CONTROL DATA
CORPORATION

CONTROL DATA®
1700 COMPUTER SYSTEM

CODES

RECORD of REVISIONS

REVISION	NOTES
A	Original printing.
(4-4-66)	
B	PCO 16001 adds information for the 1718-A Satellite
(3-15-67)	Coupler, 1731-A/B Magnetic Tape Controllers, and
	1738-A/B Disk Pack Controller. This edition obsoletes
	all previous editions.
C	Engineering Change Order 20275. This edition
(8-12-68)	obsoletes all previous editions.
D	Manual Revised; includes Engineering Change Order
(2-6-70)	23214. Pages 21, 22, and 23 revised.
E	Manual revised; includes Engineering Change Order
(2-6-70)	24531. Pages 13, 14, 15, 51, 52, and 53 added. This
	edition obsoletes all previous editions.
F	Manual revised; includes Engineering Change Order
(8-1-72)	30429. Pages 20 and 28 are revised.
G	Manual revised; Engineering Change Order 33738. Pages
(5-9-73)	iii, 50, and 52 are revised. Pages 41.1, 41.2, 41.3,
	46.1, 46.2, 46.3, 46.4 are added.

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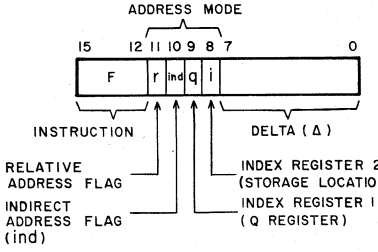
INSTRUCTIONS

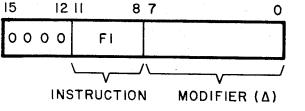
STORAGE REFERENCE



F			
1	0001	JMP	Jump
2	0010	MUI	Multiply Integer
3	0011	DVI	Divide Integer
4	0100	STQ	Store Q
5	0101	RTJ	Return Jump
6	0110	STA	Store A
7	0111	SPA	Store A, Parity to A
8	1000	ADD	Add A
9	1001	SUB	Subtract
A	1010	AND	AND With A
B	1011	EOR	Exclusive OR With A
C	1100	LDA	Load A
D	1101	RAO	Replace Add 1 in Storag
E	1110	LDQ	Load Q
F	1111	ADQ	Add Q

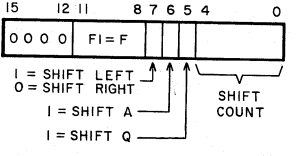
REGISTER REFERENCE/SHIFT

REGISTER REFERENCE

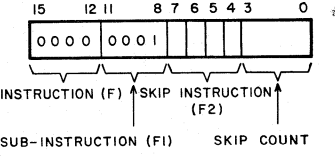


F1			
0	0000	SLS	Selective Stop
1	0001		SKIPS
2	0010	INP	Input to A
3	0011	OUT	Output From A
4	0100	EIN	Enable Interrupt
5	0101	IIN	Inhibit Interrupt
6	0110	SPB	Set Program Protect
7	0111	CPB	Clear Program Protect
8	1000		INTERREGISTER
9	1001	INA	Increase A
A	1010	ENA	Enter A
B	1011	NOP	No Operation
C	1100	ENQ	Enter Q
D	1101	INQ	Increase Q
E	1110	EXI	Exit Interrupt State
F	1111		SHIFTS

SHIFT

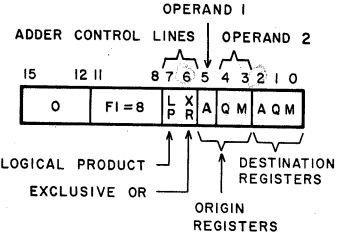


SKIP



F2			
0	0000	SAZ	A = +0
1	0001	SAN	A ≠ +0
2	0010	SAP	A = +
3	0011	SAM	A = -
4	0100	SQZ	Q = +0
5	0101	SQN	Q ≠ +0
6	0110	SQP	Q = +
7	0111	SQM	Q = -
8	1000	SWS	Skip If Switch Set
9	1001	SWN	Skip If Switch Not Set
A	1010	SOV	Skip On Overflow
B	1011	SNO	Skip On No Overflow
C	1100	SPE	Skip On Storage Parity Error
D	1101	SNP	Skip On No Storage Parity Error
E	1110	SPF	Skip On Program Protect Fault
F	1111	SNF	Skip On No Program Protect Fault

INTERREGISTER



INTERREGISTER LOGICAL OPERATIONS

LP (Bit 7)	XR (Bit 6)	Logical Operations
0	0	Arithmetic Sum
0	1	Exclusive OR
1	0	Logical Product
1	1	Complement Logical Product

OPERAND 1

A (Bit 5)	Operand 1
0	FFFF
1	Contents of A

OPERAND 2

Q (Bit 4)	M (Bit 3)	Operand 2
0	0	FFFF
0	1	Contents of M (Mask register)
1	0	Contents of Q
1	1	Inclusive OR of (Q) and (M)

Inclusive OR Truth Table

Q. Reg. Bit	M Reg. Bit	Inclusive OR
0	0	0
1	0	1
0	1	1
1	1	1

DESTINATION REGISTERS

A (Bit 2)	Q (Bit 1)	M (Bit 0)	Destination Register
0	0	0	See note b.
0	0	1	M (Mask register)
0	1	0	Q
1	0	0	A
0	1	1	M and Q
1	0	1	M and A
1	1	0	Q and A
1	1	1	M, Q, and A

INTERREGISTER INSTRUCTION TRUTH TABLE

Operand 1	Operand 2	Exclusive OR	Logical Product	Complement Logical Product
0	0	0	0	1
0	1	1	0	1
1	0	1	0	1
1	1	0	1	0

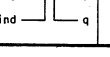
Notes:

a. Register transfers can be accomplished by setting LP and XR to "0" and either operand 1 or operand 2 to $FFFF_{16}$.

b. Magnitude comparisons without destroying either operand can be done by setting LP and XR to "0", selecting no destination register, and then testing the OVERFLOW indicator.

c. Complementing registers can be done by setting LP to "0", XR to "1", and either operand 1 or operand 2 to $FFFF_{16}$.

STORAGE ADDRESSING RELATIONSHIPS

Mode	Address Mode Bits Binary	Hex	Delta
Absolute	0000	0	$\Delta \neq 0$
Constant			$\Delta = 0$
Absolute	0001	1	$\Delta \neq 0$
Constant			$\Delta = 0$
Absolute	0010	2	$\Delta \neq 0$
Constant			$\Delta = 0$
Absolute	0011	3	$\Delta \neq 0$
Constant			$\Delta = 0$
Indirect	0100	4	$\Delta \neq 0$
Storage			$\Delta = 0$
Indirect	0101	5	$\Delta \neq 0$
Storage			$\Delta = 0$
Indirect	0110	6	$\Delta \neq 0$
Storage			$\Delta = 0$
Indirect	0111	7	$\Delta \neq 0$
Storage			$\Delta = 0$
Relative	1000	8	$\Delta \neq 0$
16-Bit Relative			$\Delta = 0$
Relative	1001	9	$\Delta \neq 0$
16-Bit Relative			$\Delta = 0$
Relative	1010	A	$\Delta \neq 0$
16-Bit Relative			$\Delta = 0$
Relative	1011	B	$\Delta \neq 0$
16-Bit Relative			$\Delta = 0$
Relative Indirect	1100	C	$\Delta \neq 0$
Relative Indirect			$\Delta = 0$
Relative Indirect	1101	D	$\Delta \neq 0$
Relative Indirect			$\Delta = 0$
Relative Indirect	1110	E	$\Delta \neq 0$
Relative Indirect			$\Delta = 0$
Relative Indirect	1111	F	$\Delta \neq 0$
Relative Indirect			$\Delta = 0$

Effective Address	Address of Next Instruction
Δ	P + 1
P + 1	P + 2
Δ + (00FF)	P + 1
(P + 1) + (00FF)*	P + 2
Δ + (Q)	P + 1
(P + 1) + (Q)*	P + 2
Δ + (Q) + (00FF)	P + 1
(P + 1) + (Q) + (00FF)*	P + 2
(Δ)	P + 1
(P + 1)	P + 2
(Δ) + (00FF)	P + 1
(P + 1) + (00FF)	P + 2
(Δ) + (Q)	P + 1
(P + 1) + (Q)	P + 2
(Δ) + (Q) + (00FF)	P + 1
(P + 1) + (Q) + (00FF)	P + 2
P + Δ	P + 1
P + 1 + (P + 1)	P + 2
P + Δ + (00FF)	P + 1
P + 1 + (P + 1) + (00FF)	P + 2
P + Δ + (Q)	P + 1
P + 1 + (P + 1) + (Q)	P + 2
P + Δ + (Q) + (00FF)	P + 1
P + 1 + (P + 1) + (Q) + (00FF)	P + 2
(P + Δ)	P + 1
[P + 1 + (P + 1)]	P + 2
(P + Δ) + (00FF)	P + 1
[P + 1 + (P + 1)] + (00FF)	P + 2
(P + Δ) + (Q)	P + 1
[P + 1 + (P + 1)] + (Q)	P + 2
(P + Δ) + (Q) + (00FF)	P + 1
[P + 1 + (P + 1)] + (Q) + (00FF)	P + 2

*Effective address is the operand for read-operand-type instructions

INSTRUCTION EXECUTION TIMES

		Execution Time (usec)
AAB	Transfer Arithmetic Sum A, Q + M	1.1
AAM	Transfer Arithmetic Sum A, M	1.1
AAQ	Transfer Arithmetic Sum A, Q	1.1
ADD	Add A	2.2
ADQ	Add Q	2.2
ALS	A Left Shift	$1.1 + \left(\frac{\text{shift count}}{2}\right)(.2)$
AND	AND With A	2.2
ARS	A Right Shift	$1.1 + \left(\frac{\text{shift count}}{2}\right)(.2)$
CAB	Transfer Complement Logical Product A, Q + M	1.1
CAM	Transfer Complement Logical Product A, M	1.1
CAQ	Transfer Complement Logical Product A, Q	1.1
CLR	Clear To Zero	1.1
CPB	Clear Program Protect	2.2
DVI	Divide Integer	9.0
EAB	Transfer Exclusive OR A, Q + M	1.1
EAM	Transfer Exclusive OR A, M	1.1
EAQ	Transfer Exclusive OR A, Q	1.1
EIN	Enable Interrupt	1.1
ENA	Enter A	1.1
ENQ	Enter Q	1.1
EOR	Exclusive OR With A	2.2
EXI	Exit Interrupt State	2.2
IIN	Inhibit Interrupt	1.1
INA	Increase A	1.1
INP	Input to A	1.1 min., 10 max.
INQ	Increase Q	1.1
JMP	Jump	1.1
LAB	Transfer Logical Product A, Q + M	1.1
LAM	Transfer Logical Product A, M	1.1

		Execution Time (usec)
LAQ	Transfer Logical Product A, Q	1.1
LDA	Load A	2.2
LDQ	Load Q	2.2
LLS	Long Left Shift	1.1 + (shift count) (.2)
LRS	Long Right Shift	1.1 + (shift count) (.2)
MUI	Multiply Integer	7.0
NOP	No Operation	1.1
OUT	Output From A	$\overline{1.1}$ min., 10 max.
QLS	Q Left Shift	$1.1 + \left(\frac{\text{shift count}}{2}\right)$ (.2)
QRS	Q Right Shift	$1.1 + \left(\frac{\text{shift count}}{2}\right)$ (.2)
RAO	Replace Add 1 in Storage	3.3
RTJ	Return Jump	2.2
SAM	Skip If A = -	1.1
SAN	Skip if A ≠ +0	1.1
SAP	Skip if A = +	1.1
SAZ	Skip If A = +0	1.1
SET	Set to Ones	1.1
SLS	Selective Stop	1.1
SNF	Skip On No Program Protect Fault	1.1
SNO	Skip On No Overflow	1.1
SNP	Skip On No Storage Parity Error	1.1
SOV	Skip On Overflow	1.1
SPA	Store A, Parity to A	2.2
SPB	Set Program Protect	2.2
SPE	Skip On Storage Parity Error	1.1
SPF	Skip On Program Protect Fault	1.1
SQM	Skip If Q = -	1.1
SQN	Skip If Q ≠ +0	1.1
SQP	Skip If Q = +	1.1
SQZ	Skip If Q = +0	1.1
STA	Store A	2.2
STQ	Store Q	2.2

		Execution Time (usec)
SUB	Subtract	2.2
SWN	Skip If Switch Not Set	1.1
SWS	Skip If Switch Set	1.1
TCA	Transfer Complement A	1.1
TCB	Transfer Complement Q + M	1.1
TCM	Transfer Complement M	1.1
TCQ	Transfer Complement Q	1.1
TRA	Transfer A	1.1
TRB	Transfer Q + M	1.1
TRM	Transfer M	1.1
TRQ	Transfer Q	1.1

Note: Add 1.1 microsecond if Storage Index Register is used.

Add 1.1 microsecond for each level of Indirect Addressing.

INSTRUCTION EXECUTION TIMES

		Execution Time (usec)
AAB	Transfer Arithmetic Sum A, Q+M	1.5
AAM	Transfer Arithmetic Sum A, M	1.5
AAQ	Transfer Arithmetic Sum A, Q	1.5
ADD	Add A	3.0
ADQ	Add Q	3.0
ALS	A Left Shift 1.5+(shift count)	(.5)
AND	AND With A	3.0
ARS	A Right Shift 1.5+(shift count)	(.5)
CAB	Transfer Complement Logical Product A, Q, + M	1.5
CAM	Transfer Complement Logical Product A, M	1.5
CAQ	Transfer Complement Logical Product A, Q	1.5
CLR	Clear To Zero	1.5
CPB	Clear Program Protect	3.5
DCA	Disable Character Addressing	1.5
DVI	Divide Integer	30.0
EAB	Transfer Exclusive OR A, Q, M	1.5
EAM	Transfer Exclusive OR A, M	1.5
EAQ	Transfer Exclusive OR A, Q	1.5
ECA	Enable Character Addressing	1.5
EIN	Enable Interrupt	1.5
ENA	Enter A	1.5
ENQ	Enter Q	1.5
EOR	Exclusive OR With A	3.0
EXI	Exit Interrupt State	3.5
IIN	Inhibit Interrupt	1.5

INA	Increase A	1.5
INP	Input to A	2.0 min., 10 max.
INQ	Increase Q	1.5
JMP	Jump	1.5
LAB	Transfer Logical Product A, Q+M	1.5
LAM	Transfer Logical Product A, M	1.5
LAQ	Transfer Logical Product A, Q	1.5
LDA	Load A	3.0
LDQ	Load Q	3.0
LLS	Long Left Shift 1.5+(shift count)	(1.0)
LRS	Long Right Shift 1.5+(shift count)	(1.0)
MUI	Multiply Integer	20.0
NOP	No Operation	1.5
OUT	Output From A	2.0 min., 10 max.
GLS	Q Left Shift 1.5+(shift count)	(.5)
QRS	Q Right Shift 1.5+(shift count)	(.5)
RAO	Replace Add 1 in Storage	4.5
RTJ	Return Jump	3.5
SAM	Skip If A = -	2.0
SAN	Skip if A ≠ +0	2.0
SAP	Skip if A = +	2.0
SAZ	Skip if A = +0	2.0
SET	Set to Ones	1.5
SLS	Selective Stop	1.5
SNF	Skip On No Program Protect Fault	2.0
SNO	Skip On No Overflow	2.0
SNP	Skip On No Storage Parity Error	2.0
SOV	Skip On Overflow	2.0
SPA	Store A, Parity to A	3.0
SPB	Set Program Protect	3.5
SPE	Skip On Storage Parity Error	2.0
SPF	Skip on Program Protect Fault	2.0
SQM	Skip if Q = -	2.0
SQN	Skip if Q ≠ +0	2.0
SQP	Skip if Q = +	2.0
SQZ	Skip if Q = +0	2.0

STA	Store A	3.0
STQ	Store Q	3.0
SUB	Subtract	3.0
SWN	Skip If Switch Not Set	2.0
SWS	Skip If Switch Set	2.0
TCA	Transfer Complement A	1.5
TCB	Transfer Complement Q + M	1.5
TCM	Transfer Complement M	1.5
TCQ	Transfer Complement Q	1.5
TRA	Transfer A	1.5
TRB	Transfer Q + M	1.5
TRM	Transfer M	1.5
TRQ	Transfer Q	1.5

Note: Add 0.75 microsecond if Storage Index Register is used.

Add 1.5 microsecond for each level of Indirect Addressing

Add 0.5 microsecond for Q indexing

INTERRUPT STATE DEFINITIONS

	Interrupt state$_{10}$	Value of Δ to exit state$_{16}$	Location of return address$_{16}$	Location of first instruction after interrupt occurs$_{16}$
*	00	00	0100	0101
*	01	04	0104	0105
	02	08	0108	0109
	03	0C	010C	010D
	04	10	0110	0111
	05	14	0114	0115
	06	18	0118	0119
	07	1C	011C	011D
**	08	20	0120	0121
	09	24	0124	0125
	10	28	0128	0129
	11	2C	012C	012D
	12	30	0130	0131
	13	34	0134	0135
	14	38	0138	0139
	15	3C	013C	013D

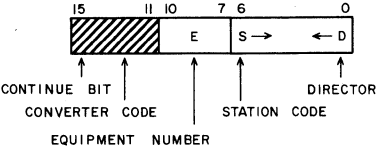
*Interrupts in basic computer

**Interrupts added by 1705 Interrupt Data Channel option

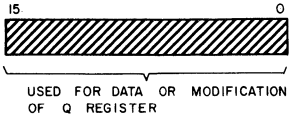
AQ CHANNEL PERIPHERAL DEVICE ADDRESSING

ADDRESSES

Q Register

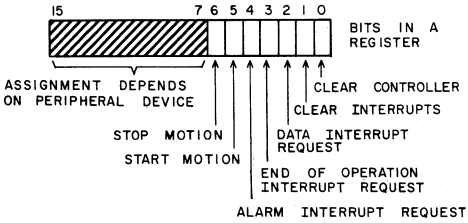


A Register



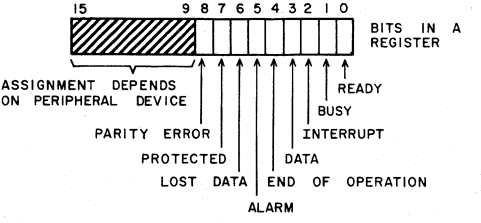
OPERATIONS

Director Function

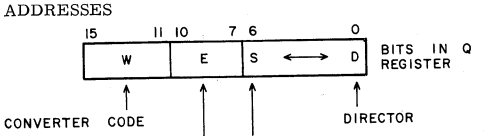


STATUS RESPONSE

Director Status



ADDRESSES



W*			Computer Instruction	
1706 #3	1706 #2	1706 #1	Input	Output
0C	07	02	Direct input**	Direct output
0D	08	03	Terminate buffer: 1706 current address	Function
0E	09	04	1706 status	Buffered output
0F	0A	05	1706 current address	Buffered input

*The left digit is binary; the right digit is hexadecimal.

**Terminate buffer operation will cause the 1706 to remain busy for 10 μsec.

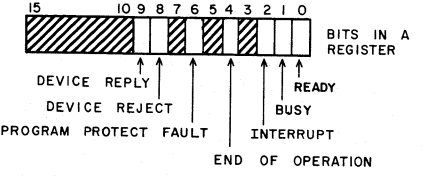
OPERATIONS

Function

Bit in A Register		Meaning
A15	= 1	Set condition for "1's" in bits A14 - A00
	= 0	Clear condition for "1's" in bits A14 - A00
A14 - A01		Not defined
A00		Enable interrupt on 1706 end of operation

STATUS RESPONSE

1706 Status

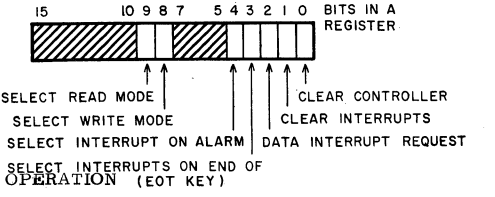


ADDRESSES

Q Register	Computer Instruction	
	Output From A	Input To A
0090	Write	Read
0091	Director Function	Director Status

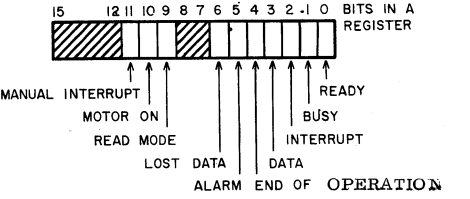
OPERATIONS

Director Function



STATUS RESPONSE

Director Status



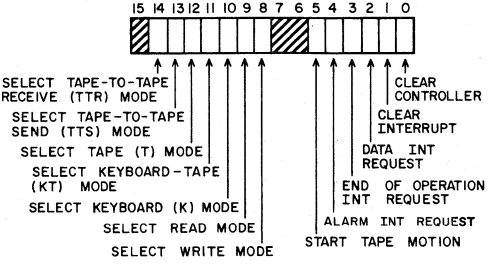
1713-A TELETYPEWRITER

ADDRESSES

Same as for 1711/1712 Teletypewriter.

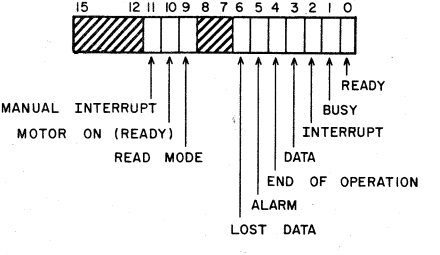
OPERATIONS

Director Function



STATUS RESPONSE

Director Status



Control Characters:

NUL	Null (two successive nulls lock keyboard and stop tape reader)
EOA	End of Address (cc)*
EOT	End of Transmission, shuts off motors (cc)
WRU	Who are you? (cc)
BELL	Bell (audible or attention signal)
TAB	Horizontal Tab (FE)
LINE FEED	Line Feed (FE)
VT	Vertical Tab (FE)
FORM	Form, top of page (FE)
RETURN	Carriage Return, does not advance paper. (FE)
TAPE	Tape (no operation)
X-OFF	Auxiliary off (no operation)
~~TAPE~~	Not Tape (no operation)
RUB OUT	Delete (punches all levels on paper tape, no effect on printer)

*(cc) Communication Control
(FE) Format Effector

Graphic Characters:

Column/Row	Symbol	Name
2/0	SP	Space (normally non-printing)
2/1	!	Exclamation Point
2/2	"	Quotation Marks (Diaeresis)
2/3	#	Number Sign
2/4	$	Dollar Sign
2/5	%	Percent
2/6	&	Ampersand
2/7	'	Apostrophe (Closing Single Quotation Mark; Acute Accent)
2/8	(	Opening Parenthesis
2/9	)	Closing Parenthesis
2/10	*	Asterisk
2/11	+	Plus
2/12	,	Comma (Cedilla)
2/13	-	Hyphen (Minus)
2/14	.	Period (Decimal Point)
2/15	/	Slant
3/10	:	Colon
3/11	;	Semicolon
3/12	<	Less Than
3/13	=	Equals
3/14	>	Greater Than
3/15	?	Question Mark
4/0	@	Commercial Art
5/11	[	Opening Bracket
5/12		Grave Accent (Opening) Single Quotation Mark)
5/13	]	Closing Bracket
5/14	↑	*
5/15	←	*
7/11	{	* Opening Brace
7/13	}	* Closing Brace

* See Table page 27

** Optional Braces replace Brackets. Both use the same type pallet position in the type box.

b7 → b6 → b5 → BITS	b4 ↓	b3 ↓	b2 ↓	b1 ↓	COLUMN → / ROW ↓	0 0 0
						0
	0	0	0	0	0	NUL
	0	0	0	1	1	Note 1
	0	0	1	0	2	*EOA
	0	0	1	1	3	
	0	1	0	0	4	EOT
	0	1	0	1	5	*WRU
	0	1	1	0	6	*RU
	0	1	1	1	7	BELL
	1	0	0	0	8	
	1	0	0	1	9	TAB
	1	0	1	0	10	LINE FEED
	1	0	1	1	11	VT
	1	1	0	0	12	FORM
	1	1	0	1	13	RETURN
	1	1	1	0	14	
	1	1	1	1	15	

*May be generated from keyboard but does not affect printer; it is punched on tape.

Note 1 Any character left blank does not affect the printer but is punched on tape.

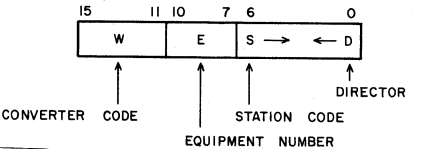
$0\ 0\ 1$	$0\ 1\ 0$	$0\ 1\ 1$	$1\ 0\ 0$	$1\ 0\ 1$	$1\ 1\ 0$	$1\ 1\ 1$
1	2	3	4	5	6	7
	SP	** 0	@	P		
	!	1	A	Q		
*TAPE	** "	2	B	R		
*X-OFF	#	3	C	S		
~~*TAPE~~	$	4	D	T		
	%	5	E	U		
	&	6	F	V		
	** '	7	G	W		
	(	8	H	X		
	)	9	I	Y		
	*	:	J	Z		
	+	;	K	[		*** {
	** ,	<	L	\		
	-	=	M	]		*** }
	.	>	N	** ↑		
	/	?	** O	** ←		*RUB OUT

** The 1711-1, 1712 and 1713-1 use ASCII63 codes. The 1711-2 and 1713-2 use ASCII68 codes. The following table shows the equivalent characters where differences exist for ASCII63 and ASCII68.

*** Optional Braces replace Brackets. Both use the same type pallet position in the type box.

COLUMN/ROW	ASCII63	ASCII68
2/2	"	Modified to afford multiple usage as quotation or diaress
2/7	'	Slight tilt affording multiple usage as apostrophy or acute accent.
2/12	,	Modified to afford multiple usage as comma or cedilla.
3/0	Q	Slimmer zero
4/15	o	Fatter "O"
5/14	↑	^(circumflex)
5/15	←	_(underline)

ADDRESSES



W*			Computer Instruction	
1716 #3	1716 #2	1716 #1	Input To A	Output From A
0B	06	01		Buffered transfer
0C	07	02	Direct input	Direct output
0D	08	03**	Terminate buffer 1716 current address	Function
0E	09	04	1716 status	Buffered output
0F	0A	05	1716 current address	Buffered input

*The left digit is binary; the right digit is hexadecimal.

**Terminate buffer operation will cause the 1706 to remain busy for 10 μsec.

OPERATIONS

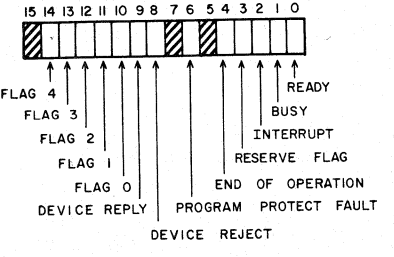
Functions

Bit in A Register		Meaning
A15	= 1	Set condition for "1's" in bits A14 - A00
	= 0	Clear condition for "1's" in bits A14-A00
A14		Flag 4
A13		Flag 3
A12		Flag 2
A11		Flag 1
A10		Flag 0
A09		Mask 4

Bit in A Register	Meaning
A08	Mask 3
A07	Mask 2
A06	Mask 1
A05	Mask 0
A04	Not defined
A03	Reserve flag
A02	Not defined
A01	Not defined
A00	Interrupt on 1716 end of operation

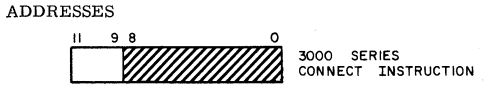
STATUS RESPONSE

1716 Status



DIVISION A

ADDRESSES



To connect division A, the 3000 Series computer channel transmits a 12-bit Connect code to the 1718. Division A must be connected before a data path is established between the computers, and the Connect code must match the switch setting on division A. Bits 9-11 are the significant bits in the Connect code; bits 0-8 are not used.

OPERATIONS

Functions

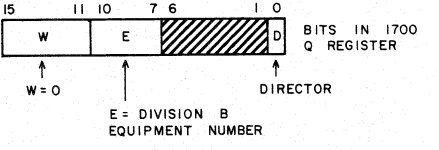
F	N	Description
0001	XXXXXXXX	Set flags for "1's" in N
0010	XXXXXXXX	Clear flags for "1's" in N
0100	XXXXXXXX	Set Mask register for "1's" in N
1000	XXXXXXXX	Clear Mask register for "1's" in N
0000	00000001	Select interrupt if other computer is not running
0000	00000010	Clear conditions set up by F = 0000, N = 00000001
0000	00000100	Select interrupt if other computer reads or writes
0000	00001000	Clear condition set up by F = 0000, N = 00000100

STATUS RESPONSE

Bit	Definition (Bit = "1")
11	Not Used
10	Division B Write
9	Division B Read
8	Division B Computer Running
7	Flag 7
6	Flag 6
5	Flag 5
4	Flag 4
3	Flag 3
2	Flag 2
1	Flag 1
0	Flag 0

DIVISION B

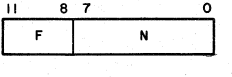
ADDRESSES



D	1704 Instruction	Division Operation
0	Output from A	Write data
0	Input to A	Read data
1	Output from A	Write function code
1	Input to A	Read status

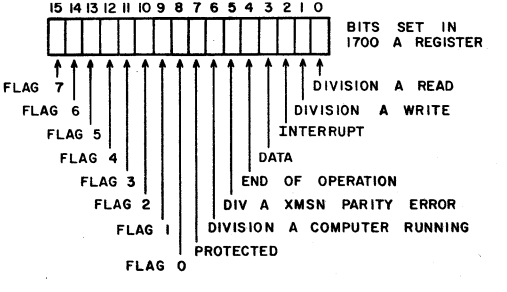
OPERATIONS

Functions



—F	N	Description
0001	XXXXXXXX	Set flags for "1's" in N
0010	XXXXXXXX	Clear flags for "1's" in N
0100	XXXXXXXX	Set Mask register for "1's" in N
1000	XXXXXXXX	Clear Mask register for "1's" in N
0000	XXXXXXX1	Clear
0000	XXXXXX1X	Clear interrupt and 8-bit Character mode
0000	XXXXX1XX	Data interrupt request
0000	XXXX1XXX	End of operation interrupt request
0000	XXX1XXXX	Alarm interrupt request
0000	XX1XXXXX	Start input data transfer
0000	X1XXXXXX	Stop data transfer
0000	1XXXXXXX	Set 8-bit Character mode

STATUS RESPONSE



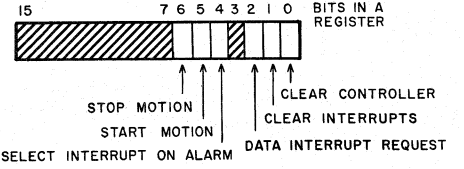
1721-A/B/C/D/1722-A/B PAPER TAPE READER

ADDRESSES

Q Register	Computer Instruction	
	Output From A	Input To A
00A0		Read
00A1	Director Function	Director Status

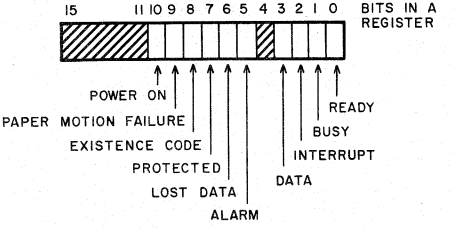
OPERATIONS

Director Function



STATUS RESPONSE

Director Status

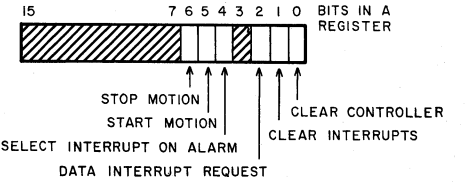


ADDRESSES

	Computer Instruction	
Q Register	Output From A	Input To A
00C0	Write	
00C1	Director Function	Director Status

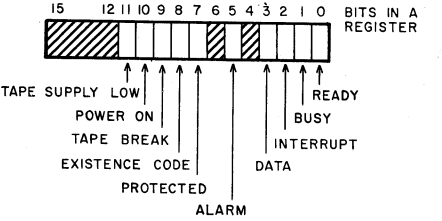
OPERATIONS

Director Function



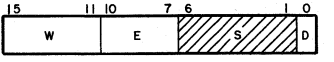
STATUS RESPONSE

Director Status



1726 CARD READER CONTROLLER

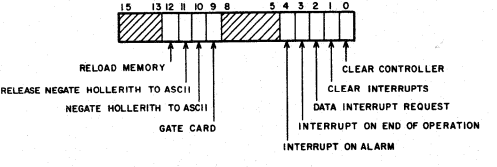
ADDRESS



D (Q Bit 00)	With Signal	Instruction	Operation
0	Read or Write	Output From A	Data Transfer
1	Write	Output From A	Director Function
1	Read	Input To A	Director Status

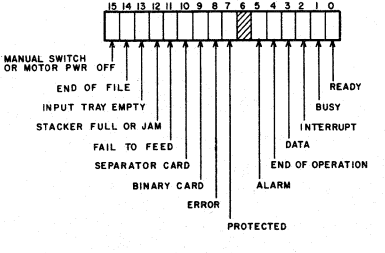
OPERATIONS

Director Function

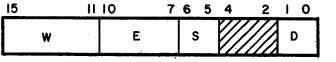


STATUS RESPONSE

Director Status



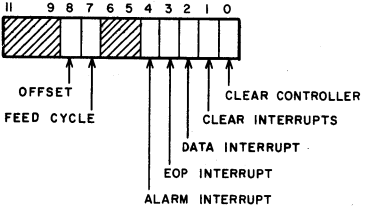
ADDRESS



D Q Bits 00	01	S Q Bits 05	06	With Signal	Instruction	Operation
0	0	1	0	Read	Input To A	Data Transfer (Reader)
0	0	0	1	Write	Output From A	Data Transfer (Punch)
1	0	0orl	0orl	Write	Output From A	Director Function
1	0			Read	Input To A	Director Status (Level 1)
1	1			Read	Input To A	Director Status (Level 2)

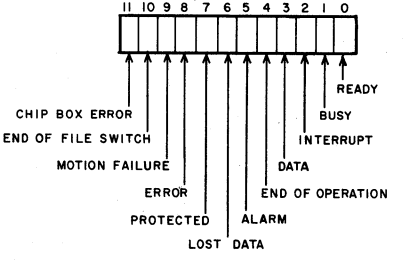
OPERATIONS

Director Function

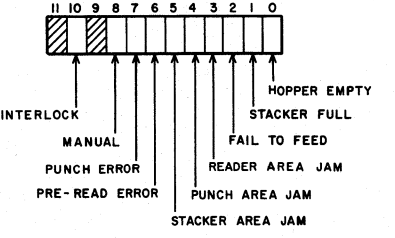


STATUS RESPONSE

Director Status Level 1



Director Status Level 2



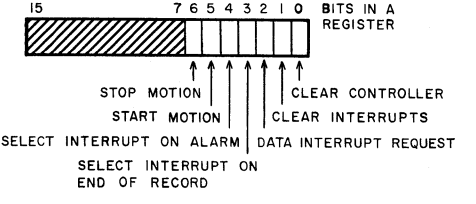
1729-A/B CARD READER

ADDRESSES

Q Register	Computer Instruction	
	Output From A	Input To A
00E0		Read
00E1	Director Function	Director Status

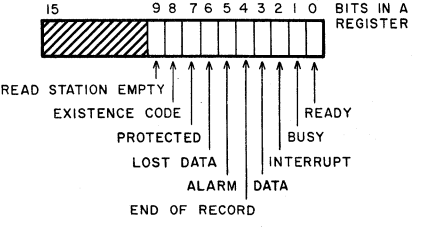
OPERATIONS

Director Function



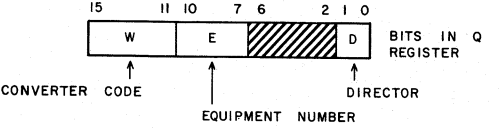
STATUS RESPONSE

Director Status:



1731-A/B MAGNETIC TAPE CONTROLLER

ADDRESSES

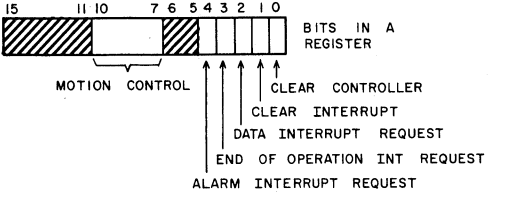


E (Bits 10-7 of Q)	Equipment Number	E (Bits 10-7 of Q)	Equipment Number
0000	0	1000	8
0001	1	1001	9
0010	2	1010	A
0011	3	1011	B
0100	4	1100	C
0101	5	1101	D
0110	6	1110	E
0111	7	1111	F

	Computer Instruction	
D	Output From A	Input To A
00	Write	Read
01	Control Function	Director Status 1
10	Unit Select	Director Status 2

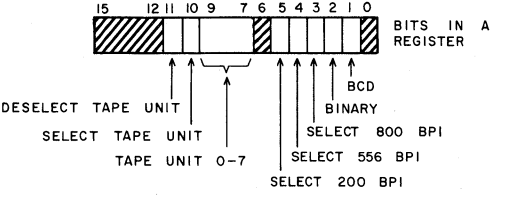
OPERATIONS

Control Function



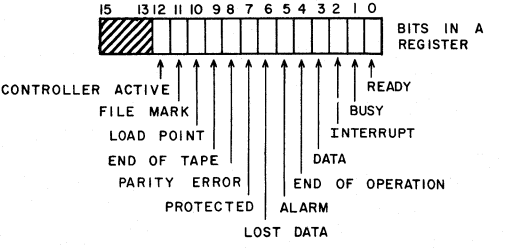
Bits 10-7 of A	Motion Function
0001	Write Motion
0010	Read Motion
0011	Backspace
0101	Write File Mark
1000	Rewind Load
1100	Rewind Unload

Unit Select

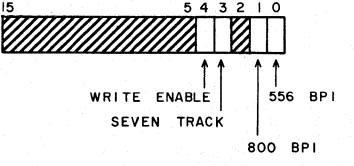


STATUS RESPONSE

Director Status 1

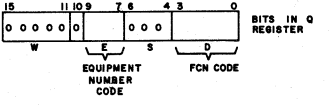


Director Status 2



1733-1 DISK STORAGE CONTROLLER

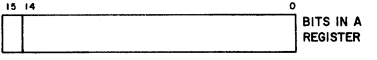
ADDRESS



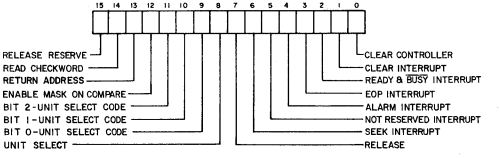
D	Computer Instruction	
	Output From A	Input to A
0000	Core to core normal*	
1000	Core to core reverse*	
0001	Director function	Controller status
0010	Load address A/Q	File address status
1010	Load address DSA	
0011	Write	Current word address status*
0100	Read	
0101	Compare	
0110	Checkword check, from address in A register	
1110	Checkword check, from current address	
0111	Write address	

*These functions will be rejected if CDC Special Option 60141-1 is not installed.

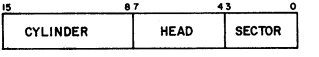
Core to Core Normal or Core to Core Reverse



Director Function

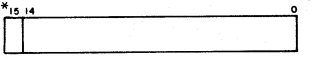


Load Address A/Q, Load Address DSA, Write Address, or File Address Status

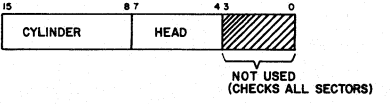


*Bit 15 is used when 65K memory is available.

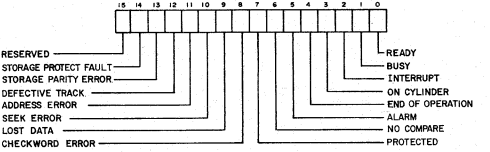
Write, Read, or Compare



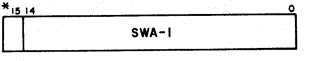
Checkword Check, From Address in A Register or
Checkword Check, From Current Address



Controller Status

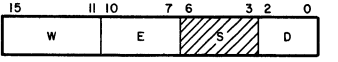


Current Word Address Status



*Bit 15 is used when 65K memory is available.

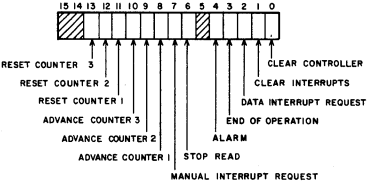
ADDRESS



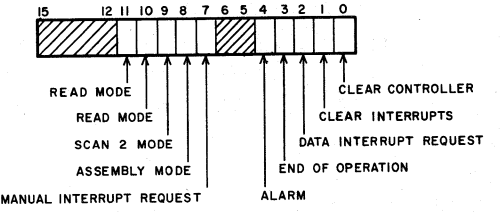
D (Q Bits 02-00)	INSTRUCTION	OPERATION
000	Input To A	Data Input Mode
001	Output From A	Operating Mode
001	Input To A	Equipment Status Mode
010	Output From A	Data Mode
010	Input To A	Mirror Status Mode
011	Output From A	Positioning Mode
100	Output From A	Mechanical Action Mode
101	Output From A	Initiate Read Mode

OPERATIONS

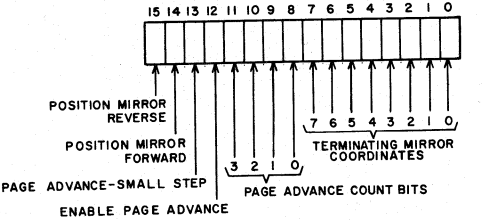
Operating Mode (D = 1)



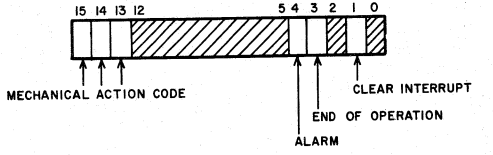
Data Mode (D = 2)



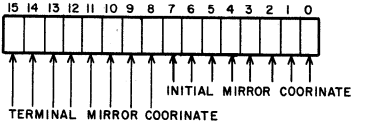
Positioning Mode (D = 3)



Mechanical Mode (D = 4)

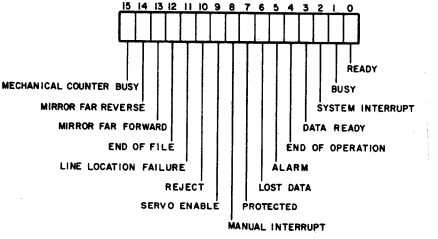


Initiate Read Mode (D = 5)

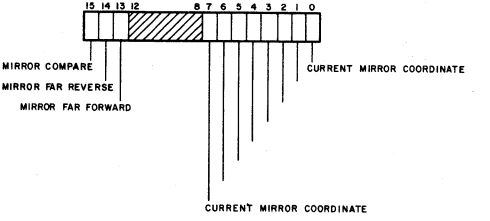


STATUS RESPONSE

Director Status 1

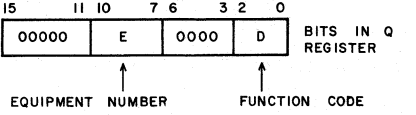


Director Status 2



1738-A/B DISK PACK CONTROLLER

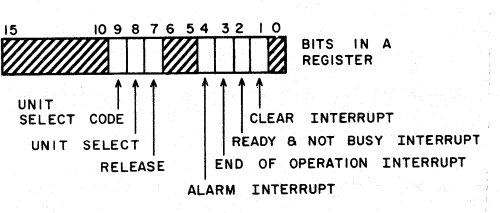
ADDRESSES



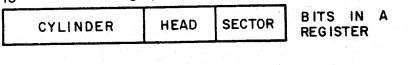
	Computer Instruction	
D	Output From A	Input To A
001	Director Function	Director Status
010	Load Address	Address Register Status
011	Write	
100	Read	
101	Compare	
110	Checkword Check	
111	Write Address	

OPERATIONS

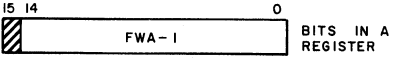
Director Function



Load Address , Checkword Check, Write Address or Address Register Status

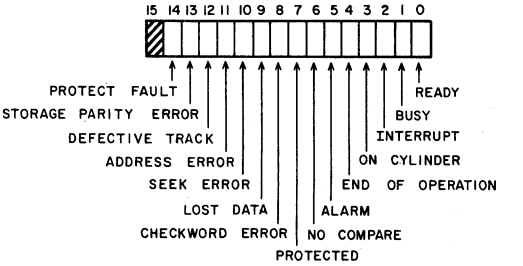


Write, Read, or Compare

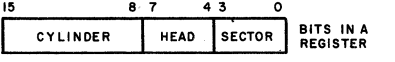


STATUS RESPONSE

Director Status

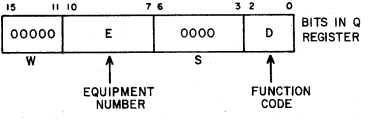


Address Register Status



1739 CARTRIDGE DISK DRIVE CONTROLLER

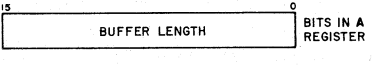
ADDRESS



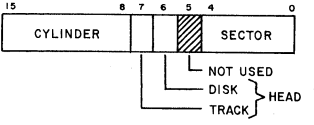
	Computer Instruction	
D	Output From A	Input To A
000	Load Buffer	Clear Controller
001	Director Function	Director Status
010	Load Address	Cylinder Address Status
011	Write	Current Word Address Status
100	Read	Checkword Status
101	Compare	Drive Cylinder Status
110	Checkword Check	
111	Write Address	

OPERATIONS

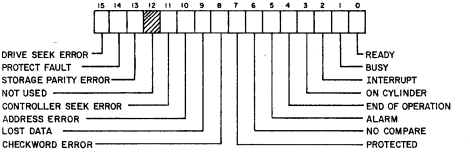
Load Buffer



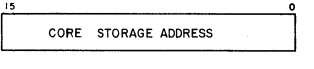
Write Address, Cylinder Address Status



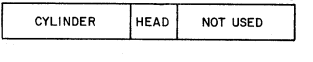
Director Status



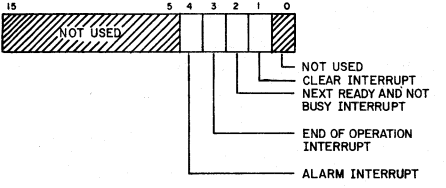
Current Word Address Status



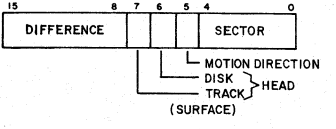
Checkword Check



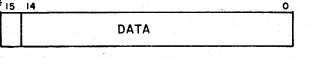
Director Function



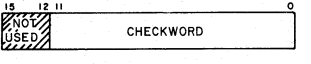
Load Address



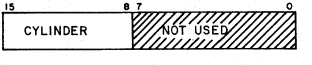
Write, Read, Compare



Checkword Status



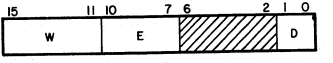
Drive Cylinder Status



*Used for 65K memory.

1740 LINE PRINTER CONTROLLER

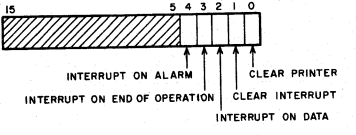
ADDRESS



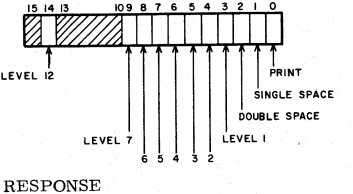
(Q BITS 01-00)	INSTRUCTION	OPERATION
00	Output From A	Data Transfer
01	Output From A	Director Function 1
11	Output From A	Director Function 2
11	Input To A	Director Status

OPERATIONS

Director Function 1

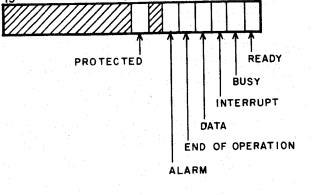


Director Function 2

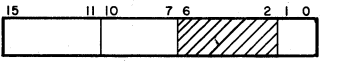


STATUS RESPONSE

Director Status



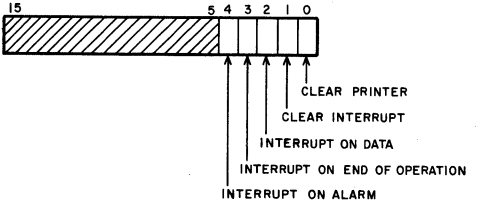
ADDRESS



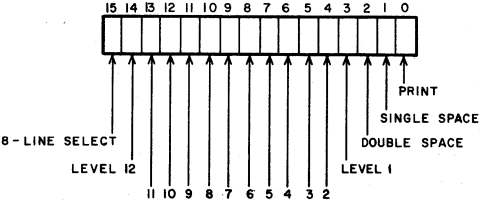
D (Q Bits 01-00)	INSTRUCTION	OPERATION
00	Data Transfer	
01	Director Function 1	
11	Director Function 2	Director Status

OPERATIONS

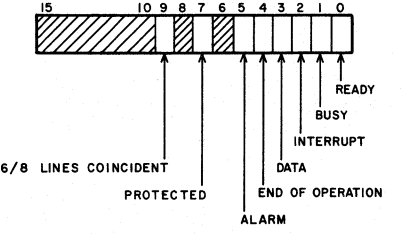
Director Function 1



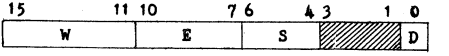
Director Function 2



STATUS RESPONSE
Director Status



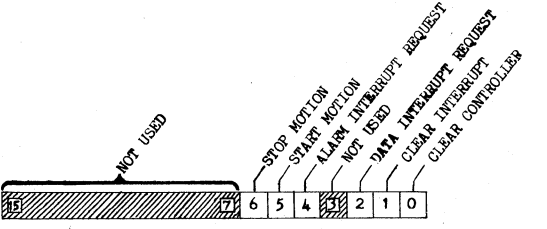
ADDRESS



	COMPUTER INSTRUCTIONS	
D	Output from A	Input to A
0	Write Function	Read Status
1		

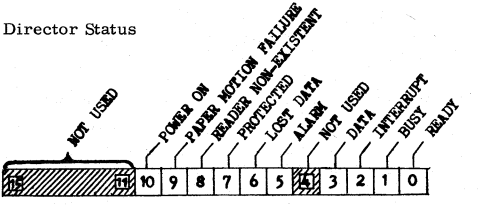
OPERATIONS

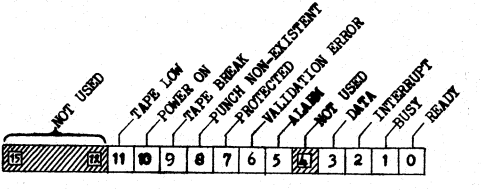
Director Function



STATUS RESPONSE

Director Status





1779 CHARACTER HANDLING

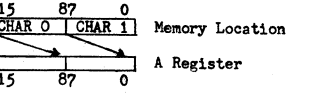
This feature is available on the 1774 only. It provides Character Addressing of memory on Load A and Store A instructions from the lower character position of the A register to the lower or upper character position of the Memory Location.

Enable Character Addressing (ECA) = 0580
Disable Character Addressing (DCA) = 05C0

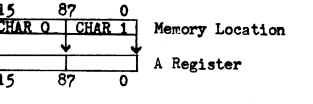
Bit 0 of the i register controls which character is selected, it is called the Character Designation Bit (CDB)

Load A (LDA)

CDB = 0

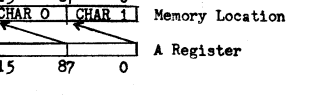


CDB = 1

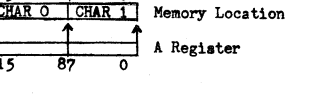


Store A (STA)

CDB = 0



CDB = 1



BINARY-DECIMAL-HEXADECIMAL RELATIONSHIPS

DECIMAL	HEXADECIMAL	BINARY
0	0	0000
1	1	0001
2	2	0010
3	3	0011
4	4	0100
5	5	0101
6	6	0110
7	7	0111
8	8	1000
9	9	1001
10	A	1010
11	B	1011
12	C	1100
13	D	1101
14	E	1110
15	F	1111

INITIALIZATION AND OPERATING SYSTEM MESSAGES

Message	Significance
ACTION	Requests operator action when a failed device has no alternate device. The device is identified in the FAILED diagnostic Respond to the error by typing one of the following: RP To repeat the request CU To report the error to the requesting program; the device is allowed to continue processing requests CD To cause any future programs calling the device to be informed of the failure by their completion addresses. The error is reported to the calling program and the device is marked down. No subsequent attempt is made to operate this device DU To activate CU and suspend job processing. If job processing is not in progress, this action is not taken and ACTION is retyped. Another option may be selected DD To activate CD and suspend job processing. If job processing is not in progress, this action is not taken and ACTION is retyped. Another option may be selected Press RETURN
ALL TESTED	TEST utility completed successfully

Message	Significance
ALT, no.	Informs operator an alternate device number has been assigned
B01, statement	Statement or parameters are unintelligible for the breakpoint program
B02, address	The specified hexadecimal address cannot be processed by breakpoint program because it is protected
B03, address	Breakpoint limit exceeded. The specified hexadecimal address is the last breakpoint processed
BSEC 02	Control module/ DOWN/ENTR/ INIT/LIST/ TAG/TEST/ UPIT; logical unit number supplied is not for a disk
BSEC 03	DOWN/TEST; error in the supplied file address; either exceeds the limit of the disk, is a file address in the bad sector directory, or DOWNING a library sector
BSEC 04	ENTR; error on the read of the bad sector directory from the disk
	INIT; error on a read/ write of the bad sector directory from the disk
	DOWN/UPIT; error when writing the bad sector directory to the disk
	TAGS; rejected write of address tags

Message	Significance
BSEC 05	DOWN/UPIT; no available alternates in the bad sector directory or there is no bad sector directory
BSEC 06	ENTR; the bad sector directory from the disk is too large to fit in core
BSEC 07	DOWN; sector previously entered in the bad sector directory
BSEC 08	UPIT; sector not in the bad sector directory
BSEC 09	UPIT; read error from the alternate sector
BSEC 10	UPIT; write error on the sector being declared as up
BSEC 11 xxxx	TAGS; error when writing address tags; xxxx is the disk status
BSEC 12	TEST; the starting file address is greater than the ending file address
BSEC 13	Control module; overlay error; error occurred when requested utility was read into core
BSEC 14	ENTR; busy after a clear controller function
BSUP IN	Bad sector utility program is in core and ready for a control statement

Message	Significance
CHECKED RECORDS nn*32768+nnnnn	The indicated number of records has been verified according to the IOUP nn — 00 through 03; the quotient obtained by dividing the total number of records by 32768. If nn is zero, only nnnnn is typed nnnnn — 0 through 32767; the remainder obtained by dividing the total number of records by 32768
DATE	The system or the initializer wants a 6-digit code for the date
DB FORMAT INCORRECT	Some part of remaining portion of request is incorrect
DB INVALID REQUEST	Mnemonic does not agree with any known mnemonic
DB I/O ERROR	Monitor request returned with error bit set
DB LHO/LHC ERROR	Data written on mass storage does not match LHO/LHC input
DEBUG IN	ODEBUG is in core and is ready for use
DEBUG OUT	Signifies termination of DEBUG and the release from core
DISK ENTR	ENTR utility completed successfully
DISK x SECTOR ZERO BAD	Sector zero of x (disk 0, disk 1, or 85x) is bad; disk cannot be used
DISK 0 SECTOR ONE BAD	Sector one of disk 0 is good; 85x is bad and the disk cannot be used

Message	Significance
*****ERROR code	SETPV4 error messages are output on the standard list device. Errors occur in two phases: statement reading and statement execution. All errors are fatal, however, some errors may be delayed fatal (DF) allowing all statements to be read and diagnosed. All errors occurring in the statement execution phase are immediately fatal (IF) and cause an exit to the job processor. A flag is set and checked on entry to phase two (execution) and, if set, the execution is not initiated

	Type	Error
1	IF	An *L control statement must be the first statement
2	DF	Illegal or wrong format for control statement
3	IF	An *E must be the last control statement
4	IF	Output attempted with parameters less than current position
5	DF	Control statements are out of order (issued after an attempted sort)
6	IF	Maximum number of control statements is exceeded (1200 maximum)

Message		Significance
7	DF	The first statement is an *I or an *R statement and can not have an asterisk (*) indicating use of the previous binary
8	IF	An attempt is made to access a unit after a file mark has been encountered
9	IF	An *E statement encountered before an *O statement. Outputting must take place if there are any *R, *I, *D, or *S statements in the set
10	IF	Mass storage overflow
E01		Irrecoverable input/output error; terminates load
E02		Overflow of entry external table reservation on mass storage; terminates load
E03		Illegal or out-of-order input block; terminates load
E04		Incorrect common or data block storage reservation. Occurs if the largest common storage declaration is not on first NAM block to declare common or data storage, or if protected common or data was being used, the NAM block declared a reservation longer than protected common or data; terminates load

Message	Significance
E05	Program longer than area or partitions allotted to it; terminates load
E06	Attempt to load information in protected core; terminates load
E07	Attempt to begin data storage beyond assigned block; terminates load
E08	Duplicate entry point
E09	High order bit of a relocatable address is set or negative relocation has been encountered during part 1 load; terminates load
E10	Unpatched externals. External name is printed following the diagnostic. When all unpatched externals have been printed, the operator may terminate the job by typing in an *T cr or continue execution by typing in an *cr. Core resident entry point tables may also be linked by typing in an *E for part 0 table or an *W for part 1 table
E11	Minimum amount of core not available for load. At least 195 words plus the length of the loader must be available; terminates load
E12	Overflow of command sequence storage reservation on mass storage; terminates load

Message	Significance
E13	Undefined or missing transfer address; this code is not given if the loading operation is part of system initialization. Occurs when loader does not encounter a name for the transfer address or the name encountered is not defined in loader's table as entry point name; loading is terminated
E14	Loader request operation code word illegal; terminate load
E15	Overflow of loader table used to store relocatable addresses that have been absolutized to $7FFF; terminates load
E16	Entry point name not in loader table. Operator must type in correct entry point name
E17	Informative diagnostic. Relocatable entry point has been absolutized to location $7FFF. If any program in system is testing for an entry point value of $7FFF to indicate that this entry point is not present, the test is not valid.
ENABLE WRITE ADDRESS TAGS SWITCH TYPE CR	Turn on WRITE ADDRESS TAGS switch; when enabled, press RETURN
END OF TAPE LU nnnn ACTION?	An end of tape mark is sensed while writing data on magnetic tape. The operator must respond with either $RES to resume action from the point of last interruption or $END to terminate the request

Message	Significance
EQUIPMENT ec CHANNEL lc FAILED code	ec Equipment code for multiplexer lc Line or channel that failed code Refer to error code section
ER	Unintelligible control statement following a manual interrupt command
ERROR 1	Asterisk initiator missing
ERROR 2	Number appears in name field
ERROR 3	Illegal control statement
ERROR 4	Input mode illegal
ERROR 5	Statement other than *Y or *YM previously entered
ERROR 6	Statement other than *Y previously entered
ERROR 7	*Y not entered prior to first *L
ERROR 8	Name appears in number field
ERROR 9	Illegal hexadecimal core relocation field
ERROR A	Illegal mass storage sector number
ERROR B	Error return from loader module
ERROR C	Unpatched external at conclusion of an *M load
ERROR D	Unpatched external at conclusion of an *L or *LP load
ERROR E	Field terminator invalid
ERROR F	More than 120 characters in control statement

Message	Significance
ERROR 10	Ordinal name without ordinal number
ERROR 11	Doubly defined entry point
ERROR 12	Invalid ordinal number
ERROR 13	Loader control statement out of order, correct order is L, LP, M, MP
ERROR 14	Data declared during an *M load but not by first segment; initialization restarted
ERROR 15	Not in ERS
ERROR 16	Irrecoverable mass storage I/O error
ERROR 17	Irrecoverable loader error; last program loaded was ignored.
ERROR 18	First statement to the initializer did not define mass storage
ERROR 19	Unable to read in bad sector directory
ERROR 20	*S, ENDOV4, hhhh not input before first *L

Message	Significance
ERROR 21	*S,MSIZV4, hhhh not input before first *LP or *MP
ERROR 22	Attempt to load Part 1 core resident into non-existent memory
ERROR 23	The name used in the second field of an *M control statement was not previously defined as an entry point
ERROR 24	The entry point sector was not defined at the start of initialization and is not available to the initializer
ERROR 25	Illegal partition number in first field of an *MP statement or illegal number of partitions in second field of statement
ERROR 26	An attempt was made to load an *MP program when no partitioned core table exists in SYSDAT
EXCEEDED THE MAX. NO. OF ALTERNATES ON x	x (disk 0, disk 1, or 85x) must be refurbished; or more alternate sectors must be specified

Message	Significance
FILE BACKD FILE nnnn FILE BACKD RECS nnnn	The specified file or unit has been backspaced by nnnn files or records
FILE SKIPD FILE nnnn FILE SKIPD RECS nnnn	The specified file or unit has been advanced by nnnn files or records
FORMAT ERROR	Invalid control statement; reenter statement
IN	LIBEDT is ready to accept the next control statement
IN/OUT ERROR LU nnnn	An error occurred in an input/output operation on logical unit nnnn.
' INPUT TAPE ON UNIT 0 READY '	LOAD option was typed after previous message appeared. If ready, press RETURN.
INTERNAL/EXTERNAL REJECT	Cannot communicate with the device.
J	Job processor waiting for control statement from input comment device
JOB ABORTED	The current batch job has abnormally terminated. If the job card included a job name, that name replaces JOB
JP,yyyyyy	yyyyyy is the last program library program executed before the job terminated
JP01,hhhh	Program protect violation. hhhh is current contents of P register. Standard comments device
JP02,address	Illegal request or parameters at the specified hexadecimal address. Standard comments device

Message	Significance
JP03, statement	Unintelligible control statement is output with the diagnostic. Standard comments device
JP04, statement	Illegal or unintelligible parameters in control statement. Standard comments device
JP05	Statement entered after manual interrupt is illegal. Standard comments device
JP06	A threadable request was made at level 1 when no protect processor stack space was available, or an unprotected threaded request was made at level 1. Standard comments device.
JP07	Unprotected program tried to access protected device; standard comments device
JP08	Attempt to access read only unit for write, or write only unit for read, or an attempt to access an unprotected request on a protected unit; standard comments device
JP09	I/O error while accessing the job processor file directory table
JP10	Operation attempted on file that is not in the file table; define the file
JP11	File name being defined already exists for another file. Dump the file table to select a name not used previously or attempt a new define with another name

Message	Significance
JP12	Attempt to access a file that has not been opened.
JP13	No files are available for definition. Purge the file table to make available any expired files
JP14	Attempt to open a previously opened file
JP15, xxx	JOB card not first control statement in job, or more than one job card detected within a job. xxx is the control statement in error
L01	More than 6 characters in a parameter name are presented to the library editing program
L02	More than 6 digits in a number are presented to the library editing program
L03	Improper system directory ordinal was presented to the library editing program.
L04	Invalid control statement was presented to the library editing program
L05	Illegal field delimiter in a control statement was presented to the library editing program
L06	Illegal field in control statement was presented to the library editing program
L07	Errors in loading as a result of a library editing program control statement

Message	Significance
L08	A program to be added to the program library has an entry point duplicating one already in the directory
L09	Standard input failed on first input record following an *N request
L10	The operator is deleting a program which is not in the library
L11	No header record on file input from mass storage
L12	On an *L entry statement either there was an input error, or the first record was not a NAM block
L13	Common declared by the program being loaded exceeds available common or system common not specified in system when requested
L14	Program being loaded is longer than the size of unprotected core, but not longer than the distance from the start of unprotected core, to the top of core
L15	Illegal input block encountered; last program stored in library is not complete
L16	I/O input error occurred; last program stored is not complete
L17	An *L program being installed exceeds the capacity of LIBEDT to input from mass storage
L18	Attempt to load a zero-length program during an *M request

Message	Significance
L19	No data base entry point specified in the system for use by an *A statement and parameters
L20	Irrecoverable error occurred during loading
L21	Attempt to write beyond maximum sector number specified for MAXSEC at initialization
LOADER ERROR 1	Unrecognizable input
LOADER ERROR 2	Mass storage overflow
LOADER ERROR 3	Out of order input block
LOADER ERROR 4	Illegal data or common declaration
LOADER ERROR 5	Core overflow
LOADER ERROR 6	Overflow of entry point table
LOADER ERROR 7	Data block overflow
LOADER ERROR 8	Duplicate entry point
LOADER ERROR 9	15116 bit arithmetic error
LOADER ERROR 10	Unpatched externals
LOADER ERROR 11	Insufficient core for both SYSDAT and paging
LOADER ERROR 12	Illegal page number used
LOADER ERROR 13	Undefined transfer address
LOADER ERROR 14	Invalid function for loader
LOADER ERROR 15	Link table overflow
LOADER ERROR 16	External table overflow
LOADER ERROR 17	Entry point absolutized to $7FFF

Message	Significance
L,no. FAILED ACTION	The number of the failed device appears when a driver cannot recover from an error Type RP to repeat the request Type CU to report the error condition to the requesting program and continue Press RETURN Other control statements are ignored (ACTION is retyped) until either RP or CU is entered on the teletypewriter
L,no. FAILED code	Informs operator of device failure no. Logical unit of failed device code Code indicates cause of failure. (See Equipment Malfunction Codes for the code description.)
LIB	Library editing program in core
LU no. DOWN	If a device is marked down, yet requested by a program, and this device contains no alternate, this message is typed on the comment device only the first time it is requested after being downed. The completion address is always scheduled with error. The requesting program should not continually request downed units
LU no. RESTORED	This message appears after an *R; no command is issued

Message	Significance
MASS STG ERR code	Informative message indicating mass storage device error. (See Equipment Malfunction Codes for the code description.)
MISMATCH REC nn*32768+nnnnn	The indicated record is not the same on both the data being verified NOTE The nn and nnnnn are defined as follows. nn 00 through 03. The quotient obtained by dividing the total number of records by 32768. If nn is 0 only nnnnn is typed out nnnnn 0 through 32767. The remainder obtained by dividing the total number of records by 32768
NBR RECS COPIED nn*32768+nnnnn	The indicated number of records has been transferred according to the IOUP request NOTE The nn and nnnnn are defined as follows. nn 00 through 03. The quotient obtained by 32768. If nn is 0 only nnnnn is typed out

Message	Significance
(Cont'd)	nnnnn 0 through 32767. The remainder obtained by dividing the total number of records by 32768
NUMBER OF FILES COPIED nnnnn	The indicated number of files has been transferred according to the IOUP request
NEXT	On-line debug or bad sector utility (BSUP) is ready for the next control statement
OUTPUT TAPE ON UNIT 3, HOW MANY SECTORS'	SAVE option was typed Type the hexadecimal number of sectors Press RETURN
OV	Overflow of volatile storage; appears on output comment device
PARITY, address	Memory parity error at the specified hexadecimal location; appears on output comment device
PP	Activate program protect switch. Output comment device
Q	Informs the operator (on comment medium) that system initializer is ready to accept another control statement
RE	Recovery program ready to accept control statements. This comment is also output if the recovery statement is illegal or improper parameters are presented

Message	Significance
SEARCH FINISHED	Terminates the search request
SECTOR SET DOWN	DOWN utility completed successfully
SECTOR SET UP	UPIT utility completed successfully
SET WRITE ADDRESS SWITCH ON THE 1738	TAGS The operator should set the WRITE ADDRESS switch and enter a carriage return
SI FWA OF CONTRL=hhhh DEFINE MASS STORAGE	Informs the operator on the comment medium that the system initializer is ready to begin operation, that the initializer begins at location hhhh, and that the initializer needs to know the mass storage device. Type either carriage return to use the standard mass storage device or input an *O control statement to define the device
TAGS WRITTEN	TAGS utility completed successfully
THE SYSTEM INITIALIZER WILL BE MOVED TO LOCATION 4000 AND EXECUTED. TURN OFF PROTECT SWITCH AND TYPE CARRIAGE RETURN	This message is typed on the comment medium if unprotected core is in the upper 32K. It is necessary to turn off the PROTECT switch to move the system initializer to location 4000
TIMER RJ	Timer start up rejected
TROUBLE WITH THE DISK	Restart the disk to tape program
CHECK TAPE UNIT	Restart the disk to tape program

Message	Significance
TYPE 4 DIG. EQ. CODE FOR DISK	For equipment 3: Type 0180 for 1739-1 Type 0181 for an 853 Press RETURN If this reply is not a legal number, processing continues normally until the message TROUBLE WITH DISK appears
' TYPE 4 DIG. EQ. CODE FOR MAG TAPE '	The DSKTAP program is executing. For equipment 7: Type 0381 Press RETURN This reply is assumed to be a legal number. If it is not correct, processing continues normally until the message CHECK TAPE UNIT appears
"TYPE CD FOR CARTRIDGE DISK, DD FOR 853/854"	CD Data is read from or written on the cartridge disk which must contain a bad sector directory DD Data is read from or written on an 853/854 disk which must contain a bad sector directory
"TYPE LOAD FOR TAPE-TO-DISK, SAVE FOR DISK-TO-TAPE'	Type either LOAD or SAVE Press RETURN

Message	Significance
'TYPE V FOR VERIFY, A FOR AUTOLOAD'	When the LOAD or SAVE option is completed, this message appears. Reply with one of the following: Type V Press RETURN To check input against output. If an error is found, a message appears to indicate the sector number at failure time. Type C and press RETURN to continue verification Type A Set PROGRAM PROTECT switch to OFF Press RETURN DSKTAP simulates an autoload and jumps to 0000
UT FORMAT INCORRECT	The request is not correctly formatted. Parameters and/or delimiters are incorrect
UT INVALID REQUEST	The mnemonic request code is illegal

DIRECTOR STATUS CODES

Following are the hardware status codes that may appear in the A register if the STATUS reguest is used. These codes also appear in the engineering file printout.

1711/1712/1713 TELETYPEWRITER

A Register Bits	Status	Description
0=1	Ready	The teletypewriter (TTY) power switch is in the ON-LINE position; power is applied to the teletype-writer
1=1	Busy	If the controller is in read mode, it is in the process of receiving a character from the TTY, or the holding register contains data for transfer to the computer. The busy status drops when the data transfer to the computer is completed, if data has not been lost in the meantime. If the controller is in write mode, the data register contains data and is in the process of transferring it to the TTY. Busy drops when the transfer is complete. In either mode, the TTY mode control relays are in the process of switch-ing from one mode to another.
2=1	Interrupt	An interrupt condition exists in the controller

A Register Bits	Status	Description
3=1	Data	If the controller is in read mode, the holding register contains data for transfer to the computer. The data status drops when the read is completed. One character (located in the lower 7 bits of the A register) is transmitted at a time If the controller is in write mode, it is ready to accept another write from the computer. The data status drops when the write is completed.
4=1	End-of-operation	The clutch in the TTY is disengaged. A change of controller mode may be accomplished at this time. This status is equivalent to a not busy status
5=1	Alarm	The ready status is a 0 or the lost data status is a 1. The alarm status drops when the condition it caused is corrected or when the interrupt request is cleared.
6=1	Lost data	The holding register contained data for transfer to the computer, and the teletypewriter began to send a new character sequence. Lost data status may be cleared by a clear controller function or a select write mode function after the TTY is stopped and the character in the holding register is read or when the interrupt request is cleared.

A Register Bits	Status	Description
7	Not used	
8	Not used	
9=1	Read mode	The controller is conditioned for input operations
10=1	Motor on (ready)	Identical to a ready status; the TTY is turned on
11=1	Manual interrupt	A manual interrupt has occurred. This status may be cleared by a clear controller, a clear interrupt, or a master clear operation.

1729–2 CARD READER

A Register Bits	Status	Description
0=1	Ready	Card reader operational
1=1	Busy	Card reader busy
2=1	Interrupt	Indicates interrupt response generated by card reader. Other status bits must be monitored to determine the cause of the interrupt
3=1	Data	Indicates data transfer may occur. Reader data: the data hold register contains information ready for transfer to the computer
4=1	End-of-operation	Indicates the card reader completed operation
5=1	Alarm	Indicates presence of alarm condition
6=1	Lost data	Indicates data not transferred out of the holding register before the next column being read appeared. The status drops when a clear (0=1) is sent to the controller.

NOTE

When lost data occurs, no further transfers occur from that card, and an end-of-operation status is generated

A Register Bits	Status	Description
7=1	Protected	Indicates the protect switch on the card reader is in PROTECT position. When in this position, the card reader only accepts instructions with a 1 on the program protect line. All other instructions are rejected. A protected instruction is used with either a protected or unprotected card reader.
8=1	Error	Indicates a preread error occurred
9=1	Feed alert	Indicates that during a card cycle, the transport of the card failed.
10=1	End-of-file switch	Indicates the end-of-file switch is on
11=1	End-of-file card	Indicates an end-of-file card has been read. The bit is set by the driver.

1726–405 CARD READER/CONTROLLER

A Register Bits	Status	Description
0=1	Ready	Card reader is operational
1=1	Busy	Controller is busy whenever a card is being entered into the buffer memory
2=1	Interrupt	Interrupt status is available if one or more of the selected interrupts has occurred. Other bits must be monitored to determine the condition causing the interrupt
3=1	Data	Card reader is ready to transfer data to the computer
4=1	End-of-operation	Last card column was read or a reload memory function was sent
5=1	Alarm	Card reader has one or more of the following alarm conditions: Compare or preread error Stacker full or jammed Input tray empty Fail to feed Separator card transferred to memory AUTO/MAN switch in MANUAL position
6	Fail to feed	Card failed to feed. Set by the driver

A Register Bits	Status	Description
7=1	Protected	Controller recognizes only the I/O instructions with the protect bit present. Bit 7 is 1 when the PROTECTED/ UNPROTECTED switch is in the PROTECT position
8=1	Error	Preread or compare error occurred
9=1	Binary card	Contents of the first card transferred to memory and a binary card detected, or the negate Hollerith to ASCII function was selected
10=1	Separator card	Contents of the first card transferred to memory and a separator card detected
11=1	End-of-file card	Indicates an end-of-file card has been read. This bit is set by the driver
12=1	Stacker full or jammed	Stacker is full of cards; or the cards have jammed
13=1	Input tray empty	Input tray is empty
14=1	End-of-file	End-of-file condition is caused by an empty input tray, unloaded buffer memory, or the END-OF-FILE switch being on. When the input tray does not contain the last card of a file, the switch should be off to inhibit the status

A Register Bits	Status	Description
15=1	Manual switch or MOTOR POWER off	AUTO/MAN switch is in MANUAL position or the MOTOR POWER switch is off

A Register Bits	Status	Description
0=1	Ready	Card reader is operational
1=1	Busy	Controller is busy whenever a card is being entered into the buffer memory
2=1	Interrupt	Interrupt status is available if one or more of the selected interrupts has occurred. Other bits must be monitored to determine the condition causing the interrupt
3=1	Data	Card reader is ready to transfer data to the computer.
4=1	End-of-operation	Last card column was read or a reload memory function was sent
5=1	Alarm	Card reader has one or more of the following alarm conditions: Compare or preread error Stacker full or jammed Input tray empty Fail to feed Separator card transferred to memory AUTO/MAN switch in MANUAL position.
6=1	Lost data	NOTE When lost data occurs, no further transfers occur from that card. An end-of-operation status is generated

A Register Bits	Status	Description
6=1 (Cont'd)		Indicates data not transferred out of the holding register before the next column being read appeared. The status drops when a clear (0=1) is sent to the controller
7=1	Protected	Controller recognizes only the I/O instructions with the protect bit present. Bit 7 is 1 when the PROTECTED/UNPROTECTED switch is in the PROTECT position
8=1	Error	Preread or compare error occurred
9=1	Motion failure	Indicates that during a card cycle, the transport of the card failed
10=1	End-of-file	End-of-file condition is caused by an empty input tray, unloaded buffer memory, or the END-OF-FILE switch being on. When the input tray does not contain the last card of a file, the switch should be off to inhibit the status
11=1	End-of-file	Indicates an end-of-file card has been read. This bit is set by the driver
12=1	Chip box error	Chip box is full

1777 PAPER TAPE STATION READER

A Register Bits	Status	Description
0=1	Ready	Paper tape reader is operational
1=1	Busy	Paper tape reader is busy
2=1	Interrupt	Indicates an interrupt has occurred
3=1	Data	Indicates the data hold register contains a frame of data ready for transfer to the computer
4	Not used	
5=1	Alarm	Indicates a paper motion failure, lost data, or reader power turned off
6=1	Lost data	Indicates the data is not transferred to the computer before the next frame appears for reading. A lost data signal is generated to indicate a frame has been passed. Tape motion stops after the frame is read
7=1	Protected	Indicates PROGRAM PROTECT switch is on
8=1	Reader non-existent	Indicates the station does not exist
9=1	Paper motion failure	Indicates a change in state did not occur in the feed hold circuit for 40 milliseconds while trying to read.
10=1	Power ON	Power is on.

1777 PAPER TAPE STATION PUNCH

A Register Bits	Status	Description
0=1	Ready	Paper tape punch is operational.
1=1	Busy	Paper tape punch is busy
2=1	Interrupt	Indicates an interrupt occurred
3=1	Data	Data in the hold register has been processed and new data may be received
4	Not used	
5=1	Alarm	Indicates a tape break, punch power off, tape supply low. A validation error sets status bit 6 only. This status is cleared with a clear interrupt or clear controller function.
6=1	Validation error	Indicates a validation error. If a validation error is detected by the controller, tape motion is prevented and the incorrect punch character is held. This permits the computer to generate the same character again or 0 characters which are punched over the incorrect character. Lack of error status after repunching does not necessarily indicate that the incorrect character was corrected
7=1	Protected	Indicates the PROGRAM PROTECT switch is on

A Register Bits	Status	Description
8=1	Punch non-existent	Indicates that the station does not exist
9=1	Tape break	Indicates the punch supply tape has broken or run out and approximately 2 inches of tape remain
10=1	Power ON	Power is on
11=1	Tape supply low	Limited supply of tape remaining to be punched

1739–1 CARTRIDGE DISK DRIVE

A Register Bits	Status	Description
0=1	Ready	The ready status bit indicates that the drive is available and ready to operate. The drive becomes not ready for the following reasons: Disk pack not in drive unit Disk drive motor not up to operating speed Read/write heads not in operating position A fault condition develops in the drive The status condition is affected by the operating program only if it selects a non-existing device or a device which is not ready Normally the ready status bit indicates that manual intervention is required at the selected drive unit.
1=1	Busy	The busy status bit indicates that the controller and/or the drive unit is presently involved in the performance of an operation The bit is set by the acceptance of a load address, write, read, compare, checkword check, or write address function.

A Register Bits	Status	Description
		The busy status bit is cleared when the controller and/or drive unit has completed its operation or an abnormal condition is detected which aborts the operation. Once initiated, the computer cannot clear the busy condition.
2=1	Interrupt	The interrupt status bit indicates that a selected interrupt condition has occurred The bit is cleared by the acceptance of any output function
3=1	On cylinder	The on cylinder status bit is set when the drive positioner is ON CYLINDER. The bit is cleared if the drive unit is presently positioning or if a seek error is detected
4=1	End-of-operation	The end-of-operation status bit is set whenever the controller portion of an operation is complete. The busy status bit may remain set if the selected unit is positioning The bit is cleared by any output function

A Register Bits	Status	Description
5=1	Alarm	The alarm status bit indicates that one of the following abnormal conditions occurred: Not ready Checkword error Lost data Seek error Address error Storage parity error Protect fault Any output function clears the bit. The not ready condition can be changed by manual intervention
6=1	No compare	The data received from computer core storage does not compare with data read from file storage during compare operation The bit is cleared by any output function
7=1	Protected	The controller is presently reserved for, or being operated on, by protected computer instructions or that the drive unit is protected and may only be accessed by protected computer instructions The controller is reserved or being operated on by a protected instruction, it can be cleared by a protected director function which has the release bit set in A

A Register Bits	Status	Description
(Cont'd)		The drive unit is protected by the protect switch on the operators panel, then it can be cleared by changing the protect switch to its off position (down) or by deselecting the unit with a director function which has the proper protect code set in A
8=1	Checkword error	The controller logic has detected an incorrect checkword in data read from file storage during a read, compare, or checkword check operation The bit is cleared by any output function
9=1	Lost data	The computers direct access bus has not been able to keep up to the file data transfer rate during a write, read, or compare operation The bit is cleared by any output function
10=1	Address error	The controller has detected an illegal file address received from the computer or the controller has advanced the file address beyond the limits of file storage The bit is cleared by any output function

A Register Bits	Status	Description
11=1	Controller seek error	The controller has been unable to obtain the file address selected during a write, read, compare, or check-word check operation. This error usually indicates a positioning error. The error can be corrected by doing a status of the drive cylinder, comparing this with the cylinder register (to find out how many tracks and in what direction the positioning error is from the selected file address). The first load address function following a controller seek error moves the CDD positioner without changing the cylinder register and can therefore correct the positioning error The bit is cleared by any function which sets the busy status
12	Not used	
13=1	Storage parity error	The controller has received a parity error signal from the direct storage bus while receiving data or control information. If the error is detected on control information transfer, the operation will end immediately. If the error is detected during data transfer the operation will end at the end of the sector being operated on The bit is cleared away by any output function

A Register Bits	Status	Description
14=1	Protect fault	An unprotected controller operation attempts to read or write in a protected computer storage area. If the error is detected while receiving control information from storage the operation will end immediately. If the error is detected while transferring data to or from storage the operation will end at the end of sector being operated in The bit is cleared by any output function
15=1	Drive seek error	The drive unit has detected that the cylinder positioner has moved beyond the legal limits of the device (below zero, cylinder position 0, and above cylinder position 202) during a load address, write, read, compare, checkword check, or write address function. The bit is cleared by any function which sets the busy status

A Register Bits	Status	Description
0=1	Ready	The selected unit is available and ready to operate. The unit becomes not ready for the following reasons: Disk pack not in drive unit Disk drive motor not up to operating speed (2400 rpm) Read/write heads not in operation position A fault condition develops in the selected unit Ready status condition will be affected by the operating program only if it selects a non-existing device or a device which is not ready. Normally, this status bit indicates that manual intervention is required at the selected drive unit
1=1	Busy	Busy status indicates that the controller and/or the drive unit is presently involved in the performance of an operation. Bit 1 is set by the acceptance of a load address, write, read, compare, checkword check, or write address function
2=1	Interrupt	Interrupt status indicates that a selected interrupt condition has occurred. The bit will be cleared by the acceptance of any output function

A Register Bits	Status	Description
3=1	On cylinder	The on-cylinder status bit is set when the selected drive unit positioner is on-cylinder. The bit is cleared if the drive unit is presently positioning or if a seek error is detected
4=1	End-of-operation	The end-of-operation status bit is set whenever the controller portion of an operation is complete. (The busy status may remain set if the selected unit is positioning.) This bit is cleared by any output function
5=1	Alarm	Indicates that one of the following abnormal conditions occurred: Not ready Checkword error Lost data Seek error Address error Defective track Storage parity error Protect fault Bit 5 is cleared by any output function. The not ready condition can be changed by selecting another drive unit or by manual intervention at the selected drive unit
6=1	No compare	Bit 6 set indicates that the data received from computer core storage does not compare with data read from file storage during a compare operation. The bit is cleared by any output function

A Register Bits	Status	Description
7=1	Protected	A selected drive unit is protected and may only be accessed by protected computer instructions. When bit 7 is set, it can be cleared by a protected director function which has the release bit set in A
8=1	Checkword error	The controller logic has detected an incorrect checkword in data read from file storage during a read, compare, or checkword check operation. This bit is cleared by any output function
9=1	Lost data	The computer's direct access bus has not been able to keep up with the file data transfer rate during a write, read, or compare operation. The bit is cleared by any output function
10=1	Seek error	The drive unit has detected a head positioner which has moved beyond the legal limits of the device during a load address, write, read, compare, checkword check, or write address function The controller has been unable to obtain the sector record address selected during a write, read, compare, and checkword check operation. The bit is cleared by any function which sets the busy status bit

A Register Bits	Status	Description
11=1	Address error	The controller has detected an illegal file address received from the computer or the controller has advanced the sector record address beyond the limits of file storage. The bit is cleared by any output function
12=1	Defective track	The controller has attempted to access a file storage address which had previously been labeled as being in a defective track. Bit 12 is cleared by any output function
13=1	Storage parity error	The controller has received a parity error signal from the direct storage bus while receiving data or control information. If the error is detected during control information transfer, the operation ends immediately. If the error is detected during data transfer, the operation ends at the end of the current sector. Bit 13 is cleared by any output function
14=1	Protect fault	An unprotected controller operation attempts to write into a protected computer storage area. When the error is detected while transferring data to storage, the operation ends at the end of the current sector. The bit is cleared by any output function

A Register Bits	Status	Description
0=1	Ready	
1=1	Busy	
2=1	Interrupt	
3	Not used	
4=1	End-of-operation	
5	Not used	
6=1	Lost data	
7=1	Protected	
8=1	Parity error	
9	Not used	
10=1	Guarded address	
11=1	Timing track error	

Status Bits	Status	Description
0=1	Ready	Printer is operational
1=1	Busy	Printer is busy during the transfer and storage of each character. It is also busy after the initiation of a print cycle and remains busy until the content of memory is printed. Paper motion also activates the printer. However, transfer of data to memory is allowed
2=1	Interrupt	Printer indicates an interrupt response. The other status bits determine the cause of the interrupt
3=1	Data	Printer is ready to receive data. If interrupt on data has been selected, data status also indicates the interrupt has occurred
4=1		Printer has completed an operation. If the bit is 1, no operation is in progress
5=1	Alarm	Printer has an alarm condition
6=1	Not used	
7=1	Protected	PROTECT switch on the printer is in the protect position. In this position the printer accepts only those instructions with a 1 on the program protect line. All other instructions are rejected. A protected instruction can be used with either a protected or unprotected printer

A Register Bits	Status	Description
0=1	Ready	Tape unit connected and ready
1=1	Busy	Equipment is busy
2=1	Interrupt	
3=1	Data	Read/write data transfer
4=1	End-of-operation	
5=1	Alarm	
6=1	Lost data	
7=1	Protected	Indicates program PROTECT switch is on
8=1	Parity error	Parity error detected
9=1	End-of-tape	End-of-tape marker sensed
10=1	Loadpoint	Load point is sensed
11=1	File mark	File mark is sensed
12=1	Controller active	Controller is active
13=1	556 bpi	Tape is set to 556 bpi
14=1	800 bpi	Tape is set to 800 bpi (for 608 and 609)
15=1	Write enable	Write enable ring is present

A Register Bits	Status	Description
0=1	Ready	Tape unit is connected and ready
1=1	Busy	Equipment is busy
2=1	Interrupt	Indicates an interrupt occurred
3=1	Data	Read/write data transfer
4=1	End-of-operation	
5=1	Alarm	
6=1	Lost data	
7=1	Protected	
8=1	Parity error	Parity error detected
9=1	End-of-tape	End-of-tape marker sensed
10=1	Loadpoint	
11=1	File mark	File mark or tape mark is sensed
12=1	556 bpi	Tape is set to 556 bpi
13=1	800 bpi	Tape is set to 800 bpi
14=1	7-track	
15=1	Write enable	Write enable ring is present

PSEUDO TAPE

Status Bits	Status	Description
0=1	Ready	Always set
1=1	Busy	Always set
2		Not used
3=1	Data	Set on completion of read or write
4=1	End-of-operation	
5=1	Alarm	
6, 7, 8	Not used	
9=1	End-of-tape	Last existing record on the file has been accessed.
10=1	Loadpoint	Internal pointers are pointing to the beginning of the file
11=1	File mark	A pseudo file mark has been sensed
12, 13	Not used	
14=1	800 bpi	Always set
15=1	Write enable	File may be written on

COSY DRIVER

The status bits in the COSY driver Physical Device Table and the status bits for the device used by the COSY driver are the same.

361—1 COMMUNICATIONS ADAPTER

A Register Bits	Status	Description
0 1 2 3 4 5 6 7	Data bits to Communication Multiplexer	Input words of 5 to 8 data bits from the modem
8=1	Break	Indicates a line current break or interruption from the remote station
9=1	Character lost	Servicing program did not receive current data character before new character was shifted into the receive sections holding register. Current character data is lost
10=1	Character request †	The send section is in condition to receive data from computer. Bit 10 is set after enable character request signal from the communication multiplexer and the clear-to-send signal from the modem are present in the send action
11-1	Character ready	Sets when holding register in receive section contains valid data character ready for transfer to the communication multiplexer

† Transmitted by send section of an input operation.

A Register Bits	Status	Description
3=1	Clock status	Indicates interrupt clock has completed a cycle since the last status check
7=1	PROTECT switch status	Indicates PROTECT switch is in the protected position

EQUIPMENT MALFUNCTION CODES

Error Code	Error	Description
0	Time out error	Failure to interrupt within allotted time. (Requires TIMER package) Teletype: Operator failed to supply input within allotted time. Ignore message and continue normally All Other Devices: Hardware failed to generate an interrupt within the allotted time. Fix the hardware
1	Lost data	Data was not transferred out of the read register before the next data word appeared 1711/1713 TTY: Retype the statement Magnetic Tape: Use the CU option to continue without processing lost record or abort the read option
2	Alarm	Indicates the presence of an abnormal condition Paper Tape Reader (1713): Paper tape motion failure. No change in the feed hole circuit has occurred for 40 milleseconds while trying to read. If not end of tape, manually position the paper tape so that the end of the next to last record and the beginning of the last record are on opposite sides of the photocells. If end of tape, take CU option

Error Code	Error	Description
2 (Cont'd)	Alarm	Paper Tape Punch: Paper tape supply low or tape break. Abort the punch operation and correct the problem Line Printer: Paper out, paper tear, fuse alarm, or interlock open. Correct the problem and use the RP option 1729-2 Card Reader: Interlock open. Correct the problem and take the RP option 1728-430 Card Reader: Interlock open or chip box full. Correct the problem and take the RP option 1726-405 Card Reader: If the output stacker is full, clear the output stacker and type RP. If a card jam has occurred, abort the operation and correct the problem. If there is a failure to feed, attempt to ready the device and take the RP option Pseudo Tape: Failure to fulfill request due to mass storage device failure COSY Driver: First record not a CSY/ control record
3	Parity error	1711/1713 TTY: Attempt recovery by retyping the command Paper Tape Reader (1713): Manually position the paper tape so that the end of the next to last record and the beginning of the last record are on opposite sides of the photo cells. Repeat the

Error Code	Error	Description
3 (Cont'd)	Parity error	read request by typing RP in response to the error message Magnetic Tape: The tape is positioned after the bad record. Either take the CU option to continue processing (the bad record will be ignored), or abort the operation COSY Driver: Last record was not an END/ record
4	Checksum error	(FREAD binary) The sum of the header word and data in a record did not balance to zero when added to the checksum word Paper Tape Reader (1713): Plugged feed holes or dirty paper tape. Check the tape for dirt and plugged feed holes. Attempt recovery by manually positioning the paper tape so that the end of the next to the last record and the beginning of the last record are on opposite sides of the photo cells. Repeat the read request by typing RP in response to the error message Card Readers: Holes are not cleanly punched. Check cards for tears between holes. If the cards are all right, attempt recovery. Otherwise, perform the following operations 1. Remove the cards from the input hopper

Error Code	Error	Description
4 (Cont'd)	Checksum error	2. (1728-430/1729-2 only) Single cycle the card in the transport area to the output stacker 3. Take the last two cards in the output hopper and put them into the input hopper ahead of the unread cards. If multicard record, re-read all cards within the record 4. (1726-405 only) Press RELOAD memory switch. 5. Ready the card reader 6. Take RP option COSY Driver: There was no end-of-file mark following the END/ record
5	Internal reject	I/O device did not send reply to the computer within the allotted time The computer cannot communicate with the device. Check hardware address switch and POWER ON switch. The RP option may be used if the problem has been corrected COSY Driver: Read on write unit or write on read before the end-of-deck marker was encountered
6	External reject	The I/O device has replied to the computer that it is not ready to perform the specified request The device is busy or not ready. If the device is not busy, check the ready switch. Attempt to continue by typing RP

Error Code	Error	Description
6 (Cont'd)	External reject	COSY Driver: Motion request on read unit after CSY/ record and before end of deck marker
7	Compare	Hardware problem. A compare error occurs when a faulty signal is detected in the area of the punch solenoid and echo amplifier circuits during an echo check 1728-430 Card Reader: Remove and discard the last card punched. Ready the device and type RP Card Readers: Attempt recovery as for card checksum error (see error code 4)
	Pre-read	A pre-read error occurs if all read amplifiers are not off during a dark check 1728-430 Card Reader: Remove and discard the last card punched. Ready the device and type RP. Card Readers: Attempt recovery as for card checksum error (see error code 4)
8	Illegal Hollerith punch	Occurs when the card reader encounters a punch sequence not complying with Hollerith to ASCII conversion table being used by the driver Software recovery allows the user to locate the illegal punch by setting an ASCII ? in the buffer word for the bad column. Select reply option to continue or abort the job and correct the mispunched cards

Error Code	Error	Description
9	Sequence error	Cards within a record are not in sequential order Abort the read operation and restore sequential order to the record
10	Non-negative record length	The first word of a formatted binary record is the complement of the number of records within the record. The word may be a negative number indicating that the card read was not the first card of the record Attempt recovery using the procedure for checksum error (see error code 4)
11	Read/write mode change	Indicates a switch from read or write mode 1728-430 Card Reader: This message is issued only as a warning to the operator If mode switch is allowable, repeat the request using the RP option
12	7/9 punch error	The error occurs if a 7/9 punch in column 1 is read when an FREAD ASCII request is specified Card reader recovery: 1. If column 1 is a 7/9 punch, no recovery. Abort operation request is wrong mode. 2. If column 1 was misread, read card as for checksum error
13	No write ring	Attempt was made to write on magnetic tape without write enabled

Error Code	Error	Description
13 (Cont'd)	No write ring	Insert write ring and use RP option Pseudo Tape: Attempt to write on file which was opened to read only
14	Not ready	Ready the device and use the RP option
15	BCD/binary mode switch	Upon detection of a parity error, the driver will attempt to read the bad record in the opposite mode. If successful, this error will be generated (see Appendix I, 1700 MSOS 4.0 Reference Manual)
16 †	Controller seek error	The controller seek error occurs when the controller has failed to obtain the file address selected during a read, write, compare or checkword operation. This is usually an indication of a positioning error
17 †	Drive seek error	A drive seek error occurs when the drive unit detects that the cylinder positioner moved beyond the legal limits of the device during a load address, write, read, compare, checkword check, or write address function
18 †	Address error	This error occurs when an illegal file address obtained from the computer is detected, or the controller has advanced beyond the limits of file storage

† This error code is not reported via the alternate device handler.

Error Code	Error	Description
19	Protect fault	The protect fault occurs when an unprotected controller operation attempts to write in a protected core location
20 †	Checkword error	The checkword error occurs when the controller logic detects an incorrect checkword in data read from file storage during a read, compare, or checkword operation
21 †	Defective sector error	The defective sector error occurs under the following conditions: 1. Error on write is attributed to a defective surface 2. This sector has not been previously downed and assigned an alternate 3. The dynamic sector downing option has not been selected
22	Card output stacker full	1728-430/1729-2 Card Readers: Empty output hopper and take RP option
23	Card input hopper empty	If read operation is complete, use CU option, otherwise supply more cards and take RP option
24	Card feed failure	The read ready station does not contain a card after a feed cycle has occurred, and the input hopper is not empty 1728-430/1729-2 Card Readers: Card feed failure error can occur as a result of warped or damaged cards. If the card reader can be made ready, take the RP option

† This error code is not reported via the Device Handler.

Error Code	Error	Description
25	Card jam	A card transport problem has occurred. It is possible for a card jam to occur in any one or more of four read stations in the 1728 Card Reader

CAUTION

Do not attempt to single-cycle the machine. Damage to the card transport or punch head may result. Call Customer Engineering to aid in clearing the jam.

Jam While Reading

1. Examine the transport area
2. Remove all cards that have completely passed under the read station
3. The cards that have not completely passed the read station have not been read. Put these cards back into the hopper. Ready the card reader and repeat the request via the RP option. The cards must be recycled in proper sequence.
4. If the procedure results in failure, abort the read

Error Code	Error	Description
25 (Cont'd)		Jam While Punching 1. Clear the jam 2. If a card has only partially passed the punch station, it has not been punched correctly. Discard the card 3. Ready the card reader and type RP. If any cards were damaged, the operation may have to be started over to obtain a readable deck
26		Not enough file space available for this request to pseudo tape driver
27	Not used	
28	File error	No file assigned to this logical unit (pseudo tape driver)
29	Read error	A read error occurred in reading mass storage resident driver
30	Validation error	The frame punched does not compare with the original data Abort the punch operation
31	Driver module not present	The driver module necessary to process the request is not present
32 †	Dynamic sector downing error	Error occurred when dynamic sector downing failed because no free entries existed in the bad sector directory
33	Line break	Line break occurred while attempting to input on 361-1 Communications Adapter

† This error code is not reported via the alternate device handler.

Error Code	Error	Description
34	Data interrupt	Data interrupt occurred after reading 80 columns 1728-430/1729-2 Card Readers: This error indicates a hardware failure, possibly due to improper card travel Reread the card (see the recovery procedure for error code 4)
35	End-of-operation	End-of-operation interrupt occurred prior to reading 80 columns 1728-430/1729-2 Card Readers: Continuous failures may indicate card slippage in feeding. Reread the card as for error code 4
36	Reserved	
37	Wrong address	1706 Buffered Data Channel is using first word address other than the address sent by a buffered driver
40 †	Repeated the request due to an error	The driver is attempting recovery
41 †	Incomplete request	The request was not successfully completed. The driver attempted to repeat the request the maximum number of times

†This error code is not reported via the alternate device handler.

Error Code	Error	Description
42†	Timing error	Occurred while drum was busy
43†	Incomplete directory call or overlay read request	Due to irrecoverable error
44†	Guarded address	Error on write
45†	Timing error	Occurred while drum was not busy
46†	External reject	On output
47†	External reject	On input
48†	Illegal access	An illegal attempt was made to access either the bad sector directory or the alternate area of the disk.

† This error code is not reported via the alternate device handler.

COSY

Message	Significance	COSY Action
no. ERRORS	This message appears at the end of a COSY job if errors exist. The number specified is the decimal count of errors in the COSY job	
****COSY Cno****		
01	First card of revisions deck is not a DCK/, MRG/, CPY/, or END/ control card	Reads revisions and lists them with asterisks in columns 1 through 4 until it reads a DCK/, MRG/, CPY/, or END/ card
02	Illegal parameters on MRG/ control card	COSY aborts
03	First card from merge input is not a DCK/ control card	Reads revisions and lists them with asterisks in columns 1 through 4 until it reads a DCK/ or END/ card
04	MRG/ control card within revisions decks	COSY aborts.
05	Illegal parameters on DEL/, INS/, or REM/ control card	Reads revisions and lists them with asterisks in columns 1 through 4 until it reads next control card

Message	Significance	COSY Action
06	Sequence numbers out of order within revisions set	Reads revisions and lists them with asterisks in columns 1 through 4 until it reads next control card
07	Two sequence numbers on INS/ control card	Reads revisions and lists them with asterisks in columns 1 through 4 until it reads next control card
08	Control card does not follow DCK/ card when merging revisions	Reads revisions and lists them with asterisks in columns 1 through 4 until it reads next control card
09	First card of source deck not CSY/ or HOL/ control card.	COSY aborts
10	Requested deck not on input library	Reads revisions and lists them with asterisks in columns 1 through 4 until it reads a DCK/, MRG/, or END/ card
11	Decknames on DCK/ and HOL/ cards do not agree when adding new deck to COSY library	COSY aborts
12	Revision card following DCK/ card not a control card	Reads revisions and lists them with asterisks in columns 1 through 4 until it reads a control card

Message	Significance	COSY Action
13	DEL/ or INS/ card contains sequence number beyond end of input deck.	Reads revisions and lists them with asterisks in columns 1 through 4 until it reads a DCK/, MRG/, or END/ card
14	Illegal parameter on DCK/ card	Reads revisions and lists them with asterisks in columns 1 through 4 until it reads a DCK/, MRG/, or END/ card
15	Parameter on DCK/ card twice	Uses second parameter
16	DCK/ card requests both H and C or H and L on same unit	C or L parameter is ignored. Processing continues
17	DCK/ card requests input from logical unit previously used for output	Reads revisions and lists them with asterisks in columns 1 through 4 until it reads a DCK/, MRG/, or END/ card
18	COSY output requested on unit previously used for Hollerith output or Hollerith output requested on unit previously used for COSY	Illegal output request is cleared. Processing continues
19	Maximum number of output units exceeded	Output is cleared Processing continues

Message	Significance	COSY Action
20	The DCK/ card requests output on a logical unit previously used as input	The output is removed. Processing continues
21	The DCK/ card requests C and L output on the same unit	The L parameter is ignored. Processing continues
22	The CPY/ control card is not the first card of the revisions deck	The CPY/ control card is listed with asterisks in the first four columns and the next control card is read
23	The CPY/ card was not followed by a CPY/ or END/ card	COSY aborts
LluFAILEDec	COSY driver errors output by the alternate device handler. All errors are catastrophic	For protected requests Type CU For unprotected requests Type DU
1	Not assigned	
2	First record read was not a CSY/ record	
3	END/ card not last card on COSY input	
4	No end-of-file on COSY input	
5	A read request was made to a logical unit assigned to output, or a write request was made to a logical unit assigned to input	

Message	Significance	COSY Action
6 (Cont'd)	MOTION request was made to a logical unit assigned to input/output and no end-of-deck marker was encountered	
REWIND LU no.	This message may appear at various times during a COSY job. The specified number is the decimal logical unit to be rewound	Operator must enter any value through the standard input comment device after rewinding unit

FORTRAN COMPILATION ERRORS

Message	Significance
$*_{F}^{N}$ code, no., part	A compilation free of diagnostics will be syntactically correct. The compilation will also be free of common semantic errors (such as undefined variables in context requiring definition). If the detected error prevents code from being generated reasonably accurate, the error is considered fatal and compilation terminates. When an assumption is made as to the intended meaning of a statement, the diagnostic indicates the assumption. When possible, errors which may not be fatal (for example an A in column 3) are flagged. A reference to such a label (or the intended nonexistent label) would cause the fatal error N Trivial error; only flagged. Example: not separating array declarators in a dimension statement F Fatal error code Diagnostic number; see the following message for listing of codes

Message	Significance
*N,F code, no. part (Cont'd)	no. Number of statement in error; appears only when applicable part Part of statement in error; appears only when applicable
variable *N,F code	Compilation error. When errors cannot be detected until all the specification statements have been read and initially processed, the error appears in this format. As the specification statements are processed further, a few diagnostics can be printed. In these cases, the variable causing the difficulty is printed. The diagnostic is printed on the next line without a statement number reference since it is no longer available. N Trivial error; only flagged. Example: not separating array declarators in a dimension statement F Fatal error code Number of statement in error; appears only when applicable
1	Field is not recognizable (illegal characters in field, such as 8 in octal field)
2	Minimum range limit of a constant is exceeded

Message	Significance
3	More than 6 characters in a name
4	Maximum range limit of a constant is exceeded
5	Exponent is missing in a constant
6	Subscripted variable was not previously dimensioned
7	Expression in an IF statement does not have initial parenthesis
8	Incorrect FORMAT statement
9	Illegal use of the . NOT. operator
10	Illegal operator or operand
11	Subprogram reference is illegal
12	Labeled END card is illegal
13	Number of arguments differs in references to the same subprogram
14	Unused
15	Expression has an illegal termination
16	Unmatched parentheses in an expression
17	Relational operator is missing

Message	Significance
18	Relational operator used illegally
19	Asterisk is assumed
20	Only one ** is allowed per parentheses level
21	A variable and a subprogram name are interchanged
22	Subprogram name does not appear in an EXTERNAL statement
23	One or more DO loops terminate on an undefined statement label
24	Illegal subscript
25	Statement is syntactically incorrect
26	This array was previously dimensioned in DIMENSION, COMMON, or TYPE statement or previously defined in an EXTERNAL statement. The previous dimensioning or defining is retained and the new ignored
27	The field must be a variable or array name if processing COMMON, EQUIVALENCE, BYTE, or SIGNED BYTE; an array name if processing DIMENSION; or an array, variable, or FUNCTION name if processing a TYPE statement

Message	Significance
28	Logical IF statement contains another logical IF or DO statement
29	Name must be the name of an array
32	A missing comma in this statement is assumed
34	Illegal character in this statement is changed to a blank
35	This line, which begins a statement, has other than zero or blank in column 6; blank is assumed
36	Too many label common blocks declared, continuation of the last declared block is assumed
37	The name in this COMMON statement is either a formal argument or defined in a previous COMMON statement. The name is ignored
38	Name specified as two different types. This specification is ignored
39	This byte typed as other than an integer, or it is a formal argument. The byte specification is ignored

Message	Significance
40	This byte previously specified as a different byte. The previous specification is retained and this specification is ignored
41	The bit specified is not within bounds of the 1700 word size
42	Least significant bit in this specification is greater than the most significant bit
43	Name must be an external function or subroutine name
44	Field must be a nonzero positive integer constant
45	Array has more than 3 dimensions
46	DATA statement contains too many constants for the space provided
47	Statement has more than five continuation cards; excess cards are ignored
48	An insufficient number of constants is provided in this data statement
50	Constant is not same type as corresponding data cell
51	Statement redefines DO loop parameter

Message	Significance
52	Statement type is unrecognizable; or it follows an executable statement
53	Not defined
54	Statement label is meaningless; label is ignored
55	Statement label previously defined; current label is ignored.
56	Program name expected in this field
57	Too many dimensions caused table overflow
58	Symbol table overflowed; compilation terminates
59	Statement label may not be zero
60	No apparent exit from this program
61	Unclosed DO-implied list
62	Unformatted WRITE must have a list
63	Name must be an integer variable or integer constant
64	Name not implicitly an integer variable
65	A RETURN statement may appear only in a subroutine or function definition. A STOP statement is assumed

Message	Significance
66	Superfluous information in this statement is ignored
67	This field on STOP card must have an octal number not greater than 77777. STOP is assumed
68	Field must be a positive integer
69	Field must be an integer variable
70	Field must be a statement label
71	This form of ASSEM argument cannot reference elements in COMMON, EXTERNAL names, or subprogram arguments
72	This type of statement may not terminate a DO loop
73	This statement terminates a DO loop which is not the last DO encountered.
74	This GO TO jumps to itself
75	A program consisting of only an END card is illegal.
78	Label in a DO statement must reference a statement following it

Message	Significance
79	Maximum allowable number of nested DO's exceeded. The DO loop may be implied in a DO list
80	Overflow of KSUBAT table. Caused by large number of declared parameters and unique references to these parameters
81	This formal argument was previously specified as another formal argument or the subprogram name
82	Too many formal arguments caused a compiler table overflow
83	The above name is not a variable or an array element
84	Two elements of the same array or common block are assigned to the same storage unit
85	Blank common and formal arguments may not be initialized with DATA statements
87	BYTE, SIGNED BYTE, or DATA statement in an EQUIVALENCE either has wrong number of subscripts or a subscript is out of range
88	Too many EQUIVALENCE names caused a compiler table overflow

Message	Significance
89	At least 2 elements must appear in an EQUIVALENCE statement
91	DATA statement field is not an integer or real constant
92	Missing terminating asterisk in a literal string
100	Catastrophic table overflow; compilation is abandoned. If the offending statement is arithmetic or a logical IF, the statement should be broken into two or more statements and the program recompiled
101	Two PROGRAM, FUNCTION, SUBROUTINE, or BLOCK DATA statements in one program unit; the second is ignored.
103	Relative address argument in ASSEM statement requires preceding control indicator argument (*)
152	Arithmetic table overflow

FORTRAN EXECUTION ERRORS

Message	Significance	Action/ Result
1 I/O RQST statement no. ffff	Error in a format statement; illegal character in format statement ffff — The current decimal value of the format statement pointer	Program terminates
2 I/O RQST statement no. ffff gggg	Illegal character in the input field. ffff — Current decimal value of format statement pointer gggg — Current decimal value of the input field pointer	Program terminates
3 I/O RQST statement no. ffff gggg	Input data exceeds limits of 1700 word: Exponent $>39_{10}$ ffff — Current decimal value of format statement pointer gggg — Current decimal value of the input field pointer	

Message	Significance	Action/ Result
4 I/O RQST statement no. xx	Attempt to read on a write unit or write on a read unit xx Decimal unit number of a device used improperly	Program terminates
5 I/O RQST statement no. xx	Read or write request after an end-of-file has been read without first doing an EOF check xx Decimal unit number of a device used improperly	Program terminates
6 I/O RQST statement no. xx	Attempt to write an EOF, to rewind, or to backspace any unit other than a magnetic tape unit xx Decimal unit number of a device used improperly	Program terminates
7 I/O RQST statement no. xx	Write attempted on magnetic tape with no write enable xx The decimal unit number of a device used improperly	To continue: press RETURN

Message	Significance	Action/ Result
8 I/O RQST statement no. xx	Attempt to use logical unit number greater than 30 xx The decimal unit number of a device used improperly	Program terminates
9 I/O RQST statement no. xx	Backspace at loadpoint xx The decimal unit number of a device used improperly	Program terminates
10 I/O RQST statement no. xx	End of magnetic tape sensed xx The decimal unit number of a device used improperly	To continue: press RETURN
11 I/O RQST statement no. xx	Illegal binary input; WRITE (u) is illegal with no list xx The decimal unit number of a device used improperly	Program terminates

Message	Significance	Action/ Result
12 I/O RQST statement no. ffff	Illegal formatted input; more elements are given than are contained in an input record ffff Current decimal value of format statement pointer	Program terminates
13 I/O RQST statement no. ffff	Illegal list; a list is given but there are no conversion codes in the format statement ffff Current decimal value of format statement pointer	Program terminates
14 I/O RQST statement no. xx	File defined twice; more than one OPEN request given for the same file xx Decimal file number for a mass storage device	Program terminates
15 I/O RQST statement no. xx	Parameter negative or zero; one of the parameters in an OPEN statement is negative or zero xx Decimal file number for a mass storage device	Program terminates

Message	Significance	Action/ Result
16 I/O RQST statement no. xx	Sector address too large; the starting sector address or ending address exceeds $2^{15}-1$ xx Decimal file number for a mass storage device	Program terminates
17 I/O RQST statement no. xx	File not defined; a READ or WRITE request was given for a file which was not defined by an OPEN statement xx Decimal file number for a mass storage device	Program terminates
18 I/O RQST statement no. xx	Logical unit not a mass storage device xx Decimal file number for a mass storage device	Program terminates
19 I/O RQST statement no. xx	Record number in READ or WRITE request incorrect. Resulting sector address is out of the range of the file or it is zero xx Decimal file number for a mass storage device	Program terminates

FORTRAN TABLE OVERFLOW ERRORS

Message	Significance
CORE OVFL	Table overflow error More than 32767 cells of object code have been produced
*UD	Table overflow error Undefined symbol in address field
UNDEFINED SYMS name name name	Table overflow error Undefined statement labels and variable names

MACRO ASSEMBLER

Message	Significance
xxxxyy**********	Format for pass 1 and 2 error messages xxxx 4-digit line number yy 2-character error code explained below
******yy**********	Format for pass 3 error messages. If the L option is selected, errors in pass 3 precede the source line on the list output. If L is not selected, error messages are output on the standard comment unit
ABS BASE ERR	Assembler was loaded at a different location from where it was absolutized
**DS	Double defined symbol; a name in: Location field of a machine instruction or an ALF, NUM, or ADC pseudo instruction, or Address field of an EQU, COM, DATA, EXT, BSS, or BZS pseudo instruction
**EX	Illegal expression. Either: No forward referencing of some symbolic operands, or No relocation of certain expression values, or A violation of relocation, or

Message	Significance
(Cont'd)	Illegal register reference, or Symbol other than Q, I, or B is specified
INPUT ERROR	An error was returned by driver when doing a read
**LB	Numeric or symbolic label contains illegal character. The label is ignored
MASS STORAGE OVERFLOW	Not enough room for input image on mass storage
**MC	Macro call error Illegal parameter list No continuation card where one was indicated
**MD	Macro definition error
**MO	Overflow of load-and-go area; affects only X option
**NN	Missing or misplaced NAM statement
**OP	Illegal operation code Either: Illegal symbol in operation code field, or Illegal operation code terminator
**OV	Either: Numeric constant or operand overflow value is greater than allowed, or Operand overflowed

Message	Significance
**PP	Error in previous pass of compilation assembly; see output page immediately preceding first page of listing for pass 1 or pass 2 error message
**RL	Illegal relocation Either: Violation of relocation, or Violation of a rule for instructions that requires the expression value to either be absolute or have no forward referencing of symbolic operands
**SQ	Sequence error; tags instructions with sequence numbers that are out of order. This is not fatal and is not counted in the number of errors reported at the bottom of the symbol table
**UD	Undefined symbol in an address expression

Message	Significance
A Q I REGISTER aaaa qqqq iiii	A printout of the contents of the registers as saved by the checkout bootstrap program aaaa = Contents of A register qqqq = Contents of Q register iiii = Contents of I register
ADDRESS IN aa WAS ffff BUT SHOULD BE iiii	LOCORE communication address error. Appears each time an altered address is found in LOCORE aa = address of LOCORE location containing a monitor address ffff = Value at failure time. The list of addresses checked for alteration includes:

ffff	contents
$B5	FNR
$B6	COMPRQ
$B7	MASKT
$B9	REQST
$BA	VOLR
$BB	VOLA
$BC	LUABS
$BD	SABS
$BE	CABS
$BF	NABS
$E9	EXTBV4
$EA	DISPxx
$F4	MONI
$F8	IMPROC
$FE	ALLIN

Message	Significance
(Cont'd)	iiii = Value at initialize time
***ALLOCATABLE CORE ERROR	Error message. Cannot account for all of allocatable core; a thread is broken

ALLOCATABLE CORE MAP
INDEX START LNGTH THRD DUMP
hhhh iiii jjjj kkkk llll mmmm nnnn oooo pppp
EMPY iiii jjjj kkkk llll mmmm nnnn oooo pppp

Support message. The first two lines appear only once. Either the third or fourth line appears for each block of allocatable core. Only the first system directory with matching length appears. If the block was assigned at failure time, the third line appears. If the block was not assigned, the fourth line is printed

hhhh Ordinal of mass storage program in the system whose length matches the length of the block

iiii Starting address of a block of allocatable core

jjjj Length of the block plus the two preceding control words (which specify length of block and starting address). If the length does not match the length in a directory entry, XXXX appears on the listing

Message	Significance
(Cont'd)	kkkk Thread to next empty block or next word llll through pppp Dump of first 5 words of the block
BIT TABLE CHECKSUM ERROR	LOCORE bit table error. An incorrect checksum of the total of locations 2 through $46. At least one location between 2 and $46 has been altered. If no error is detected, the message does not appear
CONSIDER SWAP RATE TOO RAPID	System was kept from swapping because a set time interval had not elapsed
CONSIDER UNPROTECTED I/O HANGUP	The system is waiting to swap, unprotected I/O is active
CORE USAGE CAUSED SWAP WHILE JP IN	The job processor was in core, and the system was swapped. This is not an error but occurs normally during job processing
DUMP	The package is waiting for valid dump addresses. This control message appears after completing a request or after an invalid entry. The dump is 16 locations per line unless the comment logical unit is used. Then, the dump is 8 locations per line (that is, list location unit is the same as comment logical unit)
ENTRY FOR LVL hhhh INITIALLY iiii CHANGED TO jjjj	The image for each level entry in the modified mask table (error message) hhhh Level of mask table entry - 1 to F

Message	Significance
(Cont'd)	iiii — Value on autoload image jjjj — Value on failed image
FILE1 FILE2 FILE3 FILE4 LOADR BP hhhh iiii jjjj kkkk llll	Support message. These are the job processor file locations. If an address is zero, it implies that the respective module was not active hhhh — Absolute starting addresses of the four files iiii, jjjj, kkkk — Job processing files llll — Starting address of the relocatable binary loader (in TRVEC) mmmm — Starting address of the breakpoint package ($F3)
FINISH SYSCOP	Checkout completed; core is released. This is the last SYSCOP message
FORTRAN LEVELS h i j k l	This support message designates the legal levels reserved as FORTRAN levels in FMASK. h, i, j, k, l are the levels
FORTRAN LEVELS h i j k l (ERROR)	FORTRAN levels error. There are errors between the FORTRAN priority levels 3 and E. h, i, j, k, l are the levels
ILLEGAL BUSY INDICATOR	Error message. A bit in the busy word must be set for each permanently busy or unused section

Message	Significance
IMAGE START SECTOR IS ssss	A control message acknowledging the beginning of the image sector. COBOPS must be preset by the user to contain the starting sector. If COBOPS is patched, that particular number appears on the printout ssss Starting sector of failed image
INDEX hhhh HAS INVALID REQ PRI iiii	Request priority error message. This message is printed for allocatable core programs. The only program permitted to have a request priority below 3 is the job processor. Ordinals for these modules are verified and all other programs must be at a request priority level of 4 or above. This message appears for each ordinal that does not have a valid request level hhhh Ordinal in the system directory iiii Request priority level
INDEX hhhh TOO LONG FOR REQ PRI iiii	Error message. This message is printed for allocatable core programs. The only program permitted to have a request priority below 3 is the job processor. Ordinals for these modules are verified and all other programs must be at a request priority level of 4 or above. This request priority message appears for each system directory program that is longer than the core reserved for its request priority level

Message	Significance
(Cont'd)	hhhh — System directory ordinal iiii — Request priority level
***INTERRUPT TRAP ERROR	Header indicates an error on the failed image
***INTERRUPT TRAP ERROR INITIALLY	Header indicates an error message on the autoload image in the interrupt trap region
INTRPT STACK LEVEL h i j k l m n o p q r s t u v w	This support message gives the interrupt stack entries h through w — Levels of the entries in the interrupt stack; h is the lowest and should always be -1; $E is the highest permissible level; 16 is the maximum number of entries If any of these conditions are violated or levels are not in ascending order, an error has occurred. One level can appear only once. Nothing appears if the stack is empty and the priority level was -1
JP LOCKED OUT FOR LIBEDT OR RECOVERY SIGN OFF REQUESTED OF LIBEDT OR RECOVERY	This support message gives the job processor lockout switch status. If SWTCH in TRVEC is negative, only the first line appears. If positive, only the second line appears. This indicates the job processor is either locked out or that the LIBEDT or the recovery program has requested a sign off. If SWTCH is 0, the message does not appear

Message	Significance
JP NOT IN CORE	This support message indicates that the job processing executive was not in core at the time of system failure. Specifically, address pointer FILE1 in the TRVEC program had a pointer of 0. No further job processor checks are made. The job processing executive maintains four files. These files can be located from addresses in FILE1, FILE2, FILE3, and FILE4
JP WAS IN CORE	This support message indicates that FILE1 contained a file address. The remainder of the job processor checks are made
LAST ENTRY TO BE SCHEDULED hhhh/iiii jjjj kkkk llll	This scheduler stack entry message defines the last entry that was scheduled. If jjjj is 0, the message is suppressed hhhh — Address of a scheduler stack entry iiii, jjjj, kkkk, llll — Dump of hhhh entry
LEVEL hh IS USED FOR INTERRUPTS AND IS RESERVED FOR FORTRAN	This error message indicates that the interrupts cannot use the levels reserved for FORTRAN When FMASK is unpatched (7FFF), it is assumed no FORTRAN levels are reserved hh — Priority level number
LINE 0 1 2 3 4 5 6 7 8 9 A B C D E F LEVEL h h h h h h h h h h h h h h h h	This support message gives the line and level status

Message	Significance
(Cont'd)	h — Level indicated in the trap region
LINE 0 IS NOT SETUP FOR PARITY/PROJECT	This error message indicates a line 0 error. The priority level for line 0 is assumed to be $F and the response routine is the internal interrupt handler. When this is not true, this message appears
LINE hh IS SET FOR LVL iiii BUT IS ABLE TO INTERRUPT jjjj	Mask table error. This error message appears each time a bit is encountered in the mask table for a line at a higher level than the level indicated in the trap region hh — Line number iiii, jjjj — Priority level numbers; jjjj is higher than iiii
LINE hh IS SET FOR LVL jjjj BUT UNABLE TO INTERRUPT iiii	Mask table error. This error message appears when no bit is detected in the mask tables for lower level masks hh — Line number jjjj, iiii — Priority level numbers; jjjj is higher than iiii
LINE ii LAST INTERRUPTED tttt	Last location interrupted by each valid line. This support message indicates an interrupt occurred on a line. Line 1 trap is also used by the monitor to initiate or to resume a program's operations ii — Line number tttt — Location specified in the appropriate interrupt trap

Message	Significance
LINE ii LAST INTERRUPTED tttt (INVALID)	The error message indicates an interrupt on an invalid line. The specified line has INVINT as its response routine, yet an interrupt has occurred. ii Line number tttt Location specified in the appropriate trap
LINE ii RESPONSE IS UNPATCHED	This error message indicates unpatched interrupt response routines ii Hexadecimal interrupt line number that had a $7FFF (unpatched external) for the address of its interrupt processing routine
***LOCORE CONSTANT ERROR	When the constants contained in the communication region are checked for errors, errors are detected on the failed image. Messages that follow this header refer to these errors. If no error is detected on the failed image, the message does not appear
***LOCORE CONSTANT ERROR INITIALLY	When the constants contained in the communication region were checked, errors were detected on the autoload image. Messages that follow the header refer to these errors. If no error is found on the autoload image, this message does not appear

Message	Significance
***LOGICAL UNIT CAPABILITY ERROR	Header message indicating that the failed image is incorrect. The device does not have the appropriate read or write capability
***LOGICAL UNIT CAPABILITY ERROR INITIALLY	The autoload image has logical units with illegal capabilities (header message)
***LOGICAL UNIT TABLE ERROR	Header indicates error detected on failed image
***LOGICAL UNIT TABLE ERROR INITIALLY	Header indicates error detected in the logical unit tables of the autoload image
LU uu AND vv MATCH BUT SHARED BIT IS NOT SET	This error message indicates inconsistently shared devices uu, vv: Logical units whose physical device table addresses match in LOG1A, but the LOG1 entry for logical unit uu does not indicate a shared device
LU uu CURRENT PARA LIST AT iiii RC jjjj C kkkk TH llll LU mmmm N nnnn S oooo I/O IN PROGRESS	This support message appears for each busy device. A device is considered busy if a nonzero logical unit appears in word 5 of the physical device table. The last line of this support message does not appear if the diagnostic clock (word 4) is set to minus (device idle)

Message	Significance
Continued	uu Active logical unit iiii Parameter list address contained in word 6 of the driver's physical device tables; specifies the parameter list upon which the driver last operated jjjj through oooo Hexadecimal dump of parameter list at location iii jjjj Request code kkkk Completion address llll Thread mmmm Logical unit nnnn Number of words to transfer oooo Starting address
LU aa IS ALTERNATE FOR uu, BUT HAS LESS CAPABILITY	This error message indicates that the alternate device does not have the read/write capability specified for the primary device aa Assigned alternate logical unit for logical unit uu
LU uu IS SHARED BUT UNMATCHED	This error message indicates inconsistently shared devices uu Logical unit in which bit 14 of the LOGI table entry is set but for which there is no other logical unit with an identical physical device table in LOG1A

Message	Significance
LU uu IS SHARED BUT UNMATCHED	Inconsistently shared devices are indicated uu Logical unit in which bit 14 of the LOG1 table entry is set but for which there is no other logical unit with an identical physical device table in LOG1A
LU uu THREAD jjjj kkkk llll mmmm nnnn oooo pppp qqqq rrrr ...	This support message gives information about the logical unit threads. It lists the elements of the thread until it encounters an empty entry ($FFFF) uu Logical unit whose LOG2 entry is not $FFFF jjjj Entries on the thread, et cetera
LU uu THREAD MAY BE BROKEN	If more than $40 elements are on the logical unit thread, only the first $40 are listed and this message appears. It will not appear for any logical unit whose thread is empty (that is, $FFFF)
LU uu WAS MARKED DOWN	Support message: bit 13 of the LOG1 table reflects an inoperative logical unit. This message appears for each logical unit marked down uu Logical unit number

Message	Significance
LU 1 NOT CORE ALLOCATOR	This error message indicates the equipment type code if logical unit 1 does not specify the software core allocator. If logical unit 1 is the core allocator, the message is suppressed
***MASK TABLE ERROR	Header message indicates that the failed image mask table either contains an error or was modified
***MASK TABLE ERROR INITIALLY	Header message indicates that an error was detected in the autoload image mask table
MAX CORE WAS hhhh WITH iiii TO jjjj UNPROT	Highest core location and bounds of unprotected core. This support message indicates no location error was detected. This message appears only if option 2 or 3 is selected. It appears twice on the printout. The first appearance is for the autoload image and the second for the failed image hhhh Contents of $F5 iiii Contents of $F7+1 jjjj Contents of $F6-1

MAX CORE WAS hhhh
WITH iiii TO jjjj
UNPROT (ERROR)

Error in core bounds. The error message indicates that the unprotected bounds exceed the limits of core, that the top of unprotected is below the bottom, or that some of the addresses are negative. It appears twice on the printout. The first appearance is for the autoload image and the second for the failed image

hhhh Contents of $F5
iiii Contents of $F7+1
jjjj Contents of $F6-1

MAXSEC WAS hhhhhhhh

MAXSEC value. MAXSEC is in the LOCORE program. This support message for the error in MAXSEC appears twice on the printout. The first appearance is for the autoload image and the second for the failed image

MAXSEC WAS hhhhhhhh
(ERROR)

Error in MAXSEC. The following error message indicates that the most significant bits specified in MAXSEC were not zero. This support message appears twice on the printout. The first appearance is for the autoload image and the second for the failed image

hhhhhhhh Most significant bits (msb)

Message	Significance
NO VALID PHYSTB FOR LU uu	This error message indicates that the particular LOG1A entry does not point to a core location that contains a scheduler request code ($52xx) followed by three cells, none of which is unpatched. The message appears for each error uu Logical unit number
NUM OF LUS DO NOT AGREE, ASSUME hh	This error message indicates that LOG1A, LOG1, and LOG2 do not contain the same number of logical units. The message does not appear if the first word of each of the three tables agrees. hh Number of logical units as specified in LOG1A
NUM OF SCHEDL STACK ENTRIES WAS hh NUM OF SCHEDL CALLS STACKED WAS ii	Support message: hh Total number of scheduler entries defined in the system ii Number of scheduler entries which were queued when the system failed
PARTITION 0 ABOVE 8000	Error message: Partition 0 must begin at $8000 or below
PARTITION CORE ADDRESSES PARTITION x hhhh	Support message: This message appears for every assigned partition. For example, PARTITION 2 $6000.
PARTITION CORE ERROR	Error message: This is a header message

Message	Significance
PARTITION IN USE	Support message: This message appears when the USE table is analyzed. Each partition in use is printed
PARTITION OUT OF ORDER	Error message: Partitions must be specified in ascending order
PARTITION THREADS	Support message: This message appears with a printout of partition and thread for every busy partition
PENDING INPUT REQUEST FOR JP	Manual interrupt handling support message. The MIB flag was set and input is for the job processor
PENDING INPUT REQUEST FOR MIPRO	Manual interrupt handling support message. The MIB flag was set and the input is for the MIPRO program
***POSSIBLE LEVEL HANGUP	Analysis of system priority level header. This error message requires further investigation and appears only if the priority level is above 2
PRI LVL WAS hhhh	This support message gives the system priority level and is printed only to aid subsequent debugging hhhh Priority level of system
PRI LVL WAS hhhh (ERROR)	Incorrect priority level. This error message indicates that the priority level was not between -1 and 15

Message	Significance
(Cont'd)	hhhh Priority level of system at the time the image was written on mass storage; value is from $EF
RETURN FOR FNR WAS hhhh RETURN FOR CMR WAS iiii	This support message gives the last return addresses for FNR and NCMPRQ hhhh Last location to call find next request; address should be in a driver iiii Last location to call complete request; should be in a driver
SBI IS NOT A { READ / WRIT } DEVICE	Standard I/O logical units read/write capability error. This error message appears for each input device not capable of being read or each output device that cannot write. If all five devices are of the correct capability, no messages appear The first word can be any of the following devices: SBI Standard binary input device specified in $F9 SBO Standard binary output -- $FA SCI Input comment -- $FD SCO Output comment -- $FC SLO Standard print output -- $FB

Message	Significance
SBO IS NOT A {READ / WRIT} DEVICE	See preceding message for significance
SCHEDL STACK ENTRIES hhhh/ iiii jjjj kkkk llll mmmm/...	Support message: A line for each entry appears hhhh through mmmm — Address of a scheduler stack entry iiii through llll — Dump of hhhh entry
***SCHEDULER STACK ERROR	Header message: The levels in the scheduler stack are inconsistent; priority level at time of failure is also checked
SCI IS NOT A {READ / WRIT} DEVICE	See SBI IS NOT A {READ / WRIT} DEVICE message for significance
SCO IS NOT A {READ / WRIT} DEVICE	See SBI IS NOT A {READ / WRIT} DEVICE message for significance
SELECT OPTION	This control message indicates operator selection of the message option. Each higher option includes the capabilities of the previous option Type option: *Z — Checkout package released 0 — Control transferred to dump routine 1 — To print error messages only 2 — To print error messages and support messages associated with detected errors 3 — To print error messages and all support messages Press RETURN

Message	Significance
(Cont'd)	When 1, 2, or 3 is completed, the user is again asked to select options. After a dump is completed, the typeout DUMP is repeated. The user may then return to select options, execute another dump, or release the SYSCOP program
SLO IS NOT A {READ / WRIT} DEVICE	See SBI IS NOT A {READ / WRIT} DEVICE message for significance
SYSCOP START	This control message indicates the start of the checkout program
***SYSTEM DIRECTORY ERROR	System directory not constructed correctly
SYSTEM NOT SWAPPED	This support message indicates that the SWAPON flag and the swap waiting flag (SPASW) were not set. SPASW is in the TRVEC program
SYSTEM NOT SWAPPED BUT WAITING TO SWAP	This support message appears if SWAPON is not set but SPASW is set
SYSTEM USING NDISP WITH REENT FORTRAN (ERROR)	This error message would appear if more than one FORTRAN level was reserved in FMASK, but the system was using NDISP instead of RDISP.
SYSTEM WAS SWAPPED	This support message would appear if the SWAPON flag was set thus indicating that a swap was in effect. This flag is in the DRCORE program

Message	Significance
THERE WERE hhhh OF THE iiii VOLATILE WORDS ASSIGNED	This support message specifies the amount of volatile storage in use at the time of system failure is specified by hhhh Amount of volatile storage assigned at failure iiii Total volatile storage available
hhhh UNPROT REQ WERE ACTIVE AND STACKED AT LOC iiii	This support message gives the unprotected I/O and timer request status. If no I/O or timer requests were active the message does not appear hhhh Sum of UNPIO and UNPTIM in TRVEC iiii Absolute location of the stacked requests in the protect processor (PROTEC)

SYSTEM CONFIGURATOR

Message	Significance
OPTIONS (STATISTICS, CONFIGURE, CONVERSE)	Reply with one or more options (ST, CONF, or CONV), separating options with commas: Type option Press RETURN
UNLOAD SYSTEM DATA PROGRAM, LOAD SYSTEM INSTALLATION PROGRAMS	Appears on the standard comment output unit if the system data program output device is the same as the system installation programs output device Unload the system data program Mount a tape for the system installation program Press RETURN System Configurator exits to the job processor
UNLOAD SYSTEM DEFINITIONS, LOAD SYSTEM SPECIFICATIONS	If the system definition input device is the same as the input device, this message is printed on the standard comment output unit after the system definitions have been given.
ERROR, code, no.	Specification or other type of error occurred. Also appears on the standard comment output unit if the conversational mode was selected code Error number of less than 1000 (see the following codes) no. Input record number of statement containing error

Message	Significance
ERROR, code (Cont'd)	Specification or other type of error occurred. Also appears on the standard comment output unit if the conversational mode was selected code Error number of 1000 or greater
3	Illegal control character read. Correction permitted; original record ignored
4	Extraneous *J, n record read. Correction permitted; record ignored
6	Illegal character on a control statement. Correction permissible; statement ignored if correction is not made
7	Logical unit number not in range (1 through 127) on control statement. Correction permitted; number ignored if correction not made
8	Improper character where comma was expected on control record. Correction permitted; remainder of record ignored if correction not made
9	Illegal character in input record. No correction permitted; character ignored

Message	Significance
ERROR, code (Cont'd)	
10	Component phrase not defined in system definitions (refer to note 1†)
11	Parameters not valid for this component. If correction not made component remains selected but remainder of component record is ignored. If correction is made, the component must be respecified if needed
12	Component phrase is not defined in the system definitions in the same section as it was used in specifications (refer to note 1†)
13	Null component phrase read (refer to note 1†)
14	Improper component phrase delimiter; comma must be used if parameters follow (refer to note 1†)
15	Improper delimiter for parameter values (refer to notes 2 and 3†)
16	Parameter phrase not valid for this component. If correction is not made, the invalid parameter is ignored and the program continues to process any remaining parameters (refer to notes 2 and 3†)

† Refer to notes, page 8-6.

Message	Significance
ERROR, code (Cont'd)	
17	Null parameter phrase read. Remainder of record ignored if correction is permitted, but not entered (refer to notes 2 and 3†)
18	Decimal not in range 1 through 32767 (refer to notes 2, 3, and 4†)
19	Hexadecimal variable not in range 1 through FFFF (refer to notes 2, 3, and 4†)
20	Too many characters in symbolic variable (refer to notes 2, 3, and 4†)
21	Invalid decimal variable (refer to notes 2, 3, and 4†).
22	Invalid hexadecimal variable (refer to notes 2, 3, and 4†).
23	Invalid symbolic variable (refer to notes 2, 3, and 4†)
24	Too many characters in variable (refer to notes 2, 3, and 4†)
25	Wrong type parameter value; should have been numeric (refer to notes 1, 2, and 3†)
26	Parameter value not in numeric range defined by system definitions (refer to notes 1, 2, and 3†)

†Refer to notes, page 8-6.

Message	Significance
ERROR, code (Cont'd)	
27	Wrong type parameter value; should have been symbolic (refer to notes 1, 2, and 3†)
28	Value not one of two symbolic values defined by systems definitions (refer to notes 1, 2, and 3†)
29	Improper value list. Too many values for parameter. If correction not made, the excess values are ignored (refer to notes 1, 2, and 3†)
30	Extraneous parameter record read. Correction permitted; original record ignored
31	Component specified previously; INSERT is the only one that can be specified more than once (refer to note 1†)
32	An *B record is not found where expected. No correction permitted; following input records ignored until an *T record is read. The last INSERT component is automatically ignored
33	Extraneous *B record read. Program assumes an insert follows and attempts to read it. Suceeding input records are ignored until an *T record is noted. The program assumes that extraneous inserts (noted prior to input of the system definitions or

†Refer to notes, page 8-6.

NOTES

1 The entire record is ignored whether or not a correction is made.

2 No correction is permitted for INSERT component records. An error in this component causes the present INSERT component to generate another error (33) when an *B record is noted.

3 If a correction is entered, the component is automatically ignored and has to be respecified via the comment device.

4 If a correction is not entered, the component remains selected. The bad value and any succeeding values for the same parameter are ignored. If one or more valid values were processed for the parameter, the remaining parameter values are zeroed out. If no valid values were processed, the parameter's values are automatically the same as defined in the system definitions.

Message	Significance
ERROR, code (Cont'd)	during input of the system hardware devices sections associated records) contain ASCII records. Extraneous inserts noted in later sections have binary records. Parity errors are noted if extraneous inserted records are not the type expected by the program.
34	Extraneous *T record read prior to system definitions input. Correction must be made if program terminates with a 1034 error code
35	Extraneous component record read prior to system definitions input. Record is ignored if correction is not made
36	Extraneous section record read prior to system definitions input. Correction must be made or program terminates with a 1036 error code
1000	Specification component record read before any section records. No correction permitted.
1001	Specification section record error. Record not in correct order. No correction permitted
1002	System definitions error; two identical component phrases in same section

Message	Significance
ERROR, code (Cont'd)	
1003	System definitions error; illegal control character noted
1004	System definitions error; two identical parameter phrases for a component.
1005	System definitions error; section out of order
1006	System definitions error; improper delimiter for parameter values
1007	System definitions error; improper delimiter for parameter range values
1009	System definitions or program error; section is empty
1010	System definitions error; improper range for values. A one-word range definition must be ANY
1011	System definitions error; improper range. Both range values must be the same
1012	System definitions error; improper delimiter after component phrase
1013	System definitions error; null component phrase
1014	System definitions error; null parameter phrase
1015	System definitions error; improper delimiter for parameter values

Message	Significance
ERROR, code (Cont'd)	
1018	System definitions error; decimal value out of range (1 through 32767)
1019	System definitions error; hexadecimal value out of range (1 through FFFF)
1020	System definitions error; too many characters in symbolic value
1021	System definitions error; invalid decimal value
1022	System definitions error; invalid hexadecimal value.
1023	System definitions error; invalid symbolic value
1024	System definitions error; too many characters in a value (12 or more)
1034	Extraneous *T record read prior to system definitions input. Program was not in conversational mode or operator selected not to insert correction via comment device
1036	Extraneous section record read prior to system definitions input. Program was not in conversational mode or operator selected not to insert correction via comment device
1037	System definitions error

Message	Significance
ERROR, code (Cont'd)	
1500	System configurator error; illegal data type indicator in common variable ITMPTR
1501	Overflow of a fixed length data storage region on mass storage
1502	System configurator error; core resident data block header has an illegal data type indicator.
1503	System configurator error; core resident data block header indicates overflow of a fixed length data storage region
2001	System definitions error; a control record in the system data program skeleton has called for a subroutine that is not included in the current program file. File CONF2A is currently in core
2002	Same as 2001 except file CONF2B is currently in core
2003	Same as 2001 except file CONF2C is currently in core
2004	Same as 2001 except file CONF2D is currently in core

Message	Significance
ERROR, code (Cont'd)	
2021	System definitions error; a necessary # is not present on INSERT control card
2101	System definitions error; interrupt line specified is not in the range 0 to 15
2102	Multiple devices on the same interrupt line do not have the same interrupt handler address, priority level, or interrupt response address
2111	System definitions error; interrupt priority level not in the range 0 to 15
2121	FORTRAN or Encode/ Decode cannot use levels 0 or 1
2122	FORTRAN or Encode/ Decode cannot use levels used by interrupting devices
2141	More than maximum (127) allowed logical units specified
2142	Logical unit specified more than once.
2501	System configurator error; illegal character was stored as an ASCII number
2502	System definitions error; more than 6 characters for a noncomponent/ parameter pair

Message	Significance
ERROR, code (Cont'd)	
2503	System definitions error; parameter larger than maximum defined
2504	System definitions error; improper character noted. Should be a decimal digit or terminating comma.
3001	The data storage declaration of the program whose name was printed last in the statistics is greater than previously defined.
3002	The common storage declaration of the program whose name was printed last in the statistics is greater than previously defined
3051	System definitions error; a necessary # is not present on INSERT control record.
3052	Illegal *L or *LP in a mass resident insert
3053	Illegal *L or *LP in a core resident insert
3054	Illegal *M or *MP in a core resident insert
3055	Illegal *M or *MP in a mass resident insert
3056	First statement of insert not a control statement
3101	System definition error. Improper end record for conditional select package
3111	System definition error. Parameter value not specified was to be used in building a control record