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CONTROL DATA CORPORATION

MSOS VERSION 5 DIAGNOSTIC HANDBOOK

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CYBER 18
1700

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PREFACE

The manual lists the diagnostic messages for the CDC® Mass Storage Operating System (MSOS) Version 5 and the major systems operating under it. This manual is directed at the CYBER 18/1700 MSOS Version 5 programmer and assumes a basic knowledge of the system. Information concerning the commands that operate MSOS 5 and the associated systems is found in the following manuals:

Publication	Publication Number
MSOS Version 5 Installation Handbook	96769410
MSOS Version 5 Reference Manual	96769400
Software Peripheral Drivers Reference Manual	96769390
File Manager Version 1 Reference Manual	39520600
Macro Assembler Reference Manual	60361900
MS FORTRAN 3A/B Reference Manual	60362000
1700 Small Computer Maintenance Monitor Reference Manual	39520200
Magnetic Tape Utility Processor Reference Manual	96768400
Sort/Merge Version 1.0 Reference Manual	96769260
RPG II Reference Manual	96769000
Operational Diagnostic System (ODS) Reference Manual	39452100
ITOS 1 Reference Manual	96768290

This product is intended for use only as described in this document. Control Data cannot be responsible for the proper functioning of undescribed features or unidentified parameters.

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This manual lists the diagnostic messages that may be returned to the operator (usually on the comment device) by Mass Storage Operating System (MSOS) Version 5 and the major systems operating under it. The messages are grouped into five major categories:

- Initialization
- General messages produced by the principal MSOS programs that refer to malfunctions within the central processing unit (CPU) or directly associated with file management
- Messages from background programs operating under the job processor (many of these utilities may also be called by foreground programs)
- Messages directly associated with input/output device failures

In general, these diagnostic messages are for online operation. Methods for precise hardware diagnosis are described in the Operational Diagnostic System (ODS) Reference Manual. Many input/output devices may have several status words. This manual lists only the principal status word, which is saved in the physical device table as word 12 and also is saved in the engineering log following an unrecoverable error. In some cases, a few of these additional status words are routinely saved in the unit's physical device table and can be read directly from the proper slot in that table by a user's program. For a full description of these additional status words, the reader should consult the hardware maintenance manual for the particular equipment (controller).

Table 1-1 lists the systems described in the manual.

TABLE 1-1. MANUAL FORMAT

Section	Category/System	Comments	Section	Category/System	Comments
2	System Initialization		4	Recovery Procedures	
	Initializer	To aid the user, these messages, which come from operations that are interleaved, are labeled as to source initializer loader, disk, or logical unit.		SYSCOP messages	System checkout is a diagnostic program to analyze the image of core saved in mass storage at the time of failure. The program executes online at a low priority level.
	Initializer loader				
	Disk errors				
	Initializer device failure errors				
3	General System			SCMM messages	Small Computer Maintenance Monitor (SCMM) provides online confidence tests for error isolation on peripheral devices. It is not applicable to CYBER 18-20 or 18-30 Timeshare Computer Systems.
	General errors	These errors are from scheduling, dispatching functions, etc.			
	Loader errors	These errors are for relocatable binary loading; same messages are used whether the foreground or background program is loaded.			
	File manager errors	These are the same error messages whether file manager is called from the foreground or background. The job processor and text editor files are treated separately.		Engineering file	This file contains the status of input/output devices at the time of each unrecoverable error. Commands allow the user to view the file contents online at any time.

TABLE 1-1. MANUAL FORMAT (Contd)

Section	Category/System	Comments
(4 Contd)	Online debug (ODEBUG)	Aids the programmer in checking out his program
	Breakpoint	Aids the programmer in checking out his program
	Recovery	Allows the user to find the system state at the end of an online job execution.
	Abort dumps	Allows the user to save part of all of the main memory following an abort stop. The contents are listed on a printer for visual checking.
	Snap dump	Allows the user to get the listing of major registers online
5	Job Processor and Utilities	
	Executive	
	Job Processor errors	Basic diagnostics for the background executive; available to all programs operating under the job processor
	Library Utilities	
	SKED	The skeleton editor defines the contents of the library to be built.
	LIBILD	Builds libraries
	LIBEDT	Alters existing libraries
	LIBMAC	Maintains the macro library
	Program Compression	
	COSY	Compresses programs; used for program maintenance
	Sorting, Listing, and Tracing	
	OPSORT	
	EESORT	Provide specialized sortings or listings
	LISTR	
	LULIST	
(5 Contd)	TRACE	Allows the user to list status information on the running program
	Languages (Compilers)	
	ASSEM	Macro assembler
	FTN	Mass storage FORTRAN; includes run time diagnostics as well as compiling errors
	I/O Utilities	
	IOUP	Input/output utility to transfer data from one peripheral device to another
	SETPV4	Magnetic tape installation file utility
	DTLP/DSKTAP	Disk-to-tape data transfers
	MTUP	Magnetic tape utility
	Data Management	Also see File Manager Codes in section 3.
	Sort/merge	Allows a wide range of file manipulations
	EDITOR	Allows data manipulation within job processor files
	RPG II	Report generator; allows rapid data manipulation within highly formatted files. Diagnostics are not given in this manual, since they are very numerous and highly specific. Diagnostics are fully described in the RPG II Reference Manual.
6	I/O Equipments	
	Basic logic unit failed message	Designates device that failed
	Error codes for logic unit failure	
	Special messages	Some controllers have failure messages in addition to the basic logic unit failure message
	Status words	Words available in engineering log

This section contains messages encountered when errors occur during initialization. Five subsections are included:

- Initializer error codes. These are all errors that are neither loader nor disk hardware related.
- Initializer loader error codes. These are related directly to problems the loader encounters.
- System disk error messages. These are related to address and test data on disk writing.
- Initializing input/output device failure message
- Error recovery procedures

The user is referred to section 6 of the MSOS Version 5 Reference Manual for the control comments used during system initialization.

SYSTEM INITIALIZER CODES

The following defines the system initializer error codes:

Message	Significance
ERROR 1	Asterisk initiator missing
ERROR 2	Number appears in the 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 the first *L
ERROR 8	Name appears in the number field
ERROR 9	Illegal hexadecimal core relocation field
ERROR A	Illegal mass storage sector number
ERROR B	Error return from the loader module
ERROR C	Not used
ERROR D	Not used
ERROR E	Field terminator invalid
ERROR F	More than 120 characters in the control statement
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 the first segment; initialization restarted
ERROR 15	Not used
ERROR 16	Irrecoverable mass storage input/output error
ERROR 17	Irrecoverable loader error; last program loaded was ignored.
ERROR 18	Not used
ERROR 19	Not used
ERROR 20	*S, END0V4, hhhh not defined before first *L
ERROR 21	*S, MSIZV4, hhhh not defined before first *LP or *MP
ERROR 22	Attempt to load part 1 core resident into nonexistent 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 the first field of an *MP statement or illegal number of partitions in the second field of the statement.
ERROR 26	An attempt was made to load an *MP program when no partitioned core table exists in SYSDAT.

SYSTEM INITIALIZER LOADER ERRORS

Error	Significance
LOADER ERROR 1	Unrecognizable input
LOADER ERROR 2	Mass storage overflow

Error	Significance
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	15/16-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 $7FFF_{16}$

SYSTEM INITIALIZER DISK ERROR MESSAGES

Error	Significance
DISK ERROR	The address tag write sequence was attempted, but an internal/-external reject was found.
DISK FAILURE xx	Surface test operation caused error xx. Refer to the device error codes to interpret xx.
DISK COMPARE ERROR SECT aaaa WORD bbbb IS cccc SB dddd	Surface test pattern error on sector aaaa at word bbbb. Only one error is listed per sector. Data read was cccc but it should be dddd.

SYSTEM INITIALIZER DEVICE FAILURE CODES

When the system initializer device detects an input/output failure, the message is printed:

L, nn FAILED xx (yyyy)
ACTION

Where: nn is the initializer logical unit that has failed.

xx is the failure code.

yyyy is the last hardware status of the failed device.

The error reponse is one of the two following entries:

RP To repeat the request

CU Abort the operation and return to the comment device for a subsequent control statement.

The device failure codes for the system or initializer driver follow. The xx failure codes are defined in section 6. These failure codes are the same for initializer and normal MSOS processing.

ERROR RECOVERY

The initializer handles error recovery and flags error conditions as they occur. Most error conditions are immediately recoverable, but if an irrecoverable loading error occurs in the loading of a program, the initializer bypasses the remainder of the program and continues loading the next program. ERROR 17 appears on the comment device.

The following list identifies some of the problems that may cause initializer malfunctions:

Problem	Cause
Initializer stops while loading the SYSDAT program	Index I (location FF_{16}) is not assembled in SYSDAT as a BSS(1). Locations 0 and FF_{16} usually contain the same value, which is the address of the initializer's constant table. The first *L control statement tried to load SYSDAT into the system library (an *Y,PROG,1 statement has been used). The SYSDAT program establishes the location of the system directory and therefore cannot be placed in the directory. This can be avoided by changing the first *Y statement to *Y,PROG,2.
Initializer stops or restarts during loading	Data has been stored over the initializer or a previously loaded program link string by an ORG instruction. Locate the ORG instruction.

Problem	Cause
Job processor function partially	When certain functions of the job processor are not working, it may be a system problem, or the construction of the system library may not correspond to the order in the *Y and *YM statements.
No autoload after successful initialization	The cause may be an improperly constructed interrupt trap or priority structure or a missing driver.
Initializer terminates input or output	One of the following: • The requested device is not turned on. • The requested device is not ready and is locally cleared.
Initializer skips the next program after an *V statement	When the *V statement instructs the initializer to read subsequent control statements from the binary input device, the record read may be the NAM block of the program that cannot be recognized as a control statement. Either place a control statement at the input device before typing *V or type * instead of *V.

This section contains messages encountered by the general system operating in foreground or background mode. Diagnostic messages generated only in the background mode are found either in section 4, Recovery Procedures, or in section 5, Job Processor and Utilities (i.e., background, programs). Input/output diagnostics, though they may occur in any mode, are treated separately in section 6.

The section is divided into three portions:

- Miscellaneous general error messages
- Loader error messages
- File manager errors

MISCELLANEOUS GENERAL SYSTEM ERRORS

Message	Significance
CHECKING FILES – ERRORS	Errors detected in the file manager files check after autoload.
DATE/TIME ENTRY ERROR	Re-enter MSOS date/time.
EF STACK OVERFLOW	Currently there is no space in the engineering file stack to record this device failure.
EFSTOR LU ERROR	An attempt was made to update the engineering file for a logical unit less than 1 or greater than 99.
EFSTOR MASS MEMORY ERROR	An error occurred in updating the engineering file on mass memory.
GIxx	A ghost interrupt on interrupt line xx was reported by LIN1V4.
L,nn FAILED xx ACTION	The number of the failed device appears when a driver cannot recover from an error Where: nn is the logical unit of the failed device xx is the code that indicates the cause of failure

NOTE

The above message is the general input/output device failure message. It is described in detail in section 6.

Message	Significance
LU nn 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 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.
MI INPUT ERROR	The statement presented to the manual interrupt processor is unrecognizable, or the requested program is not supplied.
MM ERR xx LU=nn T=hhmm:ss S=ssss	Mass storage input/output error Where: xx is the error number nn is the logical unit hhmm is the hours/minutes ssss is the hardware status
OV	Overflow of volatile storage; appears on the output comment device – no recovery is possible.
PARITY, hhhh	Memory parity error at the specified hexadecimal location; appears on the output comment device – no standard recovery is provided. If hhhh = DSA? no parity error was encountered on the memory scan. The parity fault was most likely caused by a DSA parity error.
SET PROGRAM PROTECT	The system is waiting for the program protect switch to be set.
TIMER REJECT	The timer start-up was rejected (SPACE or MIPRO).
STALL REJECT	The stall alarm disable was rejected (SPACE).
1781-1 REJECT	The 1781-1 Hardware Floating Point Unit startup was rejected (SPACE).

LOADER ERROR CODES

Message	Significance
E1	Irrecoverable input/output error; terminates load
E2	Overflow of entry/external table reservation on mass storage; terminates load
E3	Illegal or out-of-order input block; terminates load
E4	Incorrect common or data block storage reservation. Occurs if the largest common storage declaration is not on the 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.
E5	Program is longer than area or partitions allotted to it; terminates load.
E6	Attempt to load information in protected core; terminates load
E7	Attempt to begin data storage beyond the assigned block; terminates load
E8	Duplicate entry point
E9	High order bit of a relocatable address is set, or negative relocation has been encountered during a 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.
E11	The minimum amount or core is 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.
E13	Undefined or missing transfer address; this code is not given if the loading operation is part of system initialization. It occurs when the loader does not encounter a name for the transfer address or the name encountered is not defined in the loader's table as an entry point name; loading is terminated.
E14	The loader request operation code word is illegal; terminates load.
E15	Overflow of loader table used to store relocatable addresses that have been absolutized to $7FFF_{16}$; terminates load.
E16	Entry point name is not in the loader table; operator must type in the correct entry point name.
E17	Informative diagnostic. Relocatable entry point has been absolutized to location $7FFF_{16}$. If any program in the system is testing for an entry point value of $7FFF_{16}$ to indicate that this entry point is not present, the test is not valid.

FILE MANAGER CODES

Error	Significance
F.M. ERROR 1	An irrecoverable mass memory error occurred while space was being returned to the space pool. This error may result in invalid space pool threads and/or file space being lost to the file manager. To recover, the user may autoload and then purge all system files. Then the files may be reloaded from a user written backup program as described in the MSOS file manager reference manual.

FILE MANAGER REQUEST ERRORS

The file request indicator is a parameter returned to the requestor at the end of a file manager request. The following is a list of the file request indicator bits.

Bit	Significance
0	File defined/not defined
1	File locked/not locked
2	File store or short read
3	End-of-file encountered
4	At least one more record exists with the same key value
5	Record does not exist or has been removed
6	Unused
7	Mass storage error
8	No file space left
9	Attempt to store direct outside file manager's disk space
10	File combination incorrect

Bit	Significance
11	File already defined/not defined as indexed
12	Key length not one for indexed-ordered file
13	Unprotected file request attempt to change a protected file
14	File request illegal
15	File request rejected; this bit is set whenever:

- Bit 14, 13, 12, 11, 10, 8, 7, or 0 is set.
- Bit 5 is set for RTVIDX if the record does not exist or the request is repeated after the end of the link is reached.
- Bit 4 is set for STOIDX if the file has not been defined as linked.
- Bit 2 is set for STOSEQ/STOIDX.
- Bit 1 is set for RELFIL, UNLFIL, STODIR, LOKFIL (already locked), RTVSEQ, RTVIDX, RTVIDO, and RTVDIR (attempt to remove from locked file without the combination).

The recovery procedures are special programs to aid the user in recovering from a system malfunction or stop and to aid him in checking out programs.

The section has six major subsections:

- SYSCOP messages. System Checkout Program (SYSCOP) diagnoses failures in MSOS by analyzing the core image of the failed system that was saved on mass storage.
- SCMM messages. SCMM tests the input/output peripherals.
- Engineering log
- Online debugging program (ODEBUG)
- Breakpoint program for checking out new programs
- Recovery programs to save main or selected mass memory at the end of a job execution or to save registers and main memory following an abort condition

SYSCOP

When the system fails, the following steps are used to bootstrap the failed system onto mass memory, so that SYSCOP can analyze the CPU state at failure time.

1. Stop the computer. Do not master clear.
2. Clear the M, P, Y, and X registers.
3. Set the P register to the address 142_{16}.
4. Set the SELECTIVE STOP switch. Select the Q register.
5. Place the computer in run. The computer stops when the failed image has been transferred. If Q is zero, go to step 6; otherwise, an error has occurred – retry the sequence from step 2.
6. Autoload the system.
7. After system start-up, request SYSCOP via MIPRO.

The system checkout program produces three categories of messages: control, error, and support. The operator selects the type of message.

NOTE

All numbers included in the messages are given in hexadecimal.

- Control messages (C): System checkout gives messages to control the operation of SYSCOP. Control messages appear on the list device unless operator intervention is required. In this case, the control message and its associated input are entered via the comment device. Control messages always appear, regardless of the message option selected.
- Error messages (E): Error messages indicate that an error condition was detected. Gross error detection messages, as well as specific error messages, are included in this message level. Error messages appear on the list device.
- Support messages (S): System checkout uses support messages to support, expand, and present information to the user. Support messages supply the user with organized information that may help in isolating errors.

  Support messages may not always be related to an error. All support messages appear on the list device.

Type	Message/Significance
S	A Q I REGISTER aaaa qqqq iiii Significance: A printout of the contents of the registers as saved by the checkout bootstrap program: Where: aaaa is the contents of A register qqqq is the contents of Q register iiii is the contents of I register
E	aaa IS NOT A bbbb DEVICE Significance: This error message appears for input devices that cannot read or output devices that cannot write. aaa is one of: SBI – Standard binary input device specified in $F9_{16}$ SBO – Standard binary output device specified in FA_{16} SLO – Standard print output device specified in FB_{16} SCO – Output comment device specified in FC_{16} SCI – Input comment device specified in FD_{16} bbbb is either READ or WRITE

Type	Message/Significance
E	ADDRESS IN aa WAS ffff BUT SHOULD BE iiii

Significance: LOCORE communication address error. Appears each time an altered address is found in LOCORE

Where: aa is the address of LOCORE location containing a monitor address

ffff is the value at failure time. The list of addresses checked for alteration includes:

ffff	Contents
$B5_{16}$	FNR
$B6_{16}$	COMPRQ
$B7_{16}$	MASKT
$B9_{16}$	REQST
BA_{16}	VOLR
BB_{16}	VOLA
BC_{16}	LUABS
BD_{16}	SABS
BE_{16}	CABS
BF_{16}	NABS
EA_{16}	DISPxx
$F4_{16}$	MONI
$F8_{16}$	IMPROC
FE_{16}	ALLIN

iiii is the value at initialize time

***ALLOCATABLE CORE ERROR

Significance: Error message. Cannot account for all of allocatable core; a thread is broken.

S 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

Significance: 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.

Where: hhhh is the ordinal of mass storage program in the system whose length matches the length of the block

Type	Message/Significance

iiii is the starting address of a block of allocatable core

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

kkkk is the thread to next empty block or next word

llll thru pppp are the dump of first five words of the block

E BIT TABLE CHECKSUM ERROR

Significance: LOCORE bit table error. An incorrect checksum of the total of locations 2 through 46_{16}. At least one location between 2 and 46_{16} has been altered. If no error is detected, the message does not appear.

E CONSIDER SWAP RATE TOO RAPID

Significance: System was kept from swapping because a set time interval had not elapsed.

E CONSIDER UNPROTECTED I/O HANGUP

Significance: The system is waiting to swap; unprotected input/output is active.

E CORE USAGE CAUSED SWAP WHILE JP IN

Significance: The job processor was in core, and the system was swapped. This is not an error but occurs normally during job processing.

C *D

Significance: Output on print logical unit. This message is valid after SYSCOP announces DUMP at the end of the program.

DUMP

Significance: 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 eight locations per line (that is, the list logical unit is the same as the comment logical unit).

Type	Message/Significance
S	ENTRY FOR LVL hhhh INITIALLY iiii CHANGED TO jjjj Significance: The image for each level entry in the modified mask table Where: hhhh is the level of mask table entry – 1 to F iiii is the value on autoload image jjjj is the value on failed image
S	FILE1 FILE2 FILE3 FILE4 LOADR BP hhhh iiii jjjj kkkk llll mmmm Significance: Support message. These are the job processor file locations. If an address is zero, it implies that the respective module was not active. Where: hhhh is the absolute starting addresses of the four files iiii, jjjj, kkkk } are the job processing files llll is the starting address of the relocatable binary loader (in TRVEC) mmmm is the starting address of the breakpoint package ($F3_{16}$)
C	FINISH SYSCOP Significance: Checkout completed; core is released. This is the last SYSCOP message.
S	FORTRAN LEVELS h i j k l Significance: This support message designates the legal levels reserved as FORTRAN levels in FMASK. h, i, j, k, l are the levels.
E	FORTRAN LEVELS h i j k l (ERROR) Significance: FORTRAN levels error. There are errors between the FORTRAN priority levels 3 and E. h, i, j, k, l are the levels.
E	ILLEGAL BUSY INDICATOR Significance: Error message. A bit in the busy word must be set for each permanently busy or unused partition.
C	IMAGE START SECTOR IS ssss Significance: A control message acknowledging the beginning of the image sector Where: ssss is the starting sector of failed image

Type	Message/Significance
E	INDEX hhhh HAS INVALID REQ PRI iiii Significance: 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. Where: hhhh is the ordinal in the system directory iiii is the request priority level
E	INDEX hhhh TOO LONG FOR REQ PRI iiii Significance: 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. Where: hhhh is the system directory ordinal iiii is the request priority level
E	*** INTERRUPT TRAP ERROR Significance: Header indicates an error on the failed image.
E	***INTERRUPT TRAP ERROR INITIALLY Significance: Header indicates an error message on the autoload image in the interrupt trap region.
S	INTRPT STACK LEVEL h i j k l m n o p q r s t u v w Significance: This support message gives the interrupt stack entries: Where: h thru w are the 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.

Type	Message/Significance
S	JP LOCKED OUT FOR LIBEDT OR RECOVERY. SIGN OFF REQUESTED OF LIBEDT OR RECOVERY. Significance: This support message gives the job processor lockout switch status. If SWTCH in TRVEC is negative, only the first sentence appears. If positive, only the second sentence appears. This indicates the job processor is either locked out or the LIBEDT or the recovery program has requested a sign off. If SWTCH is 0, the message does not appear.
S	JP NOT IN CORE Significance: 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.
S	JP WAS IN CORE Significance: This support message indicates that FILE1 contained a file address. The remainder of the job processor checks are made.
S	LAST ENTRY TO BE SCHEDULED hhhh/iiii jjjj kkkk llll Significance: This scheduler stack entry message defines the last entry that was scheduled. If jjjj (starting address) is 0, the message is suppressed. Where: hhhh is the address of a scheduler stack entry iiii, jjjj, kkkk, llll } are the dumps of hhhh entry
E	LEVEL hh IS USED FOR INTERRUPTS AND IS RESERVED FOR FORTRAN Significance: 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. Where: hh is the priority level number

Type	Message/Significance
S	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 Significance: This support message gives the line and level status. Where: is the level indicated in the trap region
E	LINE 0 IS NOT SETUP FOR PARITY/PROTECT Significance: 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.
E	LINE hh IS SET FOR LVL iiii BUT IS ABLE TO INTERRUPT jjjj Significance: Mask table error. This error message appears when no bit is detected in the mask tables for lower level masks. Where: hh is the line number iiii, jjjj } are the priority level numbers; jjjj is lower than iiii.
E	LINE hh IS SET FOR LVL jjjj BUT UNABLE TO INTERRUPT iiii Significance: 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. Where: hh is the line number jjjj, iiii } are the priority level numbers; jjjj is lower than iiii.
S	LINE ii LAST INTERRUPTED tttt Significance: 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. Where: ii is the line number tttt is the location specified in the appropriate interrupt trap
E	LINE ii LAST INTERRUPTED tttt (INVALID) Significance: The error message indicates an interrupt on an invalid line. The specified line

Type	Message/Significance
	has INVINT as its response routine, yet an interrupt has occurred. Where: ii is the line number tttt is the location specified in the appropriate trap
E	LINE ii RESPONSE IS UNPATCHED Significance: This error message indicates unpatched interrupt response routines. Where: ii is the hexadecimal interrupt line number that had a $7FFF_{16}$ (unpatched external) for the address of its interrupt processing routine
E	***LOCORE CONSTANT ERROR Significance: When the constants contained in the communication region are checked for errors, errors are detected on the failed image. Messages that follow the header refer to these errors. If no error is detected on the failed image, the message does not appear.
E	***LOCORE CONSTANT ERROR INITIALLY Significance: 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.
E	***LOGICAL UNIT CAPABILITY ERROR Significance: Header message indicating that the failed image is incorrect. The device does not have the appropriate read or write capability.
E	***LOGICAL UNIT CAPABILITY ERROR INITIALLY Significance: The autoload image has logical units with illegal capabilities (header message).
E	***LOGICAL UNIT TABLE ERROR Significance: Header indicates an error detected on the failed image.
E	***LOGICAL UNIT TABLE ERROR INITIALLY Significance: Header indicates an error detected in the logical unit tables of the autoload image.
E	LU uu AND vv MATCH BUT SHARED BIT IS NOT SET Significance: This error message indicates inconsistently shared devices. Where: uu, vv are the logical units whose physical device table addresses match in LOG1A, but the LOG1 entry for logical unit uu does not indicate a shared device.
S	LU uu CURRENT PARA LIST AT iiii RC jjjj C kkkk TH llll LU mmmm N nnnn S oooo I/O IN PROGRESS Significance: 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). Where: uu is the active logical unit iiii is the 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 thru oooo are the hexadecimal dump of parameter list at location iiii jjjj is the request code kkkk is the completion address llll is the thread mmmm is the logical unit nnnn is the number of words to transfer oooo is the starting address
E	LU aa IS ALTERNATE FOR uu, BUT HAS LESS CAPABILITY Significance: This error message indicates that the alternate device does not have the

Type	Message/Significance
	read/write capability specified for the primary device. Where: aa is the assigned alternate logical unit for logical unit uu
E	LU uu IS SHARED BUT UNMATCHED Significance: This error message indicates inconsistently shared devices. Where: uu is the 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.
S	LU uu THREAD jjjj kkkk llll mmmm nnnn oooo pppp qqqq rrrr . . . Significance: This support message gives information about the logical unit threads. It lists the addresses of the threaded elements until it encounters an empty entry ($FFFF_{16}$). Where: uu is the logical unit whose LOG2 entry is not $FFFF_{16}$ jjjj is the entries on the thread
S	LU uu THREAD MAY BE BROKEN Significance: If more than 40_{16} elements are on the logical unit thread, only the first 40_{16} are listed, and this message appears. It does not appear for any logical unit whose thread is empty (that is, $FFFF_{16}$)
S	LU uu WAS MARKED DOWN Significance: Support message: bit 13 of the LOG1 table reflects an inoperative logical unit. This message appears for each logical unit marked down. Where: uu is the logical unit number
E	LU 1 NOT CORE ALLOCATOR Significance: 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.
E	***MASK TABLE ERROR Significance: Header message indicates that the failed image mask table either contains an error or was modified.

Type	Message/Significance
E	***MASK TABLE ERROR INITIALLY Significance: Header message indicates that an error was detected in the autoload image mask table.
S	MAX CORE WAS hhhh WITH iiii TO jjjj UNPROT Significance: Highest core location and bounds of unprotected core. This support message indicates no location error was detected. It appears twice on the printout. The first appearance is for the autoload image and the second for the failed image. Where: hhhh is the contents of $F5_{16}$ iiii is the contents of $F7_{16}+1$ jjjj is the contents of $F6_{16}-1$
E	MAX CORE WAS hhhh WITH iiii TO jjjj UNPROT (ERROR) Significance: 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 is for the failed image. Where: hhhh is the contents of $F5_{16}$ iiii is the contents of $F7_{16}+1$ jjjj is the contents of $F6_{16}-1$
S	MAXSEC WAS hhhhhhhh Significance: 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 is for the failed image.
E	MAXSEC WAS hhhhhhhh (ERROR) Significance: 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 is for the failed image. Where: hhhhhhhh is the most significant bits (msb)

Type	Message/Significance
E	NO VALID PHYSTB FOR LU uu Significance: This error message indicates that the particular LOG1A entry does not point to a core location that contains a scheduler request code ($52xx_{16}$) followed by three cells, none of which is unpatched. The message appears for each error. Where: uu is the logical unit number
E	NUM OF LUS DO NOT AGREE, ASSUME hh Significance: 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. Where: hh is the number of logical units as specified in LOG1A
S	NUM OF SCHEDL STACK ENTRIES WAS hh NUM OF SCHEDL CALLS STACKED WAS ii Significance: Support message: Where: hh is the total number of scheduler entries defined in the system ii is the number of scheduler entries which were queued when the system failed
E	PARTITION 0 ABOVE 8000 Significance: Error message: Partition 0 must begin at 8000_{16} or below
S	PARTITION CORE ADDRESSES PARTITION xx hhhh Significance: This support message appears for every assigned partition where xx is the partition number and hhhh is the starting address of the partition.
E	PARTITION CORE ERROR Significance: This header message reports partition errors.
S	PARTITION IN USE Significance: This support message appears when the USE table is analyzed. Each partition in use is printed. Appears with partition core address message
E	PARTITION OUT OF ORDER Significance: Error message: Partitions must be specified in ascending order.

Type	Message/Significance
S	PARTITION THREADS Significance: This support message appears with a printout of partition and thread for every busy partition.
S	PENDING INPUT REQUEST FOR JP Significance: Manual interrupt handling support message. The MIB flag was set, and input is for the job processor.
S	PENDING INPUT REQUEST FOR MIPRO Significance: Manual interrupt handling support message. The MIB flag was set, and the input is for the MIPRO program
E	***POSSIBLE LEVEL HANGUP Significance: Analysis of system priority level header. This error message requires further investigation and appears only if the priority level is above 2
S	PRI LVL WAS hhhh Significance: This support message gives the system priority level and is printed only to aid subsequent debugging. Where: hhhh is the priority level of system
E	PRI LVL WAS hhhh (ERROR) Significance: Incorrect priority level. This error message indicates that the priority level was not between -1 and 15. Where: hhhh is the priority level of system at the time the image was written on mass storage;; value is from EF_{16}.
C	*R Significance: Repeat SYSCOP program with options set. This control message is valid after SYSCOP announces DUMP at the end of the program.
S	RETURN FOR FNR WAS hhhh RETURN FOR CMR WAS iiii Significance: This support message gives the last return addresses for FNR and NCMPRQ. Where: hhhh is the last location to call find next request; address should be in a driver

Type	Message/Significance
	iiii is the last location to call complete request; should be in a driver
E	SBI IS NOT A {READ / WRIT} DEVICE Significance: Standard input/output 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 $F9_{16}$ SBO – Standard binary output – FA_{16} SCI – Input comment – FD_{16} SCO – Output comment – FC_{16} SLO – Standard print output – FB_{16}
E	SBO IS NOT A {READ / WRIT} DEVICE Significance: See preceding message for significance.
S	SCHEDL STACK ENTRIES hhhh/ iiii jjjj kkkk llll mmmm/ . . . Significance: Support message: A line for each entry appears. Where: hhhh thru mmmm are the address of a scheduler stack entry iiii thru llll are the dump of hhhh entry
E	***SCHEDULER STACK ERROR Significance: This message indicates levels in the scheduler stack are inconsistent; priority level at time of failure is also checked.
E	SCI IS NOT A {READ / WRIT} DEVICE Significance: See SBI IS NOT A {READ / WRIT} DEVICE message for significance.

Type	Message/Significance
E	SCO IS NOT A {READ / WRIT} DEVICE Significance: See SBI IS NOT A {READ / WRIT} DEVICE message for significance.
C	SELECT OPTION Significance: 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 Print error messages only. 2 Print error messages and support messages associated with detected errors. 3 Print error messages and all support messages. Press RETURN. 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. This message is repeated if the operator selectes an undefined option.
E	SLO IS NOT A {READ / WRIT} DEVICE Significance: See SBI IS NOT A {READ / WRIT} DEVICE message for significance.
C	SYSCOP START Significance: This control message indicates the start of the checkout program.
E	***SYSTEM DIRECTORY ERROR Significance: The system directory is not constructed correctly.

Type	Message/Significance
S	SYSTEM NOT SWAPPED Significance: This support message indicates that the SWAPON flag and the swap waiting flag (SPASW) were not set. SPASW is in the TRVEC program.
S	SYSTEM NOT SWAPPED BUT WAITING TO SWAP Significance: This support message appears if SWAPON is not set but SPASW is set.
E	SYSTEM USING NDISP WITH REENT FORTRAN (ERROR) Significance: This error message appears if more than one FORTRAN level is reserved in FMASK, but the system is using NDISP instead of RDISP.
S	SYSTEM WAS SWAPPED Significance: This support message appears if the SWAPON flag is set, thus indicating that a swap is in effect. This flag is in the DRCORE program.
S	THERE WERE hhhh OF THE iiii VOLATILE WORDS ASSIGNED Significance: This support message specifies the amount of volatile storage in use at the time of system failure is specified by: Where: hhhh is the amount of volatile storage assigned at failure iiii is the total volatile storage available
S	hhhh UNPROT REQ WERE ACTIVE AND STACKED AT LOC iiii Significance: This support message gives the unprotected input/output and timer request status. If no input/output or timer requests were active, the message does not appear. Where: hhhh is the sum of UNPIO and UNPTIM in TRVEC iiii is the absolute location of the stacked requests in the protect processor (PROTEC)
C	*Z Significance: Terminate SYSCOP. This control message is valid after SYSCOP announces DUMP at the end of the program.

SCMM

The Small Computer Maintenance Monitor (SCMM) provides a method of online hardware error detection for 1700 Computer Systems. SCMM consists of a main program and one test program for each input/output device to be tested. The main program is loaded into the operating system as a system ordinal and the tests are placed in the program library. SCMM runs at the lowest foreground priority and all programs are run-anywhere. This section is intended as a general description only. For detailed instructions, refer to the 1700 Small Computer Maintenance Monitor Reference Manual. SCMM is not applicable on CYBER 18-20 or 18-30 Timeshare Computer Systems.

Two types of error indications may be sent to the test operator:

- Message for errors occurring during operator-SCMM interface; i.e., while selecting a list for a particular equipment.
- Messages for errors discovered during the hardware testing. Tests are listed in the following order:

Analog input	(high and low speed)
Card reader	
Digital input/output	(logic level and relay)
Disk	(cartridge, pack, and variable position)
Drum	
Events counter	
Line printer	
Magnetic tape	
Paper tape (reader and punch)	
Teletypewriter sample timer	

OPERATOR-SCMM INTERFACE ERROR MESSAGES

Message	Significance
CONTROL ERROR	An illegal control statement was entered by the operator.†
DISK ERROR	A disk error occurred during the transfer of a test from mass storage to core. The test may request parameters, or SCMM may recycle. If parameters are requested, the prudent procedure is to abort the test by typing in ? and re-requesting the test via the SCMM monitor.

† All these entries cause SCMM to display the query line (CONTROL, TEST ID) so the operator can re-enter his request.

Message	Significance
NOT IN LIBRARY	The test required is not in the program library. †
PROGRAM NOT SCHEDULED	The operator requested a control statement (STP, PRM, NPT, or PRT) for a test that had not been set into execution. †
PROGRAM SCHEDULED	The program requested by the operator is already in operation. †

The hardware test error messages follow:

Message	Significance
Low speed analog input (1536, 1502-80, 1525-3)	
ADR ERROR	Wrong channel shows deviation value if >+7 or <-7.
CHNLxxxx CK RELAY VALUE READxxxx	
CHNLxxxx VALUE TOO+	Deviation is >+7.
CHNLxxxx VALUE TOO-	Deviation is >-7.
Histogram	See SCMM reference manual for use.
LU ERROR	Wrong logical unit
TSTAD1 CHNLxxxx ADC REJECT	Analog/digital controller rejected transfer
TSTAD1 CHNLxxxx EXT REJECT	External reject from remote unit
TSTAD1 CHNLxxxx INT REJECT	Internal reject for remote unit
TSTAD1 CHNLxxxx MUX REJECT	Multiplexer reject
TSTAD1 CHNLxxxx TIME OUT	Time out on local or remote unit
High speed analog input (1501-x, 1525-3)	
ADR ERROR	Wrong channel shows deviation value if >+7 or <-7.
CHNLxxxx CK RELAY VALUE READyyyy	
CHNLxxxx VALUE TOO+	Deviation is >+7.
CHNLxxxx VALUE TOO-	Deviation is <-7.
Histogram	See SCMM reference manual for use.
LU ERROR	Wrong logical unit
TSTAD2 CHNLxxxx BAD INDEX	Local index wrong
TSTAD2 CHNLxxxx EXT REJECT	External reject
TSTAD2 CHNLxxxx INT REJECT	Internal reject
TSTAD2 CHNLxxxx REJECT	Local reject
TSTAD2 CHNLxxxx TIME OUT	Time out on channel
Card Reader (1726/405)	
Each of the following messages (except the last) is prefaced by TST 405 SECxx CARDSxxxx.	xx is test section number: 1 = read random data 2 = read $AAA5_{16}$, $55AA_{16}$, $A555_{16}$ data pattern 4 = user supplied data pattern 8 = read sync check data pattern
ALARM	Output stacker full or card jam or feed failure
CKSUM ERROR	Holes not clearly punched
EXT REJECT	Device busy or not ready
FEED FAIL	Card did not feed
ILLEGAL ASCII	Punch pattern illegal
INPUT EMPTY INPUT HOPPER EMPTY	Both messages indicate no more cards to read
INT REJECT	Device failed to respond to CPU within allotted time
NO 7-9 PUNCH	7/9 punch in column 1 with FREAD ASCII request
NON-NEG RECORD LENGTH	Not first card of record
PRE-READ ERROR	Read amplifiers not off during dark check
READER BUSY	Card in reader

† All these entries cause SCMM to display the query line (CONTROL, TEST ID) so the operator can re-enter his request.

Message	Significance
READER NOT READY	Busy signal not dropped
SEQ ERROR	Card out of sequence
STACKER FULL/ JAM	Stacker full or card jam
TIME OUT	No interrupt within allotted time
1706 ADDRESS ERROR	Buffer address wrong
The following message occurs without the usual preface:	
TST 405 DATA ERROR COL xxxx ACTUAL yyyy EXPECTED zzzz	Card column xxxx failed the verification test

Digital I/O, logical level (1553-x/1544-x)

SCMLLV TEST aa RUN bb 15 cc CHNL dd STATUS ERROR eeee	Test error message Where: aa is the test number 1-5 bb is the run number cc is the device identification, e.g., 1533 dd is the channel identification eeee is the status for local IOM: 8000 = Bad index or 8001 = Internal or external reject For remote IOM: 7FFF = Reject on local unit Bit 13 = Receive error (local control) Bit 12 = Receive error (remote control input) Bit 10 = Internal reject on remote unit Bit 9 = External reject on remote unit
SCMLLV TEST aa RUN bb OUT CHNL ffff is gggg IN CHNL hhhh IS iiii	Data error message where aa and bb are as shown above, ffff and hhhh are channel identification, and gggg and iiii are data format out and data format on return

Digital I/O, relay (1555/1544)

SCMRLY TEST aa RUN bb 15 cc CHL dd STATUS ERROR eeee	Variables same as in the 1553/1544 test above except status 8000 is not legal.
SCMRLY TEST aa RUN bb OUT CHNL ffff IS gggg IN CHNL hhhh IS iiii	Variables same as in the 1553/1544 test above.

Disk cartridge type (1739-1, 1733-2/856-2, 1733-2/856-4)

TSTCD1 COMP ERR TOTAL xxxx	Number of errors found after full block of test data is written to disk and verified by rereading to core
TSTCD1 SEC ADDR ERROR	Operator attempted to test system area of disk or non-existent disk tracks
TSTCD1 SEC xx RUN yy COMP ERR H/W ADDR zzzz SECTOR ssss WORD wwww WAS aaaa IS bbbb	The specified word had a compare error during verification. SEC specifies the test in progress when the error occurred (6 tests).
Hardware error messages have this preamble:	Preamble and trailer have same meanings as in compare message above.
TSTCD1 SEC xx RUN yy	
The messages are:	
ADDRESS ERR	Illegal file address
CHKWRD ERR	Check on read
CONTROLLER SEEK ERR	Controller seek existing track
DRIVE SEEK ERR	Seeking beyond existing track
LOST DATA	Data not taken off bus in allotted time
PARITY	Parity error on DSA
PROTECT ERR	Attempt to write to protected main memory
NO COMP	No compare during verification
NOT READY	No disk pack or underspeed, or heads not on track, or drive fault.

Followed by this trailer message:

D-C XFER C-D XFER	H/W ADDR zzzz SECTOR aaaa	Trailer message specifies direction of data transfer and disk/-CPU address at time of fault

Message	Significance
Disk (1738/853 and 854, 1733-1/853 and 854)	
TSTDK1 COMP ERR TOTAL xxxx	Number of errors found after full block of test data is written to disk and verified by rereading to core
TSTDK1 SEC ADDR ERROR	Operator attempted to test system area of disk or nonexistent disk tracks
Hardware error messages have this preamble:	Preamble and trailer have the same meanings as in the compare message above.
TSTDK1 SEC xx RUN yy	
The messages are:	
ADDRESS ERR	Illegal file address
CHKWRD ERR	Check on read
CONTROLLER SEEK ERR	Controller seek existing track
DRIVE SEEK ERR	Seeking beyond existing track
LOST DATA	Data not taken off bus in allotted time
PARITY	Parity error on DSA
PROTECT ERR	Attempt to write to protected core
NO COMP	No compare during verification
NOT READY	No disk pack or underspeed, or heads not on track, or drive fault.
Followed by this trailer message:	
D-C XFER H/W ADDR zzzz SECTOR aaaa C-D XFER	Trailer message specifies direction of data transfer and disk/CPU addresses at time of fault.
Disk variable position test (both 1738 and 1733 Disks)	
CYL ADR ERR	Requested cylinder is in system area of disk or is a nonexistent cylinder.
HEAD NO. ERROR	Request for a nonexistent head
LU ERROR	Request for an illegal logic unit for disk
TSTDVP COMP ERR TOTAL xxxx	Number of errors found after full block of test data is written to disk and verified by rereading to core
TSTDVP SEC xx RUN yy COMP ERR H/W ADDR zzzz SECTOR ssss WORD wwww WAS aaaa IS bbbb	The specified word had a compare error during verification; SEC specifies the test in progress when the error occurred (six tests).
Hardware error messages have this preamble:	
TSTDVP SEC xx RUN yy	
The messages are:	
ADR ERR	Illegal file address
CHKWRD ERR	Check on read
DEFTRK	
LOST DATA	Data not taken off bus in allotted time
NO COMP	No compare during verification
NOT READY	No disk pack or underspeed, heads not on track, or drive fault
PARITY	Parity error on DSA
PROTECT ERR	Attempted to write to protected main memory
SEEK ERR	Incomplete seek
Followed by:	
D-C XFER H/W ADDR zzzz C-D XFER	Trailer message specifies direction of data transfer and disk/CPU address at the time of the fault.
Drum (1751)	
TSTDM1 COMP ERR TOTAL xxxx	Number of errors found after full block of test data is written to drum and verified by rereading to core
TSTDM1 SECTION xx RUN yyyy COMP ERR TRACK zzzz WORD wwww WAS aaaa IS bbbb	The specified word had a compare error during verification. SECTION specifies the test in progress when the error occurred (7 tests).
Hardware error messages have the preamble:	
TSTDM1 SECTION xx RUN yy	Where SECTION specifies the test and RUN specifies the run number

Message	Significance
The messages are:	
CHKWRD ERR	Check on read
GUARDED ADDRESS ERROR	Attempt to write on protected track
LOST DATA	Data not taken off of, or sent to, DSA within acceptable time
NOT READY	Power not on, speed low, or temperature or pressure out of tolerance
POWER FAILURE	Lost ac power to drum
PROTECT FAULT	Tried to access protected core
SECTOR OVER-RANGE ERROR	Attempted to access nonexistent track
TIMING TRACK ERROR	Lost drum timing pulses

Events counter (1547)

DASH NO. ERROR	Choices are 1 and 2
INTERRUPT ASSIGNMENT ERROR	Interrupt on wrong line
NO INTERRUPT	Interrupt selected but not generated
OUTPUT TYPE ERROR	
1572-1 SYN. NOT SYSTEM TIMER	Required for testing counting, interrupts, and events/unit time.
Hardware error messages have the following preamble:	
TSTCTR TEST xx RUN yyyy	xx is test 1 or 2; yyyy is run number
The messages are:	
COUNT ERR	
NO READ CLEAR	
READ CLEAR	
STATUS ERR	
Followed by:	
ACTUAL aaaa EXPECTED bbbb CTRWEMS cccc	Where the actual and expected values are given for the event counter with WES code cccc
TSTCTR TEST xx RUN yyyy CTRWEMS aaaa INT REJECT EXT REJECT	Reject message giving Q, A, and X register values
A = ccc X = dddd	Q = bbbb

Message	Significance
Line printer (1740/501, 1742-1, 1742-30, 1742-120)	
Hardware error messages have the following preamble:	
TSTPRT SECTION xx	Where section number is one of the six tests in bit configuration ($2, 4, 8, 10_{16}, 20_{16}, 40_{16}$)
The messages are:	
ALARM	Out of paper, torn paper, interlock open, or fuse alarm
EXT REJ	Printer busy or not ready
INT REJ	Device did not reply to CPU in allotted time
TIME OUT	Device did not generate interrupt in allotted time
Followed by:	
CNTRL NOT READY or CNTRL READY	Indicates controller status
Magnetic tape (1731/601, 1732-2/615-73, and 615-93, 1732/608 and /609, 1732/608 and /609, 1706, 1732-3/-616-72, 616-92, and 616-95)	
TSTMTT SEC xx RUN yy TAPE UNIT zz COMP ERR RECORD aaaa WORD bbbb WAS cccc IS dddd	Data error on specified run and unit. Expected and actual words received are shown. Tests (sections) are 2, 4, 8, and 10_{16}.
Hardware error messages have the following preamble:	
TSTMTT SEC xx RUN yy TAPE UNIT zz	
The messages are:	
CORRECTED DROPOUT (615 only)	On reread
END OF TAPE	
ILLEGAL DENSITY SELECTED (615, 616)	556 and 800 bits per inch are legal on seven-track 800, and 1600 bits per inch are legal on nine-track.
LOST DATA	More data to register before data transferred
NO ID (615, 616)	Drive not properly addressed
NO WRITE RING	Write command, but tape lacks write ring

Message	Significance
NOT READY	Drive not connected or controller not ready
PARITY PE LOST DATA (616) PE WARNING (616)	Parity errors
WRONG POST-AMBLE (615)	Postamble not 1 byte of 1s fol lowed by 40 bytes of 0s

Followed by:

T-C XFER or C-T XFER	RECORD aaaa	Indicating the direction of transfer at failure time and specifying the failed record

And, where applicable, one of these messages:

TSTMTT SHORT XFER TSTMTT UN-EXPECTED END-OF-FILE	Short record
TSTMTT TAPE UNIT xx COMP ERR TOTAL yy	Cumulative error for a single record check

Paper tape reader (1713, 1721, 1723, 1777)

TSTPTR DATA ERROR FRAME xx ACTUAL yyyy EXPECTED zzzz	Data error on specified frame

Error messages have the following preamble:

TSTPTR SECTION xx RECS yyyy	Specifying test section (2, 4, 8, or 10_{16}) and record

The messages are:

ALARM	Paper motion fault, lost data, or no power
BUSY CHECKSUM ERROR EXISTANCE CODE	Station does not exist (reader/punch combination units)
EXTERNAL REJECT	Reader replied that it is not ready.
INTERNAL REJECT	Reader did not reply in allotted time.
LOST DATA MOTION FAILURE NOT READY PARITY ERROR POWER FAILURE	

Message	Significance

Paper tape punch (1713, 1722, 1723, 1778)

The messages are the same as the for paper tape reader, except the unit identification is TSTPTP and TAPE SUPPLY LOW is used instead of MOTION FAILURE and VALIDATION ERROR is used instead of CHECKSUM ERROR.

Teletypewriter (1711-1 through 1711-5, 1713-1 through 1713-5, 1713-10/711 -100/713 -120 1743-2, 1595)

TSTTTY ALARM	Not ready or lost data
TSTTTY EXT REJ	Teletypewriter replied that it is not ready.
TSTTTY INT REJ	Teletypewriter did not reply in the allotted time.
TSTTTY LINE BK	Line break
TSTTTY PARITY	Parity error
TSTTTY TIME OUT	Teletypewriter did not interrupt in the allotted time.

ENGINEERING LOG

The engineering log stores equipment failure data. Such data is temporarily stored in a five-entry table in core in the following format:

word	8 7
0	logical unit
1	Day - month - year
2	Military time
3	Seconds 1 Error code
4	Hardware status

Where word 4 is word 12 of PHYSTB for this logic unit. (This may be a true hardware status or a composite status formed by the logic unit's controller.)

This information (except the first word) is later stored on mass memory in sectors so that each sector holds messages for one logic unit; i.e., 96/4 or 24 failures per device. Each sector is filled in wrap-around style, which causes the sector to be a push down/fall off stack.

The error messages are:

Message	Significance
MM ERR xx LU = yy T = hhmm:ss S = zzzz	An automatic message is sent to the comment device if a mass storage error occurs. xx is the

Message	Significance
	error code as shown in section 6; T is the time, and zzzz is the status word.
ENGINEERING FILE INFORMATION LISTING	1. In response to MI, then EF: all failure codes for all logic units
LOGICAL UNIT xx name	2. In response to MI, then EFLU: the failure codes for the logic units specified
DATE TIME aa hhmm:ss FAILURE CODE bb	3. In response to MI, then EFMM: the failure codes for the core resident mass memory failure table
HARDWARE STATUS cc	

Note that the log for each logic unit is a wrap around. The operator should inspect the date and time to find the entry for the logic unit most likely to reflect the particular error he is investigating.

ODEBUG

The on-line debug program (ODEBUG) allows the programmer to access both protected and unprotected main memory and mass storage. Both kinds of storage may be searched, altered, dumped, or moved. Main memory may be allocated; main memory and mass memory may be compared, threads may be traced, and magnetic tape transport control is available. Commands executed by ODEBUG are described in the MSOS reference manual.

The messages are:

Message	Significance
CELL CONTENT	Shows the cell content in hexadecimal
DEBUG IN	ODEBUG is ready for the first command.
DEBUG OUT	ODEBUG has exited from the system.
DB FORMAT INVALID	The parameter list for the request is invalid.
DB I/O ERROR	Input/output failure during processing
DB ILLEGAL LU	No such logic unit in the LOG tables
DB ILLEGAL MM ADD	No such sector address on mass storage
DB INVALID REQUEST	No such DEBUG mnemonic for command
DB NO CORE AVAILABLE	Insufficient core to load ODEBUG
DB ORDINAL LENGTH 0	No program is associated with this ordinal (identifier) in the system library.
DB ORDINAL OVER MAX	This ordinal is greater than the largest ordinal assigned in the system library.
DB SEARCH FINISHED	All searched cells containing the specified value are listed following the CELL CONTENT message.
NEXT	ODEBUG is ready for the next command.

BREAKPOINT

This background package allows the programmer to check out a program by use of conditional stops (breakpoints). When the specified condition occurs and the program stops, the operator may alter core or registers, dump core as registers, change the logic units, jump or resume processing, or dump mass storage. Magnetic tape control commands are also available. Commands executed by breakpoint are described in the MSOS reference manual. The messages are:

Message	Significance
xxxx FORMAT ERROR	The parameter list field specified for this breakpoint command is in error.
xxxx PROTECT ERROR	The breakpoint specified does not lie within unprotected core.
TOO MANY BREAKPOINTS xxxx FORMAT ERROR	Only 15 active breakpoints are allowed; xxxx is the location of the 16th breakpoint specified in the SET breakpoints command.

Alternate forms of the messages are:

B01, statement	Statement or parameters are unintelligible for the breakpoint program.

Message	Significance
B02, hhhh	The specified hexadecimal address hhhh cannot be processed by the breakpoint program because it is protected.
B03, hhhh	The breakpoint limit is exceeded. The specified hexadecimal address is the last breakpoint processed.

RECOVERY PROGRAMS TO SAVE SYSTEM STATE

Four programs are included in this group:

- Recovery, which allows dumps of core or mass memory following job execution
- System abort dump, which allows any specified section of core to be dumped following an abort stop
- CYBER 18 extended memory abort dump, which allows any specified section of core within a page file to be dumped following an abort stop
- On-line snap dump, which allows listing of the P, Q, A, M, and I register contents at any time.

The last three programs have no error messages; failure to obtain the requested dump is noted by a failure to respond to commands. The operator should check his request procedure and repeat the appropriate process as described in the MSOS reference manual.

RECOVERY

The recovery package allows the programmer to determine the state of the system at the end of the job execution. Recovery requests an operator command. Four standard commands are available: to dump core, to dump mass storage, to select an output device, or to terminate recovery. The program is described in the MSOS reference manual.

There is only one error message:

Message	Significance
INCORRECT OPERATOR ENTRY	The operator must reenter the proper command and parameter list.

The job processor acts as executive for almost all background programs. Included in this section are diagnostic messages for the following utilities:

- Job processor entry
- Skeleton editor (SKED) for building libraries
- Library builder (LIBILD)
- Library editor (LIBEDT) for altering libraries
- Macro library maintenance (LIBMAC)
- Program compression (COSY)
- Sorting and listing (OPSORT, EESORT, LISTR, and LULIST)
- Program trace (TRACE)
- Macro assembler (ASSEM)
- MS FORTRAN (FTN)
- Input/output utilities
  - Input/output utility program (IOUP)
  - Magnetic tape editing (SETPV4)
  - Disk/tape utility (MTUP)
- Sort/merge
- Text editor
- Report generator (RPG II)

The commands which operate the macro assembler, MS FORTRAN, magnetic tape utility, sort/merge, and report generator programs are described each in their own reference manuals. All other programs cited are described in the MSOS reference manual.

JOB PROCESSOR ERROR CODES

Message	Significance
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 the library program executed before the job terminated.
JP01,hhhh	A program protect violation occurred at address hhhh.
JP02,hhhh	Illegal request or parameters at the specified hexadecimal address, hhhh
JP03, statement	An unintelligible control statement is output with the diagnostic.
JP04, statement	Illegal or unintelligible parameters in the control statement
JP05	The statement entered after manual interrupt is illegal.
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.
JP07	An unprotected program tried to access the protected device.
JP08	An attempt was made to access the read-only unit for write or the write-only unit for read, an attempt was made to access an unprotected request on a protected unit, or an attempt was made to select a mass storage device as the standard print unit.
JP09	An input/output error occurred while accessing the job processor file directory table.
JP10	An operation was attempted on file that is not in the job processor file table; define the file.
JP11	The file name being defined already exists for another job processor file. Dump the file table to select a name not used previously or attempt a new definition with another name.
JP12	An attempt was made to access a job processor file that has not been opened.
JP13	No job processor files are available for definition. Purge the file table to make any expired files available.
JP14	An attempt was made to open a previously opened job processor file, or an attempt was made to open more than one file on the same unit at the same time.
JP15,xxx	The JOB card is not the first control statement in the job, or more than one job card is detected within a job. xxx is the control statement in error.

SKED

The skeleton editor (SKED) consists of requests to the installation file builder (LIBILD) that specify the order of the binary programs that will ultimately become one of the MSOS libraries.

Message	Significance
COMMAND NAME NOT UNIQUE	Not enough letters are included to uniquely define the command.
ERROR IN COMMAND FORMAT	A comma, argument, etc., was omitted.
INVALID CHARACTER IN NUMBER	A nondecimal character is specified in the number argument.
INVALID COMMAND	The command is not legal for SKED.
INVALID RECORD NUMBER	The record number is out of range or the second argument is less than the first argument.
LU NOT LEGAL FOR COMMANDS	The LU type is not valid for the command requiring the LU.
NO INSERTION RECORD AT SPECIFIED LU	The device defined for insertion records does not contain any records.
RANGE CONTAINS NUMBER ALREADY DELETED	The record that is referenced has been deleted.
RECORDS HAVE BEEN PREVIOUSLY DELETED	The range of record numbers of the CATALOG command includes numbers that have been deleted.
RECORDS NOT DELETED PLEASE RESEQUENCE SKELETON	An attempt was made to delete more than 500 records since the file was last resequenced.
RECORD NUMBER IS ZERO	The record number of zero is illegal.
RESPONSE MUST BE LU(CR) OR (CR)	An invalid response to the message: ANY MORE INPUT. ENTER LU
SKELETON NOT LOADED	SKELETON was not loaded prior to operating upon it.

LIBILD

The library builder (LIBILD) merges input libraries of relocatable binary programs into a single output library. The installation file generated by LIBILD can be used by LIBEDT or the system initializer to build a system.

Message	Significance
BAD *DEF RECORD. NO IDENT CHARACTER	*DEF is not the first record of a definition group.
BAD *DEF RECORD. IDENT CHAR ALREADY USED. IGNORED.	
CHECKSUM ERROR NOTED IN LAST PROGRAM	The previously generated checksum does a compare with the current checksum when the program is read from mass memory.
ILLEGAL CHARACTER STARTS IDENT FIELD	The identification field must start with a single quote.
ILLEGAL IDENT FIELD. RECORD IGNORED.	The *B record was not terminated by a single quote prior to column 73.
ILLEGAL *B RECORD. RECORD IGNORED	The name field of *B must be enclosed by single quotes.
INVALID CLASS CODE	The device is incompatible with the function to be performed.
INVALID DEFINITION RECORD. IGNORED.	
INVALID LU	The logical unit is illegal.
INVALID *USE RECORD. IDENT FIELD. RECORD IGNORED.	No nonblank character was detected prior to column 73.
INVALID *USE RECORD. MAX IMBEDDED LEVEL IS 6. RECORD IGNORED	The *USE record is infinitely recursive.
LAST DECK REJECTED - NOT UNIQUE	There are duplicate copies of the program; the program identification must be unique.
LAST DECK REJECTED - NO XFER RECORD	The binary program does not have a transfer record. Type: 1 = Terminate 2 = Proceed to subsequent library 3 = Continue with current library
MORE THAN ONE PROGRAM HAS THIS NAME.	
NAME RECORD NOT 1ST RECORD OF DECK	Type: 1 = Terminate 2 = Proceed to subsequent library 3 = Continue with current library
NO DEFINITIONS ARE STORED. RECORD IGNORED.	*USE is encountered, but no definitions are made.

Message	Significance
NO DEFINITIONS WERE SUCCESSFULLY LOADED. TOO MANY DEFINITION SETS. IGNORED.	
NULL PROGRAM NAME. RECORD IGNORED.	The name field consists of two single quotes.
PROGRAM HAVING THIS ID INFO NOT FOUND	
PROGRAM NAME TOO LONG. RECORD IGNORED	The name on *B contains more than six nonblank characters.
PROGRAM SPECIFIED BY THIS RECORD NOT FOUND.	The first program on the library with this name is written to installation file.
TOO MANY BINARY DECKS LOADED. CHANGE LIMIT AND RECOMPILE.	This library has more programs than LIBILD can process.
XFR RECORD MISSING FOR LAST PGM LISTED. PGM DELETED.	Type: 1 = Terminate 2 = Proceed to subsequent library 3 = Continue with current library

LIBEDT

The library editor (LIBEDT) program allows adding, deleting, or altering programs on the program library, replacing certain programs, setting request priorities for system library programs, combining programs for output, and transferring information between peripheral devices and job processor files.

Message	Significance
L01	More than six characters in a parameter name are presented to the library editing program.
L02	More than six digits in a number are presented to the library editing program.
L03	An improper system directory ordinal was presented to the library editing program.
L04	An invalid control statement was presented to the library editing program.
L05	The illegal field delimiter in a control statement was presented to the library editing program.
L06	The illegal field in the control statement was presented to the library editing program, or and input/output was attempted on a protected device.
L07	Errors in loading resulted from a library editing program control statement.
L08	A program to be added to the program library has an entry point duplicating one already in the directory.
L09	The standard input failed on the first input record following an *N request.
L10	The operator is deleting a program that is not in the library.
L11	There is no header record on the 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	The common declared by the program being loaded exceeds the available common, or the system common was not specified in the system when requested.
L14	The 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	The illegal input block was encountered; the last program stored in the library is not complete.
L16	An input/output input error occurred; the last program stored is not complete.
L17	An *L program being installed exceeds the capacity of LIBEDT to input from mass storage.
L18	An attempt was made to load a zero-length program during an *M request or an *N request.
L19	No data base entry point is specified in the system for use by an *A statement and parameters.
L20	An irrecoverable error occurred during loading.
L21	An attempt was made to write beyond the maximum sector number specified for MAXSEC at initialization.

LIBMAC

The following error codes are output by the macro library generator (LIBMAC). The format is:

LIBMAC ERROR nn . . .

Where nn is one of the following codes:

Code	Meaning
01	No MAC definition card
02	Address modifier on MAC card
03	Label field missing or incorrect
04	Illegal terminator after macro name
05	More than two characters in a MAC or LOC definition card
06	Invalid special character on MAC or LOC card
07	Duplicate parameter names on MAC and/or LOC card
08	Invalid special character in a parameter string on a MAC or LOC card
09	Address modifier on LOC card
0A	No terminating apostrophe on macro skeleton record
0B	Parameter name on macro skeleton record not previously defined on MAC or LOC card
0C	Internal buffer exceeded; skeleton record too long
0D	Macro definitions exceeded limit (currently 320 definitions allowed)
0E	More than 65K of skeleton file defined

The line printed following the error code is the line in error. All errors are fatal.

COSY

This program allows the operator to compress information in the source decks by replacing three or more blanks on a card with two special ASCII characters.

Message	Significance/COSY Action
nn 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 Cnn****	
01	First card of revisions deck is not a DCK/, MRG/, CPY/, or END/control card. Action: 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. Action: 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. Action: Reads revisions and lists them with asterisks in columns 1 through 4 until it reads the next control card.
06	Sequence numbers out of order within the revisions set. Action: Reads revisions and lists them with asterisks in columns 1 through 4 until it reads the next control card.
07	Two sequence numbers on INS/ control card. Action: Reads revisions and lists them with asterisks in columns 1 through 4 until it reads the next control card.
08	Control does not follow DCK/ card when merging revisions. Action: 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. Action: Reads revisions and lists them with asterisks in columns 1 through 4 until it reads a DCK/ , MRG/, or END/ card.
11	Deck names on DCK/ and HOL/ cards do not agree when adding new deck to COSY library. COSY aborts.
12	Revision card following DCK/ card is not a control card. Action: 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 the end of the input deck. Action: 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 Action: 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. Action: Uses a second parameter.
16	DCK/ card requests both H and C or H and L on the same unit. Action: C or L parameter is ignored; processing continues.
17	DCK/ card requests input from logical unit previously used for output. Action: Reads revisions and lists them with asterisks in columns 1 through 4 until it reads a DCK/, MRG/, or END/ card.
18	COSY output is requested on unit previously used for Hollerith output or Hollerith output is requested on unit previously used for COSY. Action: Illegal output request is cleared; processing continues.
19	Maximum number of output units is exceeded. Action: Output is cleared; processing continues.
20	The DCK/ card requests output on a logical unit previously used as input. Action: The output is removed; processing continues.
21	The DCK/ card requests C and L output on the same unit. Action: The L parameter is ignored; processing continues.
22	The CPY/ control card is not the first card of the revisions deck. Action: 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.

Message	Significance/COSY Action
L,lu FAILED ec	COSY driver errors are output by the alternate device handler. All errors are catastrophic. Action: For protected requests, type CU. For unprotected requests, type DU. ec = 1 Not assigned. 2 First record read was not a CSY/ record. 3 END/ card was not the 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. 6 A motion request was made to a logical unit assigned to input/ output, and no end-of-deck marker was encountered.
REWIND LUnn	This message may appear at various times during a COSY job. The specified number is the decimal logical unit to be rewound. Action: The operator must enter any value through the standard input comment device after rewinding the unit.

SORTING AND LISTING

Four utilities are included in this group:

EESORT processes relocatable binary programs to prepare a listing of program name, card comments, length, common size, data size, entries, and externals. There is only one diagnostic message:

Message	Significance
MEMORY OVERFLOW – NO SORT	Not enough core to process the program

OPSORT operates on 1700 series assembly language operands. There are no diagnostic messages.

LISTR lists the name and record length of all programs on a binary tape. There are no diagnostic messages.

LULIST lists the system logical units. There are no diagnostic messages.

PROGRAM TRACE

Trace provides the operator with the ability to list certain information about a running program. The program cannot trace through protected core (e.g., monitor calls, jumps to

dispatcher, or calls to find addresses to table of presets), but it can recommence at the completion address of a monitor request.

The messages are:

Message	Significance
SPECIFY PARMS (ssss, llll, eeee, aaaa, qqqq, iiii, x, y)	Trace has been entered, operator must specify: ssss Starting address of trace llll Starting address of traced program eeee Ending address of trace aaaa Initial contents of A, Q, qqqq and I registers iiii x if = L, loop instruction listing is suppressed y if = S, subroutine instruction listing is suppressed
TYPE *C TO CONTINUE, TYPE *Z TO ABORT	Trace reached a point where it cannot logically continue; *C returns control to the traced program.
EXECUTION TIME DURING THIS PART OF EXECUTION 1784-1 ** 1774 ** 1704 ** 1784-2 wwww xxxx yyyy zzzz	When trace is suspended, the instruction time (in hexadecimal count) is given for time spent in the specified computer.

MACRO ASSEMBLER

The macro assembler transforms source language into 1700 series object language. The OPSORT program is often used with the macro assembler.

Messages are:

Message	Significance
xxxxyy**********	Format for pass 1 and 2 error messages: xxxx A 4-digit line number. yy A 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	The assembler was loaded at a different location from the location where it was absolutized.
**DS	Double defined symbol; a name in: • The location field of a machine instruction or an ALF, NUM, or ADC pseudo instruction • The address field of an EQU, COM, DATA, EXT, BSS or BZS pseudo instruction
**EX	Illegal expression: • No forward referencing of some symbolic operands • No relocation of certain expression values • A violation of relocation • Illegal register reference • A symbol other than Q, 1, or B is specified.
INPUT ERROR	An error was returned by the driver when doing a read.
**LB	The numeric or symbolic label contains an illegal character. The label is ignored.
MASS STORAGE OVERFLOW	There is 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	Overlow 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 • Illegal operation code terminator
**OV	The numeric constant or operand value is greater than allowed.

Message	Significance
**PP	There was an error in the previous pass of the compilation assembly. See the output page immediately preceding the first page of the listing for the pass 1 or pass 2 error message.
**RL	Illegal relocation, either: • Violation of relocation • Violation of an instruction rule that requires the expression value to be either 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	An undefined symbol in an address expression

MS FORTRAN

The MS FORTRAN package allows the programmer to write his programs in simple English-like statements. The FORTRAN compiler (one of two versions) and run-time packages (one of three versions) translate the programs to 1700 series code and execute it either in foreground or background mode.

FORTRAN COMPILATION ERROR MESSAGES

Compilation errors are listed at the end of the source listing and are indicated within the source listing in the following format:

Message	Significance
* N/F , code, no., part	A compilation free of diagnostics is syntactically correct. The compilation is also free of common semantic errors, such as undefined variables in context that require definition. If the detected error prevents the code from being generated in a reasonably accurate manner, 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 that may not be fatal (e.g., an A in column 3) are flagged. A reference to such a label (or the intended nonexistent label) causes the fatal error. Where: N is a trivial error; only flagged. Example: not separating array declarators in a dimension statement F is a fatal error code is the diagnostic number; see the following message for listing of codes no. is the number of statements in error; appears only when applicable part is the 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. Where: N is a trivial error; only flagged. Example: not separating array declarators in a dimension statement F is a fatal error code is the number of statements in error; appears only when applicable

1	The field is not recognizable (illegal characters in field, such as 8 in octal field).
2	The minimum range limit of a constant is exceeded.
3	More than six characters in a name
4	The maximum range limit of a constant is exceeded.
5	The exponent is missing in a constant.
6	The subscripted variable was not previously dimensioned.
7	The expression in an IF statement does not have initial parenthesis.
8	Incorrect FORMAT statement
9	Illegal use of the .NOT. operator

Message	Significance
10	Illegal operator or operand
11	The subprogram reference is illegal.
12	The labeled END card is illegal.
13	The number of arguments differs in references to the same subprogram.
14	The implied DO in the DATA statement either contains the wrong number of subscripts or the subscript is out of range.
15	The expression has an illegal termination.
16	Unmatched parentheses in an expression
17	The relational operator is missing.
18	The relational operator was used illegally.
19	An asterisk is assumed.
20	Only one ** is allowed per parentheses level.
21	A variable and a subprogram name are interchanged.
22	The 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	The statement is syntactically incorrect.
26	This array was previously dimensioned in a DIMENSION, COMMON, or TYPE statement or previously defined in an EXTERNAL statement. The previous dimensioning or defining is retained, and the new is ignored.
27	The field must be a variable or array name if processing a COMMON, DATA, EQUIVALENCE, BYTE, or SIGNED BYTE statement; an array name if processing a DIMENSION statement; or an array, variable, or FUNCTION name if processing a type statement.
28	The logical IF statement contains another logical IF, DO, DATA, or FORMAT statement.
29	The name must be the name of an array.
30	Must be first statement of program unit
32	A missing comma in this statement is assumed.
34	The 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 labeled common blocks are 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	The name is specified as two different types. This specification is ignored.
39	This byte is typed as other than an integer, or it is a formal argument. The byte specification is ignored.
40	This byte was previously specified as a different type. The previous specification is retained, and this specification is ignored.
41	The bit specified is not within the bounds of the 1700 series word size.
42	The least significant bit in this specification is greater than the most significant bit.
43	The name must be an external function or subroutine name.
44	The field must be a nonzero positive integer constant.
45	The array has more than three dimensions.
46	The DATA statement contains too many constants for the space provided.
47	The statement has more than five continuation cards; excess cards are ignored.
48	An insufficient number of constants is provided in this data statement.
50	The constant is not the same type as the corresponding data cell.
51	The statement redefines the DO loop parameter
52	The statement type is unrecognizable, or it follows an executable statement.
53	Not defined
54	The statement label is meaningless; the label is ignored.
55	The statement label was previously defined; the current label is ignored.

Message	Significance
56	The program name is expected in this field.
57	Too many dimensions caused a table overflow.
58	The symbol table overflowed; compilation terminates.
59	The statement label may not be zero.
60	There is no apparent exit from this program.
61	Unclosed DO-implied list
62	An unformatted WRITE must have a list.
63	The name must be an integer variable or integer constant.
64	The name is not implicitly an integer variable.
65	A RETURN statement may appear only in a subroutine or function definition. A STOP statement is assumed.
66	Superflous information in this statement is ignored.
67	This field on the STOP card must have an octal number not greater than 77777. STOP is assumed.
68	The field must be a positive integer.
69	The field must be an integer variable.
70	The field must be a statement label.
71	This form of the 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 when it is not the last DO encountered.
74	This GO TO jumps to itself.
75	A program consisting of only an END card is illegal.
77	Too many unique dummy parameter references caused a compiler table overflow.
78	The label in a DO statement must reference a statement following it.
79	The maximum allowable number of nested DOs was exceeded. The DO loop may be implied in a DO list.
80	Subroutine argument table overflow caused by a 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	An array element in a BYTE, SIGNED BYTE, DATA, or EQUIVALENCE statement either has the wrong number of subscripts or the subscript is out of range.
88	Too many EQUIVALENCE names caused a compiler table overflow.
89	At least two elements must appear in an EQUIVALENCE statement.
90	The preceding equivalenced symbols have overflowed the origin of common.
91	The DATA statement field is not an integer, real, double precision, or literal constant.
92	Missing terminating asterisk or quote in a literal string as appropriate.
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	The relative address argument in the ASSEM statement requires an asterisk at the end of the preceding instruction.
110	An overflow of the table used for symbol references; subsequent references are not listed by the option S processor.
111	The index used in this subscripted variable is in conflict with the dimension declaration.

Message	Significance
113	The maximum number of macros overflowed; this macro definition is ignored.
114	This macro was previously defined; the new definition is ignored.
115	Call to an undefined macro.
116	Embedded macros are illegal.
152	Arithmetic table overflow.

FORTRAN I/O RUN-TIME ERROR MESSAGES

The following error messages apply only to the FORTRAN input/output run-time.

Message	Significance/Action/Result
1 I/O RQST statement no. ffff	Error in a format statement; illegal character in format statement. Program terminates. Where: ffff is the current decimal value of the format statement pointer.
2 I/O RQST statement no. ffff gggg	Illegal character in the input field. Program terminates. Where: ffff is the current decimal value of format statement pointer gggg is the current decimal value of input field pointer
3 I/O RQST statement no. ffff gggg	Input data exceeds the limits of the 1700 series word: Exponent >$|39_{10}|$. Program terminates. Where: ffff is the current decimal value of the format statement pointer gggg is the current decimal value of the input field pointer
4 I/O RQST statement no. xx	Attempt to read on a write unit or write on a read unit. Program terminates. Where: xx is the decimal unit number of a device used improperly.
5 I/O RQST statement no. xx	Read or write request after an end-of-file has been read without first doing an end-of-file check. Program terminates. Where: xx is the decimal unit number of a device used improperly
7 I/O RQST statement no. xx	A write was attempted on magnetic tape with no write enable. To continue, press RETURN. Where: xx is the decimal unit number of a device is used improperly.
8 I/O RQST statement no. xx	An attempt was made to use a logical unit number greater than 99. Program terminates. Where: xx is the decimal unit number of a device is used improperly.
9 I/O RQST statement no. xx	Backspace at loadpoint. Program terminates. Where: xx is the decimal unit number of a device is used improperly.
10 I/O RQST statement no. xx	The end of magnetic tape is sensed. To continue, press RETURN. Where: xx is the decimal unit number of a device is used improperly.
12 I/O RQST statement no. ffff	Illegal formatted input; more elements are given than are contained in an input record. Program terminates. Where: ffff is the current decimal value of the format statement pointer
13 I/O RQST statement no. ffff	Illegal list; a list is given but there are no conversion codes in the format statement. Program terminates. Where: ffff is the current decimal value of the format statement pointer
14 I/O RQST statement no. xx	The file is defined twice; more than one OPEN request is given for the same file. Program terminates. Where: xx is the decimal file number for a mass storage device
15 I/O RQST statement no. xx	The parameter is negative or zero; one of the parameters in an OPEN statement is negative or zero. Program terminates. Where: xx is the decimal file number for a mass storage device

Message	Significance/Action/Result
16 I/O RQST statement no. xx	The sector address is too large; the starting sector address or ending address exceeds 2^{15} -1. Program terminates. Where: xx is the decimal file number for a mass storage device
17 I/O RQST statement no. xx	The file was not defined; a READ or WRITE request was given for a file that was not defined by an OPEN statement. Program terminates. Where: xx is the decimal file number for a mass storage device
18 I/O RQST statement no. xx	The logical unit is not a mass storage device. Program terminates. Where: xx is the decimal file number for a mass storage device
19 I/O RQST statement no. xx	The record number in the READ or WRITE request is incorrect. The resulting sector address is out of the range of the file, or it is zero program terminates. Where: xx is the decimal file number for a mass storage device.

MISCELLANEOUS FORTRAN ERROR MESSAGES

Message	Significance
CORE OVFL	More than 32,767 cells of object code have been produced
*UD	Undefined symbol in address field
UNDEFINED SYMS name name name	Undefined statement labels and variable names
*SO	Scratch mass memory overflow
INPUT ERROR	A request from the comment device for input has returned on error. FORTRAN exits the job.

INPUT/OUTPUT UTILITIES

Five programs are included in this category:

- Input/output utility program (IOUP) transfers data from one input/output device to another, compares data, and commands motions on input/output devices. The devices serviced are card readers/punches, magnetic tape transports, paper tape equipment, and line printers. The MSOS reference manual describes the IOUP command set.
- Magnetic tape editing (SETPV4) provides the capability to build and maintain installation files. The MSOS reference manual describes the SETPV4 command set.
- Disk/tape utility (DSKTAP via DTLP). The DSKTAP program is loaded under the job processor using DTLP. The program allows saving the disk and tape or loading (protected as well as unprotected) the disk from tape. The MSOS reference manual describes the DSKTAP/DTLP command set.
- Magnetic tape utility (MTUP) provides a variety of tape commands including tape-to-tape copying, dumps, initialization, record control, motion, and conversion. The Magnetic Tape Utility Processor Reference Manual describes the MTUP command set.
- Flexible disk utility (FDDUTY) provides a variety of commands for the flexible disk including initialization, writing programs onto the diskette from another input/output device, copying data from one diskette to another, and verifying data from one diskette to another. The MSOS reference manual describes the FDDUTY command set.

The diagnostic messages for each of these programs follows.

IOUP

Message	Significance
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 the last interruption, or $END, to terminate the request.
FILE BACKD FILE nnnn FILE BACKD RECS nnnn	The specified unit has been backspaced by nnnn files or records.
FILE SKIPD FILE nnnn FILE SKIPD RECS nnnn	The specified unit has been advanced by nnnn files or records.
FORMAT ERROR	Invalid control statement; re-enter the statement.
IN/OUT ERROR LU	An error occurred in an input/output operation on logical unit nn.
MISMATCH REC nn*32768+nnnnn	The indicated data is not the same on both the records being verified. nn — 00 through 03; the quotient obtained by dividing the total number of records by 32,768. If nn is 0, only nnnnn is typed out.

Message	Significance
nnnnn	0 through 32,767; the remainder obtained by dividing the total number of records by 32,768.
MODE DIFFERENT ON MAG TAPE	One or more records on magnetic tape contain the same information as the record being verified against but of a different mode.
UT FORMAT INCORRECT	The request is not correctly formatted; parameters and/or delimiters are incorrect.
UT INVALID REQUEST	The mnemonic request code is illegal.

SETPV4

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. The message format is:

*****ERROR code

	Type	Error
1	IF	An *L control statement must be the first statement.
2	DF	Illegal or wrong format for the control statement.
3	IF	An *E must be the last control statement.
4	IF	Output is attempted with parameters less than the current position.
5	DF	Control statements are out of order (issued after an attempt sort).
6	IF	The maximum number of control statements is exceeded (1200 maximum).
7	DF	The first statement is an *I or an *R statement and cannot 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 is 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

DSKTAP/DTLP

The DTLP loader function has no diagnostic messages. DSKTAP messages are as follows:

Message	Significance
DISK ERROR ssss	Disk failed to respond to input/output commands; ssss is the device status.
ILLEGAL PARAMETERS SPECIFIED	The equipment code is not in hexadecimal format.
SECTOR xxxx WORD – WW DOES NOT COMPARE. TYPE C TO CONTINUE OR A CARRIAGE RETURN TO ABORT	Verification failed; the disk address is given.
TAPE ERROR ssss	Magnetic tape failed to respond to input/output commands; ssss is PHYSTB word 12 status.
TURN OFF PROTECT SWITCH, TYPE CARRIAGE RETURN	The computer protect switch must be off to run DSKTAP.

MTUP

There are four types of MTUP diagnostic messages: action, descriptive, serious errors, and warning errors.

Action Messages

Message	Significance/Action
*DATA SET NAME:	Label processing: output volumes require a data set name if not available from input. Action: DSN="XXXXX"
*INVALID PARM= "XXX. . ." *RETYPE PARM:_	The characters within quotes are invalid and may be corrected. Action: Enter corrected parameter.
*MOUNT,OUTPUT, SCRATCH:	Action: Type carriage return, which implies that tape is ready, or type any other character followed by a carriage return to terminate the initialize function.
VOLSER=nnnnnn	Informative tape file just opened with the specified volume serial number Action: None
*VOLSER=nnnnnn: VOL NOT EXPIRED USE:	Label processing: output volume header records are checked against the system date.

Message	Significance/Action
	Action: Carriage return implies do not use. U implies use, ignoring expiration date.
10 ERRORS *CONTINUE:	Verify function has located 10 consecutive records that contain errors. Action. Type carriage return to terminate or type one character followed by carriage return to continue.

Descriptive Error Messages

Message	Significance/Action
****C000****	Data buffer linkage has been destroyed. Cause: input/output malfunction, CPU malfunction Action: Reload utility.
FILES(S) NOT OPEN	A required file is not open, and the specified function cannot be executed. Action: Open the file and re-enter the function.
*FUNCTION NOT AVAILABLE	An attempted function is not available in the system. The function is not invalid; rather, the system was configured without the requested module. Action: Use another function, if possible.
*INCORRECT VOL MOUNT:	The volume mounted does not contain a volume label or the header label sequence is incorrect; i.e., the wrong volume of a multiple volume file is mounted. Action: Mount the correct volume and type a carriage return.
*INVALID OPEN OR CLOSE	The file being opened or closed is already in that state. Action: Open or close the proper file.
*PARM NOT AVAILABLE	A parameter is not available in the system. The parameter is not invalid; rather, the system was configured without the requested module. Action: Use another parameter, if possible.

Serious Error Messages

Message	Significance/Action
****S000****	Available memory has been filled. Action: Free memory by closing a file.
****S001****	Attempt to close a file already closed. Action: Close proper file.
****S002****	• Read end-of-file • Attempt to write on a file not opened for write. • Input/output error; i.e., parity, read, or write error, lost data, or alarm. Action: Retry the function.
****S003****	Variable length block does not match actual length read, or variable read length is greater than specified block size. Action: Close all files. Open input as undefined and dump records to locate the erroneous record. The file cannot be processed as variable length.
****S004****	Blocking has been requested, and specified block size is smaller than specified record size. Action: Reopen the file with proper parameters.
****S005****	A variable size error was detected prior to write. Action: Attempt to re-execute the function after closing and reopening all files. Possible hardware malfunction
****S006****	A fixed block error was detected prior to write. The record length is not specified. Action: Close the file and reopen with the proper record size or dump file to locate erroneous records.
****S007****	The labeled file sequence number is in error (file is not opened.) Action: Mount the proper volume and reopen.
****S008****	The labeled file EOF1 trailer label contains invalid information that does not correspond to header label 1. Action: This file cannot be processed with standard labels.

Message	Significance/Action
****S009****	The labeled file is missing end-of-file trailer labels. Action: The file cannot be processed as labeled.
****S010****	The end-of-tape is sensed on the output file (unlabeled). Action: Close the file with end-of-volume and reopen after mounting the new tape. Re-enter the function to complete processing.
****S011****	A double file mark has been sensed on an input file. Processing is terminated. Action: Close the input file and mount next volume. Re-enter the function to complete processing.
****S012****	Invalid date. Action: Re-enter the date function with the proper date.
****S013****	The labeled volume sequence number is incorrect (occurs after OPEN file is not opened). Action: Mount the proper volume and re-open the file.
****S014****	The ZERO LENGTH block specified in the OPEN FILE is not opened. Action: Reopen, specifying the proper block length.
****S015****	The block or record length specified is not a multiple of two. FILE, is not opened. Action: Reopen, specifying the even block and record length. If either the block or record length is odd, the data cannot be processed by the system.

Warning Error Messages

Message	Significance/Action
xxxW000xxx	Blocking is not specified but the block size and record size have been specified differently in OPEN. Action: Open the file with the proper parameters or continue the statement.
xxxW001xxx	The file count is specified as zero. Action: Re-enter the function with the proper parameters or continue the statement.
xxxW002xxx	The record count is specified as zero. Action: Re-enter the function with the proper parameters or continue the statement.
xxxW003xxx	The input and output record lengths have been specified differently for COPY. Action: Re-enter the function with the proper parameters or continue the statement.

FDDUTY

The FDDUTY error codes are numeric and are preceded by one of the three characters below:

(blank)	An incorrect user record
*	The resources of the FDDUTY program and/or computer are not sufficient to execute.
+	A possible irrecoverable hardware problem

Message	Significance
+0540	More than two bad tracks have been detected while initializing. Discard the diskette and retry with another diskette.
+0550	The written track of initialized data was not read correctly, but the hardware did not detect an error. Retry and/or request maintenance support.
0610	Illegal sector address; the user attempted to write (using an *A, *B, or *H request) beyond the maximum allowable sector address. Move the program to a lower sector address or place the program on another diskette.
+0620	A fatal flexible disk drive input/output error has occurred. Assure that the flexible disk drive unit is ready (the diskette is inserted and the door is closed) and that the switches are set properly (i.e., write enabled, initialize enabled, and unit reverse). If this has been done, retry with another diskette and/or request maintenance support.
+0630	The written data, when read, does not compare exactly. Retry and/or request maintenance support.
0710	The specified logical unit is not a flexible disk drive.
0810	One of the parameters of the last read request record is illegal. For example, the sector address may be larger than the maximum allowable sector address.

Message	Significance
0910	One of the hexadecimal parameters of the last read request record is not a hexadecimal digit.
1010	Illegal diskette format; the format (IBM or CDC) of a diskette to be read or written does not agree with the last *F request record (if there is no *F record, CDC format is assumed). This error should only occur if a diskette is inserted to be read or written without first being initialized by the FDDUTY program.
0260	Illegal NAM record; the NAM record encountered was not the first record of a relocatable binary program.
0270	Illegal relocatable binary record; an undefined or illegal (BZS or EXT) relocatable binary record has been encountered.
0280	Illegal first record of the relocatable binary program; the first record of a relocatable binary program was not a NAM record; instead it was an ENT, XFR, or RBD record.
0290	No end byte was encountered on the last relocation byte of an RBD record.
*0299	Program size is too large; the size of the program being loaded (plus the FDDUTY program) is too large to fit in the program memory area. To load such a program, the operating system must be rebuilt to sufficiently increase the program memory area.
*0510	Not enough memory to initialize; the area needed to properly initialize a diskette (plus the FDDUTY program) is too large to fit in the program memory area. To initialize, the operating system must be rebuilt to sufficiently increase the program memory area.
+0520	Fatal flexible disk drive error while initializing; a fatal error has occurred on the flexible disk drive. Ensure that the flexible disk drive unit is ready (diskette is inserted and the door is closed), and the switches are set properly (i.e., write enabled, initialize enabled, and unit reverse). If this has been done, retry with another diskette and/or request maintenance support.
+0530	Track zero was detected to be bad while initializing. Discard the diskette and retry with another diskette and/or request maintenance support.
0110	Illegal control record; position 1 of the request record does not contain an asterisk, or position 2 does not contain a legal character (A, B, C, F, H, I, R, S, V, or Z).
0120	Illegal start or end address; the ending sector address is less than the starting sector address on an *C or *V record.
0130	Illegal sector address; the computer last sector address to be written (*C) or compared (*V) is greater than the maximum allowable sector address.
0140	Illegal *F request; the specific number of words/sector and/or sector/track is incorrect.
0210	Illegal record after an *A record; position 1 does not contain an asterisk, or position 2 does not contain a comma (program name specification) or T (terminate).
*0220	Too many program names specified; more than 20 program names have been specified. To increase the number of program specification names, the FDDUTY program needs to be reconfigured.
0230	Illegal record after program name specifications; the record is neither a relocatable binary record nor an*T record.
0240	No binary program is entered; an *T record (terminate) was encountered without any relocatable binary program being loaded.
0250	Program specification error; one or more program specification names have not been encountered as relocatable binary programs.

SORT MERGE (SMC)

Sort/Merge for MSOS 5 is an interactive dialog program. For several of the diagnostics, the operator has the option of continuing, avoiding this error, or avoiding this type of error. The interactive dialog is described in the Sort/Merge reference manual.

Message	Significance
ABNORMAL ERROR = n	Values of n are given below. No operator action is expected. 1 = Unexpected release file status return 2 = Unexpected retrieve sequence status return 3 = Unexpected store sequence status return 4 = Illegal logic unit for work file; fatal error 5 = Unexpected call to or status from define file (DEFFIL); fatal error 6 = Input to binary/decimal conversion was >9999; fatal error

Message	Significance
	7 = Fixed tables contain the incorrect edit phase (SMCEDT) size; fatal error
	8 = Fixed tables contain the incorrect sort phase (SMCSRT) size; fatal error
	9 = Call to intermediate merge (SMCIMG) unjustified, since all remaining strings can be merged by the final merge (SMCFMG); fatal error
	10 = Fixed tables contain the incorrect intermediate phase (SMCIMG) size; fatal error
	11 = The call to the final merge (SMCFMG) unjustified, since the number of strings to be merged exceeds the number that can be merged in a single pass.
	12 = Fixed tables contain the incorrect final phase (SMCFMG) size; fatal error
DEFFIL REQIND = <parameters>	Bad user-defined output file status; run aborted. Action: Operator must redefine file.
FWRITE STATUS = <parameters>	Information and request for action: The operator may direct program to rewrite the file, to abort the run, or to continue without operator interaction for format write errors.
INTERPHASE RECORD COUNTS DISAGREE	The number of output records does not equal the number of input sort records. No operator action.
OVERSIZE BLOCK <parameters>	Information on operator's choice of block size. Action: The operator may direct the program to reread the file, to delete it, or to continue without operator interaction for this block size type error.
RELFIL REQIND = <parameters>	The release file operation failed. Action: Operator may direct program to retry the release or to continue with or without operation interaction for this type of error.
RTVSEQ REQIND = <parameters>	Retrieve error. Action: The operator may direct the program to again retrieve the file, to delete it, or to continue without operator interaction for this type of retrieval error.
SEGMENT LIST ERROR	Sort-only run. Work file accountability lost; run aborted. No operator action
SEQ DIR ERROR	Sort-only run. Sequence directory read/write error; run aborted. No operator action.
SEQUENCE ERROR	Latest record should have preceded previous record in key merging. Action: Operator may direct the program to delete the record or to continue with or without operator interaction for this type of error.
STOSEQ REQIND = <parameters>	Store error. Action: operator may direct the program to again store the file, to abort the run, or to continue without operator interaction for this type of store error.
TOO LITTLE CORE	The requested inputs cannot be processed in available core. No operator action.
TOO LITTLE DISK	Sort-only run. Inadequate disk space; run aborted. No operator action.
TYPE-IN ERROR	Error in trying to interpret operator's command. Action: Operator reenters proper command statement.

SORT (DSORT)

The sorting operation for ITOS (DSORT) is called only from a procedure. Most errors reported by diagnostic errors lead to a fatal error. The operator must then alter the procedure stream, and recenter it. The DSORT utility is described in the ITOS Reference Manual.

Message	Significance
ABNORMAL ERROR = n	Values of n are:
	1 = Unexpected release file status return
	2 = Unexpected retrieve sequence status return
	3 = Unexpected store sequence status return
	4 = Open file error
	5 = Unexpected call to or status from define file (CREATE)
	6 = Input to binary/decimal conversion was >9999
	7 = Fixed tables contain the incorrect edit phase (SMCEDT) size
	8 = Fixed tables contain the incorrect sort phase (SMCSRT) size

	9 = Call to intermediate merge (SMCIMG) unjustified since all remaining strings can be merged by final merge (SMCFMG)
	10 = Fixed tables contain the incorrect intermediate phase (SMCIMG) size
	11 = The call to the final merge (SMCFMG) unjustified, since the number of strings to be merged exceeds the number that can be merged in a single pass
	12 = Fixed tables contain the incorrect final phase (SMCFMG) size
	13 = Error encountered while trying to close file
	14 = Error encountered while trying to update FCB request
	15 = Error encountered while processing GETFCB request
aa...aa	Numerical data with prefix
aa... ...aa	Card image appears with other messages specifying error
ABNORMAL ERROR = (error)	Alerts operator that sorting operation failed.
ADDROUT SORTS ONLY 1 FILE	Use only one input file for an ADDROUT sort
BLKSIZ/RECLTH .NE. 1,2,3,...	Record length parameter is not a divisor of block size parameter.
CANNOT OPEN INPUT FILE	Cannot sort the requested file since it cannot be opened to be read.
CLOSEFL REQIND = $xxxx	Status word for CLOSEFL operation when CLOSEFL failed
CREATE REQIND = $xxxx	Status word for CREATE operation when CREATE failed
DELETE REQIND = $xxxx	Status word for DELETE operation when DELETE failed
DONE = (number)	Number of records processed
EXPECTED aa...aa FOUND bb	Sort did not find the type of parameter expected. Sorting is aborted
FATAL ERROR	Sorting operation was aborted
FN=aa...aa,bb...bb	Reconstructed input file name and owner
FILNAM=aa...aa, bb...bb	File name/owner for input or output files
GETFCB REQIND = $xxxx	Status word for GETFCB operation which failed
GETS REQIND = $xxxx	Status word for GETS operation when GETS failed
INTERPHASE RECORD COUNTS DISAGREE	Number of output records does not equal number of input sort records
INPUT FILE LENGTHS ARE NOT EQUAL	Cannot sort files with unequal record length
KEY FIELD EXTENDS BEYOND END OF RECORD	Key specified is too long for record
OPENFL REQIND = $xxxx	Status word for OPENFL operation when OPENFL failed
OUTPUT FILE RECORD LENGTH IS ZERO	Data sort with all of record used for keys
OUTPUT RECORD COUNT BAD	Improper number of records in output file
PASSED = (number)	The specified number of records were either processed or skipped
PUTS REQIND = $xxxx	Status word for PUTS operation when PUTS failed
SEQ. DIR. ERROR	Sequence directory read or write error
START OF KEY FIELD OUTSIDE OF RECORD	Key position starts before or after record
TOO LITTLE CORE	Requested inputs cannot be processed in amount of core space available
TOO LITTLE DISK	Inadequate disk space for sorting operation
TYPE-IN ERROR	Sort cannot interpret command statement in the procedure stream
UPDFCB REQIND = $xxxx	Status word for UPDFCB operation when UPDFCB failed
VOLUME = (name)	Volume name
VOLUME (name) NOT MOUNTED	Volume specified for output file is not mounted

TEXT EDITOR

Using its own two files (work file and user file), text editor can build files or alter any job processor files. The editor can operate on any file read into its own file space. The following diagnostic messages can appear during those commands shown:

Message	Significance/Command
DISK READ ERROR	The work file and scratch file are kept on disk; each line is read as a separate record. A disk read or write error may occur during any read operation. Commands: Any
DIRECTORY READ ERROR	The parameter fileid cannot be obtained while reading the job processor directory. Commands: GET, MERGE, SAVE
FILE NOT DEFINED	The parameter fileid is not in the job processor directory. Commands: GET, MERGE, SAVE
FILE SPACE FULL	The file manager has run out of space to assign to its text editor (work file or user file). Commands: Any except EXIT, CLEAR, CONTROL
INVALID COMMAND	The necessary characters at the beginning of the command mnemonic are erroneous, or a necessary parameter is omitted or wrong (e.g., $k_2<k_1$). Commands: Any
INVALID LINE NUMBER	The line number parameter (k or n) is greater than 9999. Commands: Any but EXIT, CLEAR, CONTROL, SAVE, ALIGN
LINE NUMBER OVERFLOW	Line number >9999. For all but RESEQ, the text editor saves in the work file all data up to the line causing the overflow. For RESEQ, the work file is lost. Commands: LOAD, MERGE, GET, AUTO, RESEQ
NAME NOT UNIQUE	The operator specified only the first letter of the command mnemonic (A,C,D,L, or S). At least the first two letters of these commands must be specified. Commands: AUTO, ALIGN, CHANGE, CLEAR, CONTRL, DELETE, DUMP, LIST, LOAD, SAVE, SEARCH

RPG II

Numerous diagnostic messages are provided by the report program generator (RPG II): Compilation errors:

- Control card diagnostics
- Extention code diagnostics
- Calculation diagnostics
- Output format specification diagnostics
- Compile time array diagnostics

Run time errors

Data manager errors

Disk file utility errors

There are several hundred of these messages that are very closely tied to the source language format of RPG II. The messages are listed in detail in the RPG II reference manual, appendix E.

Three types of input/output equipment diagnostics are provided.

- The basic failure message (LU xx FAILED yy) that specifies the unit (xx) that failed and the code (yy) that specifies the failure cause
- Other failure messages produced by a few controllers (special messages)
- Status information. In this manual, only those status words are described that are readily available to the user; i.e., the engineering log status (PHYSTB, word 12) and other status words saved in PHYSTB.

The first and second types of diagnostics are produced for all input/output devices. For additional information on the status words, the hardware maintenance manual for the individual device should be consulted.

BASIC EQUIPMENT MALFUNCTION

When a system input/output device driver has detected an error, the alternate device handler is called. The alternate device handler prints the following diagnostic message on the standard comment device if no alternate device is defined:

```
LU,nn FAILED xx
ACTION
```

Where: nn is the number of the logical unit that failed

xx is the failure code.

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 control unit 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 control unit 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.

DEVICE FAILURE CODES

Device Failure Code and Error	Significance/Action
0 Time-out	Failure to interrupt within the allotted time (requires TIMER package) Teletype: The operator failed to supply input within the allotted time. Ignore the message and continue normally. All other devices: The hardware failed to generate an interrupt within the allotted time. Hardware maintenance is required.
1 Lost data	Data was not transferred out of the read register before the next data word appeared. 1711/1713 Teletypewriter: Retype the statement. 1829-30/60 Card Reader (diagnostic logic unit only): bad initiator status 1833-5 Flexible Disk: bad initiator pseudo status Magnetic tape: Use the control unit option to continue without processing the lost record or abort the read option.
2 Alarm	Indicates the presence of an abnormal condition 1713 Paper Tape Reader: paper tape motion failure. No change in the feed hold circuit has occurred for 40 milliseconds while trying to read. If not the 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 the control unit option. Paper tape punch: paper tape supply low or tape break. Abort the punch operation and correct the problem.

Device Failure Code and Error	Significance/Action
2 Alarm (contd)	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. 1829-30/60 Card Reader (diagnostic for logic unit only): bad continuator status 1832-5 Cassette Tape: runaway tape 1833-5 Flexible Disk Drive: bad continuator pseudo status COSY driver: The first record is not a CSY/ control record. Magnetic tape simulator: failure to fulfill request due to mass storage device error Pseudo tape: Failure to fulfill request due to mass storage device failure.
3 Parity	1711/1713 Teletypewriter: Attempt recovery by retyping the command 1713 Paper Tape Reader: 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 read request by typing RP in response to the error message. Magnetic tape: The tape is positioned after the bad record. Either tape the control unit option to continue processing (the bad record is ignored) or abort the operation. COSY driver: The last record was not an END/record. COSY deck must have END/record added. Magnetic tape simulator: illegal record header or header not found

Device Failure Code and Error	Significance/Action
4 Checksum	FREAD binary: The sum of the header word and data in a record did not balance to zero when added to the checksum word. Card readers: The 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. 2. For 1728-430/1729-2/1729-3 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; with a multicard record, re-read all cards within the record. 4. For 1726-405 only, press the RELOAD memory switch. 5. Ready the card reader. 6. Take the RP option. 1833-5 Flexible Disk Drive: status faults after input/output COSY driver: There was no end-of-file mark following the END/record.
5 Internal reject	The computer cannot communicate with the device. Check the hardware address switch and POWER ON switch. The RP option may be used if the problem has been corrected. COSY driver: Read on the write unit or write on read before the end-of-deck marker is encountered.
6 External reject	The input/output 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. COSY driver: The motion request is on the read unit after the CSY/record and before the end-of-deck marker.

Device Failure Code and Error	Significance
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 the 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 the card checksum error (see error code 4).
8 Illegal Hollerith punch	Occurs when the card reader encounters a punch sequence that does not comply with the Hollerith to ASCII conversion table being used by the driver. To allow software recovery, the driver places an ASCII ? in the buffer word for the bad column. Select the repeat option to continue, or abort the job and correct the mispunched cards.
9 Sequence	Cards within a record are not in sequential order. Abort the read operation and restore the 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 the 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	The error occurs if a 7/9 punch in column 1 is read when an FREAD ASCII request is specified. Card reader recovery: • If column 1 is a 7/9 punch, there is no recovery; the abort operation request is the wrong mode. • If column 1 was misread, read the card as for a checksum error.
13 Controller write on device	Magnetic tape: no write ring is installed. An attempt was made to write on magnetic tape without the write enabled. Insert the write ring and use the RP option. Pseudo tape: An attempt was made to write on a file that was opened to read only. Magnetic tape simulator: An attempt was made to write with the write ring not enabled. See manual input operations. 1832-5 Cassette Tape: write not enabled 1833-5 Flexible Disk: The write enable switch is not set or the diskette has been defined as read only via a motion request (code = 5).
14 Not ready	Ready the device and use the RP option.
15 Noise record	1832-4 Magnetic Tape: A noise record was detected and ignored.
16 Controller seek	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	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	This error occurs when an illegal file address obtained from the computer is detected or the controller has

Device Failure Code and Error	Significance
18 Address (Contd)	advanced beyond the limits of file storage. Magnetic tape simulator: an attempted read past end of written data 1833-5 Flexible Disk: The requested sector area for input/output does not fit within the 75 logical tracks that can be addressed, or initialization of the diskette attempts to reference the track beyond the valid 0 through 76 tracks.
19 Protect	The protect fault occurs when an unprotected controller operation attempts to write in a protected core location.
20 Checkword	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. 1833-5 Flexible Disk: The data written to the diskette is not same as data read from the diskette when the software compare option is selected via a motion request (code = 3).
21 End-of-tape error	1832-5 Cassette Tape: The end-of-tape is an unrecoverable error; the tape automatically rewinds on the next back motion command.
22 Card output stacker full	1728-430/1729-2/1729-3/1829-30/60 Card Readers: Empty the output hopper and take the RP option.
23 Card input hopper empty	If the read operation is complete, use the control unit option; otherwise, supply more cards and take the RP option.
24 Card feed	The read ready station does not contain a card after a feed cycle has occurred and the input hopper is not empty. 1728-430/1729-2/1729-3/1829-30/60 Card Readers: A 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.
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. 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. 1829-30/60 Card Reader: stacker jam status returned
26 Insufficient file space	Not enough file space available for this request to the pseudo tape driver

Device Failure Code and Error		Significance
27	Device message	Illegal device message on 1720 Card Punch
28	File	No file assigned to this logical unit (pseudo tape driver)
29	Read	A read error occurred in reading the resident mass-storage driver.
30	Validation error	The frame punched does not compare with the original data, or there was an echo error on the 1720-1 Card Punch. Abort the punch operation.
31	Short record	An attempt was made to write a record with a length less than the standard noise record length. Magnetic tape simulator: noise record. Attempt to do a zero length write.
32	Tape supply	Tape supply low on the 1720-1 Card Punch
33	Line break	A line break occurred while attempting to input on the 361-1 Communications Adapter.
34	Data interrupt	A data interrupt occurred after reading 80 columns. 1728-430/1729-2/1729-3/1829-30/60 Card Readers: This error indicates a hardware failure, possibly due to improper card travel. Reread the card (see the recovery procedure for error code above).
35	End-of-operation	An end-of-operation interrupt occurred prior to reading 80 columns. 1728-430/1729-2/1729-3/1829-30/60 Card Readers: Continuous failures may indicate card slippage in feeding. Reread the card as for error code 4 above.
36	Reserved	
37	Wrong address	The buffered data channel is using the first word address other than the address sent by a buffered driver.
38	Not used	
39	Not used	

Device Failure Code and Error		Significance
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.
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 Magnetic tape simulator: An attempt was made to write past the end of the specified magnetic tape simulator disk area.
45	Timing	Occurred while drum was not busy
46	External reject	On output
47	External reject	On input
48	Controller address	The controller address status was not the expected value.
49	Drive address	The drive address status was not the expected value.
50	No ID	ID abort, no ID burst (1732-2, 1732-3)
51	Illegal density	An attempt was made to select an illegal density (1732-2, 1732-3) or an attempt was made to select a density when the unit was not at the load point.
52	Power failure	Power failure on 1752 Drum
53	EOP	End-of-operation not set after interrupt (1752 Drum) 1829-30/60 Card Reader: no end-of-operation status
54	Data	The data was not set after the interrupt (1752 Drum). 1829-30/60 Card Reader: no data before end-of-operation.

Device Failure Code and Error		Significance
55	Status	Bad status (an indeterminate error occurred on 1752)
56	Mass memory buffer expired	No more buffer space is available (software buffer driver).
57	Buffer transfer	A mass memory error on the buffer transfer, which is detected in the software buffer driver.
58	Not used	
59	PE lost data	An error occurred in the phase encode formatter that affected the data transfer.
60	Illegal tape motion request	An illegal tape motion request was made to the magnetic tape simulator.
61	Interrupt status bit	1833-5 Flexible Disk: The interrupt should not be set when the initial status is taken. 1829-30/60 Card Reader: no interrupt status indication 1833-5 Flexible Disk: same
62	ADT	1829-30/60 Card Reader: auto-data transfer fault status
63	Busy after EOP	1829-30/60 Card Reader: still busy after end-of-operation occurs
64	Not busy	1829-30/60 Card Reader: not busy before end-of-operation occurs
65	No interrupt selected	1833-5/1865-1 Flexible Disk: no interrupt select status bit when the interrupt occurred
66	Memory address	1833-5/1865-1 Flexible Disk: The direct memory access memory address fault or A/Q transfer attempted to cross a bank boundary or the direct memory access attempted to cross a bank boundary without priming the request (motion request of code = 1).
67	Not used	
68	Interrupt status bit	1833-5/1865-1 Flexible Disk: The interrupt status bit was not set when the interrupt occurred.
69	Initialization not enabled	1833-5/1865-1 Flexible Disk: The disk initialization switch was not set.
70	Connect	1833-1 Disk: failure to connect to the control unit or drive after a maximum number of retries.
71	ECC	1833-1 Disk: The error correction code could not correct the error, since too many error bits were generated.
72	Ghost interrupt	1833-1 Disk: An unexpected interrupt was received.
73	Force release	1833-1 Disk: A force release was required but the disk was not released (multiple disk adapter system).
74	Transfer length	1833-1 Disk: The data transfer was longer than requested.
75	Transfer	1833-1 Disk: The data transfer was not accomplished after the maximum number of retries.
76	Recovery indicator	1833-5/1865-1 Flexible Disk: An informative error was logged in the engineering file to indicate recovery has been performed on this device a specific number of times. The threshold value for the error is contained in word 43 of the physical device table for this unit.
77	Expected reject did not occur	1833-5/1865-1 Flexible Disk (diagnostic logic unit only): An illegal function was issued but did not cause a reject.
78	Transfer	1833-5/1865-1 Flexible Disk: The number of words transferred was not correct or the spindle speed during initialization of the disk was more than 3.5 percent off the normal value.
79	Unit busy	1833-5/1865-1 Flexible Disk: The unit is busy at the time the input/output request is attempted.
80	Unit seeking	1833-5/1865-1 Flexible Disk: The unit is seeking when the input/output request is attempted.
81	Unit doing input/output	1833-5/1865-1 Flexible Disk: The unit is doing input/output when the input/output request is attempted.
82	CU	1833-1 Disk: error in 1833-3 Control Unit
83	Main memory	1833-1 Disk: The disk adapter attempted to address a nonexistent central processing unit memory address.

SPECIAL MESSAGES

The control units for the 1744, 1745, and 1747 equipments produce the following error messages. Error messages are on the comment device unless otherwise specified.

1744/274 Digigraphic Controller Errors

Message	Significance
BDC NOT READY	Buffered data channel not ready
BDC BUSY	Buffered data channel busy
DGC NOT READY	Digigraphic console not ready
DGC EXT REJ	Digigraphic external reject
EGC INT REJ	Digigraphic internal reject

1745/210 Local Terminal Controller Errors

Local terminal controller error messages have the following format:

CRT yx

Where: y is the station number of the unit on which the error occurs.

x is the error code.

Error codes for the local terminal controller are as follows:

Error Code	Significance
0	Diagnostic timeout
1	Reject in initiator
2	Reject doing function output
3	Reject attempting buffered input/output
4	Reject on write terminate function
5	Reject in interrupt response (station interrupt)
6	Reject in interrupt response (end-of-operation interrupt)
7	Reject in send portion of continuator
8	Reject after end-of-operation in continuator
9	Allocatable core is not sufficient for this format read size
A	Zero length request; not completed with error and not executed
B	Software cannot identify interrupt (treated as ghost).

The comment device error messages are:

Message	Significance
GI 1706	Ghost (unexpected) interrupt on 1706 connected to the local terminal controller
GI CRT	Ghost interrupt from local terminal controller

1747 Data Set Controller Errors

Message	Significance
DSC REJECT	Data set controller reject
BDC NOT READY	Buffered data channel not ready
BDC BUSY	Buffered data channel busy
DSC NOT READY	Data set controller not ready
DSC BUSY	Data set controller busy
TEST MODE	Data set controller in test mode
NO CARRIER	No carrier signal on the data set

EQUIPMENT STATUS CODES

The following status codes appear in one or more of the following locations:

- System initializer error message
- Engineering log printout
- PHYSTB for the device (ESTAT2 = word 12)

In this manual, only one status is given; it is the one found in the engineering log for that device (see Engineering Log in section 4, for the method of finding the status word). This status may be a composite status word developed by the device driver. In some cases (e.g., the 1833-1 Disk), numerous status words can be obtained from the device by use of a WES code requesting status with a director bit set to the code for the status word desired. See the devices' hardware maintenance manuals for information on these status words, some of which may also be saved in other words of PHYSTB.

In most cases, the word given may be obtained by a status request (WES code) to the device. In this case, the status word is returned in the A register. However, when the device has multiple status words (see the device hardware maintenance manual), the status word shown here is the status word with the appropriate director code. If the driver generates a composite status word for ESTAT2, no status request loads the word given here into the A register.

Console Driver (752 Terminal)

Status bits for the 752 terminal are the same as those for the 1843-2 Communications Line Adapter described later in this section.

1711/1713 Teletypewriter

Status Bits	Status	Description
0=1	Ready	The teletypewriter power switch is in the on-line position; power is applied to the teletypewriter.
1=1	Busy	If the controller is in read mode, it is in the process of receiving a character from the teletypewriter, 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 teletypewriter. Busy drops when the transfer is complete. In either mode, the teletypewriter mode control relays are in the process of switching from one mode to another.
2=1	Interrupt	An interrupt condition exists in the controller.
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 seven 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 teletypewriter 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 teletypewriter is stopped and the character in the holding register is read or when the interrupt request is cleared.
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 teletypewriter is turned on.
11=1	Manual interrupt	

1721/1722/1777 Paper Tape Station Reader

Status Bits	Status	Description
0=1	Ready	The paper tape reader is operational.
1=1	Busy	The 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.

Status Bits	Status	Description
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	The power is on.
11=1	End-of-file	An end-of-file has been detected (set by driver).

1723/1724/1777 Paper Tape Station Punch

Status Bits	Status	Description
0=1	Ready	The paper tape punch is operational.
1=1	Busy	The paper tape punch is busy.
2=1	Interrupt	Indicates an interrupt occurred
3=1	Data	The 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, or 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.
		NOTE Bit 6 is used only by the 1777 Paper Tape Station Punch. Bit 6 is not used by 1723/1724 Paper Tape Station Punch Units.
7=1	Protected	Indicates the PROGRAM PROTECT switch is on
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	The power is on
11=1	Tape supply low	Limited supply of tape remaining to be punched

1726-405 Card Reader/Controller

Status Bits	Status	Description
0=1	Ready	The card reader is operational
1=1	Busy	The controller is busy whenever a card is being entered into the buffer memory.
2=1	Interrupt	The 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.

Status Bits	Status	Description
3=1	Data	The card reader is ready to transfer data to the computer.
4=1	End-of-operation	The last card column was read, or a reload memory function was sent.
5=1	Alarm	The 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	The card failed to feed. Set by the driver
7=1	Protected	The controller recognizes only the input/output instructions with the protect bit present. Bit 7 is 1 when the protect switch is in the PROT position.
8=1	Error	A preread or compare error occurred.
9=1	Binary card	The contents of the first card were transferred to memory and a binary card was detected, or the negate Hollerith to ASCII function was selected.
10=1	Separator card	The contents of the first card were transferred to memory and a separator card was detected.
11=1	Fail to feed	The card failed to feed. The failure was detected by hardware.
12=1	Stacker full or jammed	The stacker is full of cards, or the cards have jammed.
13=1	Input tray empty	The input tray is empty.
14=1	End-of-file	The 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.
15=1	Manual switch or MOTOR POWER off	The AUTO/MAN switch is in manual position or the MOTOR POWER switch is off.

1728-430 Card Reader/Punch Controller

Status Bits	Status	Description
0=1	Ready	The card reader is operational.
1=1	Busy	The controller is busy whenever a card is being entered into the buffer memory.
2=1	Interrupt	The 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	The card reader is ready to transfer data to the computer.
4=1	End-of-operation	The last card column was read or a reload memory function was sent.
5=1	Alarm	The 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

Status Bits	Status	Description
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. An end-of-operation status is generated.
7=1	Protected	The controller recognizes only the input/output instructions with the protect bit present. Bit 7 is 1 when the PROTECT switch is in the PROTECT position.
8=1	Error	A 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	The 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	Chip box error	The chip box is full.

1729-2 Card Reader

Status 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-record	Indicates the card reader completed operation
5=1	Alarm	Indicates presence of an 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.
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 and end-of-file card has been read. The bit is set by the driver.

1729-3 Card Reader/Controller

Status Bits	Status	Description
0=1	Ready	The card reader is operational.
1=1	Busy	The card reader is 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 the presence of an alarm condition
6=1	Lost data	Indicates the data was 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.
7=1	Protected	Indicates the PROTECT switch on the card reader is in the 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=0	Not used	
9=1	Not ready	Always inverse of bit 0
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.

1725-1 Card Punch

Status Bits	Status	Description
0=1	Ready	The card punch is on-line and operational.
1=1	Busy	A card is in progress
2=1	Interrupt	One of the interrupt responses was generated by the controller. Other bits must be monitored to determine the condition causing the interrupt.
3=1	Data	The card punch is ready to receive data from the computer.
4=1	End-of-operation	The referred station has completed an operation.
5=1	Alarm	Indicates the presence of one of the following abnormal conditions: The ready signal becomes not active while the controller is busy The punch is ready but an error or lost data occurred The punch is inhibited when trying to punch.
6	Not used	
7=1	Protected	Indicates the controller is in the protect state
8=1	Error	Preread or a punch error occurred.

1731/601 Magnetic Tape Controller

Status Bits	Status	Description
0=1	Ready	The tape unit is connected and ready
1=1	Busy	The equipment is busy.
2=1	Interrupt	
3=1	Data	Read/write data transfer
4=1	End-of-operation	

Status Bits	Status	Description
5=1	Alarm	
6=1	Lost data	
7=1	Protected	Indicates PROTECT PROGRAM switch is on
8=1	Parity error	A parity error is detected.
9=1	End-of-tape	The end-of-tape marker is sensed.
10=1	Loadpoint	The load point is sensed.
11=1	File mark	The file mark is sensed.
12=1	Controller active	The controller is active.
13=1	556 bpi	The tape is set to 556 bpi.
14=1	Not used	
15=1	Write enable	The write enable ring is present.

1732-1/608/609 Magnetic Tape Controller

Status Bits	Status	Description
0=1	Ready	The tape unit is connected and ready.
1=1	Busy	The 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	A parity error was detected.
9=1	End-of-tape	The end-of-tape marker is sensed.
10=1	Loadpoint	
11=1	File mark	The file mark or tape mark is sensed.
12=1	556 bpi	The tape is set to 556 bpi.
13=1	800 bpi	The tape is set to 800 bpi.
14=1	7-track	
15=1	Write enable	The write enable ring is present.

1732-2/615-73/615-93 Magnetic Tape Controller

Status Bits	Status	Description
0=1	Ready	The tape unit is connected and ready.
1=1	Busy	The equipment is busy.
2=1	PE warning	There was an error in the PE formatter that did not affect the data transfer.
3=1	PE lost data	There was an error in the PE formatter that affected the data transfer.
4=1	End-of-operation	Data transfer was completed.
5=1	Alarm	An error condition – see the other error status lists.
6=1	Lost data	
7=1	PE transport	The controller is connected to a phase encoding transport.
8=1	Parity error	A parity error was detected
9=1	End-of-tape	An end-of-tape marker was sensed.
10=1	Loadpoint	
11=1	File mark	A file mark or tape mark is sensed.
12=1	556 bpi	The tape is set to 556 bpi.
13=1	800 bpi	The tape is set to 800 bpi.
14=1	7-track	
15=1	Write enable	The write enable ring is present.

Status Bits	Status	Description
0=1	Ready	The selected unit is available and ready to operate. The unit becomes not ready for the following reasons: • The disk pack is not in the drive unit • The disk drive motor is not up to operating speed (2400 rpm). • The read/write heads are not in the operating position. • A fault condition develops in the selected unit The ready status condition is affected by the operating program only if it selects a nonexisting device or a device that is not ready. Normally, this status bit indicates that manual intervention is required at the selected drive unit.
1=1	Busy	The 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	The interrupt status 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 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.
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 that 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 direct access bus of the computer 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 that has moved beyond the legal limits of the device during a load address, write, read, compare, checkword check, or write address function.

Status Bits	Status	Description
10=1	Seek Error (Contd)	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 that sets the busy status bit.
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 that 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.
15=1	Reserve	This computer has the controller reserved.

1733-2/856-2/856-4 Cartridge Disk Controller

Status 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: • The disk pack is not in the drive unit. • The disk drive motor is not up to operating speed. • The read/write heads are not in the operating position. • A fault condition develops in the drive. The status condition is affected by the operating program only if it selects a nonexisting device or a device that 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. The busy status bit is cleared when the controller and/or drive unit has completed its operation or an abnormal condition is detected that 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-cyclinder 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.

Status 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 the protected computer instructions, or the drive unit is protected and may only be accessed by protected computer instructions. The controller is reserved for or being operated on by a protected instruction; it can be cleared by a protected director function that has the release bit set in A. The drive unit is protected by the PROTECT switch on the operators panel; it can then be cleared by changing the PROTECT switch to its off position (down) or by deselecting the unit with a director function that 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 direct access bus of the computer 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.
11=1	Controller seek error	The controller has been unable to obtain the file address selected during a write, read, compare, or checkword check operation. This error usually indicates a positioning error. The error can be corrected by doing a status of the drive cylinder, and 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 cartridge disk drive positioner without changing the cylinder register and can therefore correct the positioning error. The bit is cleared by any function that sets the busy status.
12	Drive type	An 856-2 drive is connected.
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 ends immediately. If the error is detected during data transfer, the operation ends at the end of the sector being operated on. The bit is cleared by any output function.

Status 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 ends immediately. If the error is detected while transferring data to or from storage, the operation ends 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 cylinder zero or above maximum cylinder) during a load address, write, read, compare, checkword check, or write address function. The bit is cleared by any function that sets the busy status.

1738-853/854 Disk Drive Controller

Status Bits	Status	Description
0=1	Ready	The selected unit is available and ready to operate. The unit becomes not ready for the following reasons: • The disk pack is not in the drive unit. • The disk drive motor is not up to operating speed (2400 rpm). • The read/write heads are not in operating position. • A fault condition develops in the selected unit The ready status condition is affected by the operating program only if it selects a nonexisting device or a device that is not ready. Normally, this status bit indicates that manual intervention is required at the selected drive unit.
1=1	Busy	The 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	The interrupt status 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 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	The alarm status 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 being 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.

Status 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 that 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 direct access bus of the computer 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 that 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 that sets the busy status bit.
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 that 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
13=1	Storage parity error (Contd)	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. This bit is cleared by any output function.

1739-1 Cartridge Disk Drive

Status 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: • The disk pack is not in the drive unit. • The disk drive motor is not up to operating speed. • The read/write heads are not in the operating position. • A fault condition develops in the drive The status condition is affected by the operating program only if it selects a nonexisting device or a device that 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.

Status 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 that 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.
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 the compare operation.
6=1	No compare (Contd)	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 the drive unit is protected and may only be accessed by protected computer instructions. The controller is reserved for or being operated on by a protected instruction; it can be cleared by a protected director function that has the release bit set in A. The drive unit is protected by the protect switch on the operator's panel, it can then be cleared by changing the protect switch to its off position (down) or by deselecting the unit with a director function that 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 direct access bus of the computer 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.
11=1	Controller seek error	The controller has been unable to obtain the file address selected during a write, read, compare, or checkword check operation. This error usually indicates a positioning error. The error can be

Status Bits	Status	Description
11=1	Controller seek error (Contd)	corrected by doing a status of the drive cylinder and 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 cartridge disk drive positioner without changing the cylinder register and can therefore correct the positioning error. The bit is cleared by any function that 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 ends immediately. If the error is detected during data transfer, the operation ends at the end of the sector being operated on. The bit is cleared by any output function.
14=1	Protect fault	An unprotected controller operation attempted to read or write in a protected computer storage area. If the error is detected while receiving control information from storage, the operation ends immediately. If the error is detected while transferring data to or from storage, the operation ends 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 cylinder zero or above maximum cylinder) during a load address, write, read, compare, checkword check, or write address function. The bit is cleared by any function that sets the busy status.

1740-501 and 1742-1 Line Printer Controller

Status Bits	Status	Description
0=1	Ready	The printer is operational.
1=1	Busy	The 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	The printer indicates an interrupt response. The other status bits determine the cause of the interrupt.
3=1	Data	The printer is ready to receive data. If an interrupt on data has been selected, the data status also indicates the interrupt has occurred.
4=1	EOP	The printer has completed an operation. If the bit is 1, no operation is in progress.
5=1	Alarm	The printer has an alarm condition.
6=1	Not used	
7=1	Protected	The PROTECT switch on the printer is in the protected 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.

1742-30/120 Line Printer

Status Bits	Status	Description
0=1	Ready	The printer is operational.
1=1	Busy	The 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

Status Bits	Status	Description
1=1	Busy (Contd)	motion also activates the printer. However, transfer of data to memory is allowed.
2=1	Interrupt	The printer indicates an interrupt response. The other status bits determine the cause of the interrupt.
3=1	Data	The printer is ready to receive data. If an interrupt on data has been selected, the data status also indicates the interrupt has occurred.
4=1	EOP	The printer has completed an operation. If the bit is 1, no operation is in progress.
5=1	Alarm	The printer has an alarm condition.
6=1	Error	Parity synchronization or compare error
7=1	Protected	The PROTECT switch on the printer is in the protected 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.
8=1	Load image	The image memory of the line printer must be loaded (1742-120 only). The next 288 characters are sent to image memory.

1743-2 Asynchronous Communications Controller

Status Bits	Status	Description
0=7	Data	Data received from terminal
8=1	Break	No valid stop bit has been received.
9=1	Lost data	Data was not read before a new character was shifted into the holding register.
10=1	Character request	The send section is in the proper condition to receive data from the computer.
11=1	Character ready	The holding register in the receive section contains a valid character.
15=1	Parity error	The parity of the received character does not agree with selected parity type.

1744/274 Digigraphic Controller

Status Bits	Status	Description
0=1	Power off	The console power is off (console disabled).
1=1	Delay interrupt	The delay interrupt is received.
2=1	Light pen	Light pen strike interrupt
3=1	Priority interrupt	The priority interrupt is received.
4=1	Light pen interrupt	The light pen switch interrupt flip-flop is enabled.
5=1	Delay interrupt	The delay interrupt flip-flop is enabled.
6=1	Light pen	The light pen strike interrupt flip-flop is enabled
7=1	Display	Terminate the display following the light pen strike interrupt.
8=1	Function keyboard	The variable function keyboard is activated.
9=1	Alphanumeric keyboard	The alphanumeric keyboard is activated.
10=1	Special function keyboard	The special function keyboard is activated.
11=1	LIGHT PEN switch	The LIGHT PEN switch is on.
12=1	Keyboard interrupt	Keyboard interrupt
13=1	Keyboard interrupt	The keyboard interrupt flip-flop is enabled.
14=1	Priority interrupt	The priority interrupt flip-flop is enabled.
15=1	LIGHT PEN switch interrupt	LIGHT PEN switch interrupt

1747 Data Set Controller

Status Bits	Status	Description
0=1	Ready	Bit 0 is present when the data set controller: Detects the presence of carrier-on/off and interlock signals from the data set Is not in test mode Is ready for an address or function selection
1=1	Busy	The busy status indicates that the data set controller is selected for a transmit or receive operation or is transmitting a response code.
2=1	Interrupt	The interrupt status indicates an interrupt from the data set controller is active. It clears upon receipt of a clear interrupt or clear controller function code.
3=1	Receive and full	The receive and full status indicates the data set controller has assembled a data word for input to the computer.
4=1	Transmit and empty	The transmit and empty status indicates the data set controller is ready to output another data word.
5=1	Alarm	The alarm status indicates a data set fault, data set controller is in test mode, or a cyclic code error.
6=1	Interrupt word received	The interrupt word received status indicates the data set controller detected the interrupt code word (7622_8).
7=1	Protected	The protected status indicates the data set controller protect switch is in the protected position.
8=1	Not used	
9=1	Cyclic code error	The cyclic code error status indicates the cyclic code check detected a receive error. A new function code clears this status.
10=1	Receive and not carrier-on/off	The receive and not carrier-on/off status indicates a loss of carrier after receipt of a sync word and prior to termination of a receive operation. It clears upon receipt of a select transmit, select receive, or clear controller function code or master clear from the computer.
11=1	Transmit and not clear-to-send	The transmit and not clear-to-send status indicates the data set controller has lost the clear-to-send signal from the data set during a transmit operation. It clears upon receipt of a select transmit, select receive, or clear controller function code or master clear from the computer.
12=1	Test mode	The test mode status indicates the data set controller is in test mode.
13=1	Not carrier-on/off or not interlock	The not carrier-on/off or not interlock status indicates loss of data set carrier-on/off and interlock signals.
14=1	Sync word/ interrupt word not acknowledge	The sync word/interrupt word not acknowledged status indicates the local data set controller received no response from the remote data set controller. (The remote data set controller must have a sync word acknowledge circuit).
15=1	Not used	

1751 Drum Interface and Storage

Status Bits	Status	Description
0=1	Ready	The drum is operational.
1=1	Busy	The drum is performing data transfer.
2=1	Interrupt	Drum interrupt response
3	Not used	
4=1	End-of-operation	Data transfer is complete.
5	Not used	
	Read	The data was not transferred to memory before new data was taken from the drum.
	Write	Data was not received from memory in time to be written on the drum.

Status Bits	Status	Description
6=1	Lost data	
7=1	Protected	The controller PROTECT switch is on.
8=1	Parity error	Read/write data error
9	Not used	
10=1	Guarded address	An attempt was made to write on a guarded address.
11=1	Timing track error	Loss of drum timing pulses

1752 Drum Controller

Status Bits	Status	Description
0=1	Ready	The drum is up to speed and ac power is up. The drum temperature and pressure is ok.
1=1	Busy	The controller is performing read/write.
2=1	Interrupt	An alarm, end-of-operation, or timing error cleared interrupt is present.
3=1	Data	The controller is ready for data transfer.
4=1	EOP	Data transfer is complete.
5=1	Alarm	One of the following alarm conditions exist: Drum not ready Lost data Checkword error Protect fault Timing track error Power failure Guarded address error Sector over-range error
6=1	Lost data	Read Mode – Data is not transferred to core before new data is taken from the drum. Write Mode – Data is not received from core in time to be written on the drum.
7=1	Protected	The PROGRAM PROTECT switch is in the protected position.
8=1	Checkword error	A checkword error occurred during drum read.
9=1	Protect fault	An unprotected input/output instruction has attempted to access protected core.
10=1	Guarded address enabled	The switch is set to inhibit writing into guarded track addresses.
11=1	Timing track error	Loss of drum timing pulses
12=1	Power failure	There is a loss of ac power to the drum.
13=1	Sector compare	The sector address counter equals the initial sector address register.
14=1	Guarded address error	An attempt was made to write on the drum at guarded addresses.
15=1	Sector over-range error	An attempt was made to read/write on a nonexistent drum track.

1784 Teletypewriter Controller (1711-4/5,1713-4/5)

Status Bits	Status	Description
0=1	Not used	Always 1
1=1	Busy	Read mode – The controller is in the process of receiving a character from the teletypewriter/conversational display terminal, or the holding register contains data for transfer to the computer. Write mode – The data register contains data and is in the process of transferring it to the teletypewriter/conversational display terminal.
2=1	Interrupt	An interrupt condition exists in the controller.
3=1	Data	Read mode – The holding register contains data for transfer to the computer. Write mode – The controller is ready to accept another character from the computer.
4=1	Not used	Always the inverse of busy

Status Bits	Status	Description
5=1	Alarm	A lost data or parity error condition has occurred.
6=1	Lost data	The holding register contained data for transfer to the computer, and the teletypewriter/conversational display terminal began to send a new character.
7=1	Parity error	A parity error has occurred in the data character received from the teletypewriter/conversational display terminal.
8=0	Not used	Always 0
9=1	Read mode	The controller is conditioned for an input operation.
10=1	Not used	Always 1
11=1	Manual interrupt	A manual interrupt has occurred.

1811-2 Conversational Display Terminal (CDT)

Status bits for the 1811-2 Conversational Display Terminal are the same as those for the 1843-2 Communications Line Adapter described later in this section.

1827-2 Line Printer

Status bits for the 1827-2 Line Printer are the same as those for the 1843-2 Communications Line Adapter described later in this section.

1828-1 Card Reader Controller and 1829-30/60 Card Reader

Status Bits	Status	Description
0=1	Ready	The card reader is ready (i.e., powered. input hopper loaded, output stacker not full, no feed failure, no card motion failure, and no read alter). Manual intervention is required if any of these conditions do not exist.
1=1	Busy	The card is currently being read. It is automatically cleared by card cycle completion.
2=1	Interrupt	The card reader generated an interrupt. Bits 3, 4, and 5 define the type of interrupt.
3=1	Data	The data register holds data for transfer to the CPU. Bits 2 and 3 are cleared automatically by data transfer to the CPU.
4=1	End-of-operation (EOP)	The read cycle is completed (81st column time). Bits 2 and 4 are cleared automatically by the start of the next read cycle.
5=1	Alarm	Error due to one of: • Lost data • Any not ready condition The cause of the alarm must be corrected before the alarm bit can be cleared. Bit 2 is also cleared at that same time.
6=1	Lost data	Data not transferred to the CPU before the first column of data on the next card was ready for the buffer. All the rest of the columns onthe card are rejected until an end-ofoperation occurs.
7=1	Protected	The protect jumper is installed.
8=1	Not used	
9=1	Not ready	Logical complement of bit 0 (ready)
10=1	ADT mode	The CPU has set the controller for an auto-data transfer (A/Q buffered) transfer.
11=1	End-of-file	The controller detected the end-of-file card.
12=1	Hopper empty	The input hopper is empty, and the last card was read.
13=1	Stacker full	The output stacker is full, but the top card was read.
14=1	Failed to feed	There was a failure to feed the current card after two attempts.
15=1	Stacker jam	There is a jam in the path between the reader and stacker.

1832-4 Magnetic Tape Controller and 1862-72/92 Tape Transports

Status Bits	Status	Description
0=1	Ready	The controller and drive are ready.
1=1	Busy	The drive is busy terminating the previous command (except rewind).
2=1	Recovered error	
3=1	Irrecoverable error	
4=1	Not used	

Status Bits	Status	Description
5=1	Alarm	One of the following errors occurred: end-of-tape found, tape mark found, data error, inoperative during execution, overload, program error, or read command after write without an intervening backspace command.
6=1	Lost data	Timeout or overload. On overload, the tape moves to the gap. Timeout includes the runaway tape error, written data not under the read head yet, and attempting to backspace at the beginning of tape.
7=1	Not used	
8=1	Parity error	Parity error, longitudinal redundancy check error, or cyclic redundancy check error (nine-track only)
9=1	End-of-tape	The drive reports the end of usable tape has been reached.
10=1	Noise record bypassed	
11=1	File mark	The file mark has been found.
12=1	556 fpi	The hardware supports a 556 frames per inch tape speed.
13=1	800 fpi	The hardware supports a 800 frames per inch tape speed.
14=1	7 track	The hardware supports seven-track tape; if 14=0, the hardware supports a nine-track tape.
15=1	Write enable error	No write enable ring is installed on the tape reel, and the write operation was requested.

1832-5 Cassette Tape Driver and 1861 Magnetic Tape Transport (Module FS2CAS Present)

This is a driver-composed status word.

Status Bits	Status	Description
0=1	Ready	Power is present, the cassette is loaded, and the interlock is closed. This bit equals 0 in echo mode, and the alarm = 1.
1=1	Busy	The cassette is in the motion cycle.
2=1	Recovered error	The driver reattempted the function, and the command was executed.
3=1	Data	Data is available (read) or data is needed (write).
4=1	EOP	End-of-operation; tape motion has ended.
5=1	Alarm	Not ready, lost data (overflow during read or underflow during write), cyclic redundancy check error, format error, or end of tape
6=1	Lost data	Overflow on read or underflow on write
7=1	Protected	The program protect switch is set.
8=1	CRC/format	The cyclic redundancy check detected an error or format error.
9=1	EOT	The end-of-tape was found on forward motion.
10=1	Load point	The beginning-of-tape was found on reverse motion.
11=1	File mark	Found file mark on read, or search for mark, or read after write
12=1	Irrecoverable error	The driver attempted to re-execute the failed operation the preset number of times. The operation failed on every attempt.
13=1	Overflow	Data was bypassed.
14=1	Side B	Track B under read/write head
15=1	Write enable	The tape is ready to execute write commands.

If module FS2CAS is not present, bits 2, 12, 13, 14, and 15 have the meanings given in the controller status word.

Status Bits	Status	Description
2=1	Write enabled	Tape ready to execute write commands
12=1	Side A/B	Track B under read write head = 1. Otherwise, side A is under the read/write head.

Status Bits	Status	Description
13=1	Unit 0/1	1 = Unit 1 selected, 0 = Unit 0 selected
14=1	Data available	Data available from read or echo operation
15=1	ADT mode	Auto data transfer mode selected

1833-1/2/3 Storage Module Drive and 1867 Drive Unit

In this section, CU is the control unit and DMA is the direct memory access bus.

Status Bits	Status	Description
0=1	Busy	The drive interface or control unit is busy with the previous operation (read, write, function, seek, or poll). It is cleared by operation completion, abort, or clear function.
1=1	Interrupt	The interrupt is active. Bits 2, 3, 4, 5, 6, and 7 indicate the cause of the interrupt.
2=1	CU selected	The control unit is selected by this drive interface.
3=1	Transfer complete	The read or write operation is completed.
4=1	Alarm	The drive interface detected lost direct memory access data, forced disconnect condition, memory address error, direct memory access parity error, protect fault, or control unit error.
5=1	Seek complete	One or more drives completed seek operations. The CPU should poll the drive interface to find the drives concerned.
6=1	End of cylinder	The read or write reached a cylinder boundary. Data on the current cylinder may be transferred, however. A new seek command and disk addresses must be supplied for data on the next cylinder.
7=1	Alternate drive interface interrupt	The drive interface was interrupted by the other drive interface in a dual CPU configuration.
8=1	Protected	The protect jumper is installed; the disk system is operating in the protected mode.
9=1	Lost data on DMA	The transfer rate of communications adapter and drive exceeded the direct memory access ability to handle the data. The read or write operation was terminated.
10=1	Forced disconnect	The alternate channel executed a forced release function. The drive interface disconnects from the control unit, and the alternate channel gains control. The operation in progress terminates at the end of the current sector.
11=1	Memory address error	The drive interface attempted to address a nonexistent location in the CPU main memory. The operation in progress terminates at the end of the current sector.
12=1	DMA Parity error	Parity error on direct memory access; the operation terminates at end of the current sector.
13=1	Protect error	An unprotected drive interface operation attempted to write data into the protected CPU memory. The CPU inhibits the write and the operation terminates at the end of the current sector.
14=1	CU error	The drive interface detected an error in the control unit operation. The CPU must read the drive interface and/or control unit status to determine the error.
15=1	Address field	The drive is operating in the sector address field.

The storage module drive also has a variety of other status information available. The other status words are obtained by sending the normal WES code during an input command with the D value specifying the status type requested. Table 6-1 summarizes the status types. For a standard CYBER 18-20 or 18-30 Timeshare Computer System with one storage module drive, WESD is $070x_{16}$ when x = D in range 0 through F_{16}.

TABLE 6-1. STATUS TYPE SUMMARY

D Code	Type Status	Comments
0	Disk adapter file register data	Input comparable to select file address output function
1	Physical unit number	Specifies physical number of current selected logical drive
2	Poll status	Specifies response to selected poll condition by drive number (0 through 7 or 8 through F)
3	Select acknowledge status	Drive select status
4	Drive echo input data	Verifies data lines between control unit and drive using pattern selected by echo function command
5	Cylinder address status	Last cylinder address used by disk adapter
6	Current physical sector address	Current sector under read/write head
7	Sector and head address status	Current sector and head for function
8	Disk adapter status	This is the standard status word described above.
9	Drive status word 2	Status of selected drive
A	Error correction code pattern	Error bits 00 through 07 used by ECC polynomial processor
B	Error correction code condition status	Status of error correction code used for polynomial correction
C	Drive fault condition status	Status of malfunctioning drive
D	Control unit status	Status of selected control unit
E	Drive status word 1	Valid only after direct memory access read or write command
F	Control unit echo input, data	Verifies command, status, and data paths between disk adapter and control unit using pattern selected by control unit echo function command

1833-4 Cartridge Disk (CDD)

Status Bit	Status	Description
0=1	Ready	The device is available and ready to operate. The drive becomes not ready if: • The disk pack is not in the drive unit. • The disk drive motor has not reached operating speed. • The read/write heads are not in the operating position. • A fault condition develops in the drive. The status condition is affected by the operating program only if it selects a non-existent device that is not ready. Normally, the ready status bit indicates that manual interruption is required at the selected drive unit.
1=1	Busy	The controller is presently performing an operation. The bit is set by accepting the following command: • Unit select. • Bus connect.

Status Bits	Status	Description
		• Director functions: Read, write, compare, check-word check, write address, sense-verify. • Wait for seek change. • Seek to device. Busy status is cleared upon completion of the command which caused the controller to become busy. Master clear or clear controller will also clear busy.
2=1	Interrupt	EOP or alarm or alternate bus reg interrupt response is active. The bit is reset by clear interrupts, master clear, or clear controller.
3=1	Alarm	One of the following abnormal conditions occurred: • Not ready during a director function operation. • Checkword error. • Lost data. • Controller seek error. • Drive seek error during director function operation. • DMA parity error. • DMA protect fault. • Bus relinquished. • DMA address error. • Compare error. • End of medium. • Missing index sector pulses. • Wrong sector format. • Wrong device transfer. • Not on-cylinder during director function operation. • Fault occurs during operation on CDD. This bit is reset upon acceptance of any new command which causes the controller to become busy. It is also reset by clear controller or master clear.
4=1	On-Cylinder	The heads are positioned over the cylinder selected. The bit is reset if the drive is still positioning the heads or if a seek error is detected.
5=1	Disk Write Protected	The unit's WRITE PROTECT switch is ON and all write functions are inhibited by the unit.
6	Not used	
7=1	Single Density	The selected CDD is a single density unit (203 tracks). When this bit is zero, it indicates that the CDD is a double density unit (406 tracks).
8=1	EOP	The previous operation has been completed.
9	Not used	
10	Not used	
11	Not used	
12=1	On bus	This CDD controller has control of the bus and can access the disks. If this bit is zero, it indicates that this CDD controller is not using the disks.
13=1	Device Seek Error	The heads have moved to an illegal address, or a seek was not completed within 200 milliseconds.
14=1	Controller Protected	A protected unit is selected. The controller will reject all unprotected OUTPUT instructions. Deselecting the Protected Unit or selecting a non-protected unit will clear this bit.
15=1	Bus Busy	If both this bit and bit 12 are set, this CDD controller has control on the bus and the other CDD controller is sending a bus request. If this bit is set and bit 12 is not set, the other CDD controller has control on the bus. This bit is reset upon release or relinquishment of the bus.

1833-5 Flexible Disk Drive and 1865 Disk Drive

Status Bits	Status	Description
0=1	Unit ready	The disk is at running speed. The initial seek is to track 0.
1=1	Unit busy	The unit is busy with data transfer on the seek operation. The bit cleared by the end-of-operation, seek error, operation aborted, or master clear.
2=1	Head loaded	The head is automatically loaded (brought with the proper read/write distance of the drive surface) when a data transfer begins. The head automatically unloads if no data transfer or seek occurs within six revolutions.
3=1	Seeking	The head is seeking as a result of a seek command or automatic seek to the next track. The bit cleared when the operation was completed.
4=1	Reading/ writing	The unit is transferring data or initializing. The bit clears when the operation completes or aborts.
5=1	Interrupt	The unit became not busy, and the interrupt was selected. It was cleared by interrupt select/clear or master clear.
6=1	Interrupt selected	The interrupt selected status enables the interrupt. It sets bit 5 at the end of operation. It is cleared by interrupt clear or master clear.
7=1	DMA parity error	The direct memory access parity error status detects memory parity errors during write to disk via direct memory access lines.
8=1	DMA protect fault	The direct memory access protect fault status attempted to write into protected CPU memory with a request initiated by an unprotected command.
9=1	DMA memory address fault	The direct memory access memory address fault status attempted to write to a nonexistent address in main memory.
10=1	Lost data	Direct memory access has not accepted or presented data before the controller required data to be moved. This status cannot occur during buffered operation since data is transferred to the controller buffer register one sector at a time. Transfer on the direct memory access lines is not dependent on disk rotating speed.
11=1	Seek error	One of the following errors occurred: • No address sync was found within one second. • Wrong track address for transfer • Cannot find requested sector address • Address cyclic redundancy check error found • No data record or only deleted data records found within one second Attempted transfers are aborted. The controller and unit become not busy. If the drive or controller error caused the wrong address, a seek to track 0 is required for recovery.
12=1	Data CRC error	The cyclic redundancy check failed in the sector just read.
13=1	Deleted record	The current sector being read has deleted the record sync code.
14=1	Protect switch on	The flexible disk drive system protect switch is on, sampled only after a master clear.
15=1	Controller busy	The data transfer logic of the controller is currently in use. Attempted data transfers are rejected.

1843-1 Communication Line Adapter

Status Bits	Status	Description
0=1	Ready	The power is applied.
1=1	Busy	Always 0
2=1	Interrupt/ input data	The character is ready for transmission to the CPU.
3=1	Interrupt/ output data	The receiver is ready for character transmission from the CPU.
4=1	Error interrupt	An error condition is detected
5=1	ADT on input	Auto-data transfer mode and input mode
6=1	ADT on output	Auto-data transfer mode and output mode
7=1	Sync match	During extended channel function transmission, the data matches the sync code.

Status Bits	Status	Description
8=1	Carrier	The carrier signal is detected on the link lines.
9=1	Clear-to-send	The request-to-send is received; the modem sets the clear-to-send flag.
10=1	Ring indicator	The ring signal is received from the modem.
11=1	Data set ready	Data set ready signal from modem
12=1	Data not available	The data request from the transmitter is not serviced in time; the fill character was sent instead of the data.
13=1	ADT COP	End-of-operation in auto-data transfer mode; a macro interrupt was generated.
14=1	Protect	The channel and encoder are operating in protected mode.
15=1	Test mode	The channel is operating in test mode.

1843-2 Communication Line Adapter (CLA)

Status Bit	Status	Description
0	Sub request code internal to driver	Code 0 - Normal mode 1 - Logical connect 2 - Logical disconnect 3 - Write-Read operation 4-31 - Not used
1		
2		
3		
4	Not used	
5		
6		
7		
8	Parity error	
9	Illegal request	
10	Request timeout	
11	Training error	
12	Lost data	
13	Not used	
14		
15	Communication Subsystem down	

1860 LCTT/Formatter

Status Bit	Status	Description
0	Ready	Tape unit connected and ready
1	Busy	Equipment is busy
2	Interrupt	Interrupt response
3	Alarm	
4	Not used	
5		
6		
7		
8	End of operation	Data transfer completed
9	End of tape	End-of-tape marker sensed
10	Not used	
11	File mark	File mark or tape mark is sensed
12	On-bus	Controller connected be formatter
13	Not used	
14	Controller protect	Controller cannot be accessed from unprotected location if protect is enable
15	Bus-busy	Formatter cannot be accessed by controller

361-1 and 361-4 Communication Adapter (Even Channel)

Status Bits	Status	Description
0 – 7	Data bits to Communication Multiplexer	Input words of 5 to 8 data bits from the modem
8=1	Break	The break status indicates a line current break or interruption from the remote station.
9=1	Character lost	The servicing program did not receive the current data character before a 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 the computer. Bit 10 is set after the enable character request signal from the communication multiplexer and the clear-to-send signal from the modem are present in the send action.

† Transmitted by the send section of an input operation

Status Bits	Status	Description
11=1	Character ready	The character ready status sets when the holding register in the receive section contains a valid data character ready for transfer to the communication multiplexer.
15=1	Terminal connected	The input/output terminal is connected to the communications adapter (set by the driver).

361-4 Communication Adapter (Odd Channel)

Status Bits	Status	Description
0=1	Test mode select	The test mode select status indicates the communication adapter is in test mode.
2=1	Data terminal ready	The communication adapter is ready to communicate with the data set.
3=1	Carrier on	The data carrier is being received from the data set.
6=1	Data set ready	The data set is ready to operate. This bit is also placed in position 15 of the even channel status by the driver.
7=1	Reverse channel receive	The data set is receiving the reverse channel signal from the remote receiving station.
8=1	Ring indicator	The data set is receiving an incoming call from a remote station.
9=1	Parity error	A character parity error has been received.
10=1	Function request	The control channel is able to receive function commands from the computer.
11=1	Status ready	This status can indicate: The carrier on has changed state. The reverse channel receive was received. A parity error was received. The status request was received.

364-4 Communications Multiplexer

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

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	Mode	0 for read, 1 for write
15=1	Write enable	The 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.

Pseudo Disk

The status bits in the pseudo disk physical device table are defined similarly to the status bits for a real disk.

Magnetic Tape Simulator

The status bits in the magnetic tape simulator physical device table are defined similarly to the status bits for a real magnetic tape transport.

1500 EQUIPMENT

1501 High Level Analog Input

Status Bits	Status	Description
0 – 3	Address code	The present channel address is being used.
4	Mode enabled	1 = sequential channel address 0 = random channel address
5 – 14	Not used	
15	Bad channel address code	The input occurred while incrementing.

1536 Low Level Analog Input

Status Bits	Status	Description
0	Busy	The multiplexer system is busy.
1 – 3	Not used	
4	Interrupt	The interrupt status is ready after clear interrupt.
5	Delay	700 microseconds after start interrupt
6	Read interrupt	Analog-to-digital converter read data ready interrupt
7	Signal lost interrupt	Analog signal lost interrupt
8 – 11	Not used	
12 – 14	Address code	Address code of first multiplexer module with analog signal lost (if A bit 15=1)
15	Signal lost	The analog signal is lost.

1595 Serial I/O Card

Status Bits	Status	Description
0 – 7	Not used	
8=1	DSR	The data set is ready.
9=1	EOT	The preselected ASCII character has been detected.
10=1	Receive detect	The terminal is receiving suitable data.
11=1	Character request	The transmitter accepts the next data word to be transmitted.
12=1	Parity error	The parity error occurred during a read data operation.
13=1	Line break	The line break status indicates the absence of the stop bit in the received character.
14=1	Lost data	Two or more characters were received without an intervening read operation.
15=1	Valid character	The suitable character has been received.

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