SSB SECTION

Contents

- Format F

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SSB03-790	• Message 5 (Remote Copy Paths Removed/Restored)
SSB03-800	• Message 6 (CFW impossible)
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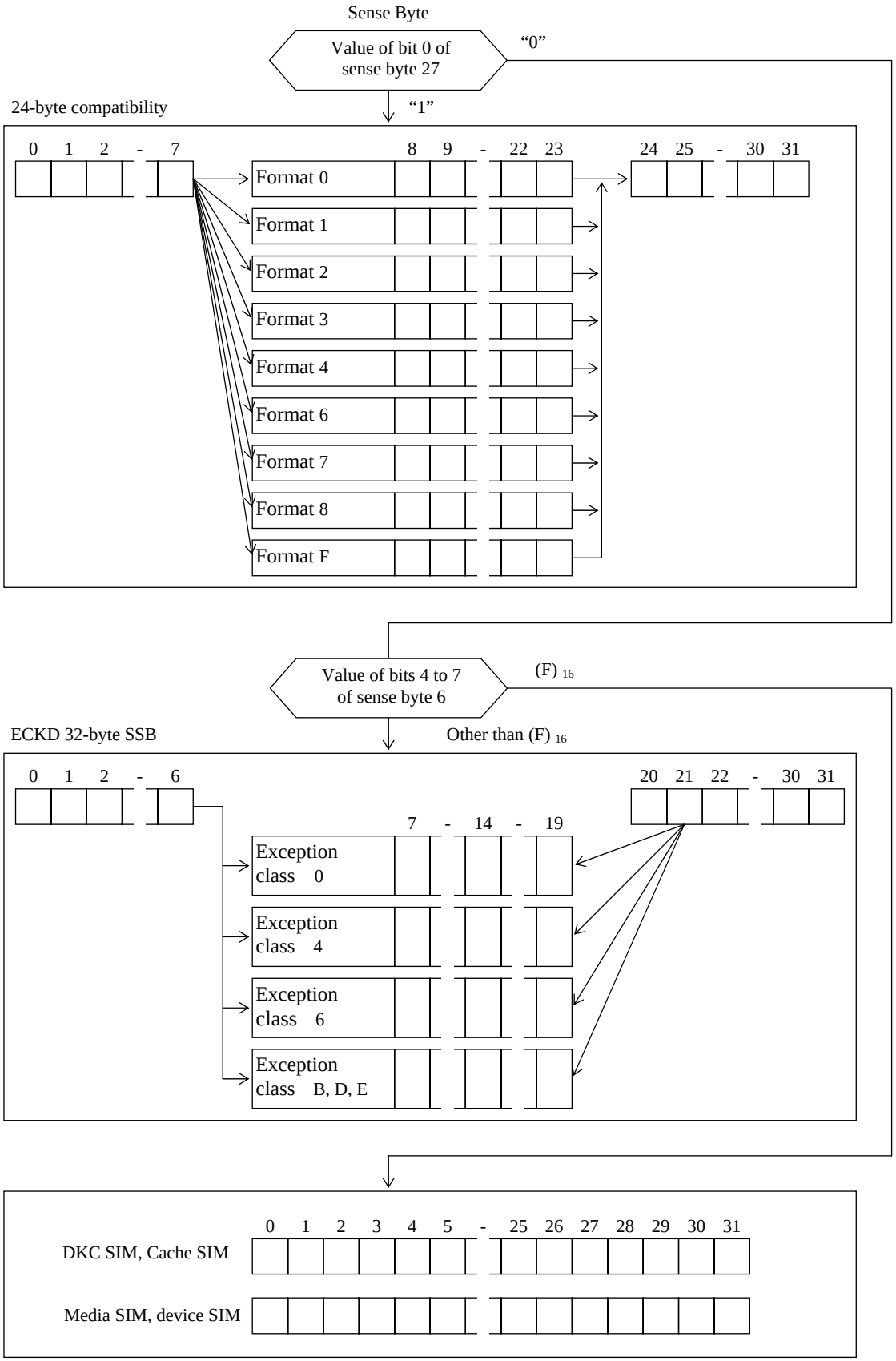
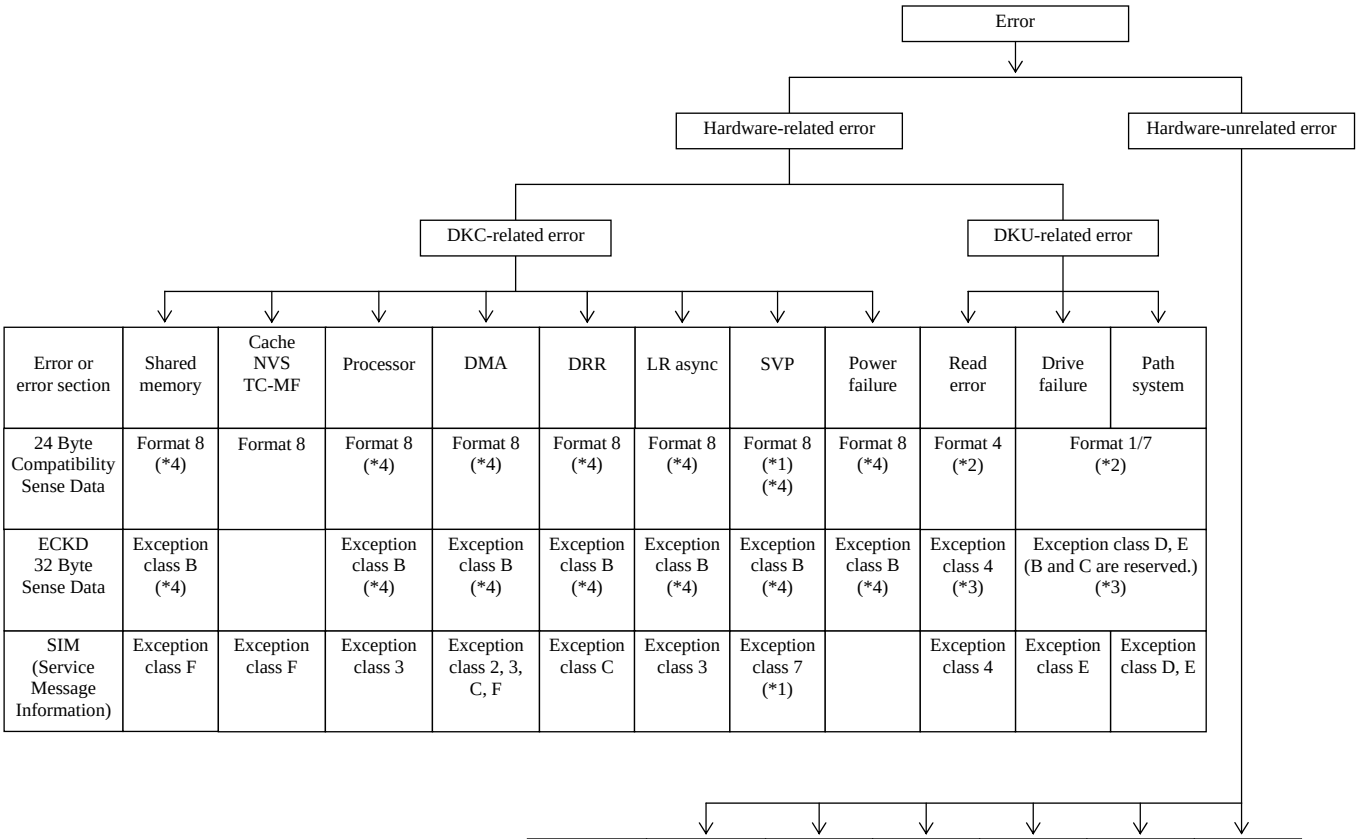
SSB03-1030	• Message F (SSD Config warning)

1. Sense Byte Analysis



2. Procedure for Searching Sense Bytes, SIM Error Table and SSB Table

The following table shows the formats for troubleshooting in this disk.



Error or error section	Shared memory	Cache NVS TC-MF	Processor	DMA	DRR	LR async	SVP	Power failure	Read error	Drive failure	Path system
24 Byte Compatibility Sense Data	Format 8 (*4)	Format 8	Format 8 (*4)	Format 8 (*4)	Format 8 (*4)	Format 8 (*4)	Format 8 (*1) (*4)	Format 8 (*4)	Format 4 (*2)	Format 1/7 (*2)	
ECKD 32 Byte Sense Data	Exception class B (*4)		Exception class B (*4)	Exception class B (*4)	Exception class B (*4)	Exception class B (*4)	Exception class B (*4)	Exception class B (*4)	Exception class 4 (*3)	Exception class D, E (B and C are reserved.) (*3)	
SIM (Service Message Information)	Exception class F	Exception class F	Exception class 3	Exception class 2, 3, C, F	Exception class C	Exception class 3	Exception class 7 (*1)		Exception class 4	Exception class E	Exception class D, E

Error or error section	Program/ system check	For "Reset Allegiance" or "Un-conditional Reserve"	I/O Program exception	Statistics	Logical inconsistency	Trace data/ Log data
24 Byte Compatibility Sense Data	Format 0	Format 3		Format 6 (*2)	Format 8 (*4)	Format 9 (*1)
ECKD 32 Byte Sense Data	Exception class 0		Exception class 0	Exception class 6 (*3)	Exception class B (*4)	
SIM (Service Message Information)						

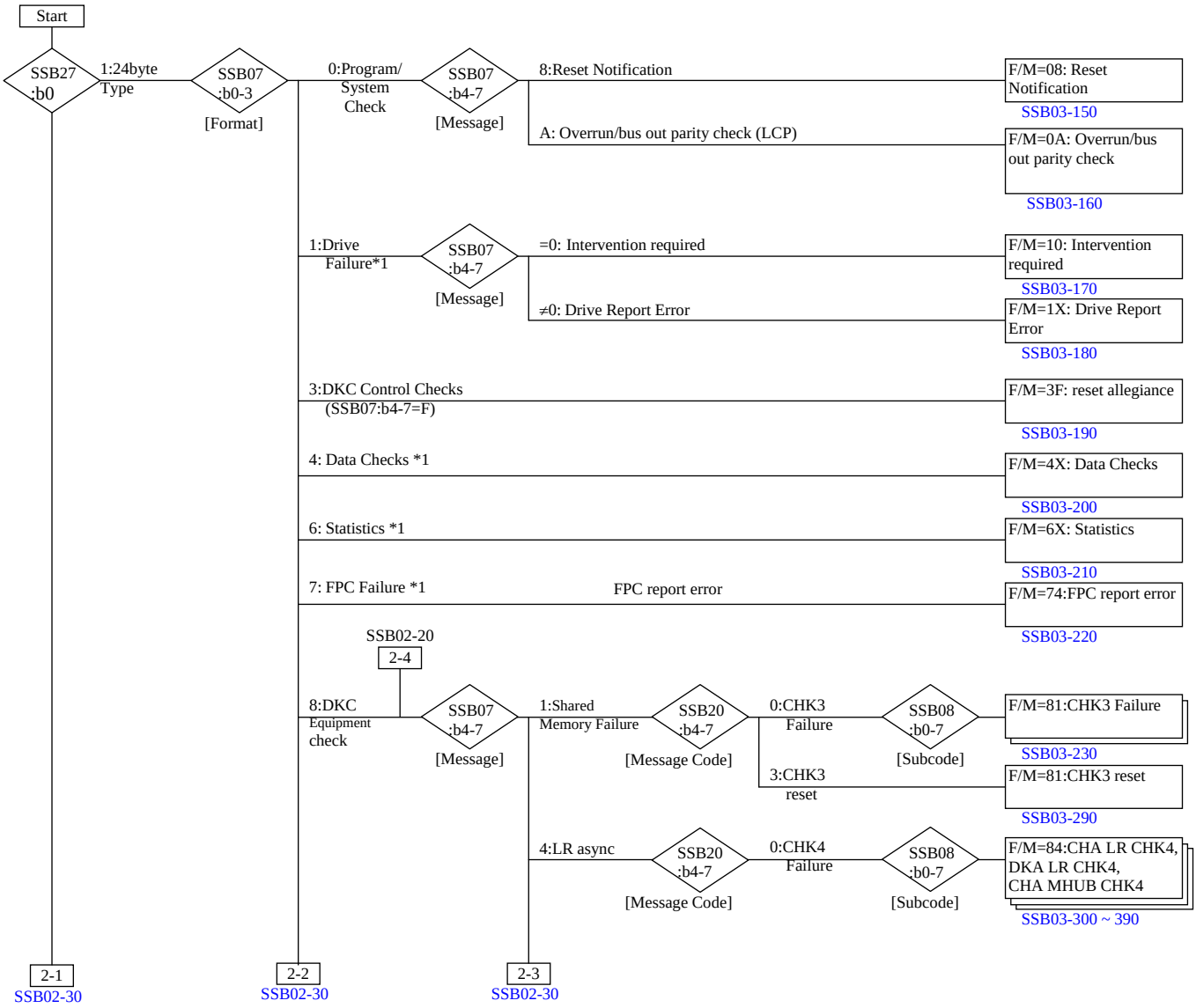
*1: This error is not reported to host. (For SSB log only)

*2: For DKU86I (IBM 3380 emulation mode) only.

*3: For DKU87I (IBM 3390 emulation mode) only.

*4: These SSBs report to host with Exception-class B in 32 Byte SSB, when DKC-Type have configured 3990-6 (Enhance mode).

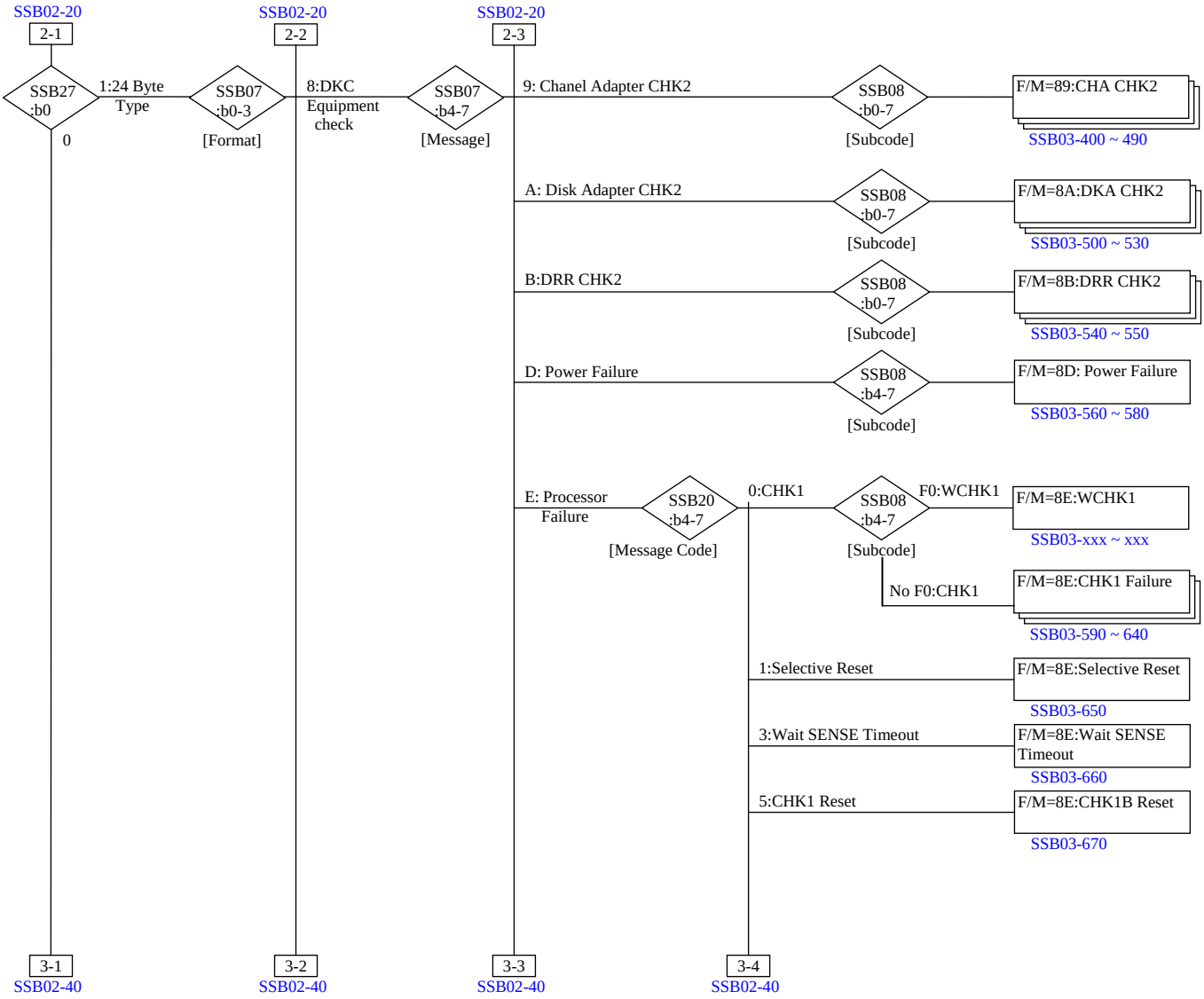
SSB02-20



*1: For DKU86I (IBM 3380 emulation mode) only.

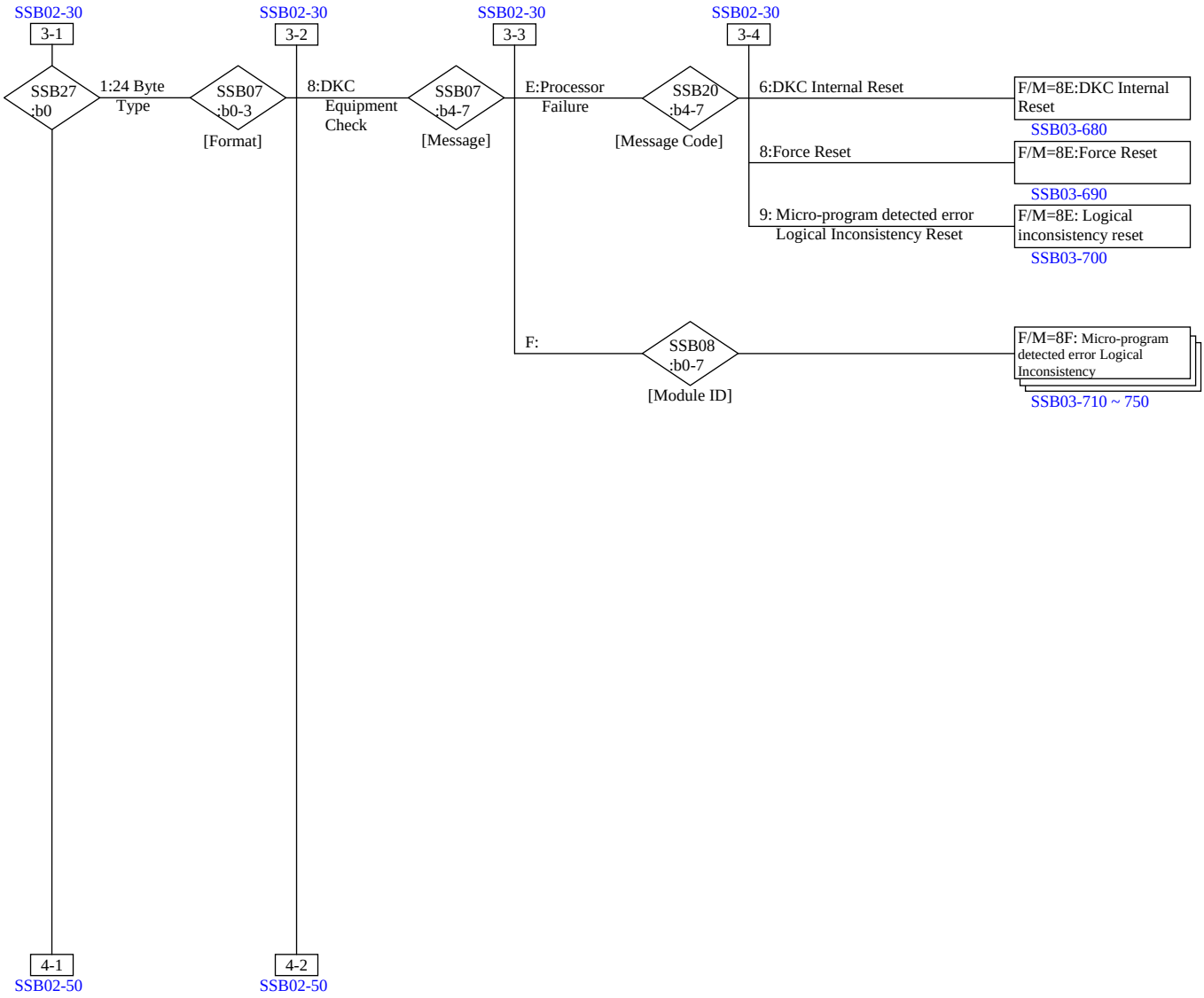
Search method for SSB tables (1/5)

SSB02-30



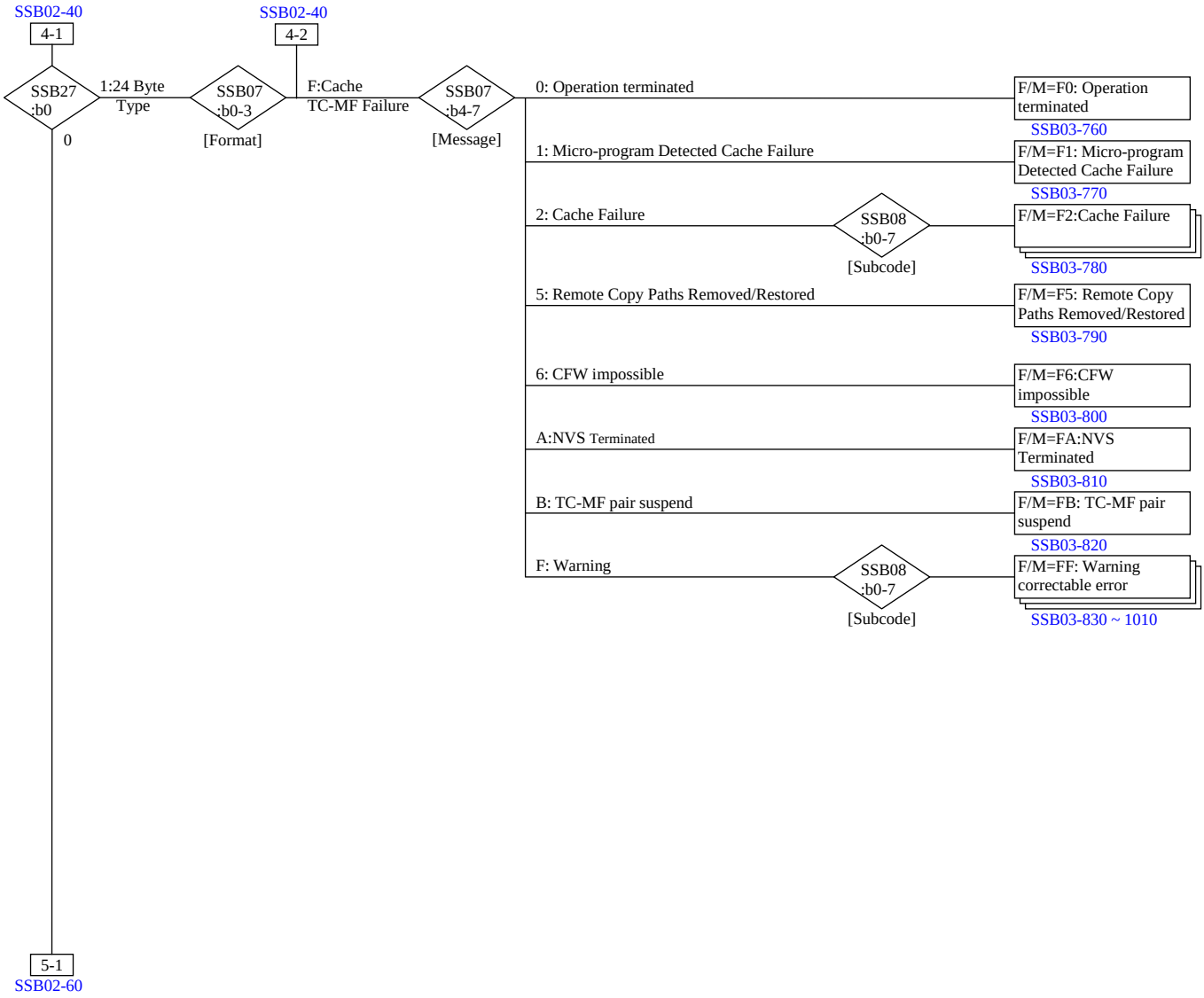
Search method for SSB tables (2/5)

SSB02-40



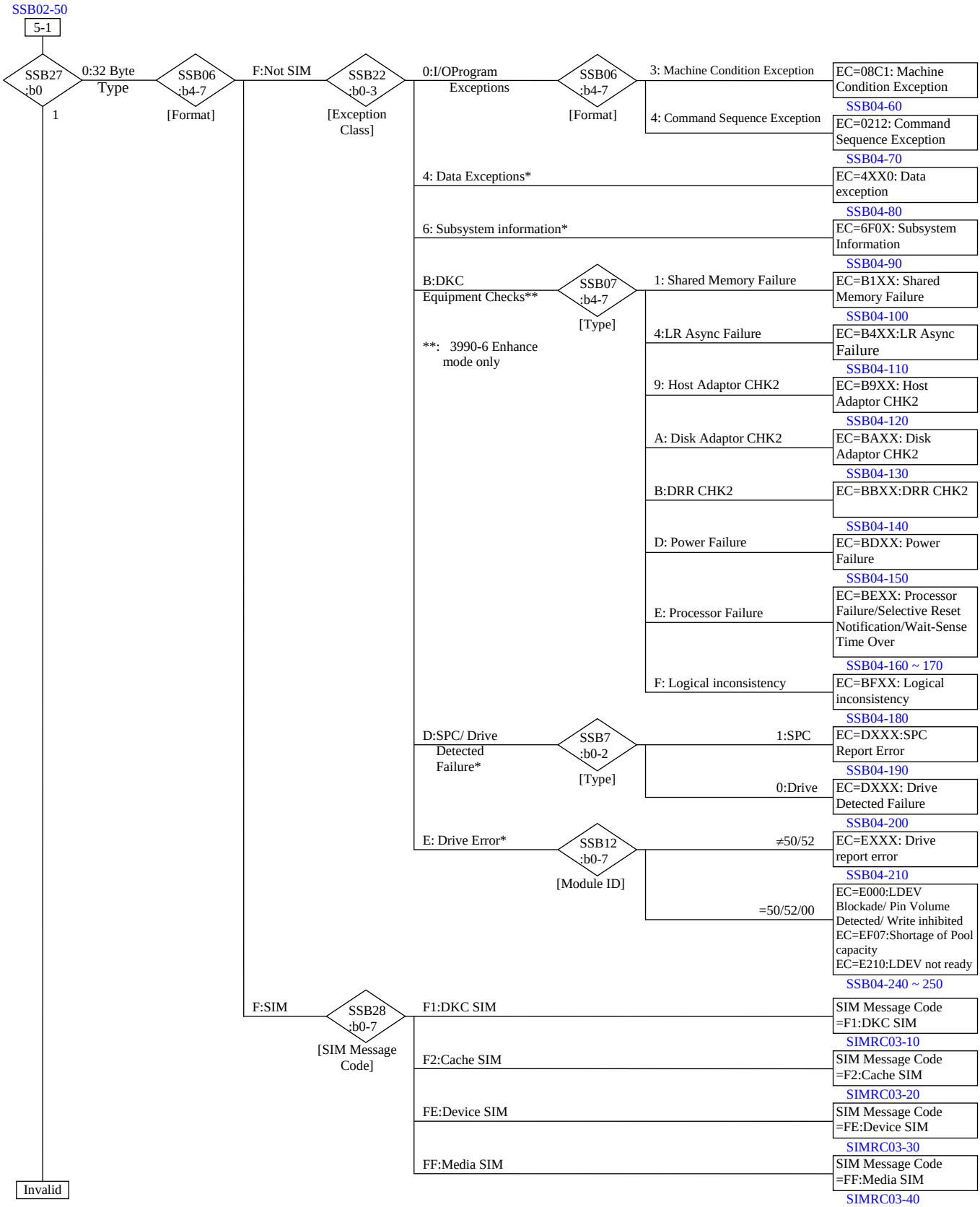
Search method for SSB tables (3/5)

SSB02-50



Search method for SSB tables (4/5)

SSB02-60



*: For DKU87I (IBM 3390 emulation mode)

Search method for SSB tables (5/5)

3. 24-Byte Compatibility SSB

3.1 Basic Sense Bytes

Byte \ Bit	0	1	2	3	4	5	6	7
0	Command reject	Intervention required	Busout parity check	Device check	Date check	Overrun	Not used	Incomplete domain
1	Permanent error	Invalid track format	End of cylinder	Operator message	No record found	File protection	Write inhibit	Imprecise ending
2	Request inhibit write	Correctable	First log mode error	Environmen-tal data present	Not used	Imprecise ending	Not used	Not used
3	Controller ID, number of retries, number of records							
4	Device address							
5	Low cylinder address, overflow flag of command overruns							
6	Head address and high cylinder address, overflow flag of data overruns							
7	Format				Message			
8 ~ 23	Bytes 8 to 23: Depends on the format and message.							
24	Logging and message control							
25	Duplex pair error	Program action code						
26	Dual frame	EDCC mode	Duplex pair	Sub-volume error	Nonsynchro-nous operation	Serial channel	Not used	Permanent path error
27	24byte SSB (1)	Device address valid	Track address valid	28 bit Cylinder	A-6586 track compatible mode	Not used	Path number	
28	Cylinder address							
29								
30								
31	Head address							

Byte	Bit	Name	Description
0	0	Command reject	1. Invalid command was received. 2. The sequence of commands is invalid. 3. The number of bytes sent by a CONTROL command is insufficient or the value is invalid. 4. A WRITE command that violates the file mask and search conditions was received. 5. A WRITE command was received when the R/W switch was set to READ. (In this case, bit 6 of byte 1 (write inhibit) also becomes “1”.) 6. The WRITE SPECIAL HA command does not permit a short byte. 7. An attempt to write an Rn record to a defective track was made. 8. No link is established for a defective or alternate track. 9. The command issued in the LOCATE domain does not match the operation specified by the LOCATE command. 10. The operation specified by the LOCATE command has violated the file mask. 11. An attempt was made to access an alternate track beyond the user cylinder during multi-track operation in the LOCATE domain. (File protected (bit 5 of byte 1) is set at the same time.) 12. The status of the cache/device does not meet the requirement of the SET SUB MD/PERF SUB FUNC command.
	1	Intervention required	1. The addressed device is not READY. 2. The DKU is in the CE mode. 3. The addressed device is not physically connected.
	2	Busout check	The data or command transferred from the channel has a parity error.
	3	Device check	A malfunction was detected in the subsystem. Details are indicated in Bytes 7 to 31.
	4	Data check	1. A correctable read error was detected in the data read from the device. (Bit 1 of byte 2 (“correctable”) is set at the same time. The information for correction is indicated in sense bytes 15 to 23.) 2. An uncorrectable read error was detected in the data read from the device. 3. The end by the PCI fetch mode is indicated. Bit 1 of byte 2 (“correctable”) is set at the same time and restart displacement is guaranteed. Error displacement and error pattern are 0.
	5	Overrun	1. A response to a data request or reconnection request could not be received within the predetermined time on the parallel channel. This error is reported with F/M=0A. 2. No response was made or an invalid frame was received when the serial channel was in a data transfer sequence; so, retry was impossible. 3. Command retry (overrun) was requested from the channel, but retry was impossible. This error is reported with F/M=0A. 4. Termination of overrun was requested from the channel. This error is reported with F/M=0A. Note: This bit is set on if ten overruns have occurred through command retry including the format write command. (Permanent error (bit 0 of byte 1) is not set.) If a data overrun has occurred with a WRITE command, data transfer is aborted immediately and (00H) is written till the end of that record.
	6	Not used	Always 0
	7	Incomplete domain	This bit is set if a short domain has been detected during a write in asynchronous transfer. Environmental data present (bit 3 of byte 2) is also set to ‘1’.
1	0	Permanent error	Command retry failed.

Byte	Bit	Name	Description
1	1	Invalid track format	1. An index was encountered during a data write. (A data write beyond the track capacity was made.) 2. An index marker was detected in the key or data field when the READ or SEARCH command (except SCH ID) was handling a record. 3. An updating write was attempted for a record with a different size from the record size specified in TLF of the LOCATE command or the block length of the DEF EXT command. 4. The length of the data field of R0 was not 8 bytes during WRITE TRK operation.
	2	End of cylinder	An attempt was made to perform track switching from the last track of the logical cylinder by a READ or SEARCH command with multi-track specification. (End of cylinder is not reported in the LOCATE domain.)
	3	Message to operator	This bit is set to display an error to the operator.
	4	No record found	1. Two index markers were detected in the same command chain without intervention of a WRITE or SENSE command or a read operation that handles the HA or data field. 2. The target record searched for by a LOCATE command could not be detected. Imprecise ending (bit 7 of byte 1) is also set at the same time.
	5	File protected	1. A SEEK command has violated the file mask or extent range. 2. A READ or SEARCH command with multi-track specification has violated the file mask or extent range. 3. An attempt was made to access an alternate track beyond the user cylinder during multi-track operation in the LOCATE domain. (Command reject (bit 0 of byte 0) is also set at the same time.) 4. Multi-track operation was tried directly to an alternate track in the asynchronous mode. 5. The track set is out of the extent specified for WRITE ANY/READ ANY. 6. The LOCATE RECORD/LOCATE RECORD EXTENDED domain is out of extent.
	6	Write inhibit	1. A WRITE command was received when the R/W switch was set to READ. (Bit 0 of byte 0 (command rejection) also becomes “1”.) 2. Indicates that the write prohibition status has been established by the DIAG CTL command. (Bit 3 of byte 0 (device check) is also set at the same time.)
	7	Imprecise ending	Indicates that the error indicated in the sense byte is due to a command before the command that reported the unit check. (abnormal end in the LOCATE domain) Bit 5 of byte 2 is also set at the same time.
2	0	Request inhibit write	Requests issuance of a DIAG CTL command that instructs prohibition of a write through the path to avoid an error from which the path cannot recover. (At the same time, the faulty section is set in byte 25 “program action code”.)
	1	Correctable	Indicates that bit 4 of sense byte 0 (data check) can be corrected. Restart displacement, error displacement, and error pattern are indicated in bytes 15 to 23.
	2	First log mode error	The number of occurrences of seek/data errors exceeded the threshold. (Bit 3 of byte 2 (environmental data present) is also set at the same time.)
	3	Environmental data present	Indicates that this SSB is not due to the current CCW chain but it is the statistics to be reported from the DKC to the host. The statistics include log information and reset notification.
	4	Not used	Always 0
	5	Imprecise ending	Same as bit 7 of byte 1
	6	Not used	Always 0
	7	Not used	Always 0

<table>
<tr><th>Byte</th><th>Bit</th><th>Name</th><th>Description</th></tr>
<tr><td>3</td><td>0 ~ 7</td><td>Controller ID, number of retries, number of records</td><td>1. Controller ID (Format 1, 6, 7, 8, or F, without imprecise ending)
2. Number of retries (Format 4 or 5, without imprecise ending, and environmental data present = 1)
3. Number of remaining records or tracks in the LOCATE domain (when indeterminate end or file protection is 1)
4. Zero (For other than 1 to 3 above)</td></tr>
<tr><td>4</td><td colspan="3"><table>
<tr><td>0</td><td>SP number 2^1</td></tr>
<tr><td>1</td><td>SP number 2^0</td></tr>
<tr><td>2</td><td>Controller number</td></tr>
<tr><td>3 ~ 7</td><td>DKU physical number</td></tr>
</table></td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">0 ~ 7</td><td>Lower digits of cylinder address</td><td>Indicates the lower digits of the cylinder address of the seek address received from the last channel (2^7 to 2^0).</td></tr>
<tr><td>Overflow flag of command overruns</td><td>Set to x‘01’ when the command overrun threshold is exceeded. (For format 6 only)</td></tr>
</table>

Byte	Bit	Name	Description
6	0 ~ 3	Upper digits of cylinder address	Indicates the upper digits of sense byte 5. Indicates the upper digits of the cylinder address of the last seek address received from the channel.
	4 ~ 7	Head address	Indicates the head address of the last seek address received from the channel. This address is updated in multi-track operation.
	0 ~ 7	Overflow flag of data overruns	Set to x‘01’ when the data overrun threshold is exceeded. (For format 6 only)
7	0 ~ 3	Format	The following indicate the meanings of sense bytes 8 to 23. 0000 Format 0 Program check or system check 0001 Format 1 Drive failure *1 0010 Format 2 DKC function check (Not used) 0011 Format 3 DKC control check 0100 Format 4 Data check without information for correction *1 0101 Format 5 Data check with information for correction (Not used) 0110 Format 6 Statistics *1 0111 Format 7 SPC Failure *1 1000 Format 8 Microprogram detected error or DKC/DKU failure 1001 Format 9 Microprogram detected error 1110 Format E Service information message (SIM) (Not used) 1111 Format F Cache system error
	4 ~ 7	Message	Indicates the determined characteristics of the error status for the above formats. Hexadecimal digits of 0 to F indicated in bits 4 to 7 correspond to 0 to F for messages.
24	0 ~ 2	Logging	Reserved
	3	message	Logging mode
	4 ~ 5	control	Logging action (only ‘01’ used) 00: Not logged 01: Unconditionally logged 10: Only the first record logged at retry 11: Only the first record logged upon occurrence of a permanent error
	6 ~ 7		Operator message control (only ‘01’ used) 00: No operator message 01: Message unconditionally output 10: Message output only for the first record at retry 11: Message output only for the first record upon occurrence of a permanent error.

*1: For DKU86I only.

Byte	Bit	Name	Description
25	0	Program action code	Duplex pair volume error (Not used) Indicates the error on a duplex pair (neither pending nor suspended). This bit is set to 1 for device check or intervention request. F/M=1/7/8
	1 ~ 7		Instructs the method of error recovery. $(00)_{16}$: No action $(10)_{16}$: SIM (Not used) $(16)_{16}$: Reset notification $(17)_{16}$ or $(57)_{16}$: Device check with FMT=7/8 during write operation. Prohibits write to the controller if a permanent error has occurred on that path. $(18)_{16}$ or $(58)_{16}$: Device check during write operation. Prohibits write to the channel path if a permanent error has occurred on that path. $(19)_{16}$ or $(59)_{16}$: Device check during write operation. Prohibits write to the storage path if a permanent error has occurred on that path. $(70)_{16}$: The command was rejected because the condition specified in the specific blocking condition setting order of the PERF SUB FUNC command was met. $(71)_{16}$: Attention was reported from the interface placed in the specific blocking status by the PERF SUB FUNC command. $(1D)_{16}$: The subsystem or device is in the State Change Pending status (statistics send (bit 3 of byte 2) = 1, F/M = F0).
26	0	Configuration information	Dual-frame configuration 0: Single-frame configuration 1: Dual-frame configuration
	1		EDCC mode 0: DCC 1: EDCC
	2		Duplex pair indication (Not used) 0: Simplex 1: Duplex pair
	3		Sub-volume error indication (Not used) 0: Not a sub-volume error 1: Sub-volume error
	4		Nonsynchronous operation 0: Synchronous operation 1: Nonsynchronous operation
	5		Serial channel 0: Parallel channel 1: Serial channel
	6		Not used
	7		Permanent path error 0: Permanent error for all paths 1: Permanent error for this path

3.2 Formats and messages

(1/2)

Format	Message	Description	
0		Operator message (bit 3 of byte 1) = 0	Operator message (bit 3 of byte 1) = 1
	0	No message	Not used
	1	Invalid command	Log mode end (Not used)
	2	Invalid sequence	Not used
	3	Data count is fewer than the specified number.	Device was fenced. (Not used)
	4	Data value differs from the specified number.	Not used
	5	The file mask allows neither RD SP HA nor WR SP HA.	
	6	The channel isolated the retry.	
	7	The channel sent an incorrect retry command.	
	8	System reset was received (reset notification).	
	9	Not used	
	A	Overrun/bus out parity check (LCP)	
	B	Improper instruction for a defective track or alternate track	
	C	Not used	
	D	ECM software error (Not used)	
	E	Invalid command for sub-volume (Not used)	
	F	Invalid status (reason code in byte 8)	
1	0	Intervention required	For DKU86I only
	1	Not used	
	2	Drive not ready	
	3	Not used	
	4	Drive report error	
	5~F	Not used	
3	0~E	Not used	
	F	Reset allegiance	
4	0	Data check in HA field	For DKU86I only
	1	Data check in C field	
	2	Data check in K field	
	3	Data check in D field	
	4	Not used	
	5	PA error	
	6-F	Not used	
6	0~7	Statistics	
	8~F	Not used	

(2/2)

Format	Message	Description	
7	0~3	Not used	For DKU86I only
	4	SPC report error	
	5~8	Not used	
	9	SCSI bus parity error	
	A~F	Not used	
8	0	Reserved	
	1	Shared memory failure	
	2~3	Reserved	
	4	LR async failure	
	5~8	Reserved	
	9	Host adapter CHK-2	
	A	Disk adapter CHK-2	
	B	DRR CHK-2	
	C	Reserved	
	D	Power failure	
	E	Processor failure	
	F	Microprogram detected error (Logical inconsistency)	
E	0	Reserved	
	1~F	Reserved	
F	0	Operation terminated	
	1	Microprogram detected cache failure	
	2	Cache failure	
	3	Reserved	
	4	Reserved	
	5	Remote Copy Paths Removed/Restored	
	6	CFW impossible	
	7	Invalid track format (Does not occur with RAID200.)	
	8~9	Reserved	
	A	NVS terminated	
	B	TrueCopy for Mainframe Pair suspend	
	C-E	Reserved	
	F	Cache/Shared memory/M-bus/F-bus/J-bus warning	

3.3 Details of Sense Bytes

Format 0, Message ≠ 8/A (Program or system check)

	0	1	2	3	4	5	6	7
7	Format (x'0')				Message (x'X' : x ≠ 8, A)			
8	Reason code when F/M = 0F Command code when F/M ≠ 0F							
9	Error detail information (Note 1)							
10								
11								
12								
13	SSID of mate subsystem (x'0000' for EDCC)							
14								
15	Manufacturer code (x'000000')						Factory code (x'00')	
16	Module ID (Note 3)							
17	Routine ID (Note 3)							
18	Processor No.				Error detail information (Note 2)			
19								
20	SSID for Self Subsystem							
21								
22	Symptom Code (x'0F0X' : X = message code) (Note 3)							
23								

(Note 1)

(1) Issued command information when F/M=02

B\b	0	1	2	3	4	5	6	7
9	SCH ID	SCH KEY	Locate, LC EXT	SK, SK CYL	RD IPL	RECAL	SUSP MPR	RD C
10	DIAG CTL	DIAG CTL (LOC DOM)	DEF EXT	SET FM	SET SUB MODE	SP C	WR CKD	WR R0
11	SET INTF ID	DIAG CTL (PRE REM)	0	Other command	RD C chaining	All byte match	LC domain	Erase execute
12	Write through	0	0	Allow WR KD	Allow WR D	Allow WR CKD	Allow WR R0	Allow WR HA

(2) Short byte flag when F/M=03
x'0040 0000'

(3) Mask information when F/M=05

Byte 9 : Mask for write control
- x‘00’ : Allows all write operation except WR HA, WR R0.
- x‘40’ : Inhibits all write operation.
- x‘80’ : Allows update write operation.
- x‘C0’ : Allows all write operation.

Byte 10 : Mask for seek control
- x‘00’ : Allows all seek commands and RECAL.
- x‘08’ : Allows SK CYL and SK HD only.
- x‘10’ : Allows SK HD only.
- x‘18’ : Inhibits all seek commands and multi operation.

Byte 11 : Mask for access
- x‘00’ : Allows normal access.
- x‘02’ : Allows device support.
- x‘04’ : Allows diagnostic access.
- x‘06’ : Allows device support inhibit data check correction and retry.

Byte 12 : Not used

(4) Record address when other F/M

Byte 9 : [In case of that the last access cylinder address is not 28 bit format]
Message code
[In case of that the last access cylinder address is 28 bit format]
Bit 12-19 of cylinder address

Byte 10 : [In case of that the last access cylinder address is not 28 bit format]
High side of cylinder address
[In case of that the last access cylinder address is 28 bit format]
Bit 20-27 of cylinder address

Byte 11 : [In case of that the last access cylinder address is not 28 bit format]
Low side of cylinder address
[In case of that the last access cylinder address is 28 bit format]
Bit 0-7 of cylinder address

Byte 12 : The last access of head address

(Note 2) Bit 4-7 of byte 18 : Type of byte 19
- x‘08’ : Byte 19 is cylinder address (high).
- x‘09’ : Byte 19 is cylinder address (low).
- x‘0A’ : Byte 19 is head address (high).
- x‘0B’ : Byte 19 is head address (low).
- x‘0C’ : Byte 19 is record number.

Byte 19 : One byte of CCHHR.

(Note 3) x‘2F00’ for dummy SENSE

Reason code list for Format 0, Message F (1/3)

Code	Reason
00	No messages
01	An attempt was made to make a cache usable but the cache was in the pending status.
02	Not used
03	An attempt was made to forcibly make a cache unusable but the cache was not holding destage completion.
04	An attempt was made to activate a CFW but the CFW was in the ending status.
05	An attempt was made to perform caching for a device but a cache was in the pending status.
06	An attempt was made to destage a track but an NVS was in the failed status.
07	An attempt was made to make an NVS unusable but the NVS was being initialized.
08	An attempt was made to halt or discarded caching/DFW for a device but the DFW of the device was in the failed status.
09	An attempt was made to forcibly halt a DFW of a device but the device was not in the following status. • The DFW was in the pending status. • The DFW was in the failed status. • An NVS was failed. The data was in the NVS but not in the cache.
0A	An attempt was made to make an NVS usable but a DFW of a device was in the pending or failed status.
0B	An attempt was made to make an NVS usable but the NVS was in the pending status.
0C	An attempt was made to halt caching/DFW of a device when an NVS was failed but the data of the device was in the NVS but not in the cache.
0D	An NVS was requested by a command but the NVS was unusable.
0E	A cache was requested by a command but the cache was unusable.
0F-10	Not used
11	Pair state not valid for this operation. Resync not valid for SIMPLEX pair. Pair state already PENDING or DUPLEX. Unable to resync for pair suspended by secondary device.
12	Pair already defined.
13	Operation not valid when target device is ONLINE.
14-18	Not used
19	Pair already in suspended state.
1A	Not used
1B	Operation not valid for SIMPLEX device.
1C	Suspend not valid for secondary device in PENDING state.
1D	Pair already suspended.
1E-24	Not used

Reason code list for Format 0, Message F (2/3)

Code	Reason
25	(TPF,RC) An SSM command (subcommand: Make Cache Unavailable to Subsystem) was received while a cache storage initialization procedure was underway.
26	Primary and Secondary volumes of different format, emulation type, or RAID level.
27	Not used
28	(TPF,RC) A PSF command (Order: Prepare for Read Subsystem Data, Suborder: X‘05’) was received when cache was not available or pending.
29	The PSF command of specific blocking status setting order was issued from an interface having no path group.
2A	An attempt was made to make a path group having parallel and serial channels intermixed.
2B	A message buffer is full.
2C~2F	Not used
30	(TPF,RC) The cache partition indicated by PSF command (Order: Prepare for Read Subsystem Data) was not initialized.
31-32	Not used
33	Target is not secondary device and/or C/T ID mismatch.
34	Not used
35	SET GUARANTEED PATH sub-command was issued to a path in a fence.
36-39	Not used
3A	(TPF,RC) Read or Search or Write commands were received while 3380 Track Compatibility Mode.
38~3E	Not used
3F	An attempt was made to execute the MAKE NVS AVAIL FOR SUB sub-command but the NVS was disabled because the ‘enable/disable NVS capability’ has been set to ‘disable’ in a VPD.
40	Not used
41	An ordinary command was issued to a device being reserved for media maintenance.
42~51	Not used
52	No path link can support the requested operation.
53	C/T ID not enabled on RAID array. Identical CT/ID exists on RCU.
54	Primary/secondary device type mismatch.
55~56	Not used
57	In the device for which the address is specified, the TrueCopy pair is in the state of Suspend. All the Write commands where Normal Authorization is shown are rejected.
58	Target is not primary device in the indicated Consistency Group. Operation not valid when primary volume is ONLINE. Pair state not valid for this operation.
59-7F	Not used

Reason code list for Format 0, Message F (3/3)

Code	Reason
80	A specific command was issued on an interface which has been in the specific command blocking status by the SET SPECIAL INTERCEPT CONDITION order of the PSF command.
81	An attention was reported to an interface which has been in the specific command blocking status by the SET SPECIAL INTERCEPT CONDITION order of the PSF command.
82	Not used
83	Pair not established as Consistency Group member.
84-8F	Not used
90	(TPF,RC) 1. A Locate Record Extended command was received on a 3990 that have ESCON channel capability. 2. A PSF command (one of these orders: Establish Duplex Pair, Terminate Duplex Pair, Suspend Duplex Pair, or Direct I/O to One Device of the Duplex Pair) was received. 3. A PSF command (Order: Prepare for Read Subsystem Data, Suborder: X‘04’) was received. 4. A PSF command (one of these orders: Prepare for Read Subsystem Data, Set Lock State, Purge Lock, Unlock, Connect, or Disconnect) was received in the case of MPLF feature was not installed.
91	(TPF,MPLF)Specified MPLP had not been initialized and the cache was not in an available status.
92	(TPF,RC) An SSS command was rejected because additional pinned data still existed.
93	(TPF,MPLF) A cache storage control command was received when Disconnect order was in progress for any MPLP.
94	(TPF,RC) Destage Modified Tracks order was received while a scan of the cache for modified data is underway, which was initiated from the receipt of a prior Destage Modified Tracks order.
95	(TPF,MPLF) The attention message buffer was full when the order which has the potential of generating attention interrupt was received.
96-E7	Not used
E8	Pair already defined.
E9-FF	Not used

Format 0, Message 8 (reset notification)

	0	1	2	3	4	5	6	7
7	Format (x‘0’)				Message (x‘8’)			
8	x‘00’							
9	x‘00’							
10	x‘00’							
11	Hardware level (Note)							
12								
13	SSID of mate subsystem (x‘0000’ for EDCC)							
14								
15	Manufacturer code (x‘000000’)						Factory code (x‘00’)	
16	Module ID							
17	Routine ID							
18	Processor No.				Not used			
19	Not used							
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘2FFF’)							
23								

(Note) Hardware level

Bit 0 : Serial channel hardware level

When the bit 0 = 0,

- Bit 1: Not used
- Bit 2-3: Reported storage path
- Bit 4-5: Number of channels per cluster
  - 00 : 4
  - 01 : 8
  - 10 : Not used
  - 11 : Not used
- Bit 6: NVS
  - 0 : Not exist
  - 1 : Exist
- Bit 7: Not used
- Bit 8-10: Cache size
  - 000 : Non cache
  - 001 : 256MB
  - 010 : 512MB
  - 011 : 768MB
  - 100 : 1024MB
  - 101 : 1280MB
  - 110 : 1536MB
  - 111 : Over 1537MB
- Bit 11-13: Cluster hardware level
- Bit 14-15: Cache/NVS hardware level

When the bit 0 = 1,

- Bit 1: Not used
- Bit 2-3: Failed storage path
- Bit 4-7: Number of channels per cluster
  - 0000 : Parallel channel = 4, serial channel = 0
  - 0001 : Parallel channel = 8, serial channel = 0
  - 0010 : Parallel channel = 4, serial channel = 2
  - 0100 : Parallel channel = 4, serial channel = 4
  - 0110 : Parallel channel = 0, serial channel = 2
  - 1000 : Parallel channel = 0, serial channel = 4
  - 1010 : Parallel channel = 0, serial channel = 8
  - 1100 : Parallel channel = 0, serial channel = 6
- Bit 8: Dual Frame
  - 0 : Dual Frame
  - 1 : Modular Power
- Bit 9-11: Cache size
  - 000 : Non cache
  - 001 : 256MB
  - 010 : 512MB
  - 011 : 768MB
  - 100 : 1024MB
  - 101 : 1280MB
  - 110 : 1536MB
  - 111 : Over 1537MB
- Bit 12-13: Cluster hardware level
- Bit 14-15: Cache/NVS hardware level

Format 0, Message A (LCP & overrun, bus out parity check)

	0	1	2	3	4	5	6	7
7	Format (x‘0’)				Message (x‘A’)			
8	Command code							
9	Cylinder address							
10								
11	Head address							
12	Record No.							
13	SSID of mate subsystem (x‘0000’ for EDCC)							
14								
15	Manufacturer code (‘000000’)						Factory code (‘00’)	
16	Module ID							
17	Routine ID							
18	PCB number				BBF OVER (XR4B)	PND OVER (XR4B)	STOP (XR49)	OVER (XR4A)
19	Not used							
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘0F0A’)							
23								

Format 1, Message 0 (Intervention required)

	0	1	2	3	4	5	6	7
7	Format (x‘1’)				Message (x‘0’)			
8	READY	ENABLE	SSB PEND	Not used (‘0000’)				
9	Not used (x‘00’)							
10	M.M.RSV	PIN VOL	Not used (‘000000’)					
11	HOST TYPE	DKC TYPE	Not used (‘00’)		DKU TYPE			
12	Module ID							
13	Routine ID							
14	Command code							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Not used (x‘00’)							
18	PCB number				Not used (x‘0000’)			
19	Not used (x‘00’)							
20	SSID of Self Subsystem							
21								
22	Symptom Code (x‘9F10’)							
23								

Format 1, Message X (Drive report error)

	0	1	2	3	4	5	6	7
7	Format (x‘1’)				Message (x‘2/4’)			
8	Additional Sense Code + Additional Sense Code Qualifier (See EC = E SSB for detail)							
9								
10	SCSI Command code (See EC = E SSB for detail)							
11	Threshold type (See EC = E SSB for detail)							
12	Module ID							
13	Routine ID							
14	Not used (X‘0’)				DKA#			
15	CDEV#				RDEV#			
16	Type Code (‘000’)			0	Sense Key (See EC = E SSB for detail)			
17	Not used (x‘00’)							
18	Not used (x‘00’)							
19	Not used (x‘00’)							
20	SSID of Self Subsystem							
21								
22	Symptom code (x‘9F1X’ X: Message)							
23								

Format 3, Message F (reset allegiance)

	0	1	2	3	4	5	6	7
7	Format (x‘3’)				Message (x‘F’)			
8	Not used (x‘00’)							
9	Activated LPN							
10	DEVICE BUSY	ECI	COMMAND CHAINING	PATH RESERVE	STACK STATUS	WAIT SENSE	LONG BUSY	PROCESSOR CONNECT
11	SINGLE PATH MODE	GUARANT PATH MODE	MCB CHAINING	0	BLOCK SWITCH	0	0	0
12	Command code							
13	SSID of mate subsystem (x‘0000’ for EDCC)							
14								
15	Manufacturer code (‘000000’)						Factory code (‘00’)	
16	Module ID							
17	Routine ID							
18	PCB number				Not used			
19	Not used							
20	SSID of Self Subsystem							
21								
22	Symptom Code (x‘3F3F’)							
23								

Format 4, Message X (Data check)

	0	1	2	3	4	5	6	7
7	Format (x‘4’)				Message (x‘X’)			
8	Cylinder address							
9								
10	Head address							
11								
12	Record number							
13	Sector number							
14	Controller ID							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Not used (x‘00’)							
18	PCB number				Not used (x‘0000’)			
19	Not used (x‘00’)							
20	Command code							
21	SSID of Self Subsystem (low order)							
22	Symptom Code (x‘4XYY’ *1)							
23								

*1: Symptom code

X: x‘0’ : Data check in HA field
x‘1’ : Data check in C field
x‘2’ : Data check in K field
x‘3’ : Data check in D field
x‘5’ : PA error

YY: x‘80’ : Correctable (Recovered)
x‘C0’: Uncorrectable

Format 6, Message X (Statistics)

	0	1	2	3	4	5	6	7
7	Format (x‘6’)				Message (x‘X’) (*1)			
8	Number of read or searched bytes							
9								
10								
11								
12	Seek count							
13								
14	Not used (x‘00’)							
15	Manufacture code (‘000000’)						Factory code (‘00’)	
16	Not used (x‘00’)							
17	DKC serial number							
18								
19								
20	SSID of Self Subsystem							
21								
22	Symptom Code (x‘6FYX’) (*2)							
23								

*1: X: Channel number when parallel channel is connected.
LCP number in cluster when serial channel is connected.

*2: Y: 0 : Statistics or RRBL command
1 : Channel data overrun
X : See *1.

Format 7, Message 4 (FPC report error)

	0	1	2	3	4	5	6	7
7	Format (x‘7’)				Message (x‘4’)			
8	Not used							
9	Not used							
10	Not used							
11	Not used							
12	Module ID							
13	Routine ID							
14	Not used							
15	Drive serial number (x‘0C24’) + (DKU sequence number) This information is not fixed until DKC reports SSB to HOST.							
16								
17								
18								
19								
20	SSID of Self Subsystem							
21								
22	Symptom Code (x‘DF74’)							
23								

Format 8, Message 1 (shared memory failure) (1/6)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘1’)			
8	Subcode (x‘00’ or x‘01’ or x‘02’ or x‘10’ or x‘F0’)							
9	MPA_location							
	Module number	MPA_LSI#						
10	MPA_ERRSTS_MPx:B7							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
11	MPA_ERRSTS_MPx:B6							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
12	MPA_ERRSTS_MPx:B5							
	Not used	Not used	DBG_BLK Warning	R_BLK Warning	D3_BLK Warning	D2_BLK Warning	D1_BLK Warning	D0_BLK Warning
13	MPA_ERRSTS_MPx:B4							
	M3_BLK Warning	M2_BLK Warning	M1_BLK Warning	M0_BLK Warning	E3_BLK Warning	E2_BLK Warning	E1_BLK Warning	E0_BLK Warning
14	MPA_ERRSTS_MPx:B3							
	Not used	Not used	DBG_BLK CHK3	R_BLK CHK3	D3_BLK CHK3	D2_BLK CHK3	D1_BLK CHK3	D0_BLK CHK3
15	MPA_ERRSTS_MPx:B2							
	M3_BLK CHK3	M2_BLK CHK3	M1_BLK CHK3	M0_BLK CHK3	E3_BLK CHK3	E2_BLK CHK3	E1_BLK CHK3	E0_BLK CHK3
16	MPA_ERRSTS_MPx:B1							
	Not used	Not used	DBG_BLK CHK1B	R_BLK CHK1B	D3_BLK CHK1B	D2_BLK CHK1B	D1_BLK CHK1B	D0_BLK CHK1B
17	MPA_ERRSTS_MPx:B0							
	M3_BLK CHK1B	M2_BLK CHK1B	M1_BLK CHK1B	M0_BLK CHK1B	E3_BLK CHK1B	E2_BLK CHK1B	E1_BLK CHK1B	E0_BLK CHK1B
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF81’)							
23								

Format 8, Message 1 (shared memory failure) (2/6)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘1’)			
8	Subcode (x‘03’ or x‘20’ or x‘30’)							
9	SW_location							
	Module number	SW_LSI#						
10	SW::REP_ERR:B3							
	SW WARNING	Not used	Not used	Not used	Not used	Not used	CPL_ERR	Not used
11	SW::REP_ERR:B2							
	SB ERR	SWD ERR	SWC ERR	SWB ERR	SWA ERR	REG ERR	Not used	PORT16 ERR
12	SW::REP_ERR:B1							
	PORT15 ERR	PORT14 ERR	PORT13 ERR	PORT12 ERR	PORT11 ERR	PORT10 ERR	PORT9 ERR	PORT8 ERR
13	SW::REP_ERR:B0							
	PORT7 ERR	PORT6 ERR	PORT5 ERR	PORT4 ERR	PORT3 ERR	PORT2 ERR	PORT1 ERR	SW SERIOUS ERR
14	Reserved							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
15	Reserved							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
16	Reserved							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
17	Reserved							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF81’)							
23								

Format 8, Message 1 (shared memory failure) (3/6)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘1’)			
8	Subcode (x‘04’)							
9	CMA location							
	Module number	CMA_LSI#						
10	HSN Status:B7							
	HSN Status Byte7							
11	HSN Status:B6							
	HSN Status Byte6							
12	HSN Status:B5							
	HSN Status Byte5							
13	HSN Status:B4							
	HSN Status Byte4							
14	HSN Status:B3							
	HSN Status Byte3							
15	HSN Status:B2							
	HSN Status Byte2							
16	HSN Status:B1							
	HSN Status Byte1							
17	HSN Status:B0							
	HSN Status Byte0							
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF81’)							
23								

Format 8, Message 1 (shared memory failure) (4/6)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘1’)			
8	Subcode (x‘28’ or x‘38’)							
9	LR: INT_STATUS(b31 – 24)							
	Module number	SW_LSI#						
10	Reserved							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
11	Reserved							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
12	Reserved							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
13	Reserved							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
14	Reserved							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
15	Reserved							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
16	Reserved							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
17	Reserved							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF81’)							
23								

Format 8, Message 1 (shared memory failure) (5/6)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘1’)			
8	Subcode (x‘40’ or x‘48’ or x‘50’ or x‘58’)							
9	SW_location							
	Module number	SW_LSI#						
10	MPA_ERRSTS_MPx:B7							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
11	MPA_ERRSTS_MPx:B6							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	Not used
12	MPA_ERRSTS_MPx:B5							
	Not used	Not used	DBG_BLK Warning	R_BLK Warning	D3_BLK Warning	D2_BLK Warning	D1_BLK Warning	Not used
13	MPA_ERRSTS_MPx:B4							
	M3_BLK Warning	M2_BLK Warning	M1_BLK Warning	M0_BLK Warning	E3_BLK Warning	E2_BLK Warning	E1_BLK Warning	M3_BLK Warning
14	MPA_ERRSTS_MPx:B3							
	Not used	Not used	DBG_BLK CHK3	R_BLK CHK3	D3_BLK CHK3	D2_BLK CHK3	D1_BLK CHK3	Not used
15	MPA_ERRSTS_MPx:B2							
	M3_BLK CHK3	M2_BLK CHK3	M1_BLK CHK3	M0_BLK CHK3	E3_BLK CHK3	E2_BLK CHK3	E1_BLK CHK3	M3_BLK CHK3
16	MPA_ERRSTS_MPx:B1							
	Not used	Not used	DBG_BLK CHK1B	R_BLK CHK1B	D3_BLK CHK1B	D2_BLK CHK1B	D1_BLK CHK1B	Not used
17	MPA_ERRSTS_MPx:B0							
	M3_BLK CHK1B	M2_BLK CHK1B	M1_BLK CHK1B	M0_BLK CHK1B	E3_BLK CHK1B	E2_BLK CHK1B	E1_BLK CHK1B	M3_BLK CHK1B
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF81’)							
23								

Format 8, Message 1 (shared memory failure) (6/6)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘1’)			
8	Subcode (x‘81’ or x‘82’ or x‘83’ or x‘89’ or x‘8A’ or x‘8B’ or x‘8C’ or x‘8D’ or x‘8E’ or x‘8F’ or x‘90’ or x‘C5’ or x‘C6’ or x‘C7’ or x‘C8’ or x‘C9’ or x‘CA’ or x‘CB’ or x‘CC’ or x‘CD’ or x‘CE’ or x‘CF’ or x‘D0’)							
9	SW_location							
	Module number	SW_LSI#						
10	SW::PORTn_PATH_ERR:B2							
	Not used	Not used	Not used	Not used	Not used	Not used	Not used	PORTn ERRINT ERR
11	SW::PORTn_PATH_ERR:B0							
	PXT PATH ERR	PXR PATH ERR	Not used	TX PATH ERR	ARB PATH ERR	BF1 PATH ERR	BF0 PATH ERR	RX PATH ERR
12	Reserved							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
13	Reserved							
	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
14	HSN Status:B7							
	HSN Status Byte7							
15	HSN Status:B6							
	HSN Status Byte6							
16	HSN Status:B5							
	HSN Status Byte5							
17	HSN Status:B4							
	HSN Status Byte4							
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF81’)							
23								

Format 8, Message 1 (CHK3 Reset)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘1’)			
8	Related failure internal SSB log No. (Error procedure aid)							
9								
10	Not used (x‘00’)							
11	Not used (x‘00’)							
12	OLD PSW (interruption source address)							
13								
14								
15								
16	Not used (x‘00’)							
17	Not used (x‘00’)							
18	Detail log number for RESET							
19								
20	PCB number				Message code (x‘3’) (*1)			
21	SSID (lower order) of Self Subsystem							
22	Symptom code							
23								

*1: Indicates the ‘CHK3 Reset’.

Format 8, Message 4 (CHA LR CHK4) (1/3)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘4’)			
8	SubCode(x‘00’ : Fibre I/F CHA LR CHK4 – HSN Error) SubCode(x‘01’ : Fibre I/F CHA LR CHK4 – DXBF Error) SubCode(x‘02’ : Fibre I/F CHA LR CHK4 – PPCI Common Error) SubCode(x‘03’ : Fibre I/F CHA LR CHK4 – PPCI Error) SubCode(x‘04’ : Fibre I/F CHA LR CHK4 – REG Error) SubCode(x‘0e’ : Fibre I/F CHA LR CHK4 – SMBUS Error)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK4_INT1(b31 – 24)							
	(RSV)	(RSV)	XREG1 CHK4	XREG0 CHK4	(RSV)	(RSV)	SMBUS1 CHK4	SMBUS0 CHK4
14	CHK4_INT1(b23 – 16)							
	(RSV)	HAT1 CHK4	HAR1 CHK4	HA1 LINKDOWN	(RSV)	HAT0 CHK4	HAR0 CHK4	HA0 LINKDOWN
15	CHK4_INT1(b15 – 08)							
	(RSV)	(RSV)	(RSV)	DA CHK4	(RSV)	(RSV)	PAT CHK4	PAR CHK4
16	CHK4_INT1(b07 – 00)							
	(RSV)	(RSV)	PAT1 CHK4	PAR1 CHK4	(RSV)	(RSV)	PAT0 CHK4	PAR0 CHK4
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF84’)							
23								

Format 8, Message 4 (CHA LR CHK4) (2/3)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘4’)			
8	SubCode(x‘05‘ : Fibre I/F CHA LR CHK4 – LRP Error) SubCode(x‘06’ : Fibre I/F CHA LR CHK4 – LRP_DMA Error) SubCode(x‘07’ : Fibre I/F CHA LR CHK4 – BRG Error) SubCode(x‘08’ : Fibre I/F CHA LR CHK4 – XD Error) SubCode(x‘09’ : Fibre I/F CHA LR CHK4 – PCDX Error) SubCode(x‘0f’ : Fibre I/F CHA LR CHK4 – PPR Error) SubCode(x‘11’ : Fibre I/F CHA LR CHK4 – No HW Error)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK4_INT0(b31 – 24)							
	FOP1 CHK4	FOP0 CHK4	FOP1 STOP	FOP0 STOP	XD CHK4	INT CHK4	FDMA1 CHK4	FDMA0 CHK4
14	CHK4_INT0(b23 – 16)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
15	CHK4_INT0(b15 – 08)							
	(RSV)	PPR CHK4	BRG1 CHK4	BRG0 CHK4	(RSV)	(RSV)	DRR1 CHK4	DRR0 CHK4
16	CHK4_INT0(b07 – 00)							
	PCDX CHK4	PCDXCS CHK4	(RSV)	DMAA CHK4	DMA3 CHK4	DMA2 CHK4	DMA1 CHK4	DMA0 CHK4
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF84’)							
23								

Format 8, Message 4 (CHA LR CHK4) (3/3)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘4’)			
8	SubCode(x‘0a’ : Fibre I/F CHA LR CHK4 – PPCI_MSG Error)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK4_INT3(b31 – 24)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	FIVE1 MCK	FIVE1 MCK1	FIVE1 MCK0
14	CHK4_INT3(b23 – 16)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	FIVE0 MCK	FIVE0 MCK1	FIVE0 MCK0
15	CHK4_INT3(b15 – 08)							
	MFCMN5 CHK4	MFCMN4 CHK4	MFCMN3 CHK4	MFCMN2 CHK4	MFCMN1 CHK4	MFCMN0 CHK4	MFPDMA1 CHK4	MFPDMA0 CHK4
16	CHK4_INT3(b07 – 00)							
	PPR MSG(7)	PPR MSG(6)	PPR MSG(5)	PPR MSG(4)	PPR MSG(3)	PPR MSG(2)	PPR MSG(1)	PPR MSG(0)
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF84’)							
23								

Format 8, Message 4 (DKA LR CHK4) (1/3)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘4’)			
8	SubCode(x‘40’ : DKA LR CHK4 – HSN Error) SubCode(x‘41’ : DKA LR CHK4 – DXBF Error) SubCode(x‘42’ : DKA LR CHK4 – PPCI Common Error) SubCode(x‘43’ : DKA LR CHK4 – PPCI Error) SubCode(x‘44’ : DKA LR CHK4 – REG Error) SubCode(x‘4e’ : DKA LR CHK4 – SMBUS Error)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK4_INT1(b31 – 24)							
	(RSV)	(RSV)	XREG1 CHK4	XREG0 CHK4	(RSV)	(RSV)	SMBUS1 CHK4	SMBUS0 CHK4
14	CHK4_INT1(b23 – 16)							
	(RSV)	HAT1 CHK4	HAR1 CHK4	HA1 LINKDOWN	(RSV)	HAT0 CHK4	HAR0 CHK4	HA0 LINKDOWN
15	CHK4_INT1(b15 – 08)							
	(RSV)	(RSV)	(RSV)	DA CHK4	(RSV)	(RSV)	PAT CHK4	PAR CHK4
16	CHK4_INT1(b07 – 00)							
	(RSV)	(RSV)	PAT1 CHK4	PAR1 CHK4	(RSV)	(RSV)	PAT0 CHK4	PAR0 CHK4
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF84’)							
23								

Format 8, Message 4 (DKA LR CHK4) (2/3)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘4’)			
8	SubCode(x‘45’ : DKA LR CHK4 – LRP Error) SubCode(x‘46’ : DKA LR CHK4 – LRP_DMA Error) SubCode(x‘47’ : DKA LR CHK4 – BRG Error) SubCode(x‘48’ : DKA LR CHK4 – XD Error) SubCode(x‘49’ : DKA LR CHK4 – PCDX Error) SubCode(x‘4f’ : DKA LR CHK4 – PPR Error) SubCode(x‘51’ : DKA LR CHK4 – No HW Error)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK4_INT0(b31 – 24)							
	FOP1 CHK4	FOP0 CHK4	FOP1 STOP	FOP0 STOP	XD CHK4	INT CHK4	FDMA1 CHK4	FDMA0 CHK4
14	CHK4_INT0(b23 – 16)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
15	CHK4_INT0(b15 – 08)							
	(RSV)	PPR CHK4	BRG1 CHK4	BRG0 CHK4	(RSV)	(RSV)	DRR1 CHK4	DRR0 CHK4
16	CHK4_INT0(b07 – 00)							
	PCDX CHK4	PCDXCS CHK4	(RSV)	DMAA CHK4	DMA3 CHK4	DMA2 CHK4	DMA1 CHK4	DMA0 CHK4
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF84’)							
23								

Format 8, Message 4 (DKA LR CHK4) (3/3)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘4’)			
8	SubCode(x‘4a’ : DKA LR CHK4 – PPCI_MSG Error)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK4_INT3(b31 – 24)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	FIVE1 MCK	FIVE1 MCK1	FIVE1 MCK0
14	CHK4_INT3(b23 – 16)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	FIVE0 MCK	FIVE0 MCK1	FIVE0 MCK0
15	CHK4_INT3(b15 – 08)							
	MFCMN5 CHK4	MFCMN4 CHK4	MFCMN3 CHK4	MFCMN2 CHK4	MFCMN1 CHK4	MFCMN0 CHK4	MFPDMA1 CHK4	MFPDMA0 CHK4
16	CHK4_INT3(b07 – 00)							
	PPR MSG(7)	PPR MSG(6)	PPR MSG(5)	PPR MSG(4)	PPR MSG(3)	PPR MSG(2)	PPR MSG(1)	PPR MSG(0)
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF84’)							
23								

Format 8, Message 4 (CHA MHUB CHK4) (1/4)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘4’)			
8	SubCode(x‘80’ : FICON I/F CHA MHUB CHK4 – HSN Error) SubCode(x‘81’ : FICON I/F CHA MHUB CHK4 – DXBF Error) SubCode(x‘82’ : FICON I/F CHA MHUB CHK4 – PPCI Common Error) SubCode(x‘83’ : FICON I/F CHA MHUB CHK4 – PPCI Error) SubCode(x‘84’ : FICON I/F CHA MHUB CHK4 – REG Error) SubCode(x‘8e’ : FICON I/F CHA MHUB CHK4 – SMBUS Error)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK4_INT1(b31 – 24)							
	(RSV)	(RSV)	XREG1 CHK4	XREG0 CHK4	(RSV)	(RSV)	SMBUS1 CHK4	SMBUS0 CHK4
14	CHK4_INT1(b23 – 16)							
	(RSV)	HAT1 CHK4	HAR1 CHK4	HA1 LINKDOWN	(RSV)	HAT0 CHK4	HAR0 CHK4	HA0 LINKDOWN
15	CHK4_INT1(b15 – 08)							
	(RSV)	(RSV)	(RSV)	DA CHK4	(RSV)	(RSV)	PAT CHK4	PAR CHK4
16	CHK4_INT1(b07 – 00)							
	(RSV)	(RSV)	PAT1 CHK4	PAR1 CHK4	(RSV)	(RSV)	PAT0 CHK4	PAR0 CHK4
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF84’)							
23								

Format 8, Message 4 (CHA MHUB CHK4) (2/4)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘4’)			
8	SubCode(x‘85’ : FICON I/F CHA MHUB CHK4 – LRP Error) SubCode(x‘86’ : FICON I/F CHA MHUB CHK4 – LRP_DMA Error) SubCode(x‘87’ : FICON I/F CHA MHUB CHK4 – BRG Error) SubCode(x‘88’ : FICON I/F CHA MHUB CHK4 – XD Error) SubCode(x‘89’ : FICON I/F CHA MHUB CHK4 – PCDX Error) SubCode(x‘8f’ : FICON I/F CHA MHUB CHK4 – PPR Error) SubCode(x‘91’ : FICON I/F CHA MHUB CHK4 – No HW Error)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK4_INT0(b31 – 24)							
	FOP1 CHK4	FOP0 CHK4	FOP1 STOP	FOP0 STOP	XD CHK4	INT CHK4	FDMA1 CHK4	FDMA0 CHK4
14	CHK4_INT0(b23 – 16)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
15	CHK4_INT0(b15 – 08)							
	(RSV)	PPR CHK4	BRG1 CHK4	BRG0 CHK4	(RSV)	(RSV)	DRR1 CHK4	DRR0 CHK4
16	CHK4_INT0(b07 – 00)							
	PCDX CHK4	PCDXCS CHK4	(RSV)	DMAA CHK4	DMA3 CHK4	DMA2 CHK4	DMA1 CHK4	DMA0 CHK4
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF84’)							
23								

Format 8, Message 4 (CHA MHUB CHK4) (3/4)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘4’)			
8	SubCode(x‘8a’ : FICON I/F CHA MHUB CHK4 – PPCI_MSG Error)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK4_INT3(b31 – 24)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	FIVE1 MCK	FIVE1 MCK1	FIVE1 MCK0
14	CHK4_INT3(b23 – 16)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	FIVE0 MCK	FIVE0 MCK1	FIVE0 MCK0
15	CHK4_INT3(b15 – 08)							
	MFCMN5 CHK4	MFCMN4 CHK4	MFCMN3 CHK4	MFCMN2 CHK4	MFCMN1 CHK4	MFCMN0 CHK4	MFPDMA1 CHK4	MFPDMA0 CHK4
16	CHK4_INT3(b07 – 00)							
	PPR MSG(7)	PPR MSG(6)	PPR MSG(5)	PPR MSG(4)	PPR MSG(3)	PPR MSG(2)	PPR MSG(1)	PPR MSG(0)
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF84’)							
23								

Format 8, Message 4 (CHA MHUB CHK4) (4/4)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘4’)			
8	SubCode(x‘90’ : FICON I/F CHA MHUB CHK4 – MF Error)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK4_INT2(b31 – 24)							
	MFCCW CHK4 (15)	MFCCW CHK4 (14)	MFCCW CHK4 (13)	MFCCW CHK4 (12)	MFCCW CHK4 (11)	MFCCW CHK4 (10)	MFCCW CHK4 (9)	MFCCW CHK4 (8)
14	CHK4_INT2(b23 – 16)							
	MFCCW CHK4 (7)	MFCCW CHK4 (6)	MFCCW CHK4 (5)	MFCCW CHK4 (4)	MFCCW CHK4 (3)	MFCCW CHK4 (2)	MFCCW CHK4 (1)	MFCCW CHK4 (0)
15	CHK4_INT2(b15 – 08)							
	MFFLD CHK4 (15)	MFFLD CHK4 (14)	MFFLD CHK4 (13)	MFFLD CHK4 (12)	MFFLD CHK4 (11)	MFFLD CHK4 (10)	MFFLD CHK4 (9)	MFFLD CHK4 (8)
16	CHK4_INT2(b07 – 00)							
	MFFLD CHK4 (7)	MFFLD CHK4 (6)	MFFLD CHK4 (5)	MFFLD CHK4 (4)	MFFLD CHK4 (3)	MFFLD CHK4 (2)	MFFLD CHK4 (1)	MFFLD CHK4 (0)
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF84’)							
23								

Format 8, Message 9 (CHA CHK2 : Abnormal Cache Slot Status 1)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘9’)			
8	SubCode (x‘01’ : ESCON I/F CHA - Abnormal Cache Slot Status1 (*1))							
9	Slot Status							
10								
11								
12								
13	WRITE in Progress	Make GAP	Execute ERASE	Update HA/R0	Update BM	(RSV)		
14	SubBlock Number for Ready Response to Transfer							
15	Start SubBlock Number for Incomplete Recode							
16	End SubBlock Number for Incomplete Recode							
17	Reserved							
18	Module ID (*2)							
19	Routine ID							
20	PCB number				Message code (Not Used)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF89’)							
23								

*1: Cache ECC/LRC error has been detected in read side.

*2: Module ID = ‘55’ :
After synchronous destage, cache slot with dirty attribute has been detected.

Module ID ≠ ‘55’ :
In internal search or orientation process, incomplete subblock has been detected.

Format 8, Message 9 (CHA CHK2 : Abnormal Cache Slot Status 2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘9’)			
8	SubCode (x‘02’ : ESCON I/F CHA - Abnormal Cache Slot Status 2 (*1))							
9	Slot Status							
10								
11								
12								
13	WRITE in Progress	Make GAP	Execute ERASE	Update HA/R0	Update BM	(RSV)		
14	SubBlock Number for Ready Response to Transfer							
15	Start SubBlock Number for Incomplete Recode							
16	End SubBlock Number for Incomplete Recode							
17	Reserved							
18	Module ID							
19	Routine ID							
20	PCB number				Message code (Not Used)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF89’)							
23								

*1: Cache ECC/LRC error has been detected in read side.

Format 8, Message 9 (CHA CHK2) (1/8)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘9’)			
8	SubCode(x‘00’ or x‘01’ or x‘02’ or x‘03’ : Fibre I/F CHA CHK2 – DMA Error) SubCode(x‘10’ or x‘11’ or x‘12’ or x‘13’ : Fibre I/F CHA CHK2 – DMA Timeout)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK2_INT0(b31 – 24)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
14	CHK2_INT0(b23 – 16)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
15	CHK2_INT0(b15 – 08)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	DRR1 CHK2	DRR0 CHK2
16	CHK2_INT0(b07 – 00)							
	(RSV)	(RSV)	(RSV)	DMAA CHK2	DMA3 CHK2	DMA2 CHK2	DMA1 CHK2	DMA0 CHK2
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF89’)							
23								

Format 8, Message 9 (CHA CHK2) (2/8)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘9’)			
8	SubCode(x‘04’ : Fibre I/F CHA CHK2 – MDMA Error) SubCode(x‘14’ : Fibre I/F CHA CHK2 – MDMA Timeout)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK2_INT0(b31 – 24)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
14	CHK2_INT0(b23 – 16)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
15	CHK2_INT0(b15 – 08)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	DRR1 CHK2	DRR0 CHK2
16	CHK2_INT0(b07 – 00)							
	(RSV)	(RSV)	(RSV)	DMAA CHK2	DMA3 CHK2	DMA2 CHK2	DMA1 CHK2	DMA0 CHK2
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF89’)							
23								

Format 8, Message 9 (CHA CHK2) (3/8)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘9’)			
8	SubCode(x‘08’ or x‘0c’ : Fibre I/F CHA CHK2 – DMA Path Error) SubCode(x‘18’ or x‘1c’ : Fibre I/F CHA CHK2 – DMA Timeout)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK2_INT0(b15 – 08)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	DRR1 CHK2	DRR0 CHK2
14	CHK2_INT0(b07 – 00)							
	(RSV)	(RSV)	(RSV)	DMAA CHK2	DMA3 CHK2	DMA2 CHK2	DMA1 CHK2	DMA0 CHK2
15	CHK4_INT1(b23 – 16)							
	(RSV)	HAT1 CHK4	HAR1 CHK4	HA1 LINKDOWN	(RSV)	HAT0 CHK4	HAR0 CHK4	HA0 LINKDOWN
16	DMA Number							
	DMA0 = 0x00 DMA1 = 0x01 DMA2 = 0x02 DMA3 = 0x03							
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF89’)							
23								

Format 8, Message 9 (CHA CHK2) (4/8)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘9’)			
8	SubCode(x‘09’ or x‘0d’ : Fibre I/F CHA CHK2 – MDMA Path Error) SubCode(x‘19’ or x‘1d’ : Fibre I/F CHA CHK2 – MDMA Timeout)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK2_INT0(b15 – 08)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	DRR1 CHK2	DRR0 CHK2
14	CHK2_INT0(b07 – 00)							
	(RSV)	(RSV)	(RSV)	DMAA CHK2	DMA3 CHK2	DMA2 CHK2	DMA1 CHK2	DMA0 CHK2
15	CHK4_INT1(b23 – 16)							
	(RSV)	HAT1 CHK4	HAR1 CHK4	HA1 LINKDOWN	(RSV)	HAT0 CHK4	HAR0 CHK4	HA0 LINKDOWN
16	DMA Number							
	MDMA = 0x04							
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF89’)							
23								

Format 8, Message 9 (CHA CHK2) (5/8)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘9’)			
8	SubCode(x‘80’ or x‘81’ : FICON I/F CHA CHK2 – DMA Error) SubCode(x‘90’ or x‘91’ : FICON I/F CHA CHK2 – DMA Timeout)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK2_INT0(b31 – 24)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
14	CHK2_INT0(b23 – 16)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
15	CHK2_INT0(b15 – 08)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	DRR1 CHK2	DRR0 CHK2
16	CHK2_INT0(b07 – 00)							
	(RSV)	(RSV)	(RSV)	DMAA CHK2	DMA3 CHK2	DMA2 CHK2	DMA1 CHK2	DMA0 CHK2
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF89’)							
23								

Format 8, Message 9 (CHA CHK2) (6/8)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘9’)			
8	SubCode(x‘85’ : FICON I/F CHA CHK2 – MFDMA Error) SubCode(x‘95’ : FICON I/F CHA CHK2 – MFDMA Timeout)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK2_INT1(b31 – 24)							
	MFCCW CHK2(15)	MFCCW CHK2(14)	MFCCW CHK2(13)	MFCCW CHK2(12)	MFCCW CHK2(11)	MFCCW CHK2(10)	MFCCW CHK2(9)	MFCCW CHK2(8)
14	CHK2_INT1(b23 – 16)							
	MFCCW CHK2(7)	MFCCW CHK2(6)	MFCCW CHK2(5)	MFCCW CHK2(4)	MFCCW CHK2(3)	MFCCW CHK2(2)	MFCCW CHK2(1)	MFCCW CHK2(0)
15	CHK2_INT1(b15 – 08)							
	MFFLD CHK2(15)	MFFLD CHK2(14)	MFFLD CHK2(13)	MFFLD CHK2(12)	MFFLD CHK2(11)	MFFLD CHK2(10)	MFFLD CHK2(9)	MFFLD CHK2(8)
16	CHK2_INT1(b07 – 00)							
	MFFLD CHK2(7)	MFFLD CHK2(6)	MFFLD CHK2(5)	MFFLD CHK2(4)	MFFLD CHK2(3)	MFFLD CHK2(2)	MFFLD CHK2(1)	MFFLD CHK2(0)
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF89’)							
23								

Format 8, Message 9 (CHA CHK2) (7/8)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘9’)			
8	SubCode(x‘88’ or x‘8c’ : FICON I/F CHA CHK2 – DMA Path Error) SubCode(x‘98’ or x‘9c’ : FICON I/F CHA CHK2 – DMA Timeout)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK2_INT0(b15 – 08)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	DRR1 CHK2	DRR0 CHK2
14	CHK2_INT0(b07 – 00)							
	(RSV)	(RSV)	(RSV)	DMAA CHK2	DMA3 CHK2	DMA2 CHK2	DMA1 CHK2	DMA0 CHK2
15	CHK4_INT1(b23 – 16)							
	(RSV)	HAT1 CHK4	HAR1 CHK4	HA1 LINKDOWN	(RSV)	HAT0 CHK4	HAR0 CHK4	HA0 LINKDOWN
16	DMA Number							
	DMA0 = 0x00 DMA1 = 0x01							
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF89’)							
23								

Format 8, Message 9 (CHA CHK2) (8/8)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘9’)			
8	SubCode(x‘8a’ or x‘8e’ : FICON I/F CHA CHK2 – MFDMA Path Error) SubCode(x‘9a’ or x‘9e’ : FICON I/F CHA CHK2 – MFDMA Timeout)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK2_INT1(b15 – 08)							
	MFFLD CHK2(15)	MFFLD CHK2(14)	MFFLD CHK2(13)	MFFLD CHK2(12)	MFFLD CHK2(11)	MFFLD CHK2(10)	MFFLD CHK2(9)	MFFLD CHK2(8)
14	CHK2_INT1(b07 – 00)							
	MFFLD CHK2(7)	MFFLD CHK2(6)	MFFLD CHK2(5)	MFFLD CHK2(4)	MFFLD CHK2(3)	MFFLD CHK2(2)	MFFLD CHK2(1)	MFFLD CHK2(0)
15	CHK4_INT1(b23 – 16)							
	(RSV)	HAT1 CHK4	HAR1 CHK4	HA1 LINKDOWN	(RSV)	HAT0 CHK4	HAR0 CHK4	HA0 LINKDOWN
16	DMA Number							
	MFDMA0 = 0x10 MFDMA1 = 0x11 MFDMA2 = 0x12 MFDMA3 = 0x13		MFDMA4 = 0x14 MFDMA5 = 0x15 MFDMA6 = 0x16 MFDMA7 = 0x17		MFDMA8 = 0x18 MFDMA9 = 0x19 MFDMA10 = 0x1a MFDMA11 = 0x1b		MFDMA12 = 0x1c MFDMA13 = 0x1d MFDMA14 = 0x1e MFDMA15 = 0x1f	
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF89’)							
23								

Format 8, Message A (DKA CHK2) (1/4)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘A’)			
8	SubCode(x’40’ or x’41’ or x’42’ or x’43’ : DKA CHK2 – DMA Error) SubCode(x’50’ or x’51’ or x’52’ or x’53’ : DKA CHK2 – DMA Timeout)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK2_INT0(b31 – 24)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
14	CHK2_INT0(b23 – 16)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
15	CHK2_INT0(b15 – 08)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	DRR1 CHK2	DRR0 CHK2
16	CHK2_INT0(b07 – 00)							
	(RSV)	(RSV)	(RSV)	DMAA CHK2	DMA3 CHK2	DMA2 CHK2	DMA1 CHK2	DMA0 CHK2
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF8A’)							
23								

Format 8, Message A (DKA CHK2) (2/4)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘A’)			
8	SubCode(x’44’ : DKA CHK2 – MDMA Error) SubCode(x’54’ : DKA CHK2 – MDMA Timeout)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK2_INT0(b31 – 24)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
14	CHK2_INT0(b23 – 16)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
15	CHK2_INT0(b15 – 08)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	DRR1 CHK2	DRR0 CHK2
16	CHK2_INT0(b07 – 00)							
	(RSV)	(RSV)	(RSV)	DMAA CHK2	DMA3 CHK2	DMA2 CHK2	DMA1 CHK2	DMA0 CHK2
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF8A’)							
23								

Format 8, Message A (DKA CHK2) (3/4)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘A’)			
8	SubCode(x’48’ or x’4c’ : DKA CHK2 – DMA Path Error) SubCode(x’58’ or x’5c’ : DKA CHK2 – DMA Timeout)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK2_INT0(b15 – 08)							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	DRR1 CHK2	DRR0 CHK2
14	CHK2_INT0(b07 – 00)							
	(RSV)	(RSV)	(RSV)	DMAA CHK2	DMA3 CHK2	DMA2 CHK2	DMA1 CHK2	DMA0 CHK2
15	CHK4_INT1(b23 – 16)							
	(RSV)	HAT1 CHK4	HAR1 CHK4	HA1 LINKDOWN	(RSV)	HAT0 CHK4	HAR0 CHK4	HA0 LINKDOWN
16	DMA Number							
	DMA0 = 0x00 DMA1 = 0x01 DMA2 = 0x02 DMA3 = 0x03							
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF8A’)							
23								

Format 8, Message A (DKA CHK2) (4/4)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘A’)			
8	SubCode(x’49’ or x’4d’ : DKA CHK2 – MDMA Path Error) SubCode(x’59’ or x’5d’ : DKA CHK2 – MDMA Timeout)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK2_INT0(b15 – 08)							
							DRR1 CHK2	DRR0 CHK2
14	CHK2_INT0(b07 – 00)							
				DMAA CHK2	DMA3 CHK2	DMA2 CHK2	DMA1 CHK2	DMA0 CHK2
15	CHK4_INT1(b23 – 16)							
	(RSV)	HAT1 CHK4	HAR1 CHK4	HA1 LINKDOWN	(RSV)	HAT0 CHK4	HAR0 CHK4	HA0 LINKDOWN
16	DMA Number							
	MDMA = 0x04							
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF8A’)							
23								

Format 8, Message B (DRR CHK2) (1/2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	SubCode(x‘00’ or x‘01’ : Fibre I/F CHA CHK2 – DRR Error) SubCode(x‘40’ or x‘41’ : DKA CHK2 – DRR Error) SubCode(x‘80’ or x‘81’ : FICON I/F CHA CHK2 – DRR Error) SubCode(x‘10’ or x‘11’ : Fibre I/F CHA CHK2 – DRR Timeout) SubCode(x‘50’ or x‘51’ : DKA CHK2 – DRR Timeout) SubCode(x‘90’ or x‘91’ : FICON I/F CHA CHK2 – DRR Timeout)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK4_INT1(b31 – 24)							
	(RSV)	(RSV)	XREG1 CHK4	XREG0 CHK4	(RSV)	(RSV)	SMBUS1 CHK4	SMBUS0 CHK4
14	CHK4_INT1(b23 – 16)							
	(RSV)	HAT1 CHK4	HAR1 CHK4	HA1 LINKDOWN	(RSV)	HAT0 CHK4	HAR0 CHK4	HA0 LINKDOWN
15	CHK4_INT1(b15 – 08)							
	(RSV)	(RSV)	(RSV)	DA CHK4	(RSV)	(RSV)	PAT CHK4	PAR CHK4
16	CHK4_INT1(b07 – 00)							
	(RSV)	(RSV)	PAT1 CHK4	PAR1 CHK4	(RSV)	(RSV)	PAT0 CHK4	PAR0 CHK4
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF8B’)							
23								

Format 8, Message B (DRR CHK2) (2/2)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘B’)			
8	SubCode(x‘08’ or x‘09’ or x‘0c’ or x‘0d’: Fibre I/F CHA CHK2 – DRR Path Error) SubCode(x‘48’ or x‘49’ or x‘4c’ or x‘4d’: DKA CHK2 – DRR Path Error) SubCode(x‘88’ or x‘89’ or x‘8c’ or x‘8d’ : FICON I/F CHA CHK2 – DRR Path Error) SubCode(x‘18’ or x‘19’ or x‘1c’ or x‘1d’ : Fibre I/F CHA CHK2 – DRR Timeout) SubCode(x‘58’ or x‘59’ or x‘5c’ or x‘5d’ : DKA CHK2 – DRR Timeout) SubCode(x‘98’ or x‘99’ or x‘9c’ or x‘9d’ : FICON I/F CHA CHK2 – DRR Timeout)							
9	LR: INT_STATUS(b31 – 24)							
	FOP1 ERR	FOP0 ERR	FOP1 STOP	FOP0 STOP	MBOX1 INT	MBOX0 INT	FDMA1 ERR	FDMA0 ERR
10	LR: INT_STATUS(b23 – 16)							
	HA1 ERR	HA0 ERR	PA1 ERR	PA0 ERR	BRG1 ERR	BRG0 ERR	LA1	LA0
11	LR: INT_STATUS(b15 – 08)							
	FIVE1 MCK	FIVE0 MCK	PPR1 MSG	PPR0 MSG	PA ERR	DA ERR	DRR ERR	PCDX ERR
12	LR: INT_STATUS(b07 – 00)							
	XREG ERR	XD/INT ERR	DMA ERR	SMBUS ERR	MF ERR	PPR ERR	CHK2	WARNING
13	CHK4_INT1(b31 – 24)							
	(RSV)	(RSV)	XREG1 CHK4	XREG0 CHK4	(RSV)	(RSV)	SMBUS1 CHK4	SMBUS0 CHK4
14	CHK4_INT1(b23 – 16)							
	(RSV)	HAT1 CHK4	HAR1 CHK4	HA1 LINKDOWN	(RSV)	HAT0 CHK4	HAR0 CHK4	HA0 LINKDOWN
15	CHK4_INT1(b15 – 08)							
	(RSV)	(RSV)	(RSV)	DA CHK4	(RSV)	(RSV)	PAT CHK4	PAR CHK4
16	CHK4_INT1(b07 – 00)							
	(RSV)	(RSV)	PAT1 CHK4	PAR1 CHK4	(RSV)	(RSV)	PAT0 CHK4	PAR0 CHK4
17	LR_STATUS(b28 – 21)							
	MODULE ID(0)	LSI NUM(6)	LSI NUM(5)	LSI NUM(4)	LSI NUM(3)	LSI NUM(2)	LSI NUM(1)	LR MODE
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF8B’)							
23								

Format 8, Message D (Power Failure) (1/3)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘D’)			
8	Sub Code (x‘40’ : DKC/HDU Power Failure)							
9	Reserved							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
10	Power Failure Hardware Information							
	Micro Information							
11	Micro Information							
	Power Failure Status Management Information							
12	Reserve							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
13	Reserve							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
14	Reserve							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
15	Reserve							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
16	Reserve							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
17	Reserve							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
18	Not used							
19								
20	Processor Number (x‘00’ ~ x‘0F’)							
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF8D’)							
23								

Format 8, Message D (Power Failure) (2/3)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘D’)			
8	SubCode (x‘80’ : DKU/HDU Power Failure)							
9	Detected from Error Occurred PDEV							
	0x00 ～ 0x4F : Detected from Error Occurred RDEV# 0xFF : Detected from Polling							
10	Micro Information							
	DKU17 Power Failure Status	DKU16 Power Failure Status	DKU15 Power Failure Status	DKU14 Power Failure Status	DKU13 Power Failure Status	DKU12 Power Failure Status	DKU11 Power Failure Status	DKU10 Power Failure Status
11	Micro Information							
	DKU07 Power Failure Status	DKU06 Power Failure Status	DKU05 Power Failure Status	DKU04 Power Failure Status	DKU03 Power Failure Status	DKU02 Power Failure Status	DKU01 Power Failure Status	DKU00 Power Failure Status
12	Micro Information							
	Power Failure Process Trace Information							
13	Micro Information							
	Power Failure Process Trace Information							
14	Micro Information							
	Power Failure Process Trace Information							
15	Micro Information							
	Power Failure Process Trace Information							
16	Reserve							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
17	Reserve							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
18	Not used							
19								
20	Processor Number (x‘00’ ~ x‘0F’)							
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF8D’)							
23								

Format 8, Message D (Power Failure) (3/3)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘D’)			
8	SubCode (x‘90’ : DKU/HDU Power Failure Recover)							
9	Reserve							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
10	Micro Information							
	DKU17 Power Failure Status	DKU16 Power Failure Status	DKU15 Power Failure Status	DKU14 Power Failure Status	DKU13 Power Failure Status	DKU12 Power Failure Status	DKU11 Power Failure Status	DKU10 Power Failure Status
11	Micro Information							
	DKU07 Power Failure Status	DKU06 Power Failure Status	DKU05 Power Failure Status	DKU04 Power Failure Status	DKU03 Power Failure Status	DKU02 Power Failure Status	DKU01 Power Failure Status	DKU00 Power Failure Status
12	Micro Information							
	Power Failure Process Trace Information							
13	Micro Information							
	Power Failure Process Trace Information							
14	Micro Information							
	Power Failure Process Trace Information							
15	Micro Information							
	Power Failure Process Trace Information							
16	Reserve							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
17	Reserve							
	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)
18	Not used							
19								
20	Processor Number (x‘00’ ~ x‘0F’)							
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF8D’)							
23								

Format 8, Message E (processor failure : CHK1) (1/7)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	SubCode(x‘20’ CHK1A – DIMM Error) SubCode(x‘21’ CHK1A – MCH Error) SubCode(x‘22’ CHK1A – ICH Error) SubCode(x‘23’ CHK1A – NMI Error) SubCode(x‘24’ CHK1A – PLD Error) SubCode(x‘25’ CHK1A – INT Error) SubCode(x‘FE’ CHK1A – No Error)							
9	MP Number							
10	NMI_STAT1							
	NMI STAT 17	NMI STAT 16	NMI STAT 15	NMI STAT 14	NMI STAT 13	NMI STAT 12	NMI STAT 11	NMI STAT 10
11	NMI_STAT0							
	NMI STAT 07	NMI STAT 06	NMI STAT 05	NMI STAT 04	NMI STAT 03	NMI STAT 02	NMI STAT 01	NMI STAT 00
12	OTHER_ISTAT1							
	OTHER_ ISTAT17	OTHER_ ISTAT16	OTHER_ ISTAT15	OTHER_ ISTAT14	OTHER_ ISTAT13	OTHER_ ISTAT12	OTHER_ ISTAT11	OTHER_ ISTAT10
13	OTHER_ISTAT1							
	OTHER_ ISTAT07	OTHER_ ISTAT06	OTHER_ ISTAT05	OTHER_ ISTAT04	OTHER_ ISTAT03	OTHER_ ISTAT02	OTHER_ ISTAT01	OTHER_ ISTAT00
14	FERR_GLOBAL:B3							
	G_FER _31	G_FER _30	G_FER _29	G_FER _28	G_FER _27	G_FER _26	G_FER _25	G_FER _24
15	FERR_GLOBAL:B2							
	G_FER _23	G_FER _22	G_FER _21	G_FER _20	G_FER _19	G_FER _18	G_FER _17	G_FER _16
16	FERR_GLOBAL:B1							
	G_FER _15	G_FER _14	G_FER _13	G_FER _12	G_FER _11	G_FER _10	G_FER _09	G_FER _08
17	FERR_GLOBAL:B0							
	G_FER _07	G_FER _06	G_FER _05	G_FER _04	G_FER _03	G_FER _02	G_FER _01	G_FER _00
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF8E’)							
23								

Format 8, Message E (processor failure : CHK1) (2/7)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	SubCode(x‘30’ : CHK1A – wrongful FERR Global)							
9	MP Number							
10	FERR_GLOBAL:B3							
	G_FER _31	G_FER _30	G_FER _29	G_FER _28	G_FER _27	G_FER _26	G_FER _25	G_FER _24
11	FERR_GLOBAL:B2							
	G_FER _23	G_FER _22	G_FER _21	G_FER _20	G_FER _19	G_FER _18	G_FER _17	G_FER _16
12	FERR_GLOBAL:B1							
	G_FER _15	G_FER _14	G_FER _13	G_FER _12	G_FER _11	G_FER _10	G_FER _09	G_FER _08
13	FERR_GLOBAL:B0							
	G_FER _07	G_FER _06	G_FER _05	G_FER _04	G_FER _03	G_FER _02	G_FER _01	G_FER _00
14	NERR_GLOBAL:B3							
	G_NER _31	G_NER _30	G_NER _29	G_NER _28	G_NER _27	G_NER _26	G_NER _25	G_NER _24
15	NERR_GLOBAL:B2							
	G_NER _23	G_NER _22	G_NER _21	G_NER _20	G_NER _19	G_NER _18	G_NER _17	G_NER _16
16	NERR_GLOBAL:B1							
	G_NER _15	G_NER _14	G_NER _13	G_NER _12	G_NER _11	G_NER _10	G_NER _09	G_NER _08
17	NERR_GLOBAL:B0							
	G_NER _07	G_NER _06	G_NER _05	G_NER _04	G_NER _03	G_NER _02	G_NER _01	G_NER _00
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF8E’)							
23								

Format 8, Message E (processor failure : CHK1) (3/7)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	SubCode(x‘40’ : CHK1B – DIMM Correctable) SubCode(x‘41’ : CHK1B – Other Correctable) SubCode(x‘42’ : CHK1B – MP Error) SubCode(x‘43’ : CHK1B – MP or Other Error) SubCode(x‘44’ : CHK1B – LAPIC Error) SubCode(x‘45’ : CHK1B – LAPIC or other Error) SubCode(x‘50’ : CHK1B – H/M(MP) Error) SubCode(x‘FF’ : CHK1B – No Error)							
9	MP Number							
10	COREn_ISTAT1							
	I STATE 17	I STATE 16	I STATE 15	I STATE 14	I STATE 13	I STATE 12	I STATE 11	I STATE 10
11	COREn_ISTAT0							
	I STATE 07	I STATE 06	I STATE 05	I STATE 04	I STATE 03	I STATE 02	I STATE 01	I STATE 00
12	IA32 THERM STATUS							
	Therm Thres 1 Log	Therm Thres 1 Status	Out of Spec Status_Log	Out of Spec Status	PROC# or FRCEPR# Log	PROC# or FRCEPR# Event	Thermal _Status Log	Thermal _Status
13	ESR							
	Illegal Reg Adr	Recved Illegal Vector	Send Illegal Vector	Reserved	Receive Acpt Error	Send Acpt Error	Receive Chk SUM Error	Send Chk SUM Error
14	FERR_GLOBAL:B3							
	G_FER _31	G_FER _30	G_FER _29	G_FER _28	G_FER _27	G_FER _26	G_FER _25	G_FER _24
15	FERR_GLOBAL:B2							
	G_FER _23	G_FER _22	G_FER _21	G_FER _20	G_FER _19	G_FER _18	G_FER _17	G_FER _16
16	FERR_GLOBAL:B1							
	G_FER _15	G_FER _14	G_FER _13	G_FER _12	G_FER _11	G_FER _10	G_FER _09	G_FER _08
17	FERR_GLOBAL:B0							
	G_FER _07	G_FER _06	G_FER _05	G_FER _04	G_FER _03	G_FER _02	G_FER _01	G_FER _00
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF8E’)							
23								

Format 8, Message E (processor failure : CHK1) (4/7)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	SubCode(x‘47’ CHK1B – E Path Blocked)							
9	MP Number							
10	P4_PEXLNKSTS:B1							
	Reserved	Reserved	Reserved	SCCON	LNKTRG	TERR	NLNKWD	NLNKWD
11	P4_PEXLNKSTS:B0							
	NLNKWD	NLNKWD	NLNKWD	NLNKWD	LNKSPD	LNKSPD	LNKSPD	LNKSPD
12	P5_PEXLNKSTS:B1							
	Reserved	Reserved	Reserved	SCCON	LNKTRG	TERR	NLNKWD	NLNKWD
13	P5_PEXLNKSTS:B0							
	NLNKWD	NLNKWD	NLNKWD	NLNKWD	LNKSPD	LNKSPD	LNKSPD	LNKSPD
14	P6_PEXLNKSTS:B1							
	Reserved	Reserved	Reserved	SCCON	LNKTRG	TERR	NLNKWD	NLNKWD
15	P6_PEXLNKSTS:B0							
	NLNKWD	NLNKWD	NLNKWD	NLNKWD	LNKSPD	LNKSPD	LNKSPD	LNKSPD
16	P7_PEXLNKSTS:B1							
	Reserved	Reserved	Reserved	SCCON	LNKTRG	TERR	NLNKWD	NLNKWD
17	P7_PEXLNKSTS:B0							
	NLNKWD	NLNKWD	NLNKWD	NLNKWD	LNKSPD	LNKSPD	LNKSPD	LNKSPD
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF8E’)							
23								

Format 8, Message E (processor failure : CHK1) (5/7)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	SubCode(x‘51’ : CHK1 – CHK1B E Path received UR)							
9	MP Number							
10	P4_SECSTS:B1							
	SDPE	SRSE	SRMAS	SRTAS	SSTAS	SDEVT	SDEVT	SMDPERR
11	P4_SECSTS:B0							
	SFB2BTC	Reserved	S66MHCAP	Reserved	Reserved	Reserved	Reserved	Reserved
12	P5_SECSTS:B1							
	SDPE	SRSE	SRMAS	SRTAS	SSTAS	SDEVT	SDEVT	SMDPERR
13	P5_SECSTS:B0							
	SFB2BTC	Reserved	S66MHCAP	Reserved	Reserved	Reserved	Reserved	Reserved
14	P6_SECSTS:B1							
	SDPE	SRSE	SRMAS	SRTAS	SSTAS	SDEVT	SDEVT	SMDPERR
15	P6_SECSTS:B0							
	SFB2BTC	Reserved	S66MHCAP	Reserved	Reserved	Reserved	Reserved	Reserved
16	P7_SECSTS:B1							
	SDPE	SRSE	SRMAS	SRTAS	SSTAS	SDEVT	SDEVT	SMDPERR
17	P7_SECSTS:B0							
	SFB2BTC	Reserved	S66MHCAP	Reserved	Reserved	Reserved	Reserved	Reserved
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF8E’)							
23								

Format 8, Message E (processor failure : CHK1) (6/7)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	SubCode(x‘80’ : CHK1 – CHK1C Error) SubCode(x‘81’ : CHK1 – CHK1C Error Correctable Error)							
9	MP Number							
10	Reserved							
11	IA32 MCi STATUS:B7							
	VAL	OVER	UC	Error enabled	MISCV	ADDRV	PCC	Reserved
12	IA32 MCi STATUS:B1							
	MCA Error Code							
13	IA32 MCi STATUS:B0							
	MCA Error Code							
14	FERR_GLOBAL:B3							
	G_FER _31	G_FER _30	G_FER _29	G_FER _28	G_FER _27	G_FER _26	G_FER _25	G_FER _24
15	FERR_GLOBAL:B2							
	G_FER _23	G_FER _22	G_FER _21	G_FER _20	G_FER _19	G_FER _18	G_FER _17	G_FER _16
16	FERR_GLOBAL:B1							
	G_FER _15	G_FER _14	G_FER _13	G_FER _12	G_FER _11	G_FER _10	G_FER _09	G_FER _08
17	FERR_GLOBAL:B0							
	G_FER _07	G_FER _06	G_FER _05	G_FER _04	G_FER _03	G_FER _02	G_FER _01	G_FER _00
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF8E’)							
23								

Format 8, Message E (processor failure : CHK1) (7/7)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	SubCode(x‘60’ CHK1B – Epath Error) SubCode(x‘61’ CHK1B – EBLK Error) SubCode(x‘62’ CHK1B – DBLK Error) SubCode(x‘63’ CHK1B – RBLK Error) SubCode(x‘64’ CHK1B – M0BLK Error) SubCode(x‘65’ CHK1B – M1BLK Error) SubCode(x‘66’ CHK1B – M2BLK Error) SubCode(x‘67’ CHK1B – M3BLK Error) SubCode(x‘68’ CHK1B – No Error)							
9	MP Number							
10	MPA_Warning_Status							
	Not used	Not used	DBG Warning	R0 Warning	D3 Warning	D2 Warning	D1 Warning	D0 Warning
11	MPA_Warning_Status							
	M3 Warning	M2 Warning	M1 Warning	M0 Warning	E3 Warning	E2 Warning	E1 Warning	E0 Warning
12	MPA_CHK3_Status							
	Not used	Not used	DBG CHK3	R0 CHK3	D3 CHK3	D2 CHK3	D1 CHK3	D0 CHK3
13	MPA_CHK3_Status							
	M3 CHK3	M2 CHK3	M1 CHK3	M0 CHK3	E3 CHK3	E2 CHK3	E1 CHK3	E0 CHK3
14	MPA_CHK1B_Status							
	Not used	Not used	DBG CHK1B	R0 CHK1B	D3 CHK1B	D2 CHK1B	D1 CHK1B	D0 CHK1B
15	MPA_CHK1B_Status							
	M3 CHK1B	M2 CHK1B	M1 CHK1B	M0 CHK1B	E3 CHK1B	E2 CHK1B	E1 CHK1B	E0 CHK1B
16	Module ID							
17	LSI Number							
18	Module ID							
19	Routine ID							
20	PKID				Message Code (x‘0’)			
21	SSID for Self Subsystem (Low)							
22	Symptom Code (x‘FF8E’)							
23								

Format 8, Message E (Selective Reset)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Not used (x‘00’)							
9	DCN status							
	Force device busy	Channel connect request	Command chain execute	Path reserve	Stack status	Sense pending	Long Busy (Command process)	Processor connect
10	DCN status							
	Single path mode	Guarant path mode	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	Guarant path MP
11	DCN flag							
	RST NTF/ RST ALG SSB PNG	Pin Data pending	(RSV)	(RSV)	ODE pending	RSQ pending	SCI/SCE pending	PCH pending
12	LCT initiation cause							
	0: Ready 1: Not ready	0: Disable 1: Enable	0: No SNS 1: 64SNS pending	0: Mount 1: No mount	0: No RST ALG LPN 1: Exist	0:No SYS RST LPN 1: Exist	0: No Stack 1: Exist	0: No Wait SNS 1: Exist
13	LCT initiation cause							
	0: No Wait-RI 1: Exist	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	(RSV)	0: Others 1: DEV BSY JOB
14	Command interface flag							
	Pending exist	SCE(RSP) pending	(RSV)	(RSV)	ODE pending	RSG pending	SCI pending	PCH Pending
15	Command code							
16	Internal SSB log No.							
17								
18	Detail log number for RESET							
19								
20	PCB number				Message code (x‘1’) (*1)			
21	SSID (lower order) of Self Subsystem							
22	Symptom Code (x‘FF8E’: LDEV type = DKU87I / x‘EF8E’: LDEV type = DKU86I)							
23								

*1: Indicates the ‘Selective Reset’.

Format 8, Message E (Wait SENSE Timeout)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Not used (x‘00’)							
9	LDEV#							
10	Basic sense byte (0)							
	Basic sense byte (0)							
11	Basic sense byte (1)							
	Basic sense byte (1)							
12	Basic sense byte (2)							
	Exception code (higher order)							
13	Format/Message							
	Exception code (lower order)							
14	Module ID							
	Module ID							
15	Routine ID							
	Routine ID							
16	Internal SSB number for RESET							
17								
18	Detail log number for RESET							
19								
20	PCB number				Message code (x‘3’) (*1)			
21	SSID (lower order) of Self Subsystem							
22	Symptom Code (x‘FF8E’: LDEV type = DKU87I / x‘EF8E’: LDEV type = DKU86I)							
23								

*: Timeout SSB information
Upper case: 24-byte format SSB
Lower case: 32-byte format SSB

*1: Indicates the ‘Wait SENSE Timeout’.

Format 8, Message E (CHK1B Reset)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Related failure internal SSB log No. (Error procedure aid)							
9								
10	Not used (x‘00’)							
11	Not used (x‘00’)							
12	OLD PSW (interruption source address)							
13								
14								
15								
16	Internal SSB log No. (reset)							
17								
18	Detail log number for RESET							
19								
20	PCB number				Message code (x‘5’) (*1)			
21	SSID (lower order) of Self Subsystem							
22	Symptom Code (x‘FF8E’: LDEV type = DKU87I / x‘EF8E’: LDEV type = DKU86I)							
23								

*1: Indicates the ‘CHK1B Reset’.

Format 8, Message E (DKC Internal Reset)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Not used (x‘00’)							
9	Not used (x‘00’)							
10	Not used (x‘00’)							
11	Not used (x‘00’)							
12	OLD PSW (interruption source address)							
13								
14								
15								
16	Internal SSB log No.							
17								
18	Detail log number for RESET							
19								
20	PCB number				Message code (x‘6’) (*1)			
21	SSID (lower order) of Self Subsystem							
22	Symptom Code (x‘FF8E’: LDEV type = DKU87I / x‘EF8E’: LDEV type = DKU86I)							
23								

*1: Indicates the ‘DKC Internal Reset’.

Format 8, Message E (Force Reset)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Not used (x‘00’)							
9	Not used (x‘00’)							
10	Not used (x‘00’)							
11	Not used (x‘00’)							
12	OLD PSW (interruption source address)							
13								
14								
15								
16	Internal SSB log No.							
17								
18	Detail log number for RESET							
19								
20	PCB number				Message code (x‘8’) (*1)			
21	SSID (lower order) of Self Subsystem							
22	Symptom Code (x‘FF8E’: LDEV type = DKU87I / x‘EF8E’: LDEV type = DKU86I)							
23								

*1: Indicates the ‘Force Reset’.

Format 8, Message E (Logical inconsistency reset)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘E’)			
8	Not used (x‘00’)							
9	Not used (x‘00’)							
10	Not used (x‘00’)							
11	Not used (x‘00’)							
12	OLD PSW (interruption source address)							
13								
14								
15								
16	Internal SSB log No.							
17								
18	Detail log number for RESET							
19								
20	PCB number				Message code (x‘9’) (*1)			
21	SSID (lower order) of Self Subsystem							
22	Symptom Code (x‘FF8E’: LDEV type = DKU87I / x‘EF8E’: LDEV type = DKU86I)							
23								

*1: Indicates the ‘Logical inconsistency reset’.

Format 8, Message F (Micro-program detected error : Logical inconsistency)

	0	1	2	3	4	5	6	7
7	Format (x‘8’)				Message (x‘F’)			
8	Module ID							
9	Routine ID							
10	Error information							
11								
12								
13								
14								
15								
16								
17								
18								
19								
20	PCB number				Message code (don’t care)			
21	SSID (lower order) of Self Subsystem							
22	Symptom Code (high order) (x‘FF’: LDEV type = DKU87I / x‘EF’: LDEV type = DKU86I)							
23	Symptom Code (low order) (x‘8F’)							

Module ID (SSB8) List (1/4)

No.	Module ID	Function name	Remarks
1	00	Initialization	
2	01	Power disconnection	
3	02	CUDG	
4	10	Job management	
5	11	Synchronous management	
6	12	Communication control between processors	
7	13	Cache control	
8	14	Resource management	
9	15	Configuration control	
10	16	Reset	
11	17	SVP management	
12	18	Configuration control (RAID provided)	
13	19	Configuration control (drive recovery provided)	
14	30	Standard function	
15	31	SVP-provided function	
16	32	Error procedure aid	
17	40	CHA monitor	
18	41	CHA initiator	
19	42	CHA terminator	
20	43	CHA kernel (common function)	
21	48	Remote copy command	
22	49	Remote copy command	
23	50	Command chain start	
24	51	Command chain termination	
25	52	Command execution status analysis	
26	53	Command execution CHL I/F control	
27	54	Channel server common process 1	
28	55	Channel server common process 2	
29	56	Channel server common process 3	
30	57	Channel server common process 4	
31	58	Channel server data transfer 1	
32	59	Channel server data transfer 2	

Module ID (SSB8) List (2/4)

No.	Module ID	Function name	Remarks
33	5A	Read/write common process	
34	5B	Subsystem command common process	
35	5C	Channel server asynchronous control 1	
36	5D	Channel server asynchronous control 2	
37	5E	Channel server command queuing control	
38	5F	Channel server JOB FRR	
39	60	Read command process 1	
40	61	Read command process 2	
41	62	Read command process 3	
42	63	Read command process 4	
43	64	Read command process 5	
44	65	Read command process 6	
45	66	Write command process 1	
46	67	Write command process 2	
47	68	Write command process 3	
48	69	Write command process 4	
49	6A	Write command process 5	
50	6B	Write command process 6	
51	6D	Control command process 1	
52	6E	Control command process 2	
53	6F	Search command	
54	70	Path control command process	
55	71	Diagnostic command process	
56	72	DIAG command process	
57	73	Subsystem command process 1	
58	74	Subsystem command process 2	
59	75	Subsystem command process 3	
60	78	CHL I/F link level frame control	
61	79	CHL I/F device frame control	

Module ID (SSB8) List (3/4)

No.	Module ID	Function name	Remarks
62	7A	CHL I/F common control	
63	7B	LDEV format	
64	7E	Concurrent Copy (CC) process	
65	7F	Channel server WDCP/differential (M specified)	
66	80	DKA monitor	
67	81	DKA initiator	
68	82	DKA terminator	
69	88	External I/O 1	
70	89	External I/O 2	
71	8A	External I/O 3	
72	8B	External I/O 4	
73	90	Staging	
74	91	LDEV destaging	
75	92	PDEV destaging	
76	93	Drive recovery	
77	94	Online monitor	
78	95	Physical drive maintenance	
79	98	RAID synchronous type	
80	99	RAID LDEV destaging	
81	9A	RAID PDEV destaging	
82	9B	RAID drive recovery	
83	9C	RAID external provided	
84	9F	RAID failed slot operation	
85	A0	SCSI control	
86	A1	DRR control	
87	A2	SVP command execution	
88	A3	Test activation	
89	A4	SCSI control	
90	A5	Offline monitor	
91	A6	Physical drive maintenance	
92	A7	SCSI control	
93	A8	DRR control	

Module ID (SSB8) List (4/4)

No.	Module ID	Function name	Remarks
94	AC	External path/device manager 1	
95	AD	External path/device manager 2	
96	AE	SCSI control	
97	C0	TC-MF CHL/SVP I/F	
98	C1	TC-MF Remote copy monitor	
99	C2	TC-MF Configuration control	
100	C3	TC-MF common copy procedure	
101	C4	TC-MF Remote copy procedure	
103	C6	TC-MF channel server procedure	*1
104	C7	TC-MF Remote I/O manager	
105	C8	TC-MF Remote I/O 1	*1
106	C9	TC-MF Remote I/O 2	
107	CA	TC-MF path control	
108	CB	TC-MF asynchronous remote copy procedure	
109	CC	TC-MF asynchronous CT manager	
110	CD	TC-MF asynchronous scheduler	
111	CE	TC-MF Configuration control	
112	CF	TC-MF Configuration control	

*1: No action is required for error codes, C60E, C870, C871 and C872. These error codes are reported only to have the host processor re-drive the failed CCW chain.

Format F, Message 0 (Operation terminated)

	0	1	2	3	4	5	6	7
7	Format (x'F')				Message (x'0')			
8	Not used (x'00')							
9								
10								
11	Hardware level (*1)							
12								
13	SSID of mate subsystem (x'0000' for EDCC)							
14								
15	Manufacturer code ('000000')						Factory code ('00')	
16	Not used (x'00')							
17	Module ID							
18	Routine ID							
19	PCB number				Error code (don't care)			
20	SSID of Self Subsystem							
21								
22	Symptom code (x'FFF0')							
23								

*1: Hardware level

Bit 0 : Hardware level

When the bit 0 = 0,

Bit 1: Not used

Bit 2-3: Reported storage path

Bit 4-5: Number of channels per cluster

00 : 4

01 : 8

10 : Not used

11 : Not used

Bit 6: NVS

0 : Not exist

1 : Exist

Bit 7: Not used

Bit 8-10: Cache size

000 : Non cache

001 : 256MB

010 : 512MB

011 : 768MB

100 : 1024MB

101 : 1280MB

110 : 1536MB

111 : Over 1537MB

Bit11-13: Cluster hardware level

BIt14-15: Cache/NVS hardware level

When the bit 0 = 1,

Bit 1: Not used

Bit 2-3: Failed storage path

Bit 4-7: Number of channels per cluster

0000 : Parallel channel = 4, serial channel = 0

0001 : Parallel channel = 8, serial channel = 0

0010 : Parallel channel = 4, serial channel = 2

0100 : Parallel channel = 4, serial channel = 4

0110 : Parallel channel = 0, serial channel = 2

1000 : Parallel channel = 0, serial channel = 4

1010 : Parallel channel = 0, serial channel = 8

1100 : Parallel channel = 4, serial channel = 6

Bit 8: Dual frame

0 : Dual frame

1 : Modular power

Bit9-11: Cache size

000 : Non cache

001 : 256MB

010 : 512MB

011 : 768MB

100 : 1024MB

101 : 1280MB

110 : 1536MB

111 : Over 1537MB

Bit 11-13: Cluster hardware level

Bit 14-15: Cache/NVS hardware level

Format F, Message 1 (Micro-program detected cache failure)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘1’)			
8	Queue transition in progress (Side A)	Queue transition in progress (Side B)	Free SGCB queue operation in progress	Free SLCB queue operation in progress	Free GRPT queue operation in progress	‘000’		
9	Not used (x‘00’)							
	VDEV number							
10	Queue type							
	VDEV number		Slot number					
11	Queue number							
	Slot number							
12	Queue number							
	Slot number							
13	SSID of mate subsystem (x‘0000’ for EDCC)							
14								
15	Manufacture code (‘000000’)						Factory code (‘00’)	
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	PCB number				Error code (don’t care)			
20	SSID of Self Subsystem							
21								
22	Symptom Code (x‘FFF1’)							
23								

*: When byte 8, bit 2-4 = 000, upper value is valid.
When byte 8, bit 2-4 ≠ 000, lower value is valid.

Format F, Message 2 (CACHE ERR)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘2’)			
8	SubCode							
	x‘1’=C_path error (SW detection) (CHK2) x‘2’=C_path error (CMA detection) (CHK2) x‘3’=CACHE board error (CHK2) x‘4’=CACHE memory error (CHK2) x‘5’=SW C_path Port error (CHK3) x‘6’=C_path error (SW detection) (CHK3) x‘7’=C_path error (CMA detection) (CHK3) x‘8’=CACHE board error (CHK3) x‘9’=CACHE memory error (CHK3)				CMA or SW BOARD error	CMA or SW ANY error	SW register LOG error	CMA register LOG error
9	Transfer information							
	Transfer P/K Type x‘1’=ESW x‘2’=CHA x‘3’=FICON x‘4’=DKA x‘5’=MPPK				Act mode x‘1’=Normal write x‘2’=Read x3’=2 Cache write x‘4’=C to C Cache Copy x‘5’=Atomic write			
10	Transfer Master P/K board number							
	ESW: x‘00’~x‘07’ CHA/FICON: x‘00’~x‘1F’ DKA: x‘00’~x‘07’							
11	Using path code0(CHK2)							
	Not used ‘0’	Not used ‘0’	Command1 Using P_Path#1	Command1 Using P_Path#0	Command1 Access CACHE board number			
12	Using path code1(CHK2)							
	Not used ‘0’	Not used ‘0’	Command2 Using P_Path#1	Command2 Using P_Path#0	Command2 Access CACHE board number			
13	SSID for Other Subsystem (‘0000’)							
14								
15	Maker Code(‘0’)				Factory Code(‘0’)			
16	Transfer Master Path							
	x‘0’=Not used ‘0’ x‘1’=MCH0, x‘2’=MCH1, x‘3’=MCH2, x‘4’=MCH3 x‘5’=MPA_DMA0, x‘6’=MPA_DMA1, x‘7’=MPA_DMA2, x‘8’=MPA_DMA3, x‘9’=LR_DMA0, x‘A’=LR_DMA1, x‘B’=LR_DMA2, x‘C’=LR_DMA3, x‘D’=DMA, x‘E’=DRR0, x‘F’=DRR1				x‘0’=MFDMA0, x‘1’=MFDMA1, x‘2’=MFDMA2, x‘3’=MFDMA3, x‘4’=MFDMA4, x‘5’=MFDMA5, x‘6’=MFDMA6, x‘7’=MFDMA7, x‘8’=MFDMA8, x‘9’=MFDMA9, x‘A’=MFDMA10, x‘B’=MFDMA11, x‘C’=MFDMA12, x‘D’=MFDMA13, x‘E’=MFDMA14, x‘F’=MFDMA15			
17	Module ID							
18	Routine ID							
19	PKID				Error code (Don’t care)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFF2’)							
23								

Format F, Message 5 (Remote Copy Paths Removed/Restored)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘5’)			
8	Reason code (*1)							
9	RCU device address							
10	RCU Manufacture code/Factory code							
11								
12	RCU Sequence No.							
13								
14								
15	MCU Manufacture code/Factory code							
16								
17	MCU Sequence No.							
18								
19								
20	SSID of self subsystem							
21								
22	Symptom Code (x‘3887’)							
23								

*1: Reason code
x‘01’ : One or more remote copy paths removed unexpectedly
x‘02’ : One or more remote copy paths restored
x‘03’ : All remote copy paths removed unexpectedly

Format F, Message 6 (CFW impossible)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘6’)			
8	Reason code (*1)							
9	Not used (x‘00’)							
10								
11								
12								
13	SSID of mate subsystem (x‘0000’ for EDCC)							
14								
15	Manufacturer code (‘000000’)						Factory code (‘00’)	
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	PCB number				Error code (don’t care)			
20	SSID of Self Subsystem							
21								
22	Symptom Code (x‘FFF6’)							
23								

*1: Reason code

x‘00’: Reserved

x‘01’: CFW ID inconsistent

x‘02’ ~ x‘0F’: Reserved

Format F, Message A (NVS terminated)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘A’)			
8	Reason code (*1)							
9	Not used (x‘00’)							
10	Not used (x‘00’)							
11	Not used (x‘00’)							
12	Not used (x‘00’)							
13	SSID of mate subsystem (x‘0000’ for EDCC)							
14								
15	Manufacturer code (‘000000’)						Factory code (‘00’)	
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	PCB number				Error code (don’t care)			
20	SSID of Self Subsystem							
21								
22	Symptom Code (x‘FFFA’)							
23								

*1: Reason code
x‘00’ ~ x‘01’ : Reserved
x‘02’ : NVS failure
x‘03’ ~ x‘0F’ : Reserved

Format F, Message B (TrueCopy for Mainframe Pair Suspend)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘B’)			
8	R-Vol suspended	R-Vol failed	Reason code (*1)					
9	RCU device address							
10	RCU Manufacture code/Factory code (x‘0C220’)							
11								
12								
13	RCU Sequence No.							
14								
15	RCU Manufacture code/Factory code (x‘0C220’)							
16								
17								
18	MCU Sequence No.							
19								
20	SSID of Self Subsystem							
21								
22	Symptom Code (x‘FE’)							
23	Symptom Code (same byte #8)							

*1: Reason code

x‘14’ ~ x‘2F’	:	Reserved
x‘30’	:	Pair suspended. MCU device write error.
x‘31’	:	Pair suspended. RCU subsystem error/or MCU subsystem error.
x‘32’	:	Pair suspended. RCU device communication error.
x‘33’	:	Pair suspended (Critical device status). All write commands are rejected until pair re-established.
x‘34’	:	Pair suspended. RCU device is not ready (intervention required).

Format F, Message F (Open-CHA DXBF correctable error)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘01’ : CHF_DXBF correctable error)							
9	MPID (Reported SSB)							
10	Module ID, LR_LSI number							
11	Not used (x‘00’)							
12	Not used (x‘00’)							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

Format F, Message F (DKA DXBF correctable error)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘04’ : DKF_DXBF correctable error)							
9	MPID (Reported SSB)							
10	Module ID, LR_LSI number							
11	Not used (x‘00’)							
12	Not used (x‘00’)							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

Format F, Message F (M/F-CHA DXBF correctable error)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘05’ : CHM_DXBF correctable error)							
9	MPID (Reported SSB)							
10	Module ID, LR_LSI number							
11	Not used (x‘00’)							
12	Not used (x‘00’)							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

Format F, Message F (Cache Memory correctable error)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘02’ : Cache Memory correctable error)							
9	MPID (Reported SSB)							
10	Module ID							
11	PK ID							
12	Not used (x‘00’)							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

Format F, Message F (SW correctable error)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘84’ : SW correctable error)							
9	MPID (Reported SSB)							
10	Not used (x‘00’)							
11	Not used (x‘00’)							
12	Not used (x‘00’)							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

Format F, Message F (LR correctable error)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘81’ : LR correctable error)							
9	MPID (Reported SSB)							
10	Module ID, LR_LSI number							
11	Not used (x‘00’)							
12	Not used (x‘00’)							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

Format F, Message F (MHUB correctable error)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘82’ : MHUB correctable error)							
9	MPID (Reported SSB)							
10	Module ID, LR_LSI number							
11	Not used (x‘00’)							
12	Not used (x‘00’)							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

Format F, Message F (CMA correctable error)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘83’ : CMA correctable error)							
9	MPID (Reported SSB)							
10	Module ID							
11	PK ID							
12	Not used (x‘00’)							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

Format F, Message F (MPA correctable error)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘11’ : MPA correctable error)							
9	MPID (Reported SSB)							
10	Module ID							
11	PK ID							
12	Not used (x‘00’)							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

Format F, Message F (Abnormal DC Voltage control warning)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘40’ : Abnormal DC Voltage control warning)							
9	MPID (Reported SSB)							
10	Register access result BYTE (00:No error, 01:Error detected)							
11	Not used (x‘00’)							
12	Not used (x‘00’)							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

Format F, Message F (Abnormal CEMODE warning)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘41’ : Abnormal CEMODE warning)							
9	MPID (Reported SSB)							
10	Not used (x‘00’)							
11	Not used (x‘00’)							
12	Not used (x‘00’)							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

Format F, Message F (Abnormal CEDT warning)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘42’ : Abnormal CEDT warning)							
9	MPID (Reported SSB)							
10	Not used (x‘00’)							
11	Not used (x‘00’)							
12	Not used (x‘00’)							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

Format F, Message F (SFP (Tachyon) warning)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘C0’ : SFP (Tachyon) warning)							
9	MPID (Reported SSB)							
10	Module ID, Tx_Fault detection LR_LSI number							
11	Tx_Fault detection port number							
12	LR TX_FAULT warning register							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

Format F, Message F (SFP (FIVE) warning)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘C2’ : SFP (FIVE) warning)							
9	MPID (Reported SSB)							
10	Module ID, Tx_Fault detection LR_LSI number							
11	Tx_Fault detection port number							
12	LR TX_FAULT warning register							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

Format F, Message F (Battery warning)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘45’ : Battery warning)							
9	MPID (Reported SSB)							
10	Module ID							
11	PK ID							
12	Not used (x‘00’)							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

Format F, Message F (SSD warning)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘46’ : SSD warning)							
9	MPID (Reported SSB)							
10	Module ID							
11	PK ID							
12	Not used (x‘00’)							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

Format F, Message F (MPPK Abnormal temperature warning)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘48’ : MPPK Abnormal temperature warning)							
9	MPID (Reported SSB)							
10	Not used (x‘00’)							
11	Not used (x‘00’)							
12	Not used (x‘00’)							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

Format F, Message F (PK Abnormal temperature warning)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘49’ : PK Abnormal temperature warning)							
9	MPID (Reported SSB)							
10	Not used (x‘00’)							
11	Not used (x‘00’)							
12	Not used (x‘00’)							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

Format F, Message F (Forced volatile reboot warning)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘43’ : Forced volatile reboot warning)							
9	MPID (Reported SSB)							
10	Module ID							
11	PK ID							
12	Not used (x‘00’)							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

Format F, Message F (SFP (CHG) warning)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘C5’ : SFP (CHG) warning)							
9	MPID (Reported SSB)							
10	Module ID, Tx_Fault detection LR_LSI number							
11	Tx_Fault detection port number							
12	LR TX_FAULT warning register							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

Format F, Message F (SSD Config warning)

	0	1	2	3	4	5	6	7
7	Format (x‘F’)				Message (x‘F’)			
8	SubCode (x‘47’ : SSD Config warning)							
9	MPID (Reported SSB)							
10	Module ID							
11	P/K ID							
12	Not used (x‘00’)							
13	Not used (x‘00’)							
14	Not used (x‘00’)							
15	Not used (x‘00’)							
16	Not used (x‘00’)							
17	Module ID							
18	Routine ID							
19	P/K ID				Not used (x‘00’)			
20	SSID for Self Subsystem							
21								
22	Symptom Code (x‘FFFF’)							
23								

4. ECKD 32-BYTE SSB

4.1 Basic Sense Bytes

The following describes details of 32 ECKD basic sense bytes 0 to 6 and 22 to 31.

ECKD 32-Byte Sense Data

Byte \ Bit	0	1	2	3	4	5	6	7
0	Command rejection	Intervention required	Not used	Device check	Data check	Not used	Not used	Incomplete domain
1	Permanent error	Invalid track format	Not used	Operator message	No used	File protection	Write inhibit	Imprecise ending
2	Storage control type							
3	Remaining count; or, command overrun reached threshold (*1)							
4	Device address							
5	Device type							
6	Unit indication 0: SSB2 1: SSB5	SSB4	SSB29-31 valid	Not used	Format			
7 ~ 21	Bytes 7 to 21: Depend on the exception class and format. (For details, see Section 4.3.)							
22 ~ 23	Exception class • Exception code; or, CHL#, LPN, and LCP# beyond the threshold (*2)							
24	Logging message control							
25	Program action code							
26	Dual frame	EDCC Mode	Duplex pair	Subvolume error	Nonsynchronous operation	Serial channel	Report output	Permanent path error
27	32 byte SSB (0)	Device Address Valid	Track Address Valid	28 bit Cylinder	DKU86I TRK compatible mode	Not used	Path number	
28	In case of being Byte27 Bit3=0 : Message Code / A number of Read, search bytes (*3) In case of being Byte27 Bit3=1 : Indicating Bit 12-19 of cylinder address / A number of Read, search bytes (*3)							
29	In case of being Byte27 Bit3=0 : High side of cylinder address / A number of Read, search bytes (*3) In case of being Byte27 Bit3=1 : Indicating Bit 20-27 of cylinder address / A number of Read, search bytes (*3)							
30	In case of being Byte27 Bit3=0 : Low side of cylinder address / A number of Read, search bytes (*3) In case of being Byte27 Bit3=1 : Indicating Bit 0-7 of cylinder address / A number of Read, search bytes (*3)							
31	In case of being Byte27 Bit3=0 : Head address / A number of Read, search bytes (*3) In case of being Byte27 Bit3=1 : High side (a half byte) of Byte31 is Bit 8-11 of cylinder address / A number of Read, search bytes (*3) Low side (a half byte) of Byte31 is head address (*3)							

: Varies by the exception class and format.

*1: “Remaining count” is for exception class 0 and format 4; otherwise, “Command overrun threshold reached” applies.

*2: “CHL#, LPN, and LCP# beyond the threshold” is for exception class 6; otherwise, “Exception code” is applied.

*3: "Number of read or searched bytes" is for exception class 6.

Otherwise:

Byte 28 =	Byte27/Bit3=0 :	"Message Code"
	Byte27/Bit3=1 :	"Bit 12-19 of cylinder address"
Byte 29 =	Byte27/Bit3=0 :	"Cylinder address (High side)"
	Byte27/Bit3=1 :	"Bit 20-27 of cylinder address"
Byte 30 =	Byte27/Bit3=0 :	"Cylinder address (Low side)"
	Byte27/Bit3=1 :	"Bit 0-7 of cylinder address"
Byte 31 =	Byte27/Bit3=0 :	"Head address"
	Byte27/Bit3=1 :	4 bits of high side is "Bit 8-11 of cylinder address" 4 bits of low side is "Head address"

ECKD 32-Byte SSB Common Sense Bytes (1/3)

Byte	Bit	Name	Description	
0	0	Command rejection	A chain ended without receiving the expected number of data transfer commands in the LR/LRE domain. If no other error is detected, “incomplete domain” (byte 0, bit 7) is also set to 1.	
	1	Intervention required	1. The drive is not physically connected. 2. The drive power is off. 3. The ENABLE/DISABLE switch is set to DISABLE.	
	2	Not used		
	3	Device check	DKC or drive hardware is abnormal.	
	4	Data check	Indicates that a data error has been detected in the information from the drive. This bit is set to 1 when the data error is uncorrectable or error correction is prohibited by the mask byte.	
	5	Not used		
	6	Not used		
	7	Incomplete domain	Indicates that as many data transfer commands as defined in the LOCATE RECORD count parameter have not been received.	
1	0	Permanent error	Indicates that an error occurred and recovery failed.	
	1	Invalid track format	1. The record size parameter is inconsistent with the record to be updated. 2. Nonstandard R0 was detected during branching in Fast Write/Dual Copy operation.	
	2	Not used		
	3	Operator message	Not used for other than DKC SIM. For DKC SIM, indicates that messages are output to the operator.	
	4	Not used		
	5	File protection	An attempt was made to move to a track not defined in DEFINE EXTENT during execution of the LOCATE RECORD command (updating write in asynchronous mode).	
	6	Write inhibit	A write command has been received that uses a resource write-prohibited by the DIAGNOSTIC CONTROL command. “Device check” (byte 0, bit 3) is also set to 1.	
	7	Imprecise ending	Indicates that CCW has ended abnormally in the LR/LRE domain and the error is for a previously completed command (whose end status report is already finished).	
2	Storage control type/ Environmental data present		1. For excluding DKC SIM and Cache SIM, this byte indicate DKC type (x‘06’) or 2107 type (x‘1f’). 2. For DKC SIM and Cache SIM, this byte indicate environmental data present (x‘10’).	
3	Remaining count; or, command overrun threshold reached		When the command overrun threshold is reached in exception class 6: X‘01’	Exception class 0 In exception class 0 and format 4: “Remaining count” (number of records/tracks remaining in the LR/LRE domain being handled)
4	Device address		1. When the exception class is 4, 6, B, C, D, or E: Bit 0-1: Storage path number Bit 2: Controller number Bit 3-7: Device number 2. When the exception class is 1, 2, 3, or F: Always ‘00’	
5	Device type code		1. For exception class 4, 6, B, C, D and E, this byte indicates device type (x‘24’) or 2107 type (x‘3C’). 2. For exception class 1, 2, 3 and F, always x‘00’.	

‘’

ECKD 32-Byte SSB Common Sense Bytes (2/3)

Byte	Bit	Name	Description			
6	0	Content and format	b‘0’: SSB2 (storage control type) is valid b‘1’: SSB5 (device type) is valid			
	1	Device address valid	b‘0’: SSB4 is invalid b‘1’: SSB4 is valid			
	2	CYL, HD address valid	b‘0’: SSB29~31 is invalid b‘1’: SSB29~31 is valid			
	3	Not used				
	4 ~ 7	Format	When x‘F’, this SSB is SIM.			
22	0 ~ 3	Exception class	0: File protection, invalid track format, status exception, command sequence exception 4: Data check, retry prohibition, PCI, subretry success 6: Subsystem data B: Failure between DKC and DASD CTL C: Controller failure (reserved) D: Failure between controller and device E: Device failure			
	4 ~ 7	Exception code; or,	For details, see Section 4.3.			
23	0 ~ 7	CHL#, LPN, and LCP# beyond the threshold				
24			Logging message control			
	0 ~ 2	Not used				
	3	Logging mode	Forced log mode			
	4 ~ 5	Logging action	00: Not logged 01: Unconditionally logged 10: Logged only once 11: Logged only for frequent occurrence on the path			
	6 ~ 7	Operator message control	00: Message not output 01: Message output unconditionally 10: Message output only once 11: Message output only once only for frequent occurrence on the path			
25	Program action code		BIT0 = ‘0’		BIT0 = ‘1’	
			BIT 1 ~ 7	Single program action code	BIT1	‘0’: SSBs 26 and 27 have no meaning. ‘1’: Executes error recovery specific to DC.
					2	‘0’: Does not execute ERP based on SSB28. ‘1’: Executes ERP based on SSB28.
					3	Another path retry request
					4 ~ 5	Not used
					6 ~ 7	00: Does not retry 01: Retry twice 10: Retry ten times 11: Retry 255 times

ECKD 32-Byte SSB Common Sense Bytes (3/3)

Byte	Bit	Name	Description		
26			Configuration information		
	0	Dual frame	0: Single-frame configuration 1: Dual-frame configuration		
	1	EDCC mode	0: DCC mode 1: EDCC mode		
	2	Duplex pair	0: Simplex 1: Duplex pair		
	3	Subvolume error	0: Not a subvolume error 1: Subvolume error		
	4	Nonsynchronous operation	0: Synchronous operation 1: Asynchronous operation		
	5	Serial channel	0: Parallel channel 1: Serial channel		
	6	Report output	0: Excluding environmental data present and SIM 1: Environmental data present and SIM		
	7	Permanent path error	0: Permanent error for all paths 1: Permanent error for this path		
27	0	32-byte SSB	ECKD 32-byte SSB = ‘0’		
	1 ~ 3	Not used			
	4	DKU86I TRK compatible mode	0: Not in DKU86I track compatible mode 1: In DKU86I track compatible mode or changing to DKU86I track compatible mode		
	5	Not used			
	6 ~ 7	Path number	Indicates the SSB creation path number.		
28	Message code		Case of Byte27 Bit3=0	Case of Byte27 Bit3=1	Case of exception class 6
			Instructs the message status of the EREP log and operator console.	Indicates the cylinder address bit 12-19 with an error.	“Number of read or searched bytes”
29	Cylinder address		Indicates the cylinder address with an error.	Indicates the cylinder address bit 20-27 with an error.	
30				Indicates the cylinder address bit 0-7 with an error.	
31	0 ~ 3	Head address	0x0	Indicates the cylinder address bit 8-11 with an error.	
	4 ~ 7	Head address	Indicates the head address with an error.	Indicates the head address with an error.	

4.2 Exception Classes and Formats

Exception class	Format	Description
0	0 ~ 1	Reserved
	2	Reserved
	3	Machine condition exception
	4	Command sequence exception
	5 ~ F	Reserved
4	0	Reserved
	1	Data exception (PCI, permanent) (*1)
	2	Reserved
	3 ~ F	Reserved
6	0	Reserved
	1	Subsystem information (*1)
	2 ~ F	Reserved
B	0	DKC and DASD CTL report error
	1 ~ F	Reserved
D	0	Drive report error (*1)
	1	FPC report error (*1)
	2 ~ F	Reserved
E	0	Drive failure, LDEV blockade/Pin volume detected/Write inhibited, LDEV not ready (*1), Shortage of Pool capacity
	1 ~ F	Reserved

*1: For DKU87I (IBM 3390 emulation mode) only.

4.3 Details of Sense Bytes

Exception 0, Format 3 (Machine condition exception)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte4 valid	Byte29 ~ 31 valid	Not used	Format (x'3')			
7	LR/LRE command operation byte							
8	Extension operation byte (byte 17) for LR/LRE command							
9	Byte 2 for LR/LRE command							
10	Reserved							
11	Search parameter of LR command (CCHHR) or Record ID of re-execution command (R)							
12								
13								
14								
15								
16	Sector number to re-execute the LR							
17	TLF for LR/LRE command							
18								
19	Operation byte = 0x3F :LR/LRE External operation byte Others :Reserved							
20	SSID of self subsystem							
21								
22	Exception code x'08C1'							
23								

Exception 0, Format 4 (Command sequence exception)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte4 valid	Byte29 ~ 31 valid	Not used	Format (x‘4’)			
7	LR/LRE command operation byte							
8	Extension operation byte (byte 17) for LR/LRE command							
9	Head address of extent (DX command parameter)							
10								
11								
12								
13	Path group ID (bytes 1 to 7 of the ID transferred by the newest SET PATH GROUP ID command)							
14								
15								
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception code x‘0212’: incomplete domain							
23								

Exception 4, Format 1 (data exception, PCI, permanent)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte4 valid	Byte29 ~ 31 valid	Not used	Format (x‘1’)			
7	Sector number (*1)							
8	Cylinder address (*1)							
9								
10								
11	Head address (*1)							
12	Record number (*1)							
13	Error displacement							
14								
15	Drive serial number (X‘0C24’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception class (x‘4’)				Message (*2)			
23	Correction flag (*3)							

*1: Not determined for occurrence in HA or R0.

*2: Contents of message
- x‘0’: Data check in HA field
- x‘1’: Data check in C field
- x‘2’: Data check in K field
- x‘3’: Data check in D field
- x‘4’: Missing sink byte in HA field (PA error)
- x'5': Missing sink byte in C field
- x'6': Missing sink byte in K field
- x'7': Missing sink byte in D field
- x'8': Not used
- x'9': Missing AM during retry
- x‘A’ ~ x‘F’: Not used

*3: Contents of correction flag
Bits 0 and 1: CORRECTION BIT
- 10: Correctable (Recovered)
- 11: Uncorrectable

Bit 2: Offset active
Bits 3 to 7: Not used

Exception 6, Format 1 (Subsystem information)

	0	1	2	3	4	5	6	7
3	Command overrun threshold exceeded							

6	Unit indication	Byte4 valid	Byte29 ~ 31 valid	Not used	Format (x‘1’)
7	Data overrun threshold exceeded				
8	Seek count				
9					
10	Drive serial number (X‘0C24’ + DKU sequence number)				
11					
12					
13					
14					
15	DKC serial number (X‘0C2400’ + DKC sequence number)				
16					
17					
18					
19					
20	SSID of self subsystem				
21					
22	Exception code (x‘6F0X’) X =For parallel/serial channel standard path: CHL#/LPN (0-7) For serial channel extension path: LCP number				
23					

28	Read / Search byte number
29	
30	
31	

Exception B, Format 0 Exception code 1 (Shared Memory Failure)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte4 valid	BytB29 ~ 31 valid	Not used	Format (x‘0’)			
7	0x81							
8	Subcode (F/M = 81 SSB Byte 8)							
9	F/M = 81 SSB Byte 9							
10	Module ID (F/M = 81 SSB Byte 18)							
11	Routine ID (F/M =81 SSB Byte 19)							
12	Internal SSB Serial number							
13								
14	F/M = 81 SSB Byte 10							
15	Drive serial number (X‘0C24’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception class (x‘B’)				Exception code (x‘1’)			
23	Exception code (F/M = 81 SSB Byte 20:Processor#/Message code)							

Exception B, Format 0 Exception code 4 (CHK4)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte4 valid	Byte29 to 31 valid	Not used	Format (x‘0’)			
7	0x84							
8	Subcode (F/M = 84 SSB Byte 8)							
9	F/M = 84 SSB Byte 9							
10	Module ID (F/M = 84 SSB Byte 18)							
11	Routine ID (F/M =84 SSB Byte 19)							
12	Internal SSB Serial number							
13								
14	Error ID Code							
15	Drive serial number (x‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception class (x‘B’)				Exception code (x‘4’)			
23	Exception code (F/M = 89 SSB Byte 20:Processor#/Message code)							

Exception B, Format 0 Exception code 9 (CHA CHK2)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte4 valid	Byte29 to 31 valid	Not used	Format (x‘0’)			
7	0x89							
8	Subcode (F/M = 89 SSB Byte 8)							
9	F/M = 89 SSB Byte 9							
10	Module ID (F/M = 89 SSB Byte 18)							
11	Routine ID (F/M =89 SSB Byte 19)							
12	Internal SSB Serial number							
13								
14	Error ID Code							
15	Drive serial number (x‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception class (x‘B’)				Exception code (x‘9’)			
23	Exception code (F/M = 89 SSB Byte 20:Processor#/Message code)							

Exception B, Format 0 Exception code A (DKA CHK2)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte4 valid	Byte29 to 31 valid	Not used	Format (x‘0’)			
7	0x8A							
8	Subcode (F/M = 8A SSB Byte 8)							
9	F/M = 8A SSB Byte 9							
10	Module ID (F/M = 8A SSB Byte 18)							
11	Routine ID (F/M =8A SSB Byte 19)							
12	Internal SSB Serial number							
13								
14	Error ID Code							
15	Drive serial number (x‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception class (x‘B’)				Exception code (x‘A’)			
23	Exception code (F/M = 8A SSB Byte 20:Processor#/Message code)							

Exception B, Format 0 Exception code B (DRR CHK2)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte4 valid	Byte29 to 31 valid	Not used	Format (x‘0’)			
7	0x8B							
8	Subcode (F/M = 8B SSB Byte 8)							
9	F/M = 8B SSB Byte 9							
10	Module ID (F/M = 8B SSB Byte 18)							
11	Routine ID (F/M =8B SSB Byte 19)							
12	Internal SSB Serial number							
13								
14	Error ID Code							
15	Drive serial number (x‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception class (x‘B’)				Exception code (x‘B’)			
23	Exception code (F/M = 8B SSB Byte 20:Processor#/Message code)							

Exception B, Format 0 Exception code D (Power Failure)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte4 valid	Byte29 to 31 valid	Not used	Format (x‘0’)			
7	0x8D							
8	Subcode (F/M = 8D SSB Byte 8)							
9	F/M = 8D SSB Byte 9							
10	F/M = 8D SSB Byte 10							
11	F/M =8D SSB Byte 11							
12	Internal SSB Serial number							
13								
14	F/M = 8D SSB Byte 18							
15	Drive serial number (x‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception class (x‘B’)				Exception code (x‘D’)			
23	Exception code (F/M = 8D SSB Byte 20:Processor#/Message code)							

Exception B, Format 0 Exception code E (Processor failure)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte4 valid	Byte29 to 31 valid	Not used	Format (x‘0’)			
7	0x8E							
8	Subcode (F/M = 8E SSB Byte 8)							
9	F/M = 8E SSB Byte 9							
10	Module ID (F/M = 8E SSB Byte 18)							
11	Routine ID (F/M =8E SSB Byte 19)							
12	Internal SSB Serial number							
13								
14	F/M = 8E SSB Byte 10							
15	Drive serial number (x‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception class (x‘B’)				Exception code (x‘E’)			
23	Exception code (F/M = 8E SSB Byte 20:Processor#/Message code)							

Exception B, Format 0 Exception code E (Selective Reset Notification/Wait-Sense Time Over)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte4 valid	Byte29 to 31 valid	Not used	Format (x‘0’)			
7	0x8E							
8	Subcode (F/M = 8E SSB Byte 8)							
9	F/M = 8E SSB Byte 9							
10	Lost SSB’s Module ID (F/M = 8E SSB Byte 14)							
11	Lost SSB’s Routine ID (F/M =8E SSB Byte 15)							
12	Internal SSB Serial number							
13								
14	F/M = 8E SSB Byte 10							
15	Drive serial number (x‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception class (x‘B’)				Exception code (x‘E’)			
23	Exception code (F/M = 8E SSB Byte 20:Processor#/Message code)							

Exception B, Format 0 Exception code F (Logical inconsistency)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte4 valid	Byte29 to 31 valid	Not used	Format (x‘0’)			
7	0x8F							
8	Module ID (F/M = 8F SSB Byte 8)							
9	Routine ID (F/M = 8F SSB Byte 9)							
10	F/M = 8F SSB Byte 10							
11	F/M =8F SSB Byte 11							
12	Internal SSB Serial number							
13								
14	F/M = 8F SSB Byte 12							
15	Drive serial number (x‘0C69’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception class (x‘B’)				Exception code (x‘F’)			
23	Exception code (F/M = 8F SSB Byte 20:Processor#/Message code)							

Exception D, Format 1 (SPC report error)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte4 valid	Byte29 to 31 valid	Not used	Format (x‘1’)			
7	Type code (‘111’) (SPC report error)			Not used	Reserved			
8								
9								
10	SCSI command code (See SSB04-200)							
11	Not used							
12	Module ID							
13	Routine ID							
14	CDEV number							
15	Drive serial number (x‘0C24’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception code (x‘D0ZZ’)							
23	[ZZ: RDEV No.]							

Exception D, Format 0 (Exception class)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte4 valid	Byte29 to 31 valid	Not used	Format (x‘0’)			
7	Type code (‘000’) (drive report error)			Not used	Sense key (*1)			
8	Additional Sense Code + Additional Sense Code Qualifier							
9								
10	SCSI command code (*2) (*3)							
11	Not used							
12	Module ID							
13	Routine ID							
14	CDEV No.							
15	Drive serial number (x‘0C24’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception code (x‘D0ZZ’) [ZZ: RDEV No.]							
23								

*1: Sense Key
- x‘0’ : NO SENSE
- x‘2’ : NOT READY
- x‘3’ : MEDIUM ERROR
- x‘4’ : HARDWARE ERROR
- x‘5’ : ILLEGAL REQUEST
- x‘6’ : UNIT ATTENTION
- x‘7’ : DATA PROTECT
- x‘8’ : BLANK CHECK (Not used)
- x‘9’ : VENDOR UNIQUE (Not used)
- x‘A’ : COPY ABORTED (Not used)
- x‘B’ : ABORTED COMMAND
- x‘C’ : EQUAL (Not used)
- x‘D’ : VOLUME OVERFLOW (Not used)
- x‘E’ : MISCOMPARE
- x‘F’ : (RESERVED)

*2: SCSI Command Code
- x‘00’ : TEST UNIT READY
- x‘03’ : REQUEST SENSE
- x‘04’ : FORMAT UNIT
- x‘07’ : REASSIGN BLOCKS
- x‘12’ : INQUIRY
- x‘15’ : MODE SELECT
- x‘1A’ : MODE SENSE
- x‘1B’ : START/STOP UNIT
- x‘1C’ : RECEIVE DIAGNOSTIC RESULT
- x‘1D’ : SEND DIAGNOSTIC
- x‘28’ : READ (EXTEND)
- x‘2A’ : WRITE (EXTEND)
- x‘2E’ : WRITE AND VERIFY
- x‘3B’ : WRITE BUFFER
- x‘FF’ : Command is non-decision

*3: 2TB SATA SCSI Command Code
- x‘0A’ : VERIFY
- x‘88’ : READ
- x‘8A’ : WRITE
- x‘8E’ : WRITE AND VERIFY
- x‘9E’ : READ CAPACITY

Exception E, Format 0 (drive report error)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte4 valid	Byte29 to 31 valid	Not used	Format (x‘0’)			
7	Type code (‘000’) (drive report error)			Not used	Sense key (*1)			
8	Additional Sense Code + Additional Sense Code Qualifier							
9								
10	SCSI command code (*2) (*3)							
11	Not used							
12	Module ID (≠ x‘5X/6X’)							
13	Routine ID							
14	CDEV No.							
15	Drive serial number (x‘0C24’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception code (x‘E0ZZ’) [ZZ: RDEV No.]							
23								

*1: Sense Key
- x‘0’ : NO SENSE
- x‘2’ : NOT READY
- x‘3’ : MEDIUM ERROR
- x‘4’ : HARDWARE ERROR
- x‘5’ : ILLEGAL REQUEST
- x‘6’ : UNIT ATTENTION
- x‘7’ : DATA PROTECT
- x‘8’ : BLANK CHECK (Not used)
- x‘9’ : VENDOR UNIQUE (Not used)
- x‘A’ : COPY ABORTED (Not used)
- x‘B’ : ABORTED COMMAND
- x‘C’ : EQUAL (Not used)
- x‘D’ : VOLUME OVERFLOW (Not used)
- x‘E’ : MISCOMPARE
- x‘F’ : (RESERVED)

*2: SCSI Command Code
- x‘00’ : TEST UNIT READY
- x‘03’ : REQUEST SENSE
- x‘04’ : FORMAT UNIT
- x‘07’ : REASSIGN BLOCKS
- x‘12’ : INQUIRY
- x‘15’ : MODE SELECT
- x‘1A’ : MODE SENSE
- x‘1B’ : START/STOP UNIT
- x‘1C’ : RECEIVE DIAGNOSTIC RESULT
- x‘1D’ : SEND DIAGNOSTIC
- x‘28’ : READ (EXTEND)
- x‘2A’ : WRITE (EXTEND)
- x‘2E’ : WRITE AND VERIFY
- x‘3B’ : WRITE BUFFER
- x‘FF’ : Command is non-decision

*3: 2TB SATA SCSI Command Code
- x‘0A’ : VERIFY
- x‘88’ : READ
- x‘8A’ : WRITE
- x‘8E’ : WRITE AND VERIFY
- x‘9E’ : READ CAPACITY

SCSI Sense key

Sense key	Definition
0_H	NO SENSE: Indicates that the key information reported from the specified logical unit is not for specific use. This indicates that the command has ended normally.
1_H	RECOVERED ERROR: Indicates that the last command has ended normally after recovery operation by the controller. Details can be determined by checking the additional sense byte and information byte.
2_H	NOT READY: Indicates that the addressed logical unit cannot be accessed. Recovery from this status may require operator's intervention.
3_H	MEDIUM ERROR: Indicates that the command has ended in the irrecoverable error status due to damage to the medium or an error in recorded data.
4_H	HARDWARE ERROR: Indicates that the controller has detected an irrecoverable hardware error (e.g., controller failure, device failure, parity error, etc.) during execution of a command or self-diagnostics.
5_H	ILLEGAL REQUEST: Indicates that illegal data has been detected in the CDB or the additional parameter given as data for some commands (FORMAT UNIT, MODE SELECT, etc.). The controller terminates the command without changing the medium if an invalid parameter has been detected in the CDB. If an invalid parameter has been detected in the additional parameter given as data, the medium may already have been changed.
6_H	UNIT ATTENTION: Indicates that the unit attention status has occurred because the MODE SELECT parameter has been changed or the controller has been reset.
7_H	DATA PROTECT: Indicates that a write command has been received when write to media is prohibited. Write operation is not performed.
8_H	BLANK CHECK. (Not used)
9_H	Vendor Unique. (Not used)
A_H	COPY ABORTED. (Not used)
B_H	ABORTED COMMAND: Indicates that the controller has aborted the command. The host can retry the command for recovery.
C_H	EQUAL. (Not used)
D_H	VOLUME OVERFLOW. (Not used)
E_H	MISCOMPARE: Data comparison failed during byte comparison and verification. Or, data in the WRITE BUFFER command from the same host was changed before execution of the READ BUFFER command.
F_H	Reserved

Threshold type

Code	Threshold (failure) type	Code	Threshold (failure) type
00	CHA CHK1A	30	Cache 1 bit correctable error
01	CHA CHK1B	31	Cache uncorrectable error
02	CHA CHK3	32	Cache 2 bits correctable error
03	CHA CHK2	33	CPC check error
04	CHA ADP temporary error	40	SCSI port failure
05	LCM hardware error	41	Drive mechanism recovered error
06	BSA F bus open	42	Drive mechanism unrecovered error
07	BSA LIVEINS	43	Drive media recovered error
08	BSA check error	44	Drive media unrecovered error
09	SMP M bus open	45	Drive R/W recovered error
0A	SMP M bus check error	46	Drive R/W unrecovered error
0B	SMP H/L check error	47	Drive interface recovered error
10	DKA CHK1A	48	Drive interface unrecovered error
11	DKA CHK1B	49	Controller recovered error
12	DKA CHK3	4A	Controller unrecovered error
13	DKA SCA temporary error	4B	SCSI interface recovered error
14	DKA DRR temporary error	4C	SCSI interface unrecovered error
16	BSA F bus open	4D	Drive I/O read error
17	BSA LIVEINS	4E	Drive I/O write error
18	BSA check error	60	SVP interface error
19	SMP M bus open	FF	Invalid threshold type
1A	SMP M bus check error		
1B	SMP H/L check error		
20	Shared memory correctable error		
21	Shared memory uncorrectable error		
22	SMC M bus open		
23	SMC H/L bus open		

Exception E, Format 0 (LDEV blockade/Pin volume detected/Write inhibited) (*1)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte4 valid	Byte29 to 31 valid	Not used	Format (x‘0’)			
7	Type Code (‘000’)			Not used	Not used			
8	READY	ENABLE	SSB PEND	Not used				
9	Not used							
10	Media maintenance RSV	PIN volume	WRITE inhibited	Not used				
11	Not used							
12	Module ID • Routine ID (x‘5XXX/6XXX’) (*2)							
13								
14	Not used							
15	Drive serial number (x‘0C24’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception code (x‘E000’)							
23								

*1: Byte 0, Bit 3 (device check) is set to 1.

*2: Module ID • Routine ID

x‘5011/501C/5202’ : LDEV blockade

x‘501A/501B’ : PIN volume detected

x‘6605/6697/6705/6784/6805/6853/6909/6953’ : WRITE inhibited

Exception E, Format 0 (Shortage of Pool capacity) (*1)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte4 valid	Byte29 to 31 valid	Not used	Format (x‘0’)			
7	Not used							
8								
9								
10								
11								
12								
13								
14								
15	Drive serial number (x‘0CE5’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception code (x‘EE07’)							
23								

*1: This SSB sets device check (Byte0 Bit3), permanent error (Byte1 Bit0) and write inhibit (Byte1 Bit6) of base sense byte.

Exception E, Format 0 (intervention required: LDEV NOT READY) (*1)

	0	1	2	3	4	5	6	7
6	Unit indication	Byte4 valid	Byte29 to 31 valid	Not used	Format (x‘0’)			
7	Type Code (‘000’)			Not used	Not used			
8	READY	ENABLE	SSB PEND	0	0	0	0	0
9	Not used							
10	Media maintenance reserve	Pin volume	0	0	0	0	0	0
11	HOST TYPE	DKC TYPE	0	0	DKU TYPE			
12	Module ID • Routine ID (x‘501C/5202’)							
13								
14	Command code							
15	Drive serial number (x‘0C24’ + DKU sequence number)							
16								
17								
18								
19								
20	SSID of self subsystem							
21								
22	Exception code (x‘E210’)							
23								

*1: Byte 0, bit 1 (intervention required) is set to 1.