160.00 00         007057.00
        B,F3A5                                                  7076.10 00                      007060.00
                                @
F3A2A   Z,G4AA                                                 11254.22 00                      007060.40
        LCI,$X1,%8□1312                                         1312.03 02                      007061.00
        T,$X1,G4AA,G4AA&1.0                                    11254.00 80 011255.02 20         007061.40
        TI,4,G4AJ,G4AF                                         12567.00 80 012554.10 A0         007062.40
F3A2B   $B,0                                                       0.10 00                      007063.40
```

```
                        @A RELIABILITY PASS OR
                        @UNCONTROLLED MARGINAL PASS
                        @
                        @CHECK CONTINUITY
F3A3    KV,$X15,F3DA                                          7177.36 90                      007064.00
        BXE,F3A4                                              7072.32 C2                      007064.40
        BZB,$X15&.18,$&2.32                                     37.22 80 007067.74 00         007065.00
        V&I,$X15,.32                                             0.77 05                      007066.00
        KV,$X15,F3DA                                          7177.36 90                      007066.40
        BXF,F3A4                                              7072.32 C2                      007067.00
        LV,$X1,EDPLOC                                         4010.42 30                      007067.40
        BB,ADA&.25%$X1□,F3A4                                    10.31 81 007072.34 02         007070.00
        SIC,F3D1A                                             7552.00 80                      007071.00
                B,F3D1    @GO TO PRINT FAILURE                7543.10 00                      007071.40
                          @
                          @CHECK FOR LOOP ON 1ST OR 2ND LEVEL OPTION
F3A4    SIC,31.0                                                37.00 80                      007072.00
                B,G1B                                         10242.50 00                     007072.40
        B,F3D4-1.                                             7175.50 00                      007073.00
                NOP             @LOOP                           0.30 00                      007073.40
        SIC,31.0                                                37.00 80                      007074.00
                B,G1A                                         10237.50 00                     007074.40
        B,F3D4-1.                                             7175.50 00                      007075.00
                NOP             @LOOP                           0.30 00                      007075.40
                          @
                          @PREPARE TO RETURN TO DP ANALYSIS BLOCK
F3A5    SIC,F2D1                                              7030.40 80                      007076.00
                B,F2D                                         7023.50 00                      007076.40
        LV,$X15,EDPLOC                                        4010.76 30                      007077.00
        LV,$X15,ACG%$X15□                                        6.36 3F                      007077.40
        KVI,$X15,%8□20000.0                                  20000.37 04                      007100.00
        BXL,F4A                                               7641.32 42                      007100.40
        B,0%$X15□       @RETURN TO ANALYSIS BLOCK                0.10 0F                      007101.00
```

```
                                @
                                @ENTRY FROM DP TEST BLOCK WITH
                                @SUCCESS
F3B     SIC,F2C1                                                    7023.00 80                      007101.40
                B,F2C                                               7020.10 00                      007102.00
        BZB,EBMCON,F3A3         @BRANCH IF MARGINS ARE OFF          4006.04 80 007064.34 00         007102.40
                                @CHECK CONTINUITY
F3B1    LV,$X15,FA1&24.0        X15                                 7231.36 30                      007103.40
        M&1%BU¤,F4AD            @STEP BINARY COUNTER FOR DISPLAY    7746.00 80 000000.22 B0         007104.00
        KV,$X15,F3DA                                                7177.36 90                      007105.00
        BXE,F3B1A                                                   7113.72 C2                      007105.40
        BZB,$X15&.18,$&2.32                                           37.22 80 007110.74 00         007106.00
        V&I,$X15,.32                                                   0.77 05                      007107.00
        KV,$X15,F3DA                                                7177.36 90                      007107.40
        BXE,F3B1A                                                   7113.72 C2                      007110.00
        LV,$X1,EDPLOG                                               4010.42 30                      007110.40
        BB,ADA&.25%$X1¤,F3B1A                                         10.31 81 007113.74 02         007111.00
        SIC,F3D1A                                                   7552.00 80                      007112.00
                B,F3D1                                              7543.10 00                      007112.40
        B,F3A1A                                                     7043.10 00                      007113.00
F3B1A   SIC,G1J1                                                    10277.00 80                     007113.40
                B,G1J                                               10267.10 00                     007114.00
        BB,ESSS&.52,F3A1A       @TERMINATE MC                       4062.64 80 007043.34 02         007114.40
        B,$&1.32                                                    7117.10 00                      007115.40
                                @
                                @PREPARE TO RETURN TO START OF TEST BLOCK
        BB1,ECTL3&.10,$&1.0     @SET TO PRINT NEW PASS ID           4010.12 80 007117.34 0E         007116.00
F3A6    SIC,F4A5                                                    7714.00 80                      007117.00
                B,F4A3                  @DISPLAY PASS COUNT         7702.10 00                      007117.40
        LV,$X3,EDPLOC                   @START LOC OF DIAG PGM      4010.46 30                      007120.00
        LX,$X2,ACF%$X3¤                                               5.04 13                       007120.40
        SC,$X2,F3DA                                                 7177.05 50                      007121.00
        7,$X1                                                         21.22 00                      007121.40
        IR,$X1,$X2                                                    22.02 70                      007122.00
        SX,$X1,F3DB                                                 7200.03 10                      007122.40
        B,F3D3                                                      7157.50 00                      007123.00
                                @
                                @
                                @
                                @ENTRY FROM DP TEST BLOCK WITH
                                @FAILURE
F3C     SIC,F2C1                                                    7023.00 80                      007123.40
                B,F2C                                               7020.10 00                      007124.00
        BZB,EBMCON,F3A3         @BRANCH IF MC OFF                   4006.04 80 007064.34 00         007124.40
        B,F3A1                                                      7035.10 00                      007125.40
```

```
                                @CHECKSUM AND CONTINUITY CHECK ROUTINE
F3D     SIC,F2C1                                                    7023.00 80                      007126.00
              B,F2C                                                 7020.10 00                      007126.40
        KV,$X15,F3DA            @CHECK CONTINUITY                   7177.36 90                      007127.00
        BXE,F3D3A               @GOOD                               7146.72 C2                      007127.40
        BZR,$X15&.18,$&2.32                                           37.22 80 007132.74 00         007130.00
        V&I,$X15,.32                                                   0.77 05                      007131.00
        KV,$X15,F3DA                                                7177.36 90                      007131.40
        BXE,F3D3A                                                   7146.72 C2                      007132.00
        LV,$X5,EDPLOC                                               4010.52 30                      007132.40
        BB,ADA&.25%$X5¤,$&2.0                                         10.31 85 007135.34 02         007133.00
        SIC,F3D1A                                                   7552.00 80                      007134.00
              B,F3D1                                                7543.10 00                      007134.40
        BB,FBMCON,$&5.0                                             4006.04 80 007142.34 02         007135.00
        SIC,31.0                                                      37.00 80                      007136.00
              B,G1B             @DO WE LOOP 2ND LEVEL             10242.50 00                      007136.40
        B,F3D4-1.                                                   7175.50 00                      007137.00
              NOP                     @LOOP                           0.30 00                      007137.40
        SIC,31.0                                                      37.00 80                      007140.00
              B,G1A             @DO WE LOOP 1ST LEVEL             10237.50 00                      007140.40
        B,F3D4-1.                                                   7175.50 00                      007141.00
              NOP                     @LOOP                           0.30 00                      007141.40
        LV,$X15,FA1&24.0                                            7231.36 30                      007142.00
        LCI,$X15,2                    @IS CONTIN CHK RECOVERABLE        2.37 02                      007142.40
        Z,$X6                                                         26.22 00                      007143.00
        LCI,$X6,100                                                  144.15 02                      007143.40
        KV,$X15,F3DD%$X6¤                                           7377.36 96                      007144.00
        BXE,F3D3B                                                   7154.32 C2                      007144.40
        CR&,$X6,$-1.0                                               7144.15 48                      007145.00
        CBH,$X15,$-2.32               @TRY AGAIN HALF LOC HIGHER    7143.36 C8                      007145.40
        B,F3D1B                 @PREPARE TO ABANDON PROGRAM         7553.10 00                      007146.00
                                @
F3D3A   BB,EBMCON,F3D3                                              4006.04 80 007157.74 02         007146.40
        SIC,31.0                                                      37.00 80                      007147.40
              B,G1B                                                 10242.50 00                      007150.00
        B,F3D4-1.                                                   7175.50 00                      007150.40
              NOP                     @LOOP                           0.30 00                      007151.00
        SIC,31.0                                                      37.00 80                      007151.40
              B,G1A             @DO WE LOOP 1ST LEVEL             10237.50 00                      007152.00
        B,F3D4-1.                                                   7175.50 00                      007152.40
              NOP                     @LOOP                           0.30 00                      007153.00
        B,F3D3                                                      7157.50 00                      007153.40
```

```
                                    @COMPUTE NEW RETURN POINT
                                    @
F3D3B   LX,$X7,F3DD%$X6¤            @SET UP F3DB                    7377.16 16                      007154.00
        Z,$X3                                                         23.22 00                      007154.40
        SC,$X7,$X2                                                    22.17 50                      007155.00
        LR,$X3,$X2                                                    22.06 70                      007155.40
        V&I,$X6,1.0                                                    1.15 05                      007156.00
        SV,$X6,$X3                                                    23.15 30                      007156.40
        SX,$X3,F3DB                                                 7200.07 10                      007157.00
F3D3    LX,$X1,F3DB                 @CONTINUE                       7200.02 10                      007157.40
        SR,$X1,$X2                                                    22.03 70                      007160.00
        LX,$X3,0.0%$X2¤                                                0.06 12                      007160.40
        L%BU,18,8¤,$X1&.46                                            21.56 80 022000.20 50        007161.00
        ST%BU,18,8¤,$&1.0                                           7163.00 80 022000.20 D0        007162.00
        V-I,$X3,0.0                                                    0.07 0D                      007163.00
        LC,$X2,$X3                                                    23.04 50                      007163.40
        Z,$L                                                          10.22 00                      007164.00
        Z,$R                                                          11.22 00                      007164.40
        &%BU,64,8¤,0.0%$X2¤                                            0.00 82 000000.20 10         007165.00
        CB&,$X2,$-1.0                                               7165.05 48                      007166.00
        KF%BU¤,F3DC%$X1¤            @CHECKSUM COMPARE               7233.00 81 000000.23 10         007166.40
        BZAE,F3D2                   @GO PRINT CKSM FAILURE          7557.76 C0                      007167.40
                                    @
                                    @
                                    @PREPARE FOR NEXT CKSM-RETURN TO DP
F3D5    LX,$X5,F3DB                                                 7200.12 10                      007170.00
        SR,$X5,$X2                                                    22.13 70                      007170.40
        V&I,$X2,1.0                                                    1.05 05                      007171.00
        SVA,$X2,F3D4                                                7176.45 D0                      007171.40
        LX,$X2,F3DD%$X1¤                                            7377.04 11                      007172.00
        SV,$X2,F3DA                                                 7177.05 30                      007172.40
        SC,$X3,$X5                                                    25.07 50                      007173.00
        BXC%,F3D4-1.-               @LOOP-                          7175.70 42                      007173.40
        LR,$X1,$X5                                                    25.02 70                      007174.00
        V&I,$X1,1.0                                                    1.03 05                      007174.40
        SX,$X1,F3DB                                                 7200.03 10                      007175.00
        SIC,F2D1                                                    7030.40 80                      007175.40
                B,F2D                                               7023.50 00                      007176.00
F3D4    $B,0.0                                                         0.10 00                      007176.40
                                    @
F3DA    XW,0.0,0,0                  @COMPARE WORD — last word          0.00 00 000000.00 00         007177.00
F3DB    XW,0.0,0,0                  @STARTING ADDRESS OF NEXT ROUTINE — 0.00 00 000000.00 00        007200.00
FA1     DR%BU,64,8¤,26                                                32.00                         007201.00
F3DC    DR%BU,64,8¤,100             @TABLE OF CHECKSUMS             144.00                          007233.00
F3DD    DR%BU,64,8¤,100             @TABLE OF CKSM BLOCK CWS —      144.00                          007377.00
```

F0

```
                                @PRINT OUT CONTINUITY FAILURE
                                @
F3D1    SV,$X15,H6B2                                    14320.37 30                    007543.00
        SIC,H6B1                                        14311.40 80                    007543.40
              B,H6B                                     14300.50 00                    007544.00
        TI,1,H6BI,F3DI                                  14321.00 80 007572.02 A0       007544.40
        LV,$X15,F3DA                                     7177.36 30                    007545.40
        SV,$X15,H6B2                                    14320.37 30                    007546.00
        SIC,H6B1                                        14311.40 80                    007546.40
              B,H6B                                     14300.50 00                    007547.00
        CNOP                                                0.30 00                    007547.40
        SIC,31.0                                           37.00 80                    007550.00
              B,H1A1A2                                  12754.10 00                    007550.40
        XW,F3DI1,61,F3DC1,4                              7573.00 40 001720.17 9C       007551.00
F3D1A   $B,0                                                0.10 00                    007552.00
          CNOP                                              0.30 00                    007552.40
                                @
F3D1B   SIC,31.0                                           37.00 80                    007553.00
              B,G4B                                     11065.10 00                    007553.40
        B,$&1.0                                          7555.10 00                    007554.00
              NOP                                           0.30 00                    007554.40
        B,$&2.0                                          7557.10 00                    007555.00
              NOP                                           0.30 00                    007555.40
        XW,F3DI3,73,0                                    7606.10 00 002220.00 00       007556.00
        B,F1E                                            6672.50 00                    007557.00
                                @
                                @
                                @
                                @PRINT CKSM FAILURE
F3D2    SR,$X1,H6B2                                     14320.03 70                    007557.40
                  CNOP
        SIC,H6B1                                        14311.40 80                    007560.00
              B,H6B                                     14300.50 00                    007560.40
        SIC,31.0                                           37.00 80                    007561.00
              B,G4B                                     11065.10 00                    007561.40
        B,$&1                                            7562.50 00                    007562.00
            NOP                                             0.30 00                    007562.40
        B,F3D5                                           7170.10 00                    007563.00
              NOP                                           0.30 00                    007563.40
        XW,F3DI4,68,F3DC4,4                              7617.20 40 002100.17 9F       007564.00
                                @
F3AI    %IQSZ¤DD%BU,8,8¤,INDICATOR REGISTER AFTER MARGINAL PASS.Z                       007565.00
F3DI    XW,0,0,0                                            0.00 00 000000.00 00       007572.00
F3DI1   %IQSZ¤DD%BU,8,8¤,**A CONTINUITY FAILURE OCCURRED. Z                             007573.00
        %IQSZ¤DD%BU,8,8¤,PROGRAM RETURNED CONTROL AT Z                                  007577.10
F3DI2   %IQSZ¤DD%BU,8,8¤,. SHOULD HAVE BEEN LOCATION Z                                 007602.50
F3DI3   %IQSZ¤DD%BU,8,8¤,**CAN NOT RECOVER FROM CONTINUITY FAILURE.Z                    007606.10
        %IQSZ¤DD%BU,8,8¤, CONTINUE WILL ABANDON PROGRAM.Z                               007613.30
F3DI4   %IQSZ¤DD%BU,8,8¤,**A CHECKSUM FAILURE OCCURRED AT CHECKSUMZ                    007617.20
        %IQSZ¤DD%BU,8,8¤, BLOCK STARTING AT ADDRESS Z                                   007624.30
F3DI5   %IQSZ¤DD%BU,8,8¤,. CONTINUING, USING PROGRAM AS IS.Z                           007627.60
F3DC1   XW,F3DI,8,F3DC2,4                               7572.00 40 000200.17 9D       007634.00
F3DC2   XW,F3DI2,28,F3DC3,4                             7602.50 40 000700.17 9E       007635.00
F3DC3   XW,H6BI,8,0                                    14321.00 00 000200.00 00       007636.00
 F3DC4  XW,H6BI,8,F3DC5,4                              14321.00 40 000200.17 A0       007637.00
F3DC5   XW,F3DI5,34,0                                   7627.60 00 001040.00 00       007640.00
```

```
                        @ENTRY FROM DP ANALYSIS BLOCK
                        @
F4A     SIC,F2C1                                                7023.00 80                      007641.00
              B,F2C                                             7020.10 00                      007641.40
        BBZ,ECTL3&.10,$&1.0  @CLEAR ID PRINT                    4010.12 80 007643.34 06         007642.00
        BB1,ECTL3,$&1.0      @SET 1ST PASS COMPLETED            4010.00 80 007644.34 0E         007643.00
        Z,ETINT                                                 4064.22 00                      007644.00
        BB,EBAUTO,F4A2       @AUTOTEST MODE                     4006.00 80 007674.74 02         007644.40
        BB,ECTL3&.14,F4A1    @LAST PASS AN MC PASS              4010.16 80 007660.34 02         007645.40
        BB,ECTL3&.16,F4A1&1.0 ~@UNCONTROLLED MARGINS IN PROGRESS 4010.20 80 007661.34 02         007646.40
        M&1%BU¤,F4AD                                            7746.00 80 000000.22 B0         007647.40
        M&1%DU,63,8¤,F4AB                                       7744.00 80 077000.26 B0         007650.40 B
        LV,$X15,EDPLOC                                          4010.76 30                      007651.40
        L%BU,18¤,ADA&.28$X15¤                                     10.34 8F 022000.20 50         007652.00
        K%BU¤,F4AD                                              7746.00 80 000000.21 10         007653.00
        BAH,F3A6-1.0         @MORE RELIABILITY PASSES           7116.37 42                      007654.00
        SIC,F3A2B                                               7063.40 80                      007654.40
              B,F3A2A                                           7060.50 00                      007655.00
        BZB,ECTL1&.05,F4A1   @UNCONTROLLED MARGINS NOT REQUESTED 4006.05 80 007660.34 00         007655.40
        BZB1,ECTL3&.16,$&2.32  @SET UNC MARGINS IN PROGRESS     4010.20 80 007661.34 0C         007656.40
        B,$&1.32                                                7661.10 00                      007657.40
                        @
                        @CHECK FOR MARGINAL PASSES
F4A1    BZB,ECTL3&.15,F4A2     @NON MC ONLY                     4010.17 80 007674.74 00         007660.00
        SIC,G1J1                                               10277.00 80                      007661.00
              B,G1J                                            10267.10 00                      007661.40
        BB,ESSS&.51,F4A2     @TERMINATE MARGINAL PASSES         4062.63 80 007674.74 02         007662.00
        BZBZ,ECTL3&.14,$&4.0                                    4010.16 80 007667.34 04         007663.00
        M&1%BU¤,F4AD                                            7746.00 80 000000.22 B0         007664.00
        M&1%DU,63,8¤,F4AC                                       7745.00 80 077000.26 B0         007665.00 B
        BB,ECTL3&.16,F3A6-1.0  @UNCONTROLLED MARGINS IN PROGRESS 4010.20 80 007116.34 02        007666.00
        TI,1,G2D&6.0,G2D1                                      10461.00 80 010513.02 A0         007667.00
        SIC,31.0                                                  37.00 80                      007670.00
              B,G2A&.32      @GO TO MC ON HALT                 10355.50 00                      007670.40
        BB,ESSS&.51,F4A2     @TERMINATE MARGINAL PASSES         4062.63 80 007674.74 02         007671.00
        BB1,EBMCON,$&1.0                                        4006.04 80 007673.34 0E         007672.00
        BB1,ECTL3&.14,$&1.0                                     4010.16 80 007674.34 0E         007673.00
        B,F3A6-1.0                                              7116.10 00                      007674.00
```

```
                        @
                        @PREPARE FOR A REPEAT FUNCTION
                        @RETURN TO DP TERMINATE BLOCK
F4A2    TI,2,F4AA,F4AB                                  7743.00 80 007744.04 A0     007674.40
        BBZ,ECTL3&.14,$&1.0                             4010.16 80 007676.74 06     007675.40
        BBZ,ECTL3&.16,$&1.0   @CLEAR UNC MARGIN BIT     4010.20 80 007677.74 06     007676.40
        SIC,F2D1                                        7030.40 80                  007677.40
                B,F2D                                   7023.50 00                  007700.00
        LV,$X15,FDPLOC                                  4010.76 30                  007700.40
        LX,$X15,ACH%$X15¤                                  7.36 1F                  007701.00
        B,0%$X15¤                                          0.10 0F                  007701.40
                        @
                        @ROUTINE TO DISPLAY PASS COUNT
F4A3    L%BU,18,8¤,F4AD&.46                             7746.56 80 022000.20 50     007702.00
        BB,ECTL2&.62,F4A4  CHECK FOR CONTROL FROM MAINT CONSOLE  4007.76 80 007707.74 02     007703.00
        ST%BU¤,G2D1                                    10513.00 80 000000.20 D0     007704.00
        SIC,G2A7                                       10440.00 80                  007705.00
                B,G2A6X                                10432.10 00                  007705.40
        SIC,G2A9                                       10447.40 80                  007706.00
                B,G2A8                                 10441.10 00                  007706.40
        B,F4A5                                          7714.10 00                  007707.00
                        @
F4A4    L%BU,18,8¤,$LB                                    3.40 80 022000.20 50     007707.40
        KI%BU,18,8¤,-8¤4000                             4000.00 80 422000.21 10     007710.40
        BAH,F4A5                                        7714.37 42                  007711.40
        L%BU¤,F4AD                                      7746.00 80 000000.20 50     007712.00
        ST%BU,18,8¤,$LB                                    3.40 80 022000.20 D0     007713.00
F4A5    $B,0                                               0.10 00                  007714.00
                        @
```

```
                        @ENTRY FROM DP TERMINATE BLOCK
                        @ENTRY FOR TERMINATING PROGRAM
                        @
F5A     B,F5A1                  @BYPASS DURING OPERATIONS                7730.10 00                      007714.40
                                @C-CARD FNTRY
        L,$TC           @COMPUTE TIME ELAPSED                               1.34 80 044000.20 50        007715.00
        -,F1CJ                                                           6750.40 80 044000.30 10        007716.00
        ST,F1CJ                 @STORE FOR PRINT                         6750.40 80 044000.20 D0        007717.00
        L,F1CJ2                 @GET BCD IMAGE                           6754.04 80 000000.20 50        007720.00
        $CI0100%BU,24,3¤,-1,1           @CLEAR NUMBERS                777777.77 80 430300.50 70        007721.00
        &%BU¤,$R,64             @DOUBLE IMAGE                              11.00 80 000040.20 10        007722.00
        C0111%BU,36,3¤,F1CJ,1                                            6750.40 80 044300.56 70        007723.00
        ST%BU¤,F1CJ2,32                                                  6754.04 80 000020.20 D0        007724.00
        ST%BU,32¤,F1CJ2&1.      @STORE IN MESSAGE                        6755.04 80 040000.20 D0        007725.00
        CNOP
        SIC,$X15                                                           37.00 80                     007726.00
        B,H1A1A2        @PRINT ELPSED TIME                              12754.10 00                     007726.40
        XW,F1CJ1,%.48¤F1CJ2.96-F1CJ1                                     6751.04 00 001100.00 00        007727.00
F5A1    SIC,$X15                                                           37.00 80                     007730.00
        B,H1A1A2                @PRINT PROG FINISHED                    12754.10 00                     007730.40
        XW,F5CI1,21,0                                                    7755.40 00 000520.00 00        007731.00
        SIC,G1J1                                                        10277.00 80                     007732.00
              B,G1J                                                     10267.10 00                     007732.40
        BB,ESSS&.59,F1C&.32     @RERUN THIS PROGRAM -                    4062.73 80 006605.34 02        007733.00
        B,F1B                                                            5252.10 00                     007734.00
                        @
                        @
                        @
                        @ENTRY FOR REPEAT FUNCTION -
F5B     B,F3A6-1.0                                                       7116.10 00                     007734.40
                        @
                        @
                        @ENTRY TO TERMINATE PGM BY DP REQUEST -
                        @
F5C     BZB,EBMCON,$&3.0                                                 4006.04 80 007740.34 00        007735.00
        TI,1,G2D&7.0,G2D1                                               10462.00 80 010513.02 A0        007736.00
        SIC,31.0                                                           37.00 80                     007737.00
              B,G2A&.32                                                 10355.50 00                     007737.40
        CNOP
        SIC,31.0                                                           37.00 80                     007740.00
              B,H1A1A                                                   12767.50 00                     007740.40
        XW,F5CI,44,0                                                     7750.00 00 001300.00 00        007741.00
        B,F5A                   @DETERMINE IF LOOPING ON DP IS DESIRED   7714.50 00                     007742.00
F3AA    B,F3A?                                                           7052.10 00                     007742.40
        CNOP
F4AA    %8¤DD%BU,8¤,140,140,140,140,140,140,140,142  @RESET REG                                  140   007743.00
                                                                                                   140   007743.10
                                                                                                   140   007743.20
                                                                                                   140   007743.30
                                                                                                   140   007743.40
                                                                                                   140   007743.50
                                                                                                   140   007743.60
                                                                                                   142   007743.70
F4AB    DD%BU¤,0                @DECIMAL REL PASS COUNTER   00000000000000000000                      007744.00
F4AC    DD%BU¤,0                @DECIMAL MC PASS COUNTER    00000000000000000000                      007745.00
F4AD    DD%BU¤,0                @BINARY PASS COUNTER        00000000000000000000                      007746.00
F4AE    DD%BU¤,0                                            00000000000000000000                      007747.00
F5CI    %IQSZ¤DD%BU,8,8¤,PROGRAM IS BEING ABANDON BY IT OWN DECISION.Z                                 007750.00
F5CI1   %IQSZ¤DD%BU¤,    PROGRAM FINISHED.Z                                                            007755.40
```

```
                                    @MASTER INTERRUPT TABLE
          CNOP                                                    0.30 00     007760.40
F6T       SIC,F6AT                                              10144.00 80   007761.00
                BD,F6A                                          10041.04 00   007761.40
          SIC,F6AT&.32                                          10144.40 80   007762.00
                     BD,F6A                                     10041.04 00   007762.40
          SIC,F6AT&1.0                                          10145.00 80   007763.00
                     BD,F6A                                     10041.04 00   007763.40
          SIC,F6AT&1.32                                         10145.40 80   007764.00
                      BD,F6A                                    10041.04 00   007764.40
          NOP                                                     0.30 00     007765.00
              NOP                 @TIME SIGNAL                    0.30 00     007765.40
          SIC,F6AT&2.32                                         10146.40 80   007766.00
                      BD,F6A                                    10041.04 00   007766.40
          SIC,F6AT&3.0                                          10147.00 80   007767.00
                     BD,F6A                                     10041.04 00   007767.40
          SIC,F6AT&3.32                                         10147.40 80   007770.00
                      BD,F6A                                    10041.04 00   007770.40
          SIC,F6AT&4.0                                          10150.00 80   007771.00
                     BD,F6A                                     10041.04 00   007771.40
          SIC,F6AT&4.32                                         10150.40 80   007772.00
                      BD,F6A                                    10041.04 00   007772.40
          SIC,F6AT&5.0                                          10151.00 80   007773.00
                     BD,F6A                                     10041.04 00   007773.40
          SIC,F6AT&5.32                                         10151.40 80   007774.00
                      BD,F6A                                    10041.04 00   007774.40
          SIC,F6AT&6.0                                          10152.00 80   007775.00
                     BD,F6A                                     10041.04 00   007775.40
          NOP                                                     0.30 00     007776.00
              NOP                 @CHANNEL SIGNAL                 0.30 00     007776.40
          SIC,F6AT&7.0                                          10153.00 80   007777.00
                     BD,F6A                                     10041.04 00   007777.40
          SIC,F6AT&7.32                                         10153.40 80   010000.00
                      BD,F6A                                    10041.04 00   010000.40
          SIC,F6AT&8.0                                          10154.00 80   010001.00
                     BD,F6A                                     10041.04 00   010001.40
          SIC,F6AT&8.32                                         10154.40 80   010002.00
                      BD,F6A                                    10041.04 00   010002.40
          SIC,F6AT&9.0                                          10155.00 80   010003.00
                     BD,F6A                                     10041.04 00   010003.40
          SIC,F6AT&9.32                                         10155.40 80   010004.00
                      BD,F6A                                    10041.04 00   010004.40
          SIC,F6AT&10.0                                         10156.00 80   010005.00
                      BD,F6A                                    10041.04 00   010005.40
          SIC,F6AT&10.32                                        10156.40 80   010006.00
                       BD,F6A                                   10041.04 00   010006.40
          SIC,F6AT&11.0                                         10157.00 80   010007.00
                      BD,F6A                                    10041.04 00   010007.40
          SIC,F6AT&11.32                                        10157.40 80   010010.00
                       BD,F6A                                   10041.04 00   010010.40
```

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SIC,F6AT&12.0                          10160.00 80        010011.00
             BD,F6A                    10041.04 00        010011.40
SIC,F6AT&12.32                         10160.40 80        010012.00
               BD,F6A                  10041.04 00        010012.40
SIC,F6AT&13.0                          10161.00 80        010013.00
             BD,F6A                    10041.04 00        010013.40
SIC,F6AT&13.32                         10161.40 80        010014.00
               BD,F6A                  10041.04 00        010014.40
SIC,F6AT&14.0                          10162.00 80        010015.00
             BD,F6A                    10041.04 00        010015.40
SIC,F6AT&14.32                         10162.40 80        010016.00
               BD,F6A                  10041.04 00        010016.40
SIC,F6AT&15.0                          10163.00 80        010017.00
             BD,F6A                    10041.04 00        010017.40
SIC,F6AT&15.32                         10163.40 80        010020.00
               BD,F6A                  10041.04 00        010020.40
SIC,F6AT&16.0                          10164.00 80        010021.00
             BD,F6A                    10041.04 00        010021.40
SIC,F6AT&16.32                         10164.40 80        010022.00
               BD,F6A                  10041.04 00        010022.40
SIC,F6AT&17.0                          10165.00 80        010023.00
             BD,F6A                    10041.04 00        010023.40
SIC,F6AT&17.32                         10165.40 80        010024.00
               BD,F6A                  10041.04 00        010024.40
SIC,F6AT&18.0                          10166.00 80        010025.00
             BD,F6A                    10041.04 00        010025.40
SIC,F6AT&18.32                         10166.40 80        010026.00
               BD,F6A                  10041.04 00        010026.40
SIC,F6AT&19.0                          10167.00 80        010027.00
             BD,F6A                    10041.04 00        010027.40
SIC,F6AT&19.32                         10167.40 80        010030.00
               BD,F6A                  10041.04 00        010030.40
SIC,F6AT&20.0                          10170.00 80        010031.00
             BD,F6A                    10041.04 00        010031.40
SIC,F6AT&20.32                         10170.40 80        010032.00
               BD,F6A                  10041.04 00        010032.40
SIC,F6AT&21.0                          10171.00 80        010033.00
             BD,F6A                    10041.04 00        010033.40
SIC,F6AT&21.32                         10171.40 80        010034.00
               BD,F6A                  10041.04 00        010034.40
SIC,F6AT&22.0                          10172.00 80        010035.00
             BD,F6A                    10041.04 00        010035.40
SIC,F6AT&22.32                         10172.40 80        010036.00
               BD,F6A                  10041.04 00        010036.40
SIC,F6AT&23.0                          10173.00 80        010037.00
             BD,F6A                    10041.04 00        010037.40
SIC,F6AT&23.32                         10173.40 80        010040.00
               BD,F6A                  10041.04 00        010040.40
```

```
                                @INTERRUPT ROUTINE
                                @
F6A     TI,9,7.0,F6AB                                                    7.00 80 010112.22 A0      010041.00
        TI,16,16.0,F6AB&9.0                                             20.00 80 010123.00 A0      010042.00
F6B     LX,$X2,F6BT1                                                 10174.04 10                   010043.00
        L%BU,32¤,F6AT%$X2¤                                           10144.00 82 040000.20 50      010043.40
        BZRZ,F6C                                                     10053.34 C0                   010044.40
        CBH,$X2,F6B&.32                                              10043.44 C8                   010045.00
F6B1    LCI,$X2,23                                                      27.05 02                   010045.40
        Z,F6AT                                                       10144.22 00                   010046.00
        T,$X2,F6AT,F6AT&1.0                                          10144.00 80 010145.04 20      010046.40
        LV,$X15,F6CTE                                                10110.36 30                   010047.40
        SVA,$X15,F6C-.32                                             10052.77 D0                   010050.00
        TI,9,F6AB,7.0                                                10112.00 80 000007.22 A0      010050.40
        TI,16.0,F6AB&9.0,16.0                                        10123.00 80 000020.00 A0      010051.40
        BE,$                    @RETURN                              10052.40 00                   010052.40

                                @
F6C     L%BU,19¤,$X2,104                                                22.00 80 023064.20 50      010053.00
        LV,$X3,$L               @SET IND ETINT                          10.06 30                   010054.00
        BB1,ETINT%$X3¤,$&1.0                                         4064.00 83 010055.74 0E      010054.40
        LV,$X5,F6AT%$X2¤                                             10144.12 32                   010055.40
        SV,$X5,F6CTE                                                 10110.13 30                   010056.00
                                @IF INRT IND 6,7,8, SUB ONE
        KVI,$X2,6.0                                                      6.05 04                   010056.40
        BXL,$&2.0                                                    10061.32 42                   010057.00
        KVI,$X2,8.0                                                      10.05 04                   010057.40
        BXH,$&1.0                                                    10061.33 42                   010060.00
        V-I,$X5,1.0             @REJECT INRT--GET CORRECT ADDR           1.13 0D                   010060.40
        SV,$X5,H6B2             @STORE SO IT CAN BE CODED            14320.13 30                   010061.00
        L%BU,24¤,$X2&.01,103                                            22.01 80 030063.60 50      010061.40
        LV,$X3,$L           @OBTAIN BIT ADDRESS OF IMAGE                10.06 30                   010062.40
        L%BU,32¤,F6CTB%$X3¤                                          10210.00 83 040000.20 50      010063.00
        SF%BU,32,8¤,F6CT2&1.16  @SET UP IND IMAGE                    10201.50 80 040000.12 F0      010064.00
        SIC,H6B1                                                     14311.40 80                   010065.00
                B,H6B                                                14300.50 00                   010065.40
        L%BU¤,H6BI                                                   14321.00 80 000000.20 50      010066.00
        SF%BU,64,8¤,F6CT1&2.24                                       10177.30 80 000000.12 F0      010067.00
        Z,$X11                                                          33.22 00                   010070.00
        LCI,$X11,8                                                      10.27 02                   010070.40
        L%BU,32¤,F6AT&3.%$X11¤                                       10147.00 8B 040000.20 50      010071.00
        BZR7,F6CX                   @BR-I/O INTRT--GET CA            10073.74 C0                   010072.00
        CBH,$X11,$-1.32                                              10071.26 C8                   010072.40
        B,F6C1                      @BR-NO I/O INTRT                 10100.10 00                   010073.00
F6CX    L,$CA                                                            5.14 80 007000.20 50      010073.40
        SIC,$X15                                                        37.00 80                   010074.40
        B,H6D                       @CONVERT TO DECIMAL BCD          14414.10 00                   010075.00
        ST%BU,24¤,F6CT2A.80         @INSERT IN IMAGE                 10203.30 80 030000.20 D0      010075.40
        TI,1,F6CT4B,F6CT4               @CHANGE CW                   10207.00 80 010205.02 A0      010076.40
        CNOP                                                             0.30 00                   010077.40
F6C1    SIC,31.0                                                        37.00 80                   010100.00
                B,H1A           @PRINT IMAGE                         12747.10 00                   010100.40
        XW,F6CT1,27,F6CT4                                            10175.00 00 000660.20 85      010101.00
        TI,1,F6CT4A,F6CT4                   @RESTORE CW              10206.00 80 010205.02 A0      010102.00
        B,F6B1                                                       10045.50 00                   010103.00
```

```
                                @
                                @CHECK FOR SAVE OF MUL REG,K2 & ABOVE
F6D     L%BU,3,3¤,ECTL2                                          4007.00 80 003300.20 50      010103.40
        B,0%$X15¤                                                   0.10 0F                   010104.40
                                @
                                @CHECK FOR RESTORE OF MUL R,K2 & ABOVE
F6F     L%BU,3,3¤,ECTL2                                          4007.00 80 003300.20 50      010105.00
        L%BU,20,8¤,F6AB&4.0,44                                  10116.00 80 024026.20 50      010106.00
        B,0%$X15¤                                                   0.10 0F                   010107.00
        CNOP                                                        0.30 00                   010107.40
F6CTE   DD%BU,64,8¤,0                                               000000000000000000000000  010110.00
F6A36   DD%BU,64,8¤,0.0                                             000000000000000000000000  010111.00
F6AB    DR%BU,64,8¤,26                                            32.00                       010112.00
F6AT    DR%BU,64,8¤,24                                            30.00                       010144.00
F6BT1   XW,0,48,0                                                   0.00 00 001400.00 00      010174.00
F6CT1   %IQSZ¤DD%BU,8,8¤,INTERRUPT LOCATION          Z                                        010175.00
F6CT2   %IQSZ¤DD%BU,8,8¤,INDICATOR     Z                                                     010200.30
F6CT2A  %IQS*¤DD%BU,8,8¤, CHAN ADDR 00*                                                       010202.10
F6CT3   DD%DU¤,0                                                    000000000000000000000000  010203.60
F6CT4   XW,F6CT2,14,0                                           10200.30 00 000340.00 00      010205.00
F6CT4A  XW,F6CT2,%.48¤F6CT2A-F6CT2                              10200.30 00 000340.00 00      010206.00
F6CT4B  XW,F6CT2,%.48¤F6CT3-F6CT2                               10200.30 00 000660.00 00      010207.00
F6CTB   %IQSZ¤DD%BU,8,8¤, MK  IK  IJ  EK  TS 7                                                010210.00
        %IQSZ¤DD%BU,8,8¤, CPU FKJUNRJ CRJFPGKZ                                                010212.40
        %IQSZ¤DD%BU,8,8¤, UK  FE EOP  CS      OP Z                                            010215.00
        %IQSZ¤DD%BU,8,8¤, AD  USA EXE DS  DF Z                                                010220.00
        %IQS@¤DD%BU¤, IF  LC  PF  ZD  IR Q                                                    010222.40
        %IQSZ¤DD%BU,8,8¤, LS  PSHXPFP XPO XPH XPLZ                                            010225.00
        %IQSQ¤DD%BU¤, XPU ZM  RU  TF  UF Q                                                    010230.00
        %IQSZ¤DD%BU,8,8¤, VF  BTR DTR PG0 PG1 PG2Z                                            010232.40
        %IQSZ¤DD%BU,64,8¤, PG3 PG4 PG5 PG6Z                                                   010235.40
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```
                        @ENTRIES TO GENERAL SSW CONTROL
                        @
G1A     SIC,G1J1                                                10277.00 80                  010237.40
              B,G1J     @LOOP 1 OPTION                          10267.10 00                  010240.00
        BB,ESSS&.56,$&1.32                                       4062.70 80 010242.34 02     010240.40
        B,1.0%$X15¤     @CONTINUE                                   1.10 0F                  010241.40
        B,0.0%$X15¤     @LOOP                                       0.10 0F                  010242.00
                        @
G1B     SIC,G1J1                                                10277.00 80                  010242.40
              B,G1J     @LOOP 2 OPTION                          10267.10 00                  010243.00
        BB,ESSS&.57,$&1.32                                       4062.71 80 010245.34 02     010243.40
        B,1.0%$X15¤     @CONTINUE                                   1.10 0F                  010244.40
        B,0.0%$X15¤     @LOOP                                       0.10 0F                  010245.00
                        @
G1C     SIC,G1J1                                                10277.00 80                  010245.40
              B,G1J     @LOOP 3 OPTION                          10267.10 00                  010246.00
        BB,ESSS&.58,$&1.32                                       4062.72 80 010250.34 02     010246.40
        B,1.0%$X15¤     @CONTINUE                                   1.10 0F                  010247.40
        B,0.0%$X15¤     @LOOP                                       0.10 0F                  010250.00
                        @
G1D     SIC,G1J1                                                10277.00 80                  010250.40
              B,G1J     @LOOP 4 OPTION                          10267.10 00                  010251.00
        BB,ESSS&.59,$&1.32                                       4062.73 80 010253.34 02     010251.40
        B,1.0%$X15¤     @CONTINUE                                   1.10 0F                  010252.40
        B,0.0%$X15¤     @LOOP                                       0.10 0F                  010253.00
                        @
G1E     SIC,G1J1                                                10277.00 80                  010253.40
              B,G1J     @LOOP ON ERROR                          10267.10 00                  010254.00
        BB,ESSS&.60,$&1.32                                       4062.74 80 010256.34 02     010254.40
        B,1.0%$X15¤     @CONTINUE                                   1.10 0F                  010255.40
        B,0.0%$X15¤     @LOOP                                       0.10 0F                  010256.00
                        @
G1F     SIC,G1J1                                                10277.00 80                  010256.40
              B,G1J     @100 X LOOP                             10267.10 00                  010257.00
        BB,ESSS&.61,$&1.32                                       4062.75 80 010261.34 02     010257.40
        B,1.0%$X15¤     @CONTINUE                                   1.10 0F                  010260.40
        B,0.0%$X15¤     @LOOP                                       0.10 0F                  010261.00
                        @
G1G     SIC,G1J1                                                10277.00 80                  010261.40
              B,G1J     @ERROR HALT                             10267.10 00                  010262.00
        BB,ESSS&.55,$&1.32  @HALT REQUESTED                      4062.67 80 010264.34 02     010262.40
        B,0.0%$X15¤     @NO, RETURN TO PROGRAM                      0.10 0F                  010263.40
        TI,1,G2D&9,G2D1 @YES, TRANSMIT ERROR HALT INDICATOR     10464.00 80 010513.02 A0     010264.00
        B,G2A&.32            @GO TO COMMON HALT ROUTINE         10355.50 00                  010265.00
                        @
G1H     SIC,G1J1                                                10277.00 80                  010265.40
              B,G1J     @ROUTINE TO RFREAD SSW FROM DP          10267.10 00                  010266.00
        B,0.0%$X15¤     @RETURN                                     0.10 0F                  010266.40
```

```
                        @GENERAL ROUTINE FOR SSW READ
                        @
G1J     BB,ECTL1,G1J1C          @BYPASS IN AUTOTEST UNLESS CHANGE      4006.00 80 010332.34 02     010267.00
                                @OF CONTROL OR ABANDON CHECK
        SVA,$X15,$&.32                                                10270.77 D0                 010270.00
        LVI,$X15,0.0    PLACE 0-24 OF XR15, BACK IN TO 0-19 OF XR15      0.37 01                 010270.40
        TI,2,$L,G1J7    SAVE L&R ACC.                                   10.00 80 010352.04 A0    010271.00
        BZB,ECTL2&.62,G1J1&.32  @OPERATE FROM OPS CNSL                4007.76 80 010277.74 00    010272.00
        TI,1,4.0,G1J6   STORE MAINTENANCE BITS                           4.00 80 010351.02 A0    010273.00
        L%BU,32,8□,G1J6&.32  STORE MAINT BITS 32-63 IN ESSS 32-68     10351.40 80 044000.20 50    010274.00
        ST%BU,64,8□,ESSS                                              4062.00 80 000000.20 D0    010275.00
        TI,2,G1J7,$L    RESTORE ACC.                                  10352.00 80 000010.04 A0    010276.00
G1J1    $B,0.0                                                           0.10 00                 010277.00
        L%BU,36,8□,1.28         @LOAD TIME CLOCK                         1.34 80 044000.20 50    010277.40
        K%BU,64,8□,G1J3                                               10346.00 80 000000.21 10    010300.40
        BAL,G1J1B                                                     10317.36 42                 010301.40
G1J1A   SX,$X1,G1J8                                                   10354.03 10                 010302.00
        LVI,$X1,19.32                                                    23.43 01                 010302.40
        REL%SEOP□,0%$X1□                                                 0.00 81 000000.33 00    010303.00
        CCW,0%$X1□,G1J5                                                  0.00 81 010350.21 00    010304.00
        BB,G1J5&.24,$-1.0                                             10350.30 80 010304.34 02    010305.00
        W%SEOP□,0%$X1□,G2D6                                              0.00 81 010606.13 00    010306.00
        CCW,0%$X1□,G1J5                                                  0.00 81 010350.21 00    010307.00
        BB,G1J5&.24,$-1.                                              10350.30 80 010307.34 02    010310.00
        RD%SEOP□,0%$X1□,G1J2                                             0.00 81 010345.11 00    010311.00
        CCW,0%$X1□,G1J5                                                  0.00 81 010350.21 00    010312.00
        BB,G1J5&.24,$-1.0                                             10350.30 80 010312.34 02    010313.00
        &%BU,64,8□,G1J4                                               10347.00 80 000000.20 10    010314.00
        ST%BU,64,8□,G1J3                                              10346.00 80 000000.20 D0    010315.00
        LX,$X1,G1J8                                                   10354.02 10                 010316.00
        B,G1J1-3,0                                                    10274.10 00                 010316.40
                        @
G1J1B   BB,ECTL3&.03,G1J1A      @IS TIME CLOCK DISABLED                4010.03 80 010302.34 02    010317.00
        &%BU,64,8□,G1J4                                               10347.00 80 000000.20 10    010320.00
        K%BU,64,8□,G1J3                                               10346.00 80 000000.21 10    010321.00
        BAE,$&1.0                                                     10323.36 C2                 010322.00
        B,G1J1-1.0                                                    10276.10 00                 010322.40
        SX,$X1,G1J8                                                   10354.03 10                 010323.00
        LCI,$X1,500                                                     764.03 02                 010323.40
        CB,$X1,$                                                      10324.02 48                 010324.00
        LX,$X1,G1J8                                                   10354.02 10                 010324.40
        L%BU,36,8□,1.28                                                  1.34 80 044000.20 50    010325.00
        &%BU,64,8□,G1J4                                               10347.00 80 000000.20 10    010326.00
        K%BU,64,8□,G1J3                                               10346.00 80 000000.21 10    010327.00
        BZAE,G1J1-1.0                                                 10276.36 C0                 010330.00
        BB1,ECTL3&.03,G1J1A                                            4010.03 80 010302.34 QE    010330.40
        B,G1J1A                                                       10302.10 00                 010331.40
                CNOP
                        @
G1J1C   TI,2,$L,G1J7                                                     10.00 80 010352.04 A0    010332.00
        Z,$R                                                             11.22 00                 010333.00
        ST%BU,63,8□,ESSS                                              4062.00 80 077000.20 D0    010333.40
        B,G1J1-1.0                                                    10276.10 00                 010334.40
```

```
                        @
G1K     SIC,G1J1                                                10277.00 80                    010335.00
              B,G1J&1.0 @ENTRY TO CHECK CHANGE OF CONTROL       10270.10 00                    010335.40
        BB,ESSS&.49,F1A1  @RESTART DCP                            4062.61 80 004405.34 02    010336.00
        BZB,ECTL1,$&2.32                                          4006.00 80 010341.74 00    010337.00
        Z,$R                                                        11.22 00                 010340.00
        ST%BU,63,8¤,ESSS                                          4062.00 80 077000.20 D0    010340.40
        B,0.0%$X15¤                                                 0.10 0F                  010341.40
                        @
G1L     SIC,G1J1                                                10277.00 80                    010342.00
              B,G1J       @ENTRY TO CHECK PGM ABANDONMENT OPTIO 10267.10 00                    010342.40
        BB,ESSS&.50,F1E1                                          4062.62 80 006674.34 02    010343.00
        B,0%$X15¤                                                   0.10 0F                  010344.00
                        @
G1J2    XW,G1J6,1,0       @READ CW                              10351.00 00 000020.00 00     010345.00
G1J3    DD%BU,64,8¤,0     @STORE TIME FOR NEXT READ                 00000000000000000000     010346.00
G1J4    %8¤DD%BU,64,8¤,2000  @CONSTANT FOR ONE SECOND               00000000000000002000     010347.00
G1J5    XW,0.0,0,0        @CCW AREA                                 0.00 00 000000.00 00     010350.00
G1J6    DD%BU,64,8¤,0     @READ AREA                                00000000000000000000     010351.00
G1J7    DD%BU¤,0          @LH ACC                                   00000000000000000000     010352.00
        DD%BU¤,0          @RH ACC                                   00000000000000000000     010353.00
G1J8    XW,0.0,0,0             @SAVE IX 1                           0.00 00 000000.00 00     010354.00
```

```
                        @COMMON HALT ROUTINE
                        @
G2A     SV,$X15,G2D1    @ENTRY FOR COMMON HALT                  10513.37 30                    010355.00
        TI,9,7.0,G2D2   @ENTRY FOR CODED HALT  STORE MAINT Σ REGS   7.00 80 010514.22 A0        010355.40
        SVA,$X15,$&.32                                          10357.37 D0                    010356.40
        LVI,$X15,0.0    PUT 0-19 IN PLACE OF 0-24 IN XR 15        0.37 01                    010357.00
        TI,16,16.0,G2D2&9.0  STORE XR'S.                         20.00 80 010525.00 A0        010357.40
        SIC,G1J1                                                10277.00 80                    010360.40
                B,G1J&1.0                                       10270.10 00                    010361.00
        BB,ECTL2&.41,G2A1B&1.0   @BR-HLT INSTEAD PRINT           4007.51 80 010372.34 02        010361.40
        LX,$X1,G2D1                                             10513.02 10                    010362.40
        KVI,$X1,%8□23.           @HI DCP HALT                     23.03 04                    010363.00
        BXH,G2A1B&1.0                                           10372.33 42                    010363.40
        KVI,$X1,10.              TIME DELAY RAN OUT OR I/O OPERATION  12.03 04                  010364.00
        BXE,G2A1B&1.0               @BR-BYPASS TIME DELAY PRINT 10372.32 C2                    010364.40
        KVI,$X1,5.                                                5.03 04                    010365.00
        BXL,G2A1B&1.         @BR-BYPASS CTL HLR PRINTS          10372.32 42                    010365.40
        L,G2D7-1.%$X1□           @CONTROL WORD                  10606.00 81 000000.20 50       010366.00
        ST,G2A1B                                                10371.00 80 000000.20 D0       010367.00
        CNOP                                                                                    
        SIC,$X15                                                  37.00 80                      010370.00
                B,H1A1A                                         12767.50 00                    010370.40
G2A1B   XW,0                                                      0.00 00 000000.00 00          010371.00
        LX,$X0,G2D1                                             10513.00 10                    010372.00
        BB,ESSS&.63,G2A3         MAINT BIT 63=1?                 4062.77 80 010412.74 02        010372.40
        BBZ,G2A2&1.62,G2A3&1.0   SET CONTROL TO CHECK MAINT BIT 63 CHANGE  10400.36 80 010413.74 06  010373.40
        B,G2A3&1.0                                              10413.50 00                    010374.40
G2A1A   KVI,$X0,1.               @IS THIS INITIAL CONTROL HALT    1.01 04                    010375.00
        BXE,G2A3A                @YES-CHECK CONSOLE CHAN SIG    10417.32 C2                    010375.40
        B,G2A1                   @DISPLAY MINT NUMBER            4177.50 00                    010376.00
G2A2    SIC,G1J1                                                10277.00 80                    010376.40
                B,G1J&1.0        CHECK MAINT BITS AGAIN.        10270.10 00                    010377.00
        BB,ESSS.63,G2A1A           @OR BZB-WAIT FOR 63 CHANGE    4062.77 80 010375.34 02        010377.40
        CM1111(BU,40)□,G2D4&1.   @ST BLNKS IN DISPLAY IMAGE      10603.00 80 050000.36 F0       010400.40
        BB,ECTL2&.62,G2A2A  @OPERATING FROM MAINT CNSL           4007.76 80 010403.74 02        010401.40
        SIC,G2A9                                                10447.40 80                    010402.40
                B,G2A8                                          10441.10 00                    010403.00
G2A2A   BZB,ECTL1,$&2.32    AUTOTEST MODE ?                      4006.00 80 010406.34 00        010403.40
        Z,$R                                                      11.22 00                      010404.40
        ST%BU,63,8□,ESSS                                        4062.00 80 077000.20 D0        010405.00
        L%BU,20,8□,G2D2&4.0,44  PLACE ORIGINAL CONTENTS OF IND REG(0-19) INTO RT ACC (0-19).  10520.00 80 024026.20 50  010406.00
        SIC,G6A5                                                12730.00 80                    010407.00
                B,G6A1                                          12712.50 00                    010407.40
        TI,9,G2D2,7.0            } RESTORE Σ REGS AND XRS AS ORIGINALLY  10514.00 80 000007.22 A0  010410.00
        TI,16,G2D2&9.0,16.0      } AT G2A (10355.4) ABOVE.      10525.00 80 000020.00 A0       010411.00
        B,0.0(%$X15)□                                             0.10 0F                       010412.00
                                 @                                                              
G2A3    BB1,G2A2&1.62,G2A3&1.0                                  10400.36 80 010413.74 0E       010412.40
        BB,ECTL2&.62,G2A1   @OPERATING FROM MAINTENANCE CNSL     4007.76 80 004177.74 02        010413.40
        SIC,G2A5X                                               10431.40 80                    010414.40
                B,G2A4      @GO ENCODE HLT IND                  10423.50 00                    010415.00
        SIC,G2A9                                                10447.40 80                    010415.40
                B,G2A8                                          10441.10 00                    010416.00
        B,G2A1                                                   4177.50 00                    010416.40
                                 @                                                              
G2A3A   CCW,$CNSL,G1J5              @GET CW                       23.40 80 010350.21 00        010417.00
        BZB,G1J5.23,G2A1            @NO CS-CHK SWITCES          10350.27 80 004177.74 00       010420.00
        BBZ,MNTCTL ,$&1.            @CONTROL FROM OPS CONSOLE    4007.76 80 010422.34 06       010421.00
        SIC, G1J1                                               10277.00 80                    010422.00
        B, G1J &1.                   @READ CONSOLE SWITCHES     10270.10 00                    010422.40
        B, G2A2 &2.                                             10400.50 00                    010423.00
```

```
                                @ROUTINE FOR ENCODING DIGITAL DISPLAY
                                @IN OCTAL
G2A4    Z,$R                                                    11.22 00                    010423.40
        Z,$X2                                                   22.22 00                    010424.00
        LX,$X3,G2D3                                          10600.06 10                    010424.40
G2A5    &%BU,3,3¤,G2D1%$X2¤,0%$X3¤                           10513.00 82 003300.20 13       010425.00
        V&,$X2,H1V&.32                                       13367.44 B0                    010426.00
        V-I,$X3,2.0                                              2.07 0D                    010426.40
        CB,$X3,G2A5                                          10425.06 48                    010427.00
        ST%BU,24¤,G2D4&1.,-88  @ST HLT IND IN IMAGE          10603.00 80 030024.20 D0       010427.40 CV
        TI,2,G2D2&1.,$L        @REST ACC                     10515.00 80 000010.04 A0       010430.40
G2A5X   B,$                                                  10431.50 00                    010431.40
G2A6X   Z,$X2                                                    22.22 00                    010432.00
        Z,$R                   @CLEAR ACC                        11.22 00                    010432.40
        LX,$X3,G2D3&1.0                                      10601.06 10                    010433.00
G2A6    &%BU,3,3¤,G2D1&.46%$X2¤,0%$X3¤                       10513.56 82 003300.20 13       010433.40
        V&,$X2,H1V&.32  INCREMENT X2 BY 103                  13367.44 B0                    010434.40
        V-I,$X3,2.0                                              2.07 0D                    010435.00
        CB,$X3,G2A6                                          10433.46 48                    010435.40
        ST%BU,24¤,G2D4&1.40  @ST PASS NO IN IMAGE            10603.50 80 030000.20 D0       010436.00
        TI,2,G2D2&1.0,$L       @RESTORE ACCUMULATOR          10515.00 80 000010.04 A0       010437.00
G2A7    $B,0,0                                                   0.10 00                    010440.00
        CNOP                                                     0.30 00                    010440.40
                                @
                                @
                                @ROUTINE TO WRITE DISPLAY AT OPS CNSL
G2A8    LVI,$X1,39                  @SET UP CONSOLE ID           23.43 01                    010441.00
        REL%SEOP¤,0%$X1¤                                         0.00 81 000000.33 00       010441.40
        CCW,0%$X1¤,G2D5                                          0.00 81 010605.21 00       010442.40
        BB,G2D5&.24,$-1.0  CHECK SEOP BIT.                   10605.30 80 010442.74 02       010443.40
        W%SEOP¤,0%$X1¤,G2D6                                      0.00 81 010606.13 00       010444.40
        CCW,0%$X1¤,G2D5                                          0.00 81 010605.21 00       010445.40
        BB,G2D5&.24,$-1.0                                    10605.30 80 010445.74 02       010446.40
G2A9    $B,0,0                                                   0.10 00                    010447.40
        CNOP
                                @
                                @CHECK FOR SAVE OF MUL REG,K2 & ABOVE
G2B     L%BU,3,3¤,FCTL2                                      4007.00 80 003300.20 50        010450.00
        B,0%$X15¤                                                0.10 0F                    010451.00
                                @
                                @CHECK FOR RESTORE OF MUL R,K2 & ABOVE
G2C     L%BU,3,3¤,FCTL2                                      4007.00 80 003300.20 50        010451.40
        B,0%$X15¤                                                0.10 0F                    010452.40
```

CHANGE 6 BIT BINARY CODE (UP TO 000111) TO 4 BIT BINARY CODE (UP TO 0111)

```
                                @TABLE OF INDEX CW
G2D     XW,0.0,0,0                                                0.00 00 000000.00 00    010453.00
        XW,1.0,0,0                                                1.00 00 000000.00 00    010454.00
        XW,2.0,0,0                                                2.00 00 000000.00 00    010455.00
        XW,3.0,0,0                                                3.00 00 000000.00 00    010456.00
        XW,4.0,0,0                                                4.00 00 000000.00 00    010457.00
        XW,5.0,0,0                                                5.00 00 000000.00 00    010460.00
        XW,6.0,0,0                                                6.00 00 000000.00 00    010461.00
        XW,7.0,0,0                                                7.00 00 000000.00 00    010462.00
        XW,8.0,0,0                                               10.00 00 000000.00 00    010463.00
        XW,9.0,0,0                                               11.00 00 000000.00 00    010464.00
        XW,10.0,0,0                                              12.00 00 000000.00 00    010465.00
        XW,11.0,0,0                                              13.00 00 000000.00 00    010466.00
        XW,12.0,0,0                                              14.00 00 000000.00 00    010467.00
        XW,13.0,0,0                                              15.00 00 000000.00 00    010470.00
        XW,14.0,0,0                                              16.00 00 000000.00 00    010471.00
        XW,15.0,0,0                                              17.00 00 000000.00 00    010472.00
        XW,16.0,0,0                                              20.00 00 000000.00 00    010473.00
        XW,17.0,0,0                                              21.00 00 000000.00 00    010474.00
        XW,18.0,0,0                                              22.00 00 000000.00 00    010475.00
        XW,19.0,0,0                                              23.00 00 000000.00 00    010476.00
        XW,20.0,0,0                                              24.00 00 000000.00 00    010477.00
        XW,21.0,0,0                                              25.00 00 000000.00 00    010500.00
        XW,22.0,0,0                                              26.00 00 000000.00 00    010501.00
        XW,23.0,0,0                                              27.00 00 000000.00 00    010502.00
        XW,24.0,0,0                                              30.00 00 000000.00 00    010503.00
        XW,25.0,0,0                                              31.00 00 000000.00 00    010504.00
        XW,26.0,0,0                                              32.00 00 000000.00 00    010505.00
        XW,27.0,0,0                                              33.00 00 000000.00 00    010506.00
        XW,28.0,0,0                                              34.00 00 000000.00 00    010507.00
        XW,29.0,0,0                                              35.00 00 000000.00 00    010510.00
        XW,30.0,0,0                                              36.00 00 000000.00 00    010511.00
        XW,31.0,0,0                                              37.00 00 000000.00 00    010512.00
                        @
G2D1    XW,0.0,0,0      @STORAGE FOR APPL HALT INDS -             0.00 00 000000.00 00    010513.00
G2D2    DR%BU,64,8¤,26                                           32.00                   010514.00
G3AA    DR%BU,64,8¤,26                                           32.00                   010546.00
G2D3    XW,30.0,6,0     @IX 3 ENCODING CTL LHW                   36.00 00 000140.00 00    010600.00
        XW,10.0,6,0     @IX 3 ENCODING CTL RHW                   12.00 00 000140.00 00    010601.00
G2D4    XW,0.0,0,0      @STORAGE LOCATION FOR WRITE IMAGE         0.00 00 000000.00 00    010602.00
        XW,%.39¤-1                                           777777.77 FF 776000.00 00    010603.00
        XW,0.0,0,0      @DUMMY LOCATION AT PRESENT                0.00 00 000000.00 00    010604.00
G2D5    XW,0.0,0,0      @CCW AREA                                 0.00 00 000000.00 00    010605.00
G2D6    XW,G2D4,3,0     @WRITE CW                             10602.00 00 000060.00 00    010606.00
G2D7    CW,G2D7A,%.48¤G2D7B-G2D7A  @DCP HALT PRINT CW-S       10632.00 00 000500.00 00    010607.00
        CW,G2D7B,%.48¤G2D7C-G2D7B                             10634.40 00 000340.00 00    010610.00
        CW,G2D7C,%.48¤G2D7D-G2D7C                             10636.20 00 000340.00 00    010611.00
        CW,G2D7D,%.48¤G2D7F-G2D7D                             10640.00 00 000620.00 00    010612.00
        CW,0                                                      0.00 00 000000.00 00    010613.00
        CW,G2D7F,%.48¤G2D7G-G2D7F                             10643.10 00 000240.00 00    010614.00
        CW,G2D7G,%.48¤G2D7H-G2D7G                             10644.30 00 000260.00 00    010615.00
        CW,G2D7H,%.48¤G2D7I-G2D7H                             10645.60 00 000560.00 00    010616.00
        CW,G2D7I,%.48¤G2D7J-G2D7I                             10650.50 00 000400.00 00    010617.00
        CW,G2D7J,%.48¤G2D7K-G2D7J                             10652.50 00 001160.00 00    010620.00
        CW,G2D7K,%.48¤G2D7L-G2D7K                             10657.40 00 000460.00 00    010621.00
        CW,G2D7L,%.48¤G2D7M-G2D7L                             10661.70 00 000420.00 00    010622.00
        CW,G2D7M,%.48¤G2D7N-G2D7M                             10664.00 00 000460.00 00    010623.00
        CW,G2D7N,%.48¤G2D7P-G2D7N                             10666.30 00 000460.00 00    010624.00
        CW,0                                                      0.00 00 000000.00 00    010625.00
        CW,G2D7P,%.48¤G2D7Q-G2D7P                             10670.60 00 000500.00 00    010626.00
        CW,G2D7Q,%.48¤,G2D7R-G2D7Q                            10673.20 00 000000.00 01    010627.00 V
        CW,G2D7R,%.48¤G2D7S-G2D7R                             10674.30 00 000620.00 00    010630.00
        CW,G2D7S,%.48¤G3A-G2D7S                               10677.40 00 000700.00 00    010631.00
G2D7A   %IOS*¤DD%BU¤,INITIAL CONTROL HALT*                                                 010632.00
```

```
G2D7B   %IQS*¤DD%BU¤,CONTROL HALT-2*                                          010634.40
G2D7C   %IQS*¤DD%BU¤,CONTROL HALT-3*                                          010636.20
G2D7D   %IQS*¤DD%BU¤,SINGLE STEP-ENTER PROG ID*                               010640.00
G2D7F   %IQS*¤DD%BU¤,TURN MC ON*                                              010643.10
G2D7G   %IQS*¤DD%BU¤,TURN MC OFF*                                             010644.30
G2D7H   %IQS*¤DD%BU¤,CORRECT CTL HALT SET UP*                                 010645.60
G2D7I   %IQS*¤DD%BU¤,HALT AFTER PRINT*                                        010650.50
G2D7J   %IQS*¤DD%BU¤,TIME DELAY RAN OUT DURING I/O OPERATION*                 010652.50
G2D7K   %IQS*¤DD%BU¤,CARD SEQUENCE ERROR*                                     010657.40
G2D7L   %IQS*¤DD%BU¤,ILLEGAL CARD READ*                                       010661.70
G2D7M   %IQS*¤DD%BU¤,CARD CHECKSUM ERROR*                                     010664.00
G2D7N   %IQS*¤DD%BU¤,TAPE CHECKSUM ERROR*                                     010666.30
G2D7P   %IQS*¤DD%BU¤,UTILITY CONTROL HALT*                                    010670.60
G2D7Q   %IQS*¤DD%BU¤,TAPE LOAD*                                               010673.20
G2D7R   %IQSZ¤DD%BU¤,UP  TAPE   LOAD SCH CARDSZ                              010674.30
G2D7S   %IQSZ¤DD%BU¤,UP  TAPE   READY CARD DECKSZ                            010677.40
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                        @MANUAL INTERVENTION ROUTINE
                        @
G3A     SIC,G3B1                                                  10730.40 80                    010703.00
              B,G3B                                               10725.50 00                    010703.40
        BR,ECTL1,G3A3                                              4006.00 80 010724.34 02       010704.00
        LX,$X2,0.0%$X15¤                                              0.04 1F                    010705.00
        BB,ECTL1&.02,$&1.32  @SURVEILLANCE MODE                    4006.02 80 010707.34 02       010705.40
        BXF,G3A3             @BRANCH IF NOT ESSENTIAL             10724.23 42                    010706.40
        BR,ECTL2&.42,G3A1    @SUPPRESS OUTPUT                      4007.52 80 010715.74 02       010707.00
        BR,ECTL2&.41,G3A1    @HALT INSTEAD OF PRINT                4007.51 80 010715.74 02       010710.00
        BXCZ,G3A2            @ZERO WC BYPASS PRINTING             10717.30 42                    010711.00
        BRZ,$X2&.25,$&1.0                                             22.31 80 010712.74 06       010711.40
        SX,$X2,G3A1-1.32                                           10714.05 10                    010712.40
        CNOP
        SIC,31.0                                                      37.00 80                    010713.00
              B,H1A1A                                              12767.50 00                    010713.40
        XW,0.0,0,0                                                    0.00 00 000000.00 00       010714.00
        B,G3A2                                                     10717.10 00                    010715.00
G3A1    LX,$X3,0.0%$X15¤     @GET START ADDRESS OF COMMENT            0.06 1F                    010715.40
        Z,$X2                                                         22.22 00                    010716.00
        LR,$X2,$X3                                                    23.04 70                    010716.40
G3A2    TI,1,G2D&31.0,G2D1                                         10512.00 80 010513.02 A0       010717.00
        SIC,31.0                                                      37.00 80                    010720.00
              B,G2A&.32      @GO TO HALT ROUTINE                   10355.50 00                    010720.40
        L%BU,32,8¤,G1J6,32                                         10351.00 80 040020.20 50       010721.00
        ST%BU,64,8¤,ESM1                                            4063.00 80 000000.20 D0       010722.00
        BRZ,ECTL3&.03,$&1.0   @RECHECK TIME CLOCK DISABLED          4010.03 80 010724.34 06       010723.00
G3A3    SIC,G3C1                                                   10737.40 80                    010724.00
              B,G3C                                                10731.10 00                    010724.40
        B,1.0%$X15¤                                                   1.10 0F                    010725.00
                        @
G3B     TI,9,7.0,G3AA                                                 7.00 80 010546.22 A0       010725.40
        SIC,F1D1                                                   6672.00 80                    010726.40
              B,F1D       @GO CLEAR UNDESIRED BITS OF IX 15        6667.50 00                    010727.00
        TI,16,16.0,G3AA&9.0                                          20.00 80 010557.00 A0       010727.40
G3B1    $B,0                                                          0.10 00                    010730.40
                        @
                        @CHECK FOR RESTORE OF MUL R,K2 & ABOVE
G3C     L%BU,3,3¤,ECTL2                                            4007.00 80 003300.20 50       010731.00
        L%BU,20,8¤,G3AA&4.0,44                                     10552.00 80 024026.20 50       010732.00
        SIC,G6A5                                                   12730.00 80                    010733.00
              B,G6A1                                               12712.50 00                    010733.40
        TI,9,G3AA,7.0                                              10546.00 80 000007.22 A0       010734.00
        TI,16,G3AA&9.0,16.0                                        10557.00 80 000020.00 A0       010735.00
        BZBZ,ECTL3&.12,$&1.32                                       4010.14 80 010737.74 04       010736.00
        V-I,$15,.32                                                   0.77 0D                    010737.00
G3C1    $B,0                                                          0.10 00                    010737.40
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                        @
                        @ERROR HALT AND LOOP DECISION ROUTINE
                        @
G4      BB,ECTL3&.02,G4A  @100 X LOOP IN PROGRESS          4010.02 80 010743.74 02   010740.00
        BB,ESSS&.56,G4A   @HAS LEVEL 1 LOOP BEEN SELECTED  4062.70 80 010743.74 02   010741.00
        SVA,$X15,$&.32                                     10742.77 D0               010742.00
        LVI,$X15,0                                             0.37 01               010742.40
        B,2.0%$X15¤       @NO                                  2.10 0F               010743.00
                        @SUCCESS ENTRY, CHECK FOR 100X LOOP
                        @
G4A     V&I,$X15,1.0                                           1.37 05               010743.40
        SIC,G3B1                                           10730.40 80               010744.00
                B,G4A1D                                    10772.10 00               010744.40
        BB,ECTL3&.02,G4A1C                                  4010.02 80 010766.34 02  010745.00
        B,G4A5                                             11057.10 00               010746.00
                        @
G4A1    M&1%BU¤,G4AH      @STEP ERROR COUNT                12565.00 80 000000.22 B0  010746.40
        BZB1,ECTL3&.02,G4A1A  @BR IF NOT IN PROGRESS        4010.02 80 010754.34 0C  010747.40
        LX,$X15,G3AA&24.0 @GET ADDR OF PRESENT RQST        10576.36 10               010750.40
        KV,$X15,G4AI      @SAVE ONLY HIGHEST RQST          12566.36 90               010751.00
        BXH,G4A1A&1.0     @BR TO SAVE ADDR                 10755.33 42               010751.40
        BXL,$&1.32                                         10753.72 42               010752.00
        M&1%BU¤,G4AG      @STEP PASS CNT IF HIGHEST ADDR   12564.00 80 000000.22 B0  010752.40
        B,G4A1B                                            10760.50 00               010753.40
G4A1A   M&1%BU¤,G4AG      @STEP PASS COUNT                 12564.00 80 000000.22 B0  010754.00
        SV,$X15,G4AI      @SAVE HIGHEST ADDRESS OF PRESENT LOOP 12566.37 30          010755.00
        LI%BU¤,1                                               0.01 80 430000.20 50  010755.40
        K%BU¤,G4AG        @IS THIS FIRST PASS              12564.00 80 000000.21 10  010756.40
        BZAE,$&1.0        @NO                              10760.76 C0               010757.40
        B,1.0%$X14¤       @YES                                 1.10 0E               010760.00
                        @
                        @STORE LAST ERROR IMAGE OVER PREVIOUS
                        @IF SAME TYPE PRINT
G4A1B   TI,4,G4AE,$X3                                      12554.00 80 000023.10 A0  010760.40
        LV,$X1,.32%$X3¤                                        0.42 33               010761.40
        BXV7,$&1.32       @FIRST IMAGE AFTER ORIGINAL FAILURE 10763.71 42           010762.00
        KV,$X1,4.32%$X14¤                                      4.42 9E               010762.40
        BZXE,G4A1C-.32                                     10765.72 C0               010763.00
        SIC,31.0                                               37.00 80              010763.40
                B,3.0%$X14¤  @GO STORE NEW IMAGE               3.10 0E               010764.00
        TI,4,$X3,G4AF                                          23.00 80 012560.10 A0 010764.40
        B,$&1.32                                           10767.10 00               010765.40
                        @
                        @IS PASS COUNT LESS THAN 100%EXLUP¤
G4A1C   M&1%BU¤,G4AG                                       12564.00 80 000000.22 B0  010766.00
        L%BU¤,G4AG                                         12564.00 80 000000.20 50  010767.00
        KF%BU,7,7¤,FXLUP                                    4076.00 80 007700.23 10  010770.00
        BZAL,G4A3                                          11022.76 40               010771.00
        B,G4A6                                             11063.50 00               010771.40
                        @
G4A1D   BZB,$X15&.18,G3B                                       37.22 80 010725.74 00 010772.00
        BZB1,ECTL3&.12,G3B                                  4010.14 80 010725.74 0C  010773.00
        B,G3B                                              10725.50 00               010774.00
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                        @
                        @ROUTINE TO STORE PRINT IMAGE
G4A2    SX,$X1,$X7      @XR1 HAS PRINT CW                    27.03 10                    010774.40
        LV,$X7,$X5                                           25.16 30                    010775.00
        L%BU,18,8□,$X1&.28,43  @DOES COUNT FIELD EXCEED CAPACITY  21.34 80 022025.60 50  010775.40
        LX,$X2,$R                                            11.04 10                    010776.40
        V&,$X2,$X5                                           25.04 B0                    010777.00
        KVI,$X2,G4AD                                      12454.05 04                    010777.40
        BXL,G4A2A       @BR-ENOUGH STOR AVAIL             11004.32 42                    011000.00
        KV,$X5,$X7                                           27.12 90                    011000.40
        BZXE,$&1.0                                        11002.32 C0                    011001.00
        LR,$X7,$L       @ORIGINAL IMAGE CHANGE               10.16 70                    011001.40
        LR,$X1,$L       @EXCEEDED, INSURE REFILL ZERO        10.02 70                    011002.00
        BB1,ECTL3&.01,$&1.0  @SET BYPASS BIT FOR NEXT REQUEST  4010.01 80 011003.74 0E   011002.40
        CB,$X1,G4A2&1.0                                   10775.42 48                    011003.40
                        @
                        @IS THIS ORIGINAL CW
G4A2A   KV,$X5,$X7                                           27.12 90                    011004.00
        BXE,G4A2B&.32   @YES                              11013.72 C2                    011004.40
        SX,$X1,$X2      @NO PREPARE FOR CW STORE             22.03 10                    011005.00
        LV,$X2,$X5                                           25.04 30                    011005.40
        L%BU,18,8□,$X2&.46                                   22.56 80 022000.20 50       011006.00
        BRZ,G4A2B       @BR-NO CNT IN NEW CW              11013.34 C2                    011007.00
        KVI,$X6,G4AE-1.0                                  12553.15 04                    011007.40
        BXL,$&2.0       @BR-HAVE CW STOR AVAIL            11012.32 42                    011010.00
        LR,$X2,$L       @INSURE REFILL ZERO                  10.04 70                    011010.40
        BB1,ECTL3&.01,$&1.0  @SET BYPASS BIT              4010.01 80 011012.34 0E        011011.00
        V&I,$X6,1.0     @CHANGE REFILL TO PRINT FROM STOR     1.15 05                    011012.00
        LR,$X2,$X6                                           26.04 70                    011012.40
G4A2B   SX,$X2,-1.0%$X6□ @CWS IN G4AD AREA               777777.05 16                    011013.00 C
                        @
                        @STORE IMAGE
        L%BU,8,8□,0%$X1□                                      0.00 81 010000.20 50       011013.40
        ST%BU,8,8□,0%$X5□ @ST IN G4AC AREA                    0.00 85 010000.20 D0       011014.40
        V&,$X1,H1V&4.0                                    13373.02 B0                    011015.40
        V&,$X5,H1V&4.0                                    13373.12 B0                    011016.00
        CB,$X1,G4A2B&.32                                  11013.42 48                    011016.40
        L%BU,18,8□,$X1&.46  @RETURN IF NO                    21.56 80 022000.20 50       011017.00
        BRZ,G4A2C&.32   @REFILL SPECIFIED                 11022.34 C2                    011020.00
        R,$X1                                                21.02 00                    011020.40
        B,G4A2&1.0      @GO WORK ON NEW CW                10775.50 00                    011021.00
                        @
G4A2C   LX,$X1,$X7      @RETURN                              27.02 10                    011021.40
        $B,0                                                  0.10 00                    011022.00
```

```
                                @
                                @1UOTH%EXLUP¤ PASS COMPLETE
                                @DETERMINE PRINTING
G4A3    LX,$X1,G4AF                                          12560.02 10                    011022.40
        BBZ,ECTL3&.02,$&1.0  @CLEAR 100X LOOP IN PROGRESS    4010.02 80 011024.34 06        011023.00
        BXVZ,G4A3A           @BRANCH IF 1ST ERROR ONLY ERROR 11031.31 42                    011024.00
        TI,4,G4AF,G4AF                                       12560.00 80 012554.10 A0       011024.40
        BB,ECTL1&.04,G4A3A   @MC ON                          4006.04 80 011031.34 02        011025.40
        L%BU,32,8¤,G4AL      @NO. PRINT                      12576.40 80 040000.20 50       011026.40
        ST%BU,32,8¤,0%$X1¤                                     0.00 81 040000.20 D0         011027.40
        B,G4AA               @PRINT STORED IMAGES            11254.10 00                    011030.40
        CNOP                 @RETURN FROM PRINT
G4A3A   L%BU¤,G4AG                                           12564.00 80 000000.20 50       011031.00
        SIC,$X15                                               37.00 80                     011032.00
        B,H6D                @PASS COUNT-BIN TO DEC CONV     14414.10 00                    011032.40
        ST%BU,24,8¤,G4AK1    @ST IN IMAGE                    12574.70 80 030000.20 D0       011033.00
        L%BU¤,G4AH           @ERROR COUNT                    12565.00 80 000000.20 50       011034.00
        BRZ,$&1.32                                           11036.74 C2                    011035.00
        SIC,$X15                                               37.00 80                     011035.40
        B,H6D                @BIN TO DEC CONV                14414.10 00                    011036.00
        C0111%BU,8,8¤,F4AA                                    7743.00 80 010000.16 70       011036.40
        ST%BU,32,8¤,G4AK                                     12573.00 80 040000.20 D0       011037.40
        CNOP                                                   0.30 00                      011040.40
        BB,ECTL1&.04,G4A3C   @MC ON                          4006.04 80 011045.74 02        011041.00
        SIC,31.0                                               37.00 80                     011042.00
        B,H1A                                                12747.10 00                    011042.40
G4A3B   XW,G4AK,26.0                                         12573.00 00 000640.00 00       011043.00
        SIC,F3A2B                                             7063.40 80                     011044.00
        B,F3A2A              @CLEAR IMAGE AREA               7060.50 00                     011044.40
        B,G4A4A                                              11055.10 00                    011045.00
G4A3C   LX,$X1,G4A3B         @STORE COMMENT IN IMAGE AREA    11043.02 10                    011045.40
        SX,$X1,G4B2                                          11076.03 10                    011046.00
        SIC,31.0                                               37.00 80                     011046.40
        B,G4B3                                               11100.50 00                    011047.00
        TI,4,$X3,G4AF                                          23.00 80 012554.10 A0        011047.40
        B,G4A5                                               11057.10 00                    011050.40
                                @
                                @
                                @CHECK FOR ERROR HALT, LOOP, OPTIONS
                                @
G4A4    BB,ECTL2&.41,$&2.0                                    4007.51 80 011053.34 02        011051.00
        SIC,31.0                                               37.00 80                     011052.00
        B,G1G                @ERROR HALT                     10261.50 00                    011052.40
        SIC,31.0                                               37.00 80                     011053.00
        B,G1E                @LOOP ON ERROR                  10253.50 00                    011053.40
        B,G4A6                                               11063.50 00                    011054.00
        NOP                                                    0.30 00                      011054.40
G4A4A   SIC,31.0                                               37.00 80                     011055.00
        B,G1F                @100 X LOOP                     10256.50 00                    011055.40
        B,G4A6-1.0                                           11062.50 00                    011056.00
        NOP                                                    0.30 00                      011056.40
G4A5    SIC,31.0                                               37.00 80                     011057.00
        B,G1A                                                10237.50 00                    011057.40
        B,G4A6                                               11063.50 00                    011060.00
        NOP                                                    0.30 00                      011060.40
        SIC,G3C1                                             10737.40 80                    011061.00
        B,G3C                                                10731.10 00                    011061.40
        B,1.0%$X15¤          @RETURN TO CONTINUE               1.10 0F                      011062.00
        BB1,ECTL3&.02,$&1.0                                   4010.02 80 011063.74 0E        011062.40
G4A6    SIC,G3C1                                             10737.40 80                    011063.40
        B,G3C                                                10731.10 00                    011064.00
        B,0.0%$X15¤          @RETURN TO LOOP ADDRESS           0.10 0F                      011064.40
```

```
                                @
                                @ENTRY FOR NORMAL COMMENT PRINT
                                @
G4B     SIC,G3B1                                        10730.40 80                    011065.00
                B,G4A1D                                 10772.10 00                    011065.40
        TI,1,2.0%$X15¤,G4B2                                 2.00 8F 011076.02 A0       011066.00
        CNOP
        SIC,$X15                                           37.00 80                    011067.00
                B,G1F           @100X LOOP ON           10256.50 00                    011067.40
        SIC,$X14                                           36.00 80                    011070.00
                B,G4A1          @YES--STEP COUNT        10746.50 00                    011070.40
        BB,ECTL3&.02,$-1.0      @LOOP IF ALREADY IN PROGRESS 4010.02 80 011070.34 02   011071.00
G4B1    BB,ECTL1&.04,$&1.32     @MC ON                   4006.04 80 011073.74 02       011072.00
        B,$&2.0                                         11075.10 00                    011073.00
                SIC,31.0                                   37.00 80                    011073.40
        B,G4B3                                          11100.50 00                    011074.00
                B,G4B4                                  11106.50 00                    011074.40
        SIC,31.0                                           37.00 80                    011075.00
                B,H1A           @NORMAL COMMENT PRINT   12747.10 00                    011075.40
G4B2    XW,0.0,0,0                                          0.00 00 000000.00 00       011076.00
        BB,ECTL3&.02,G4A6                                4010.02 80 011063.74 02       011077.00
        B,G4A4                                          11051.10 00                    011100.00
                                @
G4B3    BB,ECTL3&.01,G4B4-.32   @IMAGE STORAGE FULL      4010.01 80 011106.34 02       011100.40
        TI,4,G4AF,$X3           @NO--SET UP TO ST IMAGE 12554.00 80 000023.10 A0       011101.40
        LX,$X1,G4B2                                     11076.02 10                    011102.40
        SIC,G4A2C&.32                                   11022.00 80                    011103.00
                B,G4A2          @GO STORE IMAGE         10774.50 00                    011103.40
        SX,$X1,G4B2                                     11076.03 10                    011104.00
        TI,2,G4B2-1.0,0%$X3¤                            11075.00 80 000000.04 A3       011104.40
        V&I,$X3,2.0                                         2.07 05                    011105.40
        B,0%$X15¤                                           0.10 0F                    011106.00
                                @
G4B4    TI,4,$X3,G4AE                                      23.00 80 012554.10 A0       011106.40
        KVI,$X3,G4AB-5.0        @CHECK STORAGE AREA FULL 11347.07 04                   011107.40
        BXH,G4B5                                        11112.33 42                    011110.00
        KVI,$X4,G4AC-3.0                                11451.11 04                    011110.40
        BXH,G4B5                                        11112.33 42                    011111.00
        B,$&1.32                                        11113.10 00                    011111.40
G4B5    BB1,ECTL3&.01,$&1.0                              4010.01 80 011113.34 0E       011112.00
        B,G4A5                                          11057.10 00                    011113.00
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```
                                @
                                @ENTRY FOR COMPOSIT DEPOSIT PRINT
                                @
G4C     SIC,G3B1                                        10730.40 80                    011113.40
              B,G4A1D           @SAVE PANEL             10772.10 00                    011114.00
        TI,1,2.%$X15¤,G4C2      @COMMENT CW                 2.00 8F 011125.02 A0       011114.40
        CNOP                                                0.30 00                    011115.40
        SIC,$X15                                           37.00 80                    011116.00
              B,G1F             @CHECK FOR 100X LOOP SELCTN 10256.50 00                011116.40
        SIC,$X14                                           36.00 80                    011117.00
              B,G4A1            @YES-STEP COUNT          10746.50 00                    011117.40
        BB,ECTL3.2,$-1.         @100X LOOP IN PROGRSS     4010.02 80 011117.34 02       011120.00
G4C1    BB,ECTL1.4,$&1.32       @MC ON                    4006.04 80 011122.74 02       011121.00
        B,$&2.0                                         11124.10 00                    011122.00
              SIC,31.0                                  -37.00 80                    011122.40
        B,G4C3                                          11127.50 00                    011123.00
              B,G4B4                                    11106.50 00                    011123.40
        SIC,31.0                                           37.00 80                    011124.00
              B,H2A       @COMPOSIT DEPOSIT PRINT      13571.10 00                    011124.40
G4C2    XW,0.0,0,0                                          0.00 00 000000.00 00       011125.00
        BB,ECTL3.2,G4A6         @100X LOOP IN PRGRSS      4010.02 80 011063.74 02       011126.00
        B,G4A4                                          11051.10 00                    011127.00
                                @
G4C3    BB,ECTL3.1,G4B4-.32     @STORG AREA FULL          4010.01 80 011106.34 02       011127.40
        TI,4,G4AE,$X3                                   12554.00 80 000023.10 A0       011130.40
        LX,$X1,G4C2                                     11125.02 10                    011131.40
        R,$X1                                              21.02 00                    011132.00
        SIC,G4A2C&.32                                   11022.00 80                    011132.40
                    B,G4A2                              10774.50 00                    011133.00
        SX,$X1,0%$X4¤                                       0.03 14                    011133.40
        TI,1,G4C2-1.0,0%$X3¤                            11124.00 80 000000.02 A3       011134.00
        L%BU,28,8¤,G4C2,18                              11125.00 80 034011.20 50       011135.00
        LX,$X1,$R                                          11.02 10                    011136.00
        SR,$X1,$X2                                         22.03 70                    011136.40
        TI,2,1.0%$X2¤,$L                                    1.00 82 000010.04 A0       011137.00
        CM0111%BU¤,1.0%$X4¤,64                              1.00 84 000040.16 F0       011140.00
        CM0111%BU¤,2.0%$X4¤                                 2.00 84 000000.16 F0       011141.00
        LR,$X1,$X4                                         24.02 70                    011142.00
        SX,$X1,1.0%$X3¤                                     1.03 13                    011142.40
        V&I,$X3,2.0                                         2.07 05                    011143.00
        V&I,$X4,3.0                                         3.11 05                    011143.40
        B,0%$X15¤                                           0.10 0F                    011144.00
```

```
                                @
                                @ENTRY FOR BINARY WORD PRINT
                                @
G4D     SIC,G3B1                                                10730.40 80                    011144.40
                B,G4A1D                                         10772.10 00                    011145.00
        TI,2,2,0%$X15¤,G4D2                                         2.00 8F 011156.04 A0       011145.40
        CNOP                                                        0.30 00                    011146.40
        SIC,$X15                                                   37.00 80                    011147.00
                B,G1F           @100X LOOP ON                   10256.50 00                    011147.40
        SIC,$X14                                                   36.00 80                    011150.00
                B,G4A1          @YES--STEP COUNT                10746.50 00                    011150.40
        BB,ECTL3&.02,$-1.0      @BR IF 100X LOOP IN PROGRSS      4010.02 80 011150.34 02       011151.00
G4D1    BB,ECTL1&.04,$&1.32     @MC ON                           4006.04 80 011153.74 02       011152.00
        B,$&2.0                                                 11155.10 00                    011153.00
                SIC,31.0                                           37.00 80                    011153.40
        B,G4D3                                                  11161.50 00                    011154.00
                B,G4B4                                          11106.50 00                    011154.40
        SIC,31.0                                                   37.00 80                    011155.00
                B,H3A           @BINARY WORD PRINT              13712.10 00                    011155.40
G4D2    XW,0.0,0,0                                                  0.00 00 000000.00 00       011156.00
        XW,0.0,0,0                                                  0.00 00 000000.00 00       011157.00
        BB,ECTL3&.02,G4A6       @100X LOOP IN PROGRSS            4010.02 80 011063.74 02       011160.00
        B,G4A4                                                  11051.10 00                    011161.00
                                @
G4D3    BB,ECTL3&.01,G4B4-.32   @IMAGE STOR FULL                 4010.01 80 011106.34 02       011161.40
        TI,4,G4AF,$X3                                           12554.00 80 000023.10 A0       011162.40
        LX,$X1,G4D2&1.0                                         11157.02 10                    011163.40
        SIC,G4A2C&.32                                           11022.00 80                    011164.00
                B,G4A2                                          10774.50 00                    011164.40
        SX,$X1,2.0%$X3¤                                             2.03 13                    011165.00
        LR,$X1,G4D2                                             11156.02 70                    011165.40
        SR,$X1,$X2                                                 22.03 70                    011166.00
        L%BU¤,0%$X2¤                                                0.00 82 000000.20 50       011166.40
        CM0111%BU¤,0%$X4¤                                           0.00 84 000000.16 F0       011167.40
        L%BU,28,8¤,G4D2&.18                                     11156.22 80 034000.20 50       011170.40
        LX,$X1,G4D2                                             11156.02 10                    011171.40
        V&,$X1,$X4                                                 24.02 B0                    011172.00
        SX,$X1,1.0%$X3¤                                             1.03 13                    011172.40
        TI,1,G4D2-1.0,0%$X3¤                                    11155.00 80 000000.02 A3       011173.00
        V&I,$X3,3.0                                                 3.07 05                    011174.00
        V&I,$X4,1.0                                                 1.11 05                    011174.40
        B,0%$X15¤                                                   0.10 0F                    011175.00
```

```
                                    @
                                    @ENTRY FOR OCTAL HEX DUMP
                                    @
G4E     SIC,G3B1                                                10730.40 80                    011175.40
                B,G4A1D                                         10772.10 00                    011176.00
        TI,2,2.0%$X15¤,G4E2                                         2.00 8F 011207.04 A0       011176.40
        ¢NOP                                                        0.30 00                    011177.40
        SIC,$X15                                                   37.00 80                    011200.00
                B,G1F           @100X LOOP ON                   10256.50 00                    011200.40
        SIC,$X14                                                   36.00 80                    011201.00
                B,G4A1          @YES--STEP COUNT                10746.50 00                    011201.40
        BB,ECTL3&.02,$-1.0      @BR IF 100X LOOP IN PROGRSS      4010.02 80 011201.34 02       011202.00
G4E1    BB,ECTL1&.04,$&1.32     @MC ON                           4006.04 80 011204.74 02       011203.00
        B,$&2.0                                                 11206.10 00                    011204.00
                SIC,31.0                                           37.00 80                    011204.40
        B,G4E3                                                  11212.50 00                    011205.00
                B,G4B4                                          11106.50 00                    011205.40
        SIC,31.0                                                   37.00 80                    011206.00
                B,H4A           @OCTAL HEX DUMP                 13763.10 00                    011206.40
G4F2    XW,0.0,0,0                                                  0.00 00 000000.00 00       011207.00
        XW,0.0,0,0                                                  0.00 00 000000.00 00       011210.00
        BB,ECTL3&.02,G4A6       @100X LOOP IN PROGRESS           4010.02 80 011063.74 02       011211.00
        B,G4A4                                                  11051.10 00                    011212.00
                                    @
G4F3    BB,ECTL3&.01,G4B4-.32   @IMAGE STOR FULL                 4010.01 80 011106.34 02       011212.40
        TI,4,G4AE,$X3                                           12554.00 80 000023.10 A0       011213.40
        LX,$X1,G4F2&1.0                                         11210.02 10                    011214.40
        SIC,G4A2C&.32                                           11022.00 80                    011215.00
                B,G4A2                                          10774.50 00                    011215.40
        SX,$X1,2.0%$X3¤                                             2.03 13                    011216.00
        TI,1,G4F2-1.0,0%$X3¤                                    11206.00 80 000000.02 A3       011216.40
        LX,$X1,G4F2                                             11207.02 10                    011217.40
        BXCZ,$&1.32                                             11221.70 42                    011220.00
        KCI,$X1,4                                                   4.03 0A                    011220.40
        BZXH,$&1.0                                              11222.33 40                    011221.00
        LCI,$X1,4                                                   4.03 02                    011221.40
        T,$X1.0%$X1¤.0%$X4¤                                         0.00 81 000000.02 24       011222.00
        LV,$X1,$X4                                                 24.02 30                    011223.00
        SX,$X1,1.0%$X3¤                                             1.03 13                    011223.40
        SVA,$X1,$&.32                                           11224.43 D0                    011224.00
        V&I,$X4,4.0                                                 4.11 05                    011224.40
        V&I,$X3,3.0                                                 3.07 05                    011225.00
        B,0%$X15¤                                                   0.10 0F                    011225.40
```

```
                                @
                                @ENTRY FOR REGISTER COMPARE PRINT
                                @
G4F     SIC,G3B1                                        10730.40 80                 011226.00
              B,G4A1D                                   10772.10 00                 011226.40
        TI,2,2,0%$X15¤,G4F2                                2.00 8F 011237.04 A0     011227.00
        CNOP
        SIC,31,0                                          37.00 80                 011230.00
              B,G1F       @100 X LOOP                 10256.50 00                 011230.40
        SIC,$X14                                          36.00 80                 011231.00
              B,G4A1      @YES--STEP COUNT            10746.50 00                 011231.40
        BB,ECTL3&,02,$-1,0  @100X LOOP IN PROGRESS     4010.02 80 011231.34 02     011232.00
G4F1    BB,ECTL1&,04,$&1,32                            4006.04 80 011234.74 02     011233.00
        B,$&2,0                                     11236.10 00                    011234.00
              SIC,31,0                                  37.00 80                 011234.40
        B,G4F3                                      11242.50 00                    011235.00
              B,G4B4                                11106.50 00                    011235.40
        SIC,31,0                                          37.00 80                 011236.00
              B,H5A       @REGISTER COMPARE PRINT     14151.50 00                 011236.40
G4F2    XW,0,0,0                                          0.00 00 000000.00 00     011237.00
        XW,0,0,0                                          0.00 00 000000.00 00     011240.00
        BB,ECTL3&,02,G4A6   @100X LOOP IN PROGRESS     4010.02 80 011063.74 02     011241.00
        B,G4A4                                      11051.10 00                    011242.00
                                @
G4F3    BB,ECTL3&,01,G4B4-,32  @BR IF IMAGE STOR FULL  4010.01 80 011106.34 02     011242.40
        TI,4,G4AE,$X3                                  12554.00 80 000023.10 A0     011243.40
        LX,$X1,G4F2&1,0                                11240.02 10                  011244.40
        SIC,G4A2C&,32                                  11022.00 80                  011245.00
              B,G4A2                                   10774.50 00                  011245.40
        SX,$X1,2,0%$X3¤                                    2.03 13                  011246.00
        TI,1,G4F2-1,0,0%$X3¤                           11236.00 80 000000.02 A3     011246.40
        LX,$X1,G4F2                                    11237.02 10                  011247.40
        SC,$X1,$X2                                        22.03 50                  011250.00
        TI,2,0%$X2¤,0%$X4¤                                 0.00 82 000000.04 A4     011250.40
        IC,$X1,$X4                                        24.02 50                  011251.40
        SX,$X1,1,0%$X3¤                                    1.03 13                  011252.00
        V&I,$X3,3,0                                        3.07 05                  011252.40
        V&I,$X4,2,0                                        2.11 05                  011253.00
        B,0%$X15¤                                          0.10 0F                  011253.40
                                @
                                @
G4AA    DR%BU¤,%64¤     @SIC,B,EPNC-&CW-S                100.00                  011254.00
G4AB    DR%BU¤,%64¤     @INFORMATION                     100.00                  011354.00
G4AC    DR%BU¤,%512¤    @PRINT IMAGES                   1000.00                  011454.00
G4AD    DR%BU¤,%64¤     @ADDITNL CTL WRDS                100.00                  012454.00
G4AE    DR%BU,64,8¤,4                                      4.00                  012554.00
G4AF    DR%BU,64,8¤,4                                      4.00                  012560.00
G4AG    DD%BU¤,0                                  000000000000000000000000       012564.00
G4AH    DD%BU¤,0                                  000000000000000000000000       012565.00
G4AI    XW,0,0,0                                          0.00 00 000000.00 00     012566.00
G4AJ    XW,G4AA,0,0                                 11254.00 00 000000.00 00       012567.00
        XW,G4AB,0,0                                 11354.00 00 000000.00 00       012570.00
        XW,G4AC,0,0                                 11454.00 00 000000.00 00       012571.00
        XW,G4AD,0,0                                 12454.00 00 000000.00 00       012572.00
G4AK    %IQSZ¤DD%BU,8,8¤,XXXX ERRORS IN Z                                          012573.00
G4AK1   %IQSZ¤DD%BU,8,8¤,XXX PASSES,7                                              012574.70
G4AL    B,G4A3A                                     11031.10 00                    012576.40
```

```
                                @
                                @MEMORY COMPARE ROUTINE
                                @
G5A     SIC,G3B1                                    10730.40 80                012577.00
                B,G3B                               10725.50 00                012577.40
G5A1    LX,$X6,0.0%$X15¤                              0.14 1F                  012600.00
        LV,$X4,EQMEM                                4025.10 30                 012600.40
        V-I,$X4,%8¤4000.                            4000.11 0D                 012601.00
        KCI,X$6,%8¤4000.    @ONLY 4000 REGISTER     4000.03 0A                 012601.40 **V    $
        BZXH,$&1.0          @WILL BE COMPARED       12603.33 40                012602.00
        LCI,$X6,%8¤4000.                            4000.15 02                 012602.40
        BB,G5BS6,G5B7       @WAITING FOR COMPARE    12656.00 80 012610.74 02   012603.00
        SX,$X6,G5BM1        @NO                     12657.15 10                012604.00
        SV,$X4,G5BM3                                12661.11 30                012604.40
        I,$X6,0.0%$X6¤,0.0%$X4¤                       0.00 86 000000.14 24     012605.00
        BB1,G5BS6,G5A3      @SET IND TO WAIT COMPARE 12656.00 80 012607.34 0E  012606.00
G5A3    SIC,G3C1                                    10737.40 80                012607.00
                B,G3C                               10731.10 00                012607.40
G5A4    B,1.0%$X15¤                                   1.10 0F                  012610.00
G5B7    SX,$X6,G5BM2                                12660.15 10                012610.40
        BB1,G5BS6&0.1,G5B5                          12656.01 80 012617.34 0E   012611.00
        B,G5B5                                      12617.10 00                012612.00
G5B     Z,G5BR1                                     12677.22 00                012612.40
        TI,9,7.0,G3AA                                 7.00 80 010546.22 A0     012613.00
        V-I,$X15,1.0                                  1.37 0D                  012614.00
        SVA,$X15,$&.32                              12615.37 D0                012614.40
        LVI,$X15,0.0                                  0.37 01                  012615.00
        SIC,G3B1                                    10730.40 80                012615.40
                B,G3B&2.0                           10727.50 00                012616.00
        CNOP                                          0.30 00                  012616.40
G5B5    SIC,31.0                                     37.00 80                  012617.00
                B,H1A1A2    @PRINT HEADING          12754.10 00                012617.40
        XW,G5B6,14,G5A7                             12664.00 00 000340.25 BE   012620.00
        Z,G5BR4                                     12705.22 00                012621.00
        LX,$X2,G5BM1                                12657.04 10                012621.40
        SC,$X2,$X1                                    21.05 50                 012622.00
        LC,$X1,$X1                                    21.02 50                 012622.40
        LV,$X1,G5BM3                                12661.02 30                012623.00
G5B1    L%BU,64,8¤,0%$X2¤                             0.00 82 000000.20 50     012623.40
        KE%BU,64,8¤,0%$X1¤                            0.00 81 000000.23 10     012624.40
        BAE,G5B2            @COMPARE                12640.36 C2                012625.40
        ST%BU,64,8¤,G5B9                            12663.00 80 000000.20 D0   012626.00
        L%BU,64,8¤,0%$X1¤                             0.00 81 000000.20 50     012627.00
        ST%BU,64,8¤,G5B8                            12662.00 80 000000.20 D0   012630.00
        LVI,$X5,G5B8                                12662.13 01                012631.00
        LC,$X4,$X5                                    25.10 50                 012631.40
        SV,$X2,$X4                                    24.05 30                 012632.00
        LRI,$X4,0.0                                   0.11 03                  012632.40
        SX,$X4,G5B3                                 12635.11 10                012633.00
        Z,G5B3&1.0                                  12636.22 00                012633.40
```

```
        CNOP
        SIC,31,0                                              37.00 80                        012634.00
                  B,H5A4      @PRINT REGS THAT DONT COMPARE   14156.50 00                     012634.40
G5B3    XW,0,0,0,0                                            0.00 00 000000.00 00            012635.00
        XW,0,0,0,0                                            0.00 00 000000.00 00            012636.00
        M&1%BU,16,1¤,G5BR4                                    12705.00 80 020100.22 B0        012637.00
G5B2    V&I,$X1,1,0                                           1.03 05                         012640.00
        CB&,$X2,G5B1                                          12623.45 48                     012640.40
G5B12   B,G5C1                                                12651.50 00                     012641.00
        CNOP                                                  0.30 00                         012641.40
G5B13   SIC,$X15                                              37.00 80                        012642.00
        B,H1A1A2                   @TO COMMENT PRINT          12754.10 00                     012642.40
        XW,G5BR1,4,G5BR2,4                                    12677.00 40 000100.25 C0        012643.00
        SIC,G3C1                                              10737.40 80                     012644.00
                  B,G3C                                       10731.10 00                     012644.40
        BBZ,G5BS6&0,1,G5B4                                    12656.01 80 012647.74 06        012645.00
        BBZ,G5BS6,$&1,0                                       12656.00 80 012647.34 06        012646.00
        B,1,0%$X15¤                                           1.10 0F                         012647.00
G5B4    LX,$X6,G5BM2                                          12660.14 10                     012647.40
        BBZ,G5BS6,G5A1&,32                                    12656.00 80 012600.74 06        012650.00
        B,G5A1&,32                                            12600.50 00                     012651.00
G5C1    Z,$R                                                  11.22 00                        012651.40
        L%BU,16,1¤,G5BR4,1                                    12705.00 80 020100.60 50        012652.00
        SIC,H6B1                                              14311.40 80                     012653.00
                  B,H6B -1,  @GO ENCODE NO OF FAILURES        14277.50 00                     012653.40
        ST%BU,32¤,G5BR1,16                                    12677.00 80 040010.20 D0        012654.00
        B,G5B13                                               12642.10 00                     012655.00
        CNOP                                                  0.30 00                         012655.40
G5BS6   DD%BU,64,8¤,%8¤1000                                   0000000000000000001000          012656.00
G5BM1   DD%BU,64,8¤,0                                         0000000000000000000000          012657.00
G5BM2   DD%BU,64,8¤,0                                         0000000000000000000000          012660.00
G5BM3   DD%BU,64,8¤,0                                         0000000000000000000000          012661.00
G5B8    DD%BU,64,8¤,0                                         0000000000000000000000          012662.00
G5B9    DD%BU,64,8¤,0                                         0000000000000000000000          012663.00
G5B6    %IQSZ¤DD%BU,64,8¤,MEMORY COMPAREZ                                                     012664.00
G5A6    %IQS*¤DD%BU,8,8¤,ADDRESS        ORIGINAL CONTENTS *                                   012665.60
        %IQSZ¤DD%BU,64,8¤,               ALTERED CONTENTSZ                                    012671.60
G5A7    XW,G5A6,62                                            12665.60 00 001740.00 00        012676.00
G5BR1   DD%DU¤,0                                              0000000000000000000000          012677.00
G5BR2   XW,G5BR3,28,0                                         12701.00 00 000700.00 00        012700.00
G5BR3   %IQSZ¤DD%BU,64,8¤, REGISTERS FAILED TO COMPAREZ                                       012701.00
        CNOP                                                  0.30 00                         012704.40
G5BR4   DD%BU,64,8¤,0.0                                       0000000000000000000000          012705.00
G5BR5   DD%BU,64,8¤,%8¤240                                    0000000000000000000240          012706.00
G5BR10  XW,0.48,4,0                                           0.60 00 000100.00 00            012707.00
G5BR11  XW,0.32,4,0                                           0.40 00 000100.00 00            012710.00
G5BR12  VF,0.04                                               0.04&                           012711.00
G5BR13  VF,0.08                                               0.10&                           012711.40
G5BR14  VF,0.03                                               0.03&                           012712.00
```

```
                        @ROUTINE TO CLEAR INDICATOR SET
                        @WHILE IN DCP, EOP & TS EXCEPTED
                        @
                        @
                        @ROUTINE TO ZERO THE INDICATOR REGISTER
                        @
G6A1    BR1,ECTL3&.13,$&1.0     ZERO SELECTED INDICATORS?      4010.15 80 012713.74 0E    012712.40
        C0010%BU,48,8□,$IND,16  @GET NEW IND CHECK INTERRUBTIBLE TO SEE IF ANY CHANGE IN   13.00 80 060010.04 70    012713.40
        BRZ,G6A5                @BR=NO CHANGE IN INDS          12730.34 C2                012714.40
        ST%BU,48□,G6AC,16                                      12737.00 80 060010.20 D0    012715.00
        B,$&2.32                                               12720.50 00                012716.00
G6A     SVA,$X15,G6A5           SAVE RETURN ADDRESS            12730.37 D0                012716.40
        BRZ,ECTL3&.13,$&1.0     CHECK "ZERO SEL. INDS" BIT & SET TO ZERO.  4010.15 80 012720.34 06    012717.00
        Z,G6AC                                                 12737.22 00                012720.00
        SX,$X1,G6AA             STORE HALT CONTROL INDICATOR   12735.03 10                012720.40
        LX,$X1,G6AD             PREPARE FOR 2D PASS LOOP       12740.02 10                012721.00
        TI,1,G6AB,G6A3                                         12736.00 80 012724.02 A0    012721.40
G6A2    BR,ECTL3&.13,G6A6                                      4010.15 80 012730.74 02    012722.40
        CNOP                                                   0.30 00                    012723.40
G6A3    BMKZ,$&.32              SET INDICATOR TO ZERO          12724.40 46                012724.00
        NOP                                                    0.30 00                    012724.40
        M&1%BU,6□,G6A3&.19      ADD ONE TO IND. BIT ADDR.      12724.23 80 006000.22 B0    012725.00
        CB,$X1,G6A2             20 TIMES THROUGH LOOP          12722.42 48                012726.00
G6A4    TI,1,G6AC,$IND                                         12737.00 80 000013.02 A0    012726.40
        LX,$X1,G6AA                                            12735.02 10                012727.40
G6A5    $B,0                                                   0.10 00                    012730.00
G6A6    V&,$X1,H1V&1.0                                         13370.02 B0                012730.40
        KV,$X1,H1V&3.0                                         13372.02 90                012731.00
        BXE,G6A3&1.0                                           12725.32 C2                012731.40
        KV,$X1,F1BV1                                           6124.02 90                 012732.00
        BXE,G6A3&1.0                                           12725.32 C2                012732.40
        BR,$L&.63%$X1□,G6A3                                    10.77 81 012724.34 02      012733.00
        B,G6A3&1.0                                             12725.10 00                012734.00
                        @
G6AA    XW,0,0,0                                               0.00 00 000000.00 00       012735.00
G6AB    BMKZ,G6A3&.32                                          12724.40 46                012736.00
                        NOP                                    0.30 00                    012736.40
G6AC    DD%BU□,0                                               00000000000000000000000    012737.00
G6AD    XW,0,20,0                                              0.00 00 000500.00 00       012740.00
                        @
                        @
                        @ROUTINE TO RESTORE INT TABLE
                        @
G6B     SX,$X15,G6BA                                           12745.37 10                012741.00
        LX,$X15,G6BB                                           12746.36 10                012741.40
        T,$X15,F6T,EINT                                        7761.00 80 004100.36 20    012742.00
        SV,$X15,2,0                                            2.37 30                    012743.00
        LX,$X15,G6BA                                           12745.36 10                012743.40
        B,0,0%$X15□                                            0.10 0F                    012744.00
                        @
G6BA    XW,0,0,0                                               0.00 00 000000.00 00       012745.00
G6BB    XW,EINT,48,0                                           4100.00 00 001400.00 00    012746.00
```

```
                                    @
                                    @ENTRY FOR NORMAL COMMENT PRINT
                                    @
H1A     SIC,H1A1B1                                      13003.40 80                    012747.00
                B,H1A1B                                 13000.50 00                    012747.40
        SIC,31.0                                           37.00 80                    012750.00
                B,G1L           @CHECK FOR PROGRAM ABANDONMENT  10342.10 00            012750.40
        BB7,ECTL3&.10,$&1.32                             4010.12 80 012752.74 06       012751.00
        B,$&1.32                                        12753.50 00                    012752.00
        SIC,H6E1                                        14450.00 80                    012752.40
                B,H6E           @GO TO PRINT PASS IDENT 14435.10 00                    012753.00
        B,$&1.32                                        12755.10 00                    012753.40
H1A1A2  SIC,H1A1B1                                      13003.40 80                    012754.00
                B,H1A1B                                 13000.50 00                    012754.40
        LX,$X15,H1AA&24.0                               13441.36 10                    012755.00
        LX,$X1,0.0%$X15¤                                   0.02 1F                     012755.40
        SX,$X1,H1A1                                     12765.03 10                    012756.00
        BXC7,H1A1&1.0           @BYPASS ON ZERO COUNT   12766.30 42                    012756.40
        L%BU,64,8¤,0.0%$X15¤,64                            0.00 8F 000040.20 50        012757.00
        LX,$X2,G2D&24.0                                 10503.04 10                    012760.00
        SIC,31.0                                           37.00 80                    012760.40
                B,H1A2          @BYPASS OR HALT INSTEAD OF PRINT 13011.50 00           012761.00
        B,H1A1&1.0                                      12766.10 00                    012761.40
                NOP             @BYPASS                    0.30 00                    012762.00
        BB1,ECTL3&.06,$&1.0                              4010.06 80 012763.74 0E       012762.40
        CNOP                                               0.30 00                    012763.40
        SIC,31.0                                           37.00 80                    012764.00
                B,H1A3          @PRINT                  13022.50 00                    012764.40
H1A1    XW,0.0.0.0                                         0.00 00 000000.00 00        012765.00
        SIC,H1A1C1                                      13011.00 80                    012766.00
                B,H1A1C                                 13004.10 00                    012766.40
        B,1.0%$X15¤                                        1.10 0F                     012767.00
                                    @
                                    @
                                    @ENTRY FROM DCP FOR TW PRIORITY
H1A1A   SIC,H1A1B1                                      13003.40 80                    012767.40
                B,H1A1B                                 13000.50 00                    012770.00
        LX,$X1,0.0%$X15¤                                   0.02 1F                     012770.40
        SX,$X1,H1A1A1                                   12777.03 10                    012771.00
        BXC7,H1A1&1.0           @BYPASS ON ZERO COUNT   12766.30 42                    012771.40
        L%BU¤,0.0%$X15¤,64                                 0.00 8F 000040.20 50        012772.00
        LX,$X2,G2D&24.0                                 10503.04 10                    012773.00
        SIC,31.0                                           37.00 80                    012773.40
                B,H1A2          @BYPASS OR HALT INSTEAD OF PRINT 13011.50 00           012774.00
        B,H1A1&1.0                                      12766.10 00                    012774.40
                NOP             @BYPASS                    0.30 00                    012775.00
        CNOP                                               0.30 00                    012775.40
        SIC,31.0                                           37.00 80                    012776.00
                B,H1A4          @PRINT                  13017.10 00                    012776.40
H1A1A1  XW,0.0,0,0                                         0.00 00 000000.00 00        012777.00
        B,H1A1&1.0                                      12766.10 00                    013000.00
```

```
                                @
                                @CHECK FOR SAVE OF MUL REG,K2 & ABOVE
H1A1B   TI,9,7.0,H1AA                                    7.00 80 013411.22 A0     013000.40
        SIC,F1D1                                      6672.00 80                  013001.40
                B,F1D           @GO CLEAR UNDESIRED BITS OF IX 15  6667.50 00     013002.00
        TI,16,16.0,H1AA&9.0                             20.00 80 013422.00 A0     013002.40
H1A1B1  $B,0                                             0.10 00                  013003.40
                                @
                                @CHECK FOR RESTORE OF MUL R,K2 & ABOVE
H1A1C   L%BU,3,3¤,ECTL2                                4007.00 80 003300.20 50   013004.00
        L%BU,20,8¤,H1AA&4.0,44                        13415.00 80 024026.20 50   013005.00
        SIC,G6A5                                      12730.00 80                013006.00
                B,G6A1                                12712.50 00                013006.40
        TI,9,H1AA,7.0                                 13411.00 80 000007.22 A0   013007.00
        TI,16,H1AA&9.0,16.0                           13422.00 80 000020.00 A0   013010.00
H1A1C1  $B,0                                             0.10 00                  013011.00
                                @
                                @
                                @CHECK FOR SUPPRESS OUTPUT
                                @OR HALT INSTEAD OF PRINT
                                @
H1A2    SV,$X15,H1AB                                 13366.37 30                 013011.40
        BB,ECTL2&.42,H1A2B      @DO WE SUPPRESS OUTPUT  4007.52 80 013016.34 02   013012.00
        BZB,ECTL2&.41,H1A2B&.32                       4007.51 80 013016.74 00   013013.00
        SX,$X2,G2D1                                   10513.05 10                013014.00
        SIC,31.0                                         37.00 80                013014.40
                B,G2A&.32                             10355.50 00                013015.00
        LV,$X15,H1AB                                  13366.36 30                013015.40
H1A2B   B,0,0%$X15¤             @BYPASS PRINTING           0.10 0F               013016.00
        B,1,0%$X15¤                                        1.10 0F               013016.40
        CNOP                    @CONTINUE FOR PRINT
                                @
                                @
                                @NORMAL COMMENT PRINT ROUTINE
                                @ENTRY FROM MANUAL INTERVENTION
                                @
H1A4    SV,$X15,H1AB                                 13366.37 30                 013017.00
        BB,ECTL2&.39,H1A3       @TW NOT AVAIL-GO TRY PRNTR  4007.47 80 013022.74 02   013017.40
        LV, $X1, EDPLOC                               4010.42 30                013020.40
        BB,ADA&.46%$X1¤,H1A3    @OPS CNSL PROG - TW UNAVAILBL  10.56 81 013022.74 02   013021.00
        B,H1A5                  @GO TO PRINT ON TW    13030.50 00                 013022.00
```

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                                @
                                @ENTRY FOR PRINT-NORMAL PRIORITY
                                @
H1A3    SV,$X15,H1AB                                    13366.37 30                    013022.40
        BB,ECTL2&.40,H1B2       @BRANCH IF TAPE AVAILABLE  4007.50 80 013242.34 02     013023.00
        BZB,ECTL2&.38,H1B1      @BRANCH IF PRNTR AVAILABLE 4007.46 80 013134.74 00     013024.00
        BZB,ECTL2&.39,H1A5      @BRANCH IF TW AVAILABLE    4007.47 80 013030.74 00     013025.00
        TI,1,G2D&8.0,G2D1                                  10463.00 80 010513.02 A0     013026.00
        SIC,31,0                                              37.00 80                 013027.00
                  B,G2A&.32     @GO TO HALT                10355.50 00                 013027.40
        B,H1A3&.32              @RETURN TO NORMAL PRIORITY ENTRY 13023.10 00           013030.00
                                @
                                @
                                @ROUTINE TO SET UP TW IMAGE
                                @
H1A5    LV,$X15,H1AB                                   13366.36 30                     013030.40
        LX,$X1,0,0%$X15¤                                   0.02 1F                     013031.00
        SX,$X1,H1AE                                    13405.03 10                     013031.40
                                @
                                @SET UP IMAGE AREA FOR TRANSFER
H1A5A   Z,H1AI                                         13443.22 00                     013032.00
        TI,16,H1AI,H1AI&1.0                            13443.00 80 013444.00 A0     013032.40
        BBZ,ECTL3&.07,H1A5B  @DO WE SUPPRESS SPACE     4010.07 80 013041.74 06     013033.40
        L%BU,8,8¤,H1AC       @NO                       13403.00 80 010000.20 50     013034.40
        ST%BU,8,8¤,H1AIT                               13446.00 80 010000.20 D0     013035.40
                        NOP                                0.30 00                  013036.40
        BB,ECTL3&.08,H1A5B   @IS THIS A PGM HEADING    4010.10 80 013041.74 02     013037.00
        LV,$X2,H1V&8.0       @NO                       13377.04 30                  013040.00
        V&,$X2,ECTL1&.32     @DISPLACE IMAGE IF REQUESTED 4006.44 B0                013040.40
        B,$&1.0                                        13042.10 00                     013041.00
H1A5B   LV,$X2,H1V&4.0       @IX 2 FOR STORE IN IMAGE  13373.04 30                  013041.40
        LX,$X1,H1AE          @IX 1 FOR LOAD            13405.02 10                  013042.00
        LV,$X4,H1AE&.32                                13406.50 30                     013042.40
        BXVGZ,$&1.0                                    13044.31 C2                     013043.00
        LV,$X4,$X2                                        22.10 30                     013043.40
                                @
                                @TRANSFER IMAGE
H1A5C   L%BU,8,8¤,0,0%$X1¤                                0.00 81 010000.20 50     013044.00
        ST%BU,8,8¤,H1AIT%$X2¤                          13446.00 82 010000.20 D0     013045.00
        V&,$X1,H1V&4.0                                 13373.02 B0                     013046.00
        V&,$X2,H1V&4.0                                 13373.04 B0                     013046.40
        V&,$X4,H1V&4.0                                 13373.10 B0                     013047.00
        CB,$X1,$&1.0                                   13050.42 48                     013047.40
        B,H1A5E              @COUNT IS ZERO            13070.50 00                  013050.00
        KV,$X4,H1AB&.32      @HAVE WE REACHED 70 CHARACTERS 13366.50 90             013050.40
        BXL,H1A5C            @NO                       13044.32 42                  013051.00
        SC,$X1,H1AE                                    13405.03 50                     013051.40
        LV,$X3,$X4                                        24.06 30                     013052.00
        V&,$X3,$X4                                        24.06 B0                     013052.40
        V&,$X3,$X3                                        23.06 B0                     013053.00
        V&,$X3,$X3                                        23.06 B0                     013053.40
        V&,$X3,H1AE                                    13405.06 B0                     013054.00
        KV,$X3,H1AE          @WILL PRINT EXCEED 82 CHAR 13406.06 90                 013054.40
        BXL,H1A5C            @NO                       13044.32 42                  013055.00
        KE%BU,8,8¤,0         @YES, IS LAST CHAR A SPACE    0.00 80 010000.23 10     013055.40
        BAF,$&1.32           @YES                      13060.36 C2                  013056.40
        KVI,$X2,10.32        @HAS 83 CHARACTERS BEEN REACHED 12.45 04               013057.00
        BXL,H1A5C            @NO, CONTINUE             13044.32 42                  013057.40
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                                  @
                                  @IMAGE IS COMPLETE, DETERMINE IF MORE
                                  @PRINTING IS REQUIRED, SET CONTROLS
                                  @AND GO TO PRINT
H1A5D   L%BU,8,8¤,H1AC&.08        @YES                    13403.10 80 010000.20 50    013060.00
        ST%BU,8,8¤,H1AIT%$X2¤                             13446.00 82 010000.20 D0    013061.00
        Z,$X3                                                23.22 00                 013062.00
        LC,$X3,$X2                                           22.06 50                 013062.40
        C&I,$X3,4                                             4.07 00                 013063.00
        LVI,$X3,H1AI                                      13443.07 01                 013063.40
        SX,$X3,H1AH                                       13410.07 10                 013064.00
        SX,$X1,H1AE                                       13405.03 10                 013064.40
        BZXCZ,H1A6                @COUNT NOT ZERO         13107.70 40                 013065.00
        R,$X1                                                21.02 00                 013065.40
        LX,$X1,$X1                                           21.02 10                 013066.00
        BXVZ,H1A6A                @LAST PRINT FROM THIS REQUEST 13112.31 42           013066.40
        BXCZ,H1A6A                @SAME                   13112.30 42                 013067.00
        SX,$X1,H1AE                                       13405.03 10                 013067.40
        B,H1A6                    @MORE TO PRINT AFTER THIS IMAGE 13107.50 00         013070.00
                                  @
H1A5E   BZXF,H1A5D                @DO WE SUPPRESS SPACE   13060.23 40                 013070.40
        R,$X1                     @YES                       21.02 00                 013071.00
        LX,$X1,$X1                                           21.02 10                 013071.40
        BXCZ,H1A5E                @NO MORE REQUESTS AT THIS TIME 13075.30 42          013072.00
        BXVZ,H1A5F                @SAME                   13075.31 42                 013072.40
        SX,$X1,H1AE                                       13405.03 10                 013073.00
        KV,$X4,H1AR&.32           @HAVE WE REACHED 70 CHARACTERS 13366.50 90          013073.40
        BXH,H1A5H                 @YES                    13102.73 42                 013074.00
H1A5J   B,H1A5C                   @NO                     13044.10 00                 013074.40
                                  @
H1A5F   KV,$X4,H1AR&.32                                   13366.50 90                 013075.00
        BXH,H1A5G                                         13100.33 42                 013075.40
        BB1,ECTL3&.07,$&1.0       @SUPPRESS SPACE ON NEXT REQUEST 4010.07 80 013077.34 0E 013076.00
        SV,$X4,H1AF&.32                                   13406.51 30                 013077.00
        B,H1A5D                   @LAST PRINT FROM THIS REQUEST 13060.10 00           013077.40
                                  @
H1A5G   Z,$X4                                                24.22 00                 013100.00
        SV,$X4,H1AF&.32                                   13406.51 30                 013100.40
        BBZ,ECTL3&.07,$&1.0       @NEXT IMAGE MUST START WITH NEW LINE 4010.07 80 013102.34 06 013101.00
        B,H1A5D                   @LAST PRINT FROM THIS REQUEST 13060.10 00           013102.00
                                  @
                                  @WILL ADDED COUNT EXCEED 83 CHARACTERS
H1A5H   SC,$X1,H1AE                                       13405.03 50                 013102.40
        LV,$X3,$X4                                           24.06 30                 013103.00
        V&,$X3,$X4                                           24.06 B0                 013103.40
        V&,$X3,$X3                                           23.06 B0                 013104.00
        V&,$X3,$X3                                           23.06 B0                 013104.40
        V&,$X3,H1AE                                       13405.06 B0                 013105.00
        SX,$X1,H1AE                                       13405.03 10                 013105.40
        KV,$X3,H1AE                                       13406.06 90                 013106.00
        BXL,H1A5J                                         13074.72 42                 013106.40
        B,H1A5D                                           13060.10 00                 013107.00
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                        @
                        @ENTRY TO ISSUE TW WRITE
H1A6    SIC,H1A6C                                  13123.40 80                    013107.40
              B,H1A6B                              13116.10 00                    013110.00
        Z,$X4                                        24.22 00                    013110.40
        SV,$X4,H1AF&.32                            13406.51 30                    013111.00
        B,H1A5A         @RETURN TO PRINT MORE      13032.10 00                    013111.40
                        @
H1A6A   SIC,H1A6C                                  13123.40 80                    013112.00
              B,H1A6B                              13116.10 00                    013112.40
        Z,$X15                                       37.22 00                    013113.00
        SV,$X15,ECTL1&.32                           4006.77 30                    013113.40
        LV,$X15,H1AB                               13366.36 30                    013114.00
        BBZ,ECTL3&.08,$&1.0  @CLGAR HEADING INDICATOR 4010.10 80 013115.74 06     013114.40

        BBZ,ECTL3&.08,$&1.0  @CLEAR HEADING INDICATOR 4010.10 80 013115.74 06     013114.40
        B,1.0%$X15¤     @RETURN TO PROGRAM           1.10 0F                    013115.40
                        @
                        @WRITE COMMENT
                        @
H1A6B   LVI,$X7,19.32                                23.57 01                    013116.00
        TI,1,G2D4&1.,H1AI&1.  @PRESERVE CNSL DISPLAY 10603.00 80 013444.02 A0     013116.40
        REL%SEOP¤,0%$X7¤                              0.00 87 000000.33 00      013117.40
        SIC,H1A7A                                  13134.00 80                    013120.40
              B,H1A7                               13124.10 00                    013121.00
        W%SEOP¤,0%$X7¤,H1AH                           0.00 87 013410.13 00      013121.40
        SIC,H1A7A                                  13134.00 80                    013122.40
              B,H1A7                               13124.10 00                    013123.00
H1A6C   $B,0,0                                       0.10 00                    013123.40
                        @
                        @DELAY UNTIL COMPLETE
                        @
H1A7    LCI,$X4,%8¤777777                          777777.11 02                   013124.00
        CCW,0%$X7¤,H1AJ                               0.00 87 013464.21 00      013124.40
        BZB,H1AJ&.24,H1A7B                         13464.30 80 013127.74 00       013125.40
        CR,$X4,H1A7B&.32                           13124.50 48                    013126.40
        B,H1A7C                                    13132.10 00                    013127.00
H1A7B   CCW,0%$X7¤,H1AJ                               0.00 87 013464.21 00      013127.40
        BB,H1AJ&.18,H1A7A                          13464.22 80 013134.34 02       013130.40
        CR,$X4,H1A7B                               13127.50 48                    013131.40
H1A7C   TI,1,G2D&10.0,G2D1                         10465.00 80 010513.02 A0       013132.00
        SIC,31.0                                      37.00 80                    013133.00
              B,G2A&.32                            10355.50 00                    013133.40
H1A7A   $B,0                                         0.10 00                    013134.00
```

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                        @
                        @ROUTINE TO SET UP PRNTR IMAGE
                        @
H1B1    LV,$X15,H1AB                                    13366.36 30                    013134.40
        LX,$X1,0.0%$X15¤                                    0.02 1F                    013135.00
        SX,$X1,H1AE                                     13405.03 10                    013135.40
                        @
                        @SET UP IMAGE AREA FOR TRANSFER
H1B1A   Z,H1AI                                          13443.22 00                    013136.00
        TI,16,H1AI,H1AI&1.0                             13443.00 80 013444.00 A0       013136.40
        BBZ,ECTL3&.09,H1B1B   @DO WE SUPPRESS SPACE      4010.11 80 013146.74 06       013137.40
        L%BU,8,8¤,H1AC&.40    @NO                       13403.50 80 010000.20 50       013140.40
        BBZ,ECTL3&.17,$&1.32                             4010.21 80 013143.34 06       013141.40
        Z,$R                                                11.22 00                    013142.40
        Z,$X2                                               22.22 00                    013143.00
        NOP                                                  0.30 00                    013143.40
        BB,ECTL3&.08,H1B1C    @IS THIS A HEADING PRINT   4010.10 80 013150.74 02       013144.00
        V&,$X2,H1V&9.0        @NO                       13400.04 B0                    013145.00
        V&,$X2,ECTL1&.32                                 4006.44 B0                    013145.40
        B,H1B1D                                         13151.10 00                    013146.00
                        @
H1B1B   L%BU,8,8¤,H1AC&.32                              13403.40 80 010000.20 50       013146.40
        LV,$X2,H1AD                                     13404.04 30                    013147.40
                        @
        B,$&1.0                                         13151.10 00                    013150.00
H1B1C   V&,$X2,H1V&5.0                                  13374.04 B0                    013150.40
                        @
H1B1D   ST%BU,8,8¤,H1AI&.08   @STORE SKIP CHARACTER     13443.10 80 010000.20 D0       013151.00
        LX,$X1,H1AE           @LOAD CW                  13405.02 10                    013152.00
                        @
                        @SET UP COMMENT IN IMAGE
                        @
H1B1E   Z,$X3                                               23.22 00                    013152.40
        L%BU,7,7¤,0.01%$X1¤   @LOAD CHARACTER                0.01 81 007700.20 50       013153.00
        ST%BU,7,7¤,$X3&.12    @SET FOR INDEXING             23.14 80 007700.20 D0       013154.00
H1BA    L%BU,8,8¤,H1AT&.16%$X3¤  @LOAD CHAR FOR APPL MACHINE 13471.20 83 010000.20 50       013155.00
        ST%BU,8,8¤,H1AI%$X2¤  @STORE IN IMAGE           13443.00 82 010000.20 D0       013156.00
        V&,$X1,H1V&4.0                                  13373.02 B0                    013157.00
        V&,$X2,H1V&4.0                                  13373.04 B0                    013157.40
        CB,$X1,$&1.0                                    13161.02 48                    013160.00
        B,H1B1F               @COUNT ZERO               13204.50 00                    013160.40
                        @
        KV,$X2,H1AG           @IS CHAR COUNT 120        13407.04 90                    013161.00
        BXL,H1B1E             @NO                       13152.72 42                    013161.40
        LV,$X4,$X2                                          22.10 30                    013162.00
        V&,$X4,$X2                                          22.10 B0                    013162.40
        V&,$X4,$X4                                          24.10 B0                    013163.00
        V&,$X4,$X4                                          24.10 B0                    013163.40
        SC,$X1,$X3                                          23.03 50                    013164.00
        V&,$X4,$X3                                          23.10 B0                    013164.40
        KV,$X4,H1AG&.32       @WILL COUNT EXCEED 132 CHAR 13407.50 90                    013165.00
        BZXH,H1B1F                @NO                   13152.73 40                    013165.40
        KF%BU,8,8¤,0          @YES-IS LAST CHARACTER BLANK      0.00 80 010000.23 10       013166.00
        BAE,$&1.32            @YES                      13170.76 C2                    013167.00
        KVI,$X2,17.0          @HAS 132 CHARACTERS BEEN REACHED  21.05 04                    013167.40
        BZXH,H1B1E            @NO                       13152.73 40                    013170.00
        SX,$X1,H1AE                                     13405.03 10                    013170.40
```

```
                                    @
                                    @IMAGE COMPLETE-SET CW, END CODE, CLEAR
                                    @SUPPRESS POST-SPACE
                                    @
H1B1G   L%BU,8,8¤,H1AC&.08                                  13403.10 80 010000.20 50    013171.00
        ST%BU,8,8¤,H1AI%$X2¤                                13443.00 82 010000.20 D0    013172.00
        L%BU,8,8¤,H1AC&.56                                  13403.70 80 010000.20 50    013173.00
        ST%BU,8,8¤,H1AI                                     13443.00 80 010000.20 D0    013174.00
        V&,$X2,H1V&4.32                                     13373.44 B0                 013175.00
        Z,$X3                                                 23.22 00                  013175.40
        LC,$X3,$X2                                            22.06 50                  013176.00
        LVI,$X3,H1AI                                        13443.07 01                 013176.40
        SX,$X3,H1AH         @CW                             13410.07 10                 013177.00
        Z,$X2                                                 22.22 00                  013177.40
        SV,$X2,H1AD         @ZERO PARTIAL LINE CHARACTER COUNT 13404.05 30                013200.00
                            @
        LX,$X1,H1AE         @MORE TO PRINT AFTER THIS LINE  13405.02 10                 013200.40
        BZXCZ,H1B1H         @YES                            13227.70 40                 013201.00
        R,$X1                                                 21.02 00                  013201.40
        LX,$X1,$X1                                            21.02 10                  013202.00
        BXCZ,H1B1J          @LAST PRINT FROM THIS REQUEST   13231.30 42                 013202.40
        BXVZ,H1B1J          @SAME                           13231.31 42                 013203.00
        SX,$X1,H1AE         @MORE-STORE NEW CW              13405.03 10                 013203.40
        B,H1B1H                                             13227.50 00                 013204.00
                            @
                            @COUNT ZERO ON PRESENT CW
                            @CHECK FOR ADDITIONAL CWS
                            @
H1B1F   SX,$X1,H1AE                                         13405.03 10                 013204.40
        BZXF,H1B1G          @BRANCH IF NO SUPPRESS SPACING REQUESTED 13171.23 40        013205.00
        R,$X1                                                 21.02 00                  013205.40
        LX,$X1,$X1                                            21.02 10                  013206.00
        BXCZ,H1B1F1                                         13211.70 42                 013206.40
        BXVZ,H1B1F1                                         13211.71 42                 013207.00
        KV,$X2,H1AG                                         13407.04 90                 013207.40
        BXH,H1B1F2                                          13223.33 42                 013210.00
H1B1F3  SX,$X1,H1AE                                         13405.03 10                 013210.40
        B,H1B1F                                             13152.50 00                 013211.00
                            @
H1B1F1  KV,$X2,H1AG                                         13407.04 90                 013211.40
        BXH,H1B1G                                           13171.33 42                 013212.00
        L%BU,8,8¤,H1AC&.08                                  13403.10 80 010000.20 50    013212.40
        ST%BU,8,8¤,H1AI%$X2¤                                13443.00 82 010000.20 D0    013213.40
        L%BU,8,8¤,H1AC&.48                                  13403.60 80 010000.20 50    013214.40
        ST%BU,8,8¤,H1AI                                     13443.00 80 010000.20 D0    013215.40
        SV,$X2,H1AD                                         13404.05 30                 013216.40
        Z,$X3                                                 23.22 00                  013217.00
        V&,$X2,H1V&4.32                                     13373.44 B0                 013217.40
        LC,$X3,$X2                                            22.06 50                  013220.00
        LVI,$X3,H1AI                                        13443.07 01                 013220.40
        SX,$X3,H1AH         @CW                             13410.07 10                 013221.00
        BB1,ECTL3&.09,$&1.0  @SET SUPPRESS POST SPACE INDICATOR 4010.11 80 013222.74 0E 013221.40
        B,H1B1J             @GO TO WRITE                    13231.10 00                 013222.40
```

```
                                  @
                                  @WILL ADDED COUNT EXCEED 132 CHARACTERS
H1B1F2  LV,$X4,$X2                                                    22.10 30                    013223.00
        V&,$X4,$X2                                                    22.10 B0                    013223.40
        V&,$X4,$X4                                                    24.10 B0                    013224.00
        V&,$X4,$X4                                                    24.10 B0                    013224.40
        SC,$X1,$X3                                                    23.03 50                    013225.00
        V&,$X4,$X3                                                    23.10 B0                    013225.40
        KV,$X4,H1AG&.32                                            13407.50 90                    013226.00
        BXL,H1B1F3                                                 13210.72 42                    013226.40
        B,H1B1G                                                    13171.10 00                    013227.00
                                  @
                                  @
                                  @ENTRY TO ISSUE PRINTER WRITE
                                  @
H1B1H   SIC,H1C2A                                                  13241.40 80                    013227.40
                B,H1C2                                             13235.10 00                    013230.00
        B,H1B1A                   @RETURN TO PRINT MORE            13136.10 00                    013230.40
                                  @
H1B1J   SIC,H1C2A                                                  13241.40 80                    013231.00
                B,H1C2                                             13235.10 00                    013231.40
        Z,$X15                                                        37.22 00                    013232.00
        SV,$X15,ECTL1&.32                                          4006.77 30                    013232.40
        LV,$X15,H1AB                                               13366.36 30                    013233.00
        BBZ,ECTL3&.08,$&1.0       @CLEAR HEADING INDICATOR          4010.10 80 013234.74 06       013233.40
        B,1.0%$X15¤               @RETURN TO PROGRAM                   1.10 0F                    013234.40
                                  @
                                  @WRITE COMMENT
H1C2    LVI,$X7,18.32                                                 22.57 01                    013235.00
        REL%SEOP¤,0%$X7¤          PRINTER?                             0.00 87 000000.33 00       013235.40
        SIC,H1A7A                                                  13134.00 80                    013236.40
                B,H1A7                                             13124.10 00                    013237.00
        W%SEOP¤,0%$X7¤,H1AH       PRINTER?                             0.00 87 013410.13 00       013237.40
        SIC,H1A7A                                                  13134.00 80                    013240.40
                B,H1A7                                             13124.10 00                    013241.00
H1C2A   $B,0.0                                                        0.10 00                    013241.40
                                  @
                                  @
                                  @ROUTINE FOR TAPE OUTPUT
```

```
                @ROUTINE TO PRINT TAPE OUTPUT
H1B2    LV,$X15,H1AB                                13366.36 30                     013242.00
        LX,$X1,%$X15¤                                   0.02 1F                     013242.40
        SX,$X1,H1AE         @SAVE CW                13405.03 10                     013243.00
H1B2A   LVI,$X10,0                                      0.25 01                     013243.40
        LCI,$X10,4                                      4.25 02                     013244.00
        L,H1AITX            @LOAD TAPE BLANKS       13467.71 80 074300.20 50        013244.40
        ST%BU,60¤,H1AI%$X10¤  @STORE CONS BLANKS INTO 13443.00 8A 074000.20 D0        013245.40
        V&,$X10,H1AGT&1.0   @AT LEAST FIRST THE LOC 13466.24 B0                     013246.40
        CB,$X10,$-1.32      @IN IMAGE AREA          13245.64 48                     013247.00
        LCI,$X10,4                                      4.25 02                     013247.40
        LVI,$X10,0                                      0.25 01                     013250.00
        TI,3,H1AI%$X10¤,H1AI&3.0%$X10¤  @STORE BLANKS INTO 13443.00 8A 013446.06 AA 013250.40
        V&,$X10,3.          @THE ENTIRE IMAGE AREA      3.24 B0                     013251.40
        CB,$X10,$-1.32                          13250.64 48                     013252.00
        BBZ,ECTL3&.09,H1B2B  @BR-SUP POST SPACE REQUESTED 4010.11 80 013261.74 06 013252.40
        LI%BU¤,%8¤20        @SINGLE SPACE CHAR          0.20 80 430000.20 50        013253.40
        B7BZ,ECTL3&.17,$&2.0  @BR-NO DOUBLE SPACE REQ 4010.21 80 013256.74 04       013254.40
        LI%BU¤,%8¤12        @DBLE SPACE CHAR            0.12 80 430000.20 50        013255.40
        Z,$X2                                          22.22 00                     013256.40
        BB,ECTL3&.08,H1B2C  @BR-HEADING PRINT       4010.10 80 013263.34 02         013257.00
        V&,$X2,H1VT         @BYPASS FIRST 6 BYTES   13466.44 B0                     013260.00
        V&,$X2,ECTL1&.32                            4006.44 B0                      013260.40
        B,H1B2D                                     13263.50 00                     013261.00
                @SUP POST SPACE REQ
H1B2B   LI%BU¤,%8¤20        @SINGLE SPACE CHAR          0.20 80 430000.20 50        013261.40
        LV,$X2,H1AD         @LOAD OFFSET            13404.04 30                     013262.40
H1B2C   V&,$X2,H1VT&.32     @TWO BLANKS-HEADING     13467.04 B0                     013263.00
H1B2D   ST%BU,8¤,H1AI       @ST-CARD CNTL CHAR      13443.00 80 010000.20 D0        013263.40
        LX,$X1,H1AE         @LD CW                  13405.02 10                     013264.40
H1B2E   Z,$X3                                          23.22 00                     013265.00
        L%BU,7¤,.01%$X1¤    @LD IQS CHAR CODE           0.01 81 007000.20 50        013265.40
        ST%BU,7¤,$X3&.12    @SET TO INDEX TABLE        23.14 80 007000.20 D0        013266.40
H1B2A   L%BU,8¤,H1AT&.24%$X3¤  @LD TAPE CHAR        13471.30 83 010000.20 50        013267.40
        ST%BU,6¤,H1AI%$X2¤  @ST IN PRINT IMAGE      13443.00 82 006000.20 D0        013270.40
        V&,$X1,H1V&4.0      @STEP XR1 TO INDEX IQS CHAR 13373.02 B0                 013271.40
        V&,$X2,H1VT&1.      @STEP XR2 TO INDEX TAPE TABLE 13467.44 B0               013272.00
        CB,$X1,$&1.0                                13273.42 48                     013272.40
        B,H1B2F             @COUNT ZERO             13316.10 00                     013273.00
        KV,$X2,H1AGT                                13465.04 90                     013273.40
        BXL,H1B2E           @BR-NOT YET 110 CHAR    13265.32 42                     013274.00
        SC,$X1,$X3                                     23.03 50                     013274.40
        V&,$X3,$X3          @DOUBLE COUNT              23.06 B0                     013275.00
        V&,$X3,$X3          @DOUBLE AGAIN              23.06 B0                     013275.40
        SC,$X1,$X5                                     25.03 50                     013276.00
        V&,$X5,$X5          @DOUBLE ORIG COUNT         25.12 B0                     013276.40
        V&,$X3,$X5          @VF HAS ORIG CNT X 6       25.06 B0                     013277.00
        L%BU,18¤,$X5,-24    @VF HAS BIT CNT REQ OTHER CHAR 25.00 80 022064.20 50    013277.40 CV
        LV,$X3,$X2          @LD BIT CNT USED           22.06 30                     013300.40
        V&,$X3,$L           @ADD REQ                   10.06 B0                     013301.00
        KV,$X3,H1AGT&.32                            13465.46 90                     013301.40
        BZXH,H1B2E          @BR-TOTAL WILL NOT EXCEED 120 CHAR 13265.33 40          013302.00
        KEI%BU¤,%8¤20                                   0.20 80 430000.23 10        013302.40
        BAE,$&1.32          @BR-LAST A BLANK-TERM THIS LINE 13305.36 C2             013303.40
        KV,$X2,H1AGT&.32                            13465.44 90                     013304.00
        BZXH,H1B2E          @BR-80 CHAR NOT REACHED 13265.33 40                     013304.40
        SX,$X1,H1AE         @TERM THIS LINE         13405.03 10                     013305.00
                @THIS LINE IS COMPLETE
```

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H1B2G   KVI,$X2,%8¤11.                                    11.05 04          013305.40
        BXH,$&1.32          @BR-WRITE 15 WORDS          13307.73 42       013306.00
        LCI,$X7,9           @WRITE 9 WORDS ON THIS RECORD   11.17 02       013306.40
        B,$&1.0                                         13310.10 00       013307.00
        LCI,$X7,15                                        17.17 02        013307.40
        LVI,$X7,H1AI                                    13443.17 01       013310.00
        SX,$X7,H1AH         @ST CW FOR WRITE            13410.17 10       013310.40
        Z,$X2                                             22.22 00        013311.00
        SX,$X2,H1AD         @CLEAR PART LINE CHAR CNT   13404.05 10       013311.40

        LX,$X1,H1AE                                     13405.02 10       013312.00
        BZXCZ,H1B2H         @BR-MORE TO PRINT THIS REQ  13337.70 40       013312.40
        R,$X1                                             21.02 00        013313.00
        LX,$X1,$X1                                        21.02 10        013313.40
        BXCZ,H1B2J          @BR-LAST THIS REQ           13341.30 42       013314.00
        BXVZ,H1B2J          @BR-LAST THIS REQ           13341.31 42       013314.40
        SX,$X1,H1AE         @MORE-STORE NEW CW          13405.03 10       013315.00
        B,H1B2H                                         13337.50 00       013315.40
                    @CW CNT ZERO-CHECK NEW WORDS
H1B2F   SX,$X1,H1AE                                     13405.03 10       013316.00
        BZXF,H1B2G          @BR-NO SUP POST SPACE REQ   13305.63 40       013316.40
        R,$X1                                             21.02 00        013317.00
        LX,$X1,$X1                                        21.02 10        013317.40
        BXCZ,H1B2F1         @BR-NEW CW NOT VALID        13323.30 42       013320.00
        BXVZ,H1B2F1         @BR-NEW CW NOT VALID        13323.31 42       013320.40
        KV,$X2,H1AGT                                    13465.04 90       013321.00
        BXH,H1B2F2          @BR-ALREADY AT LEAST 110 CHAR  13331.73 42    013321.40
H1B2F3  SX,$X1,H1AE                                     13405.03 10       013322.00
        B,H1B2F             @GO START NEW CW            13265.10 00       013322.40

H1B2F1  KV,$X2,H1AGT                                    13465.04 90       013323.00
        BXH,H1B2G           @BR-ENUF CHAR ALREADY       13305.73 42       013323.40
        KVI,$X2,%8¤11.                                    11.05 04        013324.00
        BXH,$&1.32          @BR-WRITE 15 WDS            13326.33 42       013324.40
        LCI,$X7,9           @WRITE 9 WORDS                11.17 02        013325.00
        B,$&1.                                          13326.50 00       013325.40
        LCI,$X7,15                                        17.17 02        013326.00
        LVI,$X7,H1AI                                    13443.17 01       013326.40
        SX,$X7,H1AH         @ST CW FOR WRITE            13410.17 10       013327.00
        SV,$X2,H1AD         @SAVE OFFSET                13404.05 30       013327.40
        BB1,ECTL3&.09,$&1.0  @SET SUP POST SPACE BIT     4010.11 80 013331.34 0E  013330.00
        B,H1B2J             @GO TO WRITE                13341.10 00       013331.00
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H1B2F2  SC,$X1,$X3                                                  23.03 50                    013331.40
        V&,$X3,$X3                                                  23.06 B0                    013332.00
        V&,$X3,$X3                                                  23.06 B0                    013332.40
        SC,$X1,$X5                                                  25.03 50                    013333.00
        V&,$X5,$X5                                                  25.12 B0                    013333.40
        L%BU,18¤,$X5,-24                                            25.00 80 022064.20 50       013334.00 CV
        LV,$X3,$X2                                                  22.06 30                    013335.00
        V&,$X3,$L                                                   10.06 B0                    013335.40
        KV,$X3,H1AGT&.32                                            13465.46 90                 013336.00
        BZXH,H1B2F3         @BR-ADDED CNT WILL NOT EXCEED MAX       13322.33 40                 013336.40
        B,H1B2G             @                                       13305.50 00                 013337.00

                @ENTRY TO ISSUE TAPE WRITE

H1B2H   SIC,H1C2A2                                                  13363.00 80                 013337.40
                B,H1C2B2        @GO WRITE                           13345.10 00                 013340.00
        B,H1B2A             @RET--PRINT MORE                        13243.50 00                 013340.40

H1B2J   SIC,H1C2A2                                                  13363.00 80                 013341.00
                B,H1C2B2        @GO WRITE                           13345.10 00                 013341.40
        Z,$X15                                                      37.22 00                    013342.00
        SV,$X15,FCTL1&.32                                           4006.77 30                  013342.40
        LV,$X15,H1AB                                                13366.36 30                 013343.00
        BBZ,FCTL3&.08,$X1.0 @CLEAR HDG IND                          4010.10 80 000021.34 06     013343.40
        B,1.%$X15¤          @RETURN                                 1.10 0F                     013344.40

                @WRITE COMMENT
H1C2B2  L%BU,10¤,FTAPCO                                             4007.54 80 012000.20 50     013345.00
        Z,$X10                                                      32.22 00                    013346.00
        Z,$X11                                                      33.22 00                    013346.40
        SF%BU,7,8¤,$X10&.12,3  @SET TO INDEX MASTER TAPE            32.14 80 007001.52 F0       013347.00
        SF%BU,3,8¤,$X11&.15 @DRIVE                                  33.17 80 003000.12 F0       013350.00
        LOC%SEOP¤,0%$X10¤,0%$X11¤                                   0.00 8A 000000.17 0B        013351.00
        SIC,J2XW11                                                  13365.40 80                 013352.00
                B,J2XW10                                            13363.50 00                 013352.40
        REL%SEOP¤,0%$X10¤                                           0.00 8A 000000.33 00        013353.00
        SIC,J2XW11                                                  13365.40 80                 013354.00
                B,J2XW10                                            13363.50 00                 013354.40
        ODDNEC%SEOP¤,0%$X10¤                                        0.00 8A 000157.15 00        013355.00
        SIC,J2XW11                                                  13365.40 80                 013356.00
                B,J2XW10                                            13363.50 00                 013356.40
        LD%SEOP¤,0%$X10¤                                            0.00 8A 000037.15 00        013357.00
        SIC,J2XW11                                                  13365.40 80                 013360.00
                B,J2XW10                                            13363.50 00                 013360.40
        W%SEOP¤,0%$X10¤,H1AH                                        0.00 8A 013410.13 00        013361.00
        SIC,J2XW11                                                  13365.40 80                 013362.00
                B,J2XW10                                            13363.50 00                 013362.40
H1C2A2  B,$                 @RETURN                                 13363.10 00                 013363.00
J2XW10  CCW,0%$X10¤,J2AB1                                           0.00 8A 015237.21 00        013363.40
        BB,J2AB1&.24,$-1.0                                          15237.30 80 013363.74 02    013364.40
J2XW11  B,$                                                         13365.50 00                 013365.40
```

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                                     @
         CNOP
H1AB     VF,0                                                      0.00&              013366.00
              VF,9.0             @STORAGE FOR IX 15               11.00&              013366.40
H1V      VF,-.10                                                   0.12-              013367.00
                 VF,.03                                            0.03&              013367.40
         VF,.01                                                    0.01&              013370.00
                VF,1.01                                            1.01&              013370.40
         VF,.02                                                    0.02&              013371.00
                VF,1.02                                            1.02&              013371.40
         VF,.04                                                    0.04&              013372.00
                VF,1.04                                            1.04&              013372.40
         VF,.08                                                    0.10&              013373.00
                VF,1.08                                            1.10&              013373.40
         VF,.16                                                    0.20&              013374.00
                VF,1.16                                            1.20&              013374.40
         VF,.24                                                    0.30&              013375.00
                VF,1.24                                            1.30&              013375.40
         VF,.32                                                    0.40&              013376.00
                VF,1.32                                            1.40&              013376.40
         VF,.40                                                    0.50&              013377.00
                VF,1.40                                            1.50&              013377.40
         VF,.48                                                    0.60&              013400.00
                VF,1.48                                            1.60&              013400.40
         VF,.56                                                    0.70&              013401.00
                VF,1.56                                            1.70&              013401.40
         XW,-.08,0,0                                               0.10 80 000000.00 00  013402.00
H1AC     DD%BU,8,8¤,%8¤375       @TW CARRIAGE RETURN                            375   013403.00
         DD%BU,8,8¤,%8¤376       @TW END-PRNTR END                              376   013403.10
         DD%BU,8,8¤,0                                                           000   013403.20
         DD%BU,8,8¤,0                                                           000   013403.30
         DD%BU,8,8¤,%8¤0         @SINGLE SPACE                                  000   013403.40
         DD%BU,8,8¤,%8¤1         @DOUBLE SPACE                                  001   013403.50
         DD%BU,8,8¤,%8¤360       @SUPPRESS POST SPACING                         360   013403.60
         DD%BU,8,8¤,%8¤377       @NO OPERATION                                  377   013403.70
H1AD     VF,0                                                      0.00&              013404.00
              VF,0               @PARTIAL LINE CHAR COUNT-PRINTER  0.00&              013404.40
H1AE     XW,0,0,0                @STORAGE FOR CW                   0.00 00 000000.00 00  013405.00
H1AF     VF,83,0                                                 123.00&              013406.00
                VF,0             @MAX TW IMAGE/PARTIAL LINE CHAR COUNT-TW  0.00&      013406.40
H1AG     VF,15.0                                                  17.00&              013407.00
                VF,134.0                                         206.00&              013407.40
H1AH     XW,0,0,0                @CW FOR WRITE                     0.00 00 000000.00 00  013410.00
H1AA     DR%BU,64,8¤,26          @STORAGE FOR MACHINE ENVIRONMENT 32.00               013411.00
H1AI     DR%BU,64,8¤,3           @IMAGE AREA                       3.00               013443.00
H1AIT    DR%BU,64,8¤,14          @START OF TW IMAGE               16.00               013446.00
H1AJ     DD%BU¤,0                                                  00000000000000000000  013464.00
H1AGT    %8¤VF,12.24             @UF FOR 110 TAPE CHAR            14.30&              013465.00
         %8¤VF,13.20             @UF FOR 120 TAPE CHAR            15.24&              013465.40
         VF,.60                                                    0.74&              013466.00
H1VT     VF,.36                                                    0.44&              013466.40
                VF,.12                                             0.14&              013467.00
         VF,.06                                                    0.06&              013467.40
H1AITX   %8¤DD%BU,60,3¤,20202020202020202020  @TAPE BLANKS           00202020202020202020  013467.71
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@
@TABLE FOR CHARACTER CONVERSION
@
         CNOP
H1AT     %8□DD%BU□,1004026430032  @BLANK &                    000000001004026430032   013471.00
         %8□DD%BU□,2110412625442350254 3  @$ $                0021104126254423502543  013472.00
         %8□DD%BU□,2210613026030134160 34  @* %               0221061302603013416034  013473.00
         %8□DD%BU□,2303024210432274360 74  @/ □               0230302421043227436074  013474.00
         %8□DD%BU□,2405406615450130154 73  @, SEMICOLON       0240540661545013015473  013475.00
         %8□DD%BU□,2516603020052354060 40  @- -               0251660302005235406040  013476.00
         %8□DD%BU□,2651014230455220304 61  @A A               0265101423045522030461  013477.00
         %8□DD%BU□,2751214431057224310 62  @B B               0275121443105722431062  013500.00
         %8□DD%BU□,3051414631461230314 63  @C C               0305141463146123031463  013501.00
         %8□DD%BU□,3151615032063234320 64  @D D               0315161503206323432064  013502.00
         %8□DD%BU□,3252015232465240324 65  @E E               0325201523246524032465  013503.00
         %8□DD%BU□,3352215433067244330 66  @F F               0335221543306724433066  013504.00
         %8□DD%BU□,3452415633471250334 67  @G G               0345241563347125033467  013505.00
         %8□DD%BU□,3552616034073254340 70  @H H               0355261603407325434070  013506.00
         %8□DD%BU□,3653016234475260344 71  @I I               0365301623447526034471  013507.00
         %8□DD%BU□,3746010220477140204 41  @J J               0374601022047714020441  013510.00
         %8□DD%BU□,2013214015042210254 53  @& STRAP $         0201321401504221025453  013511.00
         %8□DD%BU□,2110412625442350254 53  @$ $               0211041262544235025453  013512.00
         %8□DD%BU□,2210613026030134160 34  @* %               0221061302603013416034  013513.00
         %8□DD%BU□,2303004210432274360 74  @/ □               0230300421043227436074  013514.00
         %8□DD%BU□,2405406615450130154 73  @, SEMICOLON       0240540661545013015473  013515.00
         %8□DD%BU□,2516603020052354060 40  @- -               0251660302005235406040  013516.00
         %8□DD%BU□,2651014230455220304 61  @A A               0265101423045522030461  013517.00
         %8□DD%BU□,2751214431057224310 62  @B B               0275121443105722431062  013520.00
         %8□DD%BU□,3051414631461230314 63  @C C               0305141463146123031463  013521.00
         %8□DD%BU□,3151615032063234320 64  @D D               0315161503206323432064  013522.00
         %8□DD%BU□,3252015232465240324 65  @E E               0325201523246524032465  013523.00
         %8□DD%BU□,3352215433067244330 66  @F F               0335221543306724433066  013524.00
         %8□DD%BU□,3452415633471250334 67  @G G               0345241563347125033467  013525.00
         %8□DD%BU□,3552616034073254340 70  @H H               0355261603407325434070  013526.00
         %8□DD%BU□,3653016234475260344 71  @I I               0365301623447526034471  013527.00
         %8□DD%BU□,3746010220477140204 41  @J J               0374601022047714020441  013530.00
         %8□DD%BU□,4046210421101144211 42  @K K               0404621042110114421142  013531.00
         %8□DD%BU□,4146410621503150215 43  @L L               0414641062150315021543  013532.00
         %8□DD%BU□,4246611022105154221 44  @M M               0424661102210515422144  013533.00
         %8□DD%BU□,4347011222507160225 45  @N N               0434701122250716022545  013534.00
         %8□DD%BU□,4447211423111164231 46  @O O               0444721142311116423146  013535.00
         %8□DD%BU□,4547411623513170235 47  @P P               0454741162351317023547  013536.00
         %8□DD%BU□,4647612024115174241 50  @Q Q               0464761202411517424150  013537.00
         %8□DD%BU□,4750012224517200245 51  @R R               0475001222451720024551  013540.00
         %8□DD%BU□,5043204411121064111 22  @S S               0504320441112106411122  013541.00
         %8□DD%BU□,5143404611523070115 23  @T T               0514340461152307011523  013542.00
         %8□DD%BU□,5243605012125074121 24  @U U               0524360501212507412124  013543.00
         %8□DD%BU□,5344005212527100125 25  @V V               0534400521252710012525  013544.00
         %8□DD%BU□,5441205413131104131 26  @W W               0544120541313110413126  013545.00
         %8□DD%BU□,5544405613533110135 27  @X X               0554440561353311013527  013546.00
         %8□DD%BU□,5644606014135114141 30  @Y Y               0564460601413511414130  013547.00
         %8□DD%BU□,5745006214537120145 31  @Z Z               0574500621453712014531  013550.00
```

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%8□DD%BU□,60162024051403440511 2   @0 0          06016202405140344051 12    013551.00
%8□DD%BU□,61140002005423000050 1   @1 1          06114000200542300005 01    013552.00
%8□DD%BU□,62142004011443040110 2   @2 2          06214200401144304011 02    013553.00
%8□DD%BU□,63144006015463100150 3   @3 3          06314400601546310015 03    013554.00
%8□DD%BU□,64146010021503140210 4   @4 +          06414601002150314021 04    013555.00
%8□DD%BU□,65150012025523200250 5   @5 5          06515001202552320025 05    013556.00
%8□DD%BU□,66152014031543240310 6   @6 6          06615201403154324031 06    013557.00
%8□DD%BU□,67154016035563300350 7   @7 7          06715401603556330035 07    013560.00
%8□DD%BU□,70156020041603340411 0   @8 8          07015602004160334041 10    013561.00
%8□DD%BU□,71160022045623400451 1   @9 9          07116002204562340045 11    013562.00
%8□DD%BU□,72134166351641241517 2   @. .          07213416635164124151 72    013563.00
%8□DD%BU□,73102100200000000014 0   @- -          07310210020000000001 40    013564.00
%8□DD%BU□,1000000000020   @BLANK                 00000000010000000000 20    013565.00
%8□DD%BU□,1000000000020   @BLANK                 00000000010000000000 20    013566.00
%8□DD%BU□,1000000000020   @BLANK                 00000000010000000000 20    013567.00
%8□DD%BU□,1000000000020   @BLANK                 00000000010000000000 20    013570.00
```

```
                                @COMPOSIT DEPOSIT ENTRY
                                @
H2A     SIC,H1A1B1                                          13003.40 80                    013571.00
                B,H1A1B                                     13000.50 00                    013571.40
        SIC,31,0                                               37.00 80                    013572.00
                B,G1L           @CHECK FOR PROGRAM ABANDONMENT 10342.10 00                 013572.40
        BBZ,ECTL3&,10,$&1.32    @BR-PRINT PASS NO.          4010.12 80 013574.74 06    013573.00
        B,$&1.32                                            13575.50 00                    013574.00
        SIC,H6E1                                            14450.00 80                    013574.40
                B,H6E           @GO TO PRINT PASS IDENT     14435.10 00                    013575.00
        LX,$X15,H1AA&24,0                                   13441.36 10                    013575.40
        LX,$X1,0,0%$X15¤                                        0.02 1F                    013576.00
        KV,$X1,G2D&1,0                                      10454.02 90                    013576.40
        BXH,H2A1                                            13601.73 42                    013577.00
        L%BU,18,8¤,$X1&,46,46  @ADD REFILL FLD & ONE           21.56 80 022027.20 50       013577.40
        V&,$X1,$R                                              11.02 B0                    013600.40
        V&I,$X1,1,0            @PLUS ONE                       1.03 05                    013601.00
H2A1    L%BU,64,8¤,$X1                                         21.00 80 000000.20 50       013601.40
        SX,$X1,H2A2                                         13611.03 10                    013602.40
        BXCZ,H2A2&1,0                                       13612.30 42                    013603.00
        R,$X1                                                  21.02 00                    013603.40
        &%BU,64,8¤,$X1,64                                      21.00 80 000040.20 10       013604.00
        LX,$X2,G2D&25,0                                     10504.04 10                    013605.00
        CNOP                                                    0.30 00                    013605.40
        SIC,31,0                                               37.00 80                    013606.00
                B,H1A2          @BYPASS OR HALT INSTEAD OF PRINT 13011.50 00               013606.40
        B,H2A2&1,0                                          13612.10 00                    013607.00
                NOP             @BYPASS PRINT                   0.30 00                    013607.40
        SIC,31,0                                               37.00 80                    013610.00
                B,H2A3                                      13627.10 00                    013610.40
H2A2    XW,0,0,0,0                                              0.00 00 000000.00 00       013611.00
        SIC,H1A1C1                                          13011.00 80                    013612.00
                B,H1A1C                                     13004.10 00                    013612.40
        B,1,0%$X15¤                                             1.10 0F                    013613.00
                                @
                                @
                                @COMPOSIT DEPOSIT ENCODE ONLY ENTRY
                                @
H2B     SIC,H1A1B1                                          13003.40 80                    013613.40
                B,H1A1B                                     13000.50 00                    013614.00
        SIC,31,0                                               37.00 80                    013614.40
                B,G1L           @CHECK FOR PROGRAM ABANDONMENT 10342.10 00                 013615.00
        LX,$X15,H1AA&24,0                                   13441.36 10                    013615.40
        LX,$X1,0,0%$X15¤                                        0.02 1F                    013616.00
        KV,$X1,G2D&1,0                                      10454.02 90                    013616.40
        BXH,H2B1                                            13622.73 42                    013617.00
        L%BU,18,8¤,$X1&,46                                     21.56 80 022000.20 50       013617.40
        ST%BU,18,8¤,$&1,0                                   13621.40 80 022000.20 D0       013620.40
        V&I,$X1,0,0            @ADD REFILL FIELD               0.03 05                    013621.40
        V&I,$X1,1,0            @PLUS ONE                       1.03 05                    013622.00
H2B1    SX,$X1,H2B2                                         13626.03 10                    013622.40
                CNOP
        LVI,$X15,H2B2                                       13626.37 01                    013623.00
        SV,$X15,H2AD2                                       13665.37 30                    013623.40
        SIC,H2A5                                            13703.00 80                    013624.00
                B,H2A4                                      13666.10 00                    013624.40
        B,H2A2&1,0                                          13612.10 00                    013625.00
H2B2    XW,0,0,0,0                                              0.00 00 000000.00 00       013626.00
```

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                                @COMPOSITE DEPOSIT ROUTINE
                                @
H2A3    SX,$X15,H2AD2                                    13665.37 10                    013627.00
        LX,$X1,0.0%$X15¤                                     0.02 1F                    013627.40
        KCI,$X1,64.                                        100.03 0A                    013630.00
        BZXH,$&1.                                        13631.73 40                    013630.40
        LCI,$X1,64.             @ALLOW ONLY LJ BITS        100.03 02                    013631.00
        SX,$X1,0%$X15¤                                       0.03 1F                    013631.40
        BXF,H2A3B               @BYPASS IF FLAG SET      13642.23 42                    013632.00
        L%BU,28,8¤,$X1&.18,18                              21.22 80 034011.20 50        013632.40
        KF%BU,28,8¤,H2AD1,18                             13664.00 80 034011.23 10       013633.40
        BAE,$&1.0               @HEADING SAME AS PREVIOUS PRINT 13635.76 C2             013634.40
        B,H2A3A                                          13637.10 00                    013635.00
        BBZ,ECTL3&.06,H2A3A  @WAS THERE AN INTERVENING PRINT 4010.06 80 013637.34 06    013635.40
        B,H2A3B                 @NO                      13642.10 00                    013636.40
H2A3A   ST%BU,28,8¤,H2AD1,18                             13664.00 80 034011.20 D0       013637.00
        BBZ,ECTL3&.06,$&1.0                                4010.06 80 013641.34 06      013640.00
        SIC,H6A6                                         14253.00 80                    013641.00
                B,H6A           @GO PRINT HEADING        14223.10 00                    013641.40
H2A3B   SIC,H2A5                                         13703.00 80                    013642.00
                B,H2A4          @GO TO ENCODE REGISTER   13666.10 00                    013642.40
        LX,$X15,H2AD2                                    13665.36 10                    013643.00
        LX,$X1,0.0%$X15¤                                     0.02 1F                    013643.40
        LX,$X2,$X1                                         21.04 10                     013644.00
        LVI,$X2, EPTBLB                                  4066.05 01                     013644.40
        BBZ,$X2&.25,$&1.0                                  22.31 80 013646.34 06        013645.00
        R,$X1                                              21.02 00                     013646.00
        SX,$X1,$X1                                         21.03 10                     013646.40
        BXCZ,H2A3C              @NO COMMENT              13657.30 42                    013647.00
        SC,$X2,$X3                                         23.05 50                     013647.40
        SC,$X1,$X1                                         21.03 50                     013650.00
        V&,$X1,$X3                                         23.02 B0                     013650.40
        BB,ECTL2&.38,$&2.32                              4007.46 80 013653.74 02        013651.00
        KVI,$X1,120.0                                      170.03 04                    013652.00
        BXH,H2A3C-1.0           @BR-INTV PRINT REQUIRED  13656.33 42                    013652.40
        B,$&1.32                                         13654.50 00                    013653.00
        KVI,$X1,74.0                                       112.03 04                    013653.40
        BXH,$&2.0                                        13656.33 42                    013654.00
        BB1,$X2&.25,$&1.0                                  22.31 80 013655.74 0E        013654.40
        B,$&1.32                                         13657.10 00                    013655.40
        BB1,ECTL3&.06,$&1.0 @COMMENT WILL BE PRINT - SET IND 4010.06 80 013657.34 0E    013656.00
H2A3C   SX,$X2,H2A3D                                     13661.05 10                    013657.00
        CNOP                                                 0.30 00                    013657.40
        SIC,31.0                                            37.00 80                    013660.00
                B,H1A3          @GO TO PRINT             13022.50 00                    013660.40
H2A3D   XW,0,0,0,0                                           0.00 00 000000.00 00       013661.00
        LX,$X15,H2AD2                                    13665.36 10                    013662.00
        B,1.0%$X15¤             @RETURN TO ENTRY             1.10 0F                    013662.40
                                @
H2AD    DD%BU,64,8¤,%8¤37530061044                                  0000000000037530061044 013663.00
H2AD1   XW,0,0,0,0              @STORAGE OF LAST HEADING IMAGE   0.00 00 000000.00 00   013664.00
H2AD2   XW,0,0,0,0              @IX 15 STORAGE                   0.00 00 000000.00 00   013665.00
```

```
                                @
                                @ROUTINE TO ENCODE REGISTER
                                @IN COMPOSITE DEPOSIT & BINARY WORD PRINTS
                                @
H2A4    Z,EPTBLB                                                4066.22 00                      013666.00
        TI,7,EPTBLB,EPTBLB&1.0                                  4066.00 80 004067.16 A0         013666.40
        Z,$X3                                                     23.22 00                      013667.40
        IX,$X15,H2AD2                                         13665.36 10                       013670.00
        LC,$X2,0,0%$X15¤                                          0.04 5F                       013670.40
        SC,$X2,$X2                                              22.05 50                        013671.00
H2A4A   KV,$X2,0,0%$X15¤                                          0.04 9F                       013671.40
        BXF,H2A4B                                             13673.72 C2                       013672.00
        V&,$X2,H1V&1.0                                        13370.04 B0                       013672.40
        B,H2A4A                                               13671.50 00                       013673.00
H2A4B   LX,$X1,0,0%$X15¤                                          0.02 1F                       013673.40
        KVI,$X1,1.0       @WAS WORD ADDR INCLUDED IN BIT ADDR      1.03 04                      013674.00
        BXH,H2A4C         @YES                                13676.73 42                       013674.40
        SR,$X1,$X2        @COMPUTE START BIT ADDRESS OF LOST BITS  22.03 70                     013675.00
        V&I,$X2,1.0                                               1.05 05                       013675.40
        V&,$X1,$X2                                              22.02 B0                        013676.00
H2A4C   Z,$X2             @SET IX 2 FOR STORE FOR PRINT IMAGE     22.22 00                      013676.40
        BB,0,0%$X1¤,H2A4D @BIT WAS LOST                           0.00 81 013703.74 02        013677.00
        BB,1,0%$X1¤,H2A4E @BIT WAS PICKED ONLY                    1.00 81 013706.34 02        013700.00
H2A4G   V&,$X1,H1V&1.0                                        13370.02 B0                       013701.00
        V&,$X2,H1V&4.0                                        13373.04 B0                       013701.40
        V&,$X3,H1V&4.0                                        13373.06 B0                       013702.00
        CB,$X1,H2A4C&.32  @CHECK NEXT BIT                     13677.02 48                       013702.40
H2A5    $B,0.0                                                    0.10 00                       013703.00
H2A4D   BB,1,0%$X1¤,H2A4F @BIT WAS PICKED ALSO                    1.00 81 013707.74 02        013703.40
        L%BU,8,8¤,H2AD&.40 @BIT LOST ONLY                     13663.50 80 010000.20 50        013704.40
        B,H2A4F&1.0                                           13710.50 00                       013705.40
H2A4E   L%BU,8,8¤,H2AD&.48 @BIT WAS PICKED ONLY               13663.60 80 010000.20 50        013706.00
        B,H2A4F&1.0                                           13710.50 00                       013707.00
H2A4F   L%BU,8,8¤,H2AD&.56 @BIT WAS SPURIOUS                  13663.70 80 010000.20 50        013707.40
        ST%BU,8,8¤,EPTBLB%$X3¤                                 4066.00 83 010000.20 D0        013710.40
        B,H2A4G                                               13701.10 00                       013711.40
        CNOP
                                @
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                                    @
                                    @BINARY WORD ENTRY
                                    @
H3A     SIC,H1A1B1                                      13003.40 80                    013712.00
                  B,H1A1B                               13000.50 00                    013712.40
        SIC,31,0                                           37.00 80                    013713.00
              B,G1L          @CHECK FOR PROGRAM ABANDONMENT 10342.10 00                013713.40
        BBZ,ECTL3&,10,$&1.32                             4010.12 80 013715.74 06       013714.00
        B,$&1.32                                        13716.50 00                    013715.00
        SIC,H6E1                                        14450.00 80                    013715.40
              B,H6E          @GO TO PRINT PASS IDENT    14435.10 00                    013716.00
        B,$&1.32                                        13720.10 00                    013716.40
H3A3    SIC,H1A1B1                                      13003.40 80                    013717.00
                  B,H1A1B                               13000.50 00                    013717.40
        LX,$X15,H1AA&24,0                               13441.36 10                    013720.00
        LC,$X1,0,0%$X15¤                                    0.02 5F                    013720.40
        SC,$X1,$X1                                         21.03 50                    013721.00
        BXCZ,H3A2                                       13740.30 42                    013721.40
        L%BU,64,8¤,0,0%$X1¤                                 0.00 81 000000.20 50       013722.00
        &%BU,64,8¤,1,0%$X15¤,64                             1.00 8F 000040.20 10       013723.00
        LX,$X2,G2D&26,0                                 10505.04 10                    013724.00
        SIC,31,0                                           37.00 80                    013724.40
              B,H1A2         @BYPASS OR HALT INSTEAD OF PRINT 13011.50 00              013725.00
        B,H3A2                                          13740.10 00                    013725.40
              NOP            @BYPASS PRINT                 0.30 00                    013726.00
        ST%BU,64,8¤,H3AD&2,0  @CONTINUE FOR PRINTING    13762.00 80 000000.20 D0       013726.40
        CM1010%BU,64,8¤,H3AD&1,0                        13761.00 80 000000.24 F0       013727.40
        LX,$X15,H1AA&24,0                               13441.36 10                    013730.40
        LX,$X1,0,0%$X15¤                                    0.02 1F                    013731.00
        LRI,$X1,H3AD                                    13760.03 03                    013731.40
        LI%BU,18,1¤,H3AD&1,0                            13761.00 80 422100.20 50       013732.00
        ST%BU,18,1¤,$X1                                    21.00 80 022100.20 D0       013733.00
        SX,$X1,H3A1                                     13737.03 10                    013734.00
        LX,$X1,1,0%$X15¤                                    1.02 1F                    013734.40
        SX,$X1,H3AD                                     13760.03 10                    013735.00
                  CNOP                                      0.30 00                    013735.40
        SIC,31,0                                           37.00 80                    013736.00
                  B,H2A3       @GO TO CD PRINT          13627.10 00                    013736.40
H3A1    XW,0,0,0,0                                          0.00 00 000000.00 00       013737.00
H3A2    SIC,H1A1C1                                      13011.00 80                    013740.00
                  B,H1A1C                               13004.10 00                    013740.40
        B,2,0%$X15¤                                         2.10 0F                    013741.00
                  CNOP         @RETURN TO PROGRAM           0.30 00                    013741.40
```

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                                @
                                @BINARY WORD ENCODE ONLY ENTRY
H3B     SIC,H1A1B1                                      13003.40 80                    013742.00
              B,H1A1B                                   13000.50 00                    013742.40
        SIC,31,0                                           37.00 80                    013743.00
              B,G1L             @CHECK FOR PROGRAM ABANDONMENT  10342.10 00           013743.40
        LX,$X15,H1AA&24,0                               13441.36 10                    013744.00
        LC,$X1,0,0%$X15¤        @GET FULL WORD ADDRESS      0.02 5F                    013744.40
        SC,$X1,$X2                                         22.03 50                    013745.00
        L%BU¤,0%$X2¤                                        0.00 82 000000.20 50       013745.40
        ST%BU,64,8¤,H3AD&2,0                            13762.00 80 000000.20 D0       013746.40
        CM1010%BU,64,8¤,H3AD&1,0                        13761.00 80 000000.24 F0       013747.40
        LX,$X1,0,0%$X15¤                                    0.02 1F                    013750.40
        LRI,$X1,H3AD                                    13760.03 03                    013751.00
        LI%BU¤,H3AD&1,0,40                              13761.00 80 430024.20 50       013751.40
        &%BU,6¤,$X1&,18,40                                 21.22 80 006024.20 10       013752.40
        LV,$X1,$R                                          11.02 30                    013753.40
        SX,$X1,H3B1                                     13757.03 10                    013754.00
        LVI,$X15,H3B1                                   13757.37 01                    013754.40
        SV,$X15,H2AD2                                   13665.37 30                    013755.00
        SIC,H2A5                                        13703.00 80                    013755.40
              B,H2A4            @GO TO ENCODE REGISTER  13666.10 00                    013756.00
        B,H3A2                  @GO TO RETURN           13740.10 00                    013756.40
                                @
H3B1    XW,0,0,0,0                                          0.00 00 000000.00 00       013757.00
H3AD    XW,0,0,0,0                                          0.00 00 000000.00 00       013760.00
        DD%BU,64,8¤,0                                   000000000000000000000000       013761.00
        DD%BU,64,8¤,0                                   000000000000000000000000       013762.00
```

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                                @ENTRY FOR OCTAL HEX DUMP
                                @
H4A     SIC,H1A1B1                                  13003.40 80                    013763.00
                B,H1A1B                             13000.50 00                    013763.40
        SIC,31.0                                      37.00 80                     013764.00
                B,G1L           @CHECK FOR PROGRAM ABANDONMENT 10342.10 00         013764.40
        BBZ,ECTL3&.10,$&1.32                        4010.12 80 013766.74 06        013765.00
        B,$&1.32                                    13767.50 00                    013766.00
        SIC,H6E1                                    14450.00 80                    013766.40
                B,H6E           @GO TO PRINT PASS IDENT 14435.10 00                013767.00
        LX,$X15,H1AA&24.0                           13441.36 10                    013767.40
        L%BU□,1.0%$X15□,64                            1.00 8F 000040.20 50         013770.00
        LF%BU□,0%$X15□                                0.00 8F 000000.06 70         013771.00
        SF%BU□,H4A1&1.0,64                          14003.00 80 000040.12 F0       013772.00
        SF%BU□,H4A1                                 14002.00 80 000000.12 F0       013773.00
        KF%BU,18□,0,18                                0.00 80 022011.23 10         013774.00
        BAF,H4A1&2.0                                14004.36 C2                    013775.00
        LX,$X2,G2D&27.0                             10506.04 10                    013775.40
        CNOP
        SIC,31.0                                      37.00 80                     013776.00
                B,H1A2          @BYPASS OR HALT INSTEAD OF PRINT 13011.50 00       013776.40
        B,H4A1&2.0                                  14004.10 00                    013777.00
                NOP             @BYPASS               0.30 00                    013777.40
        BB1,ECTL3&.06,$&1.0                         4010.06 80 014001.34 0E        014000.00
        SIC,31.0                                      37.00 80                     014001.00
                B,H4A2          @PRINT              14022.50 00                    014001.40
H4A1    XW,0,0,0,0                                    0.00 00 000000.00 00         014002.00
        XW,0,0,0,0                                    0.00 00 000000.00 00         014003.00
        SIC,H1A1C1                                  13011.00 80                    014004.00
                B,H1A1C                             13004.10 00                    014004.40
        B,2.0%$X15□                                   2.10 0F                      014005.00
                                @
                                @
                                @ENTRY FOR OCTAL HEX DUMP
                                @FROM MAINTENANCE SWITCHES
                                @
H4B     Z,H4A1                                      14002.22 00                    014005.40
        Z,H4A1&1.0                                  14003.22 00                    014006.00
        SIC,31.0                                      37.00 80                     014006.40
                B,H7A           @OPS CNSL           14460.10 00                    014007.00
        BB,ECTL2&.62,H4B1       @CNTL AREA IS MAINT CNSL 4007.76 80 014013.34 02   014007.40
        SIC,G1J1                                    10277.00 80                    014010.40
                B,G1J           @RFAD BINARY KEYS   10267.10 00                    014011.00
        L%BU,32□,G1J6&.32                           10351.40 80 040000.20 50       014011.40
        B,H4B1&1.0                                  14014.10 00                    014012.40
H4B1    L%BU,32□,4,32                                 4.40 80 040000.20 50         014013.00
        SF%BU,18□,H4B2,14                           14017.00 80 022007.12 F0       014014.00
        SF%BU,14□,H4B2&.32                          14017.40 80 016000.12 F0       014015.00
        CNOP
        SIC,31.0                                      37.00 80                     014016.00
                B,H4A2                              14022.50 00                    014016.40
H4B2    XW,0                                          0.00 00 000000.00 00         014017.00
        XW,0                                          0.00 00 000000.00 00         014020.00
        SIC,H1A1C1                                  13011.00 80                    014021.00
                B,H1A1C         @GO RESTORE         13004.10 00                    014021.40
        B,$                     @IDLE WHEN COMPLETE 14022.10 00                    014022.00
```

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                                @
                                @OCTAL HEX PRINT ROUTINE
                                @
H4A2    SX,$X15,H4AA                                14132.37 10                    014022.40
        LX,$X1,1.0%$X15¤        @COMMENT CW             1.02 1F                    014023.00
        BXCZ,H4A2A              @BYPASS COMMENT IF EITHER COUNT 14027.30 42        014023.40
        BXVZ,H4A2A              @OR VALUE FIELD ZERO    14027.31 42                014024.00
        SX,$X1,H4A2A-1.0                            14026.03 10                    014024.40
                        CNOP
        SIC,31.0                                        37.00 80                   014025.00
                B,H1A3          @PRINT COMMENT      13022.50 00                    014025.40
        XW,0.0,0,0                                      0.00 00 000000.00 00       014026.00
H4A2A   LX,$X15,H4AA                                14132.36 10                    014027.00
        LX,$X1,0.0%$X15¤                                0.02 1F                    014027.40
        SX,$X1,H4AB                                 14133.03 10                    014030.00
        BXCZ,H4A3C              @BYPASS WITH COUNT ZERO 14063.30 42                014030.40
H4A2B   L%BU,19,8¤,H4AB                             14133.00 80 023000.20 50       014031.00
        BBZ,ECTL3&.19,$&1.0                          4010.23 80 014033.34 06       014032.00
        SIC,H6B1                                    14311.40 80                    014033.00
                B,H6B-1.0                           14277.50 00                    014033.40
        BB,ECTL2&.38,H4A4       @PRINTER NOT AVAILABLE GO CHECK TW 4007.46 80 014101.74 02 014034.00
                                @
                                @ENCODE FOR PRINT OTHER THAN TW
                                @
H4A3    LX,$X1,H4AB             @OTHER THAN TW     14133.02 10                    014035.00
        TI,4,H4AD,H4AC                              14140.00 80 014134.10 A0       014035.40
        Z,$X2                                          22.22 00                    014036.40
        LVI,$X3,H6CD                                14370.07 01                    014037.00
        LCI,$X3,4                                       4.07 02                    014037.40
H4A3B   V&I,$X2,1.0                                     1.05 05                    014040.00
        SX,$X1,H4AB             @STILL MORE AFTER THIS PRINT 14133.03 10           014040.40
        L%BU¤,0%$X1¤                                    0.00 81 000000.20 50       014041.00
        ST%BU¤,0%$X3¤                                   0.00 83 000000.20 D0       014042.00
        BRZ,$&1.32                                  14044.74 C2                    014043.00
        BB1,ECTL3&.19,$&1.0                          4010.23 80 014044.74 0E       014043.40
        CBZ&,$X1,H4A3A                              14053.43 4A                    014044.40
        CB&,$X3,H4A3B                               14040.07 48                    014045.00
        BZB,ECTL3&.19,H4A3F                          4010.23 80 014064.34 00       014045.40
H4A3D   SX,$X1,H4AB                                 14133.03 10                    014046.40
        SVA,$X2,H6C4                                14326.45 D0                    014047.00
        CNOP                                            0.30 00                    014047.40
        SIC,31.0                                        37.00 80                   014050.00
                B,H6C           @ENCODE REGS        14325.10 00                    014050.40
        SIC,31.0                                        37.00 80                   014051.00
                B,H1A3          @PRINT OTHER THAN LAST LINE 13022.50 00            014051.40
        XW,H6B1,8,H4AC,4                            14321.00 40 000200.30 5C       014052.00
        B,H4A2B                                     14031.10 00                    014053.00
```

```
                                @
                                @FINAL PRINT ENCODING
H4A3A   BZR,ECTL36,19,H4A3J                                  4010.23 80 014066.74 00      014053.40
        SVA,$X2,H6C4                                        14326.45 D0                   014054.40
        LX,$X1,H4AC-1,0%$X2¤                                14133.02 12                   014055.00
        LR,$X1,G2D                                          10453.02 70                   014055.40
        BBZ,$X16,25,$61,0                                      21.31 80 014057.34 06      014056.00
        SX,$X1,H4AC-1,0%$X2¤                                14133.03 12                   014057.00
                                CNOP                            0.30 00                   014057.40
        SIC,31,0                                               37.00 80                   014060.00
                B,H6C           @ENCODE REGS                14325.10 00                   014060.40
        SIC,31,0                                               37.00 80                   014061.00
                B,H1A3                                      13022.50 00                   014061.40
        XW,H6BI,8,H4AC,4                                    14321.00 40 000200.30 5C      014062.00
H4A3C   LX,$X15,H4AA                                        14132.36 10                   014063.00
        B,2,0%$X15¤                                            2.10 0E                   014063.40
                                @CONTINUE CHECK FOR ADDED ZERO REGS
H4A3E   L%BU¤,0%$X1¤                                           0.00 81 000000.20 50      014064.00
        BZRZ,H4A3H                                          14070.34 C0                   014065.00
        SX,$X1,H4AB                                         14133.03 10                   014065.40
        CB6,$X1,H4A3E                                       14064.03 48                   014066.00
H4A3J   SIC,H4A3G                                           14101.00 80                   014066.40
                B,H4A3F                                     14071.50 00                   014067.00
        B,H4A3C                                             14063.10 00                   014067.40
H4A3H   SIC,H4A3G                                           14101.00 80                   014070.00
                B,H4A3E                                     14071.50 00                   014070.40
        B,H4A2B                                             14031.10 00                   014071.00

                                @PRINT ZERO ADDRESSES
H4A3F   L%BU,19¤,H4AB                                       14133.00 80 023000.20 50      014071.40
        SX,$X1,H4AB                                         14133.03 10                   014072.40
        -I%BU¤,2                @SUB ONE TO GET CORRECT FINAL ADDR      0.02 80 430000.30 10      014073.00
        II,1,H6BI,H4AE                                      14321.00 80 014144.02 A0      014074.00
        SIC,H6B1                                            14311.40 80                   014075.00
                B,H6B-1,0                                   14277.50 00                   014075.40
        ST%BU¤,H4AE&1,48                                    14145.60 80 000000.20 D0      014076.00
        CNOP                                                                              014077.00
        SIC,31,0                                               37.00 80                   014077.40
                B,H1A3                                      13022.50 00                   014077.40
        XW,H4AE,%,48¤H5A-H4AE,0                             14144.00 00 001300.00 00      014100.00
H4A3G   $B,0                                                   0.10 00                   014101.00
```

```
                                @
                                @ENCODE FOR PRINT ON TW IF AVAILABLE
                                @
H4A4    BB,ECTL2&.39,H4A3       @TW NOT AVAILABLE          4007.47 80 014035.34 02    014101.40
        LX,$X1,H4AB                                       14133.02 10                 014102.40
        TI,2,H4AD,H4AC                                    14140.00 80 014134.04 A0    014103.00
        BBZ,H4AC&1.25,$&1.0                               14135.31 80 014105.34 06    014104.00
        Z,$X2                                                22.22 00                 014105.00
        LVI,$X3,H6CD                                      14370.07 01                 014105.40
        LCI,$X4,2               @DETERMINE IF 2 ALL ZEROS REGS   2.11 02              014106.00
H4A4B   V&I,$X2,1.0                                          1.05 05                 014106.40
        SX,$X1,H4AB                                       14133.03 10                 014107.00
        L%BU¤,0%$X1¤                                         0.00 81 000000.20 50    014107.40
        ST%BU¤,0%$X3¤                                        0.00 83 000000.20 D0    014110.40
        BRZ,$&1.32                                        14113.34 C2                 014111.40
        BB1,ECTL3&.19,$&1.0                                4010.23 80 014113.34 0E    014112.00
        CBZ&,$X1,H4A4A                                    14121.43 4A                 014113.00
        CB&,$X3,H4A4B                                     14106.47 48                 014113.40
        BZB,ECTL3&.19,H4A3E                                4010.23 80 014064.34 00    014114.00
H4A4C   SX,$X1,H4AB                                       14133.03 10                 014115.00
        SVA,$X2,H6CA                                      14367.05 D0                 014115.40
        CNOP
        SIC,31,0                                             37.00 80                 014116.00
                B,H6C           @ENCODE REGS              14325.10 00                 014116.40
        SIC,31,0                                             37.00 80                 014117.00
                B,H1A3          @PRINT ENCODED IMAGE      13022.50 00                 014117.40
        XW,H6BI,8,H4AC,4                                  14321.00 40 000200.30 5C    014120.00
        B,H4A2B                                           14031.10 00                 014121.00
                                @
                                @FINAL PRINT ENCODING
H4A4A   BZB,ECTL3&.19,H4A3J                                4010.23 80 014066.74 00    014121.40
        SVA,$X2,H6C4                                      14326.45 D0                 014122.40
        LX,$X1,H4AC-1.0%$X2¤                              14133.02 12                 014123.00
        LR,$X1,G2D                                        10453.02 70                 014123.40
        BBZ,$X1&.25,$&1.0                                    21.31 80 014125.34 06    014124.00
        SX,$X1,H4AC-1.0%$X2¤                              14133.03 12                 014125.00
                        CNOP                                  0.30 00                 014125.40
        SIC,31,0                                             37.00 80                 014126.00
                B,H6C           @GO TO ENCODE             14325.10 00                 014126.40
        SIC,31,0                                             37.00 80                 014127.00
                B,H1A3                                    13022.50 00                 014127.40
        XW,H6BI,8,H4AC,4                                  14321.00 40 000200.30 5C    014130.00
        B,H4A3C                                           14063.10 00                 014131.00
                CNOP                                          0.30 00                 014131.40
                                @
H4AA    XW,0,0,0,0              @IX 15 STORAGE                0.00 00 000000.00 00    014132.00
H4AB    XW,0,0,0,0              @CW FOR REMAINING REGS TO BE PRINTED   0.00 00 000000.00 00    014133.00
H4AC    XW,0,0,0                                              0.00 00 000000.00 00    014134.00
        XW,0,0,0                                              0.00 00 000000.00 00    014135.00
        XW,0,0,0                                              0.00 00 000000.00 00    014136.00
        XW,0,0,0                                              0.00 00 000000.00 00    014137.00
H4AD    XW,H6CI&.24,29,H4AC&1.0,4                         14374.30 40 000720.30 5D    014140.00
        XW,H6CI&4.24,29,H4AC&2.0,4                        14400.30 40 000720.30 5E    014141.00
        XW,H6CI&8.24,29,H4AC&3.0,4                        14404.30 40 000720.30 5F    014142.00
        XW,H6CI&12.24,29,0                                14410.30 00 000720.00 00    014143.00
H4AF    %IQSQ¤DD%BU¤,XXXXXX.X THRU XXXXXX.X CONTAIN ALL ZEROS.Q                       014144.00
```

```
                                @
                                @REGISTER COMPARE ENTRY
                                @
H5A     SIC,H1A1B1                                      13003.40 80                    014151.40
                B,H1A1B                                 13000.50 00                    014152.00
        SIC,31,0                                           37.00 80                    014152.40
                B,G1L           @CHECK FOR PROGRAM ABANDONMENT  10342.10 00            014153.00
        BBZ,ECTL3&.10,$&1.32                             4010.12 80 014155.34 06       014153.40
        B,$&1.32                                        14156.10 00                    014154.40
        SIC,H6E1                                        14450.00 80                    014155.00
                B,H6E           @GO TO PRINT PASS IDENT 14435.10 00                    014155.40
        B,$&1.32                                        14157.50 00                    014156.00
H5A4    SIC,H1A1B1                                      13003.40 80                    014156.40
                B,H1A1B                                 13000.50 00                    014157.00
        LX,$X15,H1AA&24,0                               13441.36 10                    014157.40
        L%BU,64,8¤,0.0%$X15¤                               0.00 8F 000000.20 50        014160.00
        &%BU,64,8¤,1.0%$X15¤,64                            1.00 8F 000040.20 10        014161.00
        TI,2,0,0%$X15¤,H5A1                                0.00 8F 014170.04 A0        014162.00
        LX,$X2,G2D&28,0                                 10507.04 10                    014163.00
        CNOP                                               0.30 00                     014163.40
        SIC,31,0                                           37.00 80                    014164.00
                B,H1A2          @BYPASS OR HALT INSTEAD OF PRINT  13011.50 00          014164.40
        B,H5A1&2,0                                      14172.10 00                    014165.00
                NOP             @BYPASS                    0.30 00                     014165.40
        BB1,ECTL3&.06,$&1.0                              4010.06 80 014167.34 0E       014166.00
        SIC,31,0                                           37.00 80                    014167.00
                B,H5A2          @PRINT                  14173.50 00                    014167.40
H5A1    XW,0,0,0,0                                         0.00 00 000000.00 00        014170.00
        XW,0,0,0,0                                         0.00 00 000000.00 00        014171.00
        SIC,H1A1C1                                      13011.00 80                    014172.00
                B,H1A1C                                 13004.10 00                    014172.40
        B,2,0%$X15¤                                        2.10 0F                     014173.00
```

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                        @
                        @
                        @REGISTER COMPARE PRINT
                        @
H5A2    SV,$X15,H5AA                                14211.37 30                    014173.40
        LX,$X1,0.0%$X15¤                                0.02 1F                    014174.00
        SVA,$X1,H6B2                                14320.03 D0                    014174.40
        BXC7,H5A3&1.0                               14210.30 42                    014175.00
        Z,H5AI          @CLEAR IMAGE AREA           14212.22 00                    014175.40
        TI,8,H5AI,H5AI&1.0                          14212.00 80 014213.20 A0       014176.00
        SC,$X1,$X2                                     22.03 50                    014177.00
        TI,2,0.0%$X2¤,H6CD  @TRANSMIT REGISTERS FOR ENCODE  0.00 82 014370.04 A0   014177.40
        SIC,H6B1                                    14311.40 80                    014200.40
              B,H6B         @GO ENCODE ADDRESS      14300.50 00                    014201.00
        TI,1,H6BI,H5AI      @STORE ADDRESS IN IMAGE 14321.00 80 014212.02 A0       014201.40
        LV,$X3,H5AA&.32                             14211.46 30                    014202.40
        SVA,$X3,H6C4                                14326.47 D0                    014203.00
        CNOP                                            0.30 00                    014203.40
        SIC,31,0                                       37.00 80                    014204.00
              B,H6C         @ENCODE REGS            14325.10 00                    014204.40
        TI,8,H6CI,H5AI&1.0                          14374.00 80 014213.20 A0       014205.00
        SIC,31,0                                       37.00 80                    014206.00
              B,H1A3        @PRINT REGISTERS        13022.50 00                    014206.40
H5A3    XW,H5AI,72,H5A1&1.0                         14212.00 00 002200.30 79       014207.00
        LV,$X15,H5AA                                14211.36 30                    014210.00
        B,2,0%$X15¤                                     2.10 0F                    014210.40
                        @
H5AA    VF,0                                            0.00&                      014211.00
              VF,2,0    @IX 15 STORAGE                2.00&                      014211.40
        DD%BU,7,7¤,0                                                  000           014211.71
H5AI    DR%BU,64,8¤,9                               11.00                          014212.00
```

```
                                @HEADING PRINT FOR BINARY WORD
                                @AND COMPOSIT DEPOSIT PRINTING
                                @
H6A     L%BU,28,8¤,0,18%$X15¤,18                    0.22 8F 034011.20 50    014223.00
        LX,$X3,$R                                  11.06 10                 014224.00
        SX,$X3,H6AC2                            14256.07 10                 014224.40
        BRZ,H6AC2&,25,$&1.0                     14256.31 80 014226.34 06    014225.00
        Z,$X2                                      22.22 00                 014226.00
        LCI,$X2,6                                   6.05 02                 014226.40
        Z,H6AI1                                 14257.22 00                 014227.00
        TI,15,H6AI1,H6AI1&1.0                   14257.00 80 014260.36 A0    014227.40
H6A1    KV,$X3,H6AD1                            14254.06 90                 014230.40
        BXL,H6A2                                14232.72 42                 014231.00
        V&,$X3,H1V                              13367.06 B0                 014231.40
        CR&,$X2,H6A1                            14230.45 48                 014232.00
H6A2    Z,$X4                   @INDGX FOR STORE   24.22 00                 014232.40

H6A2    Z,$X4                   @INDEX FOR STORE   24.22 00                 014232.40
        L%BU,8,8¤,H6AD1&.56                     14254.70 80 010000.20 50    014233.00
        &%BU,3,3¤,$X2&.15,1                        22.17 80 003300.60 10    014234.00
        ST%BU,8,8¤,H6AI1%$X4¤  @STORE FIRST TENS DIGIT IMAGE
                                                14257.00 84 010000.20 D0    014235.00
H6A3    L%BU,8,8¤,H6AD1&.56                     14254.70 80 010000.20 50    014236.00
        &%BU,4,4¤,$X3&.20,1                        23.24 80 004400.60 10    014237.00
        ST%BU,8,8¤,H6AI2%$X4¤                   14267.00 84 010000.20 D0    014240.00
        CR,$X3,$&1.0                            14242.06 48                 014241.00
        B,H6A5                                  14246.10 00                 014241.40
        V&,$X4,H1V&4.0                          13373.10 B0                 014242.00
        KV,$X3,H6AD2                            14255.06 90                 014242.40
        BXE,H6A4                                14244.72 C2                 014243.00
        V&,$X3,H1V&1.0                          13370.06 B0                 014243.40
        B,H6A3                                  14236.10 00                 014244.00
H6A4    LV,$X3,0,0                                 0.06 30                 014244.40
        V&I,$X2,1.0                                1.05 05                 014245.00
        B,H6A2&.32                              14233.10 00                 014245.40
H6A5    LX,$X3,H6AC2                            14256.06 10                 014246.00
        LVI,$X3,H6AI2                           14267.07 01                 014246.40
        SX,$X3,H6AC2                            14256.07 10                 014247.00
        LVI,$X3,H6AI1                           14257.07 01                 014247.40
        LRI,$X3,H6AC2                           14256.07 03                 014250.00
        SX,$X3,H6AC1                            14252.07 10                 014250.40
                CNOP
        SIC,31,0                                   37.00 80                 014251.00
                B,H1A3                          13022.50 00                 014251.40
H6AC1   XW,0,0,0,0              @CW FOR PRINTING TENS DIGITS
                                                0.00 00 000000.00 00        014252.00
H6A6    $B,0,0                                     0.10 00                 014253.00
                NOP             @RETURN TO CD PRINT
                                                   0.30 00                 014253.40
                                @
H6AD1   XW,0,10,0,%8¤140                           0.12 00 000000.00 60    014254.00
H6AD2   XW,0,09,0,%8¤375                           0.11 00 000000.00 FD    014255.00
H6AC2   XW,0,0,0,0              @CW FOR PRINTING UNITS DIGITS
                                                0.00 00 000000.00 00        014256.00
H6AI1   DR%BU,64,8¤,8                              10.00                    014257.00
H6AI2   DR%BU,64,8¤,8                              10.00                    014267.00
```

```
                                @ROUTINE TO ENCODE AN ADDRESS
                                @FOR PRINT IN OCTAL FORMAT
                                @
H6B4    SVA,$X15,H6B1                                14311.77 D0                    014277.00
        ST%BU,19,8¤,H6B2                             14320.00 80 023000.20 D0       014277.40
H6B     TI,3,$X1,H6BA                                   21.00 80 014322.06 A0       014300.40
        LCI,$X1,7                                        7.03 02                    014301.40
        Z,$X2           @INDEX FOR ADD                  22.22 00                    014302.00
        Z,$X3           @INDEX FOR STORE                23.22 00                    014302.40
H6B3    L%BU,8,8¤,H6B2&.56                           14320.70 80 010000.20 50       014303.00
        &%BU,3,3¤,H6B2%$X2¤,1                        14320.00 82 003300.60 10       014304.00
        ST%BU,8,8¤,H6BI%$X3¤                         14321.00 83 010000.20 D0       014305.00
        V&,$X2,H1V&.32                               13367.44 B0                    014306.00
        V&,$X3,H1V&4.0                               13373.06 B0                    014306.40
        CB,$X1,$&3.0                                 14312.02 48                    014307.00
        TI,3,H6BA,$X1                                14322.00 80 000021.06 A0       014307.40
        L%BU¤,H6BI      @LOAD FOR DP                 14321.00 80 000000.20 50       014310.40
H6B1    $B,0.0                                           0.10 00                    014311.40
        KCI,$X1,1.0                                      1.03 0A                    014312.00
        BXE,$&1.0                                    14313.72 C2                    014312.40
        B,H6B3                                       14303.10 00                    014313.00
        L%BU,8,8¤,H6B2&.48                           14320.60 80 010000.20 50       014313.40
        ST%BU,8,8¤,H6BI%$X3¤                         14321.00 83 010000.20 D0       014314.40
        ST%BU,2¤,H6B2&.19,8                          14320.23 80 002004.20 D0       014315.40
        V&,$X3,H1V&4.0                               13373.06 B0                    014316.40
        B,H6B3                                       14303.10 00                    014317.00
                                @
        CNOP                                             0.30 00                    014317.40
H6B2    VE,0            @RAW ADDRESS                     0.00&                      014320.00
        DD%BU,39,8¤,%8¤72140  @CHARACTER IMAGES                  0000000072140      014320.31
H6BI    DD%BU,64,8¤,0       @IMAGE AREA      000000000000000000000000               014321.00
H6BA    DR%BU,64,8¤,3                        3.00                                   014322.00
```

```
                                @ROUTINE TO ENCODE FOUR REGISTERS
                                @OF DATA IN OCTAL HEX FORMAT
                                @
H6C     SV,$X15,H6CA                                    14367.37 30                     014325.00
        Z,$X1                   @INDEX FOR LOADING        21.22 00                     014325.40
        Z,$X2                   @INDEX FOR STORING        22.22 00                     014326.00
H6C4    LCI,$X3,4                                          4.07 02                     014326.40
        Z,H6CI                                          14374.22 00                     014327.00
        TI,15,H6CI,H6CI&1.0                             14374.00 80 014375.36 A0        014327.40
        LCI,$X2,10                                         12.05 02                     014330.40
H6C1    L%BU,8,8¤,H6CA&.56                              14367.70 80 010000.20 50        014331.00
        &%BU,3,3¤,H6CD%$X1¤,1                           14370.00 81 003300.60 10        014332.00
        ST%BU,8,8¤,H6CI&.48%$X2¤                        14374.60 82 010000.20 D0        014333.00
        L%BU,8,8¤,H6CA&.56                              14367.70 80 010000.20 50        014334.00
        &%BU,3,3¤,H6CD&.32%$X1¤,1                       14370.40 81 003300.60 10        014335.00
        ST%BU,8,8¤,H6CI&2.32%$X2¤                       14376.40 82 010000.20 D0        014336.00
        V&,$X1,H1V&.32                                  13367.42 B0                     014337.00
        V&C,$X2,H1V&4.0                                 13373.04 D0                     014337.40
        KCI,$X2,4                                          4.05 0A                      014340.00
        BXH,H6C1                                        14331.33 42                     014340.40
        BXL,H6C2                                        14345.72 42                     014341.00
                                @
                                @ENCODE POINTS
        L%BU,8,8¤,H6CA&.48                              14367.60 80 010000.20 50        014341.40
        ST%BU,8,8¤,H6CI&.48%$X2¤                        14374.60 82 010000.20 D0        014342.40
        ST%BU,8,8¤,H6CI&2.32%$X2¤                       14376.40 82 010000.20 D0        014343.40
        V&,$X2,H1V&4.0                                  13373.04 B0                     014344.40
        B,H6C1                                          14331.10 00                     014345.00
                                @
                                @ENCODE HEX CODE
H6C2    KCI,$X2,2                                          2.05 0A                      014345.40
        BXH,H6C1                @MORE OCTAL CODING      14331.33 42                     014346.00
                                @
        BXL,$&1.0                                       14347.72 42                     014346.40
        V&,$X2,H1V&4.0                                  13373.04 B0                     014347.00
        L%BU,4,4¤,H6CD%$X1¤,1                           14370.00 81 004400.60 50        014347.40
        KF%BU,8,8¤,H6CA&.40                             14367.50 80 010000.23 10        014350.40
        SIC,31.0                                           37.00 80                     014351.40
                BAH,H6C3                                14365.77 42                     014352.00
        &%BU,8,8¤,H6CA&.56                              14367.70 80 010000.20 10        014352.40
        ST%BU,8,8¤,H6CI&.48%$X2¤                        14374.60 82 010000.20 D0        014353.40
        L%BU,4,4¤,H6CD&.32%$X1¤,1                       14370.40 81 004400.60 50        014354.40
        KF%BU,8,8¤,H6CA&.40                             14367.50 80 010000.23 10        014355.40
        SIC,31.0                                           37.00 80                     014356.40
                BAH,H6C3                                14365.77 42                     014357.00
        &%BU,8,8¤,H6CA&.56                              14367.70 80 010000.20 10        014357.40
        ST%BU,8,8¤,H6CI&2.32%$X2¤                       14376.40 82 010000.20 D0        014360.40
        V&,$X1,H1V&3.0                                  13372.02 B0                     014361.40
        V&,$X2,H1V&4.0                                  13373.04 B0                     014362.00
        CB,$X2,H6C2                                     14345.44 48                     014362.40
        V&I,$X1,,32                                        0.43 05                      014363.00
        V&I,$X2,2.32                                       2.45 05                      014363.40
        CB,$X3,H6C1-.32                                 14330.46 48                     014364.00
        LV,$X15,H6CA                                    14367.36 30                     014364.40
        B,0.0%$X15¤                                        0.10 0F                      014365.00
```

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                                  @
                                  @HEX ABOVE NINE
H6C3    &%BU,8,8¤,H6CA&.32                                14367.40 80 010000.20 10    014365.40
        B,1.0%$X15¤       @RETURN TO HEX ENCODE           1.10 0F                     014366.40
                                  @
H6CA    VF,0              @IX 15 STORAGE                  0.006                       014367.00
        DD%BU,39,8¤,%8¤3104472140                                 0003104472140       014367.31
        CNOP
H6CD    DR%BU,64,8¤,4                                     4.00                        014370.00
H6CI    DR%BU,64,8¤,16                                    20.00                       014374.00
                                  @
                                  @
                                  @
                                  @BINARY TO DECIMAL CONVERSION
                                  @OUT IN BCD IN ACC
                                  @
H6D     TI,16,16.0,H1AA&9.0                               20.00 80 013422.00 A0       014414.00
        L%BU,48,8¤,$R&.16,68                              11.20 80 060042.20 50       014415.00
        BRZ,H6D3                                          14432.74 C2                 014416.00
        CV%BU,48,8¤,0                                     0.00 80 060000.21 B0        014416.40
        Z,H6DA                                            14434.22 00                 014417.40
        ST%BU,60,4¤,H6DA&.04                              14434.04 80 074400.20 D0    014420.00
        Z,$X1             @ADDRESS MODIFICATION           21.22 00                    014421.00
        Z,$X2             @OFFSET MODIFICATION            22.22 00                    014421.40
        LCI,$X2,15                                        17.05 02                    014422.00
        Z,$L                                              10.22 00                    014422.40
        Z,$R                                              11.22 00                    014423.00
        LVI,$X2,56.32                                     70.45 01                    014423.40
H6D1    &%BU,4,4¤,H6DA&.04%$X1¤,0%$X2¤                    14434.04 81 004400.20 12    014424.00
        BRZ,$&1.32                                        14426.74 C2                 014425.00
        &%BU,7,7¤,H6B2&.56,0%$X2¤                         14320.70 80 007700.20 12    014425.40
        V&,$X1,H1V&3.0                                    13372.02 B0                 014426.40
        V-I,$X2,4,0                                       4.05 0D                     014427.00
        CB,$X2,H6D1                                       14424.04 48                 014427.40
H6D2    TI,16,H1AA&9.0,16.0                               13422.00 80 000020.00 A0    014430.00
        SVA,$X15,$&.32                                    14431.77 D0                 014431.00
        LVI,$X15,0,0                                      0.37 01                     014431.40
        B,0,0%$X15¤                                       0.10 0F                     014432.00
                                  @
H6D3    LI%BU,8¤,%8¤140           @ON ALL ZEROS--ENCODE AT LEAST ONE  300000.00 80 410000.20 50  014432.40
        B,H6D2                                            14430.10 00                 014433.40
H6DA    DD%BU¤,0                                          000000000000000000000000    014434.00
```

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                                @
                                @PASS IDENTIFICATION PRINT ROUTINE
                                @
H6E     BB,ECTL2&.42,H6E1       @BYPASS IF OUTPUT SUPPRESSED          4007.52 80 014450.34 02     014435.00
        BB,ECTL2&.41,H6E1       @BYPASS IF HALT SELECTED              4007.51 80 014450.34 02     014436.00
        BB1,ECTL3&.06,$&1.0                                           4010.06 80 014440.34 0E     014437.00
        BB1,ECTL3&.17,$&1.0     @SET FOR DOUBLE SPACE                 4010.21 80 014441.34 0E     014440.00
        BB,ECTL3&.14,H6E2       @BRANCH IF MARGINAL PASS              4010.16 80 014446.34 02     014441.00
        BB,ECTL3&.16,H6E2                                             4010.20 80 014446.34 02     014442.00
        CNOP                                                                                      014443.00
        SIC,31.0                                                        37.00 80                  014443.40
                B,H1A3                                                13022.50 00                 014444.00
        XW,H6EI1,21,H6EC1,4                                           14450.40 40 000520.31 2E    014445.00
        B,H6E1                                                        14450.10 00                 014445.40
        CNOP                                                            0.30 00                   014446.00
H6E2    SIC,31.0                                                        37.00 80                  014446.40
                B,H1A3                                                13022.50 00                 014447.00
        XW,H6EI2,18,H6EC2,4                                           14453.10 40 000440.31 2F    014450.00
H6E1    $B,0                                                            0.10 00                   014450.40
                                @
H6EI1   %IQSZ¤DD%BU,8,8¤,RELIABILITY PASS NO. Z                                                   014453.10
H6EI2   %IQSZ¤DD%BU,8,8¤,MARGINAL PASS NO. Z                                                      014456.00
H6EC1   XW,F4AB&.32,4,0                                               7744.40 00 000100.00 00    014457.00
H6EC2   XW,F4AC&.32,4,0                                               7745.40 00 000100.00 00
```

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                                @
                                @PANEL DUMP
                                @
H7A     TI,6,1.0,H7AA                                    1.00 80 014640.14 A0     014460.00
        SVA,$X15,$&.32                                14461.77 D0                  014461.00
        LVI,$X15,0.0                                      0.37 01                  014461.40
        TI,9,7.0,H1AA                                     7.00 80 013411.22 A0     014462.00
        BB1, FCIL3.6, $&1.                             4010.06 80 014464.34 0E     014463.00
        SIC,H1A1B1                                    13003.40 80                  014464.00
                B,H1A1B&2.0                           13002.50 00                  014464.40
        SX,$X15,H7AB                                  14646.37 10                  014465.00
        LV,$X14,0%$X15¤                                   0.34 3F                  014465.40
        V-I,$X14,1.0                                      1.35 0D                  014466.00
        SV,$X14,H6B2                                  14320.35 30                  014466.40
        SIC,H6B1                                      14311.40 80                  014467.00
                B,H6B                                 14300.50 00                  014467.40
        ST%BU¤,H7AI1&.32                              14653.60 80 000000.20 D0     014470.00
        L%BU,19¤,H7AA                                 14640.00 80 023000.20 50     014471.00
        SIC,H7C1                                      14637.00 80                  014472.00
                B,H7C                                 14633.10 00                  014472.40
        SF%BU,56¤,H7AI1&2.32                          14655.60 80 070000.12 F0     014473.00
        L%BU,36¤,H7AA&.28                             14640.34 80 044000.20 50     014474.00
        SIC,H7C1                                      14637.00 80                  014475.00
                B,H7C                                 14633.10 00                  014475.40
        SF%BU,32¤,H7AI1&4.24,64                       14657.50 80 040040.12 F0     014476.00
        SF%BU¤,H7AI1&4.56                             14660.10 80 000000.12 F0     014477.00
        L%BU,18¤,H7AA&1.0                             14641.00 80 022000.20 50     014500.00
        SIC,H7C1                                      14637.00 80                  014501.00
                B,H7C                                 14633.10 00                  014501.40
        SF%BU,48¤,H7AI1&8.0                           14663.20 80 060000.12 F0     014502.00
        L%BU,18¤,H7AA&2.0                             14642.00 80 022000.20 50     014503.00
        SIC,H7C1                                      14637.00 80                  014504.00
                B,H7C                                 14633.10 00                  014504.40
        SF%BU,48¤,H7AI1&9.48                          14665.00 80 060000.12 F0     014505.00
        L%BU,18¤,H7AA&2.32                            14642.40 80 022000.20 50     014506.00
        SIC,H7C1                                      14637.00 80                  014507.00
                B,H7C                                 14633.10 00                  014507.40
        SF%BU,48¤,H7AI1&11.32                         14666.60 80 060000.12 F0     014510.00
        LF%BU,2,8¤,H7AA&2.57  @GET BC BIT & ERR INJ BIT 14642.71 80 002000.06 70   014511.00
        CM0101%BU,1,8¤,H7AI2-.02  @ST IQS ERR INJ BIT 14670.56 80 001000.12 F0     014512.00
        CM0101%BU,1,8¤,H7AI2-.10  @ST IQS BC BIT      14670.46 80 001000.12 F0     014513.00
        CNOP
        SIC,31.0                                          37.00 80                 014514.00
                B,H1A3      @GO TO PRINT HDG & 1ST LINE 13022.50 00                014514.40
        XW,H7AI,%.48¤H7AI1-H7AI,H7AC                  14652.00 00 000240.31 A7     014515.00
                                @
                                @ENCODE AND PRINT 2ND LINE
        LVI,$X1,1.0                                       1.03 01                  014516.00
        SVA,$X1,H6C4                                  14326.43 D0                  014516.40
        TI,1,H7AA&3.0,H6CD                            14643.00 80 014370.02 A0     014517.00
        SIC,31.0                                          37.00 80                 014520.00
                B,H6C                                 14325.10 00                  014520.40
        L%BU,7¤,H7AA&4.12                             14644.14 80 007000.20 50     014521.00
        SIC,H1AA&24.0                                 13441.00 80                  014522.00
                B,H6D&1.0                             14415.10 00                  014522.40
        SF%BU,16¤,H7AI2A&1.16                         14673.20 80 020000.12 F0     014523.00
```

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L%BU,19□,H7AA&5.0                                    14645.00 80 023000.20 50      014524.00
SIC,H7C1                                             14637.00 80                   014525.00
        B,H7C                                        14633.10 00                   014525.40
SF%BU,56□,H7AI2A&3.32                                14675.40 80 070000.12 F0      014526.00
L%BU,7□,H1AA&.17                                     13411.21 80 007000.20 50      014527.00
SIC,H7C1                                             14637.00 80                   014530.00
        B,H7C                                        14633.10 00                   014530.40
SF%BU,24□,H7AI2A&5.32                                14677.40 80 030000.12 F0      014531.00
L%BU,7□,H1AA&.44                                     13411.54 80 007000.20 50      014532.00
SIC,H7C1                                             14637.00 80                   014533.00
        B,H7C                                        14633.10 00                   014533.40
SF%BU,24□,H7AI2A&7.0                                 14701.00 80 030000.12 F0      014534.00
CNOP
SIC,31,0                                               37.00 80                    014535.00
        B,H1A3                                       13022.50 00                   014535.40
XW,H7AI2,%.48□H7AI2A-H7AI2,H7AC1,4                   14670.60 40 000240.31 A8      014536.00
                    @
                    @PRINT REGISTERS IN BINARY
                    @
CNOP
SIC,H1AA&24,0                                        13441.00 80                   014537.00
                B,H3A3&1,0  @PRINT IND REG           13720.10 00                   014537.40
XW,H1AA&4,0,64,0                                     13415.00 00 002000.00 00      014540.00
XW,H7AI5,%.48□H7AI6-H7AI5,0                          14706.60 00 000360.00 00      014541.00
SIC,H1AA&24,0                                        13441.00 80                   014542.00
                B,H3A3&1,0  @PRINT MASK REG          13720.10 00                   014542.40
XW,H1AA&5,0,64,0                                     13416.00 00 002000.00 00      014543.00
XW,H7AI6,%.48□H7AI7-H7AI6,0                          14710.50 00 000240.00 00      014544.00
LF%BU,8,1□,H1AA&3,0,1                                13414.00 80 010100.46 70      014545.00
&%BU□,H7CA                                           14752.00 80 000000.20 10      014546.00
LF%BU,8□,H7BA&.48,24                                 14722.60 80 010014.06 70      014547.00
BB,H1AA&3,04,$&2,0                                   13414.04 80 014552.34 02      014550.00
LF%BU,8□,H7BA,56,24                                  14722.70 80 010014.06 70      014551.00
SF%BU□,H7AI4A                                        14705.60 80 000000.12 F0      014552.00
CNOP
SIC,H1AA&24,0                                        13441.00 80                   014553.00
                B,H3A3&1,0  @PRINT LH ACC            13720.10 00                   014553.40
XW,H1AA&1,0,64,0                                     13412.00 00 002000.00 00      014554.00
XW,H7AI3,%.48□H7AI4-H7AI3,0                          14701.30 00 000200.00 00      014555.00
SIC,H1AA&24,0                                        13441.00 80                   014556.00
                B,H3A3&1,0  @PRINT RH ACC WITH S BYTE 13720.10 00                  014556.40
XW,H1AA&2,0,64,0                                     13413.00 00 002000.00 00      014557.00
XW,H7AI4,%.48□H7AI5-H7AI4,0                          14702.30 00 001060.00 00      014560.00
SIC,H1AA&24,0                                        13441.00 80                   014561.00
                B,H3A3&1,0  @PRINT REMAINDER         13720.10 00                   014561.40
XW,H1AA&6,0,64,0                                     13417.00 00 002000.00 00      014562.00
XW,H7AI7,%.48□H7AI8-H7AI7,0                          14711.70 00 000260.00 00      014563.00
SIC,H1AA&24,0                                        13441.00 80                   014564.00
                B,H3A3&1,0  @PRINT FACTOR            13720.10 00                   014564.40
XW,H1AA&7,0,64,0                                     13420.00 00 002000.00 00      014565.00
XW,H7AI8,%.48□H7AI9-H7AI8,0                          14713.20 00 000200.00 00      014566.00
SIC,H1AA&24,0                                        13441.00 80                   014567.00
                B,H3A3&1,0  @PRINT TRANSIT           13720.10 00                   014567.40
XW,H1AA&8,0,64,0                                     13421.00 00 002000.00 00      014570.00
XW,H7AI9,%.48□H7BI1-H7AI9,0                          14714.20 00 000220.00 00      014571.00
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                                @ENCODE AND PRINT IX REGS
                                @
                    LX,$X1,H7BC                                 14727.02 10                    014572.00
                    TI,1,H7AB,H1AA&24.0                         14646.00 80 013441.02 A0       014572.40
H7A1                SX,$X1,H7BD                                 14730.03 10                    014573.40
                    LX,$X3,H7BB%$X1¤                            14723.06 11                    014574.00
                    L%BU¤,H7BI1%$X1¤                            14715.30 81 000000.20 50       014574.40
                    LX,$X4,H7BE                                 14731.10 10                    014575.40
                    Z,$X5                                         25.22 00                     014576.00
                    SF%V&I¤%BU,16¤,4.0%$X4¤,0%$X5¤                 4.00 84 120000.12 F5          014576.40
                    V&I,$X5,8.0                                   10.13 05                     014577.40
                    CB,$X4,$-1.32                               14576.50 48                    014600.00
                    SIC,H7B1                                    14632.40 80                    014600.40
                            B,H7B                               14607.10 00                    014601.00
                    CNOP                                          0.30 00                     014601.40
                    SIC,31.0                                     37.00 80                     014602.00
                            B,H1A3                              13022.50 00                    014602.40
                    XW,H7BI,126,0                               14732.00 00 003740.00 00       014603.00
                    LX,$X1,H7BD                                 14730.02 10                    014604.00
                    CB&,$X1,H7A1                                14573.43 48                    014604.40
                                @
                                @PANEL DUMP COMPLETE,RETURN TO PGM
                    SIC,H1A1C1                                  13011.00 80                    014605.00
                            B,H1A1C                             13004.10 00                    014605.40
                    LX,$X15,H7AB                                14646.36 10                    014606.00
                    B,0%$X15¤                                     0.10 0F                      014606.40
                                @
                                @
                                @ROUTINE TO ENCODE IX REGS
                                @
H7B                 Z,$X4                                         24.22 00                     014607.00
                    L%BU,18¤,0%$X3¤,1                             0.00 83 022000.60 50         014607.40
                    SIC,H6B1                                    14311.40 80                    014610.40
                            B,H6B-1.0                           14277.50 00                    014611.00
                    SF%BU,56¤,H7BI&.32%$X4¤,8                   14732.40 84 070004.12 F0       014611.40
                    L%BU,6¤,.18%$X3¤,1                            0.22 83 006000.60 50         014612.40
                    &%BU,3¤,.25%$X3¤,10                           0.31 83 003005.20 10         014613.40
                    SIC,H6B1                                    14311.40 80                    014614.40
                            B,H6B-1.0                           14277.50 00                    014615.00
                    SF%BU,16¤,H7BI&1.24%$X4¤,16                 14733.30 84 020010.12 F0       014615.40
                    &%BU,32¤,H7BA,32                            14722.00 80 040020.20 10       014616.40
                    BZR,0.24%$X3¤,$&2.0                           0.30 83 014621.74 00         014617.40
                    &%BU,8¤,H7BA&.32,56                         14722.40 80 010034.20 10       014620.40
                    SF%BU,32¤,H7BI&1.40%$X4¤,32                 14733.50 84 040020.12 F0       014621.40
                    L%BU,18¤,.28%$X3¤,1                           0.34 83 022000.60 50         014622.40
                    SIC,H6B1                                    14311.40 80                    014623.40
                            B,H6B-1.0                           14277.50 00                    014624.00
                    LF%BU,8¤,H7BA&.40,8                         14722.50 80 010004.06 70       014624.40
                    SF%BU,56¤,H7BI&2.08%$X4¤,8                  14734.10 84 070004.12 F0       014625.40
                    L%BU,18¤,46%$X3¤,1                            0.56 83 022000.60 50         014626.40
                    SIC,H6B1                                    14311.40 80                    014627.40
                            B,H6B-1.0                           14277.50 00                    014630.00
                    SF%BU,48¤,H7BI&3.0%$X4¤,16                  14735.00 84 060010.12 F0       014630.40
                    V&I,$X4,4.0                                   4.11 05                      014631.40
                    CB&,$X3,H7B&.32                             14607.47 48                    014632.00
H7B1                $B,0                                          0.10 00                      014632.40
```

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                        @ROUTINE TO ENCODE UP TO 48 BITS
                        @IN OCTAL BCD CODE
                        @
H7C     SF%BU,48¤,H7BD                                  14730.00 80 060000.12 F0    014633.00
        LF%BU,48,3¤,H7BD,1                              14730.00 80 060300.46 70    014634.00
        &%BU¤,H7CA                                      14752.00 80 000000.20 10    014635.00
        &%BU¤,H7CA,64                                   14752.00 80 000040.20 10    014636.00
H7C1    $B,0                                              0.10 00                   014637.00
                        @
        CNOP                                              0.30 00                   014637.40
H7AA    DR%BU,64,8¤,6                                     6.00                      014640.00
H7AB    XW,0,0,0                                          0.00 00 000000.00 00      014646.00
H7AC    XW,H7AI1,*.48¤H7AI2-H7AI1,0                     14653.20 00 003300.00 00    014647.00
H7AC1   XW,H6CI&.32,32,H7AC2,4                          14374.40 40 001000.31 A9    014650.00
H7AC2   XW,H7AI2A,*.48¤H7AI3-H7AI2A,0                   14672.00 00 001660.00 00    014651.00
H7AI    %IQSQ¤DD%BU¤,PANEL DUMPQ                                                    014652.00
H7AI1   %IQSQ¤DD%BU¤,LC  123456.7    IT  1234567    TC  123456Q                     014653.20
        %IQSQ¤DD%BU¤,789012    INT ADD REG  123456    UB  123456Q                  014660.30
        %IQSQ¤DD%BU¤,    LB  123456    BCB 00Q                                    014665.60
H7AI2   %IQSQ¤DD%BU¤,MAINT BITSQ                                                    014670.60
H7AI2A  %IQSQ¤DD%BU¤,CHAN ADD  12    OTHER CPUS  1234567    LZC  Q                 014672.00
        %IQSQ¤DD%BU¤,123    AOC  123Q                                               014677.40
H7AI3   %IQSQ¤DD%BU¤,  LH ACCQ                                                      014701.30
H7AI4   %IQSQ¤DD%BU¤,  RH ACC    ACC SIGN BYTE  Q                                   014702.30
H7AI4A  %IQSQ¤DD%BU¤,12345678Q                                                      014705.60
H7AI5   %IQSQ¤DD%BU¤,  INDICATOR REGQ                                               014706.60
H7AI6   %IQSQ¤DD%BU¤,  MASK REGQ                                                    014710.50
H7AI7   %IQSQ¤DD%BU¤,  REMAINDERQ                                                   014711.70
H7AI8   %IQSQ¤DD%BU¤,  FACTORQ                                                      014713.20
H7AI9   %IQSQ¤DD%BU¤,  TRANSITQ                                                     014714.20
H7BI1   %IQSQ¤DD%BU¤,X3X2X1X0X7X6X5X4XBXAX9X8XFXEXDXCQ                             014715.30
        CNOP                                              0.30 00                   014721.40
H7BA    %8¤DD%BU,8¤,277,307,377,310,126,50,166,40                                277 014722.00
                                                                                 307 014722.10
                                                                                 377 014722.20
                                                                                 310 014722.30
                                                                                 126 014722.40
                                                                                 050 014722.50
                                                                                 166 014722.60
                                                                                 040 014722.70
H7BB    XW,H1AA&9.0,4,0                                 13422.00 00 000100.00 00    014723.00
        XW,H1AA&13.0,4,0                                13426.00 00 000100.00 00    014724.00
        XW,H1AA&17.0,4,0                                13432.00 00 000100.00 00    014725.00
        XW,H1AA&21.0,4,0                                13436.00 00 000100.00 00    014726.00
H7BC    XW,0,4,0                                          0.00 00 000100.00 00      014727.00
H7BD    XW,0,0,0                                          0.00 00 000000.00 00      014730.00
H7BE    XW,H7BI,4,0                                     14732.00 00 000100.00 00    014731.00
H7BI    DR%BU,64,8¤,16                                    20.00                     014732.00
H7CA    %8¤DD%BU,8¤,140,140,140,140,140,140,140,140                              140 014752.00
                                                                                 140 014752.10
                                                                                 140 014752.20
                                                                                 140 014752.30
                                                                                 140 014752.40
                                                                                 140 014752.50
                                                                                 140 014752.60
                                                                                 140 014752.70
```

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                @STRETCH MAINTENANCE COMPOOL, NOVEMBER 20, 1961
EBAUTO  SYN,ECTL1                                  4006.00&    &00000000    BU,100,10
EBMAIN  SYN,ECTL1&.01                              4006.01&    &00000000    BU,100,10
EBSURV  SYN,ECTL1&.02                              4006.02&    &00000000    BU,100,10
EBDCP   SYN,ECTL1&.03                              4006.03&    &00000000    BU,100,10
EBMCON  SYN,ECTL1&.04                              4006.04&    &00000000    BU,100,10
EPBLNK  SYN,ECTL1&.46                              4006.56&    &00000000    BU,100,10
EMACH   SYN,ECTL2                                  4007.00&    &00000000    BU,100,10
ETAPCM  SYN,ECTL2&.12                              4007.14&    &00000000    BU,100,10
ETAPDM  SYN,ECTL2&.19                              4007.23&    &00000000    BU,100,10
ETAPCS  SYN,ECTL2&.28                              4007.34&    &00000000    BU,100,10
ETAPDS  SYN,ECTL2&.35                              4007.43&    &00000000    BU,100,10
ETAPCO  SYN,ECTL2&.44                              4007.54&    &00000000    BU,100,10
ETAPDO  SYN,ECTL2&.51                              4007.63&    &00000000    BU,100,10
EB16CH  SYN,ECTL2&.61                              4007.75&    &00000000    BU,100,10
MNTCTL  SYN, ECTL2.62       @MAINT CONSL CONTROL   4007.76&    &00000000    BU,100,10
EBDBSP  SYN,ECTL3&.17                              4010.21&    &00000000    BU,100,10
EDPLOC  SYN,ECTL3&.32                              4010.40&    &00000000    BU,100,10
EBAEC   SYN,ECTL4&.01                              4011.01&    &00000000    BU,100,10
EBHARV  SYN,ECTL4&.02                              4011.02&    &00000000    BU,100,10
EBK1    SYN,ECTL4&.03                              4011.03&    &00000000    BU,100,10
EBK2    SYN,ECTL4&.04                              4011.04&    &00000000    BU,100,10
EBK3    SYN,ECTL4&.05                              4011.05&    &00000000    BU,100,10
EQRDR1  SYN,EQAV1                                  4012.00&    &00000000    BU,100,10
EQRDR2  SYN,EQAV1&.16                              4012.20&    &00000000    BU,100,10
EQRDR3  SYN,EQAV1&.32                              4012.40&    &00000000    BU,100,10
EQRDR4  SYN,EQAV1&.48                              4012.60&    &00000000    BU,100,10
EQPUN1  SYN,EQAV2                                  4013.00&    &00000000    BU,100,10
EQPUN2  SYN,EQAV2&.16                              4013.20&    &00000000    BU,100,10
EQPUN3  SYN,EQAV2&.32                              4013.40&    &00000000    BU,100,10
EQPUN4  SYN,EQAV2&.48                              4013.60&    &00000000    BU,100,10
EQTYP1  SYN,EQAV3                                  4014.00&    &00000000    BU,100,10
EQTYP2  SYN,EQAV3&.16                              4014.20&    &00000000    BU,100,10
EQTYP3  SYN,EQAV3&.32                              4014.40&    &00000000    BU,100,10
EQTYP4  SYN,EQAV3&.48                              4014.60&    &00000000    BU,100,10
EQPTR1  SYN,EQAV4                                  4015.00&    &00000000    BU,100,10
EQPTR2  SYN,EQAV4&.16                              4015.20&    &00000000    BU,100,10
EQPTR3  SYN,EQAV4&.32                              4015.40&    &00000000    BU,100,10
EQPTR4  SYN,EQAV4&.48                              4015.60&    &00000000    BU,100,10
EQDIS1  SYN,EQAV5                                  4016.00&    &00000000    BU,100,10
EQDIS2  SYN,EQAV5&.16                              4016.20&    &00000000    BU,100,10
EQDIS3  SYN,EQAV5&.32                              4016.40&    &00000000    BU,100,10
EQDIS4  SYN,EQAV5&.48                              4016.60&    &00000000    BU,100,10
EQTAP1  SYN,EQAV6                                  4017.00&    &00000000    BU,100,10
EQTAP2  SYN,EQAV6&.16                              4017.20&    &00000000    BU,100,10
EQTAP3  SYN,EQAV6&.32                              4017.40&    &00000000    BU,100,10
EQTAP4  SYN,EQAV6&.48                              4017.60&    &00000000    BU,100,10
EQTAP5  SYN,EQAV7                                  4020.00&    &00000000    BU,100,10
EQTAP6  SYN,EQAV7&.16                              4020.20&    &00000000    BU,100,10
ETAP7   SYN,EQAV7&.32                              4020.40&    &00000000    BU,100,10
EQTAP8  SYN,EQAV7&.48                              4020.60&    &00000000    BU,100,10
EQMEM   SYN,EDCP1&21.0                             4025.00&    &00000000    BU, 40,10
```

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ACA     SYN,0                    0.00&    &00000000
ACB     SYN,ACA&1.0              1.00&    &00000000
ACC     SYN,ACA&2.0              2.00&    &00000000
ACD     SYN,ACA&3.0              3.00&    &00000000
ACE     SYN,ACA&4.0              4.00&    &00000000
ACF     SYN,ACA&5.0              5.00&    &00000000
ACG     SYN,ACA&6.0              6.00&    &00000000
ACH     SYN,ACA&7.0              7.00&    &00000000
ADA     SYN,ACA&8.0             10.00&    &00000000
ADB     SYN,ACA&9.0             11.00&    &00000000
ADC     SYN,ACA&10.0            12.00&    &00000000
ADD     SYN,ACA&11.0            13.00&    &00000000
AIDNTA  SYN,ACA&12.0            14.00&    &00000000
AIDNTB  SYN,ACA&13.0            15.00&    &00000000
```

```
                                @
                                @
                                @UTILITY CONTROL ROUTINE
                                @CONTROLS ENTRY AND EXIT FROM UTILITY
                                @SECTION AND CONTROLS SELECTION OF
                                @UTILITY ROUTINES.

J1A1    SIC,G1J1                                                10277.00 80                    014753.00
              B,G1J             @RETURN FROM UTILITY ROUTINES   10267.10 00                    014753.40
        BZR,ESSS&.48,F1B                                          4062.60 80 005252.34 00      014754.00

J1A     TI,1,G2D&16.0,G2D1      @ENTRY FROM DCP                 10473.00 80 010513.02 A0     014755.00
        SIC,31,0                                                   37.00 80                    014756.00
              B,G2A&.32         @GO TO CONTROL HALT             10355.50 00                    014756.40
        BR,ESSS&.32,J2A         @GO TO UPDATE TAPE               4062.40 80 015431.34 02     014757.00
        BR,ESSS&.33,J2G         @GO TO LOAD TAPE                 4062.41 80 014762.74 02     014760.00
        BR,ESSS&.34,J2X         @GO TO DUPLICATE TAPE            4062.42 80 016400.34 02     014761.00
        B,J1A1                  @NO SELECTIONS, DO WE RETURN TO DCP 14753.10 00              014762.00
```

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                @INITIAL LOAD OF MASTER TAPE
                                @
                                @
J2G             SIC,$X15                                    37.00 80                    014762.40
                      B,J2AA          @GO LOCATE CHANNEL  15201.50 00                    014763.00
                                @AND DRIVE NUMBER
                SIC,J2XN7                                 16416.40 80                    014763.40
                      B,J2XN6   @GO REWIND MASTER         16410.50 00                    014764.00
                                @
                ODDNEC%SEOP¤,0%$X1¤                           0.00 81 000157.15 00       014764.40
                SIC,J2XW2                                 16252.00 80                    014765.40
                      B,J2XW1     @WAIT FOR SEOP          16250.10 00                    014766.00
                HD%SEOP¤,0%$X1¤     @SET HI-DENSITY           0.00 81 000036.15 00       014766.40
                SIC,J2XW2                                 16252.00 80                    014767.40
                      B,J2XW1   @WAIT                     16250.10 00                    014770.00
                W%SEOP¤,0%$X1¤,J2AB2      @WRITE DCP CALLER   0.00 81 015240.13 00       014770.40
                SIC,J2XW2                                 16252.00 80                    014771.40
                      B,J2XW1     @WAIT FOR SEOP          16250.10 00                    014772.00
                                @
                ECC%SEOP¤,0%$X1¤                              0.00 81 000057.15 00       014772.40
                SIC,J2XW2                                 16252.00 80                    014773.40
                      B,J2XW1     @WAIT FOR SEOP          16250.10 00                    014774.00
                W%SEOP¤,0%$X1¤,J2AC4      @WRITE DCP          0.00 81 015244.13 00       014774.40
                SIC,J2XW2                                 16252.00 80                    014775.40
                      B,J2XW1     @WAIT FOR SEOP          16250.10 00                    014776.00
                ERG%SEOP¤,0%$X1¤                              0.00 81 000056.15 00       014776.40
                SIC,J2XW2                                 16252.00 80                    014777.40
                      B,J2XW1     @WAIT FOR SEOP          16250.10 00                    015000.00
                WEF%SEOP¤,0%$X1¤                              0.00 81 000117.15 00       015000.40
                SIC,J2XW2                                 16252.00 80                    015001.40
                      B,J2XW1     @WAIT FOR S             16250.10 00                    015002.00
                                @
                LX,$X4,J2AR4        @SET UP INDEX WORD FOR PRINT  15241.10 10          015002.40
                SX,$X4,J2NCA1       @IN CASE OF I/O ERROR         16154.11 10          015003.00
                Z,ESEQTB            @ZERO                          4204.22 00          015003.40
                LCI,$X3,59          @DCP TABLE                       73.07 02          015004.00
                T,$X3,ESEQTB,ESEQTB&1.0                            4204.00 80 004205.06 20  015004.40
                Z,F1TAPO            @0 SYNC REG IN DCP             4173.22 00          015005.40
                TI,3,F1TAPO,F1TAPO&1.0                             4173.00 80 004174.06 A0  015006.00
                BBZ,J2AD1&.03,$&1.0                               15247.03 80 015010.34 06  015007.00
J2GG1           CM1111%BU,18¤,EDPLOC  @SET UP SSC ROUTINE          4010.40 80 022000.36 F0  015010.00
                Z,$R                                                 11.22 00          015011.00
                ST%BU,12¤,F1BC3                                    5616.24 80 014000.20 D0  015011.40
                ST%BU¤,F1BD                                        5623.00 80 000000.20 D0  015012.40
                                @
                SIC,J2MA2                                         15222.40 80          015013.40
                      B,J2AM1         @GO CLEAR MEMORY            15214.10 00          015014.00
                LVI,$X1,18.0        @SELECT CARD READER              22.03 01          015014.40
                LVI,$X2,0           @CHANNEL FOR INPUT                0.05 01          015015.00
                LVI,$X9,J2G3                                      15031.23 01          015015.40
                SVA,$X9,F1B1E                                      5415.63 D0          015016.00
                                @
                LOC%SEOP¤,0%$X1¤,0%$X2¤   @SELECT CHANNEL             0.00 81 000000.17 02  015016.40
                SIC,J2XW2                                         16252.00 80          015017.40
                      B,J2XW1                                     16250.10 00          015020.00
                LD%SEOP¤,0%$X1¤     @PREPARE TO READ                0.00 81 000037.15 00  015020.40
                SIC,J2XW2                                         16252.00 80          015021.40
                      B,J2XW1                                     16250.10 00          015022.00
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J2G2    REL%SEOP¤,0%$X1¤                                    0.00 81 000000.33 00    015022.40
        SIC,J2XW2                                       16252.00 80                 015023.40
              B,J2XW1                                   16250.10 00                 015024.00
        BZB,J2AB1&.18,J2G2                              15237.22 80 015022.74 00    015024.40
        RD%SEOP¤,0%$X1¤,F1BB                                0.00 81 005614.11 00    015025.40
        SIC,J2XW2                                       16252.00 80                 015026.40
              B,J2XW1                                   16250.10 00                 015027.00
        SIC,31.0                                           37.00 80                 015027.40
              B,F1B1B                                    5327.50 00                 015030.00
        B,J2G2                                          15022.50 00                 015030.40
                        @
J2G3    LVI,$X9,F1C                                         6604.63 01              015031.00
        SVA,$X9,F1B1E                                       5415.63 D0              015031.40
        L%BU,48¤,F1BI&7.32                                  5653.40 80 060000.20 50 015032.00
        KE%BU,48¤,J2AC2     @COMPARE TO TERM                15243.00 80 060000.23 10 015033.00
        BZAE,J2H                                        15036.36 C0                 015034.00
        SIC,$X15                                           37.00 80                 015034.40
              B,J2AA        @GO LOCATE MASTER           15201.50 00                 015035.00
        B,J2HT1             @GO REWRITE DCP & CHECK TAPE 15062.50 00                015035.40
                        @
J2H     SIC,J2SP5                                       16225.40 80                 015036.00
              B,J2SP1       @GO GEN CHECKSUM            16210.10 00                 015036.40
                            @STORE ID IN DCP TABLE
J2H3    LX,$X3,J2NCA1                                   16154.06 10                 015037.00
        LV,$X7,J2AD2                                    15250.16 30                 015037.40
        L%BU,24,8¤,1.40%$X7¤                                1.50 87 030000.20 50    015040.00
        ST%BU,24¤,ESEQTB&.08%$X3¤  @STORE INTO ID TABLE  4204.10 83 030000.20 D0    015041.00
        CBH,$X3,$&.32                                   15042.46 C8                 015042.00
        SX,$X3,J2NCA1                                   16154.07 10                 015042.40
                        @
        BBZ,J2AD1&.03,J2HCH1    @BR-DCP2 WAS LAST WRITTEN ON TAPE  15247.03 80 015223.34 06  015043.00
J2H4    SIC,$X15                                           37.00 80                 015044.00
              B,J2AA        @LOCATE CHANNEL JF          15201.50 00                 015044.40
        ODDECC%SEOP¤,0%$X1¤                                 0.00 81 000057.15 00    015045.00
        SIC,J2XW2                                       16252.00 80                 015046.00
              B,J2XW1                                   16250.10 00                 015046.40
                        @
        BBZ,J2AD1&.01,$&1.0                             15247.01 80 015050.34 06    015047.00
        W%SEOP¤,0%$X1¤,J2AD2  @WRITE PROGRAM                0.00 81 015250.13 00    015050.00
        SIC,J2XW2                                       16252.00 80                 015051.00
              B,J2XW1                                   16250.10 00                 015051.40
        SIC,J2ND2                                       15677.00 80                 015052.00
              B,J2ND1-1.0                               15673.10 00                 015052.40
        SIC,$X15                                           37.00 80                 015053.00
              B,J2H5        @WRITE WAS SUCCESSFUL       15060.10 00                 015053.40
        L%BU,24¤,ESEQTB-.24%$X3¤  @IF PROG JUST          4203.50 83 030000.20 50    015054.00
        KE%BU,24¤,J2HCH2    @WRITTEN IS DCP2-NEXT       15354.70 80 030000.23 10    015055.00
        BZAE,$&1.32         @PROGRAM MUST BE TEST LOW MEM 15057.76 C0               015056.00
        CM1111%BU,1.1¤,J2AD1&.03  @SETBIT TO IND DCP2   15247.03 80 001100.36 F0    015056.40
        B,J2GG1                   @GO TO HALT-READ NEXT DP 15010.10 00              015057.40
                        @
     @RESTORE BLOCK FOR INITIAL TAPE LOAD
J2H5    BBZ,J2AD1,$&1.0     @CLEAR INDICATORS           15247.00 80 015061.34 06    015060.00
        BBZ,J2AD1&.01,$&1.0                             15247.01 80 015062.34 06    015061.00
        B,0%$X15¤                                           0.10 0F                 015062.00
```

```
                @ROUTINE TO WRITE CALLER AND
                @DCP ON MASTER TAPE
                        @
J2HT1   WEF%SEOP¤,0%$X1¤                          0.00 81 000117.15 00    015062.40
        SIC,J2XW2                                16252.00 80              015063.40
                B,J2XW1                          16250.10 00              015064.00
        SIC,J2XN7                                16416.40 80              015064.40
                B,J2XN6   @GO REWIND MASTER      16410.50 00              015065.00
        CTL%SEOP¤,0%$X1¤,%8¤076  @SPACE OVER CALLER   0.00 81 000076.15 00 015065.40
        SIC,J2XW2                                16252.00 80              015066.40
                B,J2XW1                          16250.10 00              015067.00
J2HT1X  L,FECTL2          @GET NORMAL OUTPUT TABLE 4745.00 80 014000.20 50 015067.40
        ST%BU,49¤,ESSSX&.05                       4160.05 80 061000.20 D0 015070.40
        CM1111%BU,1,8¤,ESSSX&.05  @SET FOR AUTO TEST 4160.05 80 001000.36 F0 015071.40
        Z,ESSSX&1.        @AND SEQ MODES          4161.22 00              015072.40
        Z,ESSSX&2.0       @NORMAL SETUP IS-       4162.22 00              015073.00
        L,ESSSXA          @NO TW--TAPE OUTPUT--  15243.60 80 010000.20 50 015073.40
        ST%BU,8¤,ESSSX&2.0  @MAINT CNSL--REL PASSES 4162.00 80 010000.20 D0 015074.40
        Z,FDCP1                                  4000.22 00              015075.40
        LVI,$X8,FDCP1                            4000.21 01              015076.00
        SV,$X8,FDPLOC                            4010.61 30              015076.40
        LX,$X8,J2AC4                            15244.20 10              015077.00
        SC,$X8,$X7                                 27.21 50              015077.40
        V&,$X7,J2AC4                            15244.16 B0              015100.00
        V&I,$X7,1.                                 1.17 05              015100.40
        SV,$X7,F1BD&.32                          5623.57 30              015101.00
        C&I,$X8,2.        @THAN PREVIOUS TIME      2.21 00              015101.40
        SX,$X8,J2AB1                            15237.21 10              015102.00
        SIC,J2SP5                                16225.40 80              015102.40
                B,J2SP1                          16210.10 00              015103.00
        W%SEOP¤,0%$X1¤,J2AB1   @WRITE DCP             0.00 81 015237.13 00 015103.40
        CCW,0%$X1¤,J3DC1       @CCW OUTSIDE DCP TO    0.00 81 020000.21 00 015104.40
        BB,J3DC1&.24,$-1.0     @AVOID CHECKSUM ERROR 20000.30 80 015104.74 02 015105.40
        SIC,J2ND2                                15677.00 80              015106.40
                B,J2ND1-1.0                      15673.10 00              015107.00
        BBZ,J2AD1&.01,$&1.0                      15247.01 80 015110.74 06 015107.40
                        @
                        @
                        @
                        @
                @ROUTINE TO READ MASTER, CHECKSUM
                @FOR PROPER WRITE
                        @
J2HP    SIC,J2HP3A                               15174.40 80              015110.40
                B,J2HP3  @GO CHECK CALLER        15150.50 00              015111.00
        ODDECC%SEOP¤,0%$X1¤                           0.00 81 000057.15 00 015111.40
        SIC,J2XW2                                16252.00 80              015112.40
                B,J2XW1                          16250.10 00              015113.00
        SIC,J2HP4A                               15201.00 80              015113.40
                B,J2HP4                          15175.10 00              015114.00
        SPFL%SEOP¤,0%$X1¤                             0.00 81 000077.15 00 015114.40
        SIC,J2XW2                                16252.00 80              015115.40
                B,J2XW1                          16250.10 00              015116.00
        REL%SEOP¤,0%$X1¤       @RELEASE FE            0.00 81 000000.33 00 015116.40
        SIC,J2XW2                                16252.00 80              015117.40
                B,J2XW1    @WAIT                 16250.10 00              015120.00
        LX,$X9,J2AB4                             15241.22 10              015120.40
        SX,$X9,J2NCA1        @STORE INDEXING FOR I/O CHECK 16154.23 10     015121.00
J2HP1   RD%SEOP¤,0%$X1¤,J2AB7                         0.00 81 015242.11 00 015121.40
        SIC,J2XW2                                16252.00 80              015122.40
                B,J2XW1                          16250.10 00              015123.00
```

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SIC,J2ND2                                          15677.00 80                    015123.40
         B,J2ND1    @CHECK FOR OTHER THAN EE       15674.10 00                    015124.00
CT1100%BU,2,8¤,J2AB1&.21  @IF BOTH EF & EOP       15237.25 80 002000.31 70       015124.40
BRZ,J2HP2          @SET----WE READ AND END OF      15134.74 C2                    015125.40
                     @FILE----TERMINATE CHECKING
SIC,J2SP5                                          16225.40 80                    015126.00
         B,J2SP2                                   16226.10 00                    015126.40
L%BU,24¤,%8¤J3DC1&1.50  @SEE IF IT CORRESPONDS     20001.50 80 030000.20 50       015127.00
KF%BU,24¤,ESEQTB&.08%$X9¤  @TO DCP SCHEDULE TABLE   4204.10 89 030000.23 10       015130.00
BAE,J2HP2-.32                                      15134.36 C2                    015131.00
CNOP                                                   0.30 00                    015131.40
SIC,31,0                                              37.00 80                    015132.00
         B,H1A1A                                   12767.50 00                    015132.40
XW,%8¤20001.40,4,J2AC5.4                           20001.40 40 000100.32 A5       015133.00
CBH,$X9,J2HP1-.32                                  15121.22 C8                    015134.00
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                                    @GO TO PRINT OUT
J2HP2   L%BU,16¤,$X9&.03,48  @GET CHARACTER COUNT                31.03 80 020030.20 50      015134.40
        REL%SEOP¤,0%$X1¤                                          0.00 81 000000.33 00      015135.40
        SIC,J2XW2                                             16252.00 80                   015136.40
                B,J2XW1                                       16250.10 00                   015137.00
        REW%SEOP¤,0%$X1¤                                          0.00 81 000136.15 00      015137.40
        Z,$X9                                                    31.22 00                   015140.40
        LC,$X9,$R                                                11.22 50                   015141.00
        LVI,$X9,FSEOTB                                         4204.23 01                   015141.40
        SX,$X9,J2AC6                                          15246.23 10                   015142.00
        CNOP                                                      0.30 00                   015142.40
        SIC,31,0                                                 37.00 80                   015143.00
                P,H1A1A                                       12767.50 00                   015143.40
        XW,J2HP12,60,J2AC6                                    15272.40 00 001700.32 A6      015144.00
        SIC,J2XW2                                             16252.00 80                   015145.00
                B,J2XW1                                       16250.10 00                   015145.40
        BZB,J2AB1&.18,$-1.0      @WAIT UNTIL TAPE IS READY    15237.22 80 015145.34 00      015146.00
        REL%SEOP¤,0%$X1¤                                          0.00 81 000000.33 00      015147.00
        B,J1A1                   @RETURN TO UTILITY CONTROL   14753.10 00                   015150.00
                                 @
J2HP3   REW%SEOP¤,0%$X1¤                                          0.00 81 000136.15 00      015150.40
        LCI,$X5,J3A6-J3A&2.0                                     53.13 02                   015151.40
        T,$X5,J3A-1.0,63.0                                    15356.00 80 000077.12 20      015152.00
        CNOP
        LVI,$X15,$&1.0                                        15154.37 01                   015153.00
                B,EMEMCI  @CHECK IF CALLER                     4050.10 00                   015153.40
J2AB3   CW,63.0,J3A6-J3A&2.0,0  @PROPERLY WRITTEN                77.00 00 001260.00 00      015154.00
        SIC,J2XW2                                             16252.00 80                   015155.00
                B,J2XW1                                       16250.10 00                   015155.40
        BZB,J2AB1&.18,$-1.0                                   15237.22 80 015155.34 00      015156.00
        REL%SEOP¤,0%$X1¤     @RELEASE CHANNEL SIGNAL              0.00 81 000000.33 00      015157.00
        SIC,J2XW2                                             16252.00 80                   015160.00
                B,J2XW1          @WAIT                        16250.10 00                   015160.40
        ODDNEC%SEOP¤,0%$X1¤                                       0.00 81 000157.15 00      015161.00
        Z,64.0                   @CLEAR CALL&R OUT OF           100.22 00                   015162.00
        T,$X5,64.0,65.0          @100 AREA                      100.00 80 000101.12 20      015162.40
        SIC,J2XW2                                             16252.00 80                   015163.40
                B,J2XW1                                       16250.10 00                   015164.00
        RD%SEOP¤,0%$X1¤,J2AB3                                     0.00 81 015154.11 00      015164.40
        SIC,J2XW2                                             16252.00 80                   015165.40
                B,J2XW1                                       16250.10 00                   015166.00
        SIC,J2ND2                                             15677.00 80                   015166.40
                B,J2ND1-1.0                                   15673.10 00                   015167.00
        SIC,$X15                                                 37.00 80                   015167.40
                B,EMEMCR                                       4050.50 00                   015170.00
        CT0011%BU,16,8¤,G5BR4                                 12705.00 80 020000.07 70      015170.40
        BR7,J2HP3A               @BR IF NO ERRORS             15174.74 C2                   015171.40
        CNOP
        SIC,$X15                                                 37.00 80                   015172.00
                B,H1A1A                                       12767.50 00                   015172.40
        XW,J2HP10,87,0                                        15251.00 00 002560.00 00      015173.00
        B,J2G                    @GO START OVER               14762.50 00                   015174.00


J2HP3A  $R,0                                                      0.10 00                   015174.40
                                 @
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J2HP4    RD%SEOP¤,0%$X1¤,J2AB7      @READ DCP                    0.00 81 015242.11 00    015175.00
         SIC,J2XW2                                               16252.00 80             015176.00
               B,J2XW1                                           16250.10 00             015176.40
         SIC,J2ND2                                               15677.00 80             015177.00
               B,J2ND1   @CHECK ERRORS                           15674.10 00             015177.40
         SIC,J2SP5                                               16225.40 80             015200.00
               B,J2SP2   @GO COMPARE DCP CHECKSUM                16226.10 00             015200.40
J2HP4A   $B,0                                                     0.10 00                 015201.00
J2AA     L%BU,10,1¤,ECTL2&.12                                    4007.14 80 012100.20 50 015201.40
         LVI,$X1,0.0                                               0.03 01               015202.40
         LVI,$X2,0.0                                               0.05 01               015203.00
         SF%BU,7,8¤,$X1&.12,3                                     21.14 80 007001.52 F0  015203.40
         SF%BU,3¤,$X2&.15                                         22.17 80 003000.12 F0  015204.40
         RFL%SEOP¤,0%$X1¤                                          0.00 81 000000.33 00  015205.40
         SIC,J2XW2                                               16252.00 80             015206.40
               B,J2XW1                                           16250.10 00             015207.00
         LOC%SEOP¤,0%$X1¤,0%$X2¤  @LOCATE                          0.00 81 000000.17 02  015207.40
         SIC,J2XW2                                               16252.00 80             015210.40
               B,J2XW1                                           16250.10 00             015211.00
         RFL%SEOP¤,0%$X1¤                                          0.00 81 000000.33 00  015211.40
         SIC,J2XW2                                               16252.00 80             015212.40
               B,J2XW1        @WAIT                            16250.10 00             015213.00
         B,0%$X15¤                                                 0.10 0F               015213.40
                        @ROUTINE TO CLEAR MEMORY
                        @ABOVE DCP
J2AM1    TI,16,16.0,FA1&9.0                                       20.00 80 007212.00 A0  015214.00
         L%BU,18¤,EOMEM,46                                       4025.00 80 022027.20 50 015215.00
         LX,$X1,$R                                                11.02 10               015216.00
         V-I,$X1,EDCP1&13777.0                                   36721.03 0D             015216.40
         LC,$X1,$X1                                               21.02 50               015217.00
         LVI,$X1,EDCP1&13777.0                                   36721.03 01             015217.40
         Z,0%$X1¤                                                  0.22 01               015220.00
         T,$X1,00%$X1¤,1,0%$X1¤                                    0.00 81 000001.02 21  015220.40
         TI,16,FA1&9.0,16.0                                       7212.00 80 000020.00 A0 015221.40
J2MA2    $B,0                                                      0.10 00               015222.40
                        @
                @SEE IF UPPER MEM PROG FOLLOWS DCP2
J2HCH1   LV,$X6,EDPLOC        @IF BIT 47 IS A ONE, IT             4010.54 30             015223.00
         CT1100%BU,1,1¤,ADA&.47%$X6¤  @IS THE CORRECT PROG        10.57 86 001100.31 70  015223.40
         BRZ,J2H4              @CONTINUE                         15044.34 C2            015224.40
         C0011%BU,1,1¤,ECTL2&.39                                 4007.47 80 001100.06 70 015225.00
         BRZ,ECTL2&.39,$&1.0  @SET BIT TO PRINT ON TW            4007.47 80 015227.34 06 015226.00
         SIC,$X15                                                37.00 80               015227.00
               B,H1A1A                                           12767.50 00            015227.40
         XW,J2HCH3,%.48¤J2HCH2-J2HCH1                            15302.00 00 026360.00 00 015230.00
         CM0101%BU,1,1¤,ECTL2&.39  @RESTORE I/O SELECTION        4007.47 80 001100.12 F0 015231.00
         V-I,$X3,.32           @RESTORE INDEXING                   0.47 0D               015232.00
         C&I,$X3,1.                                                1.07 00               015232.40
         CCW,0%$X1¤,J2AB1      @WAIT FOR CS FROM READER            0.00 81 015237.21 00  015233.00
         BZB,J2AB1&.23,$-1.0                                     15237.27 80 015233.34 00 015234.00
         CM1111%BU,1,1¤,J2AD1&.03  @SET BIT TO SHOW WAIT LOW MEM 15247.03 80 001100.36 F0 015235.00
         B,J2GG1                                                 15010.10 00            015236.00
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J2AB1   XW,0.0,0,0          @AREA FOR CCW                    0.00 00 000000.00 00      015237.00
J2AB2   CW,J3A-1.0,J3A6-J3A&2.0,0                        15356.00 00 001260.00 00      015240.00
J2AB4   XW,0.0,120,0                                         0.00 00 003600.00 00      015241.00
J2AB7   CW,J3DC1,%8¤60000.0                              20000.00 01 400000.00 00      015242.00
J2AC2   %8¤DD%BU,12¤,1100,4020,2001,2040                                        1100   015243.00
                                                                                4020   015243.14
                                                                                2001   015243.30
                                                                                2040   015243.44
ESSSXA  %8¤DD%BU,8¤,105                                                          105   015243.60
J2AC4   CW,EDCP1,%8¤13500,0                               4000.00 00 272000.00 00      015244.00
J2AC5   XW,J2HP11,53,0                                   15263.70 00 001520.00 00      015245.00
J2AC6   XW,0,0,0                                             0.00 00 000000.00 00      015246.00
J2AD1   DD%BU,64,8¤,0                                    000000000000000000000000      015247.00
J2AD2   DD%BU,64,8¤,0                                    000000000000000000000000      015250.00
J2HP10  %IQSZ¤DD%BU,8¤,*CALLER IS NOT PROPERLY WRITTEN  Z                             015251.00
        %IQSZ¤DD%BU,8¤, RETURN TO INITIAL LOAD CONTROL Z                               015255.10
        %IQSZ¤DD%BU,8¤,HALT        START OVERZ                                        015261.10
J2HP11  %IQSZ¤DD%BU¤,FAILED TO CHECK WITH ID STORED Z                                 015263.70
        %IQSZ¤DD%BU¤,IN DCP SEQUENCE TABLE.Z                                          015267.60
J2HP12  %IQSZ¤DD%BU¤,THE FOLLOWING PROGRAMS ARE ON THE Z                              015272.40
        %IQSZ¤DD%BU¤,MASTER TAPE FILE WITH DCP.Z                                      015276.60
J2HCH3  %IQSZ¤DD%BU¤,**OPERATOR---THE TEST LOWER MEM PROG IS THEZ                     015302.00
        %IQSZ¤DD%BU¤, NEXT TO BE LOADED.    THE PROG JUST READZ                       015307.30
        %IQSZ¤DD%BU¤, HAS NOT BEEN WRITTEN ON TAPE.    PLACE THEZ                     015314.40
        %IQSZ¤DD%BU¤, TEST LOW MEMORY PROG IN THE READER, FOLLZ                       015321.70
        %IQSZ¤DD%BU¤,OWED BY ANY OTHERS IN THE ORDER DESIRED.    Z                    015327.00
        %IQSZ¤DD%BU¤,LOAD WILL CONTINUE WHEN THE READER ISZ                           015334.40
        %IQSZ¤DD%BU¤, OWED BY ANY OTHERS IN THE ORDER DESIRED.    Z                   015341.10
        %IQSZ¤DD%BU¤, LOAD WILL CONTINUE WHEN THE READER ISZ                          015346.60
        %IQSZ¤DD%BU¤, MADE READYZ                                                     015353.40
J2HCH2  %IQSZ¤DD%BU¤, UA2Z                                                            015354.70
J3DC1   SYN,%8¤20000.0                                   20000.00&    &00000000
J3DC5   SYN,%8¤220000.                                  220000.00&    &00000000
J3DG1   SYN,%8¤4000.0                                    4000.00&    &00000000
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      @    DCP CALLER--WILL OPERATE AT LOC %8¤ 100.0
             @IF DCP FAILS TO READ IN CORRECTLY, CALLER
             @WILL HANG---TO CONTINUE, CHANGE BIT 63
             @OF MAINT KEYS OR REWIND TAPE &
             @IPL CALLER AGAIN


                CNOP                                                    0.30 00                          015355.40
                CW,64.,J3A6-J3A&1,%8¤765431  @REFILL IS UNIQUE NMBR   100.00 00 001257.53 19      015356.00
      J3A       BD,%8¤102.                                            102.04 00                        015357.00
                      NOP       @SET IC                                 0.30 00                        015357.40
                NOP                                                     0.30 00                        015360.00
                   NOP              @MAY BE USED FOR CKSUM              0.30 00                        015360.40
                Z,J3A6-J3A&65.0                                       152.22 00                        015361.00
                LCI,$X3,%8¤20000-1.       @ZERO READ IN              17777.07 02                        015361.40
                T,$X3,J3A6-J3A&65.0,J3A6-J3A&66.0  @DCP CALLER        152.00 80 000153.06 20           015362.00
                LCI,$X1,16.               @                           20.03 02                       015363.00
                LVI,$X1,32                @                           20.03 01                       015363.40
                LI,%8¤765431              @LOOK FOR UNIQUE REFILL    7654.31 80 430000.20 50           015364.00 M
      J3A1      CCW,%$X1¤,J3A6-J3A&64.    @IN ALL CONTRL WORDS          0.00 81 000151.21 00           015365.00
                KF%BU,18¤,J3A6-J3A&64.46                              151.56 80 022000.23 10           015366.00
                BAE,$-J3A&65.32           @THIS CHAN IS MASTER        111.76 C2                        015367.00
                CBH,$X1,J3A1-J3A&64.                                  106.02 C8                        015367.40
                LVI,$X1,32                @USE 32                     20.03 01                       015370.00
      J3A1A     ODDECC%SEOP¤,%$X1¤        @NORMALLY CALLER              0.00 81 000057.15 00           015370.40
                CCW,0%$X1¤,J3A6-J3A&64.0  @IS READ NO ECC               0.00 81 000151.21 00           015371.40
                BB,J3A6-J3A&64.0&.24,J3A2-2.0-J3A&64.0                151.30 80 000112.74 02           015372.40
      J3A2      RD%SEOP¤,0%$X1¤,J3AA2-J3A&64.0  @READ DCP               0.00 81 000150.11 00           015373.40
                CCW,0%$X1¤,J3A6-J3A&64.0                                0.00 81 000151.21 00           015374.40
                BB,J3A6-J3A&64.0&.24,J3A2-J3A&64.0&1.0                151.30 80 000115.74 02           015375.40
      J3A2A     LX,$X2,J3AA2-J3A&64.0  @SET INDEXING TO               150.04 10                        015376.40
                CB&,$X2,$-J3A&64.32  @CHECKSUM DCP                    120.45 48                        015377.00
                L%BU¤,0%$X2¤                                            0.00 82 000000.20 50           015377.40
                &%BU¤,1%$X2¤                                            1.00 82 000000.20 10           015400.40
                CB&,$X2,$-J3A&63.0                                    121.45 48                        015401.40
                &%BU¤,$L                                               10.00 80 000000.20 10           015402.00
                KF%BU¤,J3DG1                                        4000.00 80 000000.23 10           015403.00
                BZAE,J3A3-J3A&64.          @BR IF NO COMPARE          131.36 C0                        015404.00
      J3A2A1    L%BU,19¤,$X1               @STORE MASTER CHANNEL       21.00 80 023000.20 50           015404.40
                ST%BU,7¤,ETAPCM                                     4007.14 80 007000.20 D0           015405.40
                CM0000%BU,1,8¤,ECTL3&.11  @CLEAR BIT SO WE DO SPACE FILE 4010.13 80 001000.00 F0      015406.40
                B,F1A                                               4375.50 00                        015407.40
      J3A3      BB1,J3AA1-J3A&64.62,J3A3A-J3A&64.0  @RECHECKSUM ONCE  147.76 80 000132.74 0E           015410.00
                B,J3A2A-J3A&64.0                                      117.50 00                        015411.00
      J3A3A     BB1,J3AA1-J3A&64.0&.63,J3AB3-J3A&64.0  @HAVE WE TRIED SECOND 147.77 80 000142.34 0E   015411.40
                REL%SEOP¤,0%$X1¤                                        0.00 81 000000.33 00           015412.40
                CCW,0%$X1¤,J3A6-J3A&64.0                                0.00 81 000151.21 00           015413.40
                BB,J3A6-J3A&64.24,$-J3A&63.0                          151.30 80 000134.74 02           015414.40
                BS%SEOP¤,0%$X1¤       @READ-NO-BACKSPACE                0.00 81 000176.15 00           015415.40
                CCW,0%$X1¤,J3A6-J3A&64.0  @& READ AGAIN                 0.00 81 000151.21 00           015416.40
                BB,J3A6-J3A&64.24,$-J3A&63.  @WAIT FOR SEOP           151.30 80 000137.74 02           015417.40
                B,J3A1A-J3                                            111.50 00                        015420.40
      J3AB3     LVI,$X0,0,0          @HALT ON 2 ERRORS                  0.01 01                        015421.00
                L%BU,1¤,$MB&.63      @WE CAN TRY AGAIN                  4.77 80 001000.20 50           015421.40
                CM1010%BU,1¤,J3AB4&.30-J3A&64.0  @BY CALLER            145.76 80 001000.24 F0           015422.40
                L%BU,1¤,$MB&.63      @THROUGH IPL---/R                  4.77 80 001000.20 50           015423.40
      J3AB4     BZRZ,$-J3A&63.0       @CONTINUE BY CHANGING            144.74 C0                        015424.40
                B,J3A2A1-J3A&64.0     @BIT 63 OF THE MAINT KEYS        125.50 00                        015425.00
                CNOP                                                    0.30 00                        015425.40
      J3AA1     XW,16.0,0,0                                           20.00 00 000000.00 00           015426.00
      J3AA2     CW,J3DG1,%8¤14000,0                                 4000.00 00 300000.00 00           015427.00
      J3A6      DD%BU,64,8¤,0                                                 000000000000000000000    015430.00
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J3      SYN,J3A-64.0                                    15257.006     &00000000      BU, 40,10


        @UPDATE MASTER TAPE ROUTINE
             @OPERATOR WILL PLACE SCHEDULE CARDS
             @IN THE READER AND DCP WILL IDLE.
             @ON CONTINUE, THE ORDER IN WHICH
             @DECKS SHOULD BE PLACED IN READER WILL
             @BE PRINTED ON THE OPS CONSOLE


J2A     SIC,J2M1                                        16457.40 80                  015431.00
                B,J2M       @GO SET UP                  16435.50 00                  015431.40
        Z,J2ABF             @ZERO XREG STORAGE          16014.22 00                  015432.00

        BPG1Z,$&.32         @CLEAR IND                  15433.25 46                  015432.40
        Z,J2AR1                                         16057.22 00                  015433.00
        LCI,$X11,59                                        73.27 02                  015433.40
        T,$X11,J2AR1,J2AR1&1.0  @ZERO SCHEDULE TABLE    16057.00 80 016060.26 20     015434.00
        CM0000%BU,1,8¤,J2AD1&.03  @CLEAR DCP2 BIT       15247.03 80 001000.00 F0     015435.00
        SIC,J2MD9                                       16465.00 80                  015436.00
                B,J2MD8         @GO LOCATE READER       16460.10 00                  015436.40
        LX,$X2,G2D&18.                                  10475.04 10                  015437.00
        SX,$X2,G2D1         @WAIT TILL OP HAS SCH CARDS 10513.05 10                  015437.40
        SIC,$X15                                           37.00 80                  015440.00
                B,G2A&.32  @IN READER & READY           10355.50 00                  015440.40
                 @SET UP SCHEDULE TABLE FOR UPDATE
J2ABC   RD%SEOP¤,0%$X13¤,F1BB    @READ SCH CARD             0.00 8D 005614.11 00     015441.00
        SIC,J2XW8                                       15662.40 80                  015442.00
                B,J2XW7     @WAIT FOR RDR               15641.50 00                  015442.40

        L%BU,48¤,F1BI&7.32  @CHECK FOR TERM CARD         5653.40 80 060000.20 50     015443.00
        KF%BU,48¤,J2AC2     @IF IT IS GO PREPARE        15243.00 80 060000.23 10     015444.00
        BAE,J2ABD           @TO START UPDATING          15463.36 C2                  015445.00
J2ABC1  SIC,F1B7F7                                       6510.40 80                  015445.40
                B,F1B7F6  @GO PROCESS SCH CARD           6470.50 00                  015446.00
        LX,$X1,J2ABF                                    16014.02 10                  015446.40
        L%BU¤,F1BQ1                                      6107.00 80 000000.20 50     015447.00
        B7BZ,J2AD1&.03,J2HCH6  @BR IF LAST ONE NOT DCP2 15247.03 80 015456.34 04     015450.00
        KF%BU,24¤,F1BI5&.40,16                           5720.20 80 030010.23 10     015451.00
        BAE,J2HCH6          @BR-TEST LOW MEM PROG       15456.36 C2                  015452.00
        L%BU,24¤,F2BI5&.40                              16504.50 80 030000.20 50     015452.40 **
        SF%BU,24¤,J2AR1&.08%$X1¤  @STORE TEST LOW MEM   16057.10 81 030000.12 F0     015453.40
        V&I,$X1,.32         @RESTORE ACC AND               0.43 05                  015454.40
        L%BU¤,F1BQ1         @INDEX - CONTINUE           6107.00 80 000000.20 50     015455.00
J2HCH6  SF%BU,24¤,J2AR1&.08%$X1¤,16                     16057.10 81 030010.12 F0     015456.00
        V&I,$X1,.32                                        0.43 05                  015457.00
        SX,$X1,J2ABF        @SAVE INDEXING              16014.03 10                  015457.40
        KF%BU,24¤,J2HCH2,16  @SEE IF IT IS DCP2         15354.70 80 030010.23 10     015460.00
        BZAF,$&1,32                                     15462.76 C0                  015461.00
        CM1111%BU,1,1¤,J2AD1&.03  @SET IND TO SHOW DCP2 15247.03 80 001100.36 F0     015461.40
        B,J2ABC             @READ NEXT CARD             15441.10 00                  015462.40
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J2ABD   SIC,J2L2                                          15746.00 80                    015463.00
              B,J2L1      @LOCATE OUTPUT                  15734.10 00                    015463.40
        ODDNEC%SEOP¤,0%$X12¤  @PREPARE FOR IPL                0.00 8C 000157.15 00       015464.00
        SIC,J2XW4                                         16254.40 80                    015465.00
              B,J2XW3     @WAIT                           16252.50 00                    015465.40
        W%SEOP¤,0%$X12¤,J2AB2  @WRITE CALLER                  0.00 8C 015240.13 00       015466.00
        ENOP
        SIC,$X15                                             37.00 80                    015467.00
              B,H1A1A2    @PRINT INST TO OPERATOR         12754.10 00                    015467.40
        XW,J2ABD2,%.48¤J2ABF-J2ABD2,J2XW7X                15766.00 00 005400.34 87       015470.00
        SIC,J2XW4                                         16254.40 80                    015471.00
              B,J2XW3     @WAIT TILL CALLER IS WRITTEN    16252.50 00                    015471.40
        ODDECC%SEOP¤,0%$X12¤                                  0.00 8C 000057.15 00       015472.00
        SIC,J2XW4                                         16254.40 80                    015473.00
              B,J2XW3                                     16252.50 00                    015473.40
        W%SEOP¤,0%$X12¤,J2AC4  @WRITE DCP                     0.00 8C 015244.13 00       015474.00
        SIC,J2XW4                                         16254.40 80                    015475.00
              B,J2XW3     @WAIT                           16252.50 00                    015475.40
        ERG%SEOP¤,0%$X12¤   @ERASE GAP                        0.00 8C 000056.15 00       015476.00
        SIC,J2XW4                                         16254.40 80                    015477.00
              B,J2XW3     @& WRITE END                    16252.50 00                    015477.40
        WEF%SEOP¤,0%$X12¤   @OF FILE                          0.00 8C 000117.15 00       015500.00
        SIC,J2XW4                                         16254.40 80                    015501.00
              B,J2XW3     @WAIT UNTIL                     16252.50 00                    015501.40
        LX,$X5,G2D&19.      @OPERATOR HAS                 10476.12 10                    015502.00
        SX,$X5,G2D1         @DECKS IN THE                 10513.13 10                    015502.40
        SIC,$X15                                             37.00 80                    015503.00
              B,G2A&.32   @READER & IS READY              10355.50 00                    015503.40
                          @TO GO

        LX,$X6,J2AB4                                      15241.14 10                    015504.00
        SX,$X6,J2ABF                                      16014.15 10                    015504.40
        SX,$X6,J2NCA1             @SET UP TAPE SYNCH LOC  16154.15 10                    015505.00
                    @READ FIRST CARD IN DECK &
                    @STORE THE IDENTITY
J2A1    BPG1,J2A3A                                        15524.25 42                    015505.40
        SIC,J2MD9                                         16465.00 80                    015506.00
              B,J2MD8           @GO LOCATE READER         16460.10 00                    015506.40
        RD%SEOP¤,0%$X13¤,F1BB     @READ FIRST CARD OF DECK    0.00 8D 005614.11 00       015507.00
        SIC,J2XW8                                         15662.40 80                    015510.00
              B,J2XW7     @CHECK READ                     15641.50 00                    015510.40
        L%BU,48¤,F1BI&7.32                                 5653.40 80 060000.20 50       015511.00
        KF%BU,48¤,J2AC2     @CHECK FOR TERM CARD          15243.00 80 060000.23 10       015512.00
        BAE,J2A4                  @BR IF END OF CARDS     15571.76 C2                    015513.00
J2A2    LX,$X2,J2AB4              @SEE IF SAME PROGRAM IS 15241.04 10                    015513.40
        L%BU,19¤,$X6,46     @ALREADY ON TAPE                26.00 80 023027.20 50       015514.00
        LC,$X2,$R                                            11.04 50                    015515.00
        BXCZ,J2A3                                         15521.70 42                    015515.40
        L%BU,24¤,J2AR1&.08%$X6¤  @LOAD ID OF NEXT TO GO ON TAPE 16057.10 86 030000.20 50       015516.00
        BRZ,J2C                   @TERMINATE              15632.34 C2                    015517.00
        KF%BU,24¤,J2AR1&.08%$X2¤ @COMPARE WITH ALL PREVIOUS 16057.10 82 030000.23 10       015517.40
        BAE,J2B                   @BR IF ALREADY ON NEW TAPE 15615.76 C2                 015520.40
        CBH,$X2,$-1.32                                    15517.44 C8                    015521.00
J2A3    L%BU,24¤,J2AR1&.08%$X6¤                           16057.10 86 030000.20 50       015521.40
        KF%BU,24¤,F1BI&3.28  @ALREADY ON NEW TAPE          5647.24 80 030000.23 10       015522.40
        BAE,J2A2A                 @IF EQUAL - READ CARD DECK 15573.36 C2                 015523.40
```

```
                        @SEARCH TAPE FOR CORRECT
                        @PORGRAM TO READ
J2A3A   LX,$X5,J2AB4        @SEARCH FOR PROG TO          15241.12 10                  015524.00
        L%BU,24¤,J2AR1&.08%$X6¤  @READ FROM TAPE         16057.10 86 030000.20 50     015524.40
        KF%BU,24¤,FSEQTB&.08%$X5¤                         4204.10 85 030000.23 10     015525.40
        BAE,J2A3A1          @BR IF RIGHT ONE             15530.36 C2                  015526.40
        CRH,$X5,$-1.32                                   15525.52 C8                  015527.00
        B,$                 @HANG IF NOT THERE           15527.50 00                  015527.40

J2A3A1  SIC,$X15                                            37.00 80                  015530.00
              B,J2AA        @GO LOC MASTER               15201.50 00                  015530.40
        L%BU,19¤,J2NCA1,46                               16154.00 80 023027.20 50     015531.00
        -%BU,19¤,$X5,46                                     25.00 80 023027.30 10     015532.00
        BRZ,J2A3B2          @BACKSPACE ONE & READ        15545.74 C2                  015533.00
        BRLZ,J2A3B3         @GO SPACE FORWARD            15541.34 42                  015533.40
        BRGZ,J2A3B1         @GO BACKSPACE                15535.35 42                  015534.00
        B,$                 @HANG-SEEMS TO BE AN ERROR   15534.50 00                  015534.40

J2A3B1  LC,$X9,$R           @SET UP                          11.22 50                  015535.00
        C&I,$X9,1.0         @COUNT FOR BACKSPACE              1.23 00                  015535.40
        BS%SEOP¤,0%$X1¤                                       0.00 81 000176.15 00     015536.00
        SIC,J2XW2                                        16252.00 80                  015537.00
              B,J2XW1                                    16250.10 00                  015537.40
        CB,$X9,$-2.0                                     15536.22 48                  015540.00
        B,J2A3C1            @GO READ                     15550.10 00                  015540.40
                            @
                            @
J2A3B3  LC,$X9,$R           @SET UP COUNT TO SPACE           11.22 50                  015541.00
        C-I,$X9,1.0         @TO CORRECT RECORD                1.23 08                  015541.40
        BXCZ,J2A3C1         @IF ZERO,THIS IS ONE TO READ 15550.30 42                   015542.00
        SP%SEOP¤,0%$X1¤                                       0.00 81 000076.15 00     015542.40
        SIC,J2XW2                                        16252.00 80                  015543.40
              B,J2XW1                                    16250.10 00                  015544.00
        CB,$X9,$-2.0                                     15542.62 48                  015544.40
        B,J2A3C1            @GO READ ONE RECORD          15550.10 00                  015545.00

J2A3B2  BS%SEOP¤,0%$X1¤     @BACKSPACE ONCE & READ           0.00 81 000176.15 00     015545.40
        SIC,J2XW2                                        16252.00 80                  015546.40
              B,J2XW1                                    16250.10 00                  015547.00
        B,J2A3C1            @GO READ THIS ONE            15550.10 00                  015547.40
```

```
                    @READ PROGRAM FROM TAPE, CHECKSUM
                    @& WRITE ON NEW MASTER

J2A3C1  SX,$X5,J2NCA1                                  16154.13 10                    015550.00
        SIC,$X15                                          37.00 80                    015550.40
              B,J2AA                                   15201.50 00                    015551.00
        RD%SEOP¤,0%$X1¤,J2AB7  @READ MASTER               0.00 81 015242.11 00        015551.40
        SIC,J2XW2                                      16252.00 80                    015552.40
              B,J2XW1   @WAIT                          16250.10 00                    015553.00
        SIC,J2ND2                                      15677.00 80                    015553.40
              B,J2ND1-1.0  @CHECK READ                 15673.10 00                    015554.00
        BBZ,J2AD1&.01,$&1.0                            15247.01 80 015555.74 06       015554.40
        L%BU,24¤,J2AR1&.08%$X6¤  @CHECK TO SEE IF      16057.10 86 030000.20 50       015555.40
        KF%BU,24¤,J3DC1&1.40     @WE DID GET CORRECT ONE 20001.50 80 030000.23 10      015556.40
        BAE,$&1.0                                      15560.76 C2                    015557.40
        B,$                      @HANG-PROGRAM BUG     15560.10 00                    015560.00
        SIC,J2SP5                                      16225.40 80                    015560.40
              B,J2SP2   @GO COMPARE CHECKSUM           16226.10 00                    015561.00
        LX,$X7,J3DC1&2.0   @LOAD SA & WC               20002.16 10                    015561.40
        LVI,$X7,J3DC1      @SET UP CW FOR WRITE        20000.17 01                    015562.00
        SX,$X7,J2A3CA                                  15765.17 10                    015562.40
        SIC,J2L2                                       15746.00 80                    015563.00
              B,J2L1       @LOC OUTPUT                 15734.10 00                    015563.40
        W%SEOP¤,0%$X12¤,J2A3CA  @WRITE PROGRAM            0.00 8C 015765.13 00        015564.00
        SIC,J2XW4                                      16254.40 80                    015565.00
              B,J2XW3   @WAIT                          16252.50 00                    015565.40
        SIC,J2ND2                                      15677.00 80                    015566.00
              B,J2ND1-1.0  @GO CHECK WRITE             15673.10 00                    015566.40
        BBZ,J2AD1&.01,$&1.0                            15247.01 80 015570.34 06       015567.00
        SIC,J2D2                                       15641.00 80                    015570.00
              B,J2D1       @GO UPDATE WRITE TABLE      15640.10 00                    015570.40
        CBH,$X6,J2A2       @BACK & CHECK NEXT PROGRAM  15513.54 C8                    015571.00

                    @TERM CARD-NO MORE FROM RADER

J2A4    BZB1,$PG1,J2A3A                                   13.52 80 015513.74 0C       015571.40
        B,$                @HANG-PROGRAM BUG           15572.50 00                    015572.40
                                                       15524.34 0C
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```
                                @READ CARD DECK
J2A2A   LVI,$X10,J2A2A1     @FIRST CARD IS STILL IN SSC     15576.25 01                  015573.00
        SVA,$X10,F1B1E      @LOC--GO PROCESS IT             5415.65 D0                   015573.40
        SIC,J2MD7                                           16471.00 80                  015574.00
                B,J2MD6       @GO HOUSEKEEP SSC             16465.50 00                  015574.40
        SIC,$X15                                              37.00 80                   015575.00
              B,F1B1B                                       5327.50 00                   015575.40
J2A2A1  LVI,$X10,J2A2A2     @SET UP SSC                     15603.65 01                  015576.00
        SVA,$X10,F1B1E                                      5415.65 D0                   015576.40
        SIC,J2MD9                                           16465.00 80                  015577.00
                B,J2MD8         @GO LOCATE READER           16460.10 00                  015577.40
J2A2B   RD%SEOP¤,0%$X13¤,F1BB   @READ ONE CARD                0.00 8D 005614.11 00      015600.00
        SIC,J2XW8                                           15662.40 80                  015601.00
                B,J2XW7   @WAIT                             15641.50 00                  015601.40
        SIC,$15                                               37.00 80                   015602.00
              B,F1B1B                                       5327.50 00                   015602.40
        B,J2A2B             @READ NEXT CARD                 15600.10 00                  015603.00
                            @
                            @
                                @HAVE COMPLETED READING CARD DECK
J2A2A2  LVI,$X10,F1C                                        6604.65 01                   015603.40
        SVA,$X10,F1B1E      @RESTORE SSC                    5415.65 D0                   015604.00
        SIC,J2SP5                                           16225.40 80                  015604.40
                B,J2SP1   @GO GENERATE CHECKSUM             16210.10 00                  015605.00
        SIC,J2L2                                            15746.00 80                  015605.40
                B,J2L1    @GO LOC OUTPUT                    15734.10 00                  015606.00
        W%SEOP¤,0%$X12¤,J2AD2  @WRITE PROGRAM                 0.00 8C 015250.13 00      015606.40
        SIC,J2XW4                                           16254.40 80                  015607.40
                B,J2XW3   @WAIT                             16252.50 00                  015610.00
        SIC,J2ND6                                           15703.40 80                  015610.40
                B,J2ND5-1.      @GO CHECK FOR ERRORS        15677.50 00                  015611.00
        BB7,J2AD18.01,$61.0                                 15247.01 80 015612.74 06     015611.40
        SIC,J2D2                                            15641.00 80                  015612.40
                B,J2D1    @GO UPDATE WRITE TABLE            15640.10 00                  015613.00
        CM1111%BU¤,F1B1&3.    @STORE ONES TO INSURE AGAINST   5647.00 80 000000.36 F0     015613.40
                              @COMPARING TO ZEROS
        CBH,$X6,J2A1        @GO READ FIRST CARD OF          15505.54 C8                  015614.40
        B,$                 @NEXT DECK                      15615.10 00                  015615.00
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```
                    @OPERATOR ERROR--DECKS WERE NOT PLACED IN
                    @THE READER IN THE ORDER SPECIFIED

J2B     L%BU,24¤,J2AR1&,08%$X6¤  @LOAD ID          16057.10 86 030000.20 50   015615.40
        ST%BU,24¤,J2F2&,08  @STORE IN IMAGE        15756.60 80 030000.20 D0   015616.40
        CNOP                                           0.30 00                015617.40
        SIC,$X15                                      37.00 80                015620.00
              B,H1A1A2                                12754.10 00            015620.40
        XW,J2F1,%,48¤J2F2-J2F1,J2F4                   15746.40 00 002020.33 F3 015621.00
        SVA,$X2,$&.32                                 15622.45 D0              015622.00
        V-I,$X6,0.0           @RESET XR6                0.15 0D              015622.40
        LX,$X9,$X2            @OUTPUT MUST BE BACKSPACED  22.22 10           015623.00
        BS%SEOP¤,0%$X12¤                                0.00 8C 000176.15 00 015623.40
        SIC,J2XW4                                     16254.40 80              015624.40
                    B,J2XW3                           16252.50 00            015625.00
        CB,$X9,$-2.0                                  15623.62 48              015625.40
        L%BU,19¤,$X6,46                                  26.00 80 023027.20 50 015626.00
        LC,$X2,$R             @WE WILL START AGAIN       11.04 50              015627.00
        LX,$X6,$X2                                       22.14 10              015627.40
        SV,$X6,G2D1                                   10513.15 30              015630.00
        SIC,$X15                                         37.00 80              015630.40
              B,G2A&.32       @HANG TILL OP READY     10355.50 00              015631.00
        B,J2A1                @GO CONTINUE            15505.50 00              015631.40


                    @HAVE FINISHED--PREPARE TO TERMINATE

J2C     LCI,$X6,60                                       74.15 02              015632.00
        T,$X6,J2AR1,ESEQTB  @SET UP DCP TABLE         16057.00 80 004204.14 20 015632.40
        Z,J2AR1                                       16057.22 00              015633.40
        CB,$X6,$&.32                                  15634.54 48              015634.00
        T,$X6,J2AR1,J2AR1&1.0  @CLEAR TABLE FOR UPDATE 16057.00 80 016060.14 20 015634.40
        SIC,J2L2                                      15746.00 80              015635.40
              B,J2L1          @LOC OUTPUT             15734.10 00            015636.00
        LX,$X1,$X12                                      34.02 10              015636.40
        LX,$X2,$X13                                      35.04 10              015637.00
        B,J2HT1               @GO TO INITIAL LOAD     15062.50 00              015637.40
                              @TO CHECK TAPE


                    @UPDATE WRITE TABLE % J2AR1 ¤
J2D1    BB1,J2AR1%$X6¤,$&1.0 @SET IND TO SHOW IT IS  16057.00 86 015641.34 0E 015640.00
J2D2    B,$                   @ON OUTPUT TAPE         15641.10 00              015641.00
J2XW7   CCW,0%$X13¤,J2AB1                                0.00 8D 015237.21 00 015641.40
        BB,J2AB1&.24,$-1.0                            15237.30 80 015641.74 02 015642.40
        BB,J2AB1&.18,J2XW8  @NO BR IF RDR NOT READY   15237.22 80 015662.74 02 015643.40
        C0011%BU,1,1¤,ECTL2&.38  @SET BIT TO GO        4007.46 80 001100.06 70 015644.40
        BB1,ECTL2&.38,$&1.0      @OUT ON TYPEWRITER    4007.46 80 015646.74 0E 015645.40
        CNOP                                             0.30 00              015646.40
        SIC,$X15                                         37.00 80              015647.00
              B,H1A1A                                 12767.50 00            015647.40
        XW,J2XW7A,%,48¤J2XW7X-J2XW7A                  16172.00 00 003200.00 00 015650.00
        CM0101%BU,1,1¤,ECTL2&.38                       4007.46 80 001100.12 F0 015651.00
        CCW,0%$X13¤,J2AB1          @HANG TILL OPER        0.00 8D 015237.21 00 015652.00
        BZR,J2AB1&.18,$-1.0        @MAKES READER RDY   15237.22 80 015652.34 00 015653.00
        CCW,0%$X13¤,J2AB1                                0.00 8D 015237.21 00 015654.00
        BZR,J2AB1&.18,$-1.0                           15237.22 80 015654.34 00 015655.00
        REL%SEOP¤,0%$X13¤                                0.00 8D 000000.33 00 015656.00
        CCW,0%$X13¤,J2AB1                                0.00 8D 015237.21 00 015657.00
        BB,J2AB1&.24,$-1.0                            15237.30 80 015657.34 02 015660.00
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                LV,$X9,J2XW8                                15662.62 30          015661.00
                          V-I,$X9,1.0  @GO READ AGAIN          1.23 0D          015661.40
                SVA,$X9,J2XW8                               15662.63 D0          015662.00
J2XW8           B,$                                         15662.50 00          015662.40
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```
J2CH8   REL%SEOP¤,0%$X12¤       @RELEASE OUTPUT                  0.00 8C 000000.33 00      015663.00
        SX,$X4,J2NCA7           @SAVE XR 4                   16157.11 10                   015664.00
        LX,$X4,J2NCA1           @STORE ID IN PRINT IMAGE     16154.10 10                   015664.40
        L%BU,24¤,ESEQTB&.08%$X4¤                              4204.10 84 030000.20 50      015665.00
        ST%BU,24¤,J2NCA8                                     16166.10 80 030000.20 D0      015666.00
        CNOP
        SIC,$X15                                                37.00 80                   015667.00
                B,H1A1A                                      12767.50 00                   015667.40
        XW,J2CH1,47,J2CH2,4                                  16160.00 40 001360.34 79      015670.00
        CBH,$X4,$&.32                                        15671.50 C8                   015671.00
        SX,$X4,J2NCA1                                        16154.11 10                   015671.40
        LX,$X4,J2NCA7           @RESTORE XR 4                16157.10 10                   015672.00
        B,J2ND6                                              15703.50 00                   015672.40
                                @
            @CHECK IF WRITE WAS SUCCESSFUL
        BR,J2AB1&.21,J2CH5                                   15237.25 80 015714.34 02      015673.00
J2ND1   BZR,J2AB1&.18,J2CH5                                  15237.22 80 015714.34 00      015674.00
        BR,J2AB1&.19,J2CH5                                   15237.23 80 015714.34 02      015675.00
        BR,J2AB1&.20,J2CH5                                   15237.24 80 015714.34 02      015676.00
J2ND2   $B,0                    @WRITE WAS SUCCESSFUL            0.10 00                   015677.00
                                @
        BR,J2AB1&.21,J2CH9                                   15237.25 80 015704.34 02      015677.40
J2ND5   BZR,J2AB1&.18,J2CH9                                  15237.22 80 015704.34 00      015700.40
        BR,J2AB1&.19,J2CH9                                   15237.23 80 015704.34 02      015701.40
        BR,J2AB1&.20,J2CH9                                   15237.24 80 015704.34 02      015702.40
J2ND6   $B,0                            0.10 00                                           015703.40
                @ROUTINE TO TR. AGAIN IF UNSUCCESSFUL

                @ROUTINE TO TRY AGAIN IF UNSUCCESSFUL
                @READ OR WRITE OF OUTPUT TAPE
J2CH9   BR1,J2AD1&.01,J2CH8                                  15247.01 80 015663.34 0E      015704.00
        REL%SEOP¤,0%$X12¤                                        0.00 8C 000000.33 00      015705.00
        SIC,J2XW4                                            16254.40 80                   015706.00
                B,J2XW3         @WAIT FOR OUTPUT             16252.50 00                   015706.40
        BS%SEOP¤,0%$X12¤         @BACKSPACE OUTPUT                0.00 8C 000176.15 00      015707.00
        SIC,J2XW4                                            16254.40 80                   015710.00
                B,J2XW3         @WAIT FOR OUTPUT             16252.50 00                   015710.40
        SV,$X4,J2NCA7                                        16157.11 30                   015711.00
        LV,$X4,J2ND6                                         15703.50 30                   015711.40
        V-I,$X4,3.0             @SET UP TO TRY INST AGAIN        3.11 0D                   015712.00
        SVA,$X4,J2ND6                                        15703.51 D0                   015712.40
        LV,$X4,J2NCA7                                        16157.10 30                   015713.00
        B,J2ND6                                              15703.50 00                   015713.40
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                    @ROUTINE TO TRY AGAIN IF UNSUCCESSFUL
                    @READ OR WRITE OF MASTER TAPE
J2CH5   BR1,J2AD18,01,J2CH6                          15247.01 80 015724.34 0E    015714.00
        REL%SEOP¤,0%$X1¤                                 0.00 81 000000.33 00    015715.00
        SIC,J2XW2                                    16252.00 80                 015716.00
                B,J2XW1    @WAIT FOR MASTER          16250.10 00                 015716.40
        BS%SEOP¤,0%$X1¤    @BACKSPACE MASTER             0.00 81 000176.15 00    015717.00
        SIC,J2XW2                                    16252.00 80                 015720.00
                B,J2XW1    @WAIT FOR MASTER          16250.10 00                 015720.40
        SV,$X5,J2NCA7      @SAVE XR 5                16157.13 30                 015721.00
        LV,$X5,J2ND2                                 15677.12 30                 015721.40
        V-I,$X5,3,0        @SET UP TO TRY INST AGAIN     3.13 0D                 015722.00
        SVA,$X5,J2ND2      @TRY AGAIN                15677.13 D0                 015722.40
        LV,$X5,J2NCA7                                16157.12 30                 015723.00
        B,J2ND2            @TRY AGAIN                15677.10 00                 015723.40
                           @
                           @
                    @ERROR OCCURED TWICE ON THE
                    @SAME I/O OPERATION WITH
                    @MASTER TAPE
J2CH6   REL%SEOP¤,0%$X1¤     @CLEAR IND                  0.00 81 000000.33 00    015724.00
        SX,$X4,J2NCA7      @SAVE XR4                 16157.11 10                 015725.00
        LX,$X4,J2NCA1                                16154.10 10                 015725.40
        L%BU,24¤,ESEQTB&,08%$X4¤  @STORE ID           4204.10 84 030000.20 50    015726.00
        ST%BU,24¤,J2NCA8       @IN PRINT IMAGE       16166.10 80 030000.20 D0    015727.00
        CNOP
        SIC,$X15                                        37.00 80                 015730.00
                B,H1A1A    @PRINT ERROR              12767.50 00                 015730.40
        XW,J2CH1,47,J2CH2,4  @& OMMIT PROG.          16160.00 40 001360.34 79    015731.00
        CRH,$X4,$&,32                                15732.50 C8                 015732.00
        SX,$X4,J2NCA1                                16154.11 10                 015732.40
        LX,$X4,J2NCA7      @RESTORE XR4              16157.10 10                 015733.00
        B,J2ND2                                      15677.10 00                 015733.40
             @CHECK IF ST I-O OP WAS SUCCESSFUL
                           @
                              @
                              @
                              @
                    @ROUTINE TO LOCATE OUTPUT TAPE
J2L1    L%BU,10,1¤,ECTL2&,44                         4007.54 80 012100.20 50    015734.00
        LVI,$X12,0                                       0.31 01                 015735.00
        LVI,$X13,0                                       0.33 01                 015735.40
        SF%BU,7,8¤,$X12&,12,3     @WILL LOC CHANNEL     34.14 80 007001.52 F0    015736.00
        SF%BU,3,8¤,$X13&,15       @WILL LOC DRIVE       35.17 80 003000.12 F0    015737.00
        REL%SEOP¤,0%$X12¤                                0.00 8C 000000.33 00    015740.00
        SIC,J2XW4                                    16254.40 80                 015741.00
                B,J2XW3    @WAIT FOR OUTPUT          16252.50 00                 015741.40
        LOC%SEOP¤,0%$X12¤,0%$X13¤                        0.00 8C 000000.17 0D    015742.00
        SIC,J2XW4                                    16254.40 80                 015743.00
                B,J2XW3    @WAIT FOR OUTPUT          16252.50 00                 015743.40
        REL%SEOP¤,0%$X12¤                                0.00 8C 000000.33 00    015744.00
        SIC,J2XW4                                    16254.40 80                 015745.00
                B,J2XW3    @WAIT FOR OUTPUT          16252.50 00                 015745.40
J2L2    $B,0                                             0.10 00                 015746.00
```

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J2F1     %IQSZ¤DD%BU¤,****OPERATOR ERROR          PLACE Z                                                  015746.40
         %IQSZ¤DD%BU¤,ALL PROGRAMS TO BE CHANGED AFTERZ                                                    015752.50
J2F2     DD%BU,32¤,0                                                          00000000000                 015756.50
J2F3     %IQSZ¤DD%BU¤,  IN THE ORDER SPECIFIED ABOVEZ                                                     015757.10
J2F4     XW,J2F2,4,J2F5,4                                          15756.50 40 000100.33 F4               015763.00
J2F5     XW,J2F3,%.48¤J2F4-J2F3,0,4                                15757.10 40 000760.00 00               015764.00
J2A3CA   XW,,0                                                       0.00 00 000000.00 00                015765.00
                                  @WAIT FOR RDR
J2ABD2   %IQSZ¤DD%BU¤,OPERATOR          THE FOLLOWING PROGRAMS Z                                         015766.00
         %IQSZ¤DD%BU¤,WILL BE LOADED ON THE NEW MASTER Z                                                   015772.70
         %IQSZ¤DD%BU¤,TAPE          TO CORRECT ANY PROGRAM Z                                              015777.00
         %IQSZ¤DD%BU¤,PLACE THE DECK IN THE READER %IN Z                                                   016003.30
         %IQSZ¤DD%BU¤,THE SAME ORDER IT APPEARS BELOW ¤Z                                                   016007.40
J2ABF    XW,0                                                  0.00 00 000000.00 00                     016014.00
         CNOP
J2MBC2   DR%BU,64,8¤,3                                          3.00                                      016015.00
J2MBC3   ST%BU,64,1¤,%8¤4000.0                                4000.00 80 000100.20 D0                    016020.00
J2MBC6   DD%BU,64¤,0                                           00000000000000000000000                   016021.00
J2NB11   VF,0,0                                               0.00&                                     016022.00
         CNOP                                                  0.30 00                                   016022.40
J2MBC7   DR7%BU,64,1¤,5                                        5.00                                      016023.00
J2MBC8   DR%BU¤,2                                             2.00                                      016030.00
J2NP10   DD%BU,64,1¤,0                                        00000000000000000000000                   016032.00
J2NP11   DD%BU,64,1¤,0                                        00000000000000000000000                   016033.00
J2NP12   DD%BU,64,1¤,0                                        00000000000000000000000                   016034.00
J3DC2    SYN,%8¤100000.0                                100000.00&      &00000000
         CNOP
J2M4BC   DD%BU,64,8¤,0                                          00000000000000000000000                  016035.00
J2M4BD   DR%BU,64,8¤,16                                        20.00                                     016036.00
J2M4B4   VF,0,0                                                0.00&                                     016056.00
         CNOP                                                  0.30 00                                   016056.40
J2AR1    DR%BU,64,8¤,60      @TABLE FOR UPDATING               74.00                                     016057.00
J2MB10   DD%BU,64,8¤,0                                         00000000000000000000000                   016153.00
J2NCA1   DD%BU,64,8¤,0                                         00000000000000000000000                   016154.00
J2NCA4   CW,%8¤20000.0,%8¤40000,0  @CW FOR READ FROM MASTER  20000.00 01 000000.00 00                     016155.00
J2NCA5   DD%BU,64,8¤,0                                          00000000000000000000000                  016156.00
J2NCA7   DD%BU,64,8¤,0                                          00000000000000000000000                  016157.00
J2CH1    %IQSZ¤DD%BU,8,8¤,ERROR OCCURED DURING I-O OPERATION Z                                            016160.00
         %IQSZ¤DD%BU,8,8¤,MANIPULATING  Z                                                                 016164.30
J2NCA8   %IQSZ¤DD%BU,8,8¤,     IT WILL BE OMITTEDZ                                                       016166.10
J2CH2    XW,J2NCA8,23,0                                  16166.10 00 000560.00 00                         016171.00
J2XW7A   %IQSZ¤DD%BU¤,****OPERATOR---I AM TRYING TO READZ                                                016172.00
         %IQSZ¤DD%BU¤, THE CARD READER FOR THE ABOVE REASONZ                                               016176.20
         %IQSZ¤DD%BU¤,      WHY IS IT NOT READY  Z                                                        016202.70
J2XW7X   XW,J2AR1,60,0                                   16057.00 00 001700.00 00                         016207.00
                                  @
```

```
                                    @ROUTINE TO GENERATE CHECKSUMS
                                    @
J2SP1   TI,2,$L,J2MBC7                                  10.00 80 016023.04 A0      016210.00
        TI,3,$X4,J2MBC7&2.0                             24.00 80 016025.06 A0      016211.00
        Z,$X4                                           24.22 00                   016212.00
        LV,$X6,EDPLOC                                 4010.54 30                   016212.40
        SVA,$X6,$&1.0                                16214.15 D0                   016213.00
        LV,$X5,F1BD&.32                               5623.52 30                   016213.40
        V-I,$X5,0                                       0.13 0D                   016214.00
        V&I,$X5,1.0                                     1.13 05                   016214.40
        L%BU,6□,$X5&.18                                25.22 80 006000.20 50      016215.00
        BRZ,$&1.0                                    16217.34 C2                   016216.00
        V&I,$X5,1.0                                     1.13 05                   016216.40
        LC,$X4,$X5                                     25.10 50                   016217.00
        LV,$X4,EDPLOC                                 4010.50 30                   016217.40
        Z,0%$X6□                                        0.22 06                   016220.00
        SX,$X4,2.0%$X6□                                 2.11 16                   016220.40
        SX,$X4,J2AD2                                 15250.11 10                   016221.00
        SIC,J2SP4                                    16242.40 80                   016221.40
                B,J2SP3                              16236.50 00                   016222.00
        SF%BU□,0%$X6□                                   0.00 86 000000.12 F0      016222.40
        TI,2,J2MBC7,$L                               16023.00 80 000010.04 A0      016223.40
        TI,3,J2MBC7&2.0,$X4                          16025.00 80 000024.06 A0      016224.40
J2SP5   $B,0                                            0.10 00                   016225.40

                                    @ENTRY TO COMPARE CHECKSUMS
J2SP2   TI,2,$L,J2MBC7                                  10.00 80 016023.04 A0      016226.00
        TI,3,$X4,J2MBC7&2.0                             24.00 80 016025.06 A0      016227.00
        LX,$X4,J3DC1&2.0        @LOAD SA & WC        20002.10 10                   016230.00
        LVI,$X4,J3DC1           @ALL PROGRAMS READ IN FOR CHECK 20000.11 01        016230.40
                                @WILL START AT 20000
        SIC,J2SP4                                    16242.40 80                   016231.00
                B,J2SP3                              16236.50 00                   016231.40
        KE%BU□,J3DC1                                 20000.00 80 000000.23 10      016232.00
        BAE,J2SP5-2.0                                16223.76 C2                   016233.00
        CNOP                                            0.30 00                   016233.40
        SIC,31.0                                       37.00 80                   016234.00
                B,H1A1A                              12767.50 00                   016234.40
        XW,%8□20001.40,4,J2SP6,4                     20001.40 40 000100.34 A3      016235.00
        B,J2SP5-2.0                                  16223.50 00                   016236.00
                                    @
J2SP3   Z,$R                                            11.22 00                   016236.40
        Z,$L                                            10.22 00                   016237.00
        CB&,$X4,$&.32                                16240.11 48                   016237.40
        &%BU□,0%$X4□                                    0.00 84 000000.20 10      016240.00
        CB&,$X4,$-1.0                                16240.11 48                   016241.00
        &%BU□,$L                                        10.00 80 000000.20 10      016241.40
J2SP4   $B,0                                            0.10 00                   016242.40
                                    @
J2SP6   XW,$&1.0,29,0                                16244.00 00 000720.00 00      016243.00
        %IQSZ□DD%BU□, FAILED TO CHECKSUM PROPERLY.Z                                016244.00
```

```
                        @WAIT FOR MASTER TAPE SEOP
J2XW1   CCW,0%$X1¤,J2AB1                                  0.00 81 015237.21 00      016250.00
        BB,J2AB1&.24,$-1,0                               15237.30 80 016250.34 02   016251.00
J2XW2   B,$                                              16252.10 00                016252.00
                        @WAIT FOR OUTPUT TAPE SEOP
J2XW3   CCW,0%$X12¤,J2AB1                                 0.00 8C 015237.21 00      016252.40
        BB,J2AB1&.24,$-1,0                               15237.30 80 016252.74 02   016253.40
J2XW4   B,$                                          @   16254.50 00                016254.40

                        @WAIT FOR SCRATCH TAPE SEOP
J2XW5   CCW,0%$X7¤,J2AB1                                  0.00 87 015237.21 00      016255.00
        BB,J2AB1&.24,$-1,0                               15237.30 80 016255.34 02   016256.00
J2XW6   B,$                                              16257.10 00                016257.00
J2HT24  DR%BU,64,8¤,30                                       36.00                  016257.40
J2HT23  XW,J2HT22,98,0,4                                 16363.31 40 003040.00 00   016316.00
J2HT20  DR%BU,64,8¤,30                                       36.00                  016317.00
J2HT21  DD%BU,64,8¤,0                                        0000000000000000000000 016355.00
        CNOP                    @CONSTANTS FOR SUBROUTINES
J2KB3   CW,20000.0,50000,0                               47040.00 03 032400.00 00   016356.00
J2KB2   CW,20000.0,0,0                                   47040.00 00 000000.00 00   016357.00
J2JJ1   DD%BU,64,8¤,0                                        0000000000000000000000 016360.00
J2JJ3   DD%BU,64,8¤,0                                        0000000000000000000000 016361.00
J2JJ4   DD%BU,64,8¤,0                                        0000000000000000000000 016362.00
J2JJ2   VF,0,40                                              0.50&                  016363.00
J2HT22  %IQSZ¤DD%BU,8,8¤,HAD AN UNCORRECTABLE ERROR Z                               016363.31
        %IQSZ¤DD%BU,8,8¤,   RESET CHANNEL TO READ PROGRAM Z                         016366.61
        %IQSZ¤DD%BU,8,8¤,AGAIN    USE FORMAT FOR Z                                  016372.71
        %IQSZ¤DD%BU,8,8¤,UPDATING TAPE Z                                            016375.71
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                @DUPLICATE MASTER TAPE

J2X     LCI,$X4,60.             @SET UP SCHEDULE TABLE          74.11 02                    016400.00
        T,$X4,ESEQTB,J2AR1      @IN UPDATE TAPE               4204.00 80 016057.10 20       016400.40
        SIC,J2M1                                              16457.40 80                   016401.40
                B,J2M           @GO SET UP FOR UPDATE         16435.50 00                   016402.00
        SIC,J2XW2                                             16252.00 80                   016402.40
                B,J2XW1         @WAIT                         16250.10 00                   016403.00
        LX,$X6,J2AR4                                          15241.14 10                   016403.40
        SX,$X6,J2ABE                                          16014.15 10                   016404.00
        SX,$X6,J2NCA1           @SET UP TAPE SUNCH LOC        16154.15 10                   016404.40
        BB1,$PG1,$&1.0                                          13.52 80 016406.34 0E       016405.00
        B,J2A3A                 @GO TO UPDATE                 15524.10 00                   016406.00
```

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                        @CHECK PROPER I-O ON MASTER

                        @ROUTINE TO WRITE ON OUTPUT

J2XG1   W%SEOP¤,0%$X12¤,J2XNB1                          0.00 8C 016427.13 00    016406.40
        SIC,J2XW4                                   16254.40 80                 016407.40
                B,J2XW3                             16252.50 00                 016410.00
                        @ROUTINE TO REWIND MASTER

J2XN6   REW%SEOP¤,0%$X1¤                                0.00 81 000136.15 00    016410.40
        SIC,J2XW2                                   16252.00 80                 016411.40
                B,J2XW1     @WAIT FOR MASTER        16250.10 00                 016412.00
        CCW,0%$X1¤,J2AB1                                0.00 81 015237.21 00    016412.40
        BZR,J2AB1&.18,$-1.0                         15237.22 80 016412.74 00    016413.40
        REL%SEOP¤,0%$X1¤                                0.00 81 000000.33 00    016414.40
        SIC,J2XW2                                   16252.00 80                 016415.40
                B,J2XW1     @WAIT FOR MASTER        16250.10 00                 016416.00
J2XN7   $B,0                @RETURN                     0.10 00                 016416.40

                        @SET OUTPUT ECC
J2XG4   ODDECC%SEOP¤,0%$X12¤                            0.00 8C 000057.15 00    016417.00
        SIC,J2XW4                                   16254.40 80                 016420.00
                B,J2XW3                             16252.50 00                 016420.40
J2XG5   $B,0                @RETURN                     0.10 00                 016421.00

                        @SET MASTER ECC
J2XG6   ODDECC%SEOP¤,0%$X1¤                             0.00 81 000057.15 00    016421.40
        SIC,J2XW2                                   16252.00 80                 016422.40
                B,J2XW1     @WAIT FOR MA            16250.10 00                 016423.00
J2XG7   $B,0                @RETURN                     0.10 00                 016423.40


J2XG10  WEF%SEOP¤,0%$X12¤                               0.00 8C 000117.15 00    016424.00
        SIC,J2XW4                                   16254.40 80                 016425.00
                B,J2XW3                             16252.50 00                 016425.40
J2XG11  $B,0                                            0.10 00                 016426.00
        CNOP                                            0.30 00                 016426.40
J2XNB1  CW,%8¤20000.0,%8¤60000,0  @CONSTANT FOR     20000.00 01 400000.00 00    016427.00
                                  @READING ONE PROGRAM
J2XNB7  XW,0,0,0,0                                      0.00 00 000000.00 00    016430.00
J2XNB8  VF,%8¤0.40                                      0.406                   016431.00
J2XNB9  XW,EOFQTB,0,0,4                              4204.00 40 000000.00 00    016432.00
J2XNB5  %IOS7¤DD%BU,8,8¤,CHECKSUM ERROR     Z                                   016433.00
J2M     SIC,$X15                                    37.00 80                    016435.40
                B,J2AA      @GO LOCATE MASTER       15201.50 00                 016436.00
        REW%SEOP¤,0%$X1¤                                0.00 81 000136.15 00    016436.40
        SIC,J2XW2                                   16252.00 80                 016437.40
                B,J2XW1     @WAIT FOR MASTER        16250.10 00                 016440.00
        SIC,J2L2                                    15746.00 80                 016440.40
                B,J2L1      @LOC OUTPUT             15734.10 00                 016441.00
        REW%SEOP¤,0%$X12¤                               0.00 8C 000136.15 00    016441.40
        SIC,J2XW4                                   16254.40 80                 016442.40
                B,J2XW3     @WAIT FOR OUTPUT        16252.50 00                 016443.00
        BZR,J2AB1&.18,$-1.0  @WAIT TILL READY       15237.22 80 016442.74 00    016443.40
        REL%SEOP¤,0%$X12¤                               0.00 8C 000000.33 00    016444.40
        SIC,J2XW4                                   16254.40 80                 016445.40
                B,J2XW3                             16252.50 00                 016446.00
        LOC%SEOP¤,0%$X1¤,0%$X2¤  @LOCATE MASTER         0.00 81 000000.17 02    016446.40
        SIC,J2XW2                                   16252.00 80                 016447.40
                B,J2XW1                             16250.10 00                 016450.00
        BZR,J2AB1&.18,$-1.0  @WAIT TILL READY       15237.22 80 016447.74 00    016450.40
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                REL%SEOP¤,0%$X1¤     @RFL MASTER                    0.00 81 000000.33 00     016451.40
                SIC,J2XW2                                           16252.00 80              016452.40
                        B,J2XW1      @WAIT                          16250.10 00              016453.00
                SPFL%SEOP¤,0%$X1¤    @SPACE BY CALLER & DCP          0.00 81 000077.15 00     016453.40
                SIC,J2XW2                                           16252.00 80              016454.40
                        B,J2XW1      @WAIT FOR FINISH               16250.10 00              016455.00
                REL%SEOP¤,0%$X1¤                                     0.00 81 000000.33 00     016455.40
                SIC,J2XW2                                           16252.00 80              016456.40
                        B,J2XW1                                     16250.10 00              016457.00
        J2M1    B,$                  @RETURN                        16457.50 00              016457.40
        J2MD8   L%BU,7¤,EQRDR1,45        @SET UP TO READ             4012.00 80 007026.60 50  016460.00
                LW,$X13,$R           @FROM CARD READER              11.32 30                 016461.00
                Z,$X14                                              36.22 00                 016461.40
                REL%SEOP¤,0%$X13¤                                    0.00 8D 000000.33 00     016462.00
                CCW,0%$X13¤,J2AB1                                    0.00 8D 015237.21 00     016463.00
                BB,J2AB1&.24,$-1.0                                  15237.30 80 016463.34 02 016464.00
        J2MD9   B,$                  @RETURN                        16465.10 00              016465.00
        J2MD6   CM1111%BU,18¤,EDPLOC     @HOUSEKEEP AREA            4010.40 80 022000.36 E0  016465.40
                Z,$R                 @FOR SINGLE STEP               11.22 00                 016466.40
                ST%BU,12¤,F1BC3                                     5616.24 80 014000.20 D0  016467.00
                ST%BU¤,F1BD                                         5623.00 80 000000.20 D0  016470.00
        J2MD7   B,$                                                 16471.10 00              016471.00
                        @ROUTINE TO REWIND OUTPUT

        J2XN4   REW%SEOP¤,0%$X12¤                                    0.00 8C 000136.15 00     016471.40
                SIC,J2XW4                                           16254.40 80              016472.40
                        B,J2XW3                                     16252.50 00              016473.00
                CCW,0%$X12¤,J2AB1                                    0.00 8C 015237.21 00     016473.40
                BZB,J2AB1&.18,$-1.0                                 15237.22 80 016473.74 00 016474.40
                REL%SEOP¤,0%$X12¤                                    0.00 8C 000000.33 00     016475.40
                SIC,J2XW4                                           16254.40 80              016476.40
                        B,J2XW3                                     16252.50 00              016477.00
                CNOP                                                 0.30 00                 016477.40
        J2XN5   $B,0                 @RETURN                         0.10 00                 016500.00


                END,F1                                              4374.00                  016500.40
```