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82-100 HOW TO USE CONTROL PROCESSOR ERROR INFORMATION

Control processor error information is used to determine the cause of failures of the control processor. These failures may be intermittent failures or solid failures that the MAPs do not find.

Run the error recording analysis procedure for the control processor and look at the error information that has been recorded. If a specific control processor check byte or port check byte has been recorded frequently in the latest entries of the table, suspect an intermittent failure. Go to MAP 8201 to determine the failing field replaceable unit.

If there is not a frequent pattern associated with the error history information, go to paragraph 82-200 for a general description of what the recorded information means. If more detail is desired, a section number is given.

82-200 CONTROL PROCESSOR ERROR HISTORY INFORMATION

An example of the control processor error history information that is recorded is shown in the following sample printout.

ERROR HISTORY TABLE FOR CONTROL STORAGE PROCESSOR

PCR	IL	BYT		WRO	WR1	WR2	WR3	WR4	WR5	WR6	WR7	MAR	MAB	DATE	TIME	
		0	1													
							HEX								YYMMDD	HHMMSS
A2	07	3C	00	0800	3CA2	113F	0000	0000	0000	0000	0000	21A5	21AE	770413	111111	
A2	07	18	00	0800	18A2	1143	0000	0000	0000	0000	4000	21AF	21A8	770413	111111	
22	07	28	00	F3C0	2822	FFFE	0028	21B4	0300	0219	C000	F3B6	21B4	770413	111111	
92	07	30	00	0800	3092	1142	0000	0000	0000	0000	2000	21AB	0000	770413	111111	
A2	07	3C	00	0800	3CA2	1143	0000	0000	0000	0000	0000	21A2	21AE	770413	094500	
9C	04	2C	00	1143	0000	18B8	92F1	C3F1	C3F1	C3F1	C3F1	00E1	00E4	770413	111111	
92	07	3C	00	0800	3C92	1141	0000	0000	0000	0000	1000	21A9	21A8	770413	111111	
A2	07	10	00	0000	10A2	1143	0000	0000	0000	0000	3000	21CE	21AC	770413	093000	
A2	07	20	00	0000	20A2	1141	0000	0000	0000	0000	0000	21CE	21A8	770413	111111	
A2	02	A0	A2	00C0	1140	1000	92F1	A191	040A	C3F1	C3F1	0149	0146	770610	102900	

82-300 CONTROL PROCESSOR SENSE BYTES—GENERAL INFORMATION

The information recorded is that which was present when the error occurred. The amount of information recorded relies on the programs that were running in the system at that time.

82-310 PROCESSOR CONDITION REGISTER (PCR)

The PCR (processor condition register) contains information about the status of the last operation (of the type that affect the PCR) performed in the control processor.

Processor Condition Register

Bit	Condition
0	Flag
1	Positive
2	Negative
3	Zero
4	Carry
5	High
6	Low
7	Equal

82-320 ILBB (INTERRUPT LEVEL BACKUP BYTE)

The interrupt level backup byte indicates on which hardware interrupt level the control processor was executing when the error occurred that caused the log out.

Interrupt Level Backup Byte	Hardware Interrupt Level
00	5
01	4 or work station controller cycle steal (note 1)
02	Work station controller cycle steal or disk cycle steal (note 2)
03	3
04	2
05	1 or disk cycle steal (note 1)
07	Main level

Notes:

1. See the cycle steal bit in the port check byte to determine if the interrupt was caused by a cycle steal check.
2. Work station controller registers (level 4) are logged.

82-330 CONTROL PROCESSOR CHECK BYTE (BYTE 0)

The control processor check byte contains information about the control processor checks that were present when the error occurred that caused the log out.

Control Processor Check Byte

Bit	Condition
0	Storage data register parity check
1	Micro-operation register parity check
2	Storage gate parity check
3	Arithmetic and logic unit gate parity check
4, 5	Value Meaning
	01 Time-out
	10 Not valid control storage address
	11 Control storage address register parity check
6, 7	Value Meaning
	01 Storage exception
	10 Not valid main storage address
	11 Main storage address register parity check

If the microinstruction address register (paragraph 82-360) contains X'1111', a software-generated processor check occurred. See the description of work register 2 in paragraph 82-350. Also see paragraph 82-340 as an aid in determining any failures that occurred while data was being moved on the channel.

82-340 PORT CHECK BYTE (BYTE 1)

The port check byte contains information about any port checks that were present when the error occurred that caused the log out.

Port Check Byte

Bit	Condition
0	Data bus out parity check
1	Device address not valid
2	Data bus in parity check
3	Input/output time-out check
4	Command bus in or data bus in not zero
5	System bus parity check
6	Cycle steal check
7	Port address not valid

If the microinstruction address register (paragraph 82-360) contains X'1111', a software-generated processor check occurred. See the description of work register 2 in paragraph 82-350.

If bit 6 (cycle steal check) condition is on, also check the other bits to aid in determining the direction data was moved when the failure occurred.

82-350 WORK REGISTERS 0 THROUGH 7

These values represent the contents of work registers 0 through 7 (except WR1) when the error occurred. Since register 1 of the main program level (ILBB = hexadecimal 07) is used during the error log procedure, it no longer contains the same contents as when the error originally occurred.

If the microinstruction address register contains X'1111', a software-generated processor check occurred. Work register 2 contains the information that will aid you in determining what caused the error.

Work Register 2

Work register 2 (high) contains the error message identification code (MIC) in hexadecimal that caused the system to stop, and work register 2 (low) contains the error MIC (in hexadecimal) of any previous error that may have been sensed by the system.

In most cases, the high and low bytes of work register 2 are equal, or the low byte contains X'00'. If the high and low bytes are not equal or if the low byte does not contain X'00', a not normal end condition was sensed and before the error routine was completed, another software-generated processor check was sensed. Also, if the high and low bytes are not equal, look up each error message identification code. The following table gives the message identification codes in hex, the name of the message issuing module, and the error messages for work register 2:

Hex	Dec	Message Issuing Module	Error Message
01	0001	\$NULC, \$IPW	Module ID not found in control storage library
02	0002	\$NULX	Attempt to relocate a module that has no RLDs
03	0003	\$NULC	Control storage module link, load address unequal
05	0005	\$NU1	Quiesce counter has negative value
06	0006	\$NU1	Privileged operation issued in nonprivileged mode
07	0007	\$NU1	Control storage register stack area overflow
08	0008	\$NUBL/\$NUSL	Address translation error logging communication line data
09	0009	\$NULX	Address translation error relocating main storage module
0A	0010	\$NU2/\$NU2A	Invalid disk IOB parameters
0B	0011	\$ALT3	Permanent disk read error
0C	0012	\$FD1	Disk interrupt timeout check
0E	0014	\$CPO	Invalid main storage address or nonprivileged program issued LPMR
0F	0015	\$NU1	Invalid main storage operation code
10	0016	\$NUAB	Storage dump has been requested . . .
11	0017	\$NU1	Address translation error—storage not assigned
14	0020	\$NU1	Invalid timer queue element
15	0021	\$NUTIX	Address translation error on \$TRB parameter list
16	0022	\$NUTIX	Invalid system date flag found in system communication area
17	0023	\$NUTIX	Nonprivileged program issued timer load request
18	0024	\$NUTIX	Invalid type specified with timer request
19	0025	\$NUTIX	Nonprivileged program issued multiple wait timer request
1A	0026	\$NUTIX	Invalid type specified with timer request
1B	0027	\$NUTIX	Negative time value specified with timer request
1C	0028	\$NUTIX	Invalid INLINE parameter specified with timer request
1D	0029	\$NU2/\$NU2A	Disk error—second disk error before first handled

Hex	Dec	Message Issuing Module	Error Message
1E	0030	\$NU2/\$NU2A	Address translation error on disk IOB address
1F	0031	\$IPL, \$IPS	Permanent diskette error during IPL from diskette
20	0032	\$NULC	Address translation error moving main storage program
21	0033	\$ALT1/\$ALT1A	Disk error—unrecoverable disk operation
22	0034	\$ALT1/\$ALT1A/ \$ALT2A	Disk error—unrecoverable hardware error
23	0035	\$ALT1/\$ALT1A	Disk error—unrecoverable or invalid sector
24	0036	\$ALT2/\$ALT2A	Disk error—no alternative sectors available
25	0037	\$ALT1, \$ALT2/\$ALT1A/ \$ALT2A/\$ALT4A	Disk error—defective disk
26	0038	\$ALT3	Disk error—data accessed may be invalid
27	0039	\$IOIOCH	Address translation error on diskette IOB address
28	0040	\$IOIOCH	Invalid diskette data buffer address
29	0041	\$CPO	Dump storage requested by Reset/CE Start
2A	0042	\$NUAB2	Error TCB is the command processor TCB
2B	0043	\$NUAB2	Error TCB is not on the TCB chain
2C	0044	\$NUMSER2	Program size larger than main storage user area
2D	0045	\$NUAB2	Error TCB is already in abnormal termination
2E	0046	\$ALT3	Disk error—read error during system I/O function
2F	0047	\$NUMSER/ \$NUMSER2	Main storage 2K-segment error
30	0048	\$HC2	Unrecoverable main storage processor error
31	0049	\$NUAB2	Disk error—main storage dump not completed
32	0050	\$NULC/\$MRALD	Disk error—loading control storage module
33	0051	\$ALT1/\$ALT1A	Invalid disk data buffer address
34	0052	\$NU1	Invalid assign SVC or free SVC parameters
35	0053	\$NU2/\$NU2A	Disk error—loading control storage transient
36	0054	\$NU1	Invalid sector address calculated on TWA request
37	0055	\$NU2/\$NU2A	Nonprivileged program accessing privileged transient
38	0056	\$NU1	Dump storage requested by address compare service aid

Message Issuing			
Hex	Dec	Module	Error Message
39	0057	\$WS1	End of TUB chain found by work station IOCH
3A	0058	\$WS1	Invalid I/O device address in a work station IOB
3B	0059	\$NUWE	Permanent local work station controller error
3C	0060	\$NU1	Permanent assign failure
3D	0061	\$NU3	Invalid transfer instruction
3E	0062	\$MRF	Invalid MICR reader/sorter IOB parameter
3F	0063	\$MRF	ATR load error on MICR reader/sorter IOB address
40	0064	\$MRF	ATR load error on MICR reader/sorter IOB data buffer address
41	0065	\$NURL	ATR load error while logging MICR reader/sorter data
42	0066	\$MRF	MICR reader/sorter error recovery block not found
43	0067	\$NUWL	Address translation error—logging remote work station data
44	0068	\$NU1	Address translation error—executing MOVEI SVC
45	0069	NUER	Invalid ID used on MOVEI SVC
46	0070	\$IOIOCH \$16IOCH	Invalid diskette sector address
47	0071	\$NU3	Machine check during scientific execution
48	0072	\$FD2	Invalid disk interrupt
49	0073	\$FD2	Disk error—interface parity check
4A	0074	\$FD2	Disk error—unrecoverable adapter check
4B	0075	\$ALT3	Disk error, but no disk error recovery block found
EA	0234	#DDXL	Unexpected return code while extending a file
EB	0235	#CTEIF	Program check in termination exit routine
EC	0236	#CTECM	No main storage for this task
ED	0237	#SVERP	All console SYSLOG sectors in use—have more messages
EE	0238	#SVWSR	I/O error at system console during MSIPL

Hex	Dec	Message Issuing Module	Error Message
F0	0240	#CLSG	Program tried to cancel a noncancelable task
F1	0241	\$MARCK	Disk error compressing the system library
F2	0242	#CTEPR	Deallocate or termination found printer specification block with no TUB
F3	0243	#CTEIF	Command processor task or user task has no JCB
F4	0244	#CLSG, #CLST, #CLSW, #CLSP	MICs 3700, 3712, or 3713 not found in ##MSG2 member
F5	0245	#CLSG	MICs 3710 or 3711 not found in ##MSG2 message member
F6	0246	#CLXS	SYSLOG function called before MSIPL completed
F7	0247	#MARXF	SSP module has invalid where-to-go or format index table
F9	0249	#MSNIP	Required SSP module not found during MSIPL
FA	0250	#CTEPR	Format 5 extents partially free during file delete
FB	0251	#CTEPR	Format 5 file count is less than zero
FC	0252	#CTEPR	An AFA format 1 has an invalid file type
FD	0253	#CTEPR	Unexpected return code from diskette VTOC read/write
FE	0254	#CTEPR	Unexpected return code from disk VTOC read/write
FF ¹	0255	#CTEIF	Invalid recursive call to termination

¹This MIC is issued through a system error interface, and then the control program is terminated. This code specifies that SSP or DCP has received the request for termination a second time, but the supervisor has not had time to perform or complete the first request.

82-360 MICROINSTRUCTION ADDRESS REGISTER (MAR)

The value in the MAR represents the address + 1 of the microinstruction that was being executed when the error occurred that caused the log out.

82-370 MICROINSTRUCTION ADDRESS BACKUP REGISTER (MAB)

This is the address that the MAB contained at the time of the error. The address is that of the next microinstruction *after* the last branch and link microinstruction was executed.

Note: The date and time entries are not logged when the error occurs; however, they are logged when the load operation is performed after the error.