

CONTROL DATA

CORPORATION

**CONTROL DATA®
3000 SERIES
COMPUTER SYSTEMS**

**PERIPHERAL
EQUIPMENT CODES**

FAHEY

CTM-31

CONTROL DATA
CORPORATION

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3000 SERIES
COMPUTER SYSTEMS

PERIPHERAL
EQUIPMENT CODES

RECORD of REVISIONS

REVISION	NOTES
A	BCD Codes added.
B	Obsoletes all previous editions.
C	Pages 1, 2, 4, 6, 7, 14, 19, 23, 24, 25 and 26 revised.
(6-17-65)	Obsoletes all previous editions.
D	Publications Change Order #12244 adds and revises
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G	Manual revised; includes Engineering Change Order
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H	Manual revised; includes Engineering Change Order
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or use Comment Sheet in the
back of this manual.

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MAGNETIC TAPE CONTROLLERS

3127/3128/322X/342X/362X

FUNCTION CODES

SEL

0000	Release
0001	Binary
0002	Coded
0003	556 BPI
0004	200 BPI
0005	Clear
0006	800 BPI*
0010	Rewind
0011	Rewind Unload
0012	Backspace**
0013	Search Forward to File Mark
0014	Search Backward to File Mark
0015	Write File Mark
0016	Skip Bad Spot
0020	Select Interrupt on Ready and $\overline{\text{Busy}}$
0021	Release Interrupt on Ready and $\overline{\text{Busy}}$
0022	Select Interrupt on End of Operation
0023	Release Interrupt on End of Operation
0024	Select Interrupt on Abnormal End of Operation
0025	Release Interrupt on Abnormal End of Operation

*602, 604, 607, and 608 Tape Units only.

**Backspace moves tape forward if reverse read is selected.

0040 Clear Reverse Read*
 0041 Set Reverse Read*
 0X50 Programmable Clip Level Select**

STATUS CODES

EYS

XXX1 Ready
 XXX2 Channel and/or Read/Write Control and/or
 Unit Busy
 XXX4 Write Enable
 XX1X File Mark
 XX2X Loadpoint
 XX4X End of Tape
 X1XX Density***
 X2XX Density****
 X4XX Lost Data
 1XXX End of Operation
 2XXX Vertical or Longitudinal Parity Error
 4XXX Reserved (by other channel)*****

*3127 and 3128 only.

**322X only.

***1 in bit 6 = 556 BPI.
 0 in bits 6 and 7 = 200 BPI.

****1 in bit 7 = 800 BPI.

*****362X and 342X only.

FUNCTION CODES

0000	Release
0005	Clear
0010	Rewind
0011	Rewind Unload
0012	Backspace
0015	Write File Mark
0020	Select Interrupt on Ready and $\overline{\text{Busy}}$
0021	Release Interrupt on Ready and $\overline{\text{Busy}}$
0022	Select Interrupt on End of Operation
0023	Release Interrupt on End of Operation
0024	Select Interrupt on Abnormal End of Operation
0025	Release Interrupt on Abnormal End of Operation

STATUS CODES

XXX1	Ready
XXX2	Channel and/or Read/Write Control and/or Unit Busy
XXX4	Write Enable
XX1X	File Mark
XX2X	Load Point
XX4X	End of Tape
X2XX	Density*

*1 in bit 7 indicates 800 bpi.

X4XX	Lost Data
1XXX	End of Operation
2XXX	Vertical Parity Error, Longitudinal Parity Error, or CRC Error During Read

3518-1,2,3/3528-1,2,3

FUNCTION CODES

0000	Release
0001	Binary
0002	Coded
0003	556 CPI Density
0004	200 CPI Density
0005	Clear
0006	800 CPI Density
0007	1600 CPI Density
0010	Rewind
0011	Rewind Unload
0012	Backspace
0013	Search File Mark Forward/Search Tape Mark Forward
0014	Search File Mark Reverse/Search Tape Mark Reverse
0015	Write End of File Mark/Write Tape Mark
0016	Skip Bad Spot
0020	Interrupt on Ready and $\overline{\text{Busy}}$
0021	Release Interrupt on Ready and $\overline{\text{Busy}}$
0022	Interrupt on End of Operation
0023	Release Interrupt on End of Operation

0024	Interrupt on Abnormal End of Operation
0025	Release Interrupt on Abnormal End of Operation
0040	Clear Reverse Read
0041	Set Reverse Read
0042	Clear Memory Mode
0043	Set Memory Mode
0044	Clear Conversion Mode
0045	Set Conversion Mode
0046	Clear Controlled Backspace
0047	Set Controlled Backspace
0051	Clear Opposite Channel (used in 2X8 only)
0052	Clear 3N + 2 Mode
0053	Set 3N + 2 Mode
0056	Clear Status 2, Return to Status 1
0057	Set Status 2

STATUS CODES

STATUS WORD 1

XXX1	Ready
XXX2	R/W Control and/or Tape Unit and/or Channel Busy
XXX4	Write Enable
XX1X	File Mark/Tape Mark Detected
XX2X	Load Point
XX4X	End of Tape
X1XX	Density

X2XX	Density
X4XX	Lost Data
1XXX	End of Operation
2XXX	Alert (further defined in status 2)
4XXX	Tape Unit reserved for other control (used in 2X8 only)

STATUS WORD 2

XXX1	Transverse and/or Longitudinal Parity Error
XXX2	Memory Parity Error
XXX4	Memory Flag Bit Error
XX1X	CRC Error
XX2X	Multitrack Phase Error or Uncorrectable CRC Error NRZI
XX4X	Character Fill 7/9 Track
X1XX	Character Crowding on Dropout and False End of Operation
X2XX	Phase Error Correction
X4XX	(Spare)
1XXX	End of Operation
2XXX	Alert
4XXX	Tape Unit reserved for other control (not used in 1X8)

CARD PUNCH CONTROLLERS

3245

FUNCTION CODES

0003	Select Offset Stacker*
0005	Clear
0020	Select Interrupt on Ready and $\overline{\text{Busy}}$
0021	Release Interrupt on Ready and $\overline{\text{Busy}}$
0022	Select Interrupt on End of Operation
0023	Release Interrupt on End of Operation
0024	Select Interrupt on Abnormal End of Operation
0025	Release Interrupt on Abnormal End of Operation

STATUS CODES

XXX1	Ready
XXX2	Busy
X1XX	Fail to Feed
X2XX	Ready and $\overline{\text{Busy}}$ Interrupt
X4XX	End of Operation Interrupt
1XXX	Abnormal End of Operation Interrupt

*Applicable to CONTROL DATA® 415 Card Punch and IBM punches adapted to include this feature.

3446/3446-2/3644

FUNCTION CODES

0000	Release and Disconnect
0001	Negate BCD to Hollerith Conversion
0002	Release Negate BCD to Hollerith Conversion
0002	Select Standard Hollerith*
0003	Select Offset Stacker**
0004	Check Last Card
0005	Clear
0020	Select Interrupt on Ready and $\overline{\text{Busy}}$
0021	Release Interrupt on Ready and $\overline{\text{Busy}}$
0022	Select Interrupt on End of Operation
0023	Release Interrupt on End of Operation
0024	Select Interrupt on Abnormal End of Operation
0025	Release Interrupt on Abnormal End of Operation
0042	Set ASCII Conversion*

*Applicable to the 3446 with standard option 10194-1 only.

**Applicable to CONTROL DATA 415 Card Punch.

STATUS CODES

XXX1	Ready
XXX2	Busy
X1XX	Fail to Feed
X2XX	Ready and $\overline{\text{Busy}}$ Interrupt
X4XX	End of Operation Interrupt
1XXX	Abnormal End of Operation Interrupt
2XXX	Compare Error
4XXX	Reserved (by other channel)*

*3644 only.

CARD READER CONTROLLERS

3142/3248

FUNCTION CODES

0000	Release and Disconnect
0001	Negate Hollerith to Internal BCD Conversion
0002	Release Negate Hollerith to Internal BCD Conversion
0004	Set Gate Card*
0005	Clear
0020	Select Interrupt on Ready and $\overline{\text{Busy}}$
0021	Release Interrupt on Ready and $\overline{\text{Busy}}$
0022	Select Interrupt on End of Operation
0023	Release Interrupt on End of Operation
0024	Select Interrupt on Abnormal End of Operation
0025	Release Interrupt on Abnormal End of Operation

STATUS CODES

XXX1	Ready
XXX2	Busy
XXX4	Binary Card
XX1X	File Card
XX2X	Fail to Feed, Stacker Full or Jam (3142X: Read Station Empty)
XX4X	Input Tray Empty (3142X: Reader Power Off)

*3248 only.

X1XX	End of File (3142X: Manual)
X2XX	Ready and $\overline{\text{Busy}}$ Interrupt
X4XX	End of Operation Interrupt
1XXX	Abnormal End of Operation Interrupt
2XXX	Read Compare*, Preread Error*

3447/3447-2/3649

FUNCTION CODES

0000	Release and Disconnect
0001	Negate Hollerith to Internal BCD Conversion
0002	Release Negate Hollerith to Internal BCD Conversion
0002	Select Standard Hollerith to BCD**
0004	Set Gate Card
0005	Clear
0020	Select Interrupt on Ready and $\overline{\text{Busy}}$
0021	Release Interrupt on Ready and $\overline{\text{Busy}}$
0022	Select Interrupt on End of Operation
0023	Release Interrupt on End of Operation
0024	Select Interrupt on Abnormal End of Operation
0025	Release Interrupt on Abnormal End of Operation
0026	Ready Clear
0042	Select ASCII Hollerith**

*3248 only.

**Applicable to the 3447-2 and the 3447-A/B/C with standard option 10194-2 only.

STATUS CODES

XXX1	Ready
XXX2	Busy
XXX4	Binary Card
XX1X	File Card
XX2X	Fail to Feed or Stacker Full or Jam
XX4X	Input Tray Empty
X1XX	End of File
X2XX	Ready and $\overline{\text{Busy}}$ Interrupt
X4XX	End of Operation Interrupt
1XXX	Abnormal End of Operation Interrupt
2XXX	Read Compare or Preread Error
4XXX	Reserved (for other channel)*

*3649 only.

LINE PRINTER CONTROLLERS

3152/3254/3254-2/3256/3659

FUNCTION CODES

0000,

0040* Release and Disconnect

0001 Single Space

0002 Double Space

0003 Advance to Last Line

0004 Page Eject

0005 Auto Page Eject

0006 Suppress Space

0010 Clear Format Selection

Select format tape level for postprint
spacing:

0011 Level 1

0012 Level 2

0013 Level 3

0014 Level 4

0015 Level 5

0016 Level 6

0020 Select Preprint Spacing

Select format tape level for preprint
spacing:

0021 Level 1

0022 Level 2

0023 Level 3

0024 Level 4

*3254 uses 0000 code only.

0025	Level 5
0026	Level 6
0030	Select Interrupt on Ready and $\overline{\text{Busy}}$
0031	Release Interrupt on Ready and $\overline{\text{Busy}}$
0032	Select Interrupt on End of Operation
0033	Release Interrupt on End of Operation
0034	Select Interrupt on Abnormal End of Operation
0035	Release Interrupt on Abnormal End of Operation

STATUS CODES

XXX1	Ready
XXX2	Busy
XX1X	Paper Out
XX2X	Last Line of Form
X2XX	Ready and $\overline{\text{Busy}}$ Interrupt
X4XX	End of Operation Interrupt
1XXX	Abnormal End of Operation Interrupt
2XXX	Error*
4XXX	Reserved (by other channel)**

*3152/3256 equipped with error checking option only.

**3152/3256/3659 only.

3152/3254/3256/3659 CHARACTER CODES

Char Prd.	Int. BCD	Ext. BCD	Char Prd.	Int. BCD	Ext. BCD
0	00	12	- (minus)	40	40
1	01	01	J	41	41
2	02	02	K	42	42
3	03	03	L	43	43
4	04	04	M	44	44
5	05	05	N	45	45
6	06	06	O	46	46
7	07	07	P	47	47
8	10	10	Q	50	50
9	11	11	R	51	51
:	12	00	√ (or)	52	52
=	13	13	\$	53	53
≠	14	14	*	54	54
≤	15	15	↑	55	55
%	16	16	↓	56	56
[	17	17	>	57	57
+	20	60	Blank	60	20
A	21	61	/	61	21
B	22	62	S	62	22
C	23	63	T	63	23
D	24	64	U	64	24
E	25	65	V	65	25
F	26	66	W	66	26
G	27	67	X	67	27
H	30	70	Y	70	30
I	31	71	Z	71	31
<	32	72	]	72	32
.	33	73	,	73	33
)	34	74	(	74	34
≥	35	75	→	75	35
⌋ (not)	36	76	≡	76	36
;	37	77	∧ (and)	77	37

NOTE

The following deviations exist for the 3152
Line Printer Controller.

<u>Character Printed</u>	<u>Internal BCD Code</u>
' (apostrophe)	16
?	36
%	52
~	77

3254-2 CHARACTER CODES

Char Prd.	Int. BCD	Ext. BCD	Char Prd.	Int. BCD	Ext. BCD
0	00	12	- (minus)	40	40
1	01	01	J	41	41
2	02	02	K	42	42
3	03	03	L	43	43
4	04	04	M	44	44
5	05	05	N	45	45
6	06	06	O	46	46
7	07	07	P	47	47
8	10	10	Q	50	50
9	11	11	R	51	51
:	12	00	&	52	52
=	13	13	⌘	53	53
▽	14	14	⊗	54	54
"	15	15	↑	55	55
%	16	16	↓	56	56
┌	17	17	┐	57	57
+	20	60	BLANK	60	20
A	21	61	/	61	21
B	22	62	S	62	22
C	23	63	T	63	23
D	24	64	U	64	24
E	25	65	V	65	25
F	26	66	W	66	26
G	27	67	X	67	27
H	30	70	Y	70	30
I	31	71	Z	71	31
┐	32	72	△	72	32
.	33	73	,	73	33
}	34	74	{	74	34
*	35	75	§	75	35
?	36	76	└	76	36
;	37	77	#	77	37

3458

FUNCTION CODES

0000	Release and Disconnect
0001	Single Space
0002	Double Space
0003	Advance to Last Line
0004	Page Eject
0005	Auto Page Eject
0006	Suppress Space
0020	Select Interrupt on Ready and Not Busy
0021	Release Interrupt on Ready and Not Busy
0022	Select Interrupt on End of Operation
0023	Release Interrupt on End of Operation
0024	Select Interrupt on Abnormal End of Operation
0025	Release Interrupt on Abnormal End of Operation
0030	Postprint Spacing Mode (Clear Carriage Selections) Select carriage tape level for postprint line spacing:
0031	Level 1
0032	Level 2
0033	Level 3
0034	Level 4
0035	Level 5
0036	Level 6

0037	Level 7
0040	Level 8
0041	Level 9
0042	Level 10
0043	Level 11
0044	Level 12
0050	Preprint Spacing Mode
	Select carriage tape level for preprint line spacing:
0051	Level 1
0052	Level 2
0053	Level 3
0054	Level 4
0055	Level 5
0056	Level 6
0057	Level 7
0060	Level 8
0061	Level 9
0062	Level 10
0063	Level 11
0064	Level 12

STATUS CODES

XXX1	Ready
XXX2	Busy
XXX4	Program Error
XX1X	Paper Out
XX2X	Last Line on Form
XX4X	Carriage Tape Level 9
X1XX	Memory Busy
X2XX	Ready and Not Busy Interrupt
X4XX	End of Operation Interrupt
1XXX	Abnormal End of Operation Interrupt
2XXX	Error

**48 CHARACTER* TRAIN USE TRANSLATOR
BOARDS PA03 AND PA04**

Character Printed	External BCD	Internal BCD
1	01	01
2	02	02
3	03	03
4	04	04
5	05	05
6	06	06
7	07	07
8	10	10
9	11	11
0	12	00
#	13	13
@ (at)	14	14
/ (slash)	21	61
S	22	62
T	23	63
U	24	64
V	25	65
W	26	66
X	27	67
Y	30	70
Z	31	71
≠	32	72
, (comma)	33	73
%	34	74
J	41	41
K	42	42
L	43	43

*64 character train, use same codes as the standard 3256, using translator boards PA01 and PA02.

Character Printed	External BCD	Internal BCD
M	44	44
N	45	45
O	46	46
P	47	47
Q	50	50
R	51	51
① - (minus)	52	52
\$	53	53
*	54	54
A	61	22
B	62	22
C	63	23
D	64	24
E	65	25
F	66	26
G	67	27
H	70	30
I	71	31
① & (and)	72	32
. (period)	73	33
Ⓜ	74	34

① Character	Ext PA04	BCD PA08	Internal PA04	BCD PA08
Hyphen	52	40	52	40
& Amper- sand	72	60	32	20

3555-1

FUNCTION CODES

0000	Release and Disconnect
0001	Single Space
0002	Double Space
0003	Advance to Last Line
0004	Page Eject
0005	Auto Page Eject
0006	Suppress Space
0007	Conditional Clear Format
0010	8 Line Select
0011	6 Line Select
0012	Fill Image Memory
0013	Select Extended Array
0014	Clear Extended Array
0020	Select Interrupt on Ready and Not Busy
0021	Clear Interrupt on Ready and Not Busy
0022	Select Interrupt on End of Operation
0023	Clear Interrupt on End of Operation
0024	Select Interrupt on Abnormal End of Operation
0025	Clear Interrupt on Abnormal End of Operation
0026	Reload Memory and Enable
0030	Clear Format Selections (Post Print Spacing Mode)

- 0031 Select Format Level 1 for Post Print
Line Spacing
- 0032 Select Format Level 2 for Post Print
Line Spacing
- 0033 Select Format Level 3 for Post Print
Line Spacing
- 0034 Select Format Level 4 for Post Print
Line Spacing
- 0035 Select Format Level 5 for Post Print
Line Spacing
- 0036 Select Format Level 6 for Post Print
Line Spacing
- 0037 Select Format Level 7 for Post Print
Line Spacing
- 0040 Select Format Level 8 for Post Print
Line Spacing
- 0041 Select Format Level 9 for Post Print
Line Spacing
- 0042 Select Format Level 10 for Post Print
Line Spacing
- 0043 Select Format Level 11 for Post Print
Line Spacing
- 0044 Select Format Level 12 for Post Print
Line Spacing
- 0050 Pre-Print Spacing Mode
- 0051 Select Format Level 1 for Pre-Print
Line Spacing
- 0052 Select Format Level 2 for Pre-Print
Line Spacing
- 0053 Select Format Level 3 for Pre-Print
Line Spacing

0054	Select Format Level 4 for Pre-Print Line Spacing
0055	Select Format Level 5 for Pre-Print Line Spacing
0056	Select Format Level 6 for Pre-Print Line Spacing
0057	Select Format Level 7 for Pre-Print Line Spacing
0060	Select Format Level 8 for Pre-Print Line Spacing
0061	Select Format Level 9 for Pre-Print Line Spacing
0062	Select Format Level 10 for Pre-Print Line Spacing
0063	Select Format Level 11 for Pre-Print Line Spacing
0064	Select Format Level 12 for Pre-Print Line Spacing

STATUS CODES

XXX1	Ready
XXX2	Busy
XXX4	Compare Fault
XX1X	Paper Fault
XX2X	Last Line of Form
XX4X	Format Tape Level 9
X1XX	Memory Busy
X2XX	Ready and Not Busy Interrupt

X4XX	End of Operation Interrupt
1XXX	Abnormal End of Operation Interrupt
2XXX	Print Error
4XXX	6/8 Line of Coincident

TYPEWRITERS

3192 CONSOLE

CHARACTER CODES

Print Out	Case	BCD Code
0	L	00
1	L	01
2	L	02
3	L	03
4	L	04
5	L	05
6	L	06
7	L	07
8	L	10
9	L	11
+	U	12
=	L	13
"	U	14
:	U	15
;	L	16
?	U	17
+	U	20
A	U/L	21
B	U/L	22
C	U/L	23
D	U/L	24
E	U/L	25
F	U/L	26
G	U/L	27
H	U/L	30
I	U/L	31
.	U/L	33
)	U	34
'	L	35
@	U	36
!	L	37

Print Out	Case	BCD Code
-	L	40
J	U/L	41
K	U/L	42
L	U/L	43
M	U/L	44
N	U/L	45
O	U/L	46
P	U/L	47
Q	U/L	50
R	U/L	51
(degree) ^o	U	52
\$	U	53
*	U	54
#	U	55
%	U	56
/	L	61
S	U/L	62
T	U/L	63
U	U/L	64
V	U/L	65
W	U/L	66
X	U/L	67
Y	U/L	70
Z	U/L	71
&	U	72
,	U/L	73
(	U	74
Shift to Upper Case		57
Shift to Lower Case		32
Space		60
Tab		75
Backspace		76
Carriage Return		77

3692 I/O AND 3400, 3600, 3800 CONSOLE

FUNCTION CODES

0001	Interrupt on Abnormal Operation
0002	Release Interrupt on Abnormal Operation
0004	Clear Interrupt
0010	Select Interrupt on Manual Switch*
0020	Release Interrupt on Manual Switch*
0100	Select Interrupt on Character Ready**
0200	Release Interrupt on Character Ready**

STATUS CODES

XXX1	Ready
XXX2	Busy
XXX4	Upper Case Mode
XX4X	End of Line
2XXX	Type Parity Error

*3692 only.

**3800 Console Typewriter only.

CHARACTER CODES

LC	Code	LC	Code	UC
A	12			
B	01	0 (zero)	43)
C	11	1	77	<u>+</u>
D	55	2	37	@
E	51	3	33	#
F	30	4	47	\$
G	74	5	57	%
H	45	6	13	¢
I	16	7	53	& (and)
J	70	8	17	* (asterisk)
K	15	9	07	(
L	41	!	76	° (degree)
M	72	.	32	.
N	31	'	52	"
O	42	;	50	:
P	54	,	14	,
Q	10	/	44	?
R	56	=	34	+
S	46	Dash -	04	Underline _
T	75	Space	60	Space
U	35	Backspace	61	Backspace
V	36	Tab	62	Tab
W	02	CR	63	CR
X	71	UC	64	UC
Y	40	LC	66	LC
Z	73			

LC - Lower Case

UC - Upper Case

CR - Carriage Return

INCREMENTAL PLOTTER

FUNCTION CODES

0000	Release and Disconnect
0001	Disassembly Mode
0002	Character Mode
0005	Clear
0020	Select Interrupt on Ready and $\overline{\text{Busy}}$
0021	Release Interrupt on Ready and $\overline{\text{Busy}}$
0022	Select Interrupt on End of Operation
0023	Release Interrupt on End of Operation
0024	Select Interrupt on Abnormal End of Operation
0025	Release Interrupt on Abnormal End of Operation

STATUS CODES

XXX1	Ready
XXX2	Busy
XXX4	Stop
X2XX	Ready and $\overline{\text{Busy}}$ Interrupt
X4XX	End of Operation Interrupt
1XXX	Abnormal End of Operation Interrupt

MOVEMENT CODES

<u>Code</u>	<u>Movement</u>
01	+X
02	-X
04	+Y
05	+X +Y
06	-X +Y
10	- Y
11	+X - Y
12	-X - Y
20	Lower Pen
40	Raise Pen

PAPER TAPE READER/PUNCHES

3295

CONNECT CODES

N000	Connect Reader
N001	Connect Punch

FUNCTION CODES

0001	Assembly Mode
0002	Character Mode
0003	Select Odd Parity Mode
0004	Release Parity Mode
0005	Clear
0006	Select Even Parity Mode
0020	Select Interrupt on Ready and $\overline{\text{Busy}}$
0021	Release Interrupt on Ready and $\overline{\text{Busy}}$
0022	Select Interrupt on End of Operation
0023	Release Interrupt on End of Operation
0024	Select Interrupt on Abnormal End of Operation
0025	Release Interrupt on Abnormal End of Operation

STATUS CODES

XXX1	Station Ready
XXX2	Station Busy
XXX4	Punch Tape Supply Low
XX1X	Reader Last Device
XX2X	Reader Paper Motion Failure
XX4X	5-Level Read
X2XX	Ready and $\overline{\text{Busy}}$ Interrupt
X4XX	End of Operation Interrupt
1XXX	Abnormal End of Operation Interrupt
2XXX	Parity Error

CONNECT CODES

N000	Connect Reader
N001	Connect Punch

FUNCTION CODES

0000	Release and Disconnect
0001	Assembly Mode
0002	Character Mode
0005	Clear
0020	Select Interrupt on Ready and $\overline{\text{Busy}}$
0021	Release Interrupt on Ready and $\overline{\text{Busy}}$
0022	Select Interrupt on End of Operation
0023	Release Interrupt on End of Operation
0024	Select Interrupt on Abnormal End of Operation
0025	Release Interrupt on Abnormal End of Operation

STATUS CODES

XXX1	Station Ready
XXX2	Station Busy
XXX4	Punch Tape Supply Low
XX1X	Reader Last Device
XX2X	Paper Motion Failure
X2XX	Ready and $\overline{\text{Busy}}$ Interrupt
X4XX	End of Operation Interrupt
1XXX	Abnormal End of Operation Interrupt

3694

CONNECT CODES

N000	Connect Reader
N001	Connect Punch

FUNCTION CODES

0000	Release and Disconnect
0001	Assembly Mode
0002	Character Mode
0003	Select Parity Mode (Odd)
0004	Release Parity Mode
0005	Clear
0006	Select Parity Mode (Even)
0007	Select Punch Parity (5th Level)
0011	Rewind Unload (Reader Only)
0020	Select Interrupt on Ready and $\overline{\text{Busy}}$
0021	Release Interrupt on Ready and $\overline{\text{Busy}}$
0022	Select Interrupt on End of Operation
0023	Release Interrupt on End of Operation
0024	Select Interrupt on Abnormal End of Operation
0025	Release Interrupt on Abnormal End of Operation
0040	Clear Reverse Read
0041	Set Reverse Read

STATUS CODES

XXX1	Station Ready
XXX2	Station Busy
XXX4	Punch Tape Supply Low
XX1X	Reader Last Device
XX2X	Paper Motion Failure
XX4X	8 Level Punch*
X2XX	Ready and Busy Interrupt
X4XX	End of Operation Interrupt
1XXX	Abnormal End of Operation Interrupt
2XXX	Parity Error
4XXX	Reserved (by other channel)

*3694-B/C models only.

DISK STORAGE DRIVE CONTROLLERS

3231/3232

FUNCTION CODES

0000	Clear
0001	Release and Disconnect
0002	Address Seek
0003	Address Seek, Direct
0004	Return Address
0005	Address Write
0010	Write
0011	Read
0012	Write Check
0013	Search
0022	Select Interrupt on End of Operation
0023	Release Interrupt on End of Operation
0024	Select Interrupt on Abnormal End of Operation
0025	Release Interrupt on Abnormal End of Operation
0026	Select Interrupt on Opposite Channel Release
0027	Release Interrupt on Opposite Channel Release
0030	Track Record
0031	Sector Record
0032	Select Masked Search
0033	Release Masked Search
0034	Select Magnitude Search \leq Computer Record

- 0035 Select Magnitude Search \geq Computer Record
0036 Release Magnitude Search

STATUS CODES

- XXX1 Ready
XXX2 Busy
XXX4 End of Cylinder
XX1X Search Satisfied or Write Check Error
XX2X Non-Operable
XX4X Lost Data
X4XX End of Operation Interrupt
1XXX Abnormal End of Operation Interrupt
2XXX Read Parity Error
4XXX Reserved

MASS STORAGE CONTROLLERS

3234

CONNECT CODE

N0dU* Connect 3234

FUNCTION CODES

0000	Release and Disconnect
0001	Restore
0005	Clear
0010	Load Address
0011	Return Address
0020	Select Interrupt on Ready and Not Busy
0021	Release Interrupt on Ready and Not Busy
0022	Select Interrupt on End of Operation
0023	Release Interrupt on End of Operation
0024	Select Interrupt on Abnormal End of Operation
0025	Release Interrupt on Abnormal End of Operation
0026	Select Interrupt on Opposite Channel Release
0027	Release Interrupt on Opposite Channel Release
0030	Select Interrupt on End of Seek
0031	Release Interrupt on End of Seek
0040	Read
0041	Write

*N=equipment number, d=device type (1=disk drive, 2=disk file, 3=data cell), U=unit number.

0042	Search Compare
0043	Masked Search Compare
0044	Checkword Verify
0045	Read Checkword
0050	Magnitude Search (Record \leq Buffer)
0051	Magnitude Search (Record \geq Buffer)
0052	Equality Search (Record = Buffer)
0053	Buffer Mode
0054	End of Record Mode

STATUS CODES

XXX1	Ready
XXX2	Busy
XXX4*	Abnormal/Unavailable
XX1X	On Sector
XX14*	Address Error
XX2X	No Compare
XX24*	Lost Data
XX4X	End of Record
XX44*	Checkword Error
X1XX	Write Lockout on Read (normal)
X1X4*	Write Lockout on Write (abnormal)
X2XX	Positioner Ready
X4XX	End of Operation Interrupt
1XXX	Abnormal End of Operation Interrupt
2XXX	Seek Interrupt
4XXX	Reserved
4XX4*	Defective Track

*On an unsuccessful connect, XXX4 indicates equipment or unit unavailable. On any function, an abnormal condition is indicated by XXX4 and XX1X, XX2X, XX4X, X1XX, or 4XXX.

3553-1, 2

CONNECT CODE

NODU* Connect 3553 and Disk Unit

FUNCTION CODES

0000	Channel Release
0001	Restore
0005	Clear
0007	Drive Release
0010	Load Address at 1:1 Interlace
0011	Return Address
0012	Load Address at 2:1 Interlace**
0014	Load Address at 4:1 Interlace**
0016	Load Address at 8:1 Interlace**
0020	Select Interrupt on Ready and Not Busy
0021	Release Interrupt on Ready and Not Busy
0022	Select Interrupt on End of Operation
0023	Release Interrupt on End of Operation
0024	Select Interrupt on Abnormal End of Operation
0025	Release Interrupt on Abnormal End of Operation
0026	Select Interrupt on Opposite Channel Release

*N = equipment number of controller.

U = logical unit number of storage devices.

D = device type (1=MDD; 2=disk file).

**3553-2 only.

0027	Release Interrupt on Opposite Channel Release
0030	Select Interrupt on End of Seek
0031	Release Interrupt on End of Seek
0040	Read
0041	Write
0042	Search Compare
0043	Marked Search Compare
0044	Checkword Verify
0045	Read Checkword
0050	Magnitude Search (Record \leq Buffer)
0051	Magnitude Search (Record \geq Buffer)
0052	Equality Search (Record = Buffer)
0053	Buffer Mode
0054	End of Record Mode

STATUS CODES

XXX1	Ready
XXX2	Busy
XXX4	Abnormal/Unavailable
XXX6	Unit Reserved
XX10	On Sector
XX14	Address Error
XX20	No Compare
XX24	Operation Error (3553-2) Lost Data (3553-1)
XX40	End of Record
XX44	Checkword Error
X1X0	Write Lockout on Read (normal)
X1X4	Write Lockout on Write (abnormal)
X2XX	Positioner Ready
X4XX	End of Operation Interrupt
1XXX	Abnormal End of Operation Interrupt
2XXX	Seek Interrupt
4XX0	Controller Reserved
4XX4	Defective Track

DISK FILE CONTROLLER

363X

FUNCTION CODES

0000	Release and Disconnect
0007	Clear
0040	Read Data
0060	Read Data with End of Record Disabled
0041	Write Data
0042	Check Mode
0062	Check Mode with End of Record Disabled
0043	Write Check
0044	Data Search
0046	Error Search
0050	Return Address
0051	Load Address
0020	Select Interrupt on Ready and $\overline{\text{Busy}}$
0021	Release Interrupt on Ready and $\overline{\text{Busy}}$
0022	Select Interrupt on End of Operation
0023	Release Interrupt on End of Operation
0024	Select Interrupt on Abnormal End of Operation
0025	Release Interrupt on Abnormal End of Operation

STATUS CODES

XXX1	Ready
XXX2	Busy
XXX4	Access Unavailable
XX1X	On Track
XX2X	Write Permit
XX4X	Lost Data
X1XX	Search Satisfied
X2XX	Ready and $\overline{\text{Busy}}$ Interrupt
X4XX	End of Operation Interrupt
1XXX	Abnormal End of Operation Interrupt
2XXX	Checkword Error
4XXX	Disk Reserved

DRUM CONTROLLERS

3235/3436/3637

CONNECT CODES

- N000* Connect 3255
N00U* Connect 3436/3637

FUNCTION CODES

- 0000 Release and Disconnect
0040 Load Address
0041 Read
0042 Write
0043 Write Check
0044 Read Angular Count
0020 Select Interrupt on Ready and $\overline{\text{Busy}}$
0021 Release Interrupt on Ready and $\overline{\text{Busy}}$
0022 Select Interrupt on End of Operation
0023 Release Interrupt on End of Operation
0024 Select Interrupt on Abnormal End of
 Operation
0025 Release Interrupt on Abnormal End of
 Operation
0026 Select Interrupt on Opposite Channel
 Release**
0027 Release Interrupt on Opposite Channel
 Release**
0030 Select Interrupt on Address Compare
0031 Release Interrupt on Address Compare

*N = equipment number, U = unit number.

**3235/3637 only.

STATUS CODES

XXX1	Ready
XXX2	Busy
XXX4	Drum Reject*/Lost Data**

NOTE

Lost data status not used when operating 863 or BG108.

XX1X	Write Check Error
XX2X	End of Drum
XX4X	Release Interrupt***
X1XX	Address Compare Interrupt
X2XX	Ready and $\overline{\text{Busy}}$ Interrupt
X4XX	End of Operation Interrupt
1XXX	Abnormal End of Operation Interrupt
2XXX	Read Parity Error*/CKWD Error or Parity Error. **
4XXX	Drum Reserved***

*3235/3436/3637A only.

**3637B/3637C only.

***3235/3637 only.

PAGE READER CONTROLLER

FUNCTION CODES

1XXX	Select Page Advance
2XXX	Select Forward Position
3XXX	Select Reverse Position
4XXX	Read
5XXX	Special External Device Control
0000	Release
0004	Start Coordinate Search
0005	Zero Mirror
0007	Line Locator
0010	Alpha-Numeric Read
0011	Alpha Read
0012	Numeric Read
0013	Mark Sense
0014	Scan 3
0015	Scan 2
0020	Select Interrupt on Ready and <u>Busy</u>
0021	Clear Interrupt on Ready and <u>Busy</u>
0022	Select Interrupt on End of Operation
0023	Clear Interrupt on End of Operation
0024	Select Interrupt on Abnormal End of Operation
0025	Clear Interrupt on Abnormal End of Operation
0030	Advance Document Counter 1
0032	Advance Document Counter 2

0034	Advance Document Counter 3
0031	Clear Counter 1
0033	Clear Counter 2
0035	Clear Counter 3
0041	Request Mirror Status
0047	Stop Read
0050	Sort to Primary
0051	Sort to Secondary
0057	Mark
0077	Clear Entry

STATUS CODES

READER CONTROL STATUS

XXX1	Ready
XXX2	Busy
XXX4	End of File
XX1X	Compare
XX2X	Memory Full
XX4X	Mirror Far Reverse
X1XX	Mirror Far Forward
X2XX	Interrupt on Ready and <u>Busy</u>
X4XX	Interrupt on End of Operation
1XXX	Interrupt on Abnormal End of Operation
2XXX	Reject
4XXX	Program Error

ENTRY CONTROL STATUS

XX1X	End of File
XX2X	Function 1
XX4X	Function 2
X1XX	Function 3

DATA CHANNEL CONVERTER

FUNCTION CODES

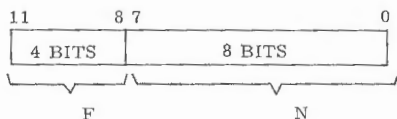
5001/6001	Channel Status
5002/6002	Equipment Status
5003/6003	Master Clear
5004/6004	Connect Initiate
5010/6010	Function Initiate
5020/6020	Read
5120/6120	Negate BCD Conversion on Read
5040/6040	Write
5140/6140	Negate BCD Conversion on Write
5200/6200	Clear Functions
5400/6400	Clear Functions and Interrupt

STATUS CODES

XXX1	Reject
XXX2	Transmission Parity Error
XXX4	Interrupt Equipment 0
XX1X	Interrupt Equipment 1
XX2X	Interrupt Equipment 2
XX4X	Interrupt Equipment 3
X1XX	Interrupt Equipment 4
X2XX	Interrupt Equipment 5
X4XX	Interrupt Equipment 6
1XXX	Interrupt Equipment 7

SATELLITE COUPLER

FUNCTION CODES



OCTAL NOTATION

N000	Connect
01xxXX	Set Flags for 1 bits in N
10xxXX	Clear Flags for 1 bits in N
20xxXX	Set Interrupt Mask Register for 1 bits in N
40xxXX	Clear Interrupt Mask Register for 1 bits in N
0001	Select Interrupt on Other Division in Abnormal Condition
0002	Release Interrupt on Other Division in Abnormal Condition
0004	Select Interrupt on Other Division Active
0010	Release Interrupt on Other Division Active

STATUS CODES

XXX1	Flag 0	XX4X	Flag 5
XXX2	Flag 1	X1XX	Flag 6
XXX4	Flag 2	X2XX	Flag 7
XX1X	Flag 3		
XX2X	Flag 4		
X4XX	Other Division Computer Running (not necessarily connected)		
1XXX	Other Division, Read signal up		
2XXX	Other Division, Write signal up		
4XXX	Other Division, Transmission Parity Error		

DATA CHANNELS

3606/3806/3816

FUNCTION CODES*

0001	Stop Channel Activity
0002	Select Interrupt on End of Chain
0004	Clear Interrupt on End of Chain
0010	Select Interrupt on Error
0020	Clear Interrupt on Error
0040	Select Equipment Interrupt Lockout**
0100	Clear Equipment Interrupt Lockout**

STATUS CODES

1XXX	Read Operation in Progress
2XXX	Write Operation in Progress
4XXX	Transmission Parity Error

CHANNEL PRODUCT REGISTER

BIT ASSIGNMENTS

Bits 0-7	Interrupts from Equipments 0-7
Bit 8	Interrupt on End of Chain
Bit 9	Interrupt on Storage or Transmission Parity Error
Bit 10	Control Word Parity Error

*Bit 23 in function instruction designates channel function codes.

**3806 only.

COMMUNICATION TERMINAL CONTROLLER

3266

FUNCTION CODES

0001	Interrupt Only on Character Ready
0002	Interrupt Only on Character Ready
0040	Interrupt Enable
0100	Interrupt Disable
0200	Interrupt Clear

STATUS CODES

X4XX	Break
1XXX	Character Lost/Idle
2XXX	Character Request
4XXX	Character Ready

DATA SET CONTROLLER

3275

FUNCTION CODES

XXX1	Receive
XXX2	Redundancy Check
XXX4	Multiple Record Receive
XX1X	End of Record
XX4X	Interrupt on Error/Inoperative Common Carrier Channel
X1XX	Interrupt Code Word Interrupt
X2XX	Interrupt on Word Ready/Word Request
X4XX	Interrupt on End of Operation
1XXX	Transmit
2XXX	Synchronizing Word Transmit
4XXX	Redundancy Transmit

STATUS CODES

XXX1	Ready
XXX2	Busy
XXX4	Sync/Interrupt Word Not Acknowledged
XX1X	Interrupt Code Word Received
XX2X	End of Operation Interrupt
X1XX	No Sync Word Received
X2XX	Inoperative Common Carrier Channel
X4XX	Word Ready
1XXX	Word Request
2XXX	Record Error

MULTIPLEXER CONTROLLERS

3316/3516

FUNCTION CODES

0XXX	Enable Interrupts
1XXX	Disable Interrupts
2XXX	Clear Interrupts
2001	Clear Status (X1XX, X2XX, X4XX)
3001	Dual Scan Mode
3002	Start Scan
3004	Stop Scan
3010	Clear TU Address Register
3020	Clear Dual Mode Reset FF
3040	Clear Dual Mode
3100	Select Status One
3200	Select Status Two
4XXX	Clear IBTI

STATUS CODES

STATUS WORD 1

XXX1	Ready
XXX2	Busy
XXX4	Dual Mode Established
XX1X	Scan Stopped This Unit
XX2X	Scan Stopped Other Unit
XX4X	End of Operation Interrupt
X1XX	Interrupt Buffer 7* Parity Error**
X2XX	Interrupt Buffer 6* Illegal Address**
X4XX	Interrupt Buffer 5* Dual Mode Failure**
1XXX	Interrupt Buffer 4*
2XXX	Interrupt Buffer 3*
4XXX	Interrupt Buffer 2*

STATUS WORD 2

Status word 2 contains the nine bits of TU address in effect in the expansion network at the time the status word is selected.

*If controller provides the interrupt buffer, terminate interrupt on interrupt line 01.

**If interrupt buffers are not selected.



CONTROL DATA

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