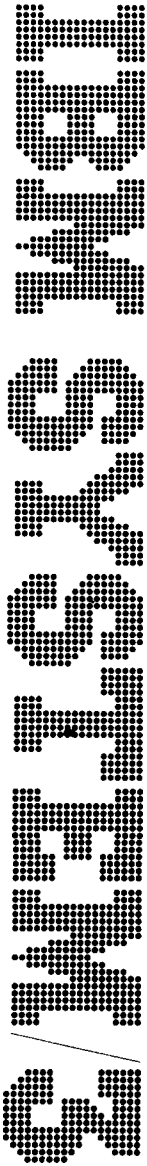


IBM System/3
Models 4, 8, 10, and 12
Communications Control Program
Data Areas and Diagnostic Aids

Program Numbers:
5702-SC1 (Models 8 and 10)
5703-SC1 (Model 4)
5705-SC1 (Model 12)

Features 6033/6070/6071

SY21-0048-1
File No. S3-36

Second Edition (March 1978)

This is a major revision of, and obsoletes, SY21-0048-0 and Technical Newsletters SN21-5529 and SN21-5517. Information has been added to support improvements in IBM System/3 Model 12 System Control Program (Program Number 5705-SC1). Changes to text and illustrations are indicated by a vertical line at the left of the change.

This edition applies to the System/3 program versions listed below and to all subsequent versions and modifications until otherwise indicated in new editions or technical newsleters.

Version	Modification	Program Number	Feature Number	Model
15	0	5702-SC1	6033	8, 10
15	0	5703-SC1	6033	4
4	0	5705-SC1	6070, 6071	12

Changes are periodically made to the specifications herein; before using this publication in connection with the operation of IBM systems, refer to the latest *IBM System/3 Bibliography*, GC20-8080, for the editions that are applicable and current.

Use this publication only for the purposes stated in the *Preface*.

Publications are not stocked at the address below. Requests for copies of IBM publications and for technical information about the system should be made to your IBM representative or to the branch office serving your locality.

This publication could contain technical inaccuracies or typographical errors. Address your comments about this publication to IBM Corporation, Publications, Department 245, Rochester, Minnesota 55901. Comments become the property of IBM.

This handbook is designed to aid IBM personnel responsible for supporting the IBM System/3 Models 4, 8, 10, and 12 Communications Control Program. This handbook provides:

- Descriptions of data areas
- Descriptions of how to use the diagnostic aids
- Additional references

Note: All displacements herein are relative to zero and are in hexadecimal notation. All lengths are in decimal notation. Field names reference the entire field and do not imply either leftmost or rightmost addressability.

RELATED PUBLICATIONS

- *IBM System/3 Model 4 Operator's Guide*, GC21-5149
- *IBM System/3 Communications Control Program Programmer's Reference Manual*, GC21-7579
- *IBM System/3 Models 8, 10, and 12 System Communication Control Program System Reference*, GC21-7588
- *IBM System/3 Communications Control Program (5702-SC1) Terminal Operator's Guide*, GC21-7580
- *IBM System/3 Models 8, 10, and 12 System Communications Control Program System Operator's Guide*, GC21-7581
- *IBM System/3 Multiline/Multipoint Binary Synchronous Communications Reference Manual*, GC21-7573
- *IBM System/3 Multiple Line Terminal Adapter RPQ Program Reference and Component Description Manual*, GC21-7560
- *IBM System/3 Disk Systems Binary Synchronous Communications Programming Support Input/Output Control System Logic*, SY21-0526
- *IBM System/3 Multiple Line Terminal Adapter RPQ Supporting RPQs S40028-S40033 Program Numbers 5799-WAU (Models 10 and 12) 5799-WEK (Model 15) Program Logic Manual*, SY21-0527
- *IBM System/3 Models 4, 8, 10, and 12 Communications Control Program Logic Manual*, SY21-0531
- *IBM System/3 Model 4 Communications Control Program Programmer's Reference Manual*, GC21-5150
- *IBM System/3 Communication Control Program Messages Manual*, GC21-5170
- *IBM System/3 Disk Sort Reference Manual*, SC21-7522
- *IBM System/3 Communications Control Program System Design Guide*, GC21-5165

List of Abbreviations

Addr	A main storage address
AID	Attention ID
AM	Allocation manager
APL	Applied program language
Arith	Arithmetic variable
ARR	Address recall register
ASCII	American National Standard Code for Information Interchange
ATR	Address translation register
Bin	Binary number
Bool	Binary (Boolean) variable
BSCA	Binary synchronous communications adapter
CDE	Contents directory entry
C/H	Disk address (cylinder/head)
C/H/R	Disk address (cylinder/head/record)
C/H/R/D	Disk address (cylinder/head/record/displacement)
C/S	Disk address (cylinder/sector)
C/S/D	Disk address (cylinder/sector/byte displacement within sector)
C/S/D/D	Disk address (cylinder/sector/byte displacement from the beginning of that sector)
C/S/N	Disk address and length (cylinder/sector/number of sectors)
CAB	Current address buffer
calcs	Calculations
CAM	Compiler access method
CAR	Current address register
CCP	Communications control program
CCPIVP	CCP installation verification program
Char	Alphameric characters
Charn	Character variable
CM	Communications manager
CMD	Command
CMT	Console management task
COMARA	Communications area
COMMON	Common area
CP	Command processor
CPU	Central processing unit
CRT	Cathode-ray tube
DC	Define constant
Dec	Zoned decimal characters
DFCR	Display format control routine
DFGR	Display format generator routine
DFF	Display format facility
DFT	Display format table
Disp	Displacement
DME	Data mode escape
DPF	Dual program feature
DSM	Disk system management
DTF	Define the file
DTT	Define the table

EAU	Erase all unprotected
EBCDIC	Extended binary-coded decimal interchange code
EOJ	End of job
EOT	End of transmission
EPL	External pointer list
ERP	Error recovery procedure
ESL	External symbol list
FCT	File control table
FDT	Field descriptor table
FSA	File share area
FSB	File specification block
FT	Format table
HDB	High density buffer
HPL	Halt program level
IAR	Instruction address register
ID	Identification
IFT	Input format table
I/O	Input/output
Inst	Instruction
IOB	Input/output block
IOCS	Input/output control system
IOS	Input/output supervisor
IPL	Initial program load
ITB	Intermediate text block
LCB	Line control block
LCT	Line control table
Lng	Length
MDT	Modified data tag
MFCM	Multifunction card machine
MFCU	Multifunction card unit
MLMP	Multiline/multipoint
MLTA	Multiple line terminal adapter
MRT	Multiple requesting terminal
NEP	Never-ending program
OBR	Outboard recorder
OCL	Operation control language
OHA	Output hold area
OLE	Overlay linkage editor
OLT	Online test
parm	Parameter
PAS	Program appended storage
PCI	Program check interrupt
PCSR	Program check status register
PCT	Program control table or program characteristics table
PID	Program Information Department
PLCA	Program level communication area
PMR	Program mode register
PSR	Program status register
PTAM	Pseudo tape access method
PTTC/EBCD	Perforated tape and transmission code/extended binary-coded decimal

RB	Request block
REQ	Request
RIB	Request indicator byte
RJE	Remote job entry
RLD	Relocation list dictionary
RVI	Reverse interrupt
SAR	Stop address register
SCA	System communication area
SCB	Segment control block
SCP	System control program
SDF	Short disk DTF
SDR	Statistical data recording
SIO	Start input/output
SIT	System information table
SPD	Selector pen detectable
SQB	Sector enqueue block
SRT	Single requesting terminal
STT	Switched terminal table
SVC	Supervisor call
SWA	Scheduler work area
SYSBFR	Control statement input buffer
SYSCOM	System communication region
SYSLOG	System log routine
TAB	Transition address buffer
TAR	Transition address register
TAS	Terminal attributes set
TAT	Terminal attributes table
TAU	Terminal attributes use
TCB	Task control block
TM	Termination management
TNT	Terminal name table
TP	Teleprocessing
TT	Terminal table
TUB	Terminal unit block
TUT	Terminals used table
UPA	User program area
UPSI	User program switch indicator
VTOC	Volume table of contents
WCC	Write control character
WTO	Write to operator
WTOR	Write to operator with reply
XCTL	Transfer control
XDT	Symbolic file table
XREF	Cross-reference
XR1	Index register 1
XR2	Index register 2

Section 1. Data Areas

This section describes data areas used by CCP routines. Data areas used by CCP routines but not unique to CCP (for example, disk DTFs or telecommunications polling lists) are not described here; their descriptions can be found in the logic manual of the appropriate DSM component program.

The CCP data areas are described in eight groups:

1. SCP generator data areas
2. Assignment build local data areas
3. $$CCPFILE
4. $CCPLOG File (Model 4 only)
5. Startup data areas
6. CCP execution data areas
7. DFF data areas
8. Installation verification program disk record

CCP data areas are described in tables (arranged in alphabetic sequence with in each group) containing the following information about each field:

- Disp Hex—The displacement of the field from the beginning of the data area, given in hex. If the field consists of more than one byte, the displacements of the first byte and the last bytes are indicated. When a byte is used more than once within the same area, the second and subsequent entries for the byte are shown in parenthesis.
- Label—The name of the field as it is referred to by CCP routines.
- Lng Dec—The number of bytes in the field, given in decimal.
- Form—The form of data contained in the field. The codes used are:

Code	Description
Addr	A main storage address
Bin	Binary number
Bits	A collection of bits, each of which has individual significance
C/H	Disk address (cylinder/head)
Char	Alphameric characters
C/H/R	Disk address (cylinder/head/record)
C/H/R/D	Disk address (cylinder/head/record/displacement)
C/S	Disk address (cylinder/sector)
C/S/D	Disk address (cylinder/sector/byte displacement within sector)
C/S/D/D	Disk address (cylinder/sector/byte displacement from the beginning of that sector)
C/S/N	Disk address and length (cylinder/sector/number of sectors)
Dec	Zoned decimal characters
Disp	A binary number representing a displacement within main storage
Inst	Instruction
Mix	More than one of the above forms in the same field

- Description—The content of the field and the meaning of the information in the field. When the *Form* of the field is *bit*, the following information is also given:
  - Hex Value—The hex value indicates when a bit is on. More than one significant bit can be on (multiple meanings for the byte).
  - Symbol—The name of the bit if applicable.
  - Meaning—The meaning of the bit when it is on.

COMMUNICATIONS AREA (COMARA)

- COMARA is part of $CGNIN.
- This area contains the transfer vector and an address table for all other tables in $CGNIN.

Disp Hex	Label[1]	Lng Dec	Form	Description
00-05		6	Bin	Current phase name
06-07		2	Bin	Displacement from COMARA to COMMON. If a register points to COMARA, adding this constant to its contents causes the result to point to COMMON
Transfer Vector				
08-0B		4	Addr	Transfer to disk data management
0C-0F		4	Addr	Transfer to printer data management
Address Table				
10-11		2	Addr	Disk data management transfer address
12-13		2	Addr	Printer data management transfer address
14-15		2	Addr	Printer DTF address
16-17		2	Addr	Header area start address
DTFs and IOBs				
18-48		49	Bin	Object file ($WORK) DTF
49-5E		22	Bin	Object file ($WORK) IOB
5F-8F		49	Bin	Source file ($SOURCE) DTF
90-A5		22	Bin	Source file ($SOURCE) IOB
A6-D6		49	Bin	Work file ($WORK2) DTF
D7-EC		22	Bin	Work file ($WORK2) IOB

[1] All labels address the high-storage (rightmost) byte of the field.

COMMON AREA (COMMON)

- COMMON is part of $CGNIN.
- This area is used for interphase constants, working storage, and communication among phases.

The following chart shows which fields in COMMON are used by more than one phase of the SCP generator. Only data fields used by more than one phase are shown. Fields that are merely initialized for the next phase are not included. A bullet (●) is used to indicate the phase in which a data field is initialized, used in, or terminated.

Phase / Field	$CGNIN	$CGNCM	$CGNSB	$CGNSF	$CGNSS	$CGNPE	$CGNPS	$CGNBX	$CGNSX
OPTIONS	●	●	●	●	●	●	●	●	●
BGNCOL	●	●					●		
ENDCOL	●	●							
SEQCNT		●							●
MODULE		●			●	●			
TITLEN		●				●			
ESLCNT		●			●	●			
INTLCR			●		●				
MAXLCR			●		●				
SYMOVS			●	●					
NSTENT			●	●	●				
MAXSTE			●	●	●				
SYTBSA			●	●	●				
SYTBEA			●	●	●				
SYMCNT			●	●	●				
ESLTBA					●	●			
PAGCNT						●	●		●
LPSIZE						●	●		
LPCLSW						●	●		
SQFDST						●	●		
SQFDLG						●	●		
MNESCT							●		●
ERRCNT							●		●
XRPASR								●	●
XRFRST								●	●
XRLAST								●	●
XRBLKC								●	●

Disp Hex	Label[1]	Lng Dec	Form	Description
Contents for $CGNIN and $CGNCM				
00-01	CMCADP	2	Disp	Displacement to COMARA
02-03	I0	2	Bin	Binary 0 constant
04-05	I1	2	Bin	Binary 1 constant
06-07	I2	2	Bin	Binary 2 constant
08	OPTONS	1	Bin	Processor options
09-0A	SEQCNT	2	Bin	Count of sequence errors in the source file ($SOUCRE)
0B-13	INTRCD	10	Bin	Disk data management work area
14-15	BGNCOL	2	Bin	Source record begin column
16	–	1	–	Reserved
17-1C	MODULE	6	Char	Module name
1D-22	TITLEN	6	Char	Title name
23	ESLCNT	1	Bin	Count of ESL records
24	CATGVL	1	Bin	Module category level
25-26	COML4V	2	Bin	EXTRN subtype 4 common length
27-28	COML5V	2	Bin	EXTRN subtype 5 common length
29-2A	NAMLNG	2	Bin	Length of name field
2B-2C	OPTCOL	2	Bin	Rightmost column number of operation code
2D-2E	OPTLNG	2	Bin	Operation code length
2F-30	OPDCOL	2	Bin	Leftmost column number of operation field
31-32	OPDLNG	2	Bin	Operand field length

[1] All labels address the high-storage (rightmost) byte of the field.

Disp Hex	Label[1]	Lng Dec	Form	Description
33-34	OPDEND	2	Bin	Rightmost column number of operand field
35-36	PRECOL	2	Bin	Points to current source column
37-39	OPFTEN	3	Addr	End of operand format table
3A	NOFOPD	1	Bin	Number of operands
3B-46	EPOSEN	12	Bin	Operand element position table
47	NOFELE	1	Bin	Number of elements in operand
48-51	INTEND	10	Bin	Control record build area
52-5B	NAMEND	10	Bin	Name record build area
5C-65	TRMEND	10	Bin	Term record build area
66-6F	ERREND	10	Bin	Error record build area
70-D0	SOURFD	97	Char	Source record input area
D1-D8	LASTSQ	8	Char	Last source sequence field
D9	CTLSWS	1	Bin	Control switches
DA-DB	AAWORK	2	Bin	Work area A
DC-DD	ABWORK	2	Bin	Work area B
DE-DF	ACWORK	2	Bin	Work area C
E0	PACI	1	Bin	Pseudo accumlator switches
E1-E4	PAC	4	Bin	Pseudo accumulator 1
E5-E8	TPAC	4	Bin	Pseudo accumulator 2
E9	SWTCH1	1	Bin	Temporary bit switches
EA-EB	I3	2	Bin	Binary constant 3
EC	EXTCNT	1	Bin	EXTRN count

[1] All labels address the high-storage (rightmost) byte of the field.

COMMON AREA (COMMON) (Continued)

Disp Hex	Label[1]	Lng Dec	Form	Description
ED-EE	ON	2	Char	Print keyword
EF-F1	OFF	3	Char	Print keyword
F2-F5	DATA	4	Char	Print keyword
F6-FB	NODATA	6	Char	Print keyword
FC-FD	ENDCOL	2	Bin	Source record end column

Contents for $CGNSB and $CGNSF

00-01	CMCADP	2	Disp	Displacement to COMARA
02-03	I0	2	Bin	Binary 0 constant
04-05	I1	2	Bin	Binary 1 constant
06-07	I2	2	Bin	Binary 2 constant
08	OPTONS	1	Bin	Processor options
09-0A	SEQCNT	2	Bin	Count of sequence errors in the source file ($SOURCE)
0B-13	INTRCD	10	Bin	Disk data management work area
14-15	BGNCOL	2	Bin	Source record begin column
16	—	1	—	Reserved
17-1C	MODULE	6	Char	Module name
1D-22	TITLEN	6	Char	Title name
23	ESLCNT	1	Bin	Count of ESL records
24	CATGVL	1	Bin	Module category level
25-26	COML4V	2	Bin	EXTRN subtype 4 common length
27-28	COML5V	2	Bin	EXTRN subtype 5 common length
29-2C	LOCNTR	3	Bin	Current location counter value
2D-2F	LCRCHG	3	Bin	Location counter increment

[1] All labels address the high-storage (rightmost) byte of the field.

COMMON AREA (COMMON) (Continued)

Disp Hex	Label[1]	Lng Dec	Form	Description
30	LOCRSW	1	Bin	Location counter switch
31	SYMOVS	1	Bin	Symbol table overflow switches
32-33	NSTENT	2	Bin	Number of table entries
34-35	MAXSTE	2	Bin	Maximum number of entries
36-37	SYTBSA	2	Addr	Symbol table start address
38-39	SYTBEA	2	Addr	Symbol table end address
3A-3B	SYMCNT	2	Bin	Current symbol count
3C	SYMIND	1	Bin	Symbol table indicators
3D-46	SYMEND	10	Bin	Symbol entry build/search area
47-50	INTEND	10	Bin	Control record save area
51-5A	TRMEND	10	Bin	Term record save area
5B-64	ERREND	10	Bin	Error record build area
65-66	AAWORK	2	Bin	Work area A
67-68	ABWORK	2	Bin	Work area B
69-6A	ACWORK	2	Bin	Work area C
6B	PACI	1	Bin	Pseudo accumulator switches
6C-6F	PAC	4	Bin	Pseudo accumulator 1
70-73	TPAC	4	Bin	Pseudo accumulator 2
74-76	INTLCR	3	Bin	Initial location counter
77-79	MAXLCR	3	Bin	Maximum location counter
7A-A5	EXPVTB	44	Bin	Expression evaluation tables
A6-B3	EXPWRK	14	Bin	Expression evaluation work area
B4-B7	MWORK	4	Bin	Multiplication work area
B8-BD	SYMSAV	6	Bin	Symbol save area

[1] All labels address the high-storage (rightmost) byte of the field.

Disp Hex	Label[1]	Lng Dec	Form	Description
Contents for $CGNSS				
00-01	CMCADP	2	Disp	Displacement to COMARA
02-03	I0	2	Bin	Binary 0 constant
04-05	I1	2	Bin	Binary 1 constant
06-07	I2	2	Bin	Binary 2 constant
08	OPTONS	1	Bin	Processor options
09-0A	SEQCNT	2	Bin	Count of sequence errors in the source file ($SOURCE)
0B-13	INTRCD	10	Bin	Disk data management work area
14-15	BGNCOL	2	Bin	Source record begin column
16	–	1	–	Reserved
17-1C	MODULE	6	Char	Module name
1D-22	TITLEN	6	Char	Title name
23	ESLCNT	1	Bin	Count of ESL records
24	CATGVL	1	Bin	Module category level
25-26	COML4V	2	Bin	EXTRN subtype 4 common length
27-28	COML5V	2	Bin	EXTRN subtype 5 common length
29-2C	LOCNTR	3	Bin	Current location counter value
2D-2F	LCRCHG	3	Bin	Location counter increment
30	LOCRSW	1	Bin	Location counter switch
31	SYMOVS	1	Bin	Symbol table overflow switches
32-33	NSTENT	2	Bin	Number of table entries
34-25	MAXSTE	2	Bin	Maximum number of entries
36-37	SYTBSA	2	Addr	Symbol table start address
38-39	SYTBEA	2	Addr	Symbol table end address

[1] All labels address the high-storage (rightmost) byte of the field.

COMMON AREA (COMMON) (Continued)

Disp Hex	Label[1]	Lng Dec	Form	Description
3A-3B	SYMCNT	2	Bin	Current symbol count
3C	SYMIND	1	Bin	Symbol table indicators
3D-46	SYMEND	10	Bin	Symbol entry build/search area
47-50	INTEND	10	Bin	Control record save area
51-5A	TRMEND	10	Bin	Term record save area
5B-64	ERREND	10	Bin	Error record build area
65-66	AAWPRL	2	Bin	Work area A
67-68	ABWORK	2	Bin	Work area B
69-6A	ACWORK	2	Bin	Work area C
6B	PACI	1	Bin	Pseudo accumulator switches
6C-6F	PAC	4	Bin	Pseudo accumulator 1
70-73	TPAC	4	Bin	Pseudo accumulator 2
74-76	INTLCR	3	Bin	Initial location counter
77-79	MAXLCR	3	Bin	Maximum location counter
7A-7B	ESLINC	2	Bin	ESL record length constant
7C-7D	ESLPTR	2	Addr	Pointer to ESL table
7E-89	ESLREC	12	Bin	ESL record build area

Contents for $CGNPE

00-01	CMCADP	2	Disp	Displacement to COMARA
02-03	I0	2	Bin	Binary 0 constants
04-05	I1	2	Bin	Binary 1 constant
06-07	I2	2	Bin	Binary 2 constant
08	OPTONS	1	Bin	Processor options

[1] All labels address the high-storage (rightmost) byte of the field.

COMMON AREA (COMMON) (Continued)

Disp Hex	Label[1]	Lng Dec	Form	Description
09-0A	SEQCNT	2	Bin	Count of sequence errors in the source file ($SOURCE)
0B-13	INTRCD	10	Bin	Disk data management work area
14-15	BGNCOL	2	Bin	Source record begin column
16	—	1	—	Reserved
17-1C	MODULE	6	Char	Module name
1D-22	TITLEN	6	Char	Title name
23	ESLCNT	1	Bin	Count of ESL records
24-25	ESLINC	2	Bin	ESL record increment
26-27	—	2	—	Reserved
28-29	ESLTBA	2	Addr	Address of ESL table
2A-35	ESLREC	12	Bin	ESL record save area
36-37	—	2	—	Reserved
38-39	AAWORK	2	Bin	Work area A
3A-3B	ABWORK	2	Bin	Work area B
3C-3D	ACWORK	2	Bin	Work area C
3E	PACI	1	Bin	Pseudo accumulator switches
3F-42	PAC	4	Bin	Pseudo accumulator 1
43-44	TPAC	4	Bin	Pseudo accumulator 2

Contents for $CGNPS

00-01	CMCADP	2	Disp	Displacement to COMARA
02-03	I0	2	Bin	Binary 0 constant
04-05	I1	2	Bin	Binary 1 constant
06-07	I2	2	Bin	Binary 2 constant

[1] All labels address the high-storage (rightmost) byte of the field.

COMMON AREA (COMMON) (Continued)

Disp Hex	Label[1]	Lng Dec	Form	Description
08	OPTONS	1	Bin	Processor options
09-0A	SEQCNT	2	Bin	Count of sequence errors in the source file ($SOURCE)
0B-13	INTRCD	10	Bin	Disk data management work area
14-15	BGNCOL	2	Bin	Source record begin column
16-17	ERRCNT	2	Bin	Count of source statements in error
18	PAGCNT	1	Bin	Printer page size
19	LINCNT	1	Bin	Printer line count
1A	LPSIZE	1	Bin	Printer column size
1B	LPCLSW	1	Bin	Print size switches
1C-25	INTEND	10	Bin	Control record area
26-30	ERREND	11	Bin	Error record area
31	PRNTSW	1	Bin	Print control switches
32	USWTCH	1	Bin	Temporary bit switches
33-34	LDADDR	2	Addr	Object code load address
35-37	DCWORK	3	Bin	DC work area
38-39	AAWORK	2	Bin	Work area A
3A-3B	ABWORK	2	Bin	Work area B
3C-3D	ACWORK	2	Bin	Work area C
3E	PACI	1	Bin	Pseudo accumulator switches
3F-42	PAC	4	Bin	Pseudo accumulator 1
43-46	TPAC	4	Bin	Pseudo accumulator 2
47	RELIND	1	Bin	Relocation and EXTRN switches
48-4F	OBJECT	8	Bin	Object code assembly area

[1] All labels address the high-storage (rightmost) byte of the field.

COMMON AREA (COMMON) (Continued)

Disp Hex	Label[1]	Lng Dec	Form	Description
50-51	VALUE1	2	Bin	Base value for register 1
52-53	VALUE2	2	Bin	Base value for register 2
54-63	HEXOBJ	16	Mix	Hex object conversion area
64-8F	EXPVTB	44	Mix	Expression evaluation tables
90-93	MWORK	4	Bin	Multiplication work area
94-95	OBDADF	2	Bin	Duplication factor for DC code
96-97	OBDAAD	2	Addr	Address of DC code
98-99	OBDLTH	2	Bin	Object code length
9A-9B	MOVELH	2	Bin	Object code move length
9C	RELDSP	1	Bin	RLD value
9D-9E	BYTAVL	2	Bin	Bytes left on object record
9F	–	1	–	Reserved
A0	FX96LN	1	Bin	Fold column for 96-column printer
A1	F120LN	1	Bin	Fold column for 120-column printer
A2	DCZERO	1	Char	Decimal 0
A3-A5	SEQALP	3	Bin	Sequence error code
A6	OPCDNO	1	Bin	Operation code error constant
A7	OPNDNO	1	Bin	Operand error constant
A8-A9	I8	2	Bin	Binary 8
AA-AB	MINUS8	2	Bin	Binary -8
AC-AD	I16	2	Bin	Binary 16
AE	I57	1	Bin	Binary 57
AF-B0	I256	2	Bin	Binary 256

[1] All labels address the high-storage (rightmost) byte of the field.

COMMON AREA (COMMON) (Continued)

Disp Hex	Label[1]	Lng Dec	Form	Description
B1-B2	QCDMAX	2	Bin	Maximum MVX instruction queue code value
B3-B4	JPDEC3	2	Bin	Jump instruction length
B5-B6	HEXSAD	2	Addr	Start address of hex conversion
B7-B8	HEXEAD	2	Addr	End address of hex conversion
B9	D1	1	Char	Decimal 1
BA-BB	TXTTXA	2	Addr	Object text address
BC-BD	TDTRLA	2	Addr	Object RLD field address
BE-BF	ASEMAD	2	Addr	Assembly area address
C0-C1	SOURAD	2	Addr	Address of source start
C2-C3	OBOADR	2	Addr	Object output area address
C4-C5	SRCADR	2	Addr	Source input area address
C6-C9	STMTNO	4	Bin	Source statement number
CA-CB	MINUS1	2	Bin	Binary -1
CC-CD	NAMEXN	2	Bin	EXTRN number
CE-CF	OPADEC	2	Bin	Output area decrement
D0-D1	OBJDEC	2	Bin	Input area decrement
D2-D3	PRTOAD	2	Addr	Print area start address
D4-D5	PRTOCA	2	Addr	Print object field address
D6-D7	ASEMSA	2	Addr	Assembly area start address
D8-D9	HEADRA	2	Addr	Header area address
DA-DC	ERRFLG	3	Bin	Error flag

[1] All labels address the high-storage (rightmost) byte of the field.

COMMON AREA (COMMON) (Continued)

Disp Hex	Label[1]	Lng Dec	Form	Description
Contents for $CGNBX and $CGNSX				
00-01	CMCADP	2	Disp	Displacement to COMARA
02-03	I0	2	Bin	Binary 0 constant
04-05	I1	2	Bin	Binary 1 constant
06-07	I2	2	Bin	Binary 2 constant
08	OPTONS	1	Bin	Processor options
09-0A	SEQCNT	2	Bin	Count of sequence errors in the source file ($SOURCE)
0B-13	INTRCD	10	Bin	Disk data management work area
14-15	BGNCOL	2	Bin	Source record begin column
16-17	ERRCNT	2	Bin	Count of source statements in error
18	PAGCNT	1	Bin	Printer page size
19	LINCNT	1	Bin	Printer line count
1A	LPSIZE	1	Bin	Printer column size
1B	LPCLSW	1	Bin	Print size switches
1C-27	XRTAB	12	Bin	Merge string table A (see $CGNBX or $CGNSX listing, *COMMON Subfields and Values Definitions,* for details)
28-33	XRBTAB	12	Bin	Merge string table B (see $CGNBX or $CGNSX listing, *COMMON Subfields and Values Definitions,* for details)
34-3B	XRAVLT	8	Bin	Cross-reference file availability table
3C-3D	XRPASR	2	Bin	Merge passes to last pass
3E-3F	XRPASC	2	Bin	Current pass count
40-41	XRFRST	2	C/S	Address of first XREF block
42-43	XRLAST	2	C/S	Address of last XREF block

[1] All labels address the high-storage (rightmost) byte of the field.

COMMON AREA (COMMON) (Continued)

Disp Hex	Label[1]	Lng Dec	Form	Description
44-45	XRBSST	2	Bin	Block string length in sectors
48-49	XRRCSZ	2	Bin	Blocks in XREF file
4A-57	XRCTAB	14	Bin	XREF file output block table (see $CGNBX listing, *COMMON Subfields and Values Definitions*, for details)
58-B7	XRPIME	96	Char	Print image area
B8	XRREFC	1	Bin	Reference count
B9-BA	XRREFP	2	Bin	Reference pointer
BB-BC	XRRFPS	2	Bin	Start reference pointer
BD	XRRDSW	1	Bin	String switch A/B
BE-C3	XRSYMS	6	Char	Current symbol save area
C4-C5	XRKYLC	2	Bin	Length of sort key minus 1
C6-C7	XRNKRL	2	Bin	Length of record not in key
C8-C9	AAWORK	2	Bin	Work area A
CA-CB	ABWORK	2	Bin	Work area B
CC-CD	ACWORK	2	Bin	Work area C
CE	PACI	1	Bin	Pseudo accumulator switches
CD-D2	PAC	4	Bin	Pseudo accumulator 1
D3-D6	TPAC	4	Bin	Pseudo accumulator 2

[1] All labels address the high-storage (rightmost) byte of the field.

PRINTER COMMUNICATIONS AREA

- The printer communications area is loaded with $CGNPE.
- This area remains in main storage through the end of SCP generator execution.
- The area consists of the following:
  - Printer DTF
  - Printer buffer
  - Header area

SYMBOL TABLE

- The symbol table is built in the lower end of main stoage by $CGNSB.
- The table consists of 10-byte entries, one for each symbol found.
- The table is used by $CGNSF (if overflow occurs) and $CGNSS.
- The table is designed to fill the entire space between the code and the work file disk buffer as shown in the following storage layout:
  - Communications area (COMARA)
  - Common area (COMMON)
  - Disk data management
  - $CGNSB code
  - Symbol table
  - Disk buffers

Following is the breakdown for each 10-byte entry in the symbol table:

Disp Hex	Label	Lng Dec	Form	Description
00	SYMATR	1	Bit	Symbol attributes: *Hex Value* — *Symbol* — *Meaning* 30 — EXTIND — Indicates an EXTRN symbol 02 — SYMRES — Indicates symbol is resolved 01 — ABSIND — Indicates an absolute attribute 00 — RELIND — Indicates a relocatable attribute
01-06	SYMBOL	6	Char	The symbol padded with blanks
07	SYMLNG	1	Bin	Length attribute of symbol minus 1
08-09	SYMVAL	2	Bin	Symbol value

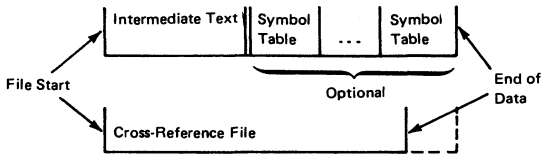
WORK FILE ($WORK2)

- $WORK2 is used by the SCP generator for intermediate storage (on a disk storage drive) throughout execution (see *Work File Activity,* following).
- The file contains three types of data: intermediate text, symbol table entries, and cross-reference data.
- The cross-reference data is written into the same area as the intermediate text and symbol table, and imposes no additional space requirements (see *Work File Format,* following).

Work File Activity

Phase	Function	Data Activity
$CGNIN	Initialize	None
$CGNCM	Compression	Put intermediate text
$CGNSB	Build symbol table; assign location counter	Update with location counter value and error records
$CGNSF	Process overflow symbol table	Update symbolic terms Add symbol table entries Update symbolic term
$CGNSS	Substitute symbols	Update symbolic term Add symbol table entries
$CGNPE	ESL processing; initialize	Prime buffer
$CGNPS	Generate object code	Get intermediate text
$CGNBX	XREF build	Get intermediate text Write XREF blocks
$CGNSX	XREF merge	Read XREF blocks Write XREF blocks

Work File Format



Intermediate Text Data

This data is used by the processor for translation from the source assembler language to either a relocatable or an absolute object module. The source code is translated to object code during a series of passes. At any point, the intermediate text contains the object program information at its current level of translation.

The intermediate text data is made up of variable length strings of fixed length (10-byte) records. There are four types of records in the file:

1. Control Records—one produced for each instruction in the program. Delimits the variable length string.
2. Name Records—one produced for each name field entry and for all EXTRN names.
3. Term Records—produced from the contents of the operand field. Contain expression terms, constants, and miscellaneous information.
4. Error Records—contain error indicators.

The size of a string for a source statement is dependent on the statement type and the contents of the operand field. The following rules can be used to determine intermediate text requirements. (The rules apply only to error free source programs. A statement that contains errors generally requires less storage space.)

1. All Instructions:
   a. One record for each machine or assembler instruction or comment statement in the program.
   b. One record if there is a name field entry.
2. Machine Instructions—one additional record for each term in the operand field.
3. Assembler Instructions:
   a. END, ENTRY, EQU, EXTRN, ORG, USING—one additional record for each term in the operand field.
   b. EXTRN, ISEQ, PRINT, SPACE, START—one additional record for each instruction.
   c. TITLE—additional records = N/8 (plus one for any nonzero remainder), where N is the number of characters in the title operand field.
   d. DS/DC:
      1) One additional record for duplication factor (default or specified value).
      2) One additional record for each term in the length specification.
   e. DC:
      1) Address constant—one record for each term in address expression.
      2) All other constants—additional records = N/8 (plus one for any nonzero remainder), where N is the number of bytes required to contain the converted constant plus one.

Following is a sample list of instructions together with the intermediate text space requirements for each:

Label	Instruction	Text Space
DECK	START 0	3
ENTRY	SLC A(2),A	5
	MVC A(2),CON1	4
	ALC A(2),CON2	4
	HPL X'FF',X'FF'	3
A	DS CL2	4
CON1	DC IL2'500'	5
CON2	DC IL2'320'	5
	END ENTRY	2

Disp Hex	Label	Lng Dec	Form	Description
Control Record				
00		1	Bit	Record type and indicators: *Hex Value* *Symbol* *Meaning* 20 — Sequence error on this statement 10 — Symbol table overflow 08 — Last text record 04 — Missing end statement (last text record only) 02 — Module name missing (last text record only) 01 — Name record follows
01		1	—	Reserved
02		1	Bin	Object code length for machine instructions
03		1	Bin	Operation code (machine code for machine instructions)

WORK FILE ($WORK2) (Continued)

Disp Hex	Form	Lng Dec	Form	Description
04		1	Bin	Q-code (machine code for machine instructions)
05		1	Bit	Operand format:

Hex Value	*Symbol*	*Meaning*
		Operand 1:
E0		A(L,R)
C0		A(L)
A0		A(,R)
80		A
		Operand 2:
0E		,A(L,R)
0C		,A(L)
0A		,A(,R)
01		,A

06-07		2	Bin	Location counter value assigned before this instruction
08-09		2	Bin	Statement number of this instruction

Name Record

00		1	Bit	Record type and indicator:

Hex Value	*Symbol*	*Meaning*
44		Symbol defined more than once
40		Symbol defined only once

01-06		6	Char	The symbol padded with blanks
07-08		2	Bin	Statement number where the symbol is defined
09		1	Bin	EXTRN number for external symbol, otherwise zero

Disp Hex	Label	Lng Dec	Form	Description
Term Record				
00		1	Bit	Record type and term attributes:

Hex Value	*Symbol*	*Meaning*
B0		EXTERN symbol
A0		Multiplication operation
90		Subtraction operation
80		Addition operation
08		Operation could be changed by execution (machine instruction)
04		Last term in an expression
02		Symbolic term resolved
01		Absolute term

Disp Hex	Label	Lng Dec	Form	Description
01-09		9	Mix	The contents of these bytes are determined as follows: If byte 01 contains: *Hex Value* — *Meaning* 3F — This is a self-defining term. Bytes 02-06 have miscellaneous uses. Byte 07 contains the length attribute (0). Bytes 08-09 contain the term value. The following special terms are created with a self-defining term indicator: DC/DS — First term record contains constant type in byte 04 and the duplication factor in byte 09. SPACE — Space operand value in byte 09. PRINT — Current print control settings in byte 07: *Hex Value* — *Meaning* 08 — DATA; otherwise NODATA 04 — ON; otherwise OFF 02 — GEN; otherwise NOGEN ISEQ — Sequence ISEQ specification. Bytes 06-07 contain the sequence field length minus 1. Bytes 08-09 contain the sequence field start column.

Disp Hex	Label	Lng Dec	Form	Description
Error Record				
00		1	Bit	Record type: *Hex Value* *Symbol* *Meaning* C0 Error record type
01		1	Bin	Name field error indicator bits
02		1	Bin	Operation field error indicator bits
03-05		3	Bin	Operand field error indicator bits
06-09		4	—	Reserved

Symbol Table Entries

- Symbol table entries are added to the work file after the intermediate text only if a cross-reference listing is requested.
- Each symbol table entry is 10 bytes long.

Disp Hex	Label	Lng Dec	Form	Description
00	SYMATR	1	Bit	Symbol attributes: *Hex Value* *Symbol* *Meaning* 80 EXTDEF EXTRN definition symbol 30 EXTIND EXTRN symbol 02 SYMRES Symbol resolved 01 ABSIND An absolute attribute 00 RELIND A relocatable attribute
01-06	SYMBOL	6	Char	The symbol padded with blanks
07	SYMLNG	1	Bin	Length attribute of symbol
08-09	SYMVAL	2	Bin	Symbol value

Cross-Reference Data

- The cross-reference data is created from the intermediate text and symbol table entries.
- The blocks of cross-reference data are written into the work file as they are created.
- There are three types of records in the cross-reference data: symbol attribute records, symbol definition records, and symbol reference records.

Disp Hex	Label	Lng Dec	Form	Description
Symbol Attribute Record (Translated Symbol Table Entry)				
00-05		6	Char	The symbol padded with blanks
06		1	Bit	Type and symbol attributes:

Hex Value	*Symbol*	*Meaning*
80	EXTDEF	EXTRN definition symbol
30	EXTIND	EXTRN symbol
02	SYMRES	Symbol resolved
01	ABSIND	An absolute attribute
00	RELIND	A relocatable attribute

07		1	Bin	Length attribute
08-09		2	Bin	Symbol value
Symbol Definition Record (Translated Name Record)				
00-05		6	Char	The symbol padded with blanks
06		1	Bit	Type:

Hex Value	*Symbol*	*Meaning*
40		A symbol definition record

07-08		2	Bin	Statement number where the symbol is defined
09		1	—	Reserved

Disp Hex	Label	Lng Dec	Form	Description
Symbol Reference Record (Translated Term Record)				
00-05		6	Char	The symbol padded with blanks
06		1	Bit	Type: *Hex Value* — *Symbol* — *Meaning* 80 — A symbol reference record
07-08		2	Bin	The statement number of the reference shifted one bit to the left. The rightmost bit on indicates a machine operand which could be altered by executing the instructions
09		1	Bin	Term type and attribute byte

CONTROL STATEMENT KEYWORD PARAMETER LIST

- Each statement processor passes control to $CC2SS (syntax scan) with register 1 containing the address of the keyword parameter list within that phase.
- Syntax scan provides syntactical diagnostics for the statement keywords and modifies the parameter list (SXSVL) according to the parameter values supplied. This data is then in a form that can be processed by the calling phase.
- Control is returned to the calling phase, which continues with diagnostics and processing based on the parameter values.

Disp Hex	Label	Lng Dec	Form	Description
00-01	SXSBFR	2	Addr	Address of control statement input buffer
02-03	SXSBD@	2	Addr	Control statement input buffer pointer
04-05	SXSER@	2	Addr	Address of error routine
06	SXSFG1	1	Bit	Flag byte:
				Hex Value — *Symbol* — *Meaning*: 80 SXSCNT Continued statement; 40 SXSSCT Continued sublist value
07	SXSENT		Disp	Displacement to first keyword element

The following equates describe one keyword and are repeated for each keyword of the control statement:

00	SXSKEL	1	Bin	Length of this keyword element in binary
01	SXSKWN	1	Bin	Keyword number
02	SXSKF1	1	Bit	Input flag byte:
				Hex Value — *Symbol* — *Meaning*: 80 SXSSLC Sublist capable keyword; 40 SXSSVC Split-value capable keyword; 20 SXSCVT Convert value to binary; 10 SXSYN Yes/no type value

CONTROL STATEMENT KEYWORD PARAMETER LIST (Continued)

Disp Hex	Label	Lng Dec	Form	Description		
				Hex Value	*Symbol*	*Meaning*
02 (continued)				08	SXSCMP	Translate this keyword value to 2 bytes of hex data by using the table at the address pointed to by SXSCP@
				04	SXSREQ	Required keyword
				01	SXSCLN	Length of value must have as many characters as in SXSLNE; length of value can vary
03	SXSKF2	1	Bit	Output flag byte:		
				Hex Value	*Symbol*	*Meaning*
				80	SXSFND	Keyword given on statement
				40	SXSERR	Error detected while processing this keyword
				20	SXSCPV	Value is compressed
				10	SXSZOK	Zero value accepted, only used if SXSCVT = 1
04		1	—	Reserved		
05-06	SXSCP@	2	Addr	Address of compress table		
(05-06)	SXSMXV	2	Bin	Maximum value allowed if value is to be converted to binary (this item is mutually exclusive with SXSCP@)		
07-0E	SXSKWD	8	Char	Keyword left-justified		
0F	SXSLNE	1	Bin	Length 1 of expected value, hex 00 if a sublist used with SXSCLN		

Disp Hex	Label	Lng Dec	Form	Description
10	SXSLNG	1	Bin	Length −1 of value. Possible contents are: *Value* — *Meaning* 0 — Yes/no value 1 — Converted value 1 — Compressed (not sublist) 1 — Sublist (address of output list) 1 — Split-value (address of output list) n — Not compressed or anything else
11-nn	SXSVAL	n	Mix	Keyword value, left-justified, can vary in length
(11-12)	SXSTB@	2	Addr	Address of sublist table or split-value table
(nn)	SXSEND	1	Bin	Flag at end of last keyword parameter element, hex FF

The following equates are used for the compressed table. This table is pointed to by SXSCP@:

00	SXSVON	1	Bin	Split-value order number, hex 00 if not split-value capable
01	SXSCVL	1	Bin	Length of value to check against
02-03	SXSSCV	2	Bin	Compressed value, hex 0000 if SXSSVL contains all blanks
04-nn	SXSSVL	n	Char	Value to compare against that given in statement (if all blanks, the value is given as on the statement)

The following equates are used for the output split-value or sublist parameter list; this list is pointed to by SXSTB@:

00	SXSOLN	1	Bin	Split-value order number
01	SXSOLN	1	Bin	Length −1 of value
02-nn	SXSOVL	n	Mix	The value, variable length

MAIN STORAGE TABLE SAVE AREA

- Compressed forms of the tables built by a particular statement processor can be saved in the main storage save area.
- This is a means of passing information (from phase to phase), which is necessary for the modification of various tables.

Disp Hex	Label	Lng Dec	Form	Description
File Control Table (FCT) Compressed				
00	FTJMP	1	—	Reserved
01	FTMCL	1	Bits	Flag byte
02-09	FTNAM	8	Char	File name
0A	FTAT1	1	Bits	File attributes byte 1
0B	FTAT2	1	Bits	File attributes byte 2
0C	FTSTR	1	Bin	Relative sector of entry in work file
0D	FTDISP	1	Bin	Displacement in sector
0E-0F	FTCR1	2	Bin	Record length
10	FTLNG	0	Bin	Length of compressed entry
File Control Table (FCT) While Building FCT Entries				
(10)	FTKYL	1	Bin	Key length
11-12	FTKYD	2	Bin	Key position
13	FTLNG	0	Bin	Length of compressed entry during FCT build
Line Control Table (LCT) Compressed				
00-01	LTJMP	2	Bin	Compressed LCT entry length in binary
02	LTNLN	1	Bin	Line number and type
03	LTAT1	1	Bits	Line attributes byte 1:

Hex Value	*Symbol*	*Meaning*
40	LTSND	Index send given
02	LTPLL	Poll list given

MAIN STORAGE TABLE SAVE AREA (Continued

Disp Hex	Label	Lng Dec	Form	Description
04	LTAT2	1	Bits	Line attributes byte 2
05	LTTCD	1	Bits	Line transmission code
06	LTLNA	1	Bits	Line configuration
07-08	LTBLK	2	Bin	Block length for this line
09-0A	LTDFF	2	Bin	DFF output hold area size
0B	LTLNG	0	Bin	Minimum length of compressed entry
(0B-nn)	LTPL	n	Char	Poll list, two-byte entries, the two-character ID given on the line control statement
			Bin	Modified to one-byte entries after last terminal for this line is processed (single byte entries are terminal internal ID)

Program Characteristics Table (PCT) Compressed

00-05	PTNAM	6	Char	Program name
06	PTSTR	1	Bin	Relative sector number of this entry in the work file
07	PTDISP	1	Bin	Sector displacement to beginning of this entry
08	PTLNG	0	Bin	Length of compressed entry

Terminal Attributes Table (TAT)

00	TASAT1	1	Bits	Attribute byte 1 (for bit definitions, see index entry: *terminal attributes set*)
01	TASAT2	1	Bits	Attribute byte 2 (for bit definitions, see index entry: *terminal attributes set*)
02-03	TASRCL	2	Bin	Record length
04	TASBKF	1	Bin	Blocking factor

Disp Hex	Label	Lng Dec	Form	Description

Terminal Attributes Use (TAU) Table

00 TATBSC 1 Bin BSCA line use:

Hex Value	*Meaning*
	Referenced by a terminal on BSCA line:
88	2
81	1

01 TATMLT 1 Bit MLTA line use:

Hex Value	*Meaning*
	Referenced by a terminal on MLTA line:
80	8
40	7
20	6
10	5
08	4
04	3
02	2
01	1

Terminal Name Table (TNT) Compressed

00-05	TNNAM	6	Char	Symbolic terminal name
06	TNTUB	1	Bin	Relative number of associated TUT entry
07	TNLIN	1	Bin	Line number with which this name is associated
08	TNFLG	1	Bit	Flag byte for diagnostics:

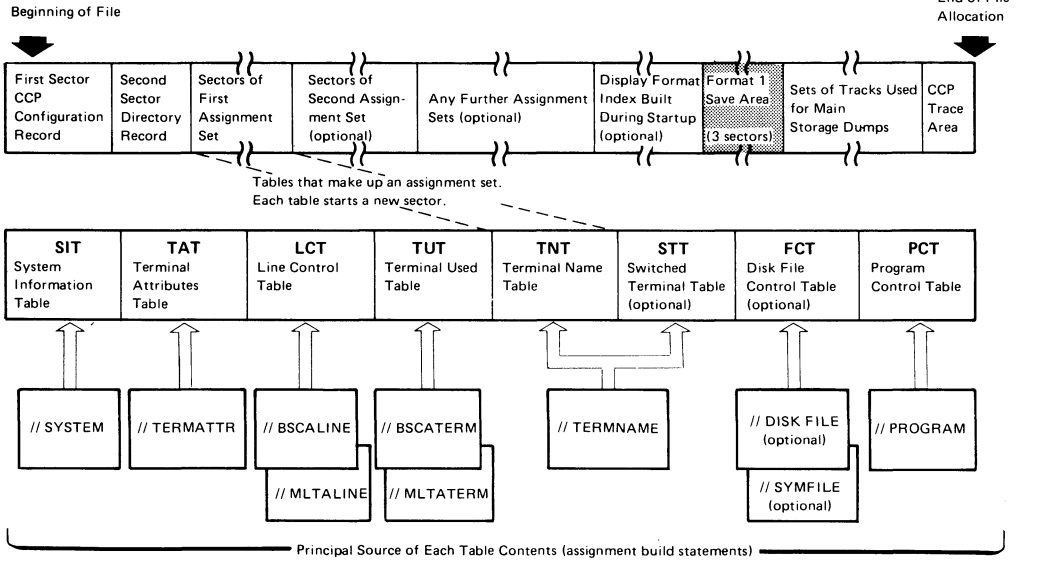
Hex Value	*Symbol*	*Meaning*
03	TNPG	Already referred to by this program

09 TNLNG 0 Bin Length of a compressed entry

Disp Hex	Label	Lng Dec	Form	Description
Terminals Used Table (TUT) Compressed				
00-01	TTID	2	Char	Terminal physical identifier
02	TTIID	1	Bin	Internal terminal ID
03	TTCHR	1	Bits	Terminal characteristics:

Hex Value	*Symbol*	*Meaning*
80	TTPRI	Primary name assigned
20	TTPH#	Phone number is required

04	TTLIN	1	Bin	Line number for this terminal
05	TTADR	1	Char	MLTA address character
06	TTLNG	0	Bin	Length of compressed entry


Beginning of File
End of File Allocation
First Sector CCP Configuration Record
Second Sector Directory Record
Sectors of First Assignment Set
Sectors of Second Assign-ment Set (optional)
Any Further Assignment Sets (optional)
Display Format Index Built During Startup (optional)
Format 1 Save Area (3 sectors)
Sets of Tracks Used for Main Storage Dumps
CCP Trace Area
Tables that make up an assignment set.
Each table starts a new sector.
SIT System Information Table
TAT Terminal Attributes Table
LCT Line Control Table
TUT Terminal Used Table
TNT Terminal Name Table
STT Switched Terminal Table (optional)
FCT Disk File Control Table (optional)
PCT Program Control Table
// SYSTEM
// TERMATTR
// BSCALINE
// MLTALINE
// BSCATERM
// MLTATERM
// TERMNAME
// DISK FILE (optional)
// SYMFILE (optional)
// PROGRAM
Principal Source of Each Table Contents (assignment build statements)

CONFIGURATION RECORD

The CCP configuration record is formatted by CCP generation and written as the first sector of $CCPFILE by $CC1BF. It is never altered after its creation. In addition to its use as a printable record of a particular version of CCP, the contents of the configuration record are also used in the following two ways:

1. The startup module, $CCP, compares the entire first sector of $CC1BF with the first sector of the operator-selected $CCPFILE to ensure that the selected $CCPFILE is the one generated when the modules on the production pack were generated.

2. The assignment stage uses specific values of various bytes and bits to determine the functional level of the CCP system, thus the validity of statements and keyword values.

Disp Hex	Label	Lng Dec	Form	Description
00-01	CFGVRF	2	Bin	Constant hex EBD7 (or hex EBD4 on Model 4) indicates $CCPFILE has been initialized by $CC1BF
02	CFGI0	1	Bit	Unit record devices supported by CCP and disk devices supported by user's DSM:
				Hex Value / *Symbol* / *Meaning*
				80 CFGMFU MFCU supported
				40 CFG142 1442 supported
				20 CFGP52 5203 supported
				10 CFGP14 1403 supported
				08 CFGR2 DSM supports disk drive R2
				04 CFGF2 DSM supports disk drive F2
				02 CFGD1 DSM supports disk drive D1
				01 CFGD2 DSM supports disk drive D2
03-06	CFGRV1	4	—	Reserved
07	CFGFA1	1	Bit	System facilities:
				Hex Value / *Symbol* / *Meaning*
				80 CFGDPF DPF supported
				40 CFGSHR File update sharing supported
				20 CFGN41 Directly attached 3741 supported

CONFIGURATION RECORD (Continued)

Disp Hex	Label	Lng Dec	Form	Description		
				Hex Value	*Symbol*	*Meaning*
07 (continued)				10	CFGXUT	Reserved
				Bits 4-7	CFGMXP	Maximum number (in binary) of concurrent user programs
08	CFGFA2	1	Bit	CCP facilities:		
				Hex Value	*Symbol*	*Meaning*
				80	CFGSYM	Symbolic files supported
				40	CFGPUC	Program requests counted
				20	CFGTF	Reserved
				Bits 3-4	CFGSEC	No terminal sign-on security if 0
				10	CFGCPW	CCP-supplied password routine
				08	CFGUPW	User-supplied security routine
				04	CFGDME	Data mode escape supported
				02	CFGFMT	3270 display formatting supported
				01	CFGRUF	Program request under format supported
09-0A	CFGRV2	2	—	Reserved		
0B	CFGPLG	1	Bit	Programming language support:		
				Hex Value	*Symbol*	*Meaning*
				80	CFGCOB	COBOL
				40	CFGFOR	FORTRAN
				20	CFGASM	Assembler
				10	CFGRPG	RPG II
0C-0D	CFGCBO	2	Disp	Offset to right end of CCP branch instruction from start of $@COIH		

CONFIGURATION RECORD (Continued)

Disp Hex	Label	Lng Dec	Form	Description
0E-13	CFGESC	6	Mix	Data mode escape string (If CFGDME is 1, these 6 bytes contain the comparand for data mode escape. These are user-specified and can be EBCDIC characters of hexadecimal digits — hex 40 if CFGDME is 0.)
14-15	CFGLUS	2	Bin	Length of user security information (Nonzero only if CFGUPW is 1; number of bytes to be moved to user security work area from $CC4Z9)
16-19	CFGRV3	4	—	Reserved
1A	CFGNS	1	Bin	Maximum number of sets planned for $CCPFILE
1B	CFGNPM	1	Bin	Maximum number of programs in a set (from generation)
1C	CFGNDF	1	Bin	Maximum number of disk files in a set (from generation)
1D	CFGNT	1	Bin	Maximum number of terminals in a set (from generation)
1E	CFGDMP	1	Bin	Maximum number of dynamic storage dumps
1F-20	CFGCOR	2	Bit	Object program CPU size (Models 4, 8, and 10): *Hex Value* — *Meaning* C000 — 48K 8000 — 32K 6000 — 24K 0000 — 64K
21	CFGTRC	1	Bin	Number of tracks for CCP trace to disk
22	CFGSRT	1	Bit	Bit 0 is 1 for sort (Model 12 only)
23	CFGSIZ	1	Bit	All bits off, 48K. Bit 7 on, 64K. Bit 3 on, 80K. Bits 7 and 3 on, 96K (Model 12 only).

Disp Hex	Label	Lng Dec	Form	Description
24	CFGTP	1	Bit	Teleprocessing adapter information:

Bit	*Symbol*	*Meaning*
0-3	CFGMLA	Binary number of MLTA lines
4-7	GFGBSC	Binary number of BSCA lines

25 CFGMD1 1 Bit MLTA device support:

Hex Value	*Symbol*	*Meaning*
80	CFG50	1050
40	CFG50D	1050D
20	CFG40	2740
10	CFG40S	2740S
08	CFG40C	2740C
04	CFG4SC	2740SC
02	CFG40D	2740D
01	CFG4DT	2740DT

26 CFGMD2 1 Bit MLTA device support:

Hex Value	*Symbol*	*Meaning*
80	CFG4DC	2740DC
40	CFGDTC	2740DTC
20	CFG2S	2740M2S
10	CFG2SB	27402SB
08	CFG2SC	27402SC
04	CFGSCB	2740M2SCB
02	CFG41	2741
01	CFG41D	2741D

27 CFGMD3 1 Bit MLTA device support:

Hex Value	*Symbol*	*Meaning*
80	CFG7C	System/7 as a 2740C
40	CFG7SC	System/7 as a 2740SC
20	CFG7DC	System/7 as 2740DC
10	CFGCMC	CMCST on dial line
08	CFG705	2970M5
04	CFG708	2970M8
02	CFG709	2970M9
01	CFG795	2970M95

Disp Hex	Label	Lng Dec	Form	Description
28	CFGMD4	1	Bit	MLTA device support:

Hex Value	*Symbol*	*Meaning*
80	CFG30	5930 (WTC only)

29	CFGRV5	1	—	Reserved
2A	CFGMXC	1	Bit	MLTA transmission codes:

Hex Value	*Symbol*	*Meaning*
80	CFGMCO	Correspondence code
40	CFGPEB	PTTCEBCD code
20	CFGPBC	PTTCBCD code
10	CFGSPB	PTTCEBCD 1050 code
01	CFGXBF	MLTA translation required

2B-2C	CFGRV6	2	—	Reserved
2D	CFGBLT	1	Bit	BSCA line support:

Hex Value	*Symbol*	*Meaning*
80	CFGBPP	Point-to-point
40	CFGBMP	Multipoint
20	CFGBCS	Control station
10	CFGBD	Dial (switched) line

2E	CFGBFA	1	Bit	BSCA facilities support:

Hex Value	*Symbol*	*Meaning*
80	CFGGET	GET message
40	CFGITB	Intermediate text blocks
20	CFGSEP	Record separators
10	CFGRSP	Resident polling
08	CFGARS	Auto response
04	CFGELC	EBCDIC line code
02	CFGALC	ASCII line code
01	CFGBXP	BSCA transparency

CONFIGURATION RECORD (Continued)

Disp Hex	Label	Lng Dec	Form	Description
2F-30	CFGRV7	2	—	Reserved
31	CFGRSB	1	Bin	Record separator byte
32	CFGBD1	1	Bit	BSCA device support byte 1:

Hex Value	*Symbol*	*Meaning*
80	CFG351	3275 Model 1
40	CFG371	3277 Model 1
20	CFG341	3284 Model 1
10	CFG361	3286 Model 1
08	CFG352	3275 Model 2
04	CFG372	3277 Model 2
02	CFG342	3284 Model 2
01	CFG362	3286 Model 2

33	CFGBD2	1	Bit	BSCA device support byte 2:

Hex Value	*Symbol*	*Meaning*
80	CFG375	3735
40	CFGCPU	CPU to CPU
20	CFG741	3741 (as a terminal)

(33)	CFGEND	1	—	End of configuration record
34	CFGLEN	34	—	Length of CCP configuration record

DIRECTORY

The directory of $CCPFILE is the second sector of $CCPFILE and is initialized by $CC1BF. The assignment build program ($CCPAS) maintains most of the information in this sector. However, startup initializes the following fields for each CCP run: DIRSRS, DIRMEM, DIRMXD, DIRDB@, DIRBT@, DIRET@.

Disp Hex	Label	Lng Dec	Form	Description
00	DIRNSA	1	Bin	Binary number of sets assigned in this $CCPFILE
01-02	DIRSRS	2	C/S	Beginning disk address of $CCPFILE, current run
03-05	DIRDAT	3	Bin	Date $CCPFILE last modified by assignment
06	DIRDID	1	Char	Execution default set ID
07	DIRNFX	1	—	Reserved
08-09	DIRMEM	2	Bits	Storage size of the object CPU, current run Model 12 only: *Hex Value* — *Meaning* 00C0 — 48K 0100 — 64K 0140 — 80K 0180 — 96K
0A	DIRMXD	1	Bin	Maximum number of disk storage dumps during current run
0B-0C	DIRBD@	2	C/S	Disk address of start of storage dump area
0D-0E	DIRED@	2	C/S	Disk address +1 of end of storage dump area

DIRECTORY (Continued)

Disp Hex	Label	Lng Dec	Form	Description
(0D-0E)	DIRBT@	2	C/S	Disk address of start of CCP trace area
0F-10	DIRET@	2	C/S	Disk address +1 of end of CCP trace area (If CCP trace is not invoked, DIRBT@ = DIRET@.)

There is one directory entry for each set in $CCPFILE:

00	DIRID	1	Char	Set identification character
01	DIRSIT	1	Bin	Number of sectors in system information table (SIT)
02	DIRTAT	1	Bin	Number of sectors in terminal attribute table (TAT)
03	DIRLCT	1	Bin	Number of sectors in line control table (LCT)
04	DIRTUT	1	Bin	Number of sectors in terminal unit table (TUT)
05	DIRTNT	1	Bin	Number of sectors in terminal name table (TNT)
06	DIRSTT	1	Bin	Number of sectors in switched terminal table (STT)
07	DIRFCT	1	Bin	Number of sectors in file control table (FCT)
08	DIRPCT	1	Bin	Number of sectors in program control table (PCT)

FILE CONTROL TABLE (FCT)

- This table contains information about all physical disk files specified to CCP by assignment.
- Information from the // DISKFILE and // SYMFILE assignment statements is used to create this table.
- To locate, add the number of sectors of the preceding six tables for this assignment set as specified in the directory entry for this set.

Disp Hex	Label	Lng Dec	Form	Description
00	FCTJMP	1	Bin	Length of this entry in binary
01	FCTMCL	1	Bit	Miscellaneous flag byte:

Hex Value	*Symbol*	*Meaning*
80	FCT45	5445 resident file
40	FCTIHO	Inhibit open, set by startup
20	FCTSYM	Symbolic file name associated with a physical file name
10	FCTMIX	Master index used

02-09	FCTNAM	8	Char	File name left-justified

Disp Hex	Label	Lng Dec	Form	Description
Symbolic File Name Entries Only				
0A-nn	FCTPYS	n	Bin	A series of one-byte index pointers, each pointing a FCT physical file entry
Physical File Name Entries Only				
0A	FCTAT1	1	Bit	Attributes byte 1:

Hex Value	*Symbol*	*Meaning*
80	FCTIND	Indexed
40	FCTCNS	Sequential
20	FCTDIR	Direct
08	FCTIN	Input
04	FCTOUT	Output
02	FCTUPD	Update
01	FCTADD	Add

0B	FCTAT2	1	Bit	Attributes byte 2:

Hex Value	*Symbol*	*Meaning*
40	FCTORD	Ordered
20	FCTRND	Random
10	FCTLMT	Limits

0C-0D	FCTRCL	2	Bin	Record length
Indexed Files Only				
0E	FCTKYL	1	Bin	Key length
0F-10	FCTKYD	2	Bin	Key position in record, leftmost byte
Indexed Files with Master Index Only				
11-12	FCTMTX	2	Bin	Master index area size

LINE CONTROL TABLE (LCT)

- This table contains information about all teleprocessing lines specified to CCP by assignment.
- Information from the // BSCALINE and // MLTALINE assignment statements are used to create this table.
- To locate, add the number of sectors of the preceding two tables for this assignment set as specified in the directory entry for this set.

Disp Hex	Label	Lng Dec	Form	Description
00-01	LCTJMP	2	Bin	Length of this entry in binary
02	LCTNLN	1	Bin	Line number and type:

Hex Value	*Symbol*	*Meaning*
88	LCTBS2	BSCA line 2
81	LCTBSC	BSCA line 1
80	LCTL8	MLTA line 8
40	LCTL7	MLTA line 7
20	LCTL6	MLTA line 6
10	LCTL5	MLTA line 5
08	LCTL4	MLTA line 4
04	LCTL3	MLTA line 3
02	LCTL2	MLTA line 2
01	LCTL1	MLTA line 1

03	LCTDEV	1	Bit	MLTA device type on this line:

Hex Value	*Symbol*	*Meaning*
03	LCT741	2741 or CMCST
02	LCT740	2740 or System/7
01	LCT050	1050

04	LCTAT1	1	Bit	Line attributes byte 1:

Hex Value	*Symbol*	*Meaning*
80	LCTTRC	Transmit control
20	LCTLRC	LRC checking or any 1050
10	LCTSWT	Switched line
08	LCT600	600 or 1200 bps MLTA line
04	LCTSC	Station control or any 1050
01	LCTAPL	Auto-poll feature

Disp Hex	Label	Lng Dec	Form	Description
05	LCTAT2	1	Bit	Line attributes byte 2:

Hex Value	*Symbol*	*Meaning*
80	LCTBFR	Buffer receive feature
10	LCTRI	Receive interrupt feature
08	LCTSU	This line suppressed by startup
04	LCTOLT	Online test supported
02	LCTDBL	Double buffering supported
01	LCTAC	Auto-call feature

Disp Hex	Label	Lng Dec	Form	Description
06	LCTTCD	1	Bit	Line transmission code:

Hex Value	*Symbol*	*Meaning*
80	LCTCOR	CORR
40	LCTPEB	PTTCEBCD
20	LCTPB	PTTCBCD
10	LCTSPB	PTTCEBCD 1050
08	LCTE	EBCDIC
04	LCTET	EBCDIC transparency
02	LCTA	ASCII
01	LCTITB	ITB, BSCA

Disp Hex	Label	Lng Dec	Form	Description
07	LCTNRT	1	Bin	Number of retries for line error
08	LCTLNA	1	Bin	Line configuration:

Hex Value	*Symbol*	*Meaning*
05	LCTCW	Switched with 1050 having station control
04	LCTSW	Switched
03	LCTCS	Control station
02	LCTMP	Multipoint tributary
01	LCTPP	Point-to-point

Disp Hex	Label	Lng Dec	Form	Description
09	LCTDLY	1	Bin	MLTA – Delay after poll list BSCA – Number of times through poll list

Disp Hex	Label	Lng Dec	Form	Description
0A-0B	LCTBLK	2	Bin	Block length for this line
0C-0D	LCTMAP	2	Bin	DFF output hold area size
0E-0F	LCTWAT	2	Bin	BSCA line active wait time
10	LCT#PL	1	Bin	Number of entries in poll list
11-12	LCTDAT	2	Bin	Maximum number of data characters in line buffers
13	LCT#RI	1	Bin	Number of receive ID entries in this LCT entry
14	LCTAT3	1	Bits	Line attributes byte 3:

Hex Value	*Symbol*	*Meaning*
80	LCTM2	2740 Model 2 supported
40	LCTIDS	ID to send contained in this LCT

15-18	LCTRV3	4	—	Reserved

Control Station Lines Only

19-nn	LCTPLL	n	Bin	Polling list (this entry is variable length and contains a series of one-byte entries that are the relative positions of the TUT entries that describe the terminals in the poll list)

Switched BSCA Lines Only (Optional)

(19)	LCTSIL	1	Bin	Length +1 of ID characters to send
(1A-nn)	LCTSID	n	Char	ID characters to send, variable length, up to 15 characters

Displacements for Each ID to Receive (Optional)

(00)	LCTTID	1	Bin	TUT internal terminal ID, relative position of TUT that describes the terminal associated with this ID to receive
(01)	LCT#RC	1	Bin	Number of characters in this receive ID

LINE CONTROL TABLE (LCT) (Continued)

Disp Hex	Label	Lng Dec	Form	Description
(02-nn)	LCTRCH	n	Char	ID to receive, variable length, up to 15 characters
(nn)	LCTSKP	1	Bin	Hex 80: Skip byte on

PROGRAM CHARACTERISTICS TABLE (PCT)

- This table describes programs and all system resources used by the program.
- Information from the // PROGRAM assignment statement is used to create this table.
- To locate, add the number of sectors of the preceding seven tables for this assignment set as specified in the directory entry for this set.

Disp Hex	Label	Lng Dec	Form	Description
00-01	PCTJMP	2	Bin	Length of this PCT entry (disk and initial input only); hex FFnn indicates last PCT in sector
02-07	PCTNAM	6	Char	Name of the user program defined by this PCT entry
08-09	PCTCS	2	C/S	Disk address (C/S) of this user program
0A	PCT#S	1	Bin	Number of text sectors (on disk) of this user program
0B-0C	PCTLNK	2	Addr	Link-edited address of this program
0D	PCTRLD	1	Bin	Offset to the RLDs in the last text sector
0E-0F	PCTENT	2	Addr	Entry point address of the program after link-editing
10-11	PCTSIZ	2	Bin	Size of the user program in total main storage requirements
(10)	PCTLNG	1	Bin	Size of the user program in number of 256-byte blocks

Disp Hex	Label	Lng Dec	Form	Description
12	PCTAT1	1	Bin	Program attributes byte 1:

Hex Value	*Symbol*	*Meaning*
Bits 0, 1	—	00: RPG program 01: COBOL program 10: Assembler program 11: FORTRAN program
20	PCTDPL	Program requires a dedicated program level
10	PCTMTS	Program supports multiple requesting terminals
08	PCTNEP	Program is a never-ending program
04	PCTPRT	Program requires the line printer during execution
02	PCTMFU	Program requires the MFCU during execution
01	PCT142	Program requires the 1442 during execution

Disp Hex	Label	Lng Dec	Form	Description
13	PCTAT2	1	Bin	Program attributes byte 2:

Hex Value	*Symbol*	*Meaning*
80	PCTSU	Program suppressed during CCP startup
40	PCTSDB	Program uses DSM shared disk I/O buffering
20	PCTPAK	Program is to be loaded from DSM system pack; otherwise, from the same pack that CCP was loaded from
10	PCTEMG	End-of-job release message to be sent to requesting terminals

Disp Hex	Label	Lng Dec	Form	Description
13 (continued)				*Hex Value* / *Symbol* / *Meaning* 08 PCTCOM Program requires common area 04 PCTSER Program is serially reusable and may be reexecuted without being reloaded 02 PCTDAT Input data is allowed (but not required) with program request 01 PCTN41 Program requires 3741
14	PCTAT3	1	Bin	Program attributes byte 3: *Hex Value* / *Symbol* / *Meaning* 80 PCTSRT CCP sort program
15	PCTMAX	1	Bin	Maximum number of requesting terminals that this program can support at one time
16	PCTFDT	1	Bin	Number of 256-byte blocks in the longest DFF format descriptor table for this program
17	PCTDFF	1	Bin	Zero: DFF not used Nonzero: Number of 256-byte blocks required for the DFF work area to be appended to the user program area requirements for this program
1A-1B	PCT$Z	4	Char	Program request under format name
1C	PCTNLT	1	Bin	Number of required terminals to be allocated to the program prior to execution
1D	PCTNDT	1	Bin	Number of disk files to be allocated to the program prior to execution
1E	PCTAT3	1	Bin	Program attributes byte 3: *Hex Value* / *Symbol* / *Meaning* 80 PCTSRT Sort program

Disp Hex	Label	Lng Dec	Form	Description
There are as many of the following fields as the value in the field PCTNLT indicates:				
00	PCTLTD	1	Bin	Index to the entry in the terminal name table for this required terminal
01	PCTTAS	1	Bin	Index to the entry in the terminal attributes set for the attributes of this terminal
The following fields follow any terminal entries. There are as many entries as the value in the field PCTNDT indicates:				
00	PCTDTD	1	Bin	Relative short DTF entry to which this entry corresponds
01	PCTMDE	1	Bit	File use attributes byte:

Hex Value	*Symbol*	*Meaning*
80	PCTMDE	Symbolic file reference; otherwise direct short DTF reference
20	PCTNRU	Once used, this file cannot be reused during the current execution
10	PCTSHR	The file is not shareable during the execution of this program
08	PCTREF	Access is reference only
04	PCTLOD	Access if file load (implies nonsharing)
02	PCTUPD	Access is update
01	PCTADD	Access if add (implies non sharing with another adder); is zero for access IRANA or IRUANA except in a one-task system

PROGRAM CHARACTERISTICS TABLE (PCT) (Continued)

Disp Hex	Label	Lng Dec	Form	Description
02	PCTDTA	1	Bin	Assignment relative DTF (value used during execution is in PCTDTD and can be different from this value if files are suppressed during startup)
03	PCTCRL	1	—	Reserved

The following two fields follow any entries for required terminals and/or disk files:

00-01	PCTDCT	2	Bin	Offset into the program request count table in main storage during execution of this program
02-03	PCTNUM	2	Bin	Number of times this program has been requested successfully during execution (reset to zero by an option of assignment list program)

SYSTEM INFORMATION TABLE (SIT)

- This table describes the system resources available and/or used by CCP for this set.
- Information from the // SYSTEM statement is used to create this table.
- It is the first table in the assignment set.

Disp Hex	Label	Lng Dec	Form	Description
00	SITMXP	1	Bits	Maximum number of concurrent user programs
01	SITMUA	1	Bits	Minimum number of blocks for CCP user program area
02-03	SITMTB	2	Bits	Minimum number of bytes for teleprocessing hold buffer area
04-09	SITCPW	6	Char	CCP password is used; otherwise, hex 40
0A	SITDED	1	Bits	Devices initially allocated to CCP:

Hex Value	*Symbol*	*Meaning*
80	SITPRT	Printer allocated
40	SITMFU	MFCU allocated
20	SIT142	1442 allocated
10	SITN41	3741 allocated

Disp Hex	Label	Lng Dec	Form	Description
0B	SITFLG	1	Bits	Flag byte for display format information: *Hex Value* — *Symbol* — *Meaning* 80 — SITDFU — Display formats are on system pack; otherwise, program pack 40 — SITFMT — DFF supported on this set
0C	SITTRC	1	Bin	Number of blocks for CCP in-storage trace
0D	SITSQB	1	Bin	Number of sector enqueue blocks (SQB)
0E	SITFSB	1	Bin	Number of file specification blocks (FSB)
0F	SITRQL	1	Bin	Maximum length of program request and data
10	SITNQL	1	Bin	Maximum length of nonprogram request command
11-12	SITMCL	2	Bin	Maximum terminal command length
13	SITTAS	1	Bin	Highest terminal attribute set ID value
14	SITSTT	1	Bin	Number of switched terminal table entries
15	SITNPC	1	Bin	Number of program control table entries
16	SITLPC	1	Bin	Length of longest program control table entry
17	SITSID	1	Char	Set ID of this set
18-19	SITRUF	2	Bin	Program request under format maximum length
1A-1B	SITRV1	2	—	Reserved

TERMINALS USED TABLE (TUT)

- This table describes physical terminal attributes.
- Information from the // BSCATERM and // MLTATERM statements is used to create this table.
- To locate, add the number of sectors of the preceding three tables for this assignment set, as specified in the directory entry for this set.

Disp Hex	Label	Lng Dec	Form	Description
00	TUTLNG	1	Bin	Length of this entry in binary
01-02	TUTID	2	Char	Terminal physical identifier
03	TUTIID	1	Bin	Internal terminal ID, relative position of this entry within the TUT table
04	TUTCHR	1	Bit	Terminal characteristics:

Hex Value	*Symbol*	*Meaning*
80	TUTLNE	BSCA line; otherwise MLTA
20	TUTTYP	Typewriter device
08	TUTCMN	Command capable terminal
04	TUTMCT	Multicomponent terminal
02	TUTOUT	Output capable terminal
01	TUTINP	Input capable terminal

Disp Hex	Label	Lng Dec	Form	Description
05	TUTAT1	1	Bit	Attributes byte 1:

Hex Value	*Symbol*	*Meaning*
80	TUTSU	Terminal was suppressed by startup
20	TUTONL	Available online
02	TUTSWC	Switched line
01	TUTOFF	Sign-off default is HOLD

Disp Hex	Label	Lng Dec	Form	Description
06	TUTAT2	1	Bin	1050 principal input and output component:

Hex Value	*Meaning*
	Input device:
30	Reader 2
20	Reader 1
10	Keyboard
	Output device:
08	Punch 2
07	Punch 1
06	Printer 2
05	Printer 1

07-08 TUTLIN 2 Bin Line number and type:

Hex Value	*Symbol*	*Meaning*
8888	TUTBS2	BSCA line 2
8081	TUTBS1	BSCA line 1
0080	TUTL8	MLTA line 8
0040	TUTL7	MLTA line 7
0020	TUTL6	MLTA line 6
0010	TUTL5	MLTA line 5
0008	TUTL4	MLTA line 4
0004	TUTL3	MLTA line 3
0002	TUTL2	MLTA line 2
0001	TUTL1	MLTA line 1

09 TUTPHY 1 Bin Physical characteristics of terminal:

Hex Value	*Symbol*	*Meaning*
09	TUTN41	3741
08	TUTCPU	CPU
07	TUT375	3735
06	TUT5M2	3275 M2-1980
05	TUT5M1	3275 M1-480
04	TUT7M2	3277-84-86 M2-1920
03	TUT7M1	3277-84-86 M1-480
02	TUT105	MLTA 1050
01	TUTMLT	MLTA (all machines except 1050)
00	TUTCON	Console

Disp Hex	Label	Lng Dec	Form	Description
0A	TUTTAS	1	Bin	Index of standard attributes set
0B-0E	TUTRV3	4	—	Reserved
BSCA Terminals on Control Station or Multipoint Lines Only (Optional)				
0F-nn	TUTADD	n	Char	Terminal address characters, variable in length, 2 to 7 characters
nn-nn	TUTPOL	n	Char	Terminal poll characters, variable in length, 2 to 7 characters
MLTA Terminals on Control Station or 1050 Switched Lines Only (Optional)				
0F	TUTADR	1	Char	MLTA address character

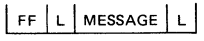
TERMINAL NAME TABLE (TNT), TERMINAL UNIT BLOCK (TUB), SWITCHED TERMINAL TABLE (STT)

The following areas, which are also a part of $CCPFILE, are listed under *Execution Data Areas*:

- Terminal name table (TNT)
- Terminal unit block (TUB)
- Switched terminal table (STT)

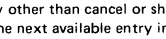
$CCPLOG File (Model 4 Only)

The CCP console messages are written on the $CCPLOG file on disk. The messages are compressed by removing all blanks on the right. A separator byte and two length bytes are added to this compressed message to give a console log file entry.



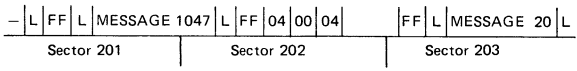
FF = Separator byte
L = Total length (message plus 3)

When CCP is started, the first message, P/000 CCP STARTED, is always written at the beginning of the file. Each message is not written to the disk individually. The console log file entries are written to the disk each time there is more than one sector (256 bytes) of entries held in memory. Therefore, if CCP terminates by other than cancel or shutdown, the newest messages will still be in memory. The next available entry in the file is always marked on disk by a special four-byte entry.



The newest entry in the file is the one before the special entry. The file automatically wraps when it is full.

The oldest entry in the file is usually the P/000 CCP STARTED message at the beginning of the file. However, if the file has wrapped, the newest information is indicated by the separator byte and the next sector is the oldest entry in the file.



Message 1047 is the newest entry.
Message 20 is the oldest entry.

Startup Data Areas

PHASE ROLLER LIST

The startup phase roller list is a 256-byte area containing a maximum of twenty-five ten-byte entries. Each entry consists of the last two characters of the startup module name (phase ID) and eight bytes reserved for the load list (directory parameters: cylinder/sector address (two bytes long), number of text sectors (one byte long), link-edit address (two bytes long), displacement to first RLD (one byte long), entry point address (seven bytes long)).

The roller list, except the entry for LO, initially resides in module $CC3PI, which is link-edited with $CC3LO. $CC3LO, initiated as the first phase after $CCP, performs the directory search for the modules, then transfers the directory information to the load list part of the entries. When the roller list is completed, it is moved to the roller list area in $CC3RO as the contents of the last sector of the program level.

The last four bytes of the program level (last four bytes of roller list) contain a two-byte eyecatcher and a two-byte address of the beginning of the startup save area. The eyecatcher is initially defined as a two-byte field containing blanks. Just prior to the passing of control to each phase, the phase ID is moved into the field by $CC3RO. This field is set to hex 0001 by $CC3EL just prior to the final passing of control to $CC4.

Label	Lng Dec	Form	Description
ROLIST	0		Startup phase roller list.
	10	Char	'LOxxxxxxxx' Roller list builder
	10	Char	'FXxxxxxxxx' Free C/S and index format
	10	Char	'CRxxxxxxxx' Cross reference transients
	10	Char	'USxxxxxxxx' Unsuppress facilities
	10	Char	'FSxxxxxxxx' Suppress facilities
	10	Char	'IPxxxxxxxx' Initialize PCT
	10	Char	'LDxxxxxxxx' Load base module
	10	Char	'UBxxxxxxxx' Build user TCBs in main storage
	10	Char	'TAxxxxxxxx' Load terminal attribute table
	10	Char	'TBxxxxxxxx' TP control blocks
	10	Char	'TCxxxxxxxx' Build TUBs and terminal names
	10	Char	'DLxxxxxxxx' Build skeleton short DTFs
	10	Char	'DMxxxxxxxx' Disk file access method of diagnostics

PHASE ROLLER LIST (Continued)

Label	Lng Dec	Form	Description
	10	Char	'DFxxxxxxxx' Open files and compress DTFs
	10	Char	'PXxxxxxxxx' Build PCT index in main storage
	10	Char	'EIxxxxxxxx Build MLTA poll list
	10	Char	'EJxxxxxxxx' End of phase 3
	10	Char	'LTxxxxxxxx' Load TP I/O trace modules
	10	Char	'EKxxxxxxxx' Allocate TPBUF and UPA
	10	Char	'EMxxxxxxxx' Allocate BSCA line buffers
	10	Char	'ELxxxxxxxx' Open teleprocessing lines
	10	Char	'CXxxxxxxxx' / 'CYxxxxxxxx' / 'CZxxxxxxxx' } NAM and REP card processor for FE
	10	Char	'MVxxxxxxxx' Load $CC4DF/$CC4#3 Init $@9CIN/$@@BIN/AIR routine in $CC4DP
		Bin	Hex 00 — Reserved for any future expansion
	2	Char	'xxxx' — Eyecatcher (phase ID placed here and modified for each phase
	2	Addr	Pointer to startup save area

STARTUP SAVE AREA

- Pointed to by the last two bytes of the phase roller list.
- Used to pass information from one phase to the next during startup.

Disp Hex	Label	Lng Dec	Form	Description
00	SSA#RS	1	Bin	Binary number of sectors reserved between phase roller ($CC3RO) and next phase to be loaded
01	SSAERR	1	Bit	Startup error switch; all bits on (hex FF) indicates that an abort error occurred
02	SSAQST	1	Bit	Flag byte: *Hex Value* — *Symbol* — *Meaning* 80 — SSACEX — Storage exhausted during startup
03-36	SSACFG	52	Mix	CCP configuration record area
37-60	SSADIR	42	Mix	Compressed $CCPFILE directory area
61-7C	SSASIT	28	Mix	System information table save area
7D-84	SSALDP	8	Mix	Base module load parameters — C/S/N/LE/D/EP
85-86	SSANB@	2	Addr	Address of where to build next control block

STARTUP SAVE AREA (Continued)

Disp Hex	Label	Lng Dec	Form	Description
87-88	SSAHB@	2	Addr	Highest control block build address +1
89	SSAMS1	1	Bit	Miscellaneous startup information switch:

Hex Value	*Symbol*	*Meaning*
80	SSADPF	DPF system
40	SSALVL	CCP operating in program level 2
20	SSAM04	Model 4 system
10	SSAECS	ECS supported on Model 4
01	SSAPRQ	Program request counting on

8A	SSAMS2	1	Bit	Second miscellaneous startup information switch:

Hex Value	*Symbol*	*Meaning*
20	SSATTD	Set CCP trace-to-disk on
10	SSATBS	Set BSCA trace on
08	SSATML	Set MLTA trace on
02	SSASUP	Ask user about suppression
01	SSAOFL	Ask user about offline terminals

8B-8C	SSAIAR	2	Addr	Saved IAR for other level in DPF system
8D	SSA$CQ	1	Bin	Q byte for unit $CCPFILE is on
8E-8F	SSA$XA	2	C/S	C/S disk address of start of $CCPFILE
90-91	SSA$XB	2	C/S	C/S disk address one past end of CCPFILE
92	SSACOR	1	Bin	Storage size of current object that CPU is running with
93-94	SSAFF@	2	C/S	C/S address of first free sector in $CCPFILE
95-96	SSAFX@	2	C/S	C/S of display format index in $CCPFILE
97-98	SSABDF	2	Addr	Storage address for first BSCA DTF address

STARTUP SAVE AREA (Continued)

Disp Hex	Label	Lng Dec	Form	Description
99	SSALPC	1	Bin	Length of longest unsuppressed PCT entry
9A	SSAML#	1	Bits	Bit significant MLTA line trace mask
9B	SSA$LQ	1	Bits	Q byte for unit $CCPLOG is on

SCAN CONTROL BLOCK USED WITH $CCSCN

Used by $CCSCN to pass information back to the requestor with information on the scanned field and delimiter.

Disp Hex	Label	Lng Dec	Form	Description
00	SCACTL	1	Bin	Length −1 of field preceding delimiter (set by $CCSCN)
01-02	SCACTA	2	Addr	Address of rightmost byte of field preceding delimiter (set by $CCSCN)
03	SCLIML	1	Bin	Length −1 of remaining area to be scanned, including current delimiter (set by invoker to total area −1 before beginning scans of an area, updated on each scan by $CCSCN)
04-05	SCLIMA	2	Addr	Address of rightmost byte of total area to be scanned (set by invoker, never changed by $CCSCN)
06	SCDLEL	1	Bin	Length of each delimiter's entry in a delimiter list; the delimiter itself must be only one byte, but additional control information might accompany each delimiter (set by invoker, never changed by $CCSCN)
07	SCDELX	1	Bit	Bit configuration of the stopper byte that marks the end of a delimiter list (set by invoker, never changed by $CCSCN)

TRANSIENT RELOCATION LIST

Lng Dec	Form	Description	
2	Char	AB	Accept BSCA check
2	Char	AC	Accept input satisfied
2	Char	AD	Disk allocation transient
2	Char	AL	Command processor allocate module
2	Char	AN	Second allocation transient
2	Char	AP	Third allocation transient
2	Char	AQ	Terminal acquire
2	Char	AS	Assign command
2	Char	AT	Second assign processor
2	Char	AU	Second assign transient
2	Char	AX	Second terminal acquire
2	Char	AY	Third terminal acquire
2	Char	A1	Allocation control transient
2	Char	A2	Second allocation control routine
2	Char	BA	BSCA 3270 sense/status
2	Char	BB	BSCA record format (blank)
2	Char	BC	BSCA stop/cancel invite
2	Char	BD	BSCA ERP clean-up
2	Char	BE	BSCA error handler
2	Char	BF	BSCA FREEMAIN invite buffer analysis
2	Char	BG	3284/3286/3288 error handler
2	Char	BI	BSCA DME inquiry
2	Char	BL	BSCA error log to operator
2	Char	BP	BSCA purge/abort line
2	Char	BQ	BSCA stop II Q analysis
2	Char	BR	CCP BSCA
2	Char	BS	Switched BSCA line purge
2	Char	BT	Start online test for BSCA
2	Char	B0	BSCA CCP format of 3270
2	Char	B1	BSCA minimum system function 1
2	Char	B2	BSCA minimum system function 2
2	Char	B3	BSCA minimum system function 3
2	Char	B5	CCP 3735 sense/status
2	Char	B9	BSCA error check trace dump
2	Char	CA	Display user transient 3
2	Char	CG	Console message command
2	Char	CJ	System operator cancel
2	Char	CN	Terminal operator cancel
2	Char	CR	First main storage allocation transient
2	Char	CS	Second main storage allocation transient
2	Char	CT	Third main storage allocation transient
2	Char	CX	Console cancel CCP
2	Char	C1-C6	Display commands
2	Char	C7	Display system by ID
2	Char	C8	Display terminal transient 2

TRANSIENT RELOCATION LIST (Continued)

Lng Dec	Form	Description	
2	Char	C9	Display user transient 2
2	Char	DA-DD	DFF
2	Char	DK	DFF
2	Char	DM	Data mode escape routine
2	Char	DR	DFF
2	Char	EA	First error message routine
2	Char	EB	Second error message module
2	Char	EC	Third CCP message module
2	Char	ED	File command processor error
2	Char	EE-EF	Message modules
2	Char	EG	Error message module, CCP
2	Char	EH	Message module
2	Char	EJ	Shutdown module
2	Char	EL	Message module
2	Char	EP	Message module
2	Char	EU	Message module
2	Char	E1-E5	Message modules
2	Char	FL	File command processor
2	Char	F2	Second file command processor
2	Char	GA	Get attributes
2	Char	GB	Second get attributes transient
2	Char	HF	CCP RPG II halt/syslog processor
2	Char	HH	Halt/syslog halt check
2	Char	H1	CCP halt/syslog processor for TID-1
2	Char	H2	CCP halt/syslog processor for TID-2
2	Char	J1-J9	Translate transients
2	Char	JA-JC	Translate transients
2	Char	JD-JE	BSCA translate transients
2	Char	KA-KB	Console management
2	Char	K1-K9	Console management
2	Char	LT	Termination close interface
2	Char	L2-L4	Close
2	Char	MA	First level MLTA error handler
2	Char	MB	Handles disconnection of MLTA
2	Char	MC-ME	MLTA error handlers
2	Char	MF	Part of MLTA switched line disconnect
2	Char	MG	Command processor teleprocessing message routine
2	Char	MP	Ignore put to terminal in ERP
2	Char	MT	Start online test for $CC4CM
2	Char	MZ	MLTA online test
2	Char	M9	MLTA error check trace dump
2	Char	NC	Cancel transient out of $CC4II
2	Char	NM	Name command processor
2	Char	OF	Terminal sign-off
2	Char	OG	Second sign-off routine

TRANSIENT RELOCATION LIST (Continued)

Lng Dec	Form	Description	
2	Char	OH	FORTRAN pseudo open
2	Char	OP	Open/close
2	Char	OR	Open/close return
2	Char	OS	Open shared I/O
2	Char	OT	Tape pseudo open
2	Char	O1	Open/close
2	Char	O2-09	Open
2	Char	PC	Command processor first load
2	Char	PF	Command processor
2	Char	PG	MLTA purge I/O
2	Char	PK	Command processor console command validator
2	Char	PR	Command processor return routine
2	Char	PT	Command processor term command validator
2	Char	QQ	Q/NOQ command processor
2	Char	RC	TUB rechain after program request
2	Char	RE	Resume command
2	Char	RF	Resume transient 2
2	Char	RL	First release module
2	Char	RN	Run processor
2	Char	RP	Teleprocessing error recovery routine
2	Char	RX	Second release module
2	Char	RY	Third release transient
2	Char	R1	$CC4R1 (program request)
2	Char	R2	$CC4R2 (program request)
2	Char	R3	Third program request routine
2	Char	R4	Fourth program request routine
2	Char	R5	Fifth program request routine
2	Char	R6	Sixth program request routine
2	Char	R7	Seventh program request routine
2	Char	R8	Eighth program request routine
2	Char	SB	Stop polling—bad abort start code
2	Char	SC	$CC4CM bad start code analysis
2	Char	SF	Handles stop polling failure
2	Char	SH	Shutdown command
2	Char	SK	Poll skip bit routine for $CC4CM
2	Char	SO	Terminal sign-on
2	Char	SP	Console management stop polling transient—MLTA
2	Char	SQ	Op end handler for stop polling
2	Char	SS	Command processor suspend module
2	Char	SU	Startup end, CCP control begin
2	Char	S0	BSCA CCP format of 3275 switched
2	Char	S2	Second level of $CC4SP
2	Char	TB	Terminal allocation routine
2	Char	TD	First termination transient
2	Char	TE	Trace-to-disk command

TRANSIENT RELOCATION LIST (Continued)

Lng Dec	Form	Description	
2	Char	TF	Termination files deallocation
2	Char	TN	Termination main transient
2	Char	TP	Termination polling restart 1
2	Char	TS	Online test command from console
2	Char	TW	Termination dump transient
2	Char	TY	Teleprocessing polling restart 2
2	Char	TZ	Online test command—XCTL/BSCA
2	Char	T1	Handle online parameter list for console management
2	Char	T2	Handle online test op end
2	Char	UR	Unit record allocation transient
2	Char	VA	Vary command
2	Char	VB	Second vary command processor
2	Char	WC	Switched line message to system operator
2	Char	WD	Second level switched line message to system operator
2	Char	WR	Translation error in $CC4CM
2	Char	YA	User first sign-on transient
2	Char	YB-YZ	User transients
2	Char	Y0-Y9	User transients
2	Char	Y$	User transient
2	Char	Y@	User transient
2	Char	Y#	User transient
1	Bin	FF	End of ID list

XREF TRANSIENT LIST

Lng Dec	Form	Description	
2	Char	AD	Disk allocation transient
2	Char	AL	Command processor allocate module
2	Char	AN	Second allocation transient
2	Char	AP	Third allocation transient
2	Char	AQ	Terminal acquire
2	Char	AS	Assign command
2	Char	AT	Second assign
2	Char	AU	Second assign transient
2	Char	AX	Second terminal acquire
2	Char	A1	Allocation control transient
2	Char	BA	BSCA sense status—3270
2	Char	BC	BSCA cancel/stop invite
2	Char	BD	BSCA ERP clean-up
2	Char	BE	BSCA error recovery
2	Char	BF	BSCA FREEMAIN of invite buffer
2	Char	BL	BSCA error log to operator
2	Char	BP	BSCA purge/stop II transient
2	Char	BQ	BSCA stop II Q analysis
2	Char	B2	Minimum system transient 2
2	Char	B5	3736 status log
2	Char	B9	BSCA dump
2	Char	CA	Display user transient 3
2	Char	CG	Console message command
2	Char	CJ	System operator cancel
2	Char	CN	Terminal operator cancel
2	Char	CR	First main storage allocation transient
2	Char	CS	Second main storage allocation transient
2	Char	CT	Third main storage allocation transient
2	Char	C1-C6	Display commands
2	Char	C7	Display system by ID
2	Char	C8	Display terminal transient 2
2	Char	C9	Display user transient 2
2	Char	DA	DFF
2	Char	DK	DFF
2	Char	FL	File command processor
2	Char	F2	Second file command processor
2	Char	GA	Get attributes
2	Char	HF	CCP RPG II halt/syslog processor
2	Char	H1	Halt/syslog
2	Char	H2	Halt/syslog processor for TID-2
2	Char	KA-KB	Console management
2	Char	K2-K4	Console management
2	Char	K6	Console management
2	Char	K8 K9	Console management
2	Char	LT	Termination close interface

XREF TRANSIENT LIST (Continued)

Lng Dec	Form	Description	
2	Char	L2-L4	Close
2	Char	MA	MLTA error handler
2	Char	MB	MLTA switched line disconnect
2	Char	MD-ME	MLTA error handler
2	Char	MF	Part of MLTA switched line disconnect
2	Char	MG	Command processor teleprocessing message routine
2	Char	MP	Ignore put to terminal in ERP
2	Char	MT	Start MLTA online test
2	Char	MZ	MLTA online test
2	Char	M9	MLTA dump
2	Char	NM	Name command processor
2	Char	OF	Terminal sign-off
2	Char	OP	Open/close
2	Char	OR	Open/close return transient
2	Char	OS	Open shared I/O
2	Char	OT	Tape pseudo open
2	Char	O1	Open/close
2	Char	O2-O9	Open
2	Char	PC	Command processor first load
2	Char	PF	Command processor
2	Char	PG	MLTA purge I/O
2	Char	PK	Command processor console command validator
2	Char	PT	Command processor term command validator
2	Char	RE	Resume command
2	Char	RF	Resume transient 2
2	Char	RL	First release module
2	Char	RP	Teleprocessing error recovery routine
2	Char	RX	Second release module
2	Char	R1	Program request routine 1
2	Char	R2	Program request routine 2
2	Char	R3	Program request routine 3
2	Char	R4	Program request routine 4
2	Char	R5	Program request routine 5
2	Char	R6	Program request routine 6
2	Char	R7	Program request routine 7
2	Char	R8	Program request routine 8
2	Char	SH	Shutdown command
2	Char	SK	MLTA, set all poll skip bits on
2	Char	SO	Terminal sign on command processor
2	Char	SP	MLTA user stop polling
2	Char	SS	Suspend commands routine
2	Char	ST	Suspend command (Model 4)
2	Char	TB	Terminal allocation routine
2	Char	TD	First termination routine
2	Char	TE	Trace-to-disk command

XREF TRANSIENT LIST (Continued)

Lng Dec	Form	Description	
2	Char	TF	Termination files deallocation
2	Char	TN	Second termination routine
2	Char	TP	Termination polling restart 1
2	Char	TS	Online test command from console
2	Char	TW	Termination dump routine
2	Char	TY	Teleprocessing polling restart 2
2	Char	TZ	Online test command--XCTL/BSCA
2	Char	T2	MLTA online test op end
2	Char	UR	Unit record allocation transient
2	Char	VA	Vary command
2	Char	VB	Second vary command processor
2	Char	WC	Switched line message to system operator
2	Char	WD	Connect switched line
2	Char	WR	Translate error transient
2	Char	XA-XC	Model 4 console management
2	Char	XF-XG	Model 4 console management
2	Char	X1-X9	Model 4 console management
2	Char	YA	User first sign-on transient
2	Char	YB-YZ	User transients
2	Char	Y0-Y9	User transients
2	Char	Y$	User transient
2	Char	Y@	User transient
2	Char	Y#	End of ID list

Lng Dec	Form	Description
		The following area is generated in the last 128 bytes of the second CCP transient area. The addresses contained within it are dependent on the MLTA and BSCA support being provided. These addresses are placed in DTFs during startup.
2	Bin	0000, reserved.
2	Addr	Address of $$BSMD if auto-response is supported. Hex 0000 if auto-response is not supported.
2	Addr	Address of $$BSMA if resident polling is supported. Hex 0000 if resident polling is not supported.
2	Addr	Address of $$BSMC if resident polling is supported. Hex 0000 if resident polling is not supported.
2	Addr	Address of $$MLRR—MLTA error recovery routine. If MLTA is supported this address must be here. If MLTA is not supported, this field contains hex 0000.
2	Addr	Address of MLTSPO—common area in $$MLDI. If MLTA is being supported this address must be here. If MLTA is not supported, this field contains hex 0000.
		The following entries exist if MLTA is supported. Also only those devices being supported under MLTA have their support module addresses and IDs in the table.
1	Char	A ID for $$MLTM—1050 support
2	Addr	Address of $$MLTM
1	Char	B ID for $$MLTB—1050D support
2	Addr	Address of $$MLTB
1	Char	C ID for $$MLTC—2740/2740M2S(B) support
2	Addr	Address of $$MLTC
1	Char	D ID for $$MLTD—2740 support
2	Addr	Address of $$MLTD
1	Char	F ID for $$MLTF—2740D support
2	Addr	Address of $$MLTF
1	Char	G ID for $$MLTG—2740C/SYS7C support
2	Addr	Address of $$MLTG
1	Char	H ID for $$MLTH—2740DC/SYS7DC support
2	Addr	Address of $$MLTH
1	Char	I ID for $$MLTI—2740DT support
2	Addr	Address of $$MLTI
1	Char	L ID for $$MLTL—2740DTC support
2	Addr	Address of $$MLTL
1	Char	M ID for $$MLTM—2740(M2)SC(B)/SYS7SC support
2	Addr	Address of $$MLTM
1	Char	O ID for $$MLTO—2741 support
2	Addr	Address of $$MLTO
1	Char	P ID for $$MLTP—2741D/CMSTD support
2	Addr	Address of $$MLTP
1	Bin	Hex 00 End of table indicator

CCP Execution Data Areas

CCP COMMUNICATION AREA – $CCCOM

- Located at start of CCP program level.
- Length is 256 bytes (hex 100).

Disp Hex	Label	Lng Dec	Form	Description
Addresses of Component Work Areas				
00-01	@CMWK	2	Addr	Communication management work area address
02-03	@KMWK	2	Addr	Console management work area address
04-05	@CPWK	2	Addr	Command processor work area address
06-07	@AMWK	2	Addr	Allocation work area address
08-09	@TMWK	2	Addr	Termination work area address
Addresses of System Task Control Blocks (TCBs)				
0A-0B	@CMTCB	2	Addr	Address of communication management task control block (TCB)
0C-0D	@KMTCB	2	Addr	Address of console management TCB; same as @CMTC
0E-0F	@TMTCB	2	Addr	Address of termination task TCB
10-11	CPTCB	2	Addr	Address of command processor TCB

Disp Hex	Label	Lng Dec	Form	Description
System Level Flags				
12	$FLGA	1	Bits	Common flag byte:

Hex Value	*Symbol*	*Meaning*
80	#DFFOK	DFF is supported
40	CPSOB1	CCP sign-on password required
20	CPSOB2	User sign-on password checking is done
10	CPSHUT	System operator has requested shutdown
08	CPSU	Initial entry to command processor
04	#DSKFS	Disk file sharing supported
02	#MODL4	System/3 Model 4
01	CPISNW	CC4IS should not wait after posting communication manager

13 $FLGB 1 Bits Second flag byte:

Hex Value	*Symbol*	*Meaning*
80	#SUALL	Suspend all user tasks in effect
40	#SUINT	Suspend initiation in effect
20	#SUCMD	Suspend commands in effect
10	#TDISK	Disk trace is on
08	#TDOFF	Trace-to-disk off is pending
04	#TDERR	Permanent I/O error occurred while writing trace to disk; trace-to-disk suppressed
02	#CPCAN	Cancel CCP received
01	#PUCNT	Program-use count maintained

Disp Hex	Label	Lng Dec	Form	Description
14	$FLGC	1	Bits	Third flag byte:

Hex Value	*Symbol*	*Meaning*
80	#MTRAC	MLTA trace on
40	#BTRAC	BSCA trace on
20	#NPDEF	DFF in use by an NEP
10	#ECSUP	ECS supported on Model 4

15	$FLGD	1	Bits	Fourth flag byte (reserved)
16	#MAXUS	1	Bin	Maximum number of user tasks allowed during this CCP execution
17	#CURUS	1	Bin	Current number of user tasks
18	#LSTSZ	1	Bin	Size of first level transient list

System Constants

19-1A	X$0000	2	Bin	Constant XL2'0000'
1B	X$0001	1	Bin	Constant XL2'0001'. Note 19-1B = Hex 00 00 01
1C-1D	X$0002	2	Bin	Constant XL2'0002'
1E-1F	X$0004	2	Bin	Constant XL2'0004'

Common Register Save Areas

20-21	$CCARR	2	Addr	CCP common ARR save area
22-23	$CCXR1	2	Addr	CCP common register 1 save area
24-25	$CCXR2	2	Addr	CCP common register 2 save area

Addresses of Disk I/O Intercept Points in CCP Dispatcher

26-27	CC@DID	2	Addr	Address of $CC4IO disk IOS intercept entry point
28-29	CC@DIW	2	Addr	Address of $CC4IW disk wait intercept entry point

Disp Hex	Label	Lng Dec	Form	Description
Queue/List Origin Address Pointers				
2A-2B	@TALST	2	Addr	Address of first level transients disk address list
2C-2D	@CDORG	2	Addr	Address of the first contents directory entry (CDE)
2E-2F	@KMOTB	2	Addr	Address of the first parameter list on the console output queue
30-31	@KMRTB	2	Addr	Address of first parameter list on the console input queue
32-33	@KMQPL	2	Addr	Address of console task parameter list
34-35	@SQB	2	Addr	Address of the first sector queue block
36-37	@TUBQ	2	Addr	Address of the first terminal unit block
38-39	@R4QUE	2	Addr	Address of the first terminal unit block being held during never-ending-program allocation
3A-3B	@TUSTG	2	Addr	Address of the terminal unit block currently (or last) processed by the command processor
3C-3D	@TUPST	2	Addr	Address of the current terminal unit block being processed by allocation
3E-3F	@DFCT	2	Addr	Address of the first CCP short disk DTF
Addresses of CCP, MLTA, and BSCA Trace Routines				
40-41	@CTRAC	2	Addr	Address of CCP dummy trace routine, $CC4TT or, if real trace is loaded, the address of the three, trace table, descriptor constants
42-43	@MTRAC	2	Addr	Address of CCP MLTA trace routine
44-45	@BTRAC	2	Addr	Address of CCP BSCA trace routine
46-47	@FSBFR	2	Addr	Address of first available file specification block
48-49	@TNT	2	Addr	Address of first terminal name table entry

Disp Hex	Label	Lng Dec	Form	Description
Buffer Storage Allocation Control Block				
4A-4B	@BUFA	2	Addr	Address of communication line buffer first free area descriptor
4C-4D	#NBND	2	Addr	Two bytes of 0
4E-4F	@LOBND	2	Addr	Address of start of communication line buffer
50-51	#HIBND	2	Addr	Address of end of communication line buffer
52-53	@GMS	2	Bin	Size of largest available segment in the communication buffer
54-55	#TPBUF	2	Bin	Original size of communication buffer area –4
User Program Area Allocation Control Block				
56-57	@UPA	2	Addr	Address of first free block of user program area; note leftmost addressing
58-59		2	Addr	Used by GETMAIN/FREEMAIN
5A-5B	@UABGN	2	Addr	Address of start of user program area
5C-5D	@UAEND	2	Addr	Address of end of user program area
5E-5F	#UMAX	2	Bin	Size of largest currently free area in the user program area
Console Buffer Control Block				
60-69	@KBCB	10	–	Console buffer control block

Disp Hex	Label	Lng Dec	Form	Description
Dispatcher Work Area				
6A	$DPFLG	1	Bits	First dispatcher control byte:

Hex Value	*Symbol*	*Meaning*
80	DPREG	Dispatcher is to store the ARR, XR1 and XR2 into the current save area in the current task control block when entered
40	DPDSP	Make the current task nondispatchable upon entry to the dispatcher
10	DPFSMC	Current task is currently processing a function that must complete before any other task can run (with the exception of the communications task)
08	DPXSMC	Current task is exiting through the dispatcher to to allow processing of any interrupts that may have occurred while it was processing

Disp Hex	Label	Lng Dec	Form	Description
6B	$DPFLH	1	Bits	Second dispatcher control byte:

Hex Value	*Symbol*	*Meaning*
80	DPDSX	DSM supervisor has been entered by some task (the particular task has its TCBDSM bit = 1)

Disp Hex	Label	Lng Dec	Form	Description		
				Hex Value	*Symbol*	*Meaning*
6B (continued)				40	DPNTRC	CCP trace routine is not to put an entry into the trace table on the current entry to it (reset by trace upon each exit from it)
				20	DPPOST	CCP post routine (CC4PS) has not made a task dispatchable
				10	DPRIT	An interrupted user task exists that is to be resumed once all system tasks have completed processing
				08	DPSMC	Some task is currently processing a must complete function (dispatch only that task or the communications task)
				04	DPHALT	Systems are generated with MINRES-NO only (dispatcher is halted awaiting interrupts to process)
				02	DPCI	A console interrupt exists that needs to be processed
				01	DPINT	Current dispatcher entry is due to CCP program level IAR reset from the common interrupt handler ($CC4IH) and an interrupted user task exists

Disp Hex	Label	Lng Dec	Form	Description
Task Control Block Dynamic Addresses				
6C-6D	@CURTB	2	Addr	Address of current (or last) active task control block
6E-6F	@PUCNT	2	Addr	Address of program-use count table
70-71	@LUSTB	2	Addr	Address of last active user task control block
72-73	@RITCB	2	Addr	Address of interrupted user task control block to be resumed (if DPRIT = 1)
General Work Area				
74-75	@PRL	2	Addr	Address of the communication task parameter list
76	#OPEND	1	Bin	Counter for teleprocessing op end interrupts
77	#TT#IC	1	Bin	Number of console interrupts since last 01 trace entry (indeterminate if trace not in use)
78	#TT#IM	1	Bin	Number of MLTA interrupts since last 01 trace entry (indeterminate if trace not in use)
79	#TT#IB	1	Bin	Number of BSCA interrupts since last 01 trace entry (indeterminate if trace not in use)
7A-7B	@PCA	2	Addr	Address of CCP program level communication area
7C-7D	@PTX	2	Addr	Address of program characteristics table master index
7E-7F	@PTXCS	2	C/S	Disk C/S address of origin of program control table portion of $CCPFILE
80-81	@CC4WT	2	Addr	Entry point of wait routine ($CC4WT)
82-83	@DMP	2	Addr	Entry point of DSM dump routine
84-85	@IOS	2	Addr	Address of DSM disk I/O supervisor entry point
86-87	@IOW	2	Addr	Address of DSM disk I/O wait entry point

Disp Hex	Label	Lng Dec	Form	Description
88-89	@CPDTF	2	Addr	Address of first symbolic disk file table (XDT)
8A-8B	#CCMCL	2	Bin	Maximum command length
8C		1	–	Reserved

Unit Record Allocation/Usage Bytes

8D	$DVSUP	1	Bit	Unit record support:

Hex Value	*Symbol*	*Meaning*
08	$DVN41	Directly attached 3741 indicator
04	$DVPRT	Printer supported
02	$DVMFU	MFCU supported
01	$DV142	1442 supported

8E	$DVALC	1	Bit	Unit record allocation:

Hex Value	*Symbol*	*Meaning*
08	$DVN41	Directly attached 3741 indicator
04	$DVPRT	Printer allocated to CCP
02	$DVMFU	MFCU allocated to CCP
01	$DV142	1442 allocated to CCP

8F	$DVPST	1	Bit	User program unit record allocation:

Hex Value	*Symbol*	*Meaning*
08	$DVN41	Directly attached 3741 indicator
04	$DVPRT	User program awaiting allocation of printer
02	$DVMFU	User program awaiting allocation of MFCU
01	$DV142	User program awaiting allocation of 1442

Disp Hex	Label	Lng Dec	Form	Description
Password Save Area				
90	CPLPWD	1	Bin	Length of sign-on password
91-96	CPPSWD	6	Char	Terminal sign-on password (right-adjusted padded with blanks)
Disk Addresses of DSM Data Management Routines				
97-98	@CLRP	2	C/S	Disk C/S address of DSM printer error recovery procedure (ERP) routine
99-9A	@CLPRT	2	C/S	Disk C/S address of DSM 5213 DM module on Model 4
(99-9A)	@CLE1	2	C/S	Disk C/S address of DSM MFCU ERP routine
9B-9C	@CLER	2	C/S	Disk C/S address of DSM 1442 ERP routine
9D-9E	@ODLM	2	C/S	Disk C/S address of DSM 5444 limits processor
9F-A0	@ODLT	2	C/S	Disk C/S address of DSM 5445 limits processor
User Program Dump Area Information				
A1-A2	@CSTRT	2	C/S	Disk C/S address of dump area in $CCPFILE
A3	#NSEC	1	Bin	Number of sectors -1 to dump all of storage
A4	#MXDMP	1	Bin	Maximum number of dumps that can be taken
A5	#CPFLQ	1	Bin	Q byte of $CCPFILE disk unit
A6	#DUMP#	1	Bin	Number of dumps that were taken
A7	–	1	–	Reserved
A8	#RUFCL	1	Bin	Maximum program request under format command length

Disp Hex	Label	Lng Dec	Form	Description
Miscellaneous Pointers				
A9	#HISTT	1	Bin	Number of entries in switched terminal table
AA-AB	@COIH	2	Addr	Address of DSM console interrupt handler ($@COIH)
AC-AD	@TAS	2	Addr	Address of terminal attribute set table
AE-AF	@UALFA	2	Addr	Start of user program area (not changed during NEP program storage allocation)
B0	#HITAS	1	Bin	Highest terminal attribute set index in system
B1-B2	#DFEND	2	Addr	Address of end -1 of $CC4DF
B3-B4	#DFBEG	2	Addr	Address of beginning of $CC4DF
B5-B6	@CSSTT	2	C/S	Disk address of switched terminal table
B7-B8	@LCB#1	2	Addr	Address of first line control block in system
B9-BA	@MLTAD	2	Addr	Address of MLTA adapter DTF; hex 0000 indicates no MLTA adapter
BB-BC	@CKLST	2	Addr	Address of teleprocessing checklist
BD	#PCTLN	1	Bin	Length of longest single PCT entry in $CCPFILE
BE	#SETID	1	Char	Assignment set ID used in current run
Expansion Area				

				Hex Value	*Symbol*	*Meaning*
BF	#TIMEX	1	Bit	80	TXOPND	Op end since last polling
C1-C2	@DUB0	–	–	C/S of transient $$DUB0		
C3-C4	@DUB1	–	–	C/S of transient $$DUB1		

CCP COMMUNICATION AREA – ($CCCOM) (Continued)

Disp Hex	Label	Lng Dec	Form	Description
Expansion Area (Continued)				
C5	$MVFLG	—	—	Movement flag byte *Hex Value* / *Symbol* / *Meaning* Bit 0 $MVOUT 1-DFF/#3 loaded in PL1 Bit 1 $HLDAR 1-OHA allocated in UPA Bit 2 $MVPRT 1-BSYPRT–YES
C6	#PLWK1	1	Bin	DFF parameter list work area
C7	#PLWK2	1	Bin	DFF parameter list work area
C8	#PLWK3	1	Bin	DFF parameter list work area
C9	#PLWK4	1	Bin	DFF parameter list work area
CA-CB	MVREAL	2	Bin	Logical to real conversion factor
CC-DB	IIPL	16	Mix	Invite input parameter list for 3284/3286/3288
DC-E8	—	13	—	Reserved
Display Formatting Facility Work Area				
E9-EA	@DFFIX	2	C/S	Disk C/S address of DFF formats index
EB	#DFQ	1	Bit	Device Q byte for DFF display formats
EC-ED	#DF1@	2	Addr	Address of DFF output hold area for BSCA line 1
EE-EF	#DF1LN	2	Bin	Length of DFF output hold area for BSCA line 1
F0	#DF1ID	1	Char	Task ID of task owning space in DFF output hold area for BSCA line 1
F1-F2	#DF2	2	Addr	Address of DFF output hold area for BSCA line 2
F3-F4	#DF2LN	2	Bin	Length of DFF output hold area for BSCA line 2
F5	#DF2ID	1	Char	Task ID of task owning space in DFF output hold area for BSCA line 2

Disp Hex	Label	Lng Dec	Form	Description
Display Format Facility Load Parameter List				
F6-F7	#DFCS	2	C/S	Disk C/S address of DFF load module
F8	#DF#S	1	Bin	Number of sectors of text data
F9-FA	#DFLNK	2	Addr	Link-edited address of DFF module
FB	#DFRLD	1	Disp	Displacement of RLD data in last text sector
FC-FD	#DFENT	2	Addr	Entry point address of DFF module
FE-FF	#DFLOD	2	Addr	Load point of DFF module if loaded; otherwise, hex 00XX

TASK CONTROL BLOCK (TCB)

- There is one TCB for each system task (communication, termination, command processor) pointed to by $CCCOM at hex 0A, 0E, and 10.
- There is one TCB for each user task (maximum = 8; maximum = 4 for Model 4), the first is pointed to by $CCCOM at hex 70, and the rest are chained in the TCB at hex 0B.
- Block length is 87 (hex 57); for Model 12 block length is 89 (hex 59).

Disp Hex	Label	Lng Dec	Form	Description		
00	TCBTSK	1	Bit	Task management control byte:		
				Hex Value	*Symbol*	*Meaning*
				80	TCBATV	Active indicator; task is executable if TCBDSP = 1; otherwise, suspended by system operator (user task only).
				40	TCBDSP	Dispatchable indicator
				20	TCBRSM	Task suspended indicator (applies only if TCBATV = 0); task was suspended while in the interrupted state (user task only).
				10	TCBSYT	System task indicator; otherwise, user task
				08	TCBDSM	Task use of disk systems management. Task is current owner of DSM in this program level.
				04	TCBDSV	Register save indicator. Registers save area address in TCB to be decreased when task is dispatched.
				02	TCBRUN	Task control block use (user TCB only). Task control block is in use by user program.
				01	TCBKRQ	System operator request bit (user TCB only). User task requested by CCP system operator.

TASK CONTROL BLOCK (TCB) (Continued)

Disp Hex	Label	Lng Dec	Form	Description
01	TCBID	1	Char	Task identification byte: System tasks: C Communications task T Termination task P Command processor task S Shutdown task User tasks: A single digit (1-n) where n is the number of tasks allowed in the current execution
02-03	TCBWMK	2	Bit	Task wait mask Byte 1:

Hex Value	*Symbol*	*Meaning*
80	WPAAII	(Communications task) Waiting for I/O service request (Any other task) Waiting for communications task to service an I/O request
40	WPADIO	Task is waiting for disk I/O completion
20	WPACP	Task is waiting for completion of an accept input from an I/O service request
10	WPASHD	Task is waiting for shutdown to be requested
08	WPATA	(Noncommunications tasks only) Waiting for CCP transient area to become available
04	WPASQB	(User task only) Task is waiting for enqueued data sectors
02	WPABSY	(User task only) Printer busy
Bit 7		Reserved

Disp Hex	Label	Lng Dec	Form	Description		
			Bit	Byte 2:		
				Hex Value	*Symbol*	*Meaning*
02-03 (continued)				80	WPBFR	(Communications task) Waiting for storage availability in communications buffer area (Any other task) Waiting for main storage availability in user program area (User task in allocation) Waiting for storage availability in user program area
				40	WPBDA	(User task in allocation) Waiting for disk file(s) availability
				20	WPBUR	(User task in allocation) Waiting for unit record device(s) availability
				10	WPBTUB	(User task in allocation) Waiting for required terminal(s) availability
				08	WPBDSX	(All tasks) Task is waiting for the availability of DSM
				04	WPBTIO	(User task only) Task waiting for unit record device ready
				02	WPBOHA	(User task using DFF only) Waiting for space in DFF output hold area

Disp Hex	Label	Lng Dec	Form	Description
				Note: The termination task does not use these wait mask definitions when waiting for work. Its wait mask is hex BFFF and its count is 255. Termination is made dispatchable by a direct setting of TCBDSP by an invoker.
04	TCBECT	1	Bin	Task event count (the number of unique events that must occur prior to the task being marked dispatchable)
05-06	TCBPMK	2	Bit	Task post mask (This byte is set by post to indicate the type of event completed. The bit definitions are the same as TCBWMK, the task wait mask byte.)
07	TCBRCT	1	Bin	Residual event count (This count is decreased by 1 for each unique event completion. The task is made dispatchable when this value becomes 0.)
08	TCBFLG	1	Bit	Save byte for $DPFLG when the task loses control or given control to the CCP dispatcher (the bit definitions for this byte are the same as those in $DPFLG in $CCCOM, CCP communications area)
09-0A	TCBIOB	2	Addr	The address of the disk input/output block being waited for (IOB)
0B-0C	TCBNXT	2	Addr	The address of the next task control block for the dispatcher (TCB)
0D-0E	TCBIAR	2	Addr	Instruction address register save area for an interrupted user task
0F-10	TCBSPR	2	Bits	Program status register save area
11-12	TCBSAV	2	Addr	The address of the register save area for the current level of control for this task (initially contains the address of high-order byte of TCBARR-8)
13-14	TCBARR	2	Addr	Level 1 address recall register save area
15-16	TCBXR1	2	Addr	Level 1 index register 1 save area
17-18	TCBXR2	2	Addr	Level 1 index register 2 save area
19-1A	—	2	Addr	Level 2 address recall register save area
1B-1C	—	2	Addr	Level 2 index register 1 save area

TASK CONTROL BLOCK (TCB) (Continued)

Disp Hex	Label	Lng Dec	Form	Description
1D-1E	–	2	Addr	Level 2 index register 2 save area
1F-20	–	2	Addr	Level 3 address recall register save area
21-22	–	2	Addr	Level 3 index register 1 save area
23-24	–	2	Addr	Level 3 index register 2 save area
25-26	–	2	Addr	Level 4 address recall register save area
27-28	–	2	Addr	Level 4 index register 1 save area
29-2A	–	2	Addr	Level 4 index register 2 save area
The following apply to Models 8, 10, and 12 only.				
2B-2C	–	2	Addr	Level 5 address recall register save area
2D-2E	–	2	Addr	Level 5 index register 1 save area
2F-30	–	2	Addr	Level 5 index register 2 save area
31-32	–	2	Addr	Level 6 address recall register save area
33-34	–	2	Addr	Level 6 XR1 save area
35-36	–	2	Addr	Level 6 XR2 save area
37-38	–	2	Addr	Level 7 address recall register save area
39-3A	–	2	Addr	Level 7 XR1 save area
3B-3C	–	2	Addr	Level 7 XR2 save area
BD-BE	–	2	Addr	Level 8 address recall register save area
3F-40	–	2	Addr	Level 8 XR1 save area
41-42	–	2	Addr	Level 8 XR2 save area
43	TCBSYS	nn	–	End of system TCB
44	–	nn	–	Reserved

Disp Hex	Label	Lng Dec	Form	Description
Task Control Block User Area				
45-46	TCBTUB	2	Addr	Address of the first terminal unit block (TUB) allocated to this task
47-48	TCBINQ	2	Addr	Beginning of the tasks TUB input queue (this field addresses the oldest terminal unit block queued for input to be processed)
49	TCBIIC	1	Bin	The number of teleprocessing invite inputs currently outstanding for this task
4A	TCBMAX	1	Bin	(User task only) The maximum number of terminals that the multiple requesting terminal support program running under the control of this TCB can support simultaneously
4B	TCBATR	1	Bin	(User task only) The number of terminals currently active for the multiple requesting terminal support program running under the control of this TCB
4C-4D	TCBDTF	2	Addr	Address of the first open nondisk DTF for the user program
4E	TCBFBM	1	Bit	Task control block file bit mask
4F	TCBDMG	1	Bit	Data management control byte:

Hex Value	*Symbol*	*Meaning*
80	TCBSHQ	Shutdown requested return code was given to the user program on an accept input operation
40	TCBACC	Program issued an accept input
20	TCBRUF	PRUF program active
10	TCBNEP	Program running under this task control block is never-ending

TASK CONTROL BLOCK (TCB) (Continued)

Disp Hex	Label	Lng Dec	Form	Description		
				Hex Value	*Symbol*	*Meaning*
4F (continued)				08	TCBIT4	User is a sort
				04	TCBMTS	The user program is a multiple requester terminal program
				02	TCBDA	Disk files are allocated
				01	TCBOCF	Close is purging buffers
50	TCBJOB	1	Bit	Job management control byte:		
				Hex Value	*Symbol*	*Meaning*
				80	TCBALC	Task is the allocation task
				40	TCBTRM	Task is in termination or has been marked for termination
				20	TCBCAN	Cancel requested by CCP
				10	TCBCON	Cancel requested by CCP operator
				08	TCBN41	Directly attached 3741 allocated
				04	TCBPRT	Printer is allocated to this task
				02	TCBMFU	MFCU is allocated to this task
				01	TCB142	1442 is allocated to this task
51	TCBCMP	1	Bin	Task completion code		
52-53	TCBCDE	2	Addr	Address of CDE for this program		
54-55	TCBDFF	2	Addr	DFF PAS address		
56	TCBWRK	1	Bit	CCP work byte:		
				Hex Value	*Symbol*	*Meaning*
				80	TCBMAP	Map ATRs to moveout area
57-58	TCBPL@	2	Addr	Address of saved put parameter list		

COMMAND PROCESSOR WORK AREA

- Located hex 500 into CCP program level.
- Pointed to by $CCCOM disp hex 04.
- Length is 60 bytes (hex 3C).
- Contains message output area.

Disp Hex	Label	Lng Dec	Form	Description
00	$CPFLG	1	Bit	Command processor (CP) flag byte:

Hex Value	*Symbol*	*Meaning*
80	$CPFR	CP return transient does FREEMAIN following processing routine return.
60	$CPPC	CP return routine does put no-wait and invite input after subroutine return; data to write is in $CPMSG area. NEP allocation is pending.
40	$CPII	Invite input is scheduled by return routine.
20	$CPPUT	CP return routine does put no-wait after subroutine return; data is in $CPMSG area.
08	$CPR4H	$CC4R4 request hold queue contains entries for validation.
04	$CPUCT	CP return routine counts this program request.

01-02	$CPLMG	2	Bin	Length of message to write
03-3B	$CPMSG	57	—	Command processor message area for output to terminals. Format of this area is NNN message text (where NNN is the message number). This area is also used to pass a TCB address between $CC4R1 and $CC4RC.

ALLOCATION WORK AREA

- Located hex 53C into CCP program level.
- Pointed to by $CCCOM at hex 06.
- Length is 40 bytes (hex 28).

Disp Hex	Label	Lng Dec	Form	Description
00-01	$AMEPA	2	Addr	Entry point address of allocation mainline $CC4AM
02	$AMFLG	1	Bit	Allocation flag byte:

Hex Value	*Symbol*	*Meaning*
80	$AMBSY	Allocation busy
40	$APEND	Allocation task post pending
20	$AMDFF	$CC4CT is to initialize and relocate $CC4DF
10	$AMDPL	Runalone program in allocation

03-05	$AMNCS	3	–	Reserved
06-08	$AMWMK	3	Bit	Wait mask set by allocation transients for resident allocate to use as a wait argument. Used to route control between allocation transients
09-0A	$AMPCT	2	Addr	Address of PCT currently in allocation
0B	$AM#LT	1	Bin	Number of terminals to be deallocated/ released prior to posting allocation that terminals are all available
0C	$AM#DA	1	Bin	Number of direct access files to be deallocated prior to posting allocation that all files are available
0D-0E	$AMTCB	2	Addr	Address of current allocation TCB
0F-10	$AMPMK	2	Bit	Allocation post mask

TERMINATION WORK AREA

- Located hex 564 into CCP program level.
- Pointed to by $CCCOM at hex 08.
- Length is 40 bytes (hex 28).

Disp Hex	Label	Lng Dec	Form	Description
00	$TMFLG	1	Bits	Terminator flag byte:

Hex Value	*Symbol*	*Meaning*
80	$TMBSY	Termination task active
40	$TMDMP	Dump taken during current termination processing
20	$TMEJ	$CC4TD, the termination control routine, has invoked $CC4EJ (CCP end of job)

01-02	$TMTCB	2	Addr	Address of TCB currently (or last) being processed by the termination task
03-27		24	—	Reserved

COMMUNICATION MANAGEMENT WORK AREA

- Located hex 58C into CCP program level.
- Pointed to by $CCCOM at hex 00.
- Length is 30 bytes (hex 14).
- Labels with command displacements indicate bytes shared by more than one function.

Disp Hex	Label	Lng Dec	Form	Description
00-01	#CMDTF	2	Addr	Save area for DTF address
02-03	#CMPL	2	Addr	Save area for parameter list address
04-05	#CMTMA	2	Addr	Save area for terminal address
(04-05)	#CMBK1	2	Addr	Save area for BSCA operator error identification
06	#CMTFT	1	Bit	Save area for terminal features
(06)	#CMBK2	1	Bit	Message format indicator: *Hex Value* — *Meaning* 04 — BSCA message 2 (invalid OLT) 02 — BSCA message 1 (POLLLOOP) 01 — BSCA message 0 (error log)
07-08	#CMPTR	2	Addr	Save area for previous pointer
09-0A	#CMFPL	2	Addr	Save area for parameter list address
0B-0C	#CMPTX	2	Addr	Save area for previous pointer
0D-0E	#CMTUB	2	Addr	Address of terminal unit block being used
0F-10	#CMERP	2	Addr	Address of DTF to be rescheduled after return from ERP routine
11	#CMSWT	1	Bit	Control switch byte: *Hex Value* — *Symbol* — *Meaning* 80 — #CMARR — Okay to modify TCBARR field in task control block

CONSOLE MANAGEMENT WORK AREA FOR MODELS 8, 10, AND 12

- Located hex 5A0 into CCP program level.
- Pointed to by $CCCOM at hex 02.
- Length is 115 bytes (hex 73).
- Contains console input buffer.

Disp Hex	Label	Lng Dec	Form	Description
00	#KMSWT	1	Bit	Console management switch:

Hex Value	*Symbol*	*Meaning*
80	#KMBSY	Console is busy
40	#KMERQ	Enable request key
20	#KMPFX	Output prefix being printed
10	#KMSWL	Ignore next output op end; there is no parameter list to dequeue
08	#KMXXE	Set on when a communication management transient transfers control to $CC4K9 and wants a transfer of control to the transient whose C/S is in #KMXCT
04	#KMACT	Prefix the output with an exclamation mark
02	#KMSCH	Output is from the transient area
01	#KMIOW	Do not let non-console CCP run until all console output complete

01-02	#KMPL	2	Addr	Console request parameter list
(03)	#KMPFA	—	—	Beginning of the output prefix area
(03)	#KMPFR	1	Char	Response indication character
04	#KMPFT	1	Char	Task identification character
05	#KMPFC	1	Char	Colon (:)
06-0B	#KMPFP	6	Char	User program name

CONSOLE MANAGEMENT WORK AREA FOR MODELS 8, 10, AND 12 (Continued)

Disp Hex	Label	Lng Dec	Form	Description
Console IOB Work Area for Models 8, 10, and 12				
0C	#KMQ	1	Bin	Input/output block Q byte
0D	#KMB	1	Bin	Input/output block R byte
0E-0F	#KMSNS	2	Bit	Input/output block sense bytes
10-11	#KMBUF	2	Addr	Buffer address
12	#KMCTL	1	Bin	Control count
13	#KMFLG	1	Bit	Flag byte
14	#KMCNT	1	Bin	Running count
15	#KMCON	1	Char	Continue character
Data Fields Passed to the Console Manager to Handle Console Requests from $CC4CM Transients				
16-17	#KMCPL	2	Addr	Address of information needed to handle the message to be printed
18-19	#KMXCT	2	C/S	C/S of the transient to transfer control to after printing a message if #KMXXE of #KMSWT is on
1A	#MKDSP	1	Bin	Console management dispatcher byte (if nonzero the console controller [$CC4KA] is in control of the CCP system)
1B	#KMFFF	1	Bit	Second console management switch:

Hex Value	*Symbol*	*Meaning*
80	#KMHLT	Secondary halt to be issued by MFCU error recovery module

Console Input Buffer				
1C-6E	#KMBFL	82	Char	Console input buffer

CONSOLE MANAGEMENT WORK AREA FOR MODEL 4

- Located at hex 0500 into CCP program level.
- Pointed to by $CCCOM at hex 02-03.

Disp Hex	Label	Lng Dec	Form	Description
00	#KMSWT	1	Bit	Console management switch:

Hex Value	*Symbol*	*Meaning*
80	#KMBSY	Console is busy
40	#KMERQ	Enable request key
20	#KMPFX	Output prefix being printed
10	#KMSWL	Swallow next output op end (no parameter list to dequeue)
08	#KMXXE	Transfer control to $CC4K9
04	#KMACT	Prefix message with exclamation
02	#KMSCH	Output is from transient ARPA
01	#KMIOW	CCP must await completion of all console output

01-02	#KMPL	2	Addr	Address of console request parameter list
03	#KMSW2	1	Bit	Keyboard switch:

Hex Value	*Symbol*	*Meaning*
80	#KMWAT	Wait on disk IOB
40	#KMSTP	Stop display backward
20	#KMENK	Enable keyboard after op end on console
10	#KMCMF	Display first line after D command
	#KMCMN	Display current command
Bit 4	Reserved	–
04	#KMSMG	Issue start of log message
02	#KMTHR	Next console log printer went past current screen end point

CONSOLE MANAGEMENT WORK AREA FOR MODEL 4 (Continued)

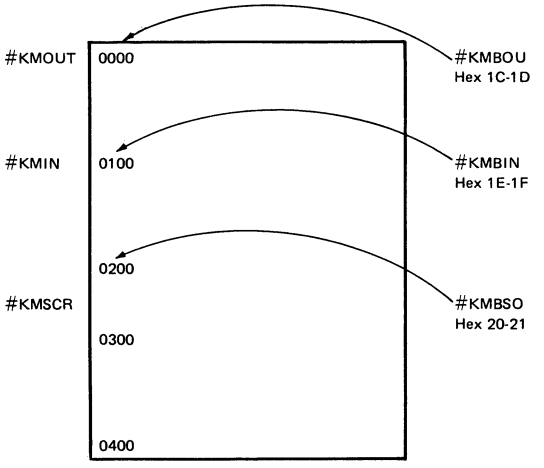
Disp Hex	Label	Lng Dec	Form	Description
				Hex Value / *Symbol* / *Meaning*
03 (continued)				01 #KMITO Next console log printer went past current screen start point
04	#KMSW3	1	Bit	Keyboard switch:
				Hex Value / *Symbol* / *Meaning*
				80 #KMSHD Shutdown console
05-06	#KMFST	2	C/S	C/S of start of console log file
07-08	#KMFED	2	C/S	C/S of end of console log file
09-0B	#KMFSS	3	C/S/D	C/S/D of start of current screen
0C-0E	#KMFSE	3	C/S/D	C/S/D of end of current screen
0F-11	#KMFD1	3	C/S/D	C/S/D of line 1 of display command
12-15	#KMFNX	4	C/S/DD	C/S/DD of next console log entry
16-17	#KMCPL	2	Addr	Address of information needed to handle the message to be printed
18-19	#KMXCT	2	C/S	C/S of transient to pass control to after printing message (if = 0, do not transfer control)
1A	#KMDSP	1	Bin	If nonzero, KM is in control of system
1B	#KMFFF	1	Bit	Console management switch:
				Hex Value / *Symbol* / *Meaning*
				80 #KMHLT Halt on next halt/ syslog request
				40 #KMCMC CM transient must wait for console output completion
1C-1D	#KMBOU	2	Addr	Address of console file output buffer

Disp Hex	Label	Lng Dec	Form	Description
1E-1F	#KMBIN	2	Addr	Address of console file input buffer
20-21	#KMBSO	2	Addr	Address of console screen output buffer
22-39	#KMIOB	23	Mix	Console log file IOB
3A-4A	#KMDPL	16	Mix	Console parameter list
4B	#KMLIT	1	Bit	Console field indicator light mask:

Hex Value	*Symbol*	*Meaning*
80	#KMLT1	CCP incrementing light indicators
40	#KMLT2	
20	#KMLT3	not used
10	#KMLT4	Reserved
08	#KMLT5	User task awaiting reply
04	#KMLT6	Console screen in ERP
02	#KMLT7	Page backward in console log file available
01	#KMLT8	Page forward in console log file available

4C-4D	#KMWK1	2	Mix	Internal work areas for console support routines
4E-4F	#KMWK2	2		
50-51	#KMWK3	2		
52-53	#KMWK4	2		
54-5B	#KMMPL	8		Move routine parameter list:
			Bin	54-55 *To* field length
			Addr	56-57 *To* field address
			Bin	58-59 *From* field address
			Addr	5A-5B *From* field length
5C-AC	#KMBFR	80	Char	Console input buffer
00AD-02AC	#KMOUT	512	–	See *Console Buffer Layout.*
01AD-04AC	#KMIN	768		
02CD-04AC	#KMSCR	480		

Console Buffer Layout



Hex 0000-0200 is output buffer
Hex 0100-0400 is input buffer
Hex 021F-0400 is screen buffer

FILE SPECIFICATION BLOCK (FSB)

- Pointer to first FSB associated with a given terminal in TUB at hex 22.
- Pointer to first available FSB in $CCCOM at hex 46.

Disp Hex	Label	Lng Dec	Form	Description
00	FSBSYM	1	Bin	Relative XDT entry
01	FSBPHY	1	Bin	Relative SDF entry
02-03	FSBNXT	2	Addr	Address of the next file specification block in the chain (hex 00xx is last)

CONSOLE IOB FOR MODELS 8, 10, AND 12

- Located in DSM supervisor module $@COIH at hex 26.
- Length is 14 bytes (hex 0E).

Disp Hex	Label	Lng Dec	Form	Description
00	CIOQ	1	Bin	Console Q-byte:

Hex Value	*Symbol*	*Meaning*
10	KEYBRD	Keyboard Q code
08	PRINTR	Printer Q code

Disp Hex	Label	Lng Dec	Form	Description
01	CIOR	1	Bit	Console R byte:

Printer

Hex Value	*Symbol*	*Meaning*
80	PRINT	Print a character
40	NEWLIN	Return the carriage
04	NABLED	Printer enabled

Keyboard

Hex Value	*Symbol*	*Meaning*
20	REQLIT	Request light off
10	PROLIT	Proceed light off
04	REQKEY	Request key enabled
02	OTRKEY	Other keys enabled

Printer and keyboard

Hex Value	*Symbol*	*Meaning*
01	RESET	Reset interrupt level
00	DISABL	Disable the device

Disp Hex	Label	Lng Dec	Form	Description
02-03	CIOSNS	2	Bit	Console sense byte: Printer

Hex Value	*Symbol*	*Meaning*
20	SNSNOP	Nonprintable character
08	SNSEOL	End of line
04	SNSFRM	End of forms
02	SNSXLT	Printer translator check
01	SNSMLF	Printer malfunction

Keyboard

Hex Value	*Symbol*	*Meaning*
40	SNSENC	End or cancel key
20	SNSCAN	Cancel key
10	SNSEND	End key
08	SNSRTD	Return or data key
04	SNSRTN	Return key
03	SNSKER	Keyboard errors

04-05	CIOBUF	2	Addr	Console operation buffer address
06	CIOCTL	1	Bin	Console control count
07	CIOFLG	1	Bit	Console operation flag byte:

Hex Value	*Symbol*	*Meaning*
80	FLGIN	Input operation
60	FLGWTR	Write to operator with reply
40	FLGOUT	Output operation
20	FLGSYS	System user indicator
10	FLGRON	Request key input
08	FLGCMP	Completion post bit
04	FLGERR	Error post bit
02	FLGEXT	Exact length input
01	FLGNOP	Halt on nonprintables

CONSOLE IOB FOR MODELS 8, 10, AND 12 (Continued)

Disp Hex	Label	Lng Dec	Form	Description
Console Additional Cells				
08	CIOCNT	1	Bin	Count for operation
09-0A	CIODTF	2	Addr	DTF (parameter list) pointer
0B	CIOINQ	1	Bin	Inquiry status byte
0C	CIOSAV	1	Bin	Data management save area
Console Status Byte				
0D	CIOSTS	1	Bit	Input/output block (IOB) status byte:

Hex Value	*Symbol*	*Meaning*
80	STSNOW	Start operation; return; otherwise, wait
40	STSCHK	On recall return; otherwise, wait
20	STSREN	Recall; otherwise, initial start
10	STSASM	Assembler user
08	STSFRM	End of forms
0F	STSHLT	Halt identification

KEYBOARD IOB FOR MODEL 4

- Located in DSM supervisor module $COIH at hex 04.
- Length is 12 bytes (hex 0C).

Disp Hex	Label	Lng Dec	Form	Description
01	CIOQ	1	Bin	Keyboard Q byte:

Hex Value	*Symbol*	*Meaning*
10	KEYBRD	Keyboard Q-code

KEYBOARD IOB FOR MODEL 4 (Continued)

Disp Hex	Label	Lng Dec	Form	Description
01	CIOR	1	Bit	Keyboard R byte:

Hex Value	*Symbol*	*Meaning*
10	RESPCK	Reset parity check
08	LOCK	Lock keyboard
04	UNLOCK	Unlock keyboard (lite keyb rdy)
02	ENABLE	Enable keyboard interrupts
01	RESET	Reset interrupt level

Disp Hex	Label	Lng Dec	Form	Description
02	CIOSN1	1	Bin	Sense byte 1: *code for key pressed Data key translated to EBCDIC

Hex Value	*Symbol*	*Meaning*
91	ENTERP	Enter plus key
81	PROGST	Program start key
80	ENDKEY	Input end indicator
16	BACKSP	Backspace key
15	RETURN	Return key
11	INQREQ	Inquiry request
05	TAB	Tab key
03	ERASE	Field erase key
02	ENTERM	Enter minus key

Disp Hex	Label	Lng Dec	Form	Description
03	CIOSN2	1	Bit	Sense byte 2:

Hex Value	*Symbol*	*Meaning*
80	SNSPCK	Parity check
40	SNSDAT	Data key
20	SNSCOM	Command key
10	SNSFUN	Function key
08	SNSWTC	World Trade bit
02	SNSTYP	Typamatic function

Disp Hex	Label	Lng Dec	Form	Description
04	CIOCNT	1	Bin	Length of input
05	CIOCRT	1	Bin	Control count

KEYBOARD IOB FOR MODEL 4 (Continued)

Disp Hex	Label	Lng Dec	Form	Description
06	CIOFLG	1	Bit	Flag byte:

Hex Value	*Symbol*	*Meaning*
40	KBRDY	Keyboard is ready
08	NUMFLD	Numeric field
02	DISPLY	Display mode (off blind key)
01	MANMOD	Manual mode

Disp Hex	Label	Lng Dec	Form	Description
07	CIOCOM	1	Bin	Completion code:

Hex Value	*Symbol*	*Meaning*
46	COMERR	Parity check error
45	COMBUF	Buffer full
44	COMNA	Not allowed (character in number field)
40	COMOK	Normal (function or command key)

Disp Hex	Label	Lng Dec	Form	Description
08-09	CIODUF	2	Addr	Buffer address
0A-0B	CIODTF	2	Addr	DTF address

DISK IOB

- Pointed to by disk I/O queue.
- Length is 26 bytes (hex 1A).

Disp Hex	Label	Lng Dec	Form	Description
00-01	IOBCHN	2	Addr	IOS queue chain pointer Address of next IOB in the queue of IOBs awaiting release of data sectors, hex 0000 if last IOB in queue (CCP file sharing system only)

Disp Hex	Label	Lng Dec	Form	Description
02	IOBCMP	1	Bin	IOB completion code:

Hex Value	*Symbol*	*Meaning*
80	SKSTR1	Seek started
40	CMPBIT	Operation complete
20	DTPND	Data transfer pending
10	DXFRST	Data transfer started
08	IOWAIT	A wait has been issued
05	IOERR	Permanent error on associated IOB
04	SCEQFN	Scan equal found
02	SCNTFN	Scan not satisfied
01	IOPERM	Permanent error

03	IOBQB	1	Bin	Q-byte for SIO
04	IOBRB	1	Bin	R-byte for SIO
05	IOBCB	1	Bin	Cylinder number (5444 only)
(05)	IOBFL2	1	Bin	Flag byte (5445 only)
06	IOBSB	1	Bin	Track and sector number (5444)
07	IOBNB	1	Bin	Number of sectors −1 (5444 only)
(06-07)	IOBDAD	2	Addr	Pointer to disk address (5445)
08-09	IOBDAT	2	Addr	Data address
0A-0B	IOBSNS	2	Bit	Sense byte store area
0C	IOBERR	1	Bin	Error retry counts
0D	IOBFLG	1	Bit	Flag bits:

Hex Value	*Symbol*	*Meaning*
08	NODTF	IOB has no associated DTF
04	NOLIO	No LIO of DFDR

0E-0F	IOBARR	2	Addr	ARR save area
10-11	IOBXR2	2	Addr	XR2 save area

DISK IOB (Continued)

Disp Hex	Label	Lng Dec	Form	Description
(10-11)	IOBTCB	2	Addr	Address of the TCB waiting for enqueued data sectors (CCP file sharing system only)
12-13	IOBDCH	2	Addr	Data management chain pointer
14-15	IOBDTF	2	Addr	Address of associated DTF
16	IOBCC	1	Bin	Cylinder address (5445 only)
17	IOBHH	2	Bin	Head address (5445 only)
18	IOBR	1	Bin	Record address (5445 only)
19	IOBN	1	Bin	Number of records −1 (5445 only)

BSCA LINE CONTROL BLOCK (LCB)

- Pointer to first LCB in $CCCOM at hex B7.
- LCBs (MLTA and BSCA) are chained by address at hex 67 in LCBs.
- Contains line DTF, SDR tables, and polling list (if any).
- There is one LCB for each line.
- Length is 125 bytes (hex 7D).

Disp Hex	Label	Lng Dec	Form	Description
00	$BDDEV	1	Bin	Device ID: Hex 88 for BSCA 2 Hex 80 for BSCA 1
01	$BDUPS	1	Bit	UPSI: U1-U8
02	$BDATT	1	Bit	Attribute byte 1:

Hex Value	*Symbol*	*Meaning*
C0	$BCCNV	Conversational file
80	$BCINP	Input file
40	$BCOUT	Output file
20	$BCITB	ITB mode
10	$BCRAN	Transparent mode
08	$BCGET	GET file
04	$BCASK	On—ASCII file Off—EBCDIC file
01	$BCASM	Assembler DTF

Disp Hex	Label	Lng Dec	Form	Description
03	$BDATR	1	Bits	Attribute byte 2:

Hex Value	*Symbol*	*Meaning*
88	$BCMCN	Control station
80	$BCMPT	Tributary station
40	—	DTF allocated
20	$BCMAN	Manual line
10	$BCANS	Answer line
08	$BCSWI	Switched line
04	$BCUSD	File used
02	$BCACT	File active
01	$BCOPN	File opened

04-05	$BDCHN	2	Addr	Chaining pointer to postopen DTFs
06-07	$BDNXT	2	Addr	Chaining pointer to next DTF, preopen or postopen
08-09	$BDWK1	2	Mix	Work area for MLMP routines
0A-0B	$BDWK2	2	Mix	Work area for MLMP routines
0C-0D	$BDWKB	2	Addr	Address of user's logical buffer
0E	$BDCMP	1	Bin	Completion codes:

Hex Value	*Symbol*	*Meaning*
59	CPURGE	Purge complete for CCP
58	$BCRLE	Maximum record length exceeded
57	$BCACD	No active DTFs in checklist
56	$BCCMP	No completion in checklist
55	$BCADP	Adapter check
54	$BCRSP	Invalid response received
53	$BCCON	Lost connection
52	$BCLOS	Lost data or no record separator found in two blocks
51	$BCDAT	Data check
50	$BCTIM	No response from remote device
4F	$BCERR	Permanent error

Disp Hex	Label	Lng Dec	Form	Description		
				Hex Value	*Symbol*	*Meaning*
0E (continued)				4E	$BCLST	Delay count (DLYCT in $DTFB) exceeded
				4D	$BCCAL	Invalid request
				4C	$BCNCN	No connection
				4B	$BCASC	Invalid ASCII character
				4A	$BCIGN	Request ignored
				49	$BCNAC	No active entry in polling list
				48	$BCOLT	Invalid $RFT (request for online test)
				47	$BCNDT	No data for conversational GET (null message received)
				46	$BCCRP	Conversational reply pending
				45	$BCNON	No response to poll/address
				44	$BCNEG	Negative response to poll/address
				43	$BDBID	Invalid ID
				42	$BCEOT	End of file
				41	$BCUER	User error
				40	$BCDNE	Normal completion
				00	$BCREQ	Request accepted
0F	$BDOPC	1	Bin	Operation code:		
				Hex Value	*Symbol*	*Meaning*
				81	$BOGBK	GET a block
				80	$BOGET	GET
				44	$BOPEW	PUT EOT to WACK response
				42	$BOPEF	PUT end of file
				41	$BOPEB	PUT end of block
				40	$BOPUT	PUT
10-11	$BDMRL	2	Bin	Save area for maximum record length		
		2	Bin	RJE save area		

Disp Hex	Label	Lng Dec	Form	Description
12	$BDLGC	1	—	BSC IOS:

Hex Value	*Symbol*	*Meaning*
80	ADSWID	Switched ID list is being used
10	EOBTWO	End-of-block indicator
08	SPNRCL	Span indicator for record length
04	MAXOFL	Truncate record indicator
02	POL1ST	First time poll resident indicator
01	ADARA1	First add on area included

13-14	$BDDCH	2	Addr	Address of dial number if a switched line is being used
(13-14)	$BDPSC	2	Char	Polling/addressing characters if a tributary station is receiving data
(13-14)	$BDLST	2	Addr	Address of polling/addressing list if a control station is receiving data
15	$BDDCC	1	Bin	Length of dial number if a switched line is being used
(15)	$BDIND	1	Char	Polling/addressing list entry ID if a control station is receiving data
16-17	$BDRID	2	Addr	Address of receive ID field or switched ID parameter list if a switched line is being used
(16-17)	$BDCNT	2	Bin	Number of times to go through a polling list when all responses are negative
18	$BDRLN	1	Bin	Length of receive ID field or entry selector
(18)	$BDLID	1	Char	Last polling/addressing ID or last polling/addressing function (hex F0 or F1)
19-1A	$BDSID	2	Addr	Address of send ID field
1B	$BDSLN	1	Bin	Length of send ID field

Disp Hex	Label	Lng Dec	Form	Description
1C-1D	$BDDLY	2	Bin	Delay count (DLYCT in $DTFB)
1E-1F	$BDREL	2	Bin	Record length
20-21	$BDBKL	2	Bin	Block length
22-23	$BDIOB	2	Addr	Address of IOB in process
24-25	$BDBKX	2	Addr	Pointer to data in BSCA buffer
26-27	$BDITB	2	Bin	ITB character count
28-2A	$BDPRM	3	—	Reserved
2B-2D	$BDRVI	3	Mix	RVI (reverse interrupt request) mask and displacement (first byte is mask; next two bytes are address)
2E	$BDNDX	1	Bin	Index for line initialization
2F-30	$BDWKA	2	Addr	Address of BSCA work area
31-32	$BDINT	2	C/S	Disk address of line initialization module
33	$BDDED	1	Mix	Work area for MLMP routines
34	$BDAT1	1	Bit	Terminal attribute byte:

Hex Value	*Symbol*	*Meaning*
40	$BCPLR	Resident polling
10	$BCRES	Restore after spanning
08	$BCPUT	PUT span file
04	$BCNOW	Spanning in process
02	$BCSPN	Spanned records used
01	$BCSEP	Record separator used

35	$BDSEP	1	Char	Record separator character
36-37	$BDSBF	2	Addr	Save area for user's logical buffer address
38-39	$BDSRL	2	Bin	Save area for record length
3A-3B	$BDRFT	2	Bin	Save area for address of online test parameter list

Disp Hex	Label	Lng Dec	Form	Description
3C-3D	$BDTSA	2	Addr	Address of terminal statistics logging area

The following are in the DTF only if storage resident polling, auto response, or user error retry count is used:

3E-3F	$BDRL0	2	Addr	Storage resident $$BSL0
40-41	$BDRCL	2	Addr	Storage resident $$BSCL
42-43	$BDARA	2	Addr	Auto response module $$BSMD
44	$BDERR	1	Bin	Retry count
45-46	$BDT1A	2	C/S	Save address of online test cylinder/ sector
47-48		2	—	Reserved

End of DTF

4C-4D	LCBPOL	2	Addr	Address of the polling list
4E-4F	LCBSEL	2	Addr	Address of the selection list
50	LCBID	1	Char	Identification of the last polled/ selected terminal
51-52	LCBPL@	2	Addr	Save area for current parameter list
53-54	LCBWRK	2	Mix	Work area address for subroutines
55	LCBAT1	1	Bit	BSCA attribute byte 1:

Hex Value	*Symbol*	*Meaning*
80	LCBCRI	Cancel receive input, stop
40	LCBPRI	Cancel receive input, handle priority put
10	LCBINT	Interrupt with no parameter list is queued
08	LCBNTQ	Active parameter list has been removed from the queue

Disp Hex	Label	Lng Dec	Form	Description		
				Hex Value	*Symbol*	*Meaning*
55 (continued)				04	LCBDEQ	Dequeue when end of text is found
				02	LCBEOT	Search for end of text
56	LCBAT2	1	Bit	BSCA attribute byte 2:		
				Hex Value	*Symbol*	*Meaning*
				80	LCBTRC	Truncate the block, bump DTFBKX (a field in the DTF) to the end
				40	LCBSET	Send end of text on the line
				20	LCBACT	Line is active with work
				10	LCBRFT	Request for test started
				08	LCBABT	Abort the line connection
				04	LCBSEC	Second block indicator
				02	LCBPUT	Put pending on the line
				01	LCBRCI	Receive initial on the line
57-58	LCBADJ	2	Bin	Adjusted output length		
59-5A	LCBATL	2	Addr	Address of ASCII translate buffer		
5B-5C	LCBOWN	2	Addr	Task control block address of task currently in control of the line		
5D-5E	LCB$LO	2	C/S	Disk address of line initialization transient		
5F-60	LCBSRT	2	Addr	Start address of the line buffer area		
61-62	LCBBND	2	Addr	End address of the line buffer area		
63-64	LCBKLC	2	Bin	Block length of the current input operation		

BSCA LINE CONTROL BLOCK (LCB) (Continued)

Disp Hex	Label	Lng Dec	Form	Description
65-66	LCBPLQ	2	Addr	Address of the first parameter list in the line queue
67-68	LCBCHN	2	Addr	Chain address of all line control blocks in the CCP system
69	—	1	—	Reserved
6A	LCBELC	1	Disp	Displacement of the translate table, which translates from line code to EBCDIC.
6B	—	1	—	Reserved
6C	LCBOPE	1	Bin	Operation-end count for this BSCA line (BSCA only)
6D	LCBLID	1	Char	Save area for last terminal ID
6E	LCBLLE	1	Disp	Displacement of the translate table, which translates from line code to lowercase EBCDIC
6F	LCBOLT	1	Bin	Polling online test count (running and pending) on this teleprocessing line (MLTA only)
(6F)	LCBAT3	1	Bit	BSCA attribute byte 3:

Hex Value	*Symbol*	*Meaning*
80	CLBITB	Intermediate text block (ITB) is supported for this DTF
40	LCBTSP	Transparency supported
20	LCBENB	BSCA line enabled (switched line)
10	LCBATO	Auto-call hardware is supported

Disp Hex	Label	Lng Dec	Form	Description
70	LCBATR	1	Bit	Line control block attribute byte:

Hex Value	*Symbol*	*Meaning*
80	LCBNIT	Had a successful initial operation on the line. (If a switched line is being used, this indicates that the line is connected.)
40	LCBOLR	Online test currently running
20	LCBGMN	GETMAIN needed for the line queue
10	LCBSTP	Abort has been issued to stop the read
08	LCBSWL	Ignore input from the next operation
04	LCB1PL	Next parameter list issued to this line should be put at the top of the line queue
02	LCBTBK	Save the data from the read operation set for the 2741 to do the read initial when write is the first operation issued to the terminal (If both LCBSWL and LCBTBK are 1, ignore the next op end whether input or output.)
0A	—	Ignore the next op end whether input or output
01	LCBAPP	Line control block allocation pending

Disp Hex	Label	Lng Dec	Form	Description
Second BSCA Only Segment				
71-72	LCBBFL	2	Bin	Length of data area in line buffer
73-74	LCBMCL	2	Bin	Maximum command length
75-76	LCBIBL	2	Bin	Length of current invite input buffer for this line
77-78	LCBIBA	2	Addr	Address of invite input buffer (hex 00XX = no invite buffer)
79-7A	LCBTCB	2	Addr	Address of TCB to which line is allocated (switched line)
7B	LCBATC	1	Bin	Terminal unit block count (switched line)
7C	LCBOPC	1	Bit	Last operation code on BSCA:

Hex Value	*Symbol*	*Meaning*
80	LCBMVD	*Data moved* indicator on
40	LCBERP	Line is in ERP mode (ignore the data)
20	LCBRVI	Reverse interrupt indicator Send/receive reverse interrupt
Bits 4-7	—	Save area for CCP operation code
02	OPPUT	Put operation
01	OPGET	Get operation

7D-87	LCBADN	11	Mix	Line selection list (output only)
(7D)	LCBADL	1	Bin	Start of line selection list
(7D-7E)	LCBMRL	2	Bin	Increment area for message length (GET message only)
(7F-80)	LCBMIL	2	Bin	Original message input length (GET message only)
(81-82)	LCBMR@	2	Bin	Original message record address (GET message only)

Disp Hex	Label	Lng Dec	Form	Description
The following apply to BSCA auto-call switched lines only.				
(7D)	LCBTEL	1	—	Beginning of auto dial number
(7D-8B)	LCBTLC	15	Char	Auto-dial telephone number
(00)	STR#LN	1	—	Length of the STT entry
(01-nn)	STTPHN	nn	—	Phone number (label refers to leftmost byte.)

BSCA INPUT/OUTPUT BLOCK (IOB)

- IOB in process pointed to by LCB at hex 22.
- Length is 21 bytes (hex 15).
- First IOB in I/O area is pointed to by LCB at hex 0C.

Disp Hex	Label	Lng Dec	Form	Description
00-01	IOBNXT	2	Addr	Address of next IOB
02	IOBQ	1	Bin	SIO Q-byte of last operation:

Hex Value BSCA Line 1	BSCA Line 2	*Symbol*	*Meaning*
84	8C	DIALOP	Auto-dial
83	8B	RCVI	Receive initial
82	8A	TROP	Transmit and receive
81	89	RCVO	Receive only

03-04	IOBDBL	2	Bin	Data buffer length
05	IOBFLA	1	Bit	Flag byte:

Hex Value	*Symbol*	*Meaning*
80	ENQSNT	ENQ has been sent
40	INVACK	Invalid ACK received
20	TDLAY	Two-second timeout started
10	LSTBLK	Indicates last block for ITB and transparent modes

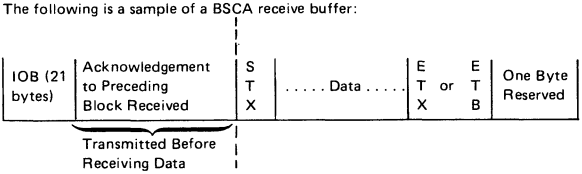
Disp Hex	Label	Lng Dec	Form	Description
05 (continued)				*Hex Value* / *Symbol* / *Meaning*: 08 EXCL Execute channel program 04 FIRST Indicates first-time logic in current file 02 DELAY Delay IOB bit 01 TXTSNT Data has been sent from this buffer
06	IOBLFG	1	Bit	Flag byte: *Hex Value* / *Symbol* / *Meaning*: C0 CONV Conversational file 80 INPUT Input file 40 OUTP Output file 20 ITBBIT ITB mode 10 TRANSP Transparent mode 08 GET Primary receive file 04 ATTCOD ASCII code 02 ATT78 Remote 2770 or 2780 01 ATTASM Assembler user
07	IOBCMP	1	Bin	IOB completion code: *Hex Value* / *Symbol* / *Meaning*: 88 ONLINE IOB being transmitted 84 READY IOB ready for transmit 80 PROC IOB in process 55 CMPADP Adapter check 54 CMPRSP Invalid response from remote device 53 CMPCON Lost connection 52 CMPLOS Lost data 51 CMPDC Data check 50 CMPTIM No response from remote device

Disp Hex	Label	Lng Dec	Form	Description
07 (continued)				*Hex Value* / *Symbol* / *Meaning*
				4F PRMER Permanent error
				4E LSTCNT Delay count exceeded
				4D INVCAL Invalid request
				4C NOCON No connection
				4B ASCERR Invalid ASCII character
				4A CMPIGN Request ignored
				49 NOACTV No active entry in poll/address list
				48 CMPOLT Invalid request for test (RFT)
				47 NODATA No data for conversational GET (null message received)
				46 CRPEND Conversational reply pending
				45 NORSP No response to poll/address
				44 NEGRES Negative response to poll/address
				43 NONTRY Invalid ID
				42 EOTRCV End of file
				41 CMPUER User error
				40 DONE Normal completion
				00 OPACC Request accepted
08-09	IOBDAT	2	Addr	Address of BSC data buffer
0A-0B	IOBSNS	2	Bin	Sense area:
(High-storage byte)				*Hex Value* / *Symbol* / *Meaning*
				02 DSR Data set ready
				80 TIMOUT Timeout error
				40 DATCHK Data check
				30 ADCHK Adapter check, receive
				20 TADCHK Adapter check, transmit
				08 ASCII Data contains invalid ASCII character
				06 LSTDIS Lost connection or disconnect
				04 — Abortive disconnect
				02 BSCABT Disconnect timeout

Disp Hex	Label	Lng Dec	Form	Description
0C	IOBERR	1	Bin	Retry count
0D-0E	IOBCAR	2	Addr	IOB current address register save area
0F-10	IOBTAR	2	Addr	IOB transition address register save area
11-12	IOBSAR	2	Addr	IOB stop address register save area
13-14	IOBDTF	2	Addr	Address of associated DTF

Receive Buffer

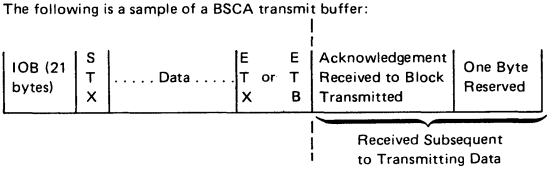
The following is a sample of a BSCA receive buffer:



Note: Each buffer contains one block of data.

Transmit Buffer

The following is a sample of a BSCA transmit buffer:



Note: Each buffer contains one block of data.

BSCA WORK AREA

- Pointed to by LCB at hex 2F.
- Preceded by eyecatcher WKA.
- Length is 179 bytes (hex B3).

Disp Hex	Label	Lng Dec	Form	Description
0-12	DLYIOB	19	Mix	BSC IOB used to send delay messages and termination sequences (DLYIOB includes WRKDTF)
13-14	WRKDTF	2	Addr	Address of the BSC DTF
15	BSRJF1	1	Bit	RJE indicator byte 1:

Hex Value	*Symbol*	*Meaning*
80	JF1RCI	RJE RCVI going
40	JF1TOS	RJE Timeout before RCVI
20	JF1ETR	RJE RCV only before writing EOT
10	JF1SOH	RJE Writing SOH-R-ETX
08	JF1SHD	RJE SOH-D sent
04	JF1WRT	RJE Writing EOT
02	JF1ETS	RJE EOT sent
01	JF1SHR	RJE SOH received

16	BSRJF2	1	Bit	RJE indicator byte 2:

Hex Value	*Symbol*	*Meaning*
80	JF2GET	Last file was an RJE receive file

17	BSPOL1	1	Bit	Polling indicator byte:

Hex Value	*Symbol*	*Meaning*
80	PL1POL	Polling being done
40	PL1EOT	Excessive record length data
20	PL1ACT	Active terminal in the list
10	PL1RES	Reset poll requested
08	PL1PAD	Off = addressing
04	PL1CNC	Cancel

Disp Hex	Label	Lng Dec	Form	Description
				Hex Value / *Symbol* / *Meaning*
17 (continued)				02 PL1CIH Common interrupt handler supported by this module
				01 PH1CHS Common interrupt handler being used during this job
18-19	WKLIST	2	Addr	Pointer to the current polling entry
1A	WKERRD	1	Bin	Error retry count
1B-1C	WKIOB@	2	Addr	Address of the last IOB
1D	BSFLG3	1	Bit	Flag byte:

Hex Value	*Symbol*	*Meaning*
80	F3RVI	RVI sent
40	F3SRVI	Sending RVI
20	F3OLTE	ERP disable for online test
10	F3HALT	Error post to DTF
08	F3OLT	Online test
04	F3MOVE	Data moved
02	F3RFTA	Online test allowed
01	F3AUTO	Auto response running

1E	WKPCT	1	Bin	Count of the times through the polling list
1F-20	@CC4BN	2	Addr	Address of common interrupt handler (Model 4)
21-22	ADRIOB	2	Addr	Address of the delay IOB used by interrupt and data management to locate BSC work area

Disp Hex	Label	Lng Dec	Form	Description
23	BSCFLG	1	Bit	Flag byte:

Hex Value	*Symbol*	*Meaning*
80	WTRTN	Signals wait to return via ARR after permanent errors (set by line initialization and close)
40	TTDRCV	Signals error recovery procedures that a TTD message was the last message received from a remote station
20	TROPID	Signals error recovery procedures to transmit and receive rather than receive only
10	ACTIVE	BSCA enabled
08	BSCDSC	Signals interrupt that a disconnect sequence is being effected by error recovery procedures (when this bit is on, interrupt reenters error recovery procedures at BSDISC)
04	FWDABT	Signals interrupt that a forward abort sequence is being effected by error recovery procedures (when this bit is on, interrupt reenters error recovery procedures at WRTEOT)
02	NEWBUF	Signals close that a new file is being opened, and that close should not disable the BSCA
01	ERRMSG	Used by error recovery procedures to force reading of an error message after an abort sequence

Disp Hex	Label	Lng Dec	Form	Description
24	ACKS	1	Bit	Flag byte:

Hex Value	Symbol	Meaning
80	NULSNT	NULL message has been sent and the data management is waiting for a conversational reply
40	AKDPF	DPF system
20	IDHALT	Invalid ID exchange has occurred
10	EOTRCD	Signals IOS that EOT has been received on a get file
08	SWICH	A switched line being used
04	AKERR	Error posted, line disabled
02	RCVACK	Alternating acknowledgments last received and last sent by this station
01	SNDACK	

Disp Hex	Label	Lng Dec	Form	Description
25	BSFLG2	1	Bit	Flag byte:

Hex Value	Symbol	Meaning
80	CLOSET	Close in progress
40	BADCAL	Invalid call by user
20	NULL78	Send NULL message for IBM 2770 or 2780
10	LG2LOG	Error already logged
08	RJEBIT	RJE is running
04	HLTY9	Issue Y9 halt from close
02	NAKSNT	NAK was the last message sent by this station
01	IDXCH	Signals wait to return to line initialization (after an error occurred during line initialization)

BSCA WORK AREA (Continued)

Disp Hex	Label	Lng Dec	Form	Description
26-27		2	Addr	Save area for the address of the new DTF on multiple file BSC jobs
28-29		2	Addr	Address of entry to interrupt
2A-2B		2	Addr	Address of entry to IOS
2C-2D		2	Addr	Address of entry to wait
2E-2F		2	C/S	Cylinder/sector address of close
30-31	ACKEVN	2	Bin	Even acknowledgment (constant)
32-33	ACK1	2	Bin	Odd acknowledgment (constant)
34-35	DLESTX	2	Bin	DLE STX sequence (constant)
36-37	SINEOT	2	Bin	SYN EOT sequence (constant)
38-39	WACK	2	Bin	WACK sequence (constant)
3A-3B	TTD	2	Bin	STX ENQ sequence (constant)
3C-3D	RVI	2	Bin	RVI sequence (constant)
3E-3F	DISCON	2	Bin	Disconnect sequence (constant)
40	ETBDC	1	Bin	ETB sequence (constant)
41	NAKDC	1	Bin	NAK sequence (constant)
42	PERCT	1	Bin	Constant for percent (%)
43-44	WKLICS	2	C/S	Cylinder/sector address of line initialization
45-46		2	Addr	Address of the VTOC read/write parameter list in either $$BSEL or $$BSMF statistic logging module
47		1	Bin	First character received
48		1	Bin	Second character received
49		1	Bin	Next to last character received
4A		1	Bin	Last character received
4B-4C	ZERO	2	Bin	Constant of 0
4D-4E	ONE	2	Bin	Constant of 1

Disp Hex	Label	Lng Dec	Form	Description
4F		1	Bin	2770-2780 blank
50		1	Bin	2770-2780 escape
51		1	Bin	2770-2780 space 1
52		1	Bin	2770-2780 space 2
53		1	Bin	2770-2780 space 3
54		1	Bin	2770-2780-device select 4
55-56		2	Bin	Terminal successful I/Os
57-58		2	Bin	Terminal unsuccessful I/Os
59		1	Bit	Display adapter indicator byte:

Hex Value	*Symbol*	*Meaning*
20	LDATT	Attachment check
10	LDTXT	Display adapter data received
04	LDAMCR	Microcode loaded successfully
02	LDADCK	Adapter check
01	LDASUP	Display adapter supported

5A-5B		2	C/S	Address of MLTERFIL for MLMP
5C-5D		2	Bin	Save area for record length when transmitting in ITB-transparent mode
5E-5F		2	Bin	Save area for TAR when transmitting in ITB-transparent mode
60-7B	STABLE	28	Mix	Error and statistics counters (each counter is two bytes long):

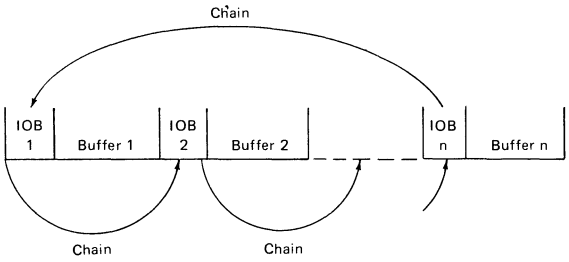
Symbol	*Meaning*
SNTTXT	Text blocks sent
RCVTXT	Text blocks received
NAKTBL	NAKs received
DATTBL	Data checks
FABTBL	Forward aborts received

Disp Hex	Label	Lng Dec	Form	Description
				Symbol *Meaning*
60-7B (continued)				ABRTBL Aborts received TADTBL Adapter checks on transmit ADTBL Adapter checks on receive INVTBL Invalid responses received ENQTBL ENQs received to ACKs sent LSTTBL Lost data errors LATBUF Disconnect timeouts and abortive disconnects TOTBL Receive timeouts DCOUNT Delay time count
7C-7F	DSENTD	4	Mix	Display message sent
80-81	ETABLE	2	Addr	Address of HPL/APL instruction in wait
82-83		2	—	Reserved
84-8B	ERLIST	8	Mix	Error logging parameter list
8C-90	HLTLST	5	Addr	Y7, Y8 halt parameter list
91-9E	OLTPRM	14	Mix	Save area for the online test parameters
9F-A0	TOLTCS	2	C/S	Cylinder/sector area for online test parameters
A1-AE	OLTSAV	14	Mix	Online test save and work area
AF-B2		4	Bin	Online test counter area

BSCA I/O AREA

- BSCA formats the allocated I/O area into IOBs and line buffers.
- Area starts at hex 22-23 in the BSCA LCB.

Organization of BSCA IOBs and Buffers in BSCA I/O Area



MLTA ADAPTER DTF

- Pointed to by $CCCOM at hex B9.
- Length is 33 bytes (hex 21).
- There is one adapter (DTF) per system.

Disp Hex	Label	Lng Dec	Form	Description
00	$MDDEV	1	Bin	Device ID—hex 28 for MLTA lines
01	$MDUP	1	Bit	UPSI U1-U8 customer controlled program switches
02	$MDAT1	1	Bit	File attribute byte 1
03	$MDAT2	1	Bit	File attribute byte 2
04-05	$MDCHA	2	—	Reserved
06-07	$MDCHB	2	Addr	DTF chain pointer—all DTFs
08-09	$MDARR	2	Addr	Address recall register save area
0A-0B	$MDXR1	2	Addr	Register 1 save area
0C-0D		2	—	Reserved
0E	$MDCMP	1	Bin	Completion code hex 41 for permanent MLTA error
0F-10	$MDUWA	2	Mix	User work area
11-12	$MDLNO	2	Bin	Adapter DTF; always hex 0000
13-14	$MDCMA	2	Addr	Address of the MLTA supervisor
15-16	$MDERA	2	Addr	Address of IBM error recovery routine
17-18	$MDUSA	2	Addr	Address of user interrupt level PCI processing routine
19-1A	$MDDEA	2	Addr	Address of user disaster exit subroutine
1B-20	$MDFIL	6	Char	Name of file containing the MLTA microcode

MLTA LINE CONTROL BLOCK (LCB)

- Pointer to first LCB in $CCCOM at hex B7.
- LCBs (MLTA and BSCA) are chained by address at hex 67 in LCB.
- Length is 125 bytes (hex 7D).
- There is one LCB for each MLTA line (maximum = 8).
- The LCB includes the MLTA line DTF.

Disp Hex	Label	Lng Dec	Form	Description
00	$MDDEV	1	Bin	Device ID—hex 28 for all MLTA lines
01	$MDUP	1	Bit	UPSI U1-U8
02	$MDAT1	1	Bit	File attribute byte 1:

Hex Value	*Symbol*	*Meaning*
80	$MAPCI	Allow PCI interrupts
10	$MATMI	Allow terminal to interrupt CPU transmission (receive interrupt feature)
08		Reserved
04	$MAILT	Inhibit timeout during text entry
02	$MATCF	Terminal control dependent flag
01	$MATCT	Terminal control type

03	$MDAT2	1	Bit	File attribute byte 2:

Hex Value	*Symbol*	*Meaning*
80	$MAUSR	Allow user PCI exit at interrupt level
40	$MAFUL	Full buffer ready for the user application program
20	$MAERP	Use MLTA error recovery procedure
10	$MARET	ERP has issued a retry on a read operation

Disp Hex	Label	Lng Dec	Form	Description
03 (continued)				*Hex Value* / *Symbol* / *Meaning*: 08 — Switch on after first buffer or a read 04 — $MAOLT — Allow online terminal test requests 02 — $MABSY — DTF busy 01 — $MAOPN — DTF opened
04-05	$MDCHA	2	—	Reserved
06-07	$MDCHB	2	Addr	DTF chain pointer—MLTA DTFs
08-09	$MDARR	2	Addr	Address recall register save area
0A-0B	$MDXR1	2	Addr	Register 1 save area
0C-0D	$MDBAA	2	Addr	Address of customer I/O buffer
0E	$MFCPC	1	Bin	Completion code: *Hex Value* / *Symbol* / *Meaning*: 82 — $MCPC2 — Full buffer with PCI 81 — $MCPC1 — Full buffer with PCI and read repeat issued by ERP 57 — $MCSKP — All skip bits are on in the check list, lines specified in the check list are closed, there is no activity on any line, or any combination of these conditions (last DTF in list only) 56 — $MCRET — No event complete and user requested return of control (last DTF in list only)

Disp Hex	Label	Lng Dec	Form	Description		
				Hex Value	*Symbol*	*Meaning*
0E (continued)				53	$MCOF6	No ERP specified, application program not able to process full buffer with PCI
				51	$MCUER	No ERP specified, operation failed
				50	$MCCSL	5471 Printer-Keyboard inquiry request (5471 printer-keyboard DTF only)
				4E	$MCCPS	©received with successful completion of a read and PCI was specified for the line DTF. Only one buffer segment is received after an ERP issued read operation.
				4C	$MCCP4	Successful completion of a read and PCI was specified for the line DTF. Only one buffer segment is received after an ERP-issued read operation.
				4B	$MCOF5	Program not able to process full buffer with PCI and the lost data error condition occurred
				4A	$MCCP3	EOT received and program not able to process full buffer with PCI, but data transmission completed without lost data. No error condition occurred.

Disp Hex	Label	Lng Dec	Form	Description		
				Hex Value	*Symbol*	*Meaning*
0E (continued)				49	$MCSDR	Current terminal address does not appear in the SDR table. The line has been closed.
				48	$MCCP2	Program not able to process full buffer with PCI, but data transmission completed without lost data and no error condition occurred.
				47	$MCOF4	Operation failed, line closed, loop test failed after a transmission or reception aborted error condition (This is a permanent line error.)
				46	$MCITP	Terminal interrupt
				45	$MCOF3	Operation failed, line closed, loop test ran successfully after a transmission or reception aborted error condition. (This is a permanent line error.)
				44	$MCTNR	Polled terminal not ready: Write Addressed terminals not ready Read Poll list completed with negative response
						Successful abort or transmit break.

Disp Hex	Label	Lng Dec	Form	Description
0E (continued)				*Hex Value* / *Symbol* / *Meaning*: 43 — $MCOF2 — Operation failed, line closed, loop test failed. (This is a permanent line error.) 42 — $MCEOT — EOT on receive (LRC terminals only). 41 — $MCOF1 — Operation failed, line open 40 — $MCCP1 — Normal completion of operation.
0F-10	$MDUWA	2	Mix	User work area
11-12	$MDLNO	2	Bit	Line number (bit significant) Bit 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 Line x x x x x x x x | 8 7 6 5 4 3 2 1
13-14	$MDCMA	2	Addr	Address of MLTA supervisor (this should be an address constant with a corresponding EXTRN) EXTRN MLTSP0 DC AL2 (MLTSP0)

Disp Hex	Label	Lng Dec	Form	Description
15	$MDOPC	1	Bin	Operation code:

Hex Value	*Symbol*	*Meaning*
29	$MWRTR	Write erase with reset
28	$MWTS	Write erase
27	$MWTLR	Write at line address with reset
26	$MWTL	Write at line address
25	$MWTVR	Write conversational and reset
24	$MWTV	Write conversational
23	MWTTR	Write continue and reset
22	MWTT	Write continue
21	$MWTIR	Write initial and reset
20	$MWTI	Write initial
1D	$MRTBR	Read full buffer with reset
1C	$MRTB	Read full buffer
1B	$MRTRR	Poll request and reset
1A	$MRTR	Poll request
18	$MRTS	Read skip
17	$MRTPR	Read repeat and reset
16	$MRTP	Read repeat
15	$MRTVR	Read conversational and reset
14	$MRTV	Read conversational
13	$MRTTR	Read continue and reset
12	$MRTT	Read continue
11	$MRTIR	Read initial and reset
10	$MRTI	Read initial
09	$MWTN	Write negative acknowledgment
08	$MWTA	Write positive acknowledgment
07	$MCTSF	Set skip bit off in poll list
06	$MCTSN	Set skip bit on in poll list
05	$MWTDS	Write disconnect

Disp Hex	Label	Lng Dec	Form	Description
15 (continued)				*Hex Value* / *Symbol* / *Meaning*: 04 $MCTBO Program-initiated online test request 03 $MCTLT Loop test 02 $MCTTO Timeout 01 $MCBRK Transmit break 00 $MCABT Abort current operation
16	$MDOSC	1	Bin	Open status code/open start code: *Hex Value* / *Symbol* / *Meaning*: 32 $MOIIS Invalid instruction sequence. Read continue (RTT), write continue (WTT), or read repeat (RTP) issued incorrectly 2E $MOBSE Buffer too short for program-initiated online test, or switched line not connected 2C $MOSKP No match found in polling list for CTSN or CTSF operation 28 $MOER Zero length specified for write 24 $MOBDC Non-MLTA DTF specified in the DTF device code 20 $MOABN Abort or transmit break operation not accepted because the line was not busy.

Disp Hex	Label	Lng Dec	Form	Description

Hex Value	Symbol	Meaning
16 (continued)	1C	$MOABE	Transmit break operation not accepted because of an attempt to issue transmit break after a control or write operation

Abort operation not accepted because:

- Abort is not supported for this operation.
- This is an initial operation on a switched line and connection has been made.
- The current operation is one of the following read operations and data has been received at the CPU.

Terminal Configuration	Operation Code
1050	RTI,RTIR,TRV,RTVR, RTR,RTRR
1050D	RTV,RTVR
2740S	RTI,RTV
2740B	RTI,RTV
2740D	RTV
2740C	RTI,RTIR,RTV, RTVR
2740DC	RTV,RTVR
2740SC	RTI,RTIR,RTV, RTVR

Hex Value	Symbol	Meaning
18	$MOCTE	Current polling list index too large
14	$MOASO	All polling list skip bits on
10	$MOUOP	Unsupported operation code or unsupported program initiated online test

Disp Hex	Label	Lng Dec	Form	Description		
				Hex Value	*Symbol*	*Meaning*
16 (continued)				0C	$MOIOP	Invalid operation code
				08	$MOBSY	Line is busy
				04	$MONOP	Line DTF not open
				00	$MOCPL	Operation started successfully
				Open definitions:		
				AC	$MOANO	Adapter DTF not open at line open
				A4	$MOENL	Could not enable line
				AO	$MOBTS	Logical record length less than 16 bytes
				9C	$MOLAO	This line already open
				98	$MOERT	PCI exit or standard ERP was specified, but the respective address field in the adapter DTF contains hex FFFF.
				94	$MOIEX	Invalid transfer vector for terminal features specified
				90	$MORTS	I/O buffer area too small
				8C	$MOILN	Invalid line number
				88	$MOEXT	Line DTF not opened because UPSI is not on in the system switch byte (UPSI did not appear in the // SWITCH statement.)
				84	$MOOPL	User provided address is outside of partition limits
				00	$MOCPL	Open completed successfully

Disp Hex	Label	Lng Dec	Form	Description
				Hex Value — *Symbol* — *Meaning*
				Close definition:
16 (continued)				A8 — $MODSL — Could not disable line
				00 — $MOCPL — Close completed successfully
17	$MDTTP	1	Bin	Terminal type:
				Hex Value — *Symbol* — *Meaning*
				03 — 2741
				02 — 2740
				01 — 1050
18	$MDTFT	1	Bit	Terminal features byte 1:
				Hex Value — *Symbol* — *Meaning*
				80 — $MTTRC — Transmit control
				40 — $MTINT — Transmit interrupt
				20 — $MTLRC — Longitudinal record checking
				10 — $MMDNT — Switched line
				08 — $MTBPS — Line speed of 600 bps
				04 — $MTPLT — Station control
				01 — MMAUP — MLTA has auto-poll
19	$MDTFR	1	Bit	Terminal features byte 2:
				Hex Value — *Symbol* — *Meaning*
				80 — $MTBFR — Buffer receive
				40 — $MTRSP — Test second byte of addressing response
1A	$MDTCT	1	Bit	Transmission code type:
				Hex Value — *Meaning*
				02 — Correspondence code
				01 — PTTC code

MLTA LINE CONTROL BLOCK (LCB) (Continued)

Disp Hex	Label	Lng Dec	Form	Description
1B	$MDRLM	1	Bin	Maximum error retry limit
1C-1D	$MDBSL	2	Bin	Length of each buffer segment (preopen)
1C-1D	$MDLNF	2	Bin	Receive length count and flags (postopen)
1E-1F	$MDBAL	2	Bin	Length of user receive area (This is the amount of storage the user has allocated at TDFBA@)
20-21	$MDCRL	2	Bin	Current record length
22-23	$MDCRA	2	Addr	Address of current record
24-25	$MDPBA	2	Addr	Address of PCI buffer
26-27	$MDPBL	2	Bin	Length of PCI buffer
(26)	$MDOLC	1	Bin	Program initiated online test control byte
(27)	$MDOLR	1	Bin	Program initiated online test start byte
28-29	$MDLPA	2	Addr	Address of last PCI buffer
2A-2B	$MDDIA	2	Addr	Address of transfer vector table for I/O operations
2C-2D	$MDDLA	2	—	Reserved
2E-2F	$MDEBA	2	Addr	Address of statistical data recording (SDR) table
30	$MDEBC	1	Bin	Number of SDR table entries
31	$MDMOD	1	Bit	MLTA mode at time of error:

Hex Value	*Meaning*
80	Receive PCI buffer overrun:
40	1 = Lowercase shift; otherwise, uppercase shift
Bits 2-3	00 = Control mode 01 = Transmit mode 10 = Receive mode

Disp Hex	Label	Lng Dec	Form	Description
32	$MDSN6	1	Bit	HDB6 sense byte:

Hex Value	*Symbol*	*Meaning*
80	$MSOUT	Timeout
40	$MSDCK	Data check
20	$MSTAB	Transmit abort
10	$MSRAB	Receive abort
08	$MSOVR	Overrun
04	$MSINT	Terminal interrupt
02	$MSNOP	No operation performed
01	$MSLDT	Lost data

Disp Hex	Label	Lng Dec	Form	Description
33	$MDSN7	1	Bit	HDB7 sense byte:

Hex Value	*Symbol*	*Meaning*
80	$MSMNR	Modem not ready
10	$MSLNR	Line not ready
Bits 5-7		SIO N-code

34-35	$MDEXP	2	Mix	Expansion area
36-37	TDFEC@	2	Addr	Address for error recovery control
38	TDFFL1	1	Bit	IOCS flag byte 1:

Hex Value	*Symbol*	*Meaning*
80	FL1ERC	Add 1 to error count for each 2740 Model 2.
40	FL1PER	Permanent line error online, otherwise; terminal error. (This switch applies only when a permanent error has occurred.)
20	FL1AUP	Auto-poll switch to first SIO
10	FL1EOB	End of block transmitted (expect LRC reply)

Disp Hex	Label	Lng Dec	Form	Description
38 (continued)				*Hex Value* / *Symbol* / *Meaning* 08 FL1ABT Abort operation code specified 04 FL1LTF Loop test failure indicator 02 FL1FBS First buffer switch 01 FL1POA Poll
39	TDFFL2	1	Bit	IOCS flag byte 2: *Hex Value* / *Symbol* / *Meaning* 40 FL2ENA Line enabled 20 FL2OLP Program requested online test 08 FL2OLT Online test in progress
3A	TDFFL3	1	Bit	IOCS flag byte 3: *Hex Value* / *Symbol* / *Meaning* 80 FL3CHK Check has called close 40 FL3SDR No SDR search for this operation 20 FL3EOA EOA received at start of message 10 FL3LTP Test mode enabled for loop test
3B-3C	TDFPC@	2	Addr	Address of program control return from interrupt routine
3D-3E	TDFFI@	2	Addr	Address of first IOB
3F-40	TDFCI@	2	Addr	Address of current IOB
41-42	TDFSC@	2	Addr	Address of current entry in SDR table
43	TDFEQA	1	Char	(D) (end of address)

Disp Hex	Label	Lng Dec	Form	Description
44	TDFYES	1	Char	(Y) (positive response)
45	TDFEPC	1	Bin	Event completion code (internal)
46	TDFCOP	1	Bin	IOCS copy of the user's operation code
47-4C	TDFIOB	6	Mix	IOCS work IOB
4D-4E	TDFHDB	2	Bin	High density buffer positions 8 and 9
(4D)	TDFHD8	1	Bin	PCI/receive length
(4E)	TDFHD9	1	Bin	HDB flag
4F	$MDOLT	1	Bit	Bit pattern for start of online test requested on this line
50	TDFERP	1	Bit	Error recovery status switches:

Hex Value	*Meaning*
80	ERP has been called.

51-53	$MDPER	3	Bin	Permanent error recording area
(51)	$MDPE0	1	Bit	High density buffer 0:

Hex Value	*Meaning*
80	PCI overrun
40	Uppercase
20	Text-in mode
10	Text-out mode
Bits 4-7	Bit time count field

(52)	$MDPE6	1	Bit	High density buffer 6:

Hex Value	*Meaning*
80	Timeout
40	Data check
20	Transmit abort
10	Receive abort
08	Overrun
04	Terminal interrupt
02	No operation performed
01	Lost data

Disp Hex	Label	Lng Dec	Form	Description
(53)	$MDPE8 or $MDPE7	1	Bit	High density buffer 7: *Hex Value* — *Meaning* 80 — Switch line disconnected 10 — 2740 M2 busy with write (CORR) 08 — 2740 M2 busy with write (PTTC) 04 — 2740 M2 in bid status 02 — 2740 M2 in enter status
54-5D	TDFWRK	10	Mix	Work area
(58-59)	$MDRSP	2	Char	Response from addressing 2740 Model 2
Device Dependent Section				
5E	$MDCTN	1	Bin	Current terminal number in polling list
5F-60	$MDPLA	2	Addr	Address of polling list
61-62	$MDTMA	2	Char	Terminal address and component number (in line code): Read — Address of the terminal from which text was received Write — Address of the terminal to which text is to be transmitted
63-64	$MDCEA	2	Addr	Address of current entry in polling list (it indicates last terminal that responded)
65-66	LCBPLQ	2	Addr	Address of first parameter list in the line queue
67-68	LCBCHN	2	Addr	LCB chain address
69	LCBATA	1	Bit	Attribute byte A: *Hex Value* — *Meaning* 80 — Ignore op end Reopen line

Disp Hex	Label	Lng Dec	Form	Description
6A	LCBELC	1	Bin	Translate table address (line code to EBCDIC)
6B		1	—	Reserved
6C	LCBLCE	1	Bin	Translate table address (line code to uppercase EBCDIC)
6D		1	—	Reserved
6E	LCBLLE	1	Bin	Translate table address (line code to lowercase EBCDIC)
6F	LCBOLT	1	Bin	Polling online test count (running and pending) on this line
70	LCBATR	1	Bit	Line control block attribute byte:

Hex Value	*Symbol*	*Meaning*
80	LCBNIT	Successful operation on this line (line connected switched)
40	LCBOBR	Online test
20	LCBGNN	GETMAIN needed for the line queue
10	LCBSTP	Abort issued to stop the read
08	LCBSWL	Ignore input from next read operation
04	LCB1PL	Put next parameter list for this line at top of line queue
02	LCBTBK	Ignore data for the read operation (set for 2741 read initial, when a write is the first operation requested)
01	LCBTIM	LCB allocation pending.
0A		Ignore next op end whether input or output

MLTA LINE CONTROL BLOCK (LCB) (Continued)

Disp Hex	Label	Lng Dec	Form	Description
71-72	LCBBFL	2	Bin	Length of data area in line buffer
73-74	LCBMCL	2		Reserved
75-76	LCBIBL	2	Bin	Length of current invite input buffer for this line
77-78	LCBIBA	2	Addr	Address of invite input buffer
79-7A	LCBTCB	2	Addr	Address of TCB to which line is allocated (switched line)
7B	LCBATC	1	Bin	TUB count (switched line)
7C	LCBWTC	1	Bit	World Trade terminal type byte:

Hex Value	*Meaning*
02	5390 WTC terminal
01	2970 WTC terminal

MLTA POLLING LIST

The polling list is pointed to in LCB at hex 5F-60. The polling list is preceded by three parameter bytes, and followed by three bytes indicating end of list. The format of the polling list is:

Parameter Bytes

Byte	Bit	Field Description
1		Index byte
	0	Skip flag (must be set on)
	1	Wrap list indicator
	2	Timeout indicator (used only with wrap list)
	3-7	Reserved
2		Timeout value
3		Number of entries in the polling list

Poll Entries

Byte	Bit	Field Description
1		Index byte
	0	Skip flag (indicates not to poll this entry)
	1-7	Polling list entry number (1-127) (must be consecutively numbered for each entry)
2		Terminal address
3		Component selection (1050), space character (other terminals)

Each poll entry must contain an index byte, a terminal address character, and a component selection character. If component selection is not required, a space character must be used for the third byte of the entry. The entry numbers of the index bytes are consecutively numbered beginning with 1.

End-of-List Bytes

Byte	Bit	Field Description
1		Hex FF (end of list indicator)
2		Reserved
3		LRC answer code to be inserted by the MLTA IOCS for read repeat (RTP) and read continue (RTT) (with auto poll)

MLTA IOCS IOB

- First IOB in chain pointed to in LCB at hex 3D.
- Current IOB pointed to in LCB at hex 3P.
- IOBs chained by pointer at hex 06.
- Length is 12 bytes (hex 0C).

Disp Hex	Label	Lng Dec	Form	Description
00	IOBQBT	1	Bin	SIO Q-byte
01	IOBCTL	1	Bin	Control byte for SIO command
02-03	IOBCAB	2	Addr	Current address register save area or interval timeout
04-05	IOBTAB	2	Addr	Transition address register save area
06-07	IOBNX@	2	Addr	Address of next IOB
08-09	IOBBS@	2	Addr	Address of data buffer start
0A-0B	IOBBE@	2	Addr	Address of data buffer end

MLTA IOCS COMMON AREA

- Located at MLTSP0 in module $$MLD1. (See generation listing.)
- Length is 163 bytes (hex A3).

Disp Hex	Label	Lng Dec	Form	Description
00	COMTRA	1	Bin	Trace control switch
01-02	COMI0	2	Bin	Two-byte binary zero constant
03	COMI1	1	Bin	Two-byte binary one constant
04-05	COMI2	2	Bin	Two-byte binary two constant
06-07	COMI3	2	Bin	Two-byte binary three constant
08-09	COMFFF	2	Bin	Two bytes with all bits on

MLTA IOCS COMMON AREA (Continued)

Disp Hex	Label	Lng Dec	Form	Description
0A	COMSWT	1	Bit	Common switch:

Hex Value	*Meaning*
80	PCI interrupt indicator
40	Last operation does not have a current address buffer address
20	Reserved
10	Close disaster error exit switch
08	Close print call switch
04	Open/close halt call switch
02	Loop test in progress
01	Adapter has been disabled

0B	COMPCI	1	Bin	PCI count for check

Some of the following fields are used by the adapter open operation after the program is loaded. The fields contain the address of instructions where the adapter open operation stores the cylinder/sector address of the transients. After the first time the adapter open operation is performed, these fields are used for other data.

0C-0D	COMDTF	2	Addr	DTF save area for open/close
0E-0F	COMPRT	2	Addr	Address of the interrupt priority table
10-11	COMERP	2	Addr	Address of the MLTA ERP routine
12-13	COMARR	2	Addr	Interrupt level ARR save area
14-15	COMXR2	2	Addr	Storage used by the interrupt level to save the contents of XR2 for the program level
16-17	COMPSR	2	Bit	Storage used by the interrupt level to save the PSR for the program level
18-19	COMPS@	2	Addr	Partition start address
1A-1B	COMPE@	2	Addr	Partition end address
1C-1D	COMIR3	2	Addr	Address of the interrupt level 3 entry
1E-1F	COMLOG	2	Addr	Address of the work area for the permanent error message buffer
20-21	COMCSA	2	C/S	Error file cylinder/sector address
22-23	COMSP@	2	Addr	Address of the branch instruction to the user PCI code at the interrupt level

MLTA IOCS COMMON AREA (Continued)

Disp Hex	Label	Lng Dec	Form	Description
24-26	COMWRK	3	Mix	Work area
27-28	COMADP	2	Addr	Address of the adapter DTF
29-2A	COMEN@	2	Addr	Address of the halt routine
2B-31	COMHLT	7	Mix	Halt parameter list
32-33	COMOA@	2	Addr	Address of the adapter DTF address saved by the open routine
34-35	COMCAB	2	Addr	Current address buffer
36-37	COMTAB	2	Addr	Transition address buffer
38-39	COMCHR	2	Char	Last two characters in buffer
3A-3B	COMSRC	2	Bin	Line source that caused the interrupt
3C-3D	COMSP1	2	Addr	Address of the start I/O routine used by open/close to issue I/O operations
3E-3F	COMIO@	2	Addr	Address of the I/O entry routine used by online test to issue I/O operations
40-41	COMCL@	2	Addr	Address of the end-of-job close
42-43	COMCK@	2	Addr	Address of the check routine entry point
44-49	COIOB1	6	Char	Exits interrupt level or transmits delete characters to terminals using PKC
4A-4F	COIOB2	6	Char	Transmits delete characters after a switched network is connected and before any text is sent.
50-5E	COMDEL	15	Char	Fifteen delete characters used by I/O modules for switched network connection timing and to keep the line active after a write operation for non-LRC terminals
5F-9E	INTPRT	64	Mix	Interrupt priority tables which can contain up to 16 entries, each comprised of a bit significant line number (two bytes) followed by the line DTF address (two bytes) (a line DTF address of hex FFFF indicates the line is closed.)
9F-A0	COMSV1	2	Addr	Save area for program level 1 IAR
A1-A2	COMSV2	2	Addr	Save area for program level 2 IAR

CONTENTS DIRECTORY ENTRY (CDE)

- Pointer to first entry in $CCCOM at hex 2C.
- Entry length is 24 bytes (hex 18).
- Entries occupy contiguous storage.

Disp Hex	Label	Lng Dec	Form	Description
00-05	CDENAM	6	Char	Object module program name
06-07	CDECS	2	C/S	C/S of user program
08	CDE#S	1	Bin	Number of text sectors of program
09-0A	CDELNK	2	Addr	Program link-edit address
0B	CDERLD	1	Disp	Displacement of the relocation directory in the last text sector
0C-0D	CDEENT	2	Addr	Program entry point address
0E-0F	CDELOD	2	Addr	Program load address
10	CDELNG	1	Bin	Program length: Number of 256-byte blocks
10-11	CDESIZ	2	Bin	Program length: Number of bytes
12	CDEATR	1	Bit	CDE attribute byte 1:

Hex Value	*Symbol*	*Meaning*
80	CDEDAT	Input data allowed on program request.
40	CDECOR	Main storage addressed by CDELOD (Program load address is allocated.)
20	CDEDPL	Program requires dedicated program level.
10	CDEMTS	Program supports multiple requesting terminals.
08	CDENEP	Program is never-ending.
04	CDESER	Program is serially reusable.
02	CDETCB	The contents directory entry belongs to a TCB (that is, program currently executing).

Disp Hex	Label	Lng Dec	Form	Description
13	CDEAT2	1	Bit	CDE attribute byte 2:

Hex Value	*Symbol*	*Meaning*
40	CDESDB	DSM shared I/O buffering in use
20	CDEPAK	Program location (pack) on DSM pack; otherwise, CCP production pack
10	CDEEMG	Issue end/release message
08	CDECOM	Program requires common area

14	CDEFDT	1	Bin	Number of 256-byte blocks in the longest display format facility file descriptor table
15	CDEDFF	1	Bin	Size of program appended storage (PAS) for display format facility in number of 256-byte blocks (This byte is zero if the display format facility is not used.)
16-17	CDESTA	2	Disp	Offset to program use count table entry

STATISTICAL DATA RECORDING (SDR) TABLE

The SDR table is pointed to in LCB at hex 2E-2F. The SDR table holds the SDR statistics. Each line DTF contains the address of this table (field TDFEB@) and a count of the number of entries in the table (field TDFEBC). Each entry in the table is five bytes long. The first byte of each entry is the communication terminal address in uppercase notation. For point-to-point lines, the terminal address is hex 80. The remaining four bytes of each entry are set to zero at open time. The format for each entry of the SDR table is:

MLTA
IOCS

Field Name	Byte	Field Description
SDRCT@	1	Communication terminal address
SDRCER	2	Number of errors (permanent and temporary)
SDRCIO	3-4	Number of successful read/write operations
SDRERC	5	Error retry count for this operation

COMMUNICATIONS PARAMETER LIST

- Located within the user's program.
- Current or last CPL pointed to by TCB at hex 17.
- Length is 16 bytes (hex 10).

Disp Hex	Label	Lng Dec	Form	Description
00-01	PLRTC	2	Bin	Return code passed to user program
(00-01)	PLCHN	2	Addr	Address of next parameter list on chain of outstanding requests
02	PLOPM	1	Bit	Operation code modifier:

Hex Value	*Symbol*	*Meaning*
80	OPREQR	User request; otherwise, system request
40	OPOLT	(To a terminal) system operator initiated online test
40	OPCIOW	(To the console) do not let non-console CCP run until all console output is complete
20	OPDISC	Disconnect switched line
10	OPNFG	Record area not freed from program request
08	OPLIST	3270 DFF special list
04	OPSTOP	Stop operation specified in parameter list
02	OPSOL	Suppress start new line; otherwise, ensure typewriter terminal begins output at a new line
01	OPEOL	Suppress end new line; otherwise, ensure typewriter terminal ends the output at the start of a new line

Disp Hex	Label	Lng Dec	Form	Description
03	PLOPC	1	Bin	Operation code:

Hex Value	*Symbol*	*Meaning*
FX	OPXCLM	Precede console output with exclamation point
80	OPJRSH	Reschedule only request
70	OPRUF	3270 read under format control
52	OPEAU	3270 EAU
42	OPCOPY	3270 copy
3X	OPMSG	Unit of data message
2X	OPBLK	Unit of data block
0X	OPSTD	Unit of data record
1A	OPKPL	On release, keep the line on
19	OPSTA	On acquire, set attributes
11	OPRVI	On get, send RVI
08	OPSTAT	Status operation
04	OPNOW	No wait operation
02	OPPUT	Output operation
01	OPGET	Input operation

04-05	PLOUTL	2	Bin	Output length
(04-05)	PLEFFL	2	Bin	Effective input length
(05)	PLASID	1	Char	Terminal attribute set identification character (hex)
06-07	PLINL	2	Bin	Maximum input length
08-09	PLRECA	2	Addr	Record area address
(08-09)	PLDATA	2	Addr	Data area address
0A-0B	PLTUBA	2	Addr	Terminal unit block address
(0A-0B)	PLTCBA	2	Addr	Task control block address

Disp Hex	Label	Lng Dec	Form	Description
0C	PL$OPM	1	Bits	Internal operation code modifier:

Hex Value	*Symbol*	*Meaning*
80	OPGETM	(For a terminal) requires successful GETMAIN before the invite input can be started (For the console) GETMAIN failed for put nowait, which is scheduled as a put wait
40	OPKONS	Request to the console
20	OPNPST	Do not post upon end of operation associated with this parameter list.
10	OPBNOP	BSCA no post upon ERP op end
04	OPNOW	No wait operation
02	OPPUT	Output operation
01	OPGET	Input operation

Disp Hex	Label	Lng Dec	Form	Description
0D	PL$OPC	1	Bits	BSCA internal operation code modifiers:

Hex Value	*Symbol*	*Meaning*
80	OPRFSH	Send refresh message to 3270
40	OPLSNS	Poll for terminal status
20	OPUSER	System function; otherwise, user function
10	OPSTCM	Stop invite has been handled for this parameter list

COMMUNICATIONS PARAMETER LIST (Continued)

Disp Hex	Label	Lng Dec	Form	Description
(0D)	PL$MCT	1	Bits	Multicomponent terminal indexes: *Bit* *Meaning* 0-3 Index of 1050 input component 4-7 Index of 1050 output component
0E-0F	PL$RTC	2	Bin	Internal return code area
(0E-0F)	PL$TNT	2	Addr	Address of terminal name table entry

GETMAIN/FREEMAIN PARAMETER LIST

This list is built within the program calling GETMAIN/FREEMAIN:

Disp Hex	Label	Lng Dec	Form	Description
00-01	GMADDR	2	Addr	Address of the leftmost byte of the segment: GETMAIN: Address of allocated segment is returned here (hex 0000 if no segment could be allocated) FREEMAIN: Address of segment to free is specified here.
02-03	GMSIZE	2	Bin	Length (in bytes) of the segment: GETMAIN: Segment length required is specified here. FREEMAIN: Length of segment to be freed is specified here.

Disp Hex	Label	Lng Dec	Form	Description

Main Storage Control Block (SCB)

- Two SCBs are normally in main storage.
- The TP buffer SCB is in $CCCOM at hex displacement 4A-53.
- The user program area SCB is in $CCCOM at hex displacement 56-5F.

00-01	SCBCHN	2	Addr	Address of leftmost byte of first free segment, or, if no free segment, hex 0000 (initially, address of first byte of storage pool)
02-03		2	Bin	Always hex 0000
04-05	SCBLO	2	Addr	Address of first byte of storage pool
06-07	SCBHI	2	Addr	Address of last byte of storage pool plus 1
08-09	SCBMAX	2	Bin	Length in bytes of largest free segment (initially, length in bytes of storage pool)

Free Segment Control Block

Located in the first 4 bytes of a free area of main storage:

00-01	SEGCHN	2	Addr	Address of first byte of next free segment, or, if no free segment beyond this, hex 0000
02-03	SEGLEN	2	Bin	Length in bytes of this segment, including the four bytes occupied by this control block

STANDARD PARAMETER LIST

- Used by COBOL, FORTRAN, Assembler.
- Set up within calling program.

Disp Hex	Label	Lng Dec	Form	Description	
00-01	–	2	Bin	Return code	
02-03	–	2	Bin	Operation code	
04-05	–	2	Bin	Output Operations	Length of data to be transmitted (not including line control or symbolic terminal name)
				Input Operations	Effective input length calculated by CCP (including record separators, but not including line control, symbolic terminal name, backspace, or truncated data
				Return Code Hex 08 Present	Number of outstanding invite inputs calculated by CCP
				Acquire Terminal and Changing Attributes	Desired terminal attribute set
				Release Terminal Operation	Number of outstanding invite inputs
06-07	–	2	Bin	Maximum input length (excluding symbolic terminal name)	
08-09	–	2	Addr	Record area address	
0A-0F	–	6	Mix	CCP work area	

USER RECORD AREA

Pointed to at hex 08-09 in the user parameter list in SUBR91, 92, and 93.

Disp Hex	Label	Lng Dec	Form	Description
00-05		6	Char	Symbolic terminal name
06-nn		nn		Data area
User Record Area for RPG II Output				
00-03	OPCODE	4	Bin	Operation code and modifier
04-07	OUTLNG	4	Bin	Output length, including first 14 positions in record area plus all data (Terminal attribute set ID if acquire operation)
08-0D	TNAME	6	Char	Symbolic name of terminal for which operation is intended (blanks if for requester of SR program)
0E	DATA	nn	Char	Data
User Record Area for RPG Input				
00-01	INRTC	2	Bin	Input return code 00-11
02-03	OUTRTC	2	Bin	Return code for last output operation (blanks if not a combined file or if the array is not used for both an output and an input file)
04-07	EFFL	4	Bin	Effective input length/number of outstanding invite inputs (The effective input length reflects the actual data length, not including the first 14 positions of the input record area.)
08-0D	TNAME	6	Char	Symbolic name of the terminal from which the data was received
0E	DATA	nn	Char	Data as received from the terminal
(0E)	AID	1	Char	If DFF is used with a 3270 terminal and this operation is not an accept input for data with a program request, the first data position contains the attention ID (AID) character.

- For subroutine 91, 92 linkage.
- Pointed to by DTT on input.
- Pointed to by DTF on output.

Disp Hex	Lng Dec	Lng Form	Description
For SUBR91 a 4 x 6 array (all data EBCDIC):			
00-03	4*	–	Not used, start first element
04-05	2	Bin	Return code
06-07	2	–	Not used, start second element
08-0B	4	Bin	Operation code
0C-0D	2	–	Not used, start third element
0E-11	4	Bin	See hex 04 in standard parameter list
12-13	2	–	Not used, start fourth element
14-M	4	Bin	Maximum input length (data only)
For SUBR92 a 5 x 6 array (all data EBCDIC):			
00-01	2	–	Not used, start first element
02-03	2	Bin	Input return code
04-05	2	Bin	Output return code
06-07	2	–	Not used, start second element
08-0B	4	Bin	Operation code
0C-0D	2	–	Not used, start third element
0E-11	4	Bin	See hex 04 in standard parameter list
12-13	2	–	Not used, start fourth element
14-17	4	Bin	Maximum input length (data plus 14)
18-1D	6	Char	Symbolic terminal name, fifth element

SECTOR QUEUE BLOCK (SQB)

- Pointer to first entry in $CCCOM at hex 34.
- Entry length is 12 bytes (hex 0C).

Disp Hex	Label	Lng Dec	Form	Description
00-01	SQBIOB	2	Addr	Address of owning input/output block
02-03	SQBTCB	2	Addr	Address of owning task control block
04	SQBQB	1	Bin	Device Q-byte
05-07	SQBBEG	3	C/S C/H/R	Starting C/S (left-justified) (5444) Starting cylinder/head/record (left-justified) (5445)
08-0A	SQBEND	3	C/S C/H/R	Ending C/S (left-justified) (5444) Ending cylinder/head/record (left-justified) (5445)
0B	SQBFLG	1	Bits	Flag byte:

Hex Value	*Symbol*	*Meaning*
80	SQBOWN	Sector enqueue block is owned (active)
40	SQBFRE	Sector enqueue block is free (inactive)
20	SQBLST	Last sector enqueue block in table

SEGMENT CONTROL BLOCK (SCB)

This four-byte segment control block precedes each assigned or unassigned area in the teleprocessing buffer. Bytes 1 and 2 are a pointer to the next free segment (or hex 0000 if the last free segment) if the block of main storage is unassigned. If assigned, bytes 1 and 2 point to the start of the segment control block.

Disp Hex	Label	Lng Dec	Form	Description
00-01	SEGCHN	2	Addr	Address of first byte of next free segment (If no free segment beyond this, then hex 0000.)
02-03	SEGLEN	2	Addr	Length in bytes of this segment, including the four bytes occupied by this control block

SHORT DISK DTF (SDF)

- Pointer to first SDF in $CCCOM at hex 3E.
- Other entries chained in SDF at hex 00.
- Length is 47 bytes (hex 2F).

Disp Hex	Label	Lng Dec	Form	Description
00-01	DFNDTF	2	Addr	Address of next short DTF
02-03	DFCHN	2	Addr	Origin of queue of the open user DTF
04-0B	DFNAME	8	Char	File name
0C	DFUSE	1	Bits	File use indicators (Each bit corresponds to a user task control block that is currently using the file.) *Hex Value* — *Meaning* 80 Task 8 40 Task 7 20 Task 6 10 Task 5 08 Task 4 04 Task 3 02 Task 2 01 Task 1
0D	DFADD	1	Bits	File add indicators (Each bit corresponds to a user task control block that is currently adding to the file. All bits on indicates that the user does not share.)
0E	DFATT	1	Bin	File attributes and status indicators: *Hex Value* — *Symbol* — *Meaning* 80 DFNCUR Current file user makes the file nonreusable. 40 DFNPND A pending nonreusable request exists for the file.

Disp Hex	Label	Lng Dec	Form	Description		
				Hex Value	*Symbol*	*Meaning*
0E (continued)				20	DFNR4	Program request has processed, through the disk file requirements in $CC4R4, a request that makes the file nonreusable. If the rest of the request is good, the bit DFNPND is turned on by $CC4R6 and this bit turned off. Else it is turned off by $CC4PR.
				10	DFTAPP	Allocation needs this file when termination deallocates it.
				08	DFXAPP	Allocation requires exclusive use of this file when termination deallocates the last user.
				04	DFAAPP	Allocation wants the file for an ADD to the file when the program currently adding to the file terminates.
				03	DFLOD	File is indexed load.
				02	DFINX	File is indexed.
				01	DFDIR	File is direct.
				Bits 6-7		Mode of CCP open: 00 Consecutive 01 Direct 10 Indexed random 11 Indexed load

Disp Hex	Label	Lng Dec	Form	Description
0F	DFFLA	1	Bits	

Hex Value	*Symbol*	*Meaning*
80	DFORDL	This file can only be opened for ordered indexed load.
08		File can be opened for input.
04		File can be opened for output.
02		File can be opened for update.
01		File can be opened for add.

10	DFDEV	1	Bin	Device Q bytes
11	DFSWA	1	Bin	Scheduler work area value saved for DSM close
12-13	DFRCL	2	Bin	Record length
14-15	DFADTF	2	Addr	Address of the user DTF that is currently adding to the file
16-17	DFXTA	2	C/S	Start extent C/S direct or sequential files
18-19	DFXTB	2	C/S	End extent C/S for indexed or sequential files

5444/5447 Disk Drive

(1A-1C)	DFEOF	3	Bin	End-of-file C/S/D for a direct file
1A-1D	DFNXR	4	C/S/D/D	Next record cylinder/sector/long displacement
1E	DFKL	1	Bin	Key length
1F-20	DFKD	2	Bin	Key displacement
21-22	DFKXA	2	C/S	Start of indexed C/S for indexed files
23-25	DFNXK	3	C/S/D	Next index record in file C/S/D
26-27	DFKXB	2	C/S	End of index portion C/S

Disp Hex	Label	Lng Dec	Form	Description
28-2A	DFKXP	3	C/S/D	End of added index records C/S/D
2B-2C	DFMIX	2	C/S	Address of master track index
5445 Disk Drive				
(1A-1D)	DXEOF	4	C/H/R/D	End-of-file C/H/R/D
1A-1E	DXNXR	5	C/H/R/ D/D	Next record in file C/H/R/DD
1F	DXSPC	1	Bin	Split cylinder number of tracks
(1F)	DXKL	1	Bin	Key length
20-21	DXKD	2	Disp	Key displacement
22-23	DXKXA	2	C/H	Start of indexed file C/H
24-27	DXNXK	4	CHRD	Next indexed record in file C/H/R/D
28-2A	DXKXB	3	CHR	End of indexed portion C/H/R
2B-2E	DXKXP	4	CHRD	End of added index records C/H/R/D
2F-30	DXMIX	2	Addr	Address of master index or high key bucket if add file

SWITCHED TERMINAL TABLE (STT)

- Contains switched line telephone numbers.
- Read from disk when needed during execution.

Length	Number (up to 25 characters)	FF

- Entries do not span sectors.

SYMBOLIC FILE TABLE (XDT)

- Pointer to first entry in $CCCOM at hex 88.
- Entries are variable in length and occupy contiguous storage.
- Each entry is delimited by hex FF.
- The table is delimited by hex FFFF.

Disp Hex	Label	Lng Dec	Form	Description
00-07	XDTNAM	8	Char	Symbolic file name
08	XDTREF	1	Disp	A series of one-byte entries that index the relative short DTFs that can be associated with the symbolic name (numbering from 1)

TERMINAL ATTRIBUTES TABLE (TAT)

- A table of five-byte terminal attribute sets.
- Pointed to by $CCCOM at hex AC.
- Number of sets in table located in $CCCOM at hex B0.
- Individual sets referenced by relative entry number.
- Table referenced by TUB.
- In-storage table is identical to TAT in $CCPFILE assignment sets.

TERMINAL ATTRIBUTES SET (TAS)

- TAS is pointed to by the CCP communication area ($CCCOM) at hex 12F-130.
- Indicates the attributes that are valid for one or more terminals.
- Each TUB points to its attributes set in the TUB fields, TUBCMA at hex 1B and TUBTAS at hex 1C.

Disp Hex	Label	Lng Dec	Form	Description
00	TASAT1	1	Bits	Attribute byte 1:

Hex Value	*Symbol*	*Meaning*
80	TASTRN	Do not translate
40	TASCAS	Do not force uppercase
20	TASCNC	Perform call
10	TASAUT	Auto-connect
01	TASDFF	Use display format facility

Disp Hex	Label	Lng Dec		Description
01	TASAT2	1	Bits	Attribute byte 2:

Hex Value	*Symbol*	*Meaning*
80	TASREC	Data format is record mode
40	TASBLK	Data format is block mode
20	TASMSG	Data format is message mode
10	TASITB	Intermediate text block (ITB) checking support
08	TASTSP	Transparency mode
04	TASVFY	No exchange identification verification
02	TASPAN	Spanned records supported
01	TASVRL	Variable length records supported

02-03	TASRCL	2	Bin	Record length
04	TASBKF	1	Bin	Blocking factor

TERMINAL NAME TABLE (TNT)

- Pointed to by $CCCOM at hex 48.
- Entry length is 11 bytes.
- Specific entries pointed to by associated TUB at hex 20.

Disp Hex	Label	Lng Dec	Form	Description
00-05	TNTNAM	6	Char	Symbolic terminal name
06-07	TNTTUB	2	Addr	Address of associated TUB
(06-07)	TNTTNT	2	Addr	Address of master TNT entry (for subterminal)
08	TNTFLG	1	Bits	Flag byte for diagnostics:

Hex Value	*Symbol*	*Meaning*
80	TNTPRI	Primary name; otherwise, secondary name
40	TNTBLK	Blank name entry
20	TNTKNS	CONSOL name entry
10	TNTR5	TNT entry is used by current program request ($CC4R5)

09	TNTMCT	1	Mix	Multicomponent terminal indexes:

Bits	*Meaning*
0-3	Index to input component
4-7	Index to output component

0A	TNTSTT	1	Bit	Index to STT (switched terminal table)

TERMINAL UNIT BLOCK (TUB)

- Pointed to by $CCCOM at hex 36.
- Entry length is 51 bytes.
- One TUB for each terminal in system.
- Built from TUT in $CCPFILE.
- Pointed to by TCB at hex 39 if allocated to a task.
- All TUBs occupy contiguous storage.

Disp Hex	Label	Lng Dec	Form	Description
System Parameter List within TUB				
00-01	TPRTC	2	Bin	Return code
(00-01)	TPCHN	2	Addr	Parameter list chain address
02	TPOPM	1	Bin	Operation code modifiers
03	TPOPC	1	Bin	Operation code
04-05	TPOUTL	2	Bin	Output length
(04-05)	TPEFFL	2	Bin	Effective input length
06-07	TPINL	2	Bin	Maximum input length
08-09	TPRECA	2	Addr	Record area address
(08-09)	TPDATA	2	Addr	Data area address
0A-0B	TPTUBA	2	Addr	Terminal unit block address
(0A-0B)	TPTCBA	2	Addr	Task control block address
0C	TP$OPM	1	Bin	Internal operation code modifier
0D	TP$OPC	1	Bin	Internal operation code work area
(0D)	TP$MCT	1	Bin	Multicomponent indexes
0E-0F	TP$RTC	2	Bin	Internal return code work area Displacement in record area of data that accompanied a program request

Terminal Identification and Address Characters

10-11	TUBID	2	Char	Terminal physical identifier: $K = Console main TUB $C = Console SUBTUB
12	TUBSID	1	Bin	BSCA internal terminal identification (always 01 for Model 4 console)
13	TUBSCS	1	Bits	BSCA status byte:

Hex Value	*Symbol*	*Meaning*
80	TUBCLR	Operator hit 3270 clear key
40	TUBDME	Data mode escape check success
20	TUBDMF	Data mode escape check failed
10	TUBSWA	Switched line terminate handled
08	TUBSSP	Started status polling
04	TUBRUF	PRUF data on screen (3270 DFF)

(12-13)	TUBTMA	2	Addr	MLTA terminal address

Disp Hex	Label	Lng Dec	Form	Description
14	TUBCHR	1	Bit	Terminal characteristics:

Hex Value	*Symbol*	*Meaning*
80	TUBLNE	BSCA line; otherwise, MLTA line
40	TUB@SL	Typewriter device at start of line
20	TUBTYP	MLTA typewriter device
10	TUBNID	Need identification at beginning of line
08	TUBCMN	Command capable terminal
04	TUBMCT	Multicomponent terminal
02	TUBOUT	Terminal capable of output
01	TUBIMP	Terminal capable of input

Disp Hex	Label	Lng Dec	Form	Description
15	TUBAT1	1	Bit	Terminal attributes byte 1:

Hex Value	*Symbol*	*Meaning*
80	TUBKNM	This TUB is the main console TUB
40	TUBKNS	Subordinate console TUB
20	TUBONL	Terminal online
10	TUBSGN	Command terminal is signed on
08	TUBQUE	Command terminal in /Q status
04	TUBREQ	Terminal is requester of program
02	TUBSWC	Terminal on switched line
01	TUBOFF	Command terminal sign-off default is HOLD

Disp Hex	Label	Lng Dec	Form	Description
16	TUBAT2	1	Bit	Terminal attributes byte 2:

Hex Value	*Symbol*	*Meaning*
CO		Terminal in command interrupt mode
80	TUBDTA	Terminal in data mode
40	TUBCMD	Terminal in command mode
20	TUBIMI	Outstanding data from program request

Disp Hex	Label	Lng Dec	Form	Description
16 (continued)				Hex Value / Symbol / Meaning
				10 TUBIIS Invite or get scheduled
				08 TUBIIQ Completed invite outstanding
				04 TUBOLT Running online test on terminal
				02 TUBAPP Allocation pending on this TUB
				01 TUBOWN Terminal communicating on BSCA line. EOT not sent or received
17	TUBAT3	1	Bit	Terminal attributes byte 3:
				Hex Value / Symbol / Meaning
				40 TUBSPF Stop polling failed
				20 TUBCNC /RELEASE command entered by terminal operator
				10 TUBERP Terminal error; awaiting error recovery procedures (ERP)
				04 TUBVFP Vary offline pending
				02 TUBSPP Stop polling pending to terminal in command interrupt mode
				01 TUBSWL or TUBINV Discard input data, terminal can be reinvited

Disp Hex	Label	Lng Dec	Form	Description
Queue Chain Fields				
18-19	TUBINQ	2	Addr	Address of next TUB on invite input queue. During program request or allocation, the address of the next TUB which requested the same MRT program
1A-1B	TUBTCB	2	Addr	Address of task control block of owning task
1C-1D	TUBTUB	2	Addr	Address of next TUB belonging to same task
(1C-1D)	TUBPST	2	Addr	Address of next TUB on allocation input queue
1E-1F	TUBLCB or TUBDTF	2	Addr	Address of line DTF and line control block
20-21	TUBTNT	2	Addr	Address of terminal name table entry for terminal (doing business as name)
22-23	TUBFSB	2	Addr	Address of first entry for this terminal in file specification block
24	TUBOTC	1	Bit	Terminal online test control byte for MLTA:

Hex Value	*Symbol*	*Meaning*
FF		Stop test
80	TUBLOP	Looping test specified
40	TUBALL	Multiple tests specified
(Bits 4-7)	TUBTNR	Binary number of single test

Disp Hex	Label	Lng Dec	Form	Description
Data Mode Escape Fields				
25-26	TUBDML	2	Mix	If invite, saved input length. If get, saved address of parameter list
27	TUBCMA	1	Bin	Multicomponent terminal index for online test. The low-order bits (0-3) contain the displacement into the multicomponent terminal table for the input component. The high-order bits (4-7) contain the displacement into the multicomponent terminal table for the output component
28	TUBDMO	1	Bit	Operation code indicator for data mode escape: *Hex Value* — *Symbol* — *Meaning* 00 — Get operation; any other value indicates an invite operation
Current Terminal Attribute Set Fields				
29	TUBTAS	1	Bin	Index to the standard attribute set for this terminal in the terminal attributes set table
2A	TUBTA1	1	Bit	First byte of attributes in current attribute set. See definition of TASAT1 field of terminal attributes set for bit definition
2B	TUBTA2	1	Bit	Second byte of attributes in current attribute set. See definition of TASAT2 of terminal attributes set for bit definition
2C-2D	TUBRCL	2	Bin	BSCA record length from current attribute set

Disp Hex	Label	Lng Dec	Form	Description
(2D)	TUBVCS	1	Bin	Multicomponent terminal index save area. The low-order bits (0-3) contain the displacement into the multi-component terminal table for the input component. The high-order bits (4-7) contain the displacement into the multicomponent terminal table for the output component
2E	TUBBKF	1	Bin	BSCA blocking factor from current attribute set
(2A-2E)	TUBCAS	5	Mix	Index to terminal attributes set currently in use for this terminal (current attribute set)

Terminal Type Fields

2F	TUBPHY	1	Bit	Physical terminal type:

Hex Value	*Symbol*	*Meaning*
09	TUB374	3741
08	TUBCPU	CPU
07	TUB375	3735
06	TUB5M2	3275 Model 2 (1920)
05	TUB5M1	3275 Model 1 (480)
04	TUB7M2	3277/84/86 Model 2 (1920)
03	TUB7M1	3277/84/86 Model 1 (480)
02	TUB105	MLTA 1050
01	TUBMLT	MLTA non-1050
00	TUBCON	Console

Disp Hex	Label	Lng Dec	Form	Description
30	TUBPCS	1	Bin	Principle components for multi-component terminal. The low-order bits (0-3) contain the displacemen into the multicomponent terminal table for input component to be used as the primary input device. The high-order bits (4-7) contain the displacement into the multicomponent terminal table for the output component to be used as the primary output device
31	TUBVHR	1	Bin	Save area for TUBCHR for MLTA
32	TUBAT4	1	Bin	Terminal attribute byte 4:

Hex Value	*Symbol*	*Meaning*
80	TUBBSY	Printer busy
40	TUBWAT	Task waiting
20	TUBPRT	Printer TUB
10	TUBRSP	Stop polling successful

Disp Hex	Label	Lng Dec	Form	Description
Beginning of a CCP Transient				
00-01	TARLD@	2	Disp	Offset from the beginning of the transient to the relocation address table (After fetch by the transient area handler, it is replaced with a hex F287 (jump op code + Q byte).)
02	TAJUMP	1	Disp	Offset from the beginning of the transient to the first instruction to be executed
03	TAID	1	Bin	Transient area ID value: *Hex Value* — *Meaning* 02 — Communications task transient area 01 — All other tasks transient area
04-05	TAXPRM	2	Mix	Parameter passed from one transient to another during an XCTL operation
06-07	TAXTID	2	Disp	Offset from the beginning of the transient to the disk address of the routine that can be called (Initially contains value to first disk address field TAXNCS.)
08-09	TAXCID	2	Char	Two-character suffix of the name of the first transient that can be called
0A-0C	TAXNCS	3	—	Three-byte disk address and length of first called transient
(0A)		1	Bin	Number of text sectors in the called transient
(0B-0C)	2	2	C/S	Disk address of called transient
0D+		1	Char	Stopper at end of transient list is $
0E+		2	Char	Two-character suffix of this transient's name
10+		1	Bin	Distribution level number of this transient

Disp Hex	Label	Lng Dec	Form	Description

Relocation Address Table in a CCP Transient

The relocation address table is found in every CCP transient and is located following the user code and preceding its RLDs. All the numbers are absolute. There are three possible types of addresses in the relocation address table. They are:

TYPE 1	2	Bin	LABEL −P is hex 0XXX Where P (defined as EQU $CC4xx, where $CC4xx is the module name on the START statement) Refers to the beginning of the module and is for reference within the module
TYPE 2	2	Bin	COM + LABEL is hex C0XX Where COM (defined as EQU hex C000) refers to the beginning of CCP communication area and the address is for reference within CCP communication area
TYPE 3	2	Bin	PGM + LABEL is hex 80XX Where PGM (defined as EQU hex 8000) refers to the beginning of CCP resident module entry points address table for references to resident CCP routines (That table is defined at the beginning of CCP transient area and is overlaid by the first transient loaded.)

DFGR COMMON AREAS

- Bytes 00-84 (hex) are internal constants.
- Used to pass information from $CC2CF to $CC2CP.
- Contains information about the FDT and text stream that is being built.

Disp Hex	Label	Lng Dec	Form	Description
85	CMTOT#	1	Bin	The length, in sectors, of the display format
86	CMFDTL	1	Bin	The length, in sectors, of field descriptor table
87	CMTXTL	1	Bin	The length, in sectors, of 3270 data stream
88-8D	CMNAME	6	Char	Display format name ($Z- - - -)
8E-8F	CMSFDT	2	Addr	Address of the field descriptor table
90-91	CMNDFT	2	Addr	Address of field descriptor table end
92-93	CMSTTX	2	Addr	Address of 3270 data stream
94-95	CMTEXT	2	Addr	Address of 3270 data stream end
96	CMERRT	1	Bin	Indicator of errors in format generation
97-98	CMAXDS	2	Bin	Maximum line/position address for this format
99	CMQCOD	1	Bin	Q code of pack on which to put display format

PFGR COMMON AREA

Disp Hex	Label	Lng Dec	Form	Description
8B-90	CMNAME	6	Char	Printer format name ($Z- - - -)
91	CMTOT#	1	Bin	The length, in sectors, of the printer format
92	CMFDTL	1	Bin	The length, in sectors, of field descriptor table
93	CMTXTL	1	Bin	The length, in sectors, of 3270 data stream
94-95	CMSFDT	2	Addr	Address of the field descriptor table

PFGR COMMON AREA (Continued)

Disp Hex	Label	Lng Dec	Form	Description
96-97	CMNDFT	2	Addr	Address of field descriptor table end
98-99	CMSTTX	2	Addr	Address of 3270 data stream
9A-9B	CMTEXT	2	Addr	Address of 3270 data stream end
9C-9D	CMTMTX	2	Addr	Temporary address of 3270 data stream end
9E	CMERRT	1	Bin	Indicator of errors in format generation
9F	CMQCOD	1	Bin	Q code of pack on which to put printer format

DFF FIELD DESCRIPTOR TABLE (FDT)

FDT is pointed to by PAS at hex 06-07. The FDT describes the fields associated with the current 3270 format attached to this particular user program.

Disp Hex	Label	Lng Dec	Form	Description
First Entry (Format Physical Attributes)				
00	FDTTSN	1	Bin	Number of sectors the text stream occupies on disk
01-02	FDTTSL	2	Bin	Number of bytes of output hold area required to put this entire format in one operation
03-04	FDTTSI	2	Bin	Number of bytes of input record area required to receive all fields for an input operation
05	FDTM#	1	Bits	Format attributes:

Hex Value	*Symbol*	*Meaning*
04	FDTNDT	Data should be given for put message of format
02	FDTM#2	Model II (1920 format
01	FDTM#1	Model I (490) format

Disp Hex	Label	Lng Dec	Form	Description
06	FDTNS	1	Bin	Number of sectors the FDT occupies in object library
07-08	FDTWRK	2	Mix	Calculation/work area
09	FDTWK2	1	Mix	Calculation/work area
0A	FDTCFG	1	Bits	Format attributes:

Hex Value	*Symbol*	*Meaning*
80	FDT11	This format has a field whose first data position is in row 1, column 1.
08	FDTPRT	Format generated by PFGR

Field Entry (14 Bytes Each: 17 Entries in First Sector, 18 in All Other Sectors)

00-05	FDTNAM	6	Char	Name of this field, left-justified
06	FDTFLG	1	Bits	Field characteristics:

Hex Value	*Symbol*	*Meaning*
80	FDTIF	Input field
40	FDTOF	Output field
20	FDTOIF	Output/input field
10	FDTDSF	Selector pen detectable/attention field
08	FDTANF	Numeric field
04	FDTSBF	Source data for this field provided during put message

07	FDTLNG	1	Bin	Length of data for this field
08-09	FDTAT@	2	Addr	3270 text address of field defining attribute
0A-0B	FDTDT@	2	Addr	3270 text address of leftmost (first) character of data for this field (If field is SPD/SPA, this is the address of designator character.)
0C-0D	FDTDTD	2	Disp	Displacement into 3270 text stream to first data character of noninput type field

DFF TERMINAL TABLE (TT)

- Pointed to by PAS at hex 00-01.
- The TT describes the terminal and the format currently in use by this terminal.

Disp Hex	Label	Lng Dec	Form	Description
00-01	TTCHN@	2	Addr	Address of next TT entry (High-order byte contains zero if it is the last entry.)
02-07	TTNAME	6	Char	Terminal name
08-09	TTFT@	2	Addr	Address of display format table (FT) entry currently used by this terminal
0A-22	TTIFT	25	Bits	Input format table (IFT) (Contains 200 bits, one for each possible nonoutput field used to determine if field should be returned in input record area in user's program. The first nonoutput field corresponds to bit 7 in rightmost byte hex 22 in IFT. The next nonoutput field (as described in the FDT) corresponds to bit 6, etc.) Bit On = Data for this field should be placed in input record area. Bit Off = Data for this field is not expected in the input record area. If data is received from the terminal for this field, ignore it.
23-24	TTINLH	2	Bin	Length of hold area space needed for 3270 text for next input operation

DFF FORMAT TABLE (FT)

- Pointed to by PAS at hex 00-01.
- The FT describes the format and location of FDT for this format.

Disp Hex	Label	Lng Dec	Form	Description
00-01	FTCHN@	2	Addr	Chain address which points to next format table entry (High-order byte is zero if this is last entry.)
02-07	FTNAME	6	Char	Name of display format
08-09	FTFCS	2	C/S	5444 C/S of FDT for this format
0A	FTDTL	1	Bin	Number of sectors FDT occupies on disk
0B-0C	FTTSCS	2	C/S	5444 C/S of beginning of 3270 text
0D	FTTSL	1	Bits	Format attributes: *Hex Value* *Symbol* *Meaning* Bits 1-7 Number of sectors 3270 text occupies in object library 80 FTM#2 Format for Model 2 terminal; otherwise, format for Model 1 terminal
0E-0F	FTOUTL	2	Bin	Byte length of 3270 text for output operation
10-11	FTINL	2	Bin	Byte length of 3270 text to expect for input operation

DFF PROGRAM APPENDED STORAGE (PAS) CONSTANTS AND WORK AREAS

- PAS is pointed to by hex 54-55 in the user's TCB.
- PAS serves as a communications area between DFF and the user task.

Disp Hex	Label	Lng Dec	Form	Description
00-01	PASITT	2	Addr	Address of first terminal table (TT) entry. (The first format table (FT) entry follows the first TT entry.)
02-03	PASNFT	2	Addr	Address of next available area for a TT or FT entry
04-05	PASEFT	2	Addr	Address of last byte to use for TT and FT entries (end of TT and FT area)
06-07	PASFDT	2	Addr	Address of beginning of area to contain field descriptor table (FDT) and format index
08	PASTID	1	Char	Task ID character
09	PASFDL	1	Bin	Number of 256-byte blocks available for FDT
0A-0B	PASCT@	2	Addr	Address of TT entry currently processing
0C-11	PASCTN	6	Char	Symbolic terminal name currently processing
12-13	PASCF@	2	Addr	Address of FT entry currently processing or whose FDT is currently in PAS
14-15	PASFR@	2	Addr	Address to return to from DFF000
16-17	PASJR@	2	Addr	Address to return to from DFJ000
18-19	PASXR@	2	Addr	Common save area for return addresses of miscellaneous routines
1A-1B	PASRE@	2	Addr	Address of function determination to return for completion of processing of an operation for which there are two calls from $CC4II
1C-1D	PASOH@	2	Addr	Beginning address of output hold area (OHA) currently in use by this task
1E-1F	PASOHL	2	Bin	Length in bytes of OHA
20-21	PASOHE	2	Addr	Address of last byte of OHA

DFF PROGRAM APPENDED STORAGE (PAS) CONSTANTS AND WORK AREAS (Continued)

Disp Hex	Label	Lng Dec	Form	Description
Copy Text and Work Area				
22-23	PASCP@	2	Addr	Beginning address of copy text
24	PASCPY	1	Disp	Beginning displacement into PAS of copy text
24	PASCES	1	Char	3270 escape character
25	PASCCM	1	Char	3270 copy command
26	PASCCC	1	Char	3270 copy control character
27	PASCFM	1		*From* terminal device address character
28-29	PASTOD	2	Addr	Address of *To* TT entry
			Char	*To* terminal control unit and device characters
2A-2B	PASFRD	2	Addr	Address of *From* TT entry
			Char	*From* terminal control unit and device characters
EAU Text and Work Area				
2C-2D	PASEU@	2	Addr	Beginning address of EAU text
2E	PASEQU	1	Disp	Displacement into PAS to beginning of EAU text
(2E)	PASEUE	1	Char	3270 escape character
2F	PASEUC	1	Bin	3270 EAU command

DFF PROGRAM APPENDED STORAGE (PAS) CONSTANTS AND WORK AREAS (Continued)

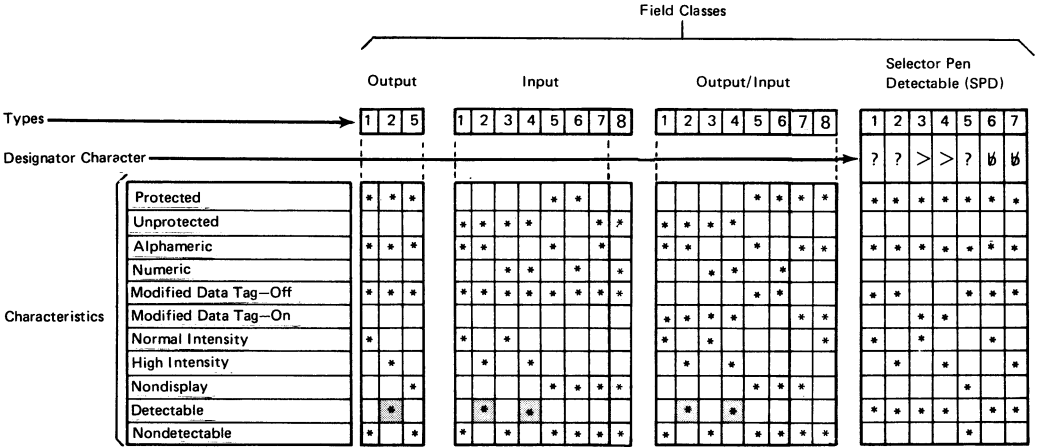
Disp Hex	Label	Lng Dec	Form	Description
30	PASFLG	1	Bit	Flag byte:

Hex Value	*Symbol*	*Meaning*
80	PASFRT	*To* terminal name (COPY); otherwise, *From* terminal name (COPY)
20	PASRST	Reset modified data tags specified in user's WCC
10	PASBLK	Blocking of output text needed
08	PASFTS	First time switch for blocking; otherwise, second or succeeding block
04	PASRUF	Request under format accept input

31-47	PASIOB	23	Mix	Disk IOB
48-49	PASPL@	2	Addr	Address of users parameter list
(4A)	PASCPL		Disp	Displacement from beginning of PAS to beginning of saved user parameter list
4A-59	PASCPE	16	Mix	Save area for users parameter list
5A-5B	PASIX1	2	Addr	Save area for XR1 upon entry from $CC4II
5C-5D	PASIAR	2	Addr	Return address to $CC4II
5E-5F	PASOF@	2	Addr	Address of FDT entry currently working with for an output operation
60-61	PASHAP	2	Addr	Points to the current position in OHA
62-63	PASRAP	2	Addr	Pointer to beginning of field name or beginning of data in user's output record area

DFF PROGRAM APPENDED STORAGE (PAS) CONSTANTS AND WORK AREAS (Continued)

Disp Hex	Label	Lng Dec	Form	Description
64-65	PASTTE	2	Addr	Address of empty (available) TT entry (A blank in first character of terminal name indicates an empty entry.)
66-6B	PASCFT	6	Char	Name of desired format for a put operation
			Addr	High-order 2 bytes contain address in output record of error detected by $CC4DB
6C	PASTC	1	Bin	Termination code if other than 00
6D-6E	PASTTS	1	Bin	Total text length for a put operation
6F-70	PASTTM	2	Bin	Length of text moved or put at this time (used mainly for blocking)
71-72	PASLTH	2	Bin	Total (gross) end position of text currently in OHA
73-74	PASUDL	2	Bin	User defined length of data provided for output
75	PASWCC	1	Char	User's WCC (write control character)
76-77	PASTAR	2	Addr	Save area for return address of caller (within DFCR) of a routine (within DFCR) that might be interrupted to allow a task switch
78-79	PASWRK	2	Mix	Work area for calculations
7A-7B	PASWKZ	2	Mix	Work area high-order byte is always hex 00
7C-7F	PASFRN	4	Char	Request under format name
80-82	PASEND	2	—	Reserved
83	PASL	1	Char	Request under format name


Field Classes
Output
Input
Output/Input
Selector Pen Detectable (SPD)
Types
1 2 5
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7
Designator Character
? ? > > ? ⊬ ⊬
Characteristics
Protected
Unprotected
Alphameric
Numeric
Modified Data Tag—Off
Modified Data Tag—On
Normal Intensity
High Intensity
Nondisplay
Detectable
Nondetectable

Installation Verification Program Disk Record

DISK RECORD CREATED BY CCPIVP

Disp Hex	Label	Lng Dec	Description
00-02		3	Data characters entered from console on an input request by CCPIVP
03		1	Always an asterisk (*)
04-08		8	Data characters entered with the program request for CCPIVP from the console (If fewer than eight characters are entered, they are left-aligned, and the field is padded with blanks.)
0C		1	Always an asterisk (*)
0D-0F		3	Record number—in record representing first input request from console, 001; in record representing next, 002; etc.

Main Storage During CCP Execution

$CC4 Load Modules

$CCCOM	CCP communication area
	Transient area 1 (noncommunication)
	Transient area 2 (communication)
	Command processor work area
	Allocating work area
	Termination work area
	Communication work area
	Console management work area
	Console buffer
	System task control blocks (TCB)
	Console main and subterminal unit blocks
	First level transient list
$CC4#3	Model 12 remap area
$CC4DF	Model 12 remap area
$CC4DP	Task dispatcher and I/O scheduler
$CC4IO	IOS intercept
$CC4IW	IOS wait intercept
DPTIAR	Routine to determine program level
$CC4IH	Common interrupt handler
$CC4WT	Wait
$CC4PS	Post
$CC4IG	General entry intercept
$CC4DI	Disk queue routine
$CC4II	TP I/O interface (user)
$CC4IS	TP I/O interface (system)
$CC4Z9	User security information
	Maintenance area
$CC4CM	Communications management
$CC4CP	Command processor
$CC4RM	Allocate
$CC4OC	Open/close
$CC4TI	Terminator
$CC4PI	Transient area handler
$CC4TX	XCTL routine
$CC4TR	Transient return
$CC4TT	Trace interface
CPHALT	Disaster (U-) halt routine
$CC4PQ	Determine selected terminal status
$CC4MX	Move/clear routine
$CC4IC	Console interrupt handler
$CC4IB	BSCA interrupt handler
	BSCA IOCS
$CC4BT	BSCA trace interface
$CC4IM	MLTA interrupt handler
	MLTA IOCS
$CC4MS	GETMAIN/FREEMAIN routine

OPTIONAL LOAD MODULES

CCTR	CCP trace routine
	CCP trace table
CCSA	Service aid module
CCBS	BSCA trace routine
CCML	MLTA trace routine

CONTROL BLOCKS AND DATA AREAS

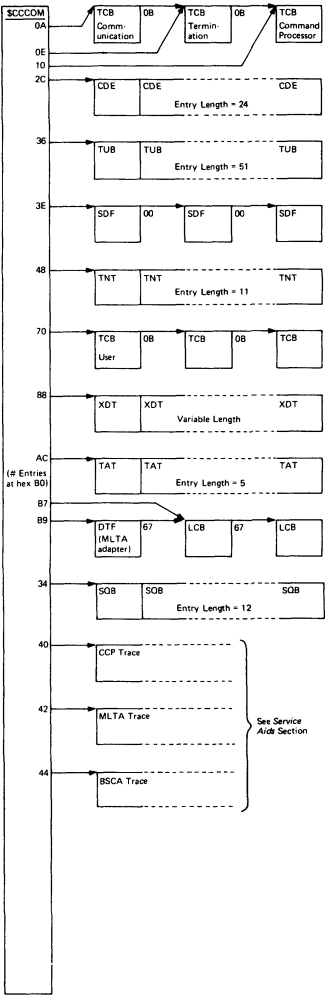
	Program request count tables
	Terminal attribute table (TAT)
	MLTA adapter DTF
These areas are duplicated for lines 2-8	MLTA line 1 DTF/LCB line control block
	MLTA line 1 statistical data recorder (SDR)
	MLTA line 1 polling list
	MLTA line 1 line buffer
These areas are duplicated for line 2	BSCA DTF/LCB line control block
	BSCA ASCII translation buffer
	BSCA addressing list
	BSCA statistical data recorder (SDR)
	Checklist
	Terminal unit blocks (TUB)
	Terminal name table (TNT)
	Task control blocks (TCB)
	Contents directory entries (CDE)
	Short disk DTFs (SDF) and storage index area
	Symbolic file tables (XDT)
	Master track index area
	Sector enqueue blocks (SQB)
	File specification blocks (FSB)
	Dynamic teleprocessing buffer area

DISPLAY FORMAT FACILITY

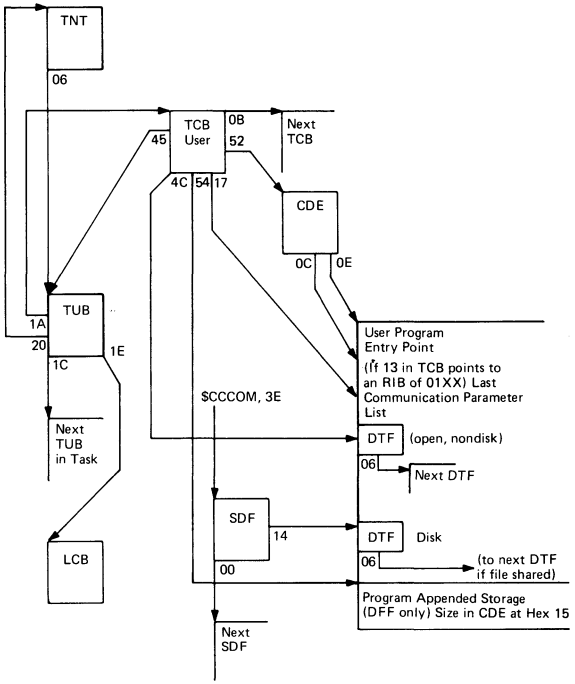
$CC4DF	Display format control routine[1]
	DFF output hold area
	User programs and program appended storage (PAS)

[1] Model 12: Only the DFF output hold area and PAS, if $CC4DF is in the remap area.

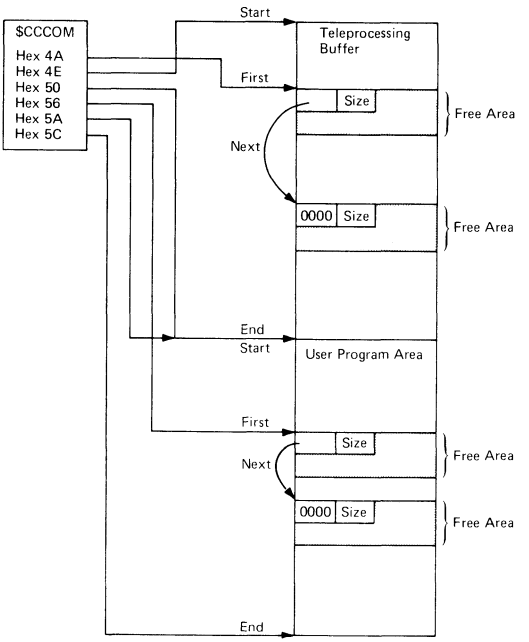
Execution Time Control Blocks



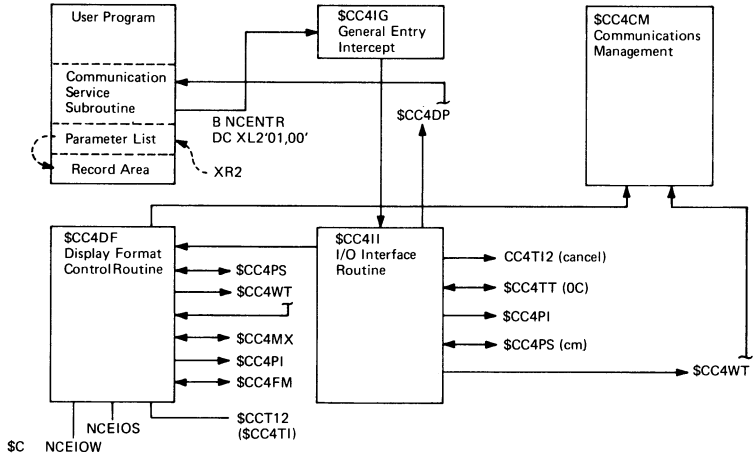
Note: All lengths are in decimal. All displacements are in hexadecimal. Symbolic file associations are not shown here.

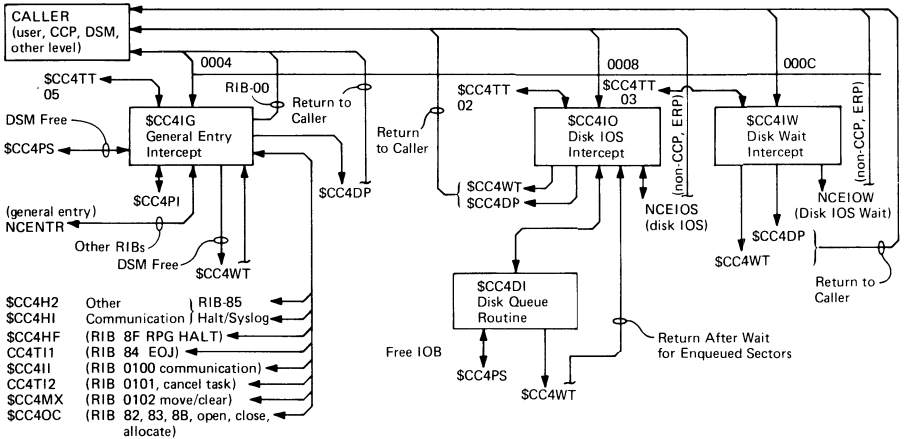

TNT
06
TCB
User
45
0B
52
Next
TCB
4C
54
17
CDE
0C
0E
TUB
1A
20
1C
1E
User Program
Entry Point
(If 13 in TCB points to
an RIB of 01XX) Last
Communication Parameter
List
$CCCOM, 3E
Next
TUB
in Task
DTF
(open, nondisk)
06
Next DTF
SDF
14
DTF
Disk
LCB
06
(to next DTF
if file shared)
00
Program Appended Storage
(DFF only) Size in CDE at Hex 15
Next
SDF

Storage Allocation



5471 Interrupt
IAR-1 (Hex C0)
BSCA Interrupt
IAR-2 (Hex A0)
MLTA Interrupt
IAR-3 (Hex 90)
$@COIH
$$BSIN
$$MLDD
MLTDD1
MLTDD2
Reset Interrupt
Reset Interrupt
Reset Interrupt
$CC4IC
Console
Interrupt
Intercept
$CC4IB
BSCA
Interrupt
Intercept
$CC4IM
MLTA
Interrupt
Intercept
MLTDD2 (op end) Entry
Make communications task dispatchable, set CCP level IAR for entry to $CC4DP. When interrupt is reset.
$CC4IH
Common
Interrupt
Handler
CCML
MLTA Trace


User Program
Communication Service Subroutine
Parameter List
Record Area
B NCENTR
DC XL2'01,00'
XR2
$CC4IG General Entry Intercept
$CC4DP
$CC4CM Communications Management
$CC4DF Display Format Control Routine
$CC4PS
$CC4WT
$CC4MX
$CC4PI
$CC4FM
$CCT12 ($CC4TI)
NCEIOS
$C NCEIOW
$CC4II I/O Interface Routine
CC4TI2 (cancel)
$CC4TT (0C)
$CC4PI
$CC4PS (cm)
$CC4WT


CALLER
(user, CCP, DSM, other level)
0004
0008
000C
$CC4TT 05
RIB-00
Return to Caller
$CC4TT 02
$CC4TT 03
DSM Free
$CC4PS
$CC4IG General Entry Intercept
$CC4PI
(general entry) NCENTR
Other RIBs
DSM Free
$CC4WT
$CC4DP
Return to Caller
$CC4IO Disk IOS Intercept
(non-CCP, ERP)
$CC4WT
$CC4DP
NCEIOS (disk IOS)
$CC4IW Disk Wait Intercept
(non-CCP, ERP)
NCEIOW (Disk IOS Wait)
$CC4DP
$CC4WT
Return to Caller
$CC4H2 Other
$CC4HI Communication
RIB-85 Halt/Syslog
$CC4HF (RIB 8F RPG HALT)
CC4TI1 (RIB 84 EOJ)
$CC4II (RIB 0100 communication)
CC4TI2 (RIB 0101, cancel task)
$CC4MX (RIB 0102 move/clear)
$CC4OC (RIB 82, 83, 8B, open, close, allocate)
$CC4DI Disk Queue Routine
Free IOB
$CC4PS
$CC4WT
Return After Wait for Enqueued Sectors

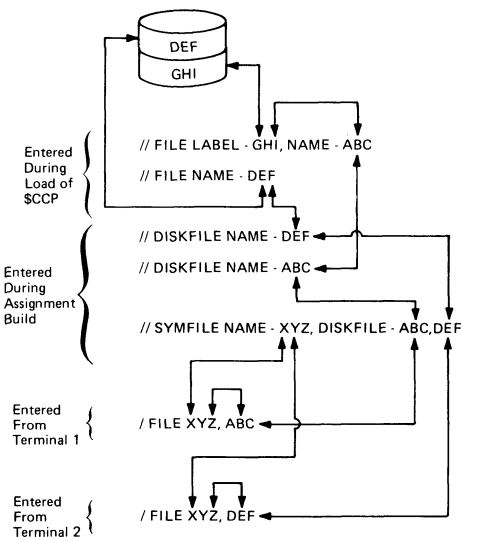
Symbolic File Support

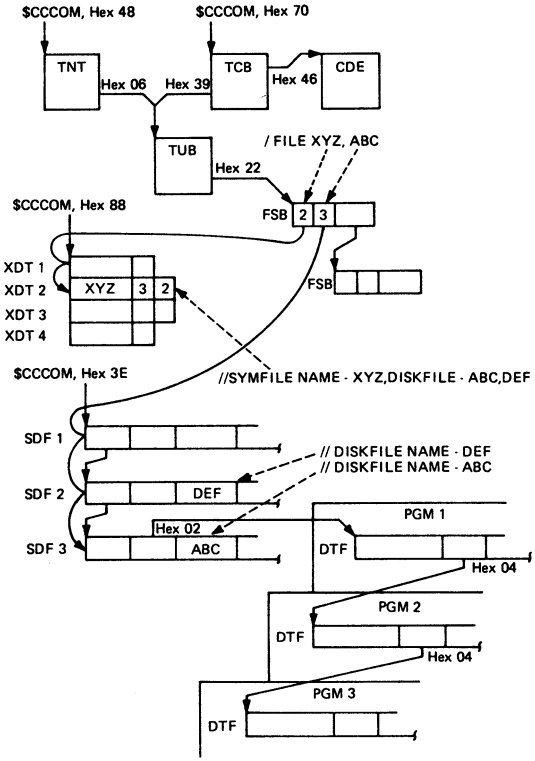
If, during CCP execution, a command terminal operator enters:

```
/FILE XYZ, ABC
```

Then compile time file name XYZ is associated with OCL file name ABC. The compile time file name is the name specified in a source program. The OCL file name is the name (not label) specified in a //FILE statement when CCP is loaded.

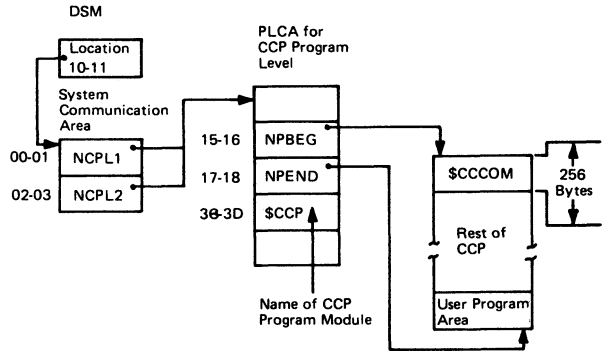
Symbolic File Association



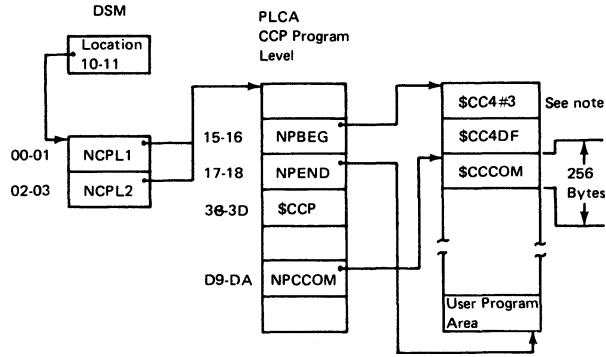


Note: All DTFs associated with a given SDF are chained together. However, if NOSHARE is in effect, the chain must be contained in one program.

HOW TO FIND $CCCOM WITHOUT REMAP



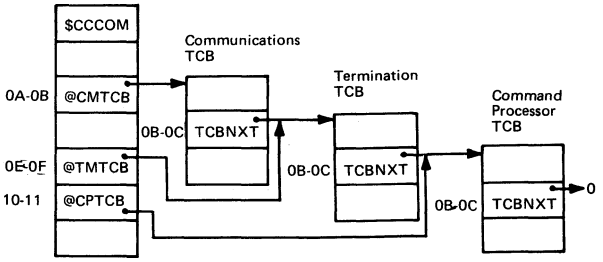
HOW TO FIND $CCCOM WITH REMAP
(DURING CCP EXECUTION ONLY)



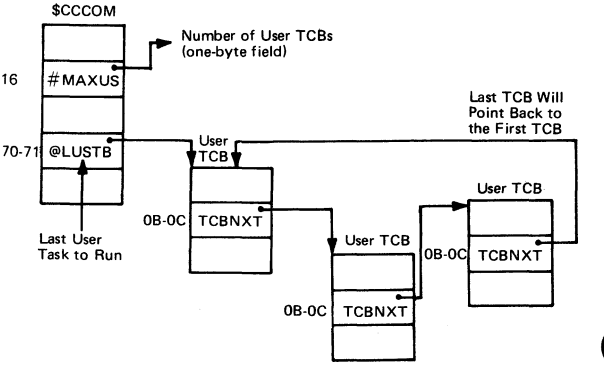
Note: Logical-to-real address translation factors:
80K: Logical address + X'4000' = real address
96K: Logical address + X'8000' = real address

If address in $CC4#3/$CC4DF:
Logical address + xxxx = real address, where xxxx is a two-byte value found in $CCCOM at X'CA'

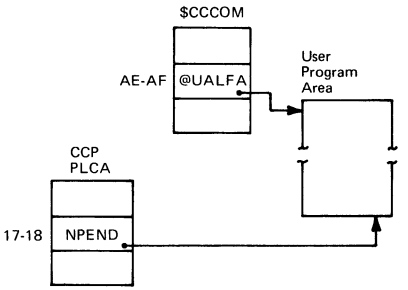
HOW TO FIND THE SYSTEM TASK CONTROL BLOCK (TCB)



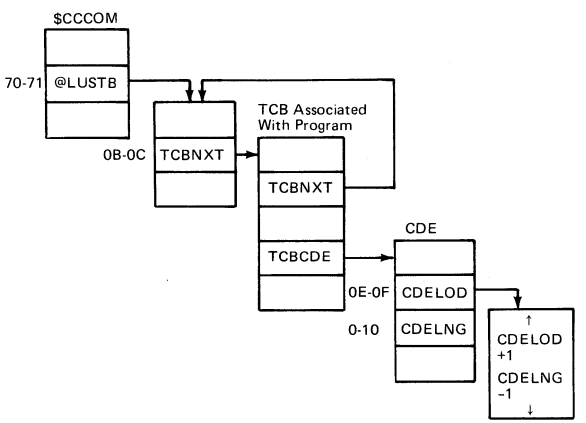
HOW TO FIND THE USER TASK CONTROL BLOCK (TCB)



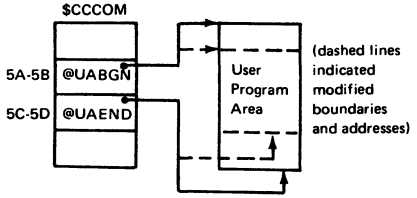
HOW TO FIND THE USER PROGRAM AREA BOUNDARIES



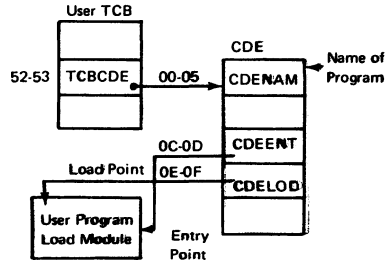
HOW TO FIND A PARTICULAR USER PROGRAM'S BOUNDARIES



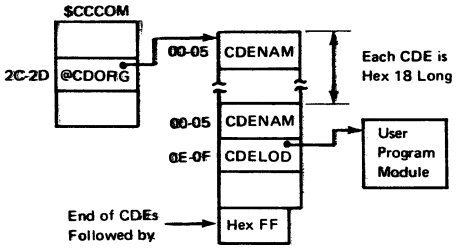
HOW TO FIND USER PROGRAM AREA AVAILABLE SPACE BOUNDARIES



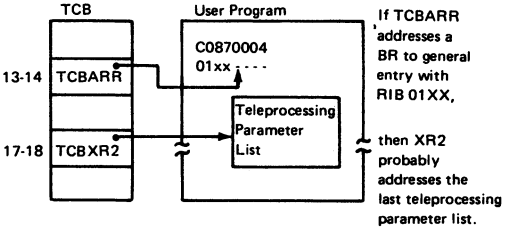
HOW TO FIND A USER PROGRAM MODULE BY ACTIVE TASK CONTROL BLOCK



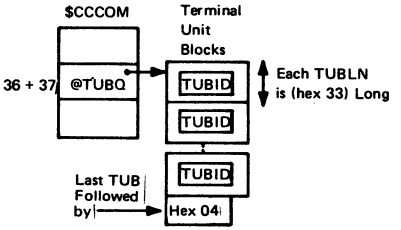
HOW TO FIND A USER PROGRAM MODULE BY CONTENTS DIRECTORY ENTRY



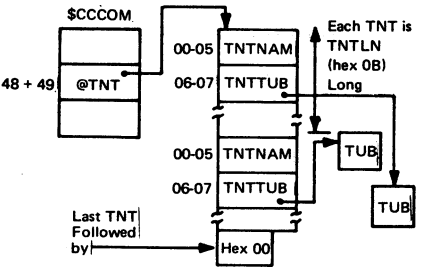
HOW TO FIND A USER TASK'S LAST TELEPROCESSING I/O REQUEST



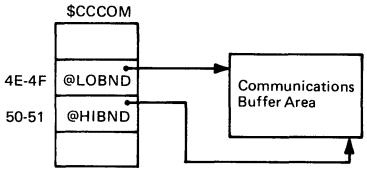
HOW TO FIND TERMINAL UNIT BLOCKS BY TERMINAL ID



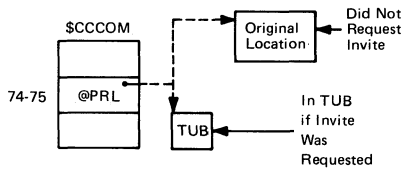
HOW TO FIND TERMINAL UNIT BLOCKS BY SYMBOLIC TERMINAL NAME



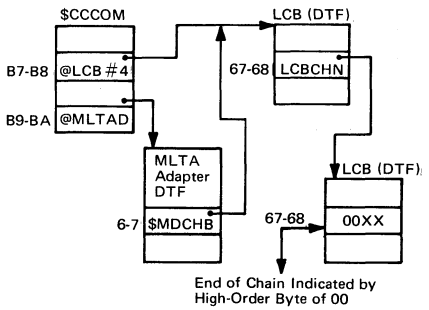
HOW TO FIND THE COMMUNICATIONS BUFFER AREA



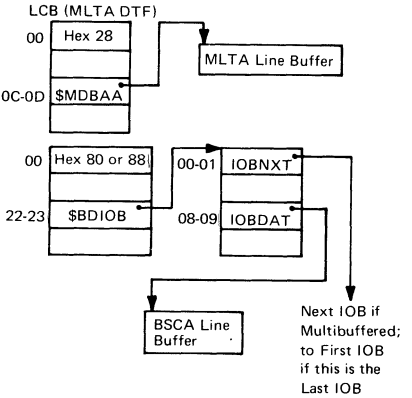
HOW TO FIND THE LAST COMMUNICATIONS PARAMETER LIST

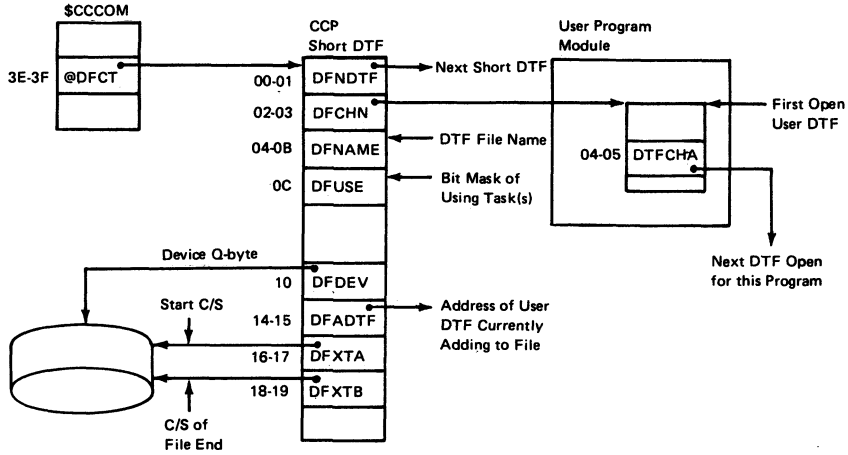


HOW TO FIND THE TELEPROCESSING DTFs (MLTA/BSCA)



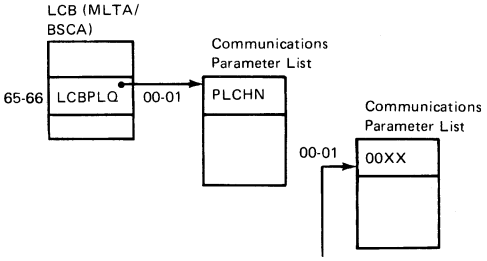
HOW TO FIND THE TELEPROCESSING LINE BUFFERS




$CCCOM
3E-3F
@DFCT
CCP
Short DTF
00-01
DFNDTF
Next Short DTF
02-03
DFCHN
First Open
User DTF
04-08
DFNAME
DTF File Name
0C
DFUSE
Bit Mask of
Using Task(s)
User Program
Module
04-05
DTFCHA
Next DTF Open
for this Program
Device Q-byte
10
DFDEV
Start C/S
14-15
DFADTF
Address of User
DTF Currently
Adding to File
16-17
DFXTA
18-19
DFXTB
C/S of
File End

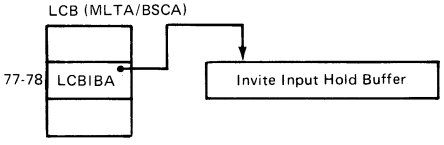
SYMBOLIC-ACTUAL DTF REFERENCES

HOW TO FIND THE TELEPROCESSING LINE QUEUE



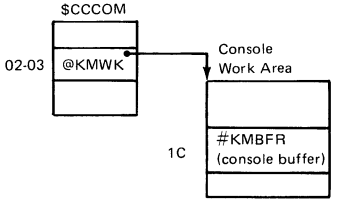
Note: High-order byte of hex 00 marks the end of the line queue.

HOW TO FIND THE INVITE INPUT HOLD BUFFER FOR A TELEPROCESSING LINE

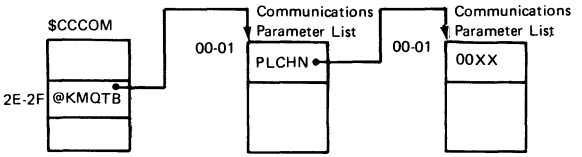


Note: High-order byte of hex 00 indicates no hold buffer for the line.

HOW TO FIND THE CONSOLE BUFFER

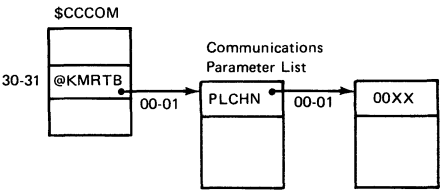


HOW TO FIND THE CONSOLE OUTPUT QUEUE



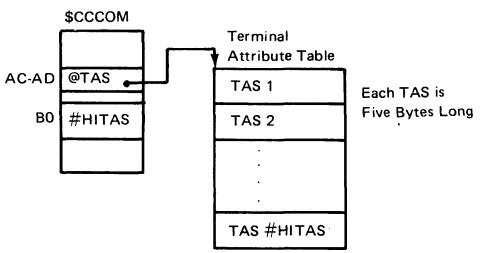
Note: High-order byte of hex 00 indicates the end of the queue.

HOW TO FIND THE CONSOLE INPUT QUEUE

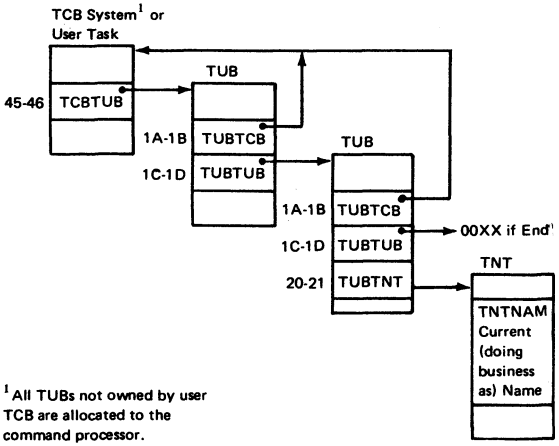


Note: High-order byte of hex 00 indicates the end of the queue.

HOW TO FIND TERMINAL ATTRIBUTE SETS IN THE TERMINAL ATTRIBUTE TABLE

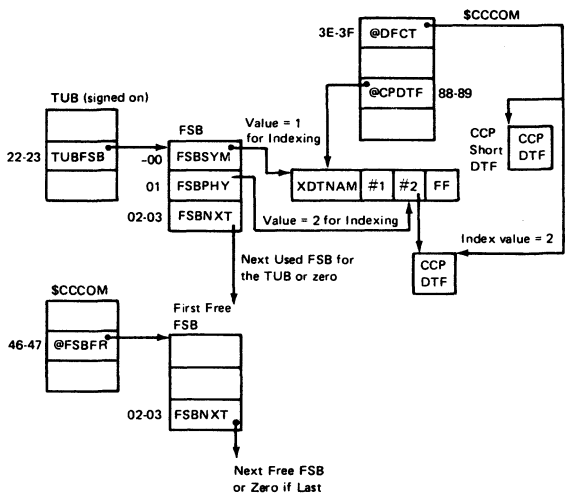


HOW TO FIND THE TUBs (TERMINALS) OWNED BY A TASK

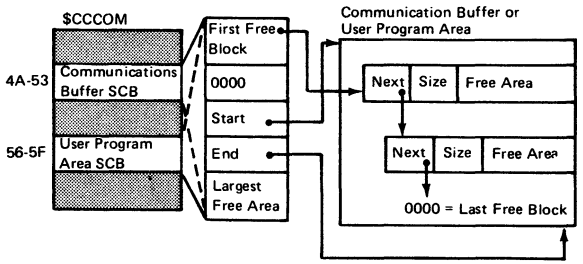


[1] All TUBs not owned by user TCB are allocated to the command processor.

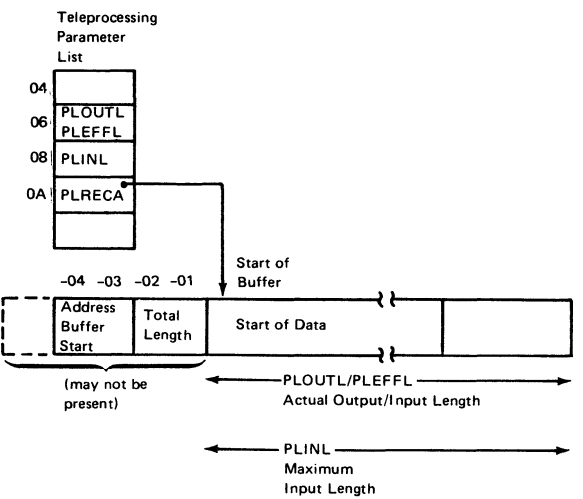
HOW TO DETERMINE THE TERMINAL OPERATOR'S/FILE SPECIFICATIONS



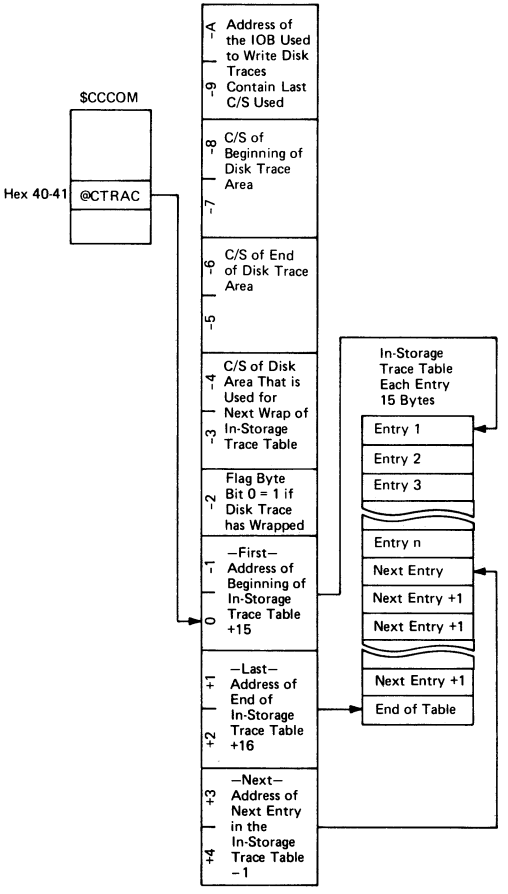
HOW TO FIND MAIN STORAGE MANAGEMENT ALLOCATED STORAGE BOUNDARIES AND FREE STORAGE CHAINS



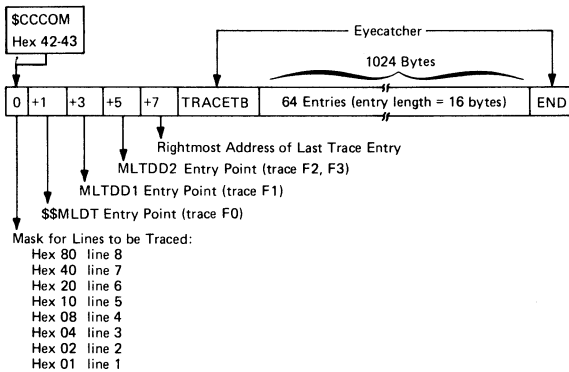
HOW TO FIND TELEPROCESSING BUFFER LOCATION AND LENGTHS



HOW TO FIND THE CCP TRACE TABLES

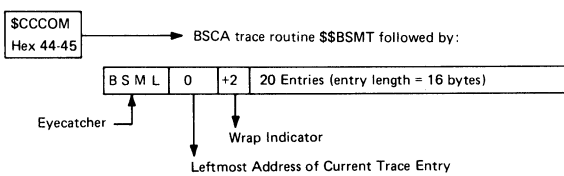


HOW TO FIND THE MLTA TRACE



- Activated by TRACEMLTA specification during startup.
- During execution the command TRACE (ON, OFF), MLTA controls dumping of the trace table to the printer whenever a permanent error occurs on an MLTA line.

HOW TO FIND THE BSCA TRACE



During execution the command TRACE (ON, OFF), BSCA controls dumping of the trace table to the printer whenever a permanent error occurs at a BSCA terminal.

Activated by TRACEMLMP specification during startup.

CCP TRACE

Disp Hex	Description

Type 01 — Dispatcher Initial Entry

00 Trace type 01

01 TCBID of TCB

02 $DPFLG from $CCCOM:

Hex Value	*Meaning*
80	Save registers in current TCB
40	Make task nondispatchable
10	Must complete status
08	Allow interrupt processing

03 Number of 5471 op ends since last 01 trace

04 Number of MLTA op ends since last 01 trace

05 Number of BSCA op ends since last 01 trace

06-07 ARR at dispatcher entry

08-09 XR1 at dispatcher entry

0A-0B XR2 at dispatcher entry

0C-0D Wait mask (indicates what task is waiting for):

Byte 1

Hex Value	*Meaning*
80	Communications I/O request completion
40	Disk I/O completion
20	Accept input completion
10	Shutdown request
08	Transient area 1 available
04	Enqueued data sectors

Disp Hex	Description
(0C-0D, continued)	Byte 2

Hex Value	*Meaning*
80	Main storage availability
40	Disk file allocation
20	Unit record allocation
10	Terminal allocation
08	DSM availability
04	Unit record ready
02	DFF hold area space

0E	Number of events to take place before redispatching
0F	$DPFLH from $CCCOM:

Hex Value	*Meaning*
80	A task has entered DSM
40	Suppress task
20	Post has made a task dispatchable
10	User task suspended
08	A task is in *must complete* status
04	Dispatcher halted, awaiting interrupt
02	A console interrupt exists

If bytes C, D, and E are hex BF, FF, and FF, and the current task ID is T, the trace indicates the completion of the termination task.

+00	Trace Type 01	Active TCBID	$DPFLG	Number of 5471 Interrupts
+04	Number of MLTA Interrupts	Number of BSCA Interrupts	CCARR	
+08	CCXR1		CCXR2	
+0C	TCB Wait Mask		TCB Event Count	$DPFLH

Disp Hex	Description

Type 02 — Dispatcher NCEIOS Intercept

00	Hex 02 disk IOS intercept
01	Current TCB ID
02	Q byte from IOB
03	R byte from IOB
04-05	C/S (5444) C/H (5445) from IOB
06-07	ARR save area
08-09	XR1 save area (IOB address)
0A-0B	XR2 save area
0C-0D	Contents of IOB chain field (for CCP XCTL, this is two-character suffix of module name)
0E	IOB completion code (N/A for CCP XCTL)
0F	

Hex Value	*Meaning*
80	DSM has been entered by a task
40	Suppress trace
20	A task has been made dispatchable
10	A user task is suspended
08	A task is in *must complete* state
04	Dispatcher halted, awaiting interrupt
02	A console interrupt exists
01	Dispatcher entered via $CC4IH (interrupt handler) and a user task is suspended

+00	Trace Type 02	Issuer's TCBID	IOBQB	IOBRB
+04	IOBCD	IOBSB	Issuer's ARR	
+08	ISSUER'S XR1 — Addresses (IOB)		Issuer's XR2	
+0C	IOBCHN/Called Transient ID		IOBCMP/ Undefined	$DPFLH

Disp Hex	Description

Type 03 — Dispatcher NCEIOW Intercept

00	Hex 03 disk wait intercept
01	Current TCB ID
02	Q byte from IOB
03	R byte from IOB
04-05	C/S (5444) C/H (5445) from IOB
06-07	ARR save area
08-09	XR1 save area (IOB address)
0A-0B	XR2 save area
0C-0D	Contents of IOB chain field (for CCP XCTL, this is two-character suffix of module name)
0E	IOB completion code
0F	

Hex Value	*Meaning*
80	DSM has been entered by a task
40	Suppress trace
20	A task has been made dispatchable
10	A user task is suspended
08	A task is in *must complete* state
04	Dispatcher halted, awaiting interrupt
02	A console interrupt exists
01	Dispatcher entered via $CC4IH (interrupt handler) and a user task is suspended

+00	Trace Type 03	Issuer's TCBID	IOBQB	IOBRB
+04	IOBCD	IOBSB	CCARR	
+08	CCXR1		CCXR2	
+0C	IOBCHN		IOBCMP	$DPFLH

Disp Hex	Description

Type 04 — NCEIOW Entry from Dispatcher

00	Hex 04 dispatcher invoking disk wait
01	TCB ID associated with IOB
02	Q byte from IOB
03	R byte from IOB
04-05	C/S (5444) C/H (5445) from IOB
06-07	ARR save area
08-09	XR1 save area (IOB address)
0A-0B	XR2 save area
0C-0D	Contents of IOB chain field (for CCP XCTL this is a two-character suffix of module name)
0E	IOB completion code
0F	

Hex Value	*Meaning*
80	DSM has been entered by a task
40	Suppress trace
20	A task has been made dispatchable
10	A user task is suspended
08	A task is in *must complete* state
04	Dispatcher halted, awaiting interrupt
02	A console interrupt exists
01	Dispatcher entered via $CC4IH (interrupt handler) and a user task is suspended

+00	Trace Type 04	IOBTCB TCBID	IOBQB	IOBRB
+04	IOBCD	IOBSB	Not Meaningful	
+08	Dispatcher's XR1—Addresses (IOB)		IOBTCB (owning TCB @)	
+0C	IOBCHN		IOBCMP	$DPFLH

Disp Hex	Description

Type 05 — General Entry Intercept

00	Hex 05 general entry intercept
01	TCB ID of task invoking general entry
02	

Hex Value	*Meaning*
80	Save registers in current TCB.
40	Make task nondispatchable
10	Must complete state
08	Allow interrupt processing

03	Reserved
04-05	Contents at ARR +2, 3 (for RIB hex 80,C0 sector and # sectors −1; otherwise, insignificant)
06-07	ARR save area
08-09	XR1 save area
0A-0B	XR2 save area (for RIB hex 01,00, address of communications parameter list)
0C	Contents at ARR +0, 1 the RIB and (for CCP requests) sub-RIB
0E	

Hex Value	*Meaning*
80	DSM has been entered by a task
40	Suppress trace
20	A task has been made dispatchable
10	A user task is suspended
08	A task is in *must complete* state
04	Dispatcher halted, awaiting interrupt
02	A console interrupt exists
01	Dispatcher entered via $CC41H (interrupt handler) and a user task is suspended

0F	Reserved

CCP TRACE (Continued)

+00	Trace Type 05	Issuer's TCBID	$DPFLG	Reserved
+04	Third and Fourth Inline Bytes after Branch		Issuer's ARR	
+08	Issuer's XR1		Issuer's XR2—Addresses (parameter list)	
+0C	First Two Inline Bytes after Branch		Reserved	$DPFLH

Disp Hex	Description

Type 06 — Transient Request

00	Hex 06 transient request
01	Current TCB ID
02	Q byte of CCP pack
03	R byte from IOB
04-05	Disk address of requested transient
06-07	ARR of calling routine
08-09	XR1 of calling program
0A-0B	XR2 of calling program
0C-0D	Two-character suffix of requested transient
0E-0F	Parameter passed to requested transient

+00	Trace Type 06	TCBID	IOBQB	IOBRB
+04	IOBCB	IOBSB	TCBARR	
+08	TCBXR1		TCBXR2	
+0C	Two-Character Suffix of the Requested Transient		TAXPRM	

Disp Hex — **Description**

Type 07 — Entry to Post ($CC4PS)

Disp Hex	Description
00	Hex 07 entry to post
01	Current TCB ID
02	

Hex Value	*Meaning*
80	Save registers in current TCB
40	Make task nondispatchable
10	*Must complete* state
08	Allow interrupt processing

03	Posted TCB ID (insignificant if general post)
04-05	Address of TCB to be posted (hex 00XX if general post)
06-07	ARR save area (address of post list)
08-09	XR1 save area
0A-0B	XR2 save area
0C	Post mask (indicates completed event):

Hex Value	*Meaning*
80	Communications I/O request
40	Disk I/O request
20	Accept input
10	Shutdown request
08	Transient area 1 available
04	Enqueued data sectors

0D — Post mask continued:

Hex Value	*Meaning*
80	Main storage available
40	Disk file allocated
20	Unit record allocated
10	Terminal allocated
08	DSM available
04	Unit record ready
02	Hold area available for DFF

Disp Hex	Description
0E	Not used
0F	

Hex Value	*Meaning*
80	DSM has been entered by a task
40	Suppress trace
20	A task has been made dispatchable
10	A user task is suspended
08	A task is in *must complete* state
04	Dispatcher halted, awaiting interrupt
02	A console interrupt exists
01	Dispatcher entered via $CC4IH (interrupt handler) and a user task is suspended

+00	Trace Type 07	Poster's TCBID	$DPFLG	Postee's TCBID
+04	Addresses (TCB to post)/00xx if All		CCARR	
+08	CCXR1		CCXR2	
+0C	Post Mask		Reserved	$DPFLH

Type 08 – Entry to GETMAIN ($CC4GM)

00	Hex 08 GETMAIN
01	TCB ID of requesting task
02-03	First free segment address after GETMAIN
04-05	Largest free segment size after GETMAIN
06-07	ARR save area
08-09	XR1 save area (address of storage control block)
0A-0B	XR2 save area (address of GETMAIN parameter)
0C-0D	Address of storage area secured by GETMAIN (hex 0000 if unsuccessful)
0E-0F	Size of storage area secured

+00	Trace Type 08	Issuer's TCBID	SCBCHN
+04	SCBMAX		CCARR
+08	Issuer's XR1—Addresses (SCB)		Issuer's XR2—Addresses (parameter list)
+0C	Address Gotten—0000 if Failed		GMSIZE

Disp Hex	Description

Type 09 – Entry to FREEMAIN ($CC4FM)

00	Hex 09 FREEMAIN
01	TCB ID of requesting task
02-03	First free storage address before FREEMAIN
04-05	Largest free storage size before FREEMAIN
06-07	ARR save area
08-09	XR1 save area (address of storage control block)
0A-0B	XR2 save area
0C-0D	Address of storage being freed
0E-0F	Size of storage being freed

+00	Trace Type 09	Issuer's TCBID	SCBCHN
+04	SCBMAX		CCARR
+08	Issuer's XR1–Addresses (SCB)		Issuer's XR2–Addresses (parameter list)
+0C	GMADDR		GMSIZE

Type 0A – $CC4CM Return from IOCS after CHECK on Op End

00	Hex 0A op end interrupt
01	C'C' TCB ID for communication manager
02	DTF op code after interrupt
03	Completion code after interrupt
04-05	Length of the operation $MDCRL or $BDREL
06-07	TUB address for which interrupt occurred
08-09	Communications parameter list address
0A-0B	Teleprocessing DTF address
0C-0D	Record area address
0E	Number of outstanding op end interrupts (those requiring a check)

Disp Hex	Description

0F

Hex Value	*Meaning*
80	Terminal in data mode
40	Terminal in command mode
20	Outstanding program data
10	Invite or get scheduled
08	Complete invite outstanding
04	Online test running
02	Allocation pending
01	If BSCA, EOT not sent or received
C0	Terminal in command interrupt mode

+00	Trace Type 0A	TCBID = C	$MDOPC/ $BDOPC	$MDCMP/ $BDCMP
+04	MLTA—SMDCRL BSCB—$BDREL		Addresses (TUB)	
+08	CM's XR1—Addresses (parameter list)		CM's XR2—Addresses (DTF)	
+0C	$BDWKB		CCOECT	TUBAT2

Type 0B/1B — $CC4CM Return from IOCS after Start I/O

Trace 0B — MLTA

00	Hex 0B MLTA I/O request from resident code
01	C'C' TCB ID for communication manager
02	MLTA operation code
03	Operation start code from IOCS (if nonzero, an error condition exists)
04-05	Size of largest segment in teleprocessing buffer area
06-07	TUB address
08-09	Communications parameter list address
0A-0B	MLTA line DTF address
0C-0D	Internal CCP op code from communications parameter list PL$PM and PL$OPC
0E-0F	User specified operation code

Disp Hex	Description

Trace 1B – BSCA

00	Hex 1B BSCA I/O request from resident code
01	C'C' for communication manager
02	Operation code
03	I/O request completion code (should be zero)
04-05	Size of largest available segment in teleprocessing buffer
06-07	TUB address
08-09	Communication parameter list address
0A-0B	BSCA line DTF address
0C-0D	Internal CCP operation code from communications parameter list PL$OPM and PL$OPC
0E-0F	External operation code

+00	Trace ID–0B/1B	TCBID = C	$MDOPC/ $BDOPC	$MDOSC/ $BDCMP
+04	SCBMAX		Addresses (TUB)	
+08	CM's XR1–Addresses (parameter list)		CM's XR2–Addresses (DTF)	
+0C	PL$OPM	PL$OPC	PLOPM	PLOPC

Disp Hex **Description**

Type 0C – $CC4II Entry to User I/O Interface

00 Hex 0C user I/O request

01 TCB ID of task that issued request

02 Number of outstanding invites from this task

03

Hex Value	*Meaning*
80	Terminal in data mode
40	Terminal in command mode
20	Outstanding program data
10	Invite or get scheduled
08	Completed invite outstanding
04	Online test running
02	Allocation pending
01	If BSCA, EOT not sent or pending
C0	Terminal in command interrupt mode

04-05 Size of largest available segment in teleprocessing buffer

06-07 TUB address

08-09 Communication parameter list address

0A-0B TNT address

0C-0D Record area address

0E-0F User op code

+00	Trace Type 0C	Issuer's TCBID	TCBIIC	TUBAT2
+04	SCBMAX		Addresses (TUB)	
+08	Addresses (parameter list)		Addresses (TNT entry)/Undefined	
+0C	PLRECA		PLOPM	PLOPC

Disp Hex	Description
Type 0D – $CC4IS Entry to System I/O Interface	
00	Hex 0D system I/O request
01	TCB ID of requesting task
02	Op code from DTF
03	Attribute byte 2 from DTF
04-05	Size of largest available segment of teleprocessing buffer
06-07	TUB address
08-09	Communication parameter list address
0A-0B	If MLTA, terminal address from DTF
0C-0D	Record area address
0E-0F	Op code from parameter list

+00	Trace Type 0D	Issuer's TCBID	$MDOPC	$MDAT2
+04	SCBMAX		Addresses (TUB)	
+08	Addresses (parameter list)		$MDTMA/Undefined	
+0C	PLRECA		PLOPM	PLOPC

Disp Hex **Description**

Type 0E – $CC4II Return to User

00 Hex 0E communication I/O complete

01 TCB ID of task that requested I/O

02 TUBAT1 – Terminal attributes byte 1:

Hex Value	*Meaning*
80	Main console TUB
40	Subordinate console TUB
20	Terminal online
10	Command terminal is signed on
08	Command terminal in /Q status
04	Terminal is requester of program
02	Terminal on switched line
01	Command terminal signoff default is hold

03 TUBAT2 – Terminal attributes byte 2:

Hex Value	*Meaning*
80	Terminal in data mode
40	Terminal in command mode
20	Outstanding data for program request
10	Invite or get scheduled
08	Completed invite outstanding
04	Running online test on terminal
02	Stop polling successful during program request validation
02	Allocation pending on this TUB
01	Terminal on BSCA line. EOT not sent or received

04 TUBAT3 – Terminal attributes byte 3:

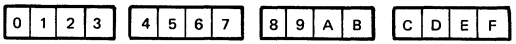
Hex Value	*Meaning*
80	Not used
40	Stop polling failed
20	/RELEASE command entered by terminal operator
10	Terminal error-waiting for ERP
08	Not used
04	Vary offline pending
02	Stop poll pending to terminal in command interrupt mode
01	Discard input data, terminal can be reinvited

Disp Hex	Description
05	TUBTA2 - Second byte of terminal attributes set:

Hex Value	*Meaning*
80	Data format is record mode
40	Data format is block mode
20	Data format is message mode
10	ITB checking supported
08	Transparency mode
04	No ID exchange verification
02	Spanned records supported
01	Variable length records supported

06-07	TUB address
08-09	Communication parameter list address
0A-0B	External return code
0C-0D	Internal return code
0E-0F	Operation code

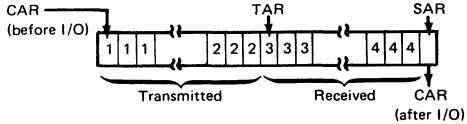
+00	Trace Type 0E	Issuer's TCBID	TUBAT1	TUBAT2
+04	TUBAT3	TUBTA2	Addresses (TUB)/Addresses (TCB)	
+08	Addresses (parameter list)		PLRTC	
+0C	PL$RTC		PLOPM	PLOPC



Disp Hex	Lng Dec	Description
00	1	Q-byte of SIO: *Hex Value* — *Meaning* 88 — BSCA line 2 80 — BSCA line 1 Bits 5-7 — 00 – Control 01 – Receive only 02 – Transmit and receive 03 – Receive initial 04 – Auto-call 06 – Loop test
01	1	R-byte of SIO: *Hex Value* — *Meaning* C0 — Enable BSCA (off-disable BSCA) A0 — Enable test mode (off-disable test mode) 90 — Enable step mode (off-disable step mode) 04 — Start two-second timeout (off-cancel two-second timeout) 02 — Enable interrupt requestability (off-disable interrupt requestability) 01 — Reset interrupt request
03	1	Sense byte 1: *Hex Value* — *Meaning* 02 — Data set ready 01 — Data line occupied (switched, auto-call)
04-06	3	First 3 characters transmitted
07-09	3	Last 3 characters transmitted
0A-0C	3	First 3 characters received
0D-0F	3	Last 3 characters received

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

Disp Hex	Lng Dec	Description

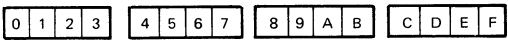


CAR: Current address register
TAR: Transition address register
SAR: Stop address register

02 1 Sense byte 2:

Hex Value	*Meaning*
80	Receive timeout, aborted auto-call
40	Data check during receive operation
20	Adapter check during transmit operation
10	Adapter check during receive operation
08	Invalid ASCII character
04	Abortive disconnect (lost connection)
02	Disconnect 20-second timeout

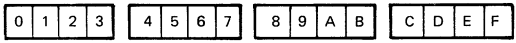
MLTA TRACE



Disp Hex	Lng Dec	Trace F0 (Program Level SIO)

MLTA Trace F0 SIO

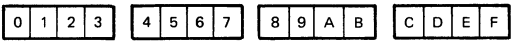
00	1	Hex F0 entry ID
01	1	Op code from DTF (contains hex FF during open/close)
02-03	2	ARR save area contents from DTF
04	1	Receive length count (HDB-8)
05	1	HDB-9: *Hex Value* — *Meaning* 80 — PCI flag 40 — Break/skip flag 10 — Terminal interrupt 08 — Inhibit receive flag 04 — Inhibit timeout 02 — Terminal dependent flag 01 — Terminal control type
06-07	2	Address to receive control at next op end interrupt
08-09	2	Contents of XR2 save area in DTF
0A-0B	2	SIO Q and R-bytes in IOB
0C-0D	2	CAB contents in IOB
0E-0F	2	TAB contents in IOB



Disp Hex	Lng Dec	Trace F1 (Interrupt Level Entry Trace Table Entry)
MLTA Trace F1		
00	1	Entry ID
01	1	Contents of high density buffer position 0 (DTF)
02	1	Contents of high density buffer position 6 (DTF)
03	1	Contents of high density buffer position 7 (DTF)
04-05	2	CAB contents (MLTCOM)[1]
06-07	2	TAB contents (MLTCOM)
08-09	2	Two characters stored at CAB contents (MLTCOM)[2]
0A	1	Bit switch of attribute byte 2 (DTF)
0B	1	Interrupt level 3 source bits (MLTCOM)
0C-0D	2	Address of DTF associated with this line (XR2)
0E	1	IOCS switches (MLTCOM)[2]
0F	1	Count of PCI processing that is pending (MLTCOM)

Note: If this current trace entry is identical to the last interrupt level entry trace entry (except when at beginning of table), it is not added to the table.

[1] MLTA IOCS common area
[2] If bits 0 or 1 are on (displacement E), the CAB characters are not meaningful.



Disp Hex	Lng Dec	Trace F2 (Interrupt Level Exit Trace Table Entry)
MLTA Trace F2		
00	1	Entry ID
01[1]	1	Operation code being processed on this line (DTF)
02	1	Internal IOCS completion code set when interrupt processing is complete (DTF)
03	1	Internal IOCS ERP switches (DTF)
04-05	2	Contents of high density buffer positions 8 and 9 (DTF)
06-07	2	Address to receive control at next operation end interrupt (DTF)
08-09	2	Internal IOCS switches (DTF)
0A-0B	2	SIO Q and control bytes (SIO)
0C-0D	2	CAB contents (IOB)
0E-0F	2	TAB contents (IOB)

Note: If this current trace entry is identical to the last interrupt level exit trace entry in the table (except when at beginning of table), it is not added to the table.

Disp Hex	Lng Dec	Trace F3 (Operation Complete)
MLTA Trace F3 Op Complete		
00	1	Hex F3 trace ID read/write operation complete
01-02	2	Current record length (DTF)
03-04	2	Current record address (DTF)
05-0F	11	Data stored at current record address (nonpolled terminal)
05-0D	(9)	Data stored at current record address (polled terminal)
0E-0F	(2)	Terminal address (DTF) (polled terminal)

[1] Contains hex FF during open and close operations

TRACE HALT CCSA

The trace halt service aid halts CCP when significant system events are traced. The service aid user can specify, by entering data on the CPU switches, the trace entry to halt. Optionally, a halt on every trace entry can be selected.

The trace halt service is loaded by startup if:

1. CCP TRACE (CCTR) is loaded, and

2. The service aid resides in the same object library as CCP trace. The module name must be CCSA.

When loaded, CCSA does not halt until FFFF is dialed into the CPU data switches. The next entry to trace causes CCSA to sense the switches and a CU halt appears. The trace entry to halt can then be selected as follows:

1. If hex 0000 is dialed in, CCSA does not halt until FFFF is sensed.

2. Hex XX01-XX1F stores the right data switches and halts when a matching trace entry occurs.

3. Hex XX20-XXFF causes the CU halt to reappear.

4. Hex XX00 causes the service aid to halt on any entry to trace.

When CCSA is entered, the current trace ID is compared to the selected trace ID. If they match, or if the selected trace ID is hex 00, an OP halt appears. If halt reset is pressed, the CPU data switches are again sensed. If hex FFFF is dialed into the switches, the CU halt appears, and a new halt ID can be selected.

At any time, 0000 can be dialed into the switches to prevent CCSA from halting CCP.

CCSA exists on CCP production pack as $CC#SA. The module must be renamed before CCTR can load and activate it.

DUMP PROGRAM

The dump program $CCPDD can be used to print dumps and CCP trace data from the most recent execution of CCP.

How to Use $CCPDD

The following OCL is used to invoke the dump program:

```
// LOAD $CCPDD,uu
// FILE UNIT-dd,NAME-$CCPFILE,PACK-XXXXXX
// RUN
```

where uu is the unit on which the program is located and dd is the unit on which $CCPFILE is located. XXXXXX is the volume identification of the pack on which $CCPFILE is located.

You can select the type of dump you want by entering any or all of the following types of dump control records from the SYSIN device:

1. To dump all of one storage dump, enter:

   // DUMP n

   The n specifies the dump number from the 526 or 530 messages issued to the system operator during CCP execution.

2. To dump all storage dumps taken during the last CCP execution, enter:

   // DUMP ALL

3. To dump the CCP trace data, enter:

   // DUMP TRACE

4. To dump a portion of one storage dump, enter:

   // DUMP n, hex aaaaaa, hex bbbbbb (Model 12 only)
   // DUMP n, hex aaaa, hex bbbb (Models 4, 8, and 10)

   The n is the dump number, aaaa is the starting address (in hexadecimal) of the area to be dumped, and bbbb is the address of the end of the area to be dumped.

5. Follow the last dump control record with a /* to terminate the dump program.

USING THE STANDALONE DUMP PROGRAM (MODELS 8, 10, AND 12 ONLY)

When the DSM CEFE storage dump fails to function properly because some error has destroyed the low-storage linkage to the dump routine, a card-loadable storage dump can be used to dump main storage to the printer.

Four MFCU-loadable storage dump programs are provided with CCP. The programs are punched during CCP generation. The dump programs differ only in the specific print chain (or train) they support. The dump programs are:

1. CCPDAN for AN or LC chain.
2. CCPDHN for HN chain.
3. CCPDPN for PN chain.
4. CCPDTN for TN chain.

The dump program itself occupies 768 (hex 300) bytes of main storage. The 768 bytes can be anywhere in the machine. The bootstrap loader used to load the dump program into main storage occupies the first 256 bytes of storage. The Model 12 dump program occupies 1024 bytes (hex 400) of main storage and must be loaded so that the entire program is below hex 8000.

To use the card-loadable dump program:

1. Place the program in the primary MFCU hopper.

2. Set the load selector dial to ALTERNATE.

3. Press PROGRAM LOAD.

4. When the CU halt appears, dial in the address where the dump program is to be loaded, then reset the halt.

5. When the 5E halt appears, use the left two dials to set the high-order two digits of the beginning dump location; use the right two dials to set the high-order two digits of the ending dump location. After setting the dials, press HALT RESET/START. (If the 5E halt remains, the beginning location is set higher than the ending location.) For Model 12 only, after the program is loaded, a 5A halt will appear. Use the four dials to set the high-order 2 bytes of the 3-byte physical address of the beginning location of the dump. Press HALT RESET/START. When the EA halt appears, set the four dials to the high-order 2 bytes of the 3-byte physical address of the ending location and press HALT RESET/START. (If the SA halt reappears, the beginning address was higher than the ending address.)

6. After printing the dump, the dump program returns to the starting address halt. You can dump another area of main storage without reloading the dump program.

REP STATEMENT PROCESSOR

This facility is used to patch execution time resident code. To activate this facility at startup time, enter the keyword FEREP.

If you wish to always activate the rep card processor at startup time, the following disk patch to $CC3CX is necessary:

```
// LOAD $SGFIX, xx
// RUN
HDR ↓ O$CC3CX, xx
PTF ↓ $CC3000
DATA ↓ 0013, 87, 80
END
```

To deactivate the facility, replace DATA card above with:

```
DATA ↓ 0013, 80, 87
```

During startup, the activated $CC3Cs prompts:

```
ANY REPS FOR THIS RUN?
```

A response of YES or Y covers rep cards to be read (from SYSIN) and then processed.

Rep card format:

Col 1-3	REP
4	Blank
5-6	Address to be patched
7	Blank
8-?	The patch bytes (Any bytes can be separated by a comma. An asterisk causes the 2 preceding bytes to be relocated relative to the start of CCP program level. Comments are allowed if separated from patch data by a blank. A card with an asterisk in column 1 is logged. The last card of the rep deck must be /*.)

HOW TO WRITE A SERVICE AID PROGRAM

To write your own service aid program, consider that:

1. The program must be named CCSA and must reside in the object library of the CCP pack.

2. The entry point of the program must be the first byte.

3. The ARR must be saved upon entry and used to return to $CCSTR.

4. General entry, IOS, and IOW cannot be invoked from the service aid program.

The input to the service aid is:

5. The address of $CCCOM is passed in XR1.

6. The address of the trace control block is passed in XR2.

CCP Halts

See *IBM System/3 Communications Control Program Messages Manual*, GC21-5170.

PROGRAM TERMINATION CODES

526 xxxxxx TASK-n CMP-nn [REQR-'xx' DUMP#-n]

Where:			
	xxxxxx	=	Program name
	TASK-n	=	CCP identification of user task
	CMP-nn	=	User program termination code
	REQR-'xx'	=	CCP terminal reference identifier of the requesting terminal, if still attached to the user program when it terminated. If the user task was an MRT program, the oldest attached requester is identified.
	DUMP#-n	=	Identification number of the disk dump of the user program on $CCPFILE (if space was available for a dump in the dump area).

When user program errors involving the DFF put override operation cause the termination, message 526 is preceded by message 528.

528 ERROR IN DATA FOR DFF AT LOCATION nnnn

Completion Code		
01	Reason	Invalid operation code or invalid operation code modifier
	Recovery	Review operation code/operation modifier combinations.
02	Reason	Invalid operation for the 5471 printer/keyboard
	Recovery	Review operations issued to CONSOL. The valid operations are put-then-get, put, put-no-wait, get attributes, and accept input (data with program request only).
03	Reason	Symbolic terminal name not defined to CCP
	Recovery	Verify the terminal names used in the program against the terminal names defined at assignment time.
04	Reason	Terminal not allocated to this program
	Recovery	Determine which operation was issued to an unallocated terminal (other than acquire terminal and get terminal attributes). Correct the program and/or the assignment set.
05	Reason	Allocated terminal referenced by other than an allocated name
	Recovery	Verify that terminal names used in the program are the names specified in the // PROGRAM assignment statement or in an acquire terminal operation.

06	Reason	Blank symbolic terminal name used in an MRT program
	Recovery	Correct the program to specify a terminal name. Blank terminal names are allowed only in SRT programs.
07	Reason	Blank terminal name used in an SRT program after the requesting terminal has been released
	Recovery	Correct the program to specify a terminal name on the operation or do not release the requesting terminal.
08	Reason	Blank symbolic terminal name is invalid for this operation
	Recovery	Review operations. A blank terminal name is not allowed for an acquire terminal operation.
09	Reason	Invalid use of a subterminal name
	Recovery	Review operations. A subterminal name (a symbolic terminal name for the component(s) of a multicomponent terminal) may not be used with acquire terminal and release terminal operations.
0A	Reason	Symbolic terminal name not assigned to a terminal
	Recovery	Verify that terminal names specified in the PROGRAM assignment statement are assigned to terminals by TERMNAME assignment statements; revise the program and/or assignment set as necessary.
0B	Reason	Terminal attribute set is invalid for the terminal specified
	Recovery	The terminal attribute set associated with a terminal by an acquire terminal operation is invalid for the terminal. Review the attribute identifiers and terminal types.
0C	Reason	Terminal does not have the I/O capability specified in the operation. Either an output operation is being issued to an input-only terminal or an input operation is being issued to an output-only terminal.
	Recovery	Review program logic and terminal assignments.
0D	Reason	Invalid output length
	Recovery	Review output lengths. The output length for put record operations must be greater than zero.
0E	Reason	Invalid input length
	Recovery	Review input lengths. The input length for input operations must be greater than zero.
0F	Reason	Input length greater than teleprocessing line buffer size (-4) for an invite input operation (Four characters are required for control information used by the main storage allocation routines.)
	Recovery	Review lengths specified for invite input operations; ensure that all necessary terminal attribute identifiers for this terminal are specified at assignment time.

10	Reason	Invalid operation issued to a terminal with data from a program request outstanding
	Recovery	Review program logic. The only operation that is valid to a terminal with data accompanying the program request is an accept input.
11	Reason	Invalid operation issued to a terminal to which an invite input operation is outstanding
	Recovery	Review program logic. Only an accept input or stop invite input operation can be issued to the terminal.
12	Reason	Accept input operation issued to a nonnever-ending program that had no outstanding invite input operations
	Recovery	Review program logic. An accept input is valid for a nonnever-ending program only if one or more invite inputs are outstanding.
13	Reason	Accept input operation issued by a never-ending program that has no outstanding invite input operations and whose active terminal count is equal to the maximum terminal count
	Recovery	Review the logic of the program and the value specified for MRTMAX on the PROGRAM assignment statement for the program.
14	Reason	Stop invite input operation issued to a terminal that has no outstanding invite input operations
	Recovery	Review program logic. Stop invite input can only be issued to a terminal that has an outstanding invite input.
15	Reason	Input record area not large enough for a get block operation (BSCA terminals).
	Recovery	Review record area sizes in the program and check the value of the BLKL keyword on the TERMATTR assignment statement.
16	Reason	DFF copy command issued to a terminal not using the DFF
	Recovery	Check the attribute sets used by the terminals in the program. The TERMATTR assignment statement must contain the DFF3270-YES keyword in order to use the copy command with the terminal.
17	Reason	Copy operation issued to a terminal whose name is not defined in the CCP system
	Recovery	Check the terminal names used in the program against the TERMNAME assignment statements for this assignment set. The error refers to the copy to terminal.
18	Reason	Copy operation issued to a 3275 display station
	Recovery	Change the program. The copy operation can be issued only to Models 1 and 2 of the following 3270 components (attached to the same 3271 control unit): 3277, 3284, and 3286.

19 Reason — DFF erase all unprotected operation issued to a terminal that does not support the display format facility

Recovery — Check the attribute sets used by the terminals in the program. The TERMATTR assignment statement must contain the DFF3270-YES keyword in order to use DFF operations with the terminal.

1A Reason — Put override operation issued to a terminal that does not support the 3270 display format facility

Recovery — Check the attribute sets used by the terminals in the program. The TERMATTR assignment statement must contain the DFF3270-YES keyword in order to use DFF operations with the terminal.

1B Reason — A put operation other than a message mode output operation issued to a terminal that supports the display format facility

Recovery — Only message mode operations can be issued to terminals that support the DFF. Check terminal attribute sets and program operations to locate the error.

1C Reason — Record area not large enough for BSCA ITB

Recovery — Review the record area size specified in the parameter list, and check the record length specified in the TERMATTR assignment statement. When processing input or output data in record mode with ITB, you must specify a record length equal to that specified in the TERMATTR statement.

1D Reason — Accept input operation issued, but it is not possible to receive data from any terminal with an outstanding invite input

Recovery — Review program logic. The only outstanding invite input operations are to BSCA terminals, but the BSCA line is currently owned by a terminal in use by your program that is awaiting EOT.

1E Reason — Output operation to the console specified a length greater than the maximum allowed. The maximum lengths are:

Model 4	66
Models 8, 10, and 12	80

Recovery — Check console operations in the program to ensure that the length specified for output operation does not exceed the maximum allowed.

1F Reason — Output length greater than the teleprocessing line buffer size

Recovery — Review the output lengths and the terminal attribute sets associated with the terminal.

20 Reason — Total length of fields to be moved by RPG II SUBR90 greater than the size of the record area provided

Recovery — Check lengths specified in the program as RLABLs for SUBR90 against the record area length specified in the RPG II file description specifications.

21	Reason	Program attempted to acquire a terminal by a symbolic subterminal name
	Recovery	Review acquire terminal operations cannot be used in an acquire terminal operation.
22	Reason	Program attempted to acquire the console
	Recovery	Review acquire terminal operations; acquire terminal cannot be issued to the console.
23	Reason	Program issued an invalid acquire terminal operation: – Attempted to acquire a nonrequesting terminal that was already allocated to the program by assignment specifications or a previous acquire terminal operation – Attempted to acquire a requesting terminal without specifying the set terminal attributes modifier in the operation code
	Recovery	Review program logic for acquiring terminals. Determine from the PROGRAM assignment statement which terminals are required to be available to the program (therefore, already allocated to the program when it is initiated). Acquire terminal can be issued to a requesting terminal only to reset the terminal attributes.
24	Reason	Acquire terminal operation issued to a requesting terminal that is in the process of transmission
	Recovery	Review program logic. Acquire terminal cannot be issued to a BSCA terminal that is operating in block or record mode and has not yet sent or received EOT.
25	Reason	Acquire terminal operation issued with an invalid attribute set identifier or with attributes invalid for the terminal.
	Recovery	Review TERMATTR and PROGRAM assignment statements to determine valid attribute set identifiers; correct the program or change the assignment set.
26	Reason	Attempted to issue a release terminal operation to a subterminal of a multicomponent terminal
	Recovery	Review release terminal operations and TERMNAME assignment statements. Release terminal cannot be issued with a subterminal name.
27	Reason	Release terminal operation issued to a BSCA terminal that is in the process of transmission
	Recovery	Review program logic. Release terminal cannot be issued to a BSCA terminal that is operating in block or record mode and has not yet sent or received EOT.
28	Reason	Input or output length specified for an RPG II operation using SUBR92 greater than the record length specified in the file description specifications or less than 14.
	Recovery	Review input and output lengths; compare to length specified in file description specifications.

29	Reason	Invalid put-then-get operation in RPG II program (using SUBR92): 1. Put-then-get issued to other than a combined file 2. Put-then-get operation code is in the array for an input operation, but the output part of the operation had not performed previously
	Recovery	Review use of put-then-get operation: 1. Must be issued to a combined file 2. The output part of the operation must precede the input part
2A	Reason	System operator canceled your program
	Recovery	Determine reason for cancelation and take appropriate action, if necessary.
2B	Reason	System operator canceled the CCP, causing all programs to be canceled.
	Recovery	Determine reason for cancelation and take appropriate action.
2C	Reason	User program went to end of job normally, but had outstanding invite input operations
	Recovery	If a program is to go to end of job prematurely (with outstanding invite input operations), it should issue stop invite input to terminals with outstanding invite inputs.
2D	Reason	User program went to end of job normally, but had an incomplete BSCA I/O operation (EOT was not sent or received on a record or block mode operation)
	Recovery	Review program logic. A user program should not go to end of job until EOT is received on BSCA I/O operations in progress.
2E	Reason	Program has two or more definitions for the same file and has tried to add records to that file using more than one of those definitions
	Recovery	Review the program and correct the logic. Two definitions of the same file are valid in Model 10 CCP systems that are generated with file sharing, but you must not add records to the file using more than one of the definitions.
2F	Reason	Invalid or illegal command, order, or buffer address in output data for the 3270 or an I/O interface overrun on the 3270 control unit.
	Recovery	Review output data to the 3270 for invalid command, order, or buffer address. If the program uses a DFF copy operation, perhaps an attempt is made to copy a protected display format (the from format contains a protected alphameric attribute byte in row 1, column 1).
30	Reason	SUBR92 used with an exit operation or SUBR91 used with a SPECIAL file
	Recovery	Check for improper use of communications service subroutines and recompile the program.

31 Reason — A never-ending program went to end of job prior to a SHUTDOWN request. Storage occupied by the program is not usable for other programs during this CCP run.

Recovery
- Change the never-ending program logic so that the program goes to end of job only when SHUTDOWN is recognized, or
- Change the PROGRAM assignment statement so that the program is no longer a never-ending program.

32 Reason — Program attempted to read a record from a shared file and sufficient control blocks (SQB) were not available for it

Recovery — Allocate more SQBs in the SQB-parameter of the SYSTEM statement for this assignment set.

33 Reason — Indicator 91 was left on after two operations to the same file or indicator 92 was left on for more than two task chain operations.

Recovery — Check all return codes in the RPG II program and reset indicator 91 or 92 after issuing a CCP operation.

34 Reason — An array is not associated with a file that used SUBR92.

Recovery — Include an extension specification associating an array with every file that uses SUBR92.

35 Reason — A user program that is not defined as using DFF attempted to perform an operation on a terminal whose attributes set indicates it does not use DFF.

Recovery — Review the TERMATTR assignment statement and/or the program's use of the terminals.

7F Reason — Halt issued by the user program or by a DSM routine supporting the user program

Recovery — The halt information is printed on the system operator's console (990 series message), preceding message 526. Determine the reason for the halt and correct the error condition. Do not use the following statements in programs written to run under CCP:

- RPG II: Halt indicators
- COBOL: STOP statement
- FORTRAN IV: PAUSE statement
- Basic Assembler: Branch to general entry (hex 0004) with a RIB of 85 (call halt/syslog)

RPG II programs must protect against an *unidentified record* halt.

80 Reason — Program requested an undefined function from CCP. In an RPG II, COBOL, or FORTRAN IV program, incorrect data area manipulation may have destroyed part of the program. In a Basic Assembler program, the sub-RIB used in a branch to general entry is invalid.

Recovery — Review the program and correct the logic.

82 Reason — Model 4:

An unrecoverable error occurred during CCP initialization of a user program's file:

- Filename not recognized.
- Filename not in PROGRAM assignment statement.
- Maximum skip line number is greater than printer page size.
- Disk file access method specified is not a valid access.
- Method of access is not permitted for this disk file organization.
- Disk file method of access does not match access method specified in PROGRAM assignment statement.
- Ordered load access specified, but it is not the first access of the file, or attempted to access a disk file to which an ordered load must be done first.
- An unordered load access is specified in this assignment set for this file; therefore, only unordered load is allowed during this CCP run.
- ISA or ISUA access was specified in the program, but cannot be allowed, because there were previous adds to the file.
- File characteristics as defined in the program do not match those declared in the DISKFILE assignment statement (ORG, RECL, KEYL, and KEYPOS parameters).
- More than one file definition is being used to update, load, or add to the same physical file in a program.

Recovery — Ensure that the file is defined at assignment time, that the file processing methods and file characteristics you defined in your program are compatible with the file definition requirements for assignment, and that you considered disk file sharing requirements.

82 Reason — Models 8, 10, and 12:

An unrecoverable error occurred during CCP initialization of a user program's file:

- Basic Assembler program attempted to open a unit record device without allocating it.
- Attempted to use a disk file, but the name of the file was not declared in the FILES parameter of the PROGRAM assignment statement.
- Method of processing a disk file does not match the access value specified for that file in the FILES parameter of the PROGRAM assignment statement.
- File characteristics as defined in the program do not match those declared in the DISKFILE assignment statement (ORG, RECL, KEYL, and KEYPOS parameters).
- Basic Assembler only: DTF is specified incorrectly or unit record device buffers are aligned incorrectly.

	Recovery	Perform one of the following: • Basic Assembler: Allocate unit record devices (branch to general entry with RIB 88) before attempting to open the files (branch to general entry with RIB 82). • Ensure that the disk file is defined at assignment time. • Ensure that the file processing methods and file characteristics you defined in your program are compatible with the file definition requirements for assignment. – For disk files, see above. – For unit record devices, ensure that you aligned your unit record device buffers correctly.
83	Reason	1. RPG II or FORTRAN IV: CCP encountered an error condition during program termination 2. COBOL or Basic Assembler: CCP encountered an error condition during disk file close
	Recovery	User program may have modified main storage outside of its bounds. If no error can be found, contact IBM for programming support.
84	Reason	Permanent I/O error during CCP initialization or termination of a user program's files
	Recovery	The problem could be hardware or, if a Basic Assembler program is being executed, it could be a program error. If an error cannot be found within the program, call IBM for programming support. *Note:* In a Basic Assembler program, a disk DTF cylinder/sector value that is incorrect can result in a permanent disk error that would look like a hardware error.
8B	Reason	Program attempted to use a card reader or printer, but the assignment parameter for the device was not specified in the PROGRAM assignment statement. Also, the program might have attempted to use the console as a non-communication device.
	Recovery	Be sure to define unit record devices used by the program in the PROGRAM assignment statement. Also, be sure that operations issued to the console by the program running under the CCP are issued as communications operations.
EE	Reason	Program attempted to use a put override operation to modify data in an input field
	Recovery	Determine program name and approximate location of error from message 528. Change field class to output/input or review logic of this operation.
EF	Reason	Program used an invalid modify data indicator in a put override operation
	Recovery	Determine program name and approximate location of error from message 528. Change indicator to blank to indicate no modified data, or M to indicate modified data.

F0 Reason — Program used an invalid character for cursor positioning in a put override operation

Recovery — Determine approximate location of error from message 528. Correct the cursor positioning character to C to position the cursor or to blank if cursor is not to be positioned.

F1 Reason — Program gave an invalid character in a put override operation to override the field type, or the field type character was not consistent with alpha/numeric field rules.

Recovery — Determine approximate location of error from message 528. The field type must be blank, 1, 2, or 5 for output fields; blank or 1-7 for SPD and input fields; blank or 1-8 for output/input fields. If the field is defined as alpha, valid override characters are 1, 2, or 5 (and 7, for input alpha fields); if the field is numeric, valid characters are 3, 4, or 6 for input or output/input fields.

F2 Reason — The value given as the output length for a DFF put message, copy, or put override operation was incorrect

Recovery — Determine which output record is in error and recalculate the length of data that should be provided or the value that should be given.

Put Message: The output length value must include the six positions for the display format name and the full length of each field supplied at execution time (+14, in RPG II SPECIAL).

Copy: The output length value must be 6 or 7 (if the copy control character is specified). (In RPG II SPECIAL, the value must be 20 or 21.)

Put Override: The output length value must include the WCC, nine positions for each field that is overridden, plus the full length of each field that has modified data (+14, in RPG II SPECIAL).

F3 Reason — The model number specified for the display format does not match the model number of the terminal

Recovery — Request a different format or regenerate the display format, designating the proper model number.

F4 Reason — A field name was expected in the record area for a put override operation with DFF and one of the following occurred:

- The field name was not provided in the correct sequence.
- A field name is duplicated in the record area.
- An invalid field name was specified.
- An incorrect value was given for output length.
- The field name was not given in the proper location in the record area.
- The field may have been defined as data source F instead of G.

	Recovery	Determine which output record contains the error and determine the position in the record area where the field name in error is located (message 528 provides this value). Verify the following: • The order and spelling of the field names match those in the format generation listing. • The proper format was overridden. • The value given for the output length includes the WCC, nine positions for each overridden field, plus the full length of each field that has modified data (+14, in RPG II SPECIAL). • The editing of an output field did not blank out the M designating modified data.
F5	Reason	A modify data indicator of E was used, but the field erased to nulls is an output or SPD field type. A modify data indicator of E is valid only for input or output/input type fields.
	Recovery	Determine the output record in error, and determine the position in the record area where the field name in error is located (message 528 provides this value). Verify that an attempt was made to override an output or SPD field type. Correct the PUT override list or format.
F6	Reason	The space available in the program appended storage area for DFF is not large enough to contain the field descriptor table for the desired format.
	Recovery	Check the field descriptor table size for every format this program uses and increase the DFFSFDT value on the PROGRAM assignment statement.
F8	Reason	The amount of text to be sent to a 3270 terminal is more than 256 bytes and the output hold area is not large enough.
	Recovery	The output hold area must be at least 512 bytes in length for blocking of output text when DFF is used. Specify a value of 512 bytes or larger on the BLKL keyword of the TERMATTR assignment statement.
F9	Reason	Disk I/O error occurred during operation of the display format control routine.
	Recovery	System operator should obtain a dump of storage from $CCPFILE. Call your IBM representative.

FA Reason — For a DFF copy operation, the *from* and *to* terminals are either not both online, not attached to the same control unit, or not on the same BSCA line.

Recovery — Verify the terminal names used in the copy operation. Obtain verification of the status of the desired *from* and *to* terminals from the system operator.

FB Reason — The BSCA line buffer is smaller than the output hold area for DFF.

Recovery — The BSCA line buffer must be at least as large as the output hold area defined for the line. Ensure that the value for BLKL in the TERMATTR statement for this terminal is large enough for your data.

FC Reason — The desired display format was not found on the specified disk pack for DFF.

Recovery — Verify that the display format name is valid and verify which disk pack it is on. All display formats must be on the same disk pack (program or system pack). If the format name and location are correct, contact IBM for CCP programming support.

FD Reason — A non-SPD field (input or output/input) was received from a terminal and the data was received because of a selector pen attention field.

Recovery — Data cannot be provided to the program for input or output/input field in this case. Evaluate the types of fields defined at the terminal. In the case of overlay formats, the modify data indicators were not reset when the overlay format was issued to the terminal or a non-SPD field was modified to an SPD field by improper data.

FE Reason — Not enough space allocated in the program-appended storage area for the program to use DFF

Recovery — Increase the number of terminals this program can communicate with concurrently in the DFFMTERM keyword or the number of display formats this program uses in the DFFNDF keyword of the appropriate PROGRAM assignment statement.

FF Reason

1. Program is attempting to communicate with a terminal using DFF, and a display format was not previously sent to a terminal by means of a put message or copy operation.
2. The format is not on the terminal because either a negative return code was received from the last output operation, or a CLEAR key return code was received from the last input operation issued to the terminal.

Recovery

1. Restructure the program to issue a display format to the terminal before attempting to receive data from the terminal via DFF. This message does not apply to an accept input that is preceded by an implied invite input (data allowed with the program request from the terminal).
2. Transmit a format to the terminal.

OPERATION CODES

Operation Symbols

GET	Get
PUT	Put
PTG	Put-then-get
PNW	Put-no-wait
INV	Invite input
ACC	Accept input
SPI	Stop invite input
ACQ	Acquire terminal
REL	Release terminal
SHQ	Shutdown inquiry
GTA	Get terminal attributes
EOF	Force end of file (RPG II only)
CPY	Copy (3270 DFF only)
EAU	Erase all unprotected (3270 DFF only)

Operation Modifier Symbols

BLK	Block—send end of block (EOB)
MSG	Message—send end of transmission (EOT)
RVI	Send reverse interrupt (RVI)
KPL	Keep line
STA	Set terminal attributes
NNL	Not start new line
NEL	Not end new line
OVR	Override (3270 DFF only)

Operation	Value		RPG II
	Dec	Hex	Code
GET	1	0001	␣␣␣A
GET,RVI	17	0011	␣␣AA
PUT	2	0002	␣␣␣B
PUT,NNL	514	0202	␣B␣B
PUT,NEL	258	0102	␣A␣B
PUT,NNL,NEL	770	0302	␣C␣B
PUT,BLK	34	0022	␣␣BB
PUT,BLK,PRF	98	0062	␣␣FB
PUT,BLK,NNL	546	0222	␣BBB
PUT,BLK,NEL	290	0122	␣ABB
PUT,BLK,NNL,NEL	802	0322	␣CBB
PUT,MSG	50	0032	␣␣CB
PUT,MSG,PRF	114	0072	␣␣GB
PUT,MSG,NNL	562	0232	␣BCB
PUT,MSG,NEL	306	0132	␣ACB
PUT,MSG,NNL,NEL	818	0332	␣CCB
PTG	3	0003	␣␣␣C
PTG,NNL	515	0203	␣B␣C
PTG,NEL	259	0103	␣A␣C
PTG,NNL,NEL	771	0303	␣C␣C
PTG,MSG,GET	51	0033	␣␣CC
PUT,MSG,OVR	2098	0832	␣HCB
PUT,MSG,PRF,OVR	2162	0872	␣HGB
PNW,MSG,OVR	3002	0836	␣HCF
EOF	–	–	␣␣GA
SHQ	0	0000	␣␣00

␣ = blank

OPERATION CODES (Continued)

Operation	Value		RPG II Code
	Dec	Hex	
CPY	66	0042	ØØDB
EAU	82	0052	ØØEB
PNW	6	0006	ØØØF
PNW,NNL	518	0206	ØBØF
PNW,NEL	262	0106	ØAØF
PNW,NNL,NEL	774	0306	ØCØF
PNW,BLK	38	0026	ØØBF
PNW,BLK,NNL	550	0226	ØBBF
PNW,BLK,NEL	294	0126	ØABF
PNW,BLK,NNL,NEL	806	0326	ØCBF
PNW,MSG	54	0036	ØØCF
PNW,MSG,PRF	118	0076	ØØGF
PNW,MSG,NNL	566	0236	ØBCF
PNW,MSG,NEL	310	0136	ØACF
PNW,MSG,NNL,NEL	822	0336	ØCCF
PNW,MSG,OVR	3022	0836	ØHCF
PNW,MSG,OVR,PRF	2166	0876	ØHGF
INV	5	0005	ØØØE
ACC	4	0004	ØØØD
SPI	1025	0401	ØDØA
GTA	8	0008	ØØØH
ACQ	9	0009	ØØØI
ACQ,STA	25	0019	ØØAI
REL	10	000A	ØØØK
REL,KPL	26	001A	ØØAK
PUT,MSG,INV	–	–	ØØØS
PNW,MSG,INV	–	–	ØØØW
PUT,MSG,INV,OVR	–	–	ØHØS
PNW,MSG,INV,OVR	–	–	ØHØW

RETURN CODES

CCP RETURN CODES			Description	Program Action Code[1]
Dec	Hex	RPGII		
0	0000	00	Successful operation.	A1
1	0001	01	DATA TRUNCATED: Data was truncated; for input operations, the data was greater than the input length specified in the parameter list; for output operations, the length of the data was greater than the length of the teleprocessing line buffer.	A2
2	0002	02	EOT: Input operation was successful; EOT was received.	A3
3	0003	03	DATA TRUNCATION AND EOT: Data truncation occurred on this operation and EOT was received.	A2
4	0004	04	SHUTDOWN REQUESTED: The system operator has requested CCP shutdown. The requested operation was not performed.	A4
5	0005	05	DATA PENDING: The operation was issued to a terminal on a BSCA line that is currently controlled by another terminal in use by your program (line awaiting EOT), or an invite input was issued to a terminal awaiting EOT.	A6
6	0006	06	TERMINAL INTERRUPT/RVI: A terminal interrupt (MLTA) or RVI (BSCA) was received from the remote station. The operation was successful.	A5
7	0007	07	3270 CLEAR: The terminal operator at 3270 pressed the CLEAR key. (See *3270 Component Description*, GA27-2749.)	A5
8	0008	08	TERMINAL NO LONGER AVAILABLE: The terminal operator went into command interrupt mode and was released (/RELEASE command). The terminal is no longer available to this program.	A3

[1] See last page in this section for description of these program action codes.

RETURN CODES (Continued)

CCP Return Codes			Description	Program Action Code[1]
Dec	Hex	RPG II		
9	0009	09	TERMINAL OFFLINE: The requested terminal was varied offline and is not available to this program.	A3
10	000A	10	STOP INVITE INPUT SUCCESSFUL: The request to stop invite input was successful; the invite input was canceled.	A1
11	000B	11	ACQUIRE TERMINAL FAILED: The attempt to acquire a terminal for this program has failed.	A1
-1	FFFF	OJ	DATA CHECK: Data was received incorrectly, checking error condition detected.	A2
-2	FFFE	OK	INVALID CHARACTER: (1) During translation of data, an invalid character was found. (2) An invalid ASCII character has been detected by BSCA.	A2
-3	FFFD	OL	LOST DATA: Data received was lost because it exceeded the size of the input buffer.	A2
-4	FFFC	OM	PERMANENT BSCA ERROR: Operation failed because a permanent error condition was detected.	A2
-5	FFFB	ON	ABNORMAL RESPONSE: An invalid response was received from the remote station.	A2
-6	FFFA	OO	TRANSMIT/RECEIVE ABORT: Data transfer failed and the teleprocessing line has been closed. CCP has varied offline all terminals on this line.	A3
-7	FFF9	OP	NO RESPONSE TO POLLING/ADDRESSING: The selected terminal does not respond to polling or addressing.	A2
-8	FFF8	OQ	TEXT TIME OUT: The terminal does not respond to attempted data transfer.	A2

[1] See last page in this section for description of these program action codes.

RETURN CODES (Continued)

CCP Return Codes			Description	Program Action Code[1]
Dec	Hex	RPG II		
-9	FFF7	OR	WAIT TIME EXCEEDED: Data was not sent or received before EOT within a specified time frame.	A2
-10	FFF6	1	NO CONNECTION: Unable to establish a connection with the remote station.	A2
-11	FFF5	1	INVALID IDs: The ID exchange with the remote station failed.	A2
-12	FFF4	1K	ABORT, DISCONNECT: The switched line connection to the remote station has been lost.	A2
-13	FFF3	1L	ADAPTER CHECK: A hardware check occurred on the teleprocessing line adapter.	A2
-14	FFF2	1M	NEGATIVE RESPONSE TO ADDRESSING: The remote terminal has an error condition that prevents it from successfully receiving data.	A2
		9J	OPERATION NOT PERFORMED (RPG II SPECIAL): The operation was not performed because indicator 91 was set on by a previous operation and was not set off.	A2
-20	FFEC	2	3270 device is unavailable or not ready	A2
-21	FFEB	2J	Reserved[2]	
-22	FFEA	2K	3270 equipment check; device end	A2
-23	FFE9	2L	3270 detected a BSCA error	A2
-24	FFE8	2M	3270 control check; data check	A2
-25	FFE7	2N	3270 data check on copy command	A2
-26	FFE6	2O	3270 operation check—copy command	A2

[1] See last page in this section for description of these program action codes.
[2] This return code is not returned to the user if CCP detects this condition and the operations message, followed by a 2F termination code, is displayed.

RETURN CODES (Continued)

CCP Return Codes			Description	Program Action Code[1]
Dec	Hex	RPG II		
-27	FFE5	2P	3270 device busy with copy command	A2
-28	FFE4	2Q	3270 control check, operation check, data check during copy command	A2
-29	FFE3	2R	3270 invalid data from 3270 using DFF.[2]	A2
-40	FFD8	4	3735 attempted send before receive	A7
-41	FFD7	4J	3735 invalid character	A2
-42	FFD6	4K	3735 buffer overflow	A2
-43	FFD5	4L	3735 disk full	A5
-44	FFD4	4M	3735 directory full	A5
-45	FFD3	4N	3735 undefined header	A2
-46	FFD2	4O	3735 disk error	A2
-50	FFCE	5	3741 transparency error occurred	A2
-51	FFCD	5J	3741 no activity within 20 seconds	A2
-52	FFCC	5K	3741 data check	A2
-53	FFCB	5L	3741 received line bid error	A2
-54	FFCA	5M	3741 wrong length error	A2
-55	C9	5N	3741 reset was pressed on 3741	A5
-56	C8	5O	3741 security check	A5
-57	C7	5P	3741 disk overflow	A5
-58	C6	5Q	3741 bad extent error	A2
-59	C5	5R	3741 both stations transmit	A7
-60	C4	G	3741 length error	A2
-61	C3	6J	3741 no record found on disk	A2

[1] See last page in this section for description of these program action codes.
[2] This condition code is returned to the user if TEST REQ is passed to a 3270 that has an invite input outstanding.

RETURN CODES (Continued)

CCP Return Codes				Program Action Code[1]
Dec	Hex	RPG II	Description	
-62	C2	6K	3741 seek error	A2
-63	C1	6L	3741 read error	A2
-64	C0	6M	3741 write error	A2
-65	BF	6N	3741 not ready	A2
-66	FFBE	60	3741 diskette label is write protected	A2

Program Action Code	Description
A1	Continue normal processing.
A2	Attempt to determine the cause of the error and retry the operation if appropriate; otherwise, go to the next logical operation.
A3	Do not reissue the operation to this terminal.
A4	Go to end of job as soon as logically possible.
A5	Process according to the requirements of the application.
A6	Process data until EOT on the terminal for which data is pending.
A7	Issue a get operation or go to end of job.

[1] See last page in this section for description of these program action codes.

BSCA CONTROL CHARACTERS AND CODES

EBCDIC

Hex	Char	Hex	Char	Hex	Char
00	NUL	32	SYN	83	c
01	SOH	34	PN	84	d
02	STX	35	RS	85	e
03	ETX	36	UC	86	f
04	PF	37	EOT	87	g
05	HT	3C	DC4	88	h
06	LC	3D	NAK	89	i
07	DEL	3E	ACK	91	j
09	RLF	3F	SUB	92	k
0A	SMM	40	SP	93	l
0B	UT	4A	¢	94	m
0C	FF	4B	.	95	n
0D	CR	4C	<	96	o
0E	SO	4D	(	97	p
0F	SI	4E	+	98	q
10	DLE	4F	|	99	r
11	DC1	50	&	A1	~
12	DC2	5A	!	A2	s
13	DC3	5B	$	A3	t
14	RES	5C	*	A4	u
15	NL	5D	)	A5	v
16	BS	5E	;	A6	w
17	IL	5F	¬	A7	x
18	CAN	60	–	A8	y
19	EM	61	/	A9	z
1A	CC	6A	|	C0	{
1C	IFS	6B	,	C1	A
1D	EGS	6C	%	C2	B
1E	IRS	6D	_	C3	C
1F	IUS	6E	>	C4	D
20	DS	6F	?	C5	E
21	SOS	79	\	C6	F
22	FS	7A	:	C7	G
24	BYP	7B	#	C8	H
25	LF	7C	@	C9	I
26	EOB (ETB)	7D	'	D0	}
27	PRE (ESC)	7E	=	D1	J
2A	SM	7F	"	D2	K
2D	ENQ	81	a	D3	L
2F	BEL	82	b	D4	M

BSCA CONTROL CHARACTERS AND CODES (Continued)

Hex	Char	Hex	Char	Hex	Char
D5	N	E6	W	F6	6
D6	O	E7	X	F7	7
D7	P	E8	Y	F8	8
D8	Q	E9	Z	F9	9
D9	R	F0	0		
E0	\	F1	1		
E2	S	F2	2		
E3	T	F3	3		
E4	U	F4	4		
E5	V	F5	5		

ASCII

00	NUL	1E	RS	3C	<
01	SOH	1F	US	3D	=
02	STX	20	SP	3E	>
03	ETX	21	!	3F	?
04	EOT	22	"	40	@
05	ENQ	23	#	41	A
06	ACK	24	$	42	B
07	BEL	25	%	43	C
08	BS	26	&	44	D
09	HT	27	'	45	E
0A	LF	28	(	46	F
0B	VT	29	)	47	G
0C	FF	2A	*	48	H
0D	CR	2B	+	49	I
0E	SO	2C	,	4A	J
0F	SI	2D	–	4B	K
10	DLE	2E	.	4C	L
11	DC1	2F	/	4D	M
12	DC2	30	0	4E	N
13	DC3	31	1	4F	O
14	DC4	32	2	50	P
15	NAK	33	3	51	Q
16	SYN	34	4	52	R
17	ETB	35	5	53	S
18	CAN	36	6	54	T
19	EM	37	7	55	U
1A	SUB	38	8	56	V
1B	ESC	39	9	57	W
1C	FS	3A	:	58	X
1D	GS	3B	;	59	Y

BSCA CONTROL CHARACTERS AND CODES (Continued)

Hex	Char	Hex	Char	Hex	Char
5A	Z	69	i	78	x
5B	[	6A	j	79	y
5C	\	6B	k	7A	z
5D	]	6C	l	7B	{
5E	¬	6D	m	7C	|
5F	—	6E	n	7D	}
60	'	6F	o	7E	~
61	a	70	p	7F	DEL
62	b	71	q		
63	c	72	r		
64	d	73	s		
65	e	74	t		
66	f	75	u		
67	g	76	v		
68	h	77	w		

CONTROL CHARACTERS

Char	EBCDIC	ASCII	Char	EBCDIC	ASCII
ACK0	1070	1030	ITB	1F	1F
ACK1	1061	1031	NAK	3D	15
DISC	1037	1004	RVI	107C	103L
DLE	10	10	SOH	01	01
ENQ	2D	05	STX	02	02
EOT	37	04	SYN	32	16
ETB	26	17	TTD	022D	0205
ETX	03	03	WACK	106B	103B

HOW TO DETERMINE THE WRITE CONTROL CHARACTER (WCC)

1. Select bits 2–7.

Bit	Name	Explanation
2,3	Printer	Define the printout format as follows: 00 The NL order in the data stream determines print line length. 01 Specifies 40-character print line. 10 Specifies 64-character print line. 11 Specifies 80-character print line.
4	Start Printer	Start Printer bit, when set to 1, initiates a printout operation at completion of the write operation.
5	Sound Alarm	The sound alarm bit, when set to 1, sounds the audible alarm at the selected device at the end of the operation if that device has an audible alarm.
6	Keyboard Restore	The keyboard restore bit, when set to 1, restores operation of the keyboard by resetting the input inhibited indicator. It also resets the AID byte at the termination of the I/O command.
7	Reset MDT	When reset MDT bits are set to 1, all MDT bits in the selected devices' existing buffer data are reset before any data is written or orders are executed.

2. Match chosen bits with bits 2–7 in chart.

3. Use EBCDIC graphic for that bit configuration. (This graphic determines contents of bits 0 and 1.)

Bits 2-7	EBCDIC Graphic	ASCII
00 0000	(space)	20
00 0001	A	41
00 0010	B	42
00 0011	C	43
00 0100	D	44
00 0101	E	45
00 0110	F	46
00 0111	G	47
00 1000	H	48
00 1001	I	49
00 1010	¢	5B
00 1011	.	2E
00 1100	<	3C
00 1101	(	28
00 1110	+	2B
00 1111	|	21
01 0000	&	26
01 0001	J	4A
01 0010	K	4B
01 0011	L	4C
01 0100	M	4D
01 0101	N	4E
01 0110	O	4F
01 0111	P	50
01 1000	Q	51
01 1001	R	52
01 1010	!	5D
01 1011	$	24
01 1100	*	2A
01 1101	)	29
01 1110	;	3B
01 1111	¬	5E
10 0000	- -	2D
10 0001	/	2F
10 0010	S	53
10 0011	T	54
10 0100	U	55
10 0101	V	56
10 0110	W	57
10 0111	X	58
10 1000	Y	59
10 1001	Z	5A
10 1010	} [1]	5C
10 1011	.	2C
10 1100	%	25
10 1101	_	5F
10 1110	>	3E
10 1111	?	3F
11 0000	0	30
11 0001	1	31
11 0010	2	32
11 0011	3	33
11 0100	4	34
11 0101	5	35
11 0110	6	36
11 0111	7	37
11 1000	8	38
11 1001	9	39
11 1010	:	3A
11 1011	#	23
11 1100	@	40
11 1101	'	27
11 1110	=	3D
11 1111	"	22

[1] The character is converted internally to hex 6A for a WCC character by DFGR when DFGR generates a format, and by DFCR when using the WCC in a put override operation.

STARTUP SPECIFICATIONS

*SU011 ANY SPECIFICATIONS?

(Enter YES to make changes via prompter mode; otherwise, use keywords.)

UNIT	Unit for $CCPFILE
LOG	Unit for $CCPLOG (Model 4 only)
SET	Assignment set ID
MAXEUP	Maximum number of concurrent user programs
MINUPA	Minimum user program area (nn.nnk)
MINTPBUF	Minimum TP buffer area (nnnnn) bytes
PASSWORD	Sign on password (cccccc)
TRACEBLK[1]	Size of in-storage CCP trace (0, 1, 2, 3, 4, 6, 8, 12, 24) 256-byte blocks Also activates trace to disk function.
TRACEMLTA[1]	MLTA line number to trace (1-8) or all (A) (Can be repeated for different lines)
TRACEMLMP[1]	Trace BSCA (no operand)
SUPPRESS	End of specifications (Return control at SU300.)
OFFLINE	End of specifications (Return control at SU340.)
CANCEL	Causes end of job
CHANGE	YES allows corrections, NO causes end of specifications (same as null reply)

*SU300 ANY FACILITY TO BE SUPPRESSED?

NO or null reply causes control to return at SU940.

*SU320 DISKFILE NAME TO BE SUPPRESSED?

Enter physical file name or end.

*SU330 SYMFILE NAME TO BE SUPPRESSED?

Enter symbolic file name or end.

*SU30S PROGRAM NAME TO BE SUPPRESSED

Enter program name or end.

*SU345 BSCA LINE NUMBER TO BE SUPPRESSED

Enter line number or end.

*SU360 MLTALINE NUMBER TO BE SUPPRESSED

Enter line number or end.

*SU375 TERMINAL ID TO BE SUPPRESSED

Enter terminal ID or end.

[1] These options available by keyword only.

STARTUP SPECIFICATIONS (Continued)

*IS PROGRAM REQUEST COUNT TO BE SUPPRESSED?

Enter YES, NO, or end.

*SU940 SPECIFY ANY OFFLINE TERMINAL ID

Enter terminal ID or end.

*SU918 SPECIFY ANY EXTRA USER PROGRAM AREA

Enter the amount of extra storage to allocate to the user program area (nn.nnK).

CONSOLE OPERATOR COMMANDS

$$\left\{\begin{matrix}\text{MSG}\\ \text{M}\end{matrix}\right\} \text{ b } \left\{\begin{matrix}\text{symbolic name}\\ \text{'physical id'}\\ \text{ALL}\end{matrix}\right\} \text{, Text}$$

Send a message to a command terminal that is not in data mode.

$$\left\{\begin{matrix}\text{DISPLAY}\\ \text{D}\end{matrix}\right\} \text{ b } \left\{\begin{matrix}\text{REPLIES}\\ \text{R}\end{matrix}\right\}$$

Display outstanding console reply requests.

$$\left\{\begin{matrix}\text{DISPLAY}\\ \text{D}\end{matrix}\right\} \text{ b } \left\{\begin{matrix}\text{QUEUE}\\ \text{Q}\end{matrix}\right\}$$

Display queued programs and the terminal that requested them.

$$\left\{\begin{matrix}\text{DISPLAY}\\ \text{D}\end{matrix}\right\} \text{ b } \left\{\begin{matrix}\text{TERMINALS}\\ \text{T}\end{matrix}\right\} \left[\begin{matrix}\text{, symbolic name}\\ \text{, 'physical id'}\end{matrix}\right] \textcircled{1}$$

Display status of specified terminal 1, or all assigned terminals.

- Physical id/symbolic name
- Associated user task (P if none)
- Status (online/offline)
- Mode (data, command, etc.)
- Has terminal issued program request?
- Number of file specification blocks (FSB)
- Error recovery/online test in effect?

$$\left\{\begin{matrix}\text{DISPLAY}\\ \text{D}\end{matrix}\right\} \text{ b } \left\{\begin{matrix}\text{TERMADDR}\\ \text{A}\end{matrix}\right\} \left[\text{, symbolic name}\right] \textcircled{1}$$

Display physical id for specified terminal (1), or all assigned terminals.

Insert as status in display users:

Hex Mask	
8000	Waiting for communication I/O completion
4000	Waiting for disk I/O completion
2000	Waiting for accept input completion
1000	Waiting for shutdown request
0800	Waiting for transient area 1 free
0400	Waiting for enqueued data sectors
0080	Waiting for main storage allocation
0040	Waiting for disk file allocation
0020	Waiting for unit record allocation
0010	Waiting for terminal allocation
0008	Waiting for DSM availability
0004	Waiting for unit record device ready
0002	Waiting for DFF output hold area space

```
{DISPLAY}  ƀ  {USERS}  [ , task id (1) ]
{   D   }     {  U  }  [ , LAST    (2) ]
```

Display status of user task(s):

- Task id
- Program name
- Storage usage
- Number of terminals used
- Number of disk files used
- Number of unit record devices used
- Status (suspend, active, wait)
- Whether or not in allocation

For (1)(specified) or (2) (last) user task display also:

- Terminal symbolic names
- Terminal identifications
- Terminal queued/active indicator
- Terminal I/O scheduled
- Disk file labels
- Unit record devices used

```
                  { 3741    }
{ALLOCATE}  ƀ     { MFCU    }  ,{CCP   (1)}
{   L    }        { 1442    }   {OTHER (2)}
                  { PRINTER }
```

Allocate (1) or deallocate (2) specified device to CCP

```
                 { USERS (1)                     }
{SUSPEND}  ƀ     { task id, program name (2)     }
{   S   }        { INIT (3)                      }
                 { COMMANDS (4)                  }
```

CONSOLE OPERATOR COMMANDS (Continued)

(1) Suspend execution and initiation of user programs.

(2) Suspend execution of specified task.

(3) Prevent program initiation.

(4) Prohibit terminal operator commands from terminals not in command interrupt mode.

```
           ( USER                  )
{ RESUME } ( task id, program name )
{   R    }ƀ( INIT                  )
           ( COMMANDS              )
```

Reset effect of SUSPEND command

```
{ VARY }   { symbolic name }   { ON  }
{  V   } ƀ { 'physical id' } , { OFF }
```

Place specified terminal on or offline

```
{ ASSIGN }
{   A    }  ƀ symbolic name, physical id [,stt index number] (1)
```

Assign a symbolic name to specified terminal. If (1), assign a telephone number from switched terminal table (STT) to specified terminal.

```
{ ERP }                  { RETRY (1)  }
{  P  } ƀ 'physical id', { BYPASS (2) }
```

```
{ TRACE }   { ON  }   { CCP  }
{   E   } ƀ { OFF } , { MLTA }
                      { BSCA }
```

Activates specified trace facility.

(For CCP, begin trace to disk.)

```
{ TEST }   { symbolic name }   { test number (1) }
{  T   } ƀ { 'physical id' } , {   ALL (2)       }  [, LOOP] (4)
                               {   STOP (3)      }
```

(1), (2) Start online test of specified MLTA terminal, if (4) loop on the specified test number.
(3) Stop a test currently being looped on.

```
{ TEST }   { symbolic name }
{  T   } ƀ { 'physical id' }  , test number, number of times to execute
                                 or to text
```

Request online test from BSCA CPU. Valid text numbers are 0, 1, 6, 14. (Text) data applies to tests 0 and 1.

{ CANCEL / C } ␣ { task id, program name (1) / CCP (2) }

Immediately cancel specified (1) task or all (2) user tasks. For (2), CCP terminates.

SHUTDOWN

Causes CCP to terminate after all currently executing or queued programs have completed processing.

Additional Console Operator Facilities for Model 4

Command key 8	Page forward in log file
Command key 7	Page backward in log file
Command key 6	Bypass error on 3277 console

Field Lights for Model 4

Lights 1-3	Alternates from 3 through 1 on a pass through the dispatcher
Light 4	Not used
Light 5	On indicates that task is awaiting operator reply
Light 6	On indicates that 3277 console is in ERP
Light 7	On indicates that oldest console message is not on screen
Light 8	On indicates that newest console message is not on screen

TERMINAL OPERATOR COMMANDS

/ON ␣ [password]

/OFF ␣ [HOLD / DROP]

/MSG ␣ text

/NAME ␣ [doing-business-as name]

/FILE ␣ [reference name] [, actual name]

Note: When reference name is specified without specifying actual name, the reference is canceled. When neither operand is specified, all references are canceled.

/Q Queue program request when resources not available.

/NOQ

/RUN Return to program control from command interrupt mode

/RELEASE Release terminal from program control from command interrupt mode

The system console operator can also enter:

/Q, /NOQ, or /FILE.

The symbolic name of the console is CONSOL.

MLTERFIL

MLTERFIL is located on F1 and consists of twenty-four 256-byte records.

Record 0 MLTA OBR (outboard recorder) contains permanent error indications.

Byte 0-1	Displacement to the most recent entry (6, 11 . . . 251)
2-3	Reserved
4-5	Total error count
6-255	Fifty 5-byte permanent error entries

Byte 0	Line number (1-8)
1	Terminal address (hex 00 if not polled)
2	High density buffer position 0 (HDB0):

Hex Value	*Meaning*
80	PCI overrun
40	Uppercase
20	Text-in mode
10	Text-out mode
Bits 4-7	Bit time count field

3 High density buffer position 6 (HDB6):

Hex Value	*Meaning*
80	Timeout
40	Data check
20	Transmit abort
10	Receive abort
08	Overrun
04	Terminal interrupt
02	No operation performed on instruction
01	Lost data

4 High density buffer position 7 (HDB7):

Hex Value	*Meaning*
80	Modem not ready
10	Line not ready
Bits 5-7	SIO n-code

Records 2-8 MLTA SDR (statistical data recorder):

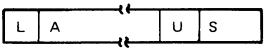
Byte 0-1 Invalid terminal address count
2-3 Reserved
4-255 Forty-two 6-byte statistical entries (one for each terminal address)
(Order of entries by terminal address is /, A-Z, 0-9, @, -, $, ., &).

Bytes 0-1 Number of errors of all types
2-5 Number of successful read/write operations (exclusive of poll with negative response and WTDS)

Records 9-17, reserved.

Records 18-20 MLMP terminal statistics line 1:

Byte 0 of each sector is the displacement of the next available byte (hex 00 indicates no logging has been done in this sector).



Entries are variable length

L Length of terminal address (1 byte)
A Terminal address (1-7 bytes)
U Number of unsuccessful operations (2 bytes)
S Number of successful operations (4 bytes)

The last entry in a sector delimited by hex F0.
The last entry for the line delimited by hex FE.

Records 21-23 MLMP terminal statistics line 2

F1 C/S 0014

Displacement (hex) of four-byte cumulative counters	Displacement (hex) of two-byte temporary counters	
77	AB	Text blocks sent
7B	AD	Text blocks received
7F	AF	NAKs received
83	B1	Data checks
87	B3	Foreward aborts received
8B	B5	Aborts received
8F	B7	Adapter checks on transmit
93	B9	Adapter checks on receive
97	BB	Invalid responses
9B	BD	ENQs received to acknowledgments sent
9F	BF	Lost data errors
A3	C1	Disconnect timeouts
A7	C3	Receive timeouts

This handbook is designed to aid IBM personnel responsible for supporting the IBM System/3 Models 4, 8, 10, and 12 Communications Control Program. This handbook provides:

- Descriptions of data areas
- Descriptions of how to use the diagnostic aids
- Additional references

Note: All displacements herein are relative to zero and are in hexadecimal notation. All lengths are in decimal notation. Field names reference the entire field and do not imply either leftmost or rightmost addressability.

RELATED PUBLICATIONS

- *IBM System/3 Model 4 Operator's Guide,* GC21-5149
- *IBM System/3 Communications Control Program Programmer's Reference Manual,* GC21-7579
- *IBM System/3 Models 8, 10, and 12 System Communication Control Program System Reference,* GC21-7588
- *IBM System/3 Communications Control Program (5702-SC1) Terminal Operator's Guide,* GC21-7580
- *IBM System/3 Models 8, 10, and 12 System Communications Control Program System Operator's Guide,* GC21-7581
- *IBM System/3 Multiline/Multipoint Binary Synchronous Communications Reference Manual,* GC21-7573
- *IBM System/3 Multiple Line Terminal Adapter RPQ Program Reference and [illegible]nent Description Manual,* GC21-7560
- *IB[illegible]em/3 Disk Systems Binary Synchronous Communications Programming [illegible]rt Input/Output Control System Logic,* SY21-0526
- *IBM Sy[illegible]/3 Multiple Line Terminal Adapter RPQ Supporting RPQs S40028-S40033 Program Numbers 5799-WAU (Models 10 and 12) 5799-WEK (Model 15) Program Logic Manual,* SY21-0527
- *IBM System/3 Models 4, 8, 10, and 12 Communications Control Program Logic Manual,* SY21-0531
- *IBM System/3 Model 4 Communications Control Program Programmer's Reference Manual,* SC21-5150
- *IBM System/3 Communication Control Program Messages Manual,* GC21-5170
- *IBM System/3 Disk Sort Reference Manual,* SC21-7522
- *IBM System/3 Communications Control Program System Design Guide,* GC21-5165

IBM

Technical Newsletter

This TNL No.	SN21-7972
Date	30 June 1978
Base Publ. No.	SY21-0048-1
File No.	S3-36
Previous TNLs	None

IBM System/3
Models 4, 8, 10, and 12
Communications Control Program
Data Areas and Diagnostic Aids

This technical newsletter applies to the current versions and modifications of the applicable System/3 programs listed in the edition notice and provides replacement pages for the subject publication. These replacement pages remain in effect for subsequent versions and modifications unless specifically altered. Pages to be inserted and/or removed are:

Cover, Edition Notice
1-79, 1-80
1-83, 1-84
1-87, 1-88

Changes to text and illustrations are indicated by a vertical line at the left of the change.

Summary of Amendments

Miscellaneous technical changes

Note: Please file this cover letter at the back of the manual to provide a record of changes.

IBM Corporation, Publications, Department 245,
Rochester, MN 55901

Printed in U.S.A.

SY21-0048-1

IBM S/3 Models 4, 8, 10, and 12 CCP Data Areas and Diagnostic Aids (File No. S3-36) Printed in U.S.A. SY21-0048-1

International Business Machines Corporation

General Systems Division
4111 Northside Parkway N.W.
P.O. Box 2150
Atlanta, Georgia 30301
(U.S.A. only)

General Business Group/International
44 South Broadway
White Plains, New York 10601
U.S.A.
(International)