Volume	**07**
Title	**MI MAPS CXXX-F500**
Machine Type	**4331-2 / 4331-11**
Power Design Level	**4/5**
B/M Number 4331-2:	**5683357**
B/M Number 4331-11:	**4687168**

REF.CODE DIRECTORY

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0020	A	1	001

001
(Entry Point A)

REFERENCE CODE DIRECTORY
==========

Reference Code	Title	Goto MAP
C1X00181	CTLI 1 Test	C180
C2X00181	CTLI 2 Test	C280
C3100181	CTLI 3 Test	C380
C400CF01	Channel Control Check (Emul.Mode)	C402
C400DA01	Channel Control Check (FA-Mode)	C402
C400FA01	Channel Control Check (FA-Mode)	C402
C4X00181	FTA-1 Test MAP	C480
C4XXXX01	FTA-1 LOG MAP	C400
C500CF01	Channel Control Check (Emul. Mode)	C502
C500DA01	Channel Control Check (FA-Mode)	C502
C500FA01	Channel Control Check (FA-Mode)	C502
C5X00181	FTA-2 Test MAP	C580

(Step 001 continues)

(Step 001 continued)

C5XXXX01	FTA-2 LOG MAP	C500
C600CF01	Channel Control Check (Emul. Mode)	C602
C600DA01	Channel Control Check (FA-Mode)	C602
C600FA01	Channel Control Check (FA-Mode)	C602
C6100181	FTA3 test MAP	C680
C6XXXX01	FTA3 log MAP	C600

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
CXXX	A	1	001
C400	A	1	001
C402	A	1	001
0C00	A	1	001
0000	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
10	040	C480	A
9	030	0001	A
10	032	0001	0

001
(Entry Point A)

CTLI 1 Test

Important hints:

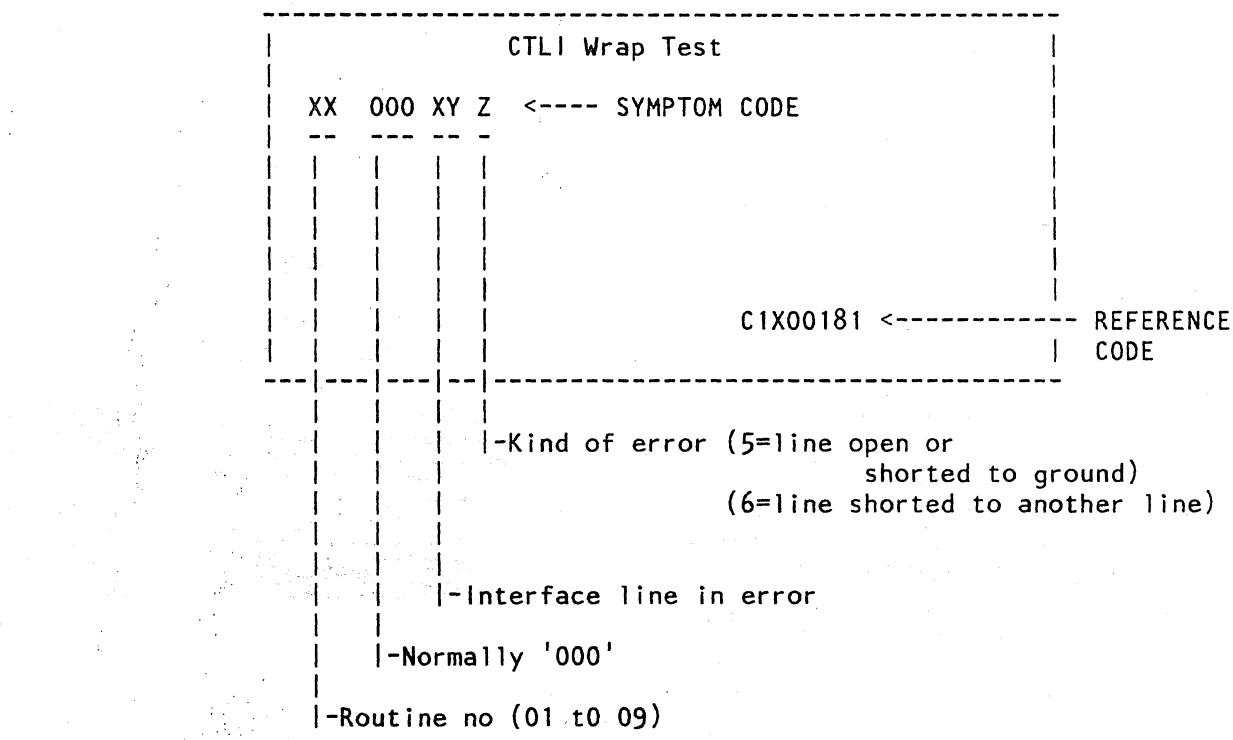
Before testing the director-controller interface (CTLI) be sure that the FTA operates properly by running the FTA test. The FTA test should also have run one time with d i s c o n n e c t e d CTLI cables. The test should have run error free before running the CTLI 1 test.

For handling of the CTLI 1 Test see Vol. 13, STM, Section 4: Diagnostic Run Procedures. (Director Controller Interface Test)

(Step 001 continues)

(Step 001 continued)

Error display is as follows:



Important:
Check to ensure that the interface BUS and TAG cables or the WRAP CONNECTORS are not interchanged!
Power down the control units during the test run.

Is symptom XX000001 displayed?

Y N

1 0 3
A B

002
Is any one of the listed symptoms displayed on screen:

XX000002
XX000003
XX000004
07000197
08000197
Y N

003
Is one of the listed symptoms displayed?
02000075
03000085
04000085
05000035
05000085
05000205
Y N

004
Any other symptom code is displayed:

(Entry Point M)

The following procedure explains how to identify a failing FRU in the director-controller interface area.
Take a note of the first symptoms shown on screen (at most, two symptoms per test run).

Are the wrap connectors already plugged in any control unit?
Y N

005
Continue testing by putting the wrap plugs in the first control unit after the processor, then in the most distant control unit. By systematically putting the wrap plugs in the other control units the area in which the fault lies is approached.

006
(Entry Point G)

Are the wrap connectors right now plugged in the first control unit after the processor?

Y N

007
Is there any more control unit in between the one with the wrap connectors and the processor?

Y N

008
Go to Page 5, Step 012, Entry Point F.

009
Put the wrap connectors into the next control unit towards the processor.

Run the CTLI 1 test again.

Same error?
Y N

010
The error is in the control unit or interface cabling which have just been eliminated by the wrap connectors.

Go to Page 6, Step 013, Entry Point T.

011
Go to Step 006, Entry Point G.

012
(Entry Point F)

Plug the wrap connectors to the CTLI Tailgate Connector (01D).
Run the CTRI 1 test again!

In case of a 3370 is connected go to 3370 MIM page:
CTLR 10
CTLR 20

Same error symptoms?

Y N

7 6
G H

013
(Entry Point T)

Inspect the interface connector contacts of the just eliminated cable for the proper positioning and/or damage.

Probe the defective line using the CE meter and the following table.
Measure for continuity or shorts.

Table 1: Bus and Serpent Connections

Symptom code:

```
XX000 XY Z
      -- -
       | |
       | 5 = Line broken or short to ground
       | 6 = Short to any other line
|------|
|
```

V	SIGN.NAME	BOARD POS.	CONN.		CONN.	BOARD POS.	SIGN.NAME
01	TAG BUS 0	B2E2M06	TAG B03	->	TAG G03	B2E2U09	SELECT ACTIV
02	TAG BUS 5	B2E2S03	TAG D04	->	TAG G05	B2E2U10	NORMAL END
03	SYNC OUT	B2E2M13	BUS D13				
	RESPONSE	B2E2S04	TAG B12	->	TAG J09	B2E2S10	INDEX ALERT
04	TAG BUS 6	B2E2S02	TAG B08	->	TAG J06	B2E2P04	CHECK END
05	SEL.HOLD	B2E2S05	TAG D11	->	TAG G12	B2E2M05	CE ALERT
06	TAG GATE	B2E2S13	TAG B10	->	TAG G08	B2E2P05	ERROR ALERT
07	TAG BUS 7	B2E2M08	TAG D06	->	BUS J13	B2F2B13	SYNC IN
08	TAG BUS 4	B2E2U02	TAG B05				
	RECYCLE	B2E2M09	TAG D13	->	TAG J04	B2E2S09	TAG VALID
10	BUS OUT 0	B2E2S11	BUS D04	->	BUS J04	B2E2U06	BUS IN 0
11	BUS OUT 1	B2E2P06	BUS B05	->	BUS G05	B2E2S06	BUS IN 1
12	BUS OUT 2	B2E2U11	BUS D06	->	BUS J06	B2E2U07	BUS IN 2
13	BUS OUT 3	B2E2P12	BUS B08	->	BUS G08	B2E2S07	BUS IN 3
14	BUS OUT 4	B2E2P11	BUS D09	->	BUS J09	B2E2P02	BUS IN 4
15	BUS OUT 5	B2E2M12	BUS B10	->	BUS G10	B2E2M02	BUS IN 5
16	BUS OUT 6	B2E2M11	BUS D11	->	BUS J11	B2E2M03	BUS IN 6
17	BUS OUT 7	B2E2P10	BUS B12				
20	TAG BUS P	B2E2M07	TAG D09	->	BUS G12	B2E2M04	BUS IN 7
18	BUS OUT P	B2E2M10	BUS B03	->	BUS G03	B2E2S08	BUS IN P
19	BOR IN FTA IS NOT CORRECT						

(Step 013 continues)

(Step 013 continued)

Any line defective?
Y N

014
Suspect the control unit which has been eliminated before be the wrap connectors.

Proceed with the respective controller maintenance documentation.

Note, always inspect interface connector contacts positioning and/or damage.

015
Repair the defective line.

1. Suspect bad connection or broken wire in one or both of the interface cable connectors.

2. Suspect short of shield to line in one or both of the interface cable connectors.

3. Suspect short of one line to another one or both of the interface cable connectors.

Open the interface connector covers and make the necessary repairs.
Go to Page 9, Step 029, Entry Point C.

016
Be sure that all connections of the interface connectors are properly seated and are not damaged.
Make the necessary repairs if required.

Run CTLI 1 test again!

Same error symptoms?
Y N

017
Error was caused by bad contacts in the FTA interface connectors.
Go to Page 9, Step 029, Entry Point C.

018
Check that the flat cables which connect the driver card top connectors with the FTA interface connectors are properly seated.

```
FLATCABLE BUS OUT 01A-B2YA TO BUS SERPENT CONN. 01D-A2BD
FLATCABLE BUS IN  01A-B2YB TO BUS SERPENT CONN. 01D-A2GJ
FLATCABLE TAG 1   01A-B2YJ TO TAG SERPENT CONN. 01D-B2BD
FLATCABLE TAG 2   01A-B2YK TO TAG SERPENT CONN. 01D-B2GJ
```

Remove and replug suspected flat cables to remove possible contamination deposits on contact surfaces.

Run CTLI 1 test again!

Same error symptoms?
Y N

019
The error was caused by bad contact in the flat cable area of the FTA.
Go to Page 9, Step 029, Entry Point C.

020
(Entry Point K)

Replace FTA card 1, 01A-B2E2.

Run CTLI 1 test again!

Same error symptoms?
Y N

021
Error was caused by bad FTA card 1, 01A-B2E2.
Go to Page 9, Step 029, Entry Point C.

022
Remove card in 01A-B2E2 and reinstall the old card. The error is not caused by this card.

Replace FTA card 2, 01A-B2F2.

Run CTLI 1 test again!

Same error symptoms?
Y N

023
Error was caused by bad FTA card 2, 01A-B2F2.
Go to Step 029, Entry Point C.

024
Remove card in 01A-B2F2 and reinstall the old card. The error was not caused by this card.

Replace FTA card 3, 01A-B2G2.
Run CTLI 1 test again!

Same error symptoms?
Y N

025
Error was caused by bad FTA card 3, 01A-B2G2.
Go to Step 029, Entry Point C.

026
Remove card in 01A-B2G2 and reinstall the old card. The error was not caused by this card.
Replace the 4 flat cables:

01A-B2YA TO BUS SERPENT CONNECTOR

01A-B2YB TO BUS SERPENT CONNECTOR

01A-B2YJ TO TAG INTERFACE CONNECTOR

01A-B2YK TO TAG SERPENT CONNECTOR

Run CTLI 1 test again!

(Step 026 continues)

(Step 026 continued)
Same error symptoms?
Y N

027
Error was caused by bad flat cables.
Go to Step 029, Entry Point C.

028
Remove just-installed flat cables. Reinstall old ones.
The error was not caused by flat cables.

Replace Board 01A-B2.

This you may do in accordance with your support structure.

Run CTLI 1 test again!

Same error symptoms?
Y N

029
(Entry Point C)

Replug all removed system parts, such as cables and controller, and plug the wrap connectors to the last controller.

Run test again to make sure that the standard interface is in good order.

Any error symptoms?
Y N

030
(Entry Point CC)

Replace the wrap connectors with the director-controller interface BUS/TAG terminators.
Go To Map 0001, Entry Point A.

031
If errors occur again it is most probable that during replugging a new error was installed, such as bad or mispositioned contacts.
Go to Page 1, Step 001, Entry Point A.

032
Make note of all symptoms and activities you have performed.
Go To Map 0001, Entry Point O.

033
CAUTION:
You may have got temperature problems on the CTLI drivers.
Please close board covers.
Check the air filters.

Make sure that the interface cables are in their specified length according to the physical planning.

Are the air filters ok and the board covers closed?
Y N

034
Correct the air flow and close the board covers.
Go to Step 035, Entry Point MS.

035
(Entry Point MS)

Is the interface cable in the specified length?
Y N

036
Install the correct interface cables.
Then run the wrap test again.

037
Go to Page 3, Step 004, Entry Point M.

038
Make sure that no wrap connector is plugged.

Run FTA 1 test!
Any reference code?
Y N

039
Go to Page 8, Step 020, Entry Point K.

040
Go To Map C480, Entry Point A.

041
The error was caused by the IC-bus.
Run IC-bus test.

CTLI 2 TEST

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
CXXX	A	1	001
C500	A	1	001
C502	A	1	001
0C00	A	1	001
0000	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
13	041	0001	0

001
(Entry Point A)
****

CTLI 2 Test

IMPORTANT HINTS:

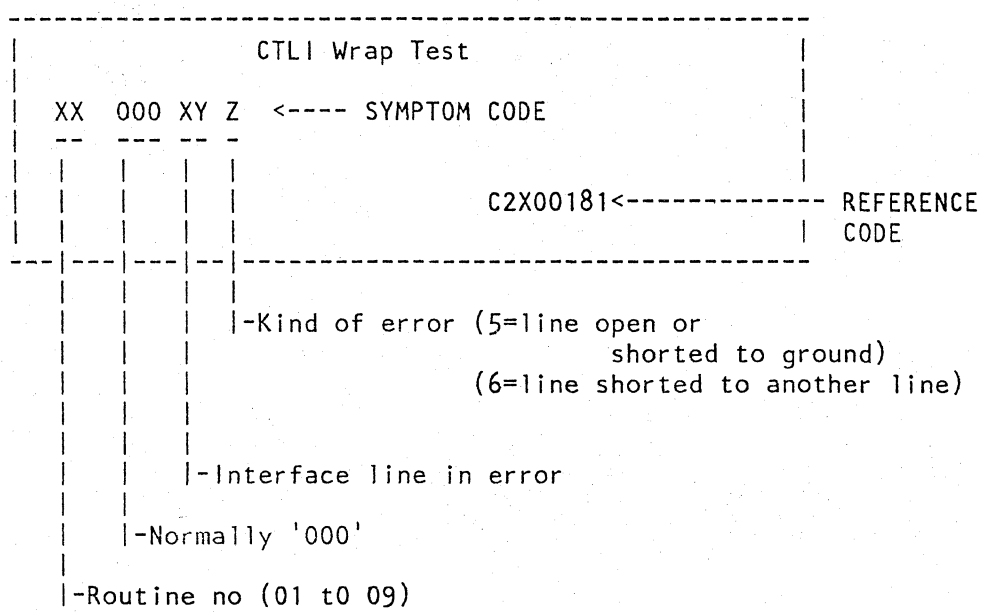
Before testing the controller interface (CTLI) 2 test be sure that the FTA operates properly by running the FTA 2 test. When running the FTA test d i s c o n n e c t the CTLI cables. The test should have run error free before running the CTLI 2 test.

For handling of the CTLI 2 test see Vol. 13, STM, Section 4: Diagnostic Run Procedures (Controller-Interface Test)

(Step 001 continues)

(Step 001 continued)

Error display is as follows:



Important:
Check to ensure that the controller interface cables or the WRAP CONNECTORS are not interchanged!
Power down the controllers before starting the test!

Is symptom code XX000001 displayed?

Y N

002

Is any of the listed symptom codes displayed on screen?

XX000002
XX000003
XX000004
07000197
08000197

Y N

9 9 3
A B C

003

Is one of the following symptom codes displayed?

02000075
03000085
04000085
05000035
05000085
05000205

Y N

004

Any other symptom code is displayed:

(Entry Point M)
****

The following procedure explains how to identify a failing FRU in the controller interface area: Take a note of the first symptom codes shown on screen (at the most two symptom codes per test run).

(Entry Point G)
****

Are the wrap connectors right now plugged in the first controller after the processor?

Y N

005
Put the wrap connectors into the next controller towards the processor.

Run the CTLI 2 test again.

Same error?

Y N

8
D E F G

E F G

006
The error is in the controller or interface cabling which have just been eliminated by the wrap connectors.

Is the system a 4321 or a 4331-1?

Y N

007
Go to Page 10, Step 033, Entry Point TT.

008
Go to Page 4, Step 011, Entry Point T.

009
Go to Step 004, Entry Point G.

010
(Entry Point F)
****

Plug the wrap connectors to the CTLI Tailgate Connector (01D).

Run the CTLI 2 test again!

Same error symptoms?

Y N

6 4
H J

011
(Entry Point T)
****

Inspect the interface connector contacts of the just eliminated cable for proper positioning and/or damage. Probe the defective line using the CE-meter and with aid of the following table.

(Step 011 continues)

(Step 011 continued)
Table 1: BUS and serpent connections

Symptom code:

```
XX000 XY Z
      -- -
       | |
       | V
       | 5 = Line broken or short to ground
       | 6 = Short to any other line
|------|
|
|
```

V	SIGN.NAME	BOARD POS.	CONN.		CONN.	BOARD POS.	SIGN.NAME
01	TAG BUS 0	B2K2M06	TAG B03	->	TAG G03	B2K2U09	SELECT ACTIV
02	TAG BUS 5	B2K2S03	TAG D04	->	TAG G05	B2K2U10	NORMAL END
03	SYNC OUT	B2K2M13	BUS D13				
	RESPONSE	B2K2S04	TAG B12	->	TAG J09	B2K2S10	INDEX ALERT
04	TAG BUS 6	B2K2S02	TAG B08	->	TAG J06	B2K2P04	CHECK END
05	SEL.HOLD	B2K2S05	TAG D11	->	TAG G12	B2K2M05	CE ALERT
06	TAG GATE	B2K2S13	TAG B10	->	TAG G08	B2K2P05	ERROR ALERT
07	TAG BUS 7	B2K2M08	TAG D06	->	BUS J13	B2L2B13	SYNC IN
08	TAG BUS 4	B2K2U02	TAG B05				
	RECYCLE	B2K2M09	TAG D13	->	TAG J04	B2K2S09	TAG VALID
10	BUS OUT 0	B2K2S11	BUS D04	->	BUS J04	B2K2U06	BUS IN 0
11	BUS OUT 1	B2K2P06	BUS B05	->	BUS G05	B2K2S06	BUS IN 1
12	BUS OUT 2	B2K2U11	BUS D06	->	BUS J06	B2K2U07	BUS IN 2
13	BUS OUT 3	B2K2P12	BUS B08	->	BUS G08	B2K2S07	BUS IN 3
14	BUS OUT 4	B2K2P11	BUS D09	->	BUS J09	B2K2P02	BUS IN 4
15	BUS OUT 5	B2K2M12	BUS B10	->	BUS G10	B2K2M02	BUS IN 5
16	BUS OUT 6	B2K2M11	BUS D11	->	BUS J11	B2K2M03	BUS IN 6
17	BUS OUT 7	B2K2P10	BUS B12				
20	TAG BUS P	B2K2M07	TAG B09	->	BUS G12	B2K2M04	BUS IN 7
18	BUS OUT P	B2K2M10	BUS B03	->	BUS G03	B2K2S08	BUS IN P

(Entry Point CA)
****

Any line defective?

```
Y  N
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
6  6
K  L
```

012
Suspect the controller which has been eliminated before by the wrap connectors.

Proceed with the respective controller maintenance documentation .

Note: Always inspect interface connector contacts positioning and/or damage.

013
Repair the defective line.

1. Suspect bad connection or broken wire in one or both of the interface cable connectors.

2. Suspect short of shield to line in one or both of the interface cable connectors.

3. Suspect short of one line to another one or both of the interface cable connectors.

Open the interface connector covers and make the necessary repairs.

Go to Page 9, Step 030, Entry Point C.

014
Check all connections of the interface connectors for damage and make sure that all connectors are properly seated.

Run CTLI2 test again!

Same error symptoms?
Y N

015
Error was caused by bad contacts in the FTA interface connectors.
Go to Page 9, Step 030, Entry Point C.

016

Check that the flat cables which connect the driver card top connectors with the FTA interface connectors are properly seated.

```
FLATCABLE BUS OUT 01A-B2ZA TO BUS SERPENT CONN. 01D-C2BD
FLATCABLE BUS IN  01A-B2ZB TO BUS SERPENT CONN. 01D-C2GJ
FLATCABLE TAG 1   01A-B2ZC TO TAG SERPENT CONN. 01D-D2BD
FLATCABLE TAG 2   01A-B2ZD TO TAG SERPENT CONN. 01D-D2GJ
```

Remove and replug suspected flat cables to remove possible contamination deposits on contact surfaces.

Run the CTLI 2 test again!

Same error symptoms?
Y N

017
The error was caused by bad contact in the flatcable area of the FTA.
Go to Page 9, Step 030, Entry Point C.

018

Is the system a 4321 or a 4331-1?
Y N

019
Go to Page 12, Step 033, Entry Point KK.

020
(Entry Point K)
****

Suspected FRU's:

replace FRU's only one at the time.

1.FTA2 card 1,2 01A-B2K2, L2

2.FTA2 card 3 01A-B2M2

Do the next steps only in accordance with your support structure!

(Step 020 continues)

(Step 020 continued)

3.Replace the 4 flatcables:

```
FLATCABLE BUS OUT 01A-B2ZA TO BUS SERPENT CONN. 01D-C2BD
FLATCABLE BUS IN  01A-B2ZB TO BUS SERPENT CONN. 01D-C2GJ
FLATCABLE TAG 1   01A-B2ZC TO TAG SERPENT CONN. 01D-D2BD
FLATCABLE TAG 2   01A-B2ZD TO TAG SERPENT CONN. 01D-D2GJ
```

4.Board 01A-B2.

After each replacement
Go to Page 13, Step 034, Entry Point V.

021
CAUTION:
You have got temperature problems on the CTLI drivers.
Please close the board covers.
Check the air filters.

Are the air filters ok and the board covers closed?
Y N

022
Correct the air flow and close the board covers.
Go to Step 023, Entry Point MS.

023
(Entry Point MS)
****

Make sure that the interface cables are in their specified length according to the physical planning guide.

Are the interface cables in the specified length?
Y N

024
Install the correct interface cables.
Then run the wrap test again.

025
Go to Page 3, Step 004, Entry Point M.

026

Is the system a 4321 or a 4331-1?
Y N

027
Go to Page 12, Step 033, Entry Point KK.

028
Go to Page 7, Step 020, Entry Point K.

029
The error was caused by the IC-bus.
Run IC-bus test!

Refer to Vol.13, STM, Section 4: Diagnostic Run Procedures, (IC-BUS TEST).

030
(Entry Point C)
****

Replug all removed system parts like cables and controller and plug the wrap connectors to the last controller.

Run wrap test again to make sure that the controller interface cable is in good condition.

Any error symptoms?
Y N

031
Replace the wrap connectors with the controller interface terminators.

032
If errors occur again it is most probable that during replugging a new error was installed.

Go to Page 1, Step 001, Entry Point A.

033
(Entry Point TT)
****

Inspect the interface connector contacts of the just eliminated cable for the proper positioning and/or damage.

Probe the defective line using the CE-meter and with aid of the following table.

Table 1: BUS and serpent connections

Symptom code:

```
XX000 XY Z
      -- -
       | |
       | 5 = Line missing or short to ground
       | 6 = Short to any other line
|------|
|
|
```

V	SIGN.NAME	BOARD POS.	CONN.		CONN.	BOARD POS.	SIGN.NAME
01	TAG BUS 0	B2L2M06	TAG B03	->	TAG G03	B2L2U09	SELECT ACTIV
02	TAG BUS 5	B2L2S03	TAG D04	->	TAG G05	B2L2U10	NORMAL END
03	SYNC OUT	B2L2M13	BUS D13				
	RESPONSE	B2L2S04	TAG B12	->	TAG J09	B2L2S10	INDEX ALERT
04	TAG BUS 6	B2L2S02	TAG B08	->	TAG J06	B2L2P04	CHECK END
05	SEL.HOLD	B2L2S05	TAG D11	->	TAG G12	B2L2M05	CE ALERT
06	TAG GATE	B2L2S13	TAG B10	->	TAG G08	B2L2P05	ERROR ALERT
07	TAG BUS 7	B2L2M08	TAG D06	->	BUS J13	B2M2B13	SYNC IN
08	TAG BUS 4	B2L2U02	TAG B05				
	RECYCLE	B2L2M09	TAG D13	->	TAG J04	B2L2S09	TAG VALID
10	BUS OUT 0	B2L2S11	BUS D04	->	BUS J04	B2L2U06	BUS IN 0
11	BUS OUT 1	B2L2P06	BUS B05	->	BUS G05	B2L2S06	BUS IN 1
12	BUS OUT 2	B2L2U11	BUS D06	->	BUS J06	B2L2U07	BUS IN 2
13	BUS OUT 3	B2L2P12	BUS B08	->	BUS G08	B2L2S07	BUS IN 3
14	BUS OUT 4	B2L2P11	BUS D09	->	BUS J09	B2L2P02	BUS IN 4
15	BUS OUT 5	B2L2M12	BUS B10	->	BUS G10	B2L2M02	BUS IN 5
16	BUS OUT 6	B2L2M11	BUS D11	->	BUS J11	B2L2M03	BUS IN 6
17	BUS OUT 7	B2L2P10	BUS B12				
20	BUS OUT P	B2L2M07	TAG D09	->	BUS G12	B2L2M04	BUS IN 7
18	BUS OUT P	B2L2M10	BUS B03	->	BUS G03	B2L2S08	BUS IN P
19	BOR IN FTA IS NOT CORRECT						

(Step 033 continues)

(Step 033 continued)

Go to Page 5, Step 011, Entry Point CA.

(Step 033 continues)

(Step 033 continued)

(Entry Point KK)
****

Suspected FRU's:

replace FRU's only one at the time.

1.FTA2 card 1,2 01A-B2K2,L2
2.FTA2 card 3 01A-B2M2

Do the next steps only in accordance with
your support structure!

3.Replace the 4 flatcables.

FLATCABLE BUS OUT 01A-B2ZA TO BUS SERPENT CONN. 01D-C2BD
FLATCABLE BUS IN 01A-B2ZB TO BUS SERPENT CONN. 01D-C2GJ
FLATCABLE BUS TAG 1 01A-B2ZC TO TAG SERPENT CONN. 01D-D2BD
FLATCABLE BUS TAG 2 01A-B2ZD TO TAG SERPENT CONN. 01D-D2GJ

4.Board 01A-B2

After each replacement
Go to Page 13, Step 034, Entry Point V.

034
(Entry Point V)
****

Make sure that no wrap connector is installed.

Run FTA2 Test.

Any Reference Code?
Y N

035
Run CTLI 2 test.

Any Reference Code?
Y N

036
Go to Page 9, Step 030, Entry Point C.

037
Same symptom?
Y N

038
New symptom may be caused by last replaced FRU.
Check it.

039
Are all repair actions done?
Y N

040
Replace the next FRU as indicated.
If 4321 or 4331-1
Go to Page 7, Step 020, Entry Point K.

If 4331-2 or 4331-11
Go to Page 12, Step 033, Entry Point KK.

041
Invoke your support structure.
Go To Map 0001, Entry Point O.

042
The error is caused by a new FTA card.
Replace the FTA card
Go to Step 034, Entry Point V.

CTLI 3 Test

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
CXXX	A	1	001
C600	A	1	001
C602	A	1	001
0C00	A	1	001
0000	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
10	040	C680	A
8	030	0001	A
9	032	0001	0

001
(Entry Point A)

IMPORTANT HINTS:

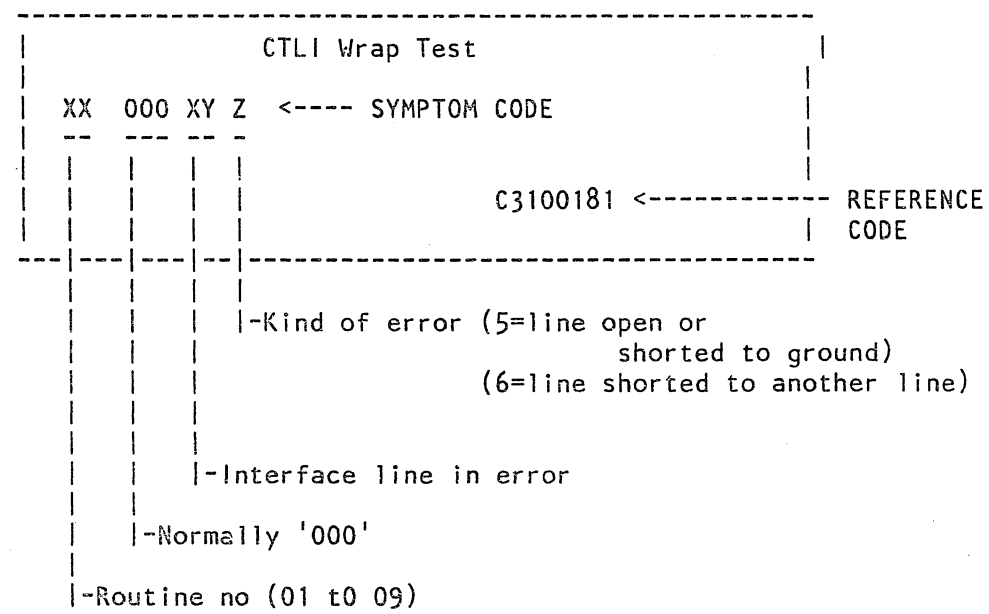
Before testing the director-controller interface (CTLI) 3
be sure that the FTA 3
operates properly by running the FTA 3 test.
When running the FTA test d i s c o n n e c t the CTLI cable.
The test should run errorfree before running the CTLI 3 test.

For handling of the CTLI 3 Test see Supplement to MAPs,
section 4: Diagnostic Run Procedures
(Director-Controller-Interface Test)

(Step 001 continues)

(Step 001 continued)

Error display is as follows:



Important:
Check to ensure that the interface BUS and TAG cables or the WRAP CONNECTORS are not interchanged

Power down the control units during the test run!

(Step 001 continues)

(Step 001 continued)
Is symptom code XX000001 displayed?
Y N

002
Is anyone of the listed symptoms displayed on screen?
XX000002
XX000003
XX000004
07000197
08000197
Y N

003
Is one of the following symptoms displayed?
02000075
03000085
04000085
05000035
05000085
05000205
Y N

004
Any other symptom code is displayed:

(Entry Point M)

The following procedure explains how to identify a failing FRU i the director-controller interface area:
Take a note of the first symptoms shown on screen (at the most two symptoms per test run).

Are the wrap connectors already plugged in any control unit?
Y N

1 1
0 0 9 4 4
A B C D E

005
Continue testing by putting the wrap plugs in the first control unit after the processor, then in the most distant control unit.
By systematically putting the wrap plugs in the other control units the area in which the fault lies is approched.

006
(Entry Point G)

Are the wrap connectors right now plugged in the first control unit after the processor?

Y N

007
Is there any more control unit in between the one with the wrap connectors and the processor?

Y N

008
Go to Step 012, Entry Point F.

009
Put the wrap connectors into the next control unit towards the processor.
Run the CTLI 3 test again.

Same error?
Y N

010
The error is in the control unit or interface cabling which has just been eliminated by the wrap connectors.
Go to Page 5, Step 013, Entry Point T.

011
Go to Step 006, Entry Point G.

F

F 1708 MAP C380-4

012
(Entry Point F)

Plug the wrap connectors to the CTLI Tailgate Connectors (01D).
Run the CTLI 3 test again!

Same error symptoms?
Y N

013
(Entry Point T)

Inspect the interface connector contacts of the just eliminated cable for the proper positioning and/or damage.
Probe the defective line using the CE-meter and with aid of the following table.

Table 1: Bus and serpent connections

Symptom code:

```
XX000 XY Z
      -- -
       | |
       | 5 = Line broken or short to ground
       | 6 = Short to any other line
|------|
|
```

V	SIGN.NAME	BOARD POS.	CONN.		CONN.	BOARD POS.	SIGN.NAME
01	TAG BUS 0	B2P2M06	TAG B03	->	TAG G03	B2P2U09	SELECT ACTIV
02	TAG BUS 5	B2P2S03	TAG D04	->	TAG G05	B2P2U10	NORMAL END
03	SYNC OUT	B2P2M13	BUS D13				
	RESPONSE	B2P2S04	TAG B12	->	TAG J09	B2P2S10	INDEX ALERT
04	TAG BUS 6	B2P2S02	TAG B08	->	TAG J06	B2P2P04	CHECK END
05	SEL.HOLD	B2P2S05	TAG D11	->	TAG G12	B2P2M05	CE ALERT
06	TAG GATE	B2P2S13	TAG B10	->	TAG G08	B2P2P05	ERROR ALERT
07	TAG BUS 7	B2P2M08	TAG D06	->	BUS J13	B2Q2B13	SYNC IN
08	TAG BUS 4	B2P2U02	TAG B05				
	RECYCLE	B2P2M09	TAG D13	->	TAG J04	B2P2S09	TAG VALID
10	BUS OUT 0	B2P2S11	BUS D04	->	BUS J04	B2P2U06	BUS IN 0
11	BUS OUT 1	B2P2P06	BUS B05	->	BUS G05	B2P2S06	BUS IN 1
12	BUS OUT 2	B2P2U11	BUS D06	->	BUS J06	B2P2U07	BUS IN 2
13	BUS OUT 3	B2P2P12	BUS B08	->	BUS G08	B2P2S07	BUS IN 3
14	BUS OUT 4	B2P2P11	BUS D09	->	BUS J09	B2P2P02	BUS IN 4
15	BUS OUT 5	B2P2M12	BUS B10	->	BUS G10	B2P2M02	BUS IN 5
16	BUS OUT 6	B2P2M11	BUS D11	->	BUS J11	B2P2M03	BUS IN 6
17	BUS OUT 7	B2P2P10	BUS B12				
20	TAG BUS P	B2P2M07	TAG B09	->	BUS 612	B2P2M04	BUS IN 7
18	BUS OUT P	B2P2M10	BUS B03	->	BUS G03	B2P2S08	BUS IN P
19	BOR IN FTA IS NOT CORRECT						

(Step 013 continues)

(Step 013 continued)
Any line defective?
Y N

014
Suspect the control unit which has been eliminated before by the wrap connectors.

Note:Always inspect interface connector contacts positioning and/or damage.

Proceed with the respective controller maintenance documentation.

015
Repair the defective line.

1. Suspect bad connection or broken wire in one or both of the the interface cable connectors.

2. Suspect short of shield to line in one or both of the interface cable connector.

3. Suspect short of one line to another or both of the interface cable connectors.

Open the interface connector covers and make the necessary repairs.
Go to Page 8, Step 028, Entry Point C.

016
Be sure that all connections of the interface connectors are properly seated and not damaged.
Make the necessary repairs if required.

Run the CTLI 3 interface test again!

Same error symptoms?
Y N

017
Error was caused by bad contacts in the FTA interface connectors.
Go to Page 8, Step 029, Entry Point C.

018
Check that the flat cables which connect the driver card top connectors with the FTA interface connectors are properly seated.

FLATCABLE BUS OUT 01A-B2ZE TO BUS SERPENT CONN. 01D-E2BD
FLATCABLE BUS IN 01A-B2ZF TO BUS SERPENT CONN. 01D-E2GJ
FLATCABLE TAG 1 01A-B2ZG TO TAG SERPENT CONN. 01D-F2BD
FLATCABLE TAG 2 01A-B2ZH TO TAG SERPENT CONN. 01D-F2GJ

Remove and replug suspected flat cables to remove possible contamination deposits on contact surfaces.

Run the CTLI 3 test again!

Same error symptoms?
Y N

019
The error was caused by bad contact in the flatcable area of the FTA.
Go to Page 8, Step 029, Entry Point C.

020
(Entry Point K)

Replace FTA card 1, 01A-B2P2.

Run the CTLI 3 test again!

Same error symptoms?
Y N

021
Error was caused by bad FTA card 1,01A-B2P2.
Go to Page 8, Step 029, Entry Point C.

022
Remove card in 01A-B2P2 and reinstall the old card. The error is not caused by this card.

Replace FTA card 2, 01A-B2Q2.

Run the CTLI 3 test again!

Same error symptoms?
Y N

023
Error was caused by bad FTA card 2, 01A-B2Q2.
Go to Step 029, Entry Point C.

024
Remove card in 01A-B2Q2 and reinstall the old card. The error was not caused by this card.

Replace FTA card 3; 01A-B2R2.
Run CTLI 3 test again!

Same error symptoms?
Y N

025
Error was caused by bad FTA card 3, 01A-B2R2.
Go to Step 029, Entry Point C.

026
Remove card in 01A-B2R2 and reinstall the old card. The error was not caused by this card.
Replace the 4 flatcables:

01A-B2ZE TO BUS SERPENT CONNECTOR

01A-B2ZF TO BUS SERPENT CONNECTOR

01A-B2ZG TO TAG INTERFACE CONNECTOR

01A-B2ZH TO TAG SERPENT CONNECTOR

Run CTLI 3 test again!

(Step 026 continues)

(Step 026 continued)
Same error symptoms?
Y N

027
Error was caused by bad flat cables.
Go to Step 029, Entry Point C.

028
Remove just installed flat cables. Reinstall old ones.
The error was not caused by flat cables.

Replace BOARD 01A-B2.

This you may do in accordance with your support structure.

Run CTLI 3 test again!

Same error symptoms?
Y N

029
(Entry Point C)

Replug all removed system parts like cables and controller and plug the wrap connectors to the last controller.

Run test again to make sure that the standard interface is in good order.

Any error symptoms?
Y N

030
(Entry Point CC)

Replace the wrap connectors with the director-controller interface BUS/TAG terminators.

Go To Map 0001, Entry Point A.

031
If errors occur again it is most probable that during replugging a new error was installed like bad or mispositioned contacts.
Go to Page 1, Step 001, Entry Point A.

032
Make note of all symptoms and activities you have performed.
Go To Map 0001, Entry Point O.

033
CAUTION:
You have got temperature problems on the CTLI drivers.
Please close the board covers.
Check the air filters.
Make sure that the interface cables are in their specified length according to the physical planning.

Are the air filters ok and the board covers closed?
Y N

034
Correct the air flow and close the board covers.
Go to Step 035, Entry Point KM.

035
(Entry Point KM)

Are the interface cables in the specified length?
Y N

036
Install the correct interface cables.
Then run the wrap test again.

037
Go to Page 3, Step 004, Entry Point M.

038
Run FTA 3 test!
Any reference code?
Y N

039
Go to Page 7, Step 020, Entry Point K.

040
Go To Map C680, Entry Point A.

Make sure that no wrap connector is plugged.

041
The error was caused by the IC-bus.
Run IC-bus test.

FTA 1 LOG MAP

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
CXXX	A	1	001
C402	A	1	001
RFCA	A	1	001
RFCA	B	3	003
RFCA	V	6	020
0C00	AA	2	002
0C00	MM	6	026
4902	MM	6	026

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
9	065	C180	A
5	012	C180	A
5	018	C180	A
5	017	C402	A
9	068	C480	A
8	045	C480	A
7	040	0000	A
6	022	0001	A
6	025	0001	A
7	029	0001	A
5	016	0001	A
9	059	0001	0

001

(Entry Point A)
****

Make sure that you have followed the START MAP 0000 precisely.

Another reference code may be more important than the one you have got first.

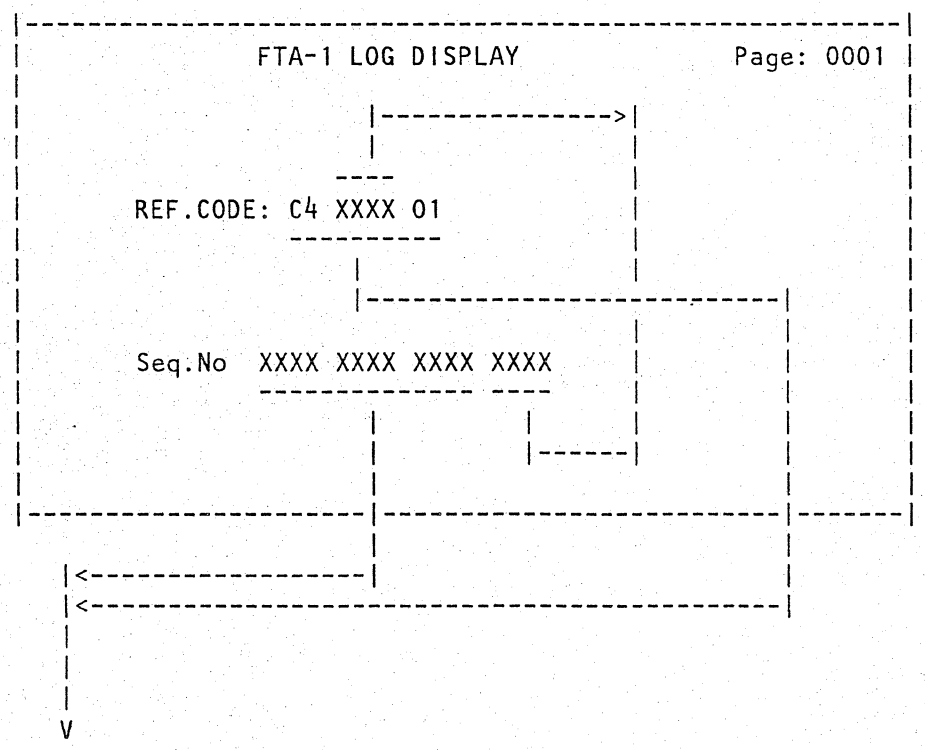
Are you led to this MAP by the REFCODE ANALYSIS?

Y N

3 2
A B

(Entry Point AA)
****

FTA 1 Log Display (Example)
==========



Select the 'IBM MAINTENANCE and SERVICE PROGRAM SELECTION'.

Invoke the REFCODE ANALYSIS.

Key in the reference code from the FTA 1 LOG.
Proceed as told by the REFCODE ANALYSIS.

003

(Entry Point B)
****

Run FTA 1 test.

Any reference code?
Y N

004
Run CTLI 1 test.

Any reference code?
Y N

005
Is the reference code from the FTA log C400XX01 ?
Y N

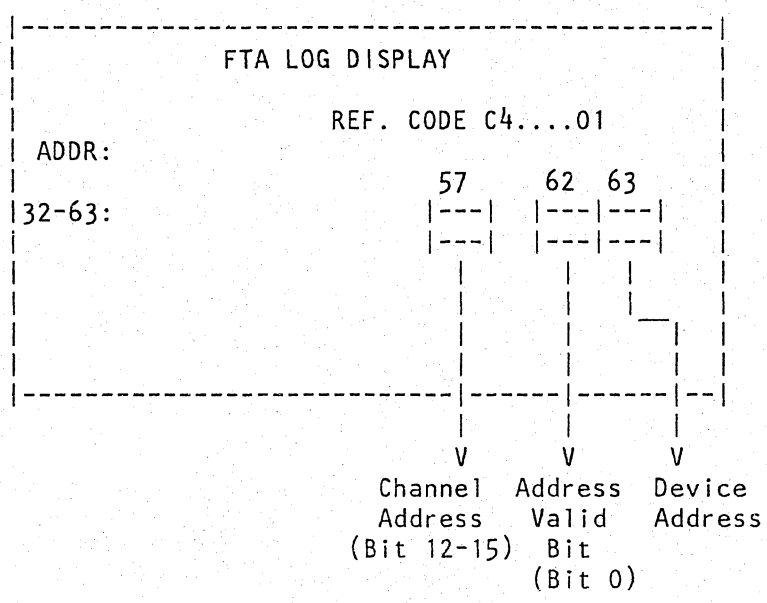
006
FTA reference codes can also be caused by I/O problems.

Look for an EREP of the I/Os connected to FTA1.

Is there a fault symptom index/code (FSI/FSC) recorded in the EREP?
Y N

5 5 5 5 4
C D E F G

007
Select FTA log.



Is the 'Address Valid Bit' (byte 62, bit 0) on?
Y N

008
Run CTLI1 (wrap) test.

Attention

Power down the controllers before the test run.

Start the test by putting the wrap plugs in the first controller after the processor, then in the most distant controller. By systematically putting the wrap plugs in the other controllers the area in which the fault lies is approached.

Any reference code?
Y N

5 5 5
H J K

009
Run inline tests for all devices attached to the FTA.

Any reference code?
Y N

010

(Entry Point N)
****

If the problem cannot be found with aid of the inlines
(Either the inlines don't find an error or they don't run):
Replace FRUs as indicated by the REFCODE ANALYSIS.

Refer to the 'Card Where Used List' in Vol. 30, PA 013 for possible card swapping.

After the repair do the verification.

Go to Page 6, Step 020, Entry Point V.

011
Go to appropriate MAP.

012
Go To Map C180, Entry Point A.

013
Take the device address from the FTA log byte 63. Run the inline tests for the addressed device.

Any reference code?
Y N

014
Go to Step 010, Entry Point N.

015
Go to appropriate MAP.

016

(Entry Point BB)
****

Go to appropriate I/O documentation using the FSI/FSC.

After the repair

Go To Map 0001, Entry Point A.

017
Go To Map C402, Entry Point A.

018
Go To Map C180, Entry Point A.

019
Go to the appropriate MAP, respectively use the REFCODE ANALYSIS.

020

(Entry Point V)
****

Verification:

After the repair run the test chaining.

Any reference code?
Y N

021
If possible run the application which caused the error and watch the system.

Does the original error come up again?
Y N

022
Go To Map 0001, Entry Point A.

023
Invoke the REFCODE ANALYSIS. Key in the reference code from the FTA 1 log.

The rightmost symptom of each sequence number log is used in creating the displayed reference code.

If the reference code fails to fix the problem, substitute the four characters in the middle of the reference code by the next symptom and return the REFCODE ANALYSIS with the so build new reference code.

Replace the FRU's that are now suspected by the REFCODE ANALYSIS.
Then run the test chaining.

Any reference codes?
Y N

1 1
0 0
M N P

024
Run the application which caused the error and watch the system.

Does the original error come up again?
Y N

025
Go To Map 0001, Entry Point A.

026

(Entry Point MM)
****

Check director-controller interface cables/connectors; check whether all cable connectors fit properly, including the flat cables from 01A-B2YA/ YB/ YJ/ YK to tailgate 01D-A2 (BD)/ A2 (GJ)/ B2 (BD)/ B2 (GJ).

Look for broken loose or bent contact pins in the connectors.

Check I/O terminators for correct position and bent pins.

Check for proper shielding of I/O cables.

Refer to Vol.16, Power Manual, EMC Checking.

Repair or replace, if needed.

Run FTA1 test.

Any error?
Y N

9 7
Q R

027

(Entry Point MA)
****

For further verification run and loop the CTLI 1 test and apply stress to the connectors by hitting them with your hand.

Any error?
Y N

028
Run the application which showed the error.

Does the error come up again?
Y N

029

(Entry Point Z)
****

Go To Map 0001, Entry Point A.

030
Same error symptom as before?
Y N

031
Go to Step 040, Entry Point Y.

032
Now suspect the tag drivers and receivers of the FTA 1: Replace
FTA1 card 3; 01A-B2G2

Run FTA 1 test and CTLI 1 test.

Any error?
Y N

033
(Entry Point MB)
****

Run the application which showed the error.

Does the error come up again?
Y N

034
Go to Step 029, Entry Point Z.

035
Same error symptom as before?
Y N

036
Go to Step 040, Entry Point Y.

037
Suspect now the tag driver and receiver cards in the controller(s). If possible swap with the bus driver and receiver cards. If possible run the application which showed the error.

Does the error come up again?
Y N

038
Go to Step 029, Entry Point Z.

039
Same error symptom as before?
Y N

040

(Entry Point Y)
****

Go To Map 0000, Entry Point A.

041
Replace now the FTA 1 card 2; 01A-B2F2

Run FTA 1 test.

Any error?
Y N

042
Go to Step 046, Entry Point W.

043
Same error symptom as before?
Y N

044
The new card may also be defective.
Correct it.

Run FTA 1 test.
Any error?
Y N

045
Second error may be in adapter.

Go To Map C480, Entry Point A.

046

(Entry Point W)
****

If possible run the application which caused the error.

Does the error come up again?
Y N

047
Go to Page 7, Step 029, Entry Point Z.

048
Same error symptoms as before?
Y N

9
W X Y

X Y 1710 MAP C400-8

049
Go to Page 7, Step 040, Entry Point Y.

050
Suspect now the terminator cards:

if 3421 or 4331-1: 01A-B2X2.

if 4331-2 or 4331-11: 01A-B2YL/YM (IC-Bus 1).

Run IC-bus test and FTA 1 test.

Any reference code?
Y N

051
Try again the application which caused the error.

Does the error come up again?
Y N

052
Go to Page 7, Step 029, Entry Point Z.

053
Same error symptoms as before?
Y N

054
Go to Page 7, Step 040, Entry Point Y.

055

(Entry Point S)
****

If 4321 or 4331-1:

Exchange IC-bus cable 3
(IC- bus sense and control lines)
from 01A-B1B4(C) to 01A-B2YD.

If 4331-2 or 4331-11:

Exchange IC-bus cable 12 (IC-bus sense and control lines) from 01A-B1B4 (C) to 01A-B2YD.

Run FTA 1 test.

Any reference code?
Y N

056
Go to Page 7, Step 029, Entry Point Z.

057
Same symptoms as before?
Y N

058
New cable is also defective.
Correct it.

Go to Page 6, Step 020, Entry Point V.

059

(Entry Point T)
****

Suspect now the board B2.
This you may replace in accordance with your support structure.
Write down all symptoms for possible later use.

Go To Map 0001, Entry Point O.

060
Go to appropriate MAP,respectively use the REFCODE ANALYSIS.

061
Go to Step 066,
Entry Point AM.

062
Same symptoms as before?
Y N

063
The new card may also be defective.
Correct it, then
Go to Page 7, Step 033,
Entry Point MB.

064
Go to Page 7, Step 033, Entry Point MB.

065
Go To Map C180, Entry Point A.

066

(Entry Point AM)
****

Disconnect interface cables.

Run FTA 1 test again to see whether the error is inside or outside the adapter.

Any error?
Y N

067
Go to Page 7, Step 027, Entry Point MA.

068
Go To Map C480, Entry Point A.

069
Go to Step 070, Entry Point K.

070

(Entry Point K)
****

Go to appropriate MAP, respectively use the REFCODE ANALYSIS.

Channel Control Check

ENTRY POINTS

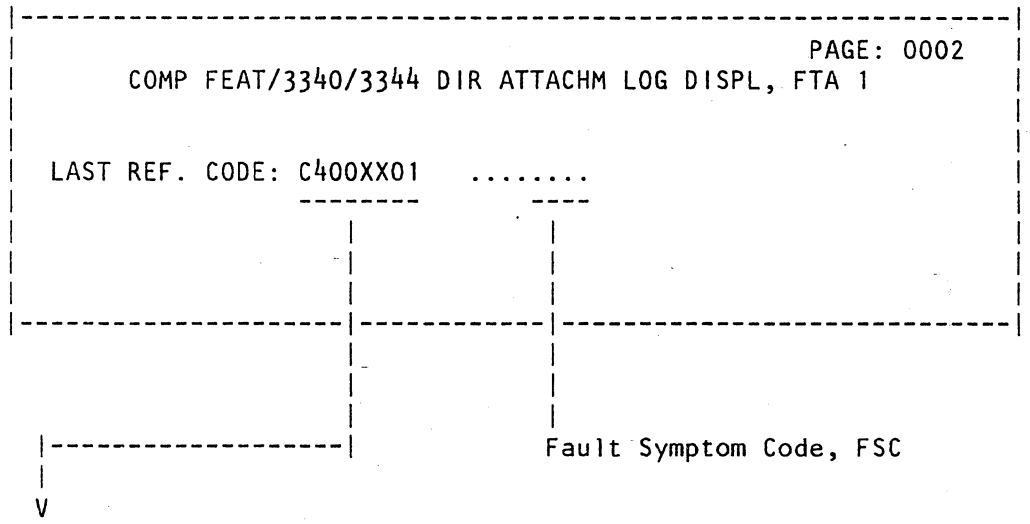
FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
CXXX	A	1	001
C400	A	1	001
RFCA	A	1	001
0020	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
9	022	C180	A
2	003	C400	A
9	023	C480	A
3	005	0001	A
4	006	0001	A
9	025	0001	A
9	021	0001	0

001
(Entry Point A)

231X/33XX compatibility feature and
3340/3344 direct attachment log display
(example)



Reference code C400CF01?

Y N

5 2
A B

FTA = Direct Access Storage Device, DASD Adapter

002
Reference code C400DA01?
Y N

003
Go To Map C400, Entry Point A.

004
The log was generated by the 3340/3344 direct attachment.
(The picture below is valid for reference code C400DA01 only.)

See the additional message in line 23 on screen.

If this message is not on screen, try to get it by doing CHANGE DISPLAY.

```
I/O ERR ADR: CUU C400DA01 XXXX   YYYY
             |       |       |      |
             |       |       |      |_fault symptom index, FSI
             |       |       |
             |       |       |_______logical cylinder/track address
             |       |
             |       |_______________ref.code 3340/3344 direct
             |                        attachment
             |
             |____________________channel and device address
```

Recommended action :

The above Channel Control Check indicates a defect in either:
the 3348 data module or HDA,
the 3340/3344 drive or
the controller.
Go to respective MAP or go directly to the 3340/3344 documentation using the fault symptom index, FSI.

This can be extraced from sense byte 22 and 23.
See log byte 38 and 39 or
message line 23 on screen in position 'YYYY'.

Any 3340/3344 problem detected?
Y N

005
Suspect 01A-B2E2/F2/G2.
After the repair
Go To Map 0001, Entry Point A.

006

Repair as told by 3340/3344 documentation, then

Go To Map 0001, Entry Point A.

007

Ref. Code C400CF01:

The log was generated by the 231X/33XX compatibility feature.

See the additional message in line 23 on screen.

If this message is not on screen, try to get it by doing CHANGE DISPLAY.

This ref. code can also be caused by a not initialized disk pack.

Programs to be used:
1. INITEM Utility,
2. Standalone Utility 5747SA1.

```
I/O ERR ADR: CUU C400CF01 XXXX YY ZZ
             |   |       |    |  |
             |   |       |    |  |___ Flag byte
             |   |       |    |       1X = control info. error
             |   |       |    |       2X = device error
             |   |       |    |       4X = device error/FTA error
             |   |       |    |       X2 = format error
             |   |       |    |       X4 = FTA error
             |   |       |    |       X8 = control info. error
             |   |       |    |
             |   |       |    |___ emulated device address
             |   |       |
             |   |       |___ emulated cyl/head address
             |   |
             |   |_______ ref. code 231X/33XX comp. feature
             |
             |_____________ native device address
```

Is the message on screen?

Y N

008

Go to Page 7, Step 015, Entry Point B.

009
Write down the error message.

Is there a '4X' shown in position 'ZZ' of the message?
Y N

010
Is there a '2X' or'X4' shown in position 'ZZ' of the message?
Y N

011
Is there an 'X2' shown in position 'ZZ' of the message?
Y N

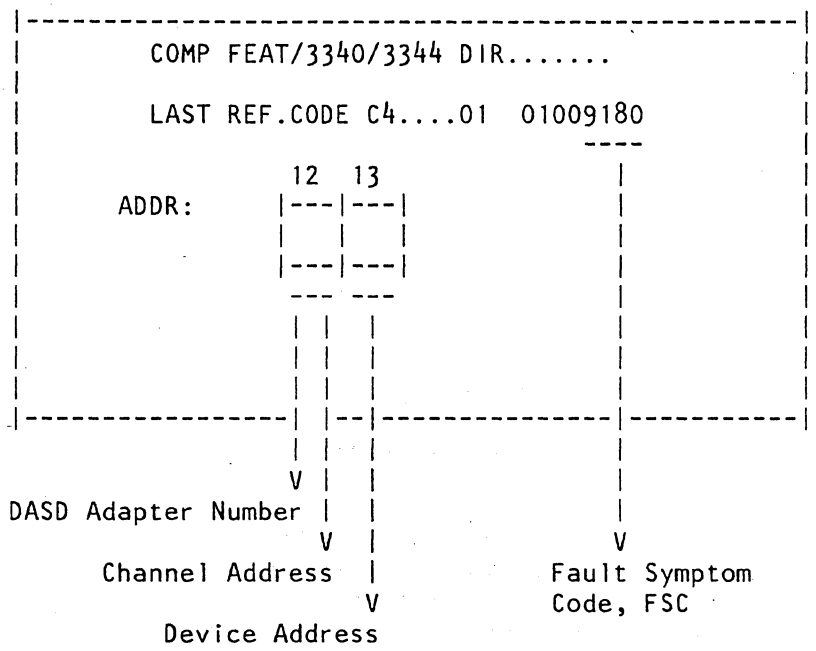
012
Go to Page 8, Step 021, Entry Point TZ.

013
Contact the customer for repetition of formatting the disk pack.

014
Go to Page 7, Step 015, Entry Point B.

015
(Entry Point B)

Select the FTA log. Press ENTER to get the COMP FEAT/3340/3344 Direct Attachment Log DISPLAY.



Is the FSC shown in the log display?
Y N

016
Go to Page 8, Step 018, Entry Point MM.

017
Use the FSC and go to the documentation of the I/O. The address of the I/O you see in byte 12 and 13 of the log display.

Repair successful?
Y N

9 8
G H

018
(Entry Point MM)

Take device address and run the inline routines with this device.

Any error?
Y N

019
(Entry Point VZ)

Run FTA 1 test.

Any error?
Y N

020
Run CTLI (wrap) 1 test.

Attention

Power down the control units during the test run.

Start the test by putting the wrap plugs in the first control unit after the processor, then in the most distant control unit.
By systematically putting the wrap plugs in the other control units the area in which the fault lies is approached.

Any error?
Y N

021
(Entry Point TZ)

Call for support.
As soon as the support structure gets involved, information concerning the following subjects should be made available:

1.Machine configuration.
2.EC REA status and installed MCTF (s).
3.Attached I/O units and associated unit addresses.
4.Software environment (release numbers, if applicable).
5.Number of 3340/3344 buffers specified at IPL time, also numbers of compatibility feature buffers specified at IPL time.

(Step 021 continues)

Channel Contr. Check

(Step 021 continued)
6.Recovery actions done so far (according to above scheme).
7.All existing log areas belonging to reference code C400XX01.
8.I/O units running concurrently at the time the logs occurred
9.Frequency of logs with reference code C400XX01.

Go To Map 0001, Entry Point O.

022
Go To Map C180, Entry Point A.

023
Go To Map C480, Entry Point A.

024
Go to respective MAP.

025
Go To Map 0001, Entry Point A.

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
CXXX	A	1	001
C180	A	1	001
C400	A	1	001
C402	A	1	001
RFCA	A	1	001
0C00	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	003	0001	A

001
(Entry Point A)

FTA1 Test MAP.

Are you led to this MAP by the REFCODE ANALYSIS?
Y N

002
Select the IBM MAINTENANCE and SERVICE SELECTION PROGRAM.

Invoke the REFCODE ANALYSIS.

Key in the reference code from the FTA1 test.
Go to Page 2, Step 003, Entry Point P.

003
(Entry Point P)

Prerequisites:

Make sure that there isn't any wrap connector
left in the system.

Do now the repair as told by the REFCODE ANALYSIS.

After the repair,
Go To Map 0001, Entry Point A.

FTA 2 LOG MAP

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
CXXX	A	1	001
C502	A	1	001
RFCA	A	1	001
RFCA	B	3	003
RFCA	V	6	020
0C00	AA	2	002
0C00	MM	7	026
4902	MM	7	026

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
10	065	C280	A
5	012	C280	A
6	018	C280	A
6	017	C502	A
10	068	C580	A
8	045	C580	A
8	040	0000	A
9	049	0000	A
6	022	0001	A
7	025	0001	A
7	029	0001	A
9	052	0001	A
9	056	0001	A
6	016	0001	A
9	059	0001	0

001

(Entry Point A)
****

Make sure that you have followed the START MAP 0000 precisely.

Another reference code may be more important than the one you have got first.

Are you led to this MAP by the REFCODE ANALYSIS?

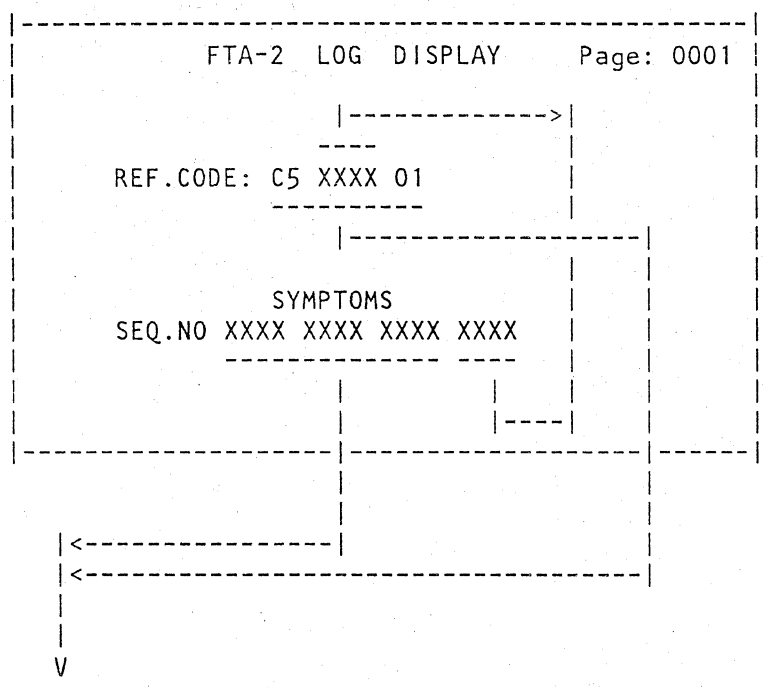
Y N

3 2
A B

002

(Entry Point AA)
****

FTA 2 Log Display (Example)
==========



Select the IBM MAINTENANCE and SERVICE SELECTION PROGRAM.

Invoke the REFCODE ANALYSIS.

Key in the reference code from the FTA 2 LOG.

Go to Page 3, Step 003, Entry Point B.

003

(Entry Point B)
****

Run FTA 2 test.

Any reference code?
Y N

004
Run CTLI 2 test.

Any reference code?
Y N

005
Is the reference code from the FTA 2 log C500XX01?
Y N

006
Attention:

Be sure that there isn't any blank tape mounted for reading.

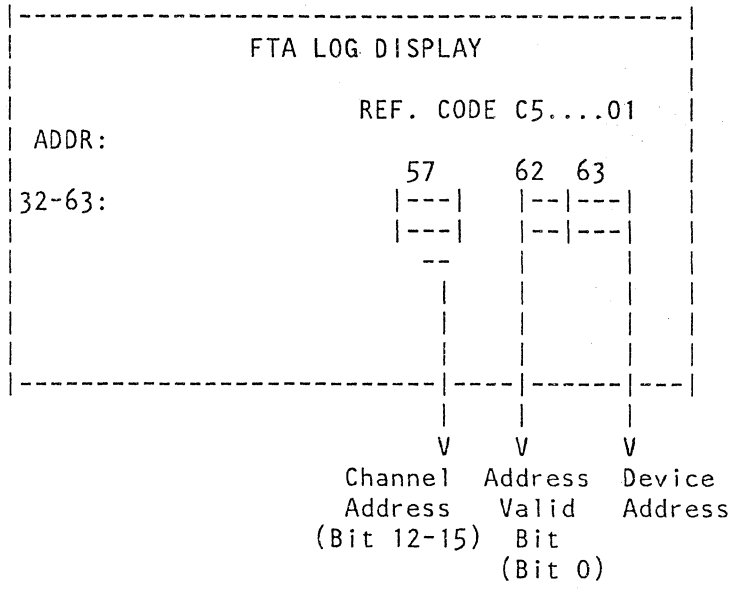
FTA reference codes can also be caused by I/O problems.

Look for an EREP of the I/Os connected to FTA2.

Is there a fault symptom index/code (FSI/FSC) recorded in the EREP?
Y N

6 6 6 6 4
C D E F G

007
Select FTA log.



Is the 'Address Valid Bit'
(byte 62, bit 0) on?
Y N

008
Run the CTLI 2 (wrap) test.

Attention:

Power down the controllers before the test run.

Any reference code?
Y N

009
Run inline tests for all devices attached to the FTA.

Any reference code?
Y N

5 5 5 5
H J K L

010

(Entry Point N)
****

If the problem cannot be found with aid of the inlines
(Either the inlines don't find an error or they don't run):
Replace FRUs as indicated by the REFCODE ANALYSIS.

Refer to the 'Card Where Used List' in Vol. 30, PA 013 for possible card swapping.

After the repair do the verification.
Go to Page 6, Step 020, Entry Point V.

011
Go to appropriate MAP.

012
Go To Map C280, Entry Point A.

013
Take the device address from the FTA log byte 63. Run the inline tests for the addressed device.

Any reference code?
Y N

014
Go to Step 010, Entry Point N.

015
Go to appropriate MAP.

016

(Entry Point BB)
****

Go to appropriate I/O documentation using the FSI/FSC.

After the repair

Go To Map 0001, Entry Point A.

017
Go To Map C502, Entry Point A.

018
Go To Map C280, Entry Point A.

019
Go to appropriate MAP, respectively use theREFCODE ANALYSIS.

020

(Entry Point V)
****

VERIFICATION:

After the repair run the test chaining.

Any reference code?
Y N

021
If possible run the application which caused the problem and watch the system.

Does the original error come up again?
Y N

022
Go To Map 0001, Entry Point A.

023
Invoke the REFCODE ANALYSIS.
Key in the reference code from the FTA 2 log.

The rightmost symptom of each sequence number log is used in creating the displayed reference code.

If the reference code fails to fix the problem, substitute the four characters in the middle of the reference code by the next symptom and return the REFCODE ANALYSIS with the so build new reference code.

Replace the FRU's that are now suspected by the REFCODE ANALYSIS.
Then run the test chaining.

Any reference codes?
Y N

024
If possible run the application which caused the error and watch the system.

Does the original error come up again?
Y N

025
Go To Map 0001, Entry Point A.

026

(Entry Point MM)
****

Check controller interface cables/connectors; check whether all cable connectors fit properly, included the flat cables from 01A-B2ZA /B2ZB/ B2ZC /B2ZD to tailgate 01D-C2(BD)/ C2(GJ)/ D2(BD)/ D2(GJ).

Look for broken loose or bent contact pins in the connectors.

Check I/O terminators for correct position and bent pins.

Check also for proper shielding of I/O cables.

Refer to Vol.16, Power Manual, EMC Checking.

Repair or replace, if needed.

Run FTA2 test.

Any error?
Y N

1
0
Q R

027

(Entry Point MA)
****

For further verification run and loop the CTLI 2 test and apply stress to the connectors by hitting them with your hand.

Any error?
Y N

028
If possible run the application which showed the error.

Does the error come up again?
Y N

029

(Entry Point Z)
****

Go To Map 0001, Entry Point A.

030
Same error symptom as before?
Y N

031
Go to Page 8, Step 040, Entry Point Y.

032
Now suspect the tag drivers and receivers of the FTA 2:
Replace FTA2 card 3:

01A-B2M2 if 4321 or 4331-1

01A-B2N2 if 4331-2 or 4331-11

Run FTA 2 test and CTLI 2 test.

(Step 032 continues)

(Step 032 continued)
Any error?
Y N

033

(Entry Point MB)
****

If possible run the application which showed the error.

Does the error come up again?
Y N

034
Go to Page 7, Step 029, Entry Point Z.

035
Same error symptom as before?
Y N

036
Go to Step 040, Entry Point Y.

037
Suspect now the tag driver and receiver cards in the control unit(s). If possible swap with the bus driver and receiver cards. If possible run the application which showed the error.

Does the error come up again?
Y N

038
Go to Page 7, Step 029, Entry Point Z.

039
Same error symptom as before?
Y N

1 0 T U V

U V 1730 MAP C500-8

040

(Entry Point Y)
****

Go To Map 0000, Entry Point A.

041
Replace now the FTA 2 card 2; 01A-B2L2 if 4321 or 4331-1

01A-B2M2 if 4331-2 or 4331-11

Run FTA 2 test.

Any error?
Y N

042
Go to Page 9, Step 046, Entry Point W.

043
Same error symptom as before?
Y N

044
The new card may also be defective. Correct it.

Run FTA 2 test.
Any error?
Y N

045
Second error may be in adapter.

Go To Map C580, Entry Point A.

1 0 9 W X

046

(Entry Point W)
****

If possible run the application which caused the error.

Does the error come up again?
Y N

047
Go to Page 7, Step 029, Entry Point Z.

048
Same error symptoms as before?
Y N

049
Go To Map 0000, Entry Point A.

050
Suspect now the terminator card; 01A-B2X2.

Run IC-bus test and FTA 2 test.

Any reference code?
Y N

051
Try again the application which caused the error.

Does the error come up again?
Y N

052
Go To Map 0001, Entry Point A.

053
Same error symptoms as before?
Y N

054
Go to Page 8, Step 040, Entry Point Y.

1
0
Y Z

Z

055

(Entry Point S)
****

For system 4321 or 4331-1
Exchange IC-bus cable 2
(IC-bus sense and control lines)
from 01A-B4(B) to 01A-B2YG.

For system 4331-2 or 4331-11:
Exchange IC-bus cable 10
(IC-bus sense and control lines)
from 01A-B1D4(D) to 01A-B2YF.

Run FTA 2 test.

Any reference code?
Y N

056
Go To Map 0001, Entry Point A.

057
Same symptoms as before?
Y N

058
New cable is also defective.
Correct it.

Go to Page 6, Step 020, Entry Point V.

059

(Entry Point T)
****

Suspect now the board B2. This you may replace in accordance with you support structure.
Write down all symptoms for possible later use.

Go To Map 0001, Entry Point O.

060
Go to appropriate MAP, respectively use the REFCODE ANALYSIS.

061
Go to Step 066, Entry Point AM.

062
Same symptoms as before?
Y N

063
The new card may also be defective. Correct it.

Go to Page 8, Step 033, Entry Point MB.

064
Go to Page 8, Step 033, Entry Point MB.

065
Go To Map C280, Entry Point A.

066

(Entry Point AM)
****

Disconnect interface cables.

Run FTA 2 test again to see whether the error is inside or outside the adapter.

Any error?
Y N

067
Go to Page 7, Step 027, Entry Point MA.

068
Go To Map C580, Entry Point A.

069
Go to Step 070, Entry Point K.

070

(Entry Point K)
****

Go to appropriate MAP, respectively use the REFCODE ANALYSIS.

CHANNEL CONTROL CHECK, FTA2

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
CXXX	A	1	001
C500	A	1	001
RFCA	A	1	001
0020	A	1	001

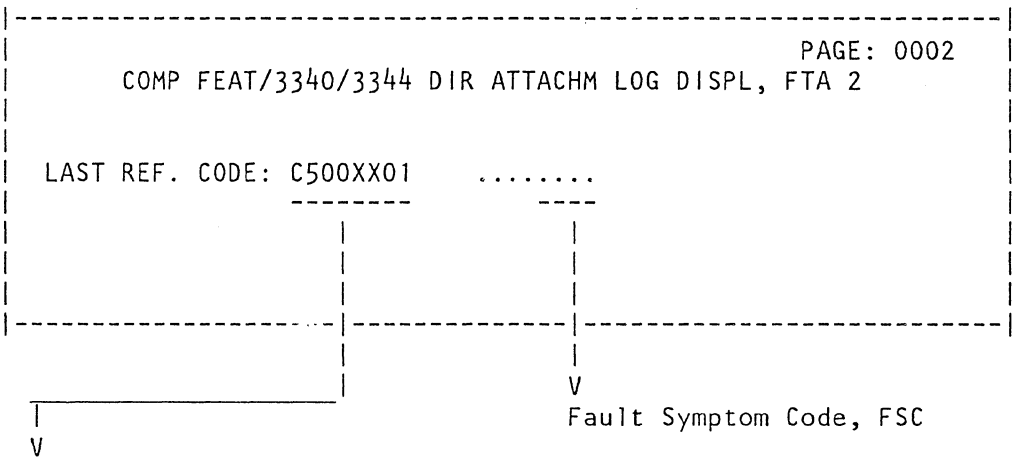
EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
8	022	C280	A
2	003	C500	A
8	023	C580	A
3	005	0001	A
3	006	0001	A
8	025	0001	A
8	021	0001	0

001

(Entry Point A)
****

231X/33XX compatibility feature and 3340/3344
direct attachment log display (example).



Reference code C500CF01?

FTA = File Tape Adapter

Y N

4 2
A B

002
Reference code C500DA01?
Y N

003
Go To Map C500, Entry Point A.

004
The log was generated by the 3340/3344 direct attachment.
The picture below is valid for reference code C500DA01 only.

See the additional message in line 23 on screen.

If this message is not on screen, try to get it by doing
CHANGE DISPLAY.

```
I/O ERR ADR: CUU C500DA01 XXXX   YYYY
             |   |       |      |
             |   |       |      |___fault symptom index, FSI
             |   |       |
             |   |       |__________logical cyl/track address
             |   |
             |   |__________________ref.code 3340/3344 direct
             |                      attachment
             |
             |_____________________________channel and device address
```

Recommended action :

The above Channel Control Check indicates a defect in either:
the 3348 data module or HDA
the 3340/3344 drive or
the controller.

Go to respective MAP or go directly to the 3340/3344 documentation
using the fault symptom index, FSI.
This can be extraced fromsense byte 22 and 23.

See log byte 38 and 39 or
message line 23 on screen in position 'YYYY'.

Any 3340/3344 problem detected?
Y N

005
Suspect:
01A-B2K2/L2/M2, if 4321 or 4331-1
01A-B2L2/M2/N2, if 4331-2 or 4331-11

After the repair

Go To Map 0001, Entry Point A.

006
Repair as told by the 3340/3344 documentation, then
Go To Map 0001, Entry Point A.

007
Ref. Code C500CF01

The log was generated by the 231X/33XX compatibility feature.

See the additional message in line 23 on screen.

If the message is not on screen, try to get it by doing
CHANGE DISPLAY

This reference code can also
be caused by a not initialized
disk pack.

Programs to be used:
1. INITEM Utility,
2. Standalone Utility 5747SA1.

```
I/O ERR ADR: CUU C500CF01 XXXX YY ZZ
             |       |       |   |  |
             |       |       |   |  |___ Flag byte
             |       |       |   |       1X = control info. error
             |       |       |   |       2X = device error
             |       |       |   |       4X = device error/FTA error
             |       |       |   |       X2 = format error
             |       |       |   |       X4 = FTA error
             |       |       |   |       X8 = Control information
             |       |       |   |            error.
             |       |       |   |
             |       |       |   |___ emulated device address
             |       |       |
             |       |       |___ emulated cyl/head address
             |       |
             |       |________ ref. code 231X/33XX comp. feature
             |
             |_________________ native device address
```

Is the message on screen?
Y N

008
Go to Page 6, Step 015, Entry Point B.

009
Write down the message.

Is there a '4X' shown in position 'ZZ' of the message?
Y N

010
Is there a '2X' or 'X4' shown in position 'ZZ' of the message?
Y N

011
Is there an 'X2' shown in position 'ZZ' of the message?
Y N

012
Go to Page 8, Step 021, Entry Point TZ.

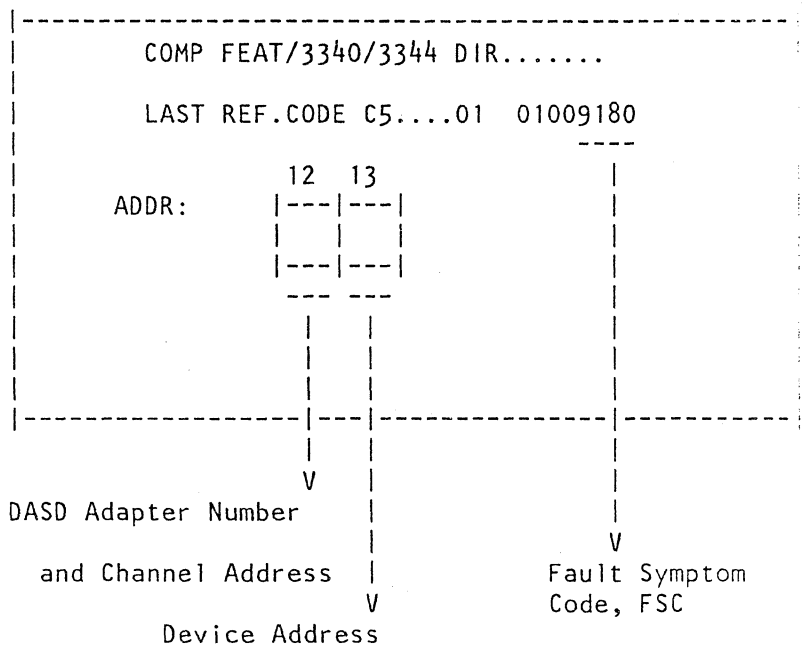
013
Contact the customer for repetition of formatting the disk pack.

014
Go to Page 6, Step 015, Entry Point B.

015

(Entry Point B)
****

Select the FTA log. Press ENTER to get the COMP FEAT/3340/3344 Direct Attachment Log DISPLAY.



Is the FSC shown in the log display?
Y N

016
Go to Page 7, Step 018, Entry Point MM.

017
Use the FSC and go to the documentation of the I/O. The address of the I/O you see in byte 12 and 13 of the log display.

Repair successful?
Y N

8 7
G H

018

(Entry Point MM)
****

Take device address and run the inline routines with this device.

Any error?
Y N

019

(Entry Point VZ)
****

Run FTA 2 test.

Any error?
Y N

020
Run CTLI (wrap) 2 test.

Attention:

Power down the controllers during the test run.

Start the test by putting the wrap plugs in the first controller after the processor, then in the most distant controller. By systematically putting the wrap plugs in the other controllers the area in which the fault lies is approached.

Any error?
Y N

8 8 8 8
J K L M

021

(Entry Point TZ)
****

Call for support.
As soon as the support structure gets involved, information concerning the following subjects should be made available:

1.Machine configuration.
2.EC REA statue and installed MCTF(s).
3.Attached I/O units and associated unit addresses.
4.Software environment (release numbers, if applicable).
5.Number of 3340/3344 buffers specified at IPL time, also the number of compatibility feature buffers specified at IPL time.
6.Recovery actions done so far (according to above scheme).
7.All existing log areas belonging to reference code C500XX01.
8.I/O units running concurrently at thea time the logs occurre
9.Frequency of logs with reference code C500XX01.

Go To Map 0001, Entry Point O.

022
Go To Map C280, Entry Point A.

023
Go To Map C580, Entry Point A.

024
Go to respective MAP.

025
Go To Map 0001, Entry Point A.

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
CXXX	A	1	001
C280	A	1	001
C500	A	1	001
C502	A	1	001
RFCA	A	1	001
0C00	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
1	003	0001	A

001
(Entry Point A)

FTA2 Test MAP.

Are you led to this MAP by the REFCODE ANALYSIS?
Y N

002
Select the IBM MAINTENANCE and SERVICE SELECTION PROGRAM.

Invoke the REFCODE ANALYSIS.

Key in the reference code from the FTA2 test.
Go to Stop 003, Entry Point P.

003
(Entry Point P)

Prerequisites:

Make sure that there isn't any wrap connector left in the system.

Do now the repair as told by the REFCODE ANALYSIS.

After the repair,
Go To Map 0001, Entry Point A.

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
CXXX	A	1	001
C602	A	1	001
RFCA	A	1	001
RFCA	B	3	003
RFCA	V	7	020
0C00	AA	2	002
0C00	MM	8	026
4902	MM	8	026

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
11	065	C380	A
5	012	C380	A
6	018	C380	A
6	017	C602	A
11	068	C680	A
10	045	C680	A
9	040	0000	A
10	049	0000	A
7	022	0001	A
8	025	0001	A
9	029	0001	A
10	052	0001	A
10	056	0001	A
6	016	0001	A
10	059	0001	0

001
(Entry Point A)

Make sure that you have followed the START MAP 0000 precisely.

Another reference code may be more important than the one you have got first.

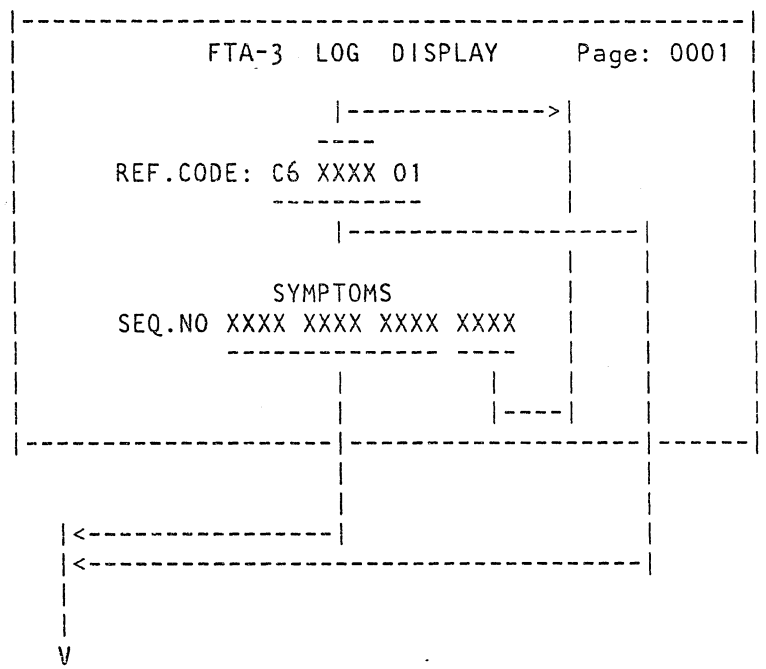
Are you led to this MAP by the REFCODE ANALYSIS?

Y N

3 2
A B

002
(Entry Point AA)

FTA 3 Log Display (Example)



Select the IBM MAINTENANCE and SERVICE SELECTION PROGRAM.

Invoke the REFCODE ANALYSIS.

Key in the reference code from the FTA 3 LOG.
Proceed as told by the REFCODE ANALYSIS.

003
(Entry Point B)

Run FTA 3 test.

Any ref. code?
Y N

004
Run CTLI 3 test.

Any ref. code?
Y N

005
Is the ref. code from the FTA 3 log C600XX01?
Y N

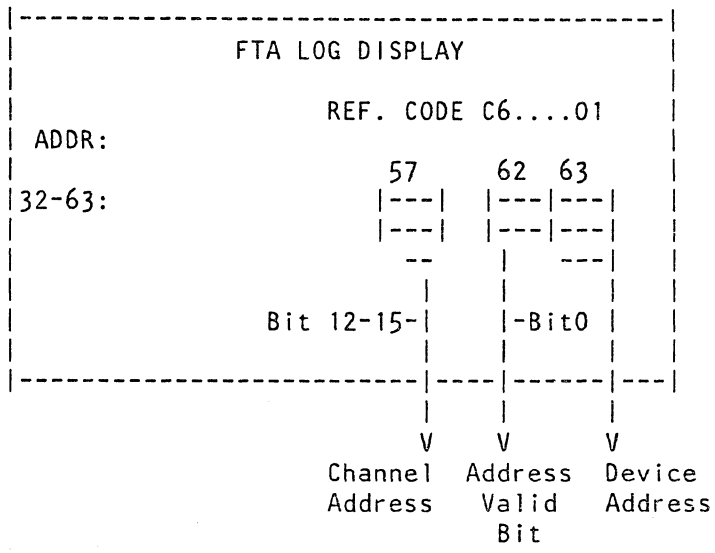
006
FTA reference codes can also be caused by I/O problems.

Look for an EREP of the I/Os connected to FTA3.

Is there a fault symptom index/code (FSI/FSC) recorded in EREP?
Y N

6 6 6 6 4
C D E F G

007
Select FTA log.



Is the 'Address Valid Bit' (byte 62, bit 0) on?
Y N

008
Run CTLI 3 (wrap) test.

Attention

Power down the control units before the test run.

Start the test by putting the wrap plugs in the first control unit after the processor, then in the most distant control unit. By systematically putting the wrap plugs in the other control units the area in which the fault lies is approached.

Any reference code?
Y N

5 5 5
H J K

009
Run inline tests for all devices attached to the FTA.

Any reference code?
Y N

010
(Entry Point N)

If the problem cannot be found with aid of the inlines
(Either the inlines don't find an error or they don't run):
Replace FRUs as indicated by the REFCODE ANALYSIS.

Refer to the 'Card Where Used List' in Vol.30, PA 013 for possible card swapping.

After the repair, do the verification.
Go to Page 7, Step 020, Entry Point V.

011
Go to appropriate MAP.

012
Go To Map C380, Entry Point A.

013
Take the device address from the FTA log byte 63.
Run the inline tests for the addressed device.

Any reference code?
Y N

014
Go to Step 010, Entry Point N.

015
Go to appropriate MAP.

016
(Entry Point BB)

Go to appropriate I/O documentation using the FSI/FSC

After the repair.
Go To Map 0001, Entry Point A.

017
Go To Map C602, Entry Point A.

018
Go To Map C380, Entry Point A.

019
Follow it.

020
(Entry Point V)

VERIFICATION:

After the repair run the test chaining.

Any reference code?
Y N

021
Run the application which caused the error and watch the system.

Does the original error come again?
Y N

022
Go To Map 0001, Entry Point A.

023
Invoke the REFCODE ANALYSIS.

Key in the reference code from the FTA 3 log.

The rightmost symptom of each sequence number log is used in creating the displayed reference code.

If the reference code fails to fix the problem, substitute the four characters in the middle of the reference code by the next symptom and return the REFCODE ANALYSIS with the so build new reference code.

Replace the FRU's that are now suspected by the REFCODE ANALYSIS.
Then run the test chaining.

Any reference codes?
Y N

024
Run the application which caused the error and watch the system.

Does the original error come up again?
Y N

1 1
1 1 8 8
L M N P

025
Go To Map 0001, Entry Point A.

026
(Entry Point MM)

Check director-controller interface cables/connectors; check whether all cable connectors fit properly, included the flat cables from 01A-B2ZE/ ZF/ ZG / ZH to tailgate 01D-E2 (BD)/ E2 (GJ)/ F2 (BD)/ F2 (GJ).

Look for broken loose or bent contact pins in the connectors.
Check I/O terminators for correct position and bent pins.

Check for proper shielding of I/O cables.

Refer to Vol.16, Power Manual, EMC Checking.

Repair or replace, if needed.

Run FTA3 test.

Any error?
Y N

027
(Entry Point MA)

For further verification run and loop the CTLI 3 test and apply stress to the connectors by hitting them with your hand.

Any error?
Y N

028
Run the application which showed the error.

Does the error come up again?
Y N

1 1
1 1 9 9
Q R S T

029
(Entry Point Z)

Go To Map 0001, Entry Point A.

030
Same error symptom as before?
Y N

031
Go to Step 040, Entry Point Y.

032
Now suspect the tag drivers and receivers of the FTA 3: Replace
FTA3 card 3; 01A-B2R2

(Entry Point X)

Run FTA 3 test and CTLI 3 test.

Any error?
Y N

033
(Entry Point MB)

Run the application which showed the error.

Does the error come up again?
Y N

034
Go to Step 029, Entry Point Z.

035
Same error symptom as before?
Y N

036
Go to Step 040, Entry Point Y.

037
Suspect now the tag driver and receiver cards in the control unit(s). If possible swap with the bus driver and receiver cards. Run the application which showed the error.

Does the error come up again?
Y N

038
Go to Step 029, Entry Point Z.

039
Same error symptom as before?
Y N

040
(Entry Point Y)

Go To Map 0000, Entry Point A.

041
Replace now the FTA 3 card 2; 01A-B2Q2.

Run FTA 3 test.

Any error?
Y N

042
Go to Page 10, Step 046, Entry Point W.

043
Same error symptom as before?
Y N

044
The new card may also be defective.
Correct it.

Run FTA 3 test. Sucessful?
Y N

045
Second error may be in adapter.

Go To Map C680, Entry Point A.

046
(Entry Point W)

Run the application which caused the error.

Does the error come up again?
Y N

047
Go to Page 9, Step 029, Entry Point Z.

048
Same error symptoms as before?
Y N

049
Go To Map 0000, Entry Point A.

050
Suspect now the terminator card; 01A-B2X2 (IC-Bus 0).

Run IC-bus test and FTA 3 test.

Any reference code?
Y N

051
Try again the application which caused the error.

Does the error come up again?
Y N

052
Go To Map 0001, Entry Point A.

053
Same error symptoms as before?
Y N

A A
Z A B

054
Go to Page 9, Step 040, Entry Point Y.

055
(Entry Point S)

Exchange IC-bus cable 9
(IC-bus sense and control lines)
from 01A-B1D4 (C) to 01A-B2YG

Run FTA 3 test.

Any reference code?
Y N

056
Go To Map 0001, Entry Point A.

057
Same symptoms as before?
Y N

058
New cable is also defective.
Correct it.
Go to Page 7, Step 020, Entry Point V.

059
(Entry Point T)

Suspect now the board B2. This you may replace in accordance with your support structure. Write down all error symptoms for possible later use.
Go To Map 0001, Entry Point O.

060
Go to appropriate MAP, respectively use the REFCODE ANALYSIS.

061
Go to Page 11, Step 066, Entry Point AM.

062
Same symptoms as before?
Y N

063
The new card may also be defective. Correct it.
Go to Page 9, Step 033, Entry Point MB.

064
Go to Page 9, Step 033, Entry Point MB.

065
Go To Map C380, Entry Point A.

066
(Entry Point AM)

Disconnect interface cables.

Run FTA 3 test again to see whether the error is inside or outside the adapter.

Any error?
Y N

067
Go to Page 8, Step 027, Entry Point MA.

068
Go To Map C680, Entry Point A.

069
Go to Step 070, Entry Point K.

070
(Entry Point K)

Go to the appropriate MAP, respective use the REFCODE ANALYSIS.

Channel Control Check

ENTRY POINTS

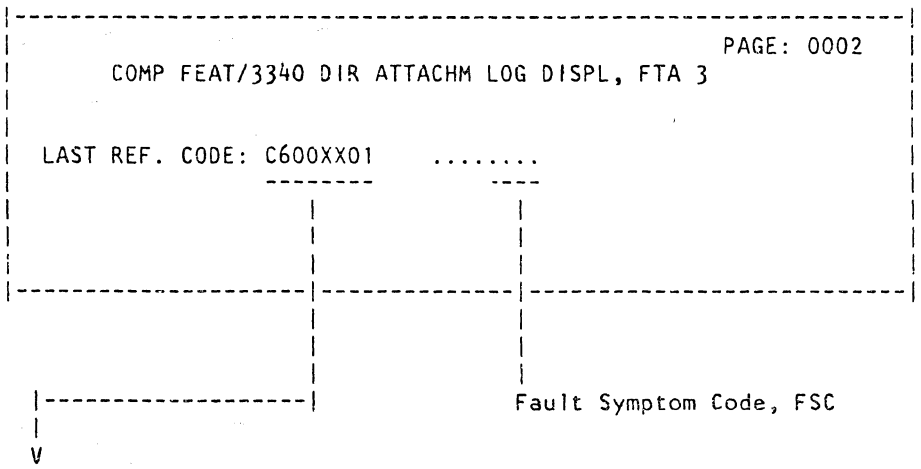
FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
CXXX	A	1	001
C600	A	1	001
RFCA	A	1	001
0020	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
8	022	C380	A
2	003	C600	A
8	023	C680	A
3	005	0001	A
3	006	0001	A
8	025	0001	A
8	021	0001	0

001
(Entry Point A)

231X/33XX compatibility feature and
3340/3344 direct attachment log display
(example)



Reference code C600CF017

FTA = File Tape Adapter

Y N

4 2
A B

Channel Contr. Check

002
Reference code C600DA01?
Y N

003
Go To Map C600, Entry Point A.

004
The log was generated by the 3340/3344 direct attachment
(The picture below is valid for reference code C600DA01 only).

See the additional message in line 23 on screen.

If the message is not on screen, try to get it by doing CHANGE DISPLAY.

```
I/O ERR ADR: CUU C600DA01 XXXX   YYYY
             |   |    |    |
             |   |    |    |_fault symptom index, FSI
             |   |    |
             |   |    |_____logical cylinder/track address
             |   |
             |   |__________ref.code 3340/3344 direct
             |              attachment
             |
             |______________channel and device address
```

Recommended action :

The above Channel Control Check indicates a defect in either:
the 3348 data module or HDA
the 3340/3344 drive or
the controller.

Go to respective MAP or go directly to the 3340/3344 documentation using the fault symptom index, FSI.

This can be extraced from sense byte22 and 23.

See log byte 38 and 39 or
message line 23 on screen in position 'YYYY'.
Any 3340/3344 problem detected?
Y N

005
Suspect:
01A-B2P2/Q2/R2.

After the repair
Go To Map 0001, Entry Point A.

008
Repair as told by the 3340/3344 documentation, then
Go To Map 0001, Entry Point A.

C07
Ref. Code C600CF01.

The log was generated by the 231X/33XX compatibility feature.
See the additional message in line 23 on screen.

If this message is not on screen, try to get it by doing CHANGE DISPLAY.

This ref. code can also come up by a not initialized disk pack.

Programs to be used:
1. INITEM Utility,
2. Standalone Utility 5747SA1.

```
I/O ERR ADR: CUU C600CF01 XXXX YY ZZ
             |       |       |    |  |
             |       |       |    |  |___ Flag byte
             |       |       |    |       1X = control info. error
             |       |       |    |       2X = device error
             |       |       |    |       4X = device error/FTA error
             |       |       |    |       X2 = format error
             |       |       |    |       X4 = FTA error
             |       |       |    |       X8 = control info. error
             |       |       |    |
             |       |       |    |___ emulated device address
             |       |       |
             |       |       |___ emulated cyl/head address
             |       |
             |       |________ ref. code 231X/33XX comp. feature
             |
             |________________ native device address
```

Is the message on screen?
Y N

008
Go to Page 6, Step 015, Entry Point W.

009
Write down the message.

Is there a '4X' shown in position 'ZZ' of the message?
Y N

010
Is there a '2X' or 'X4' shown in position 'ZZ' of the message?
Y N

011
Is there a 'X2' shown in position 'ZZ' of the message?
Y N

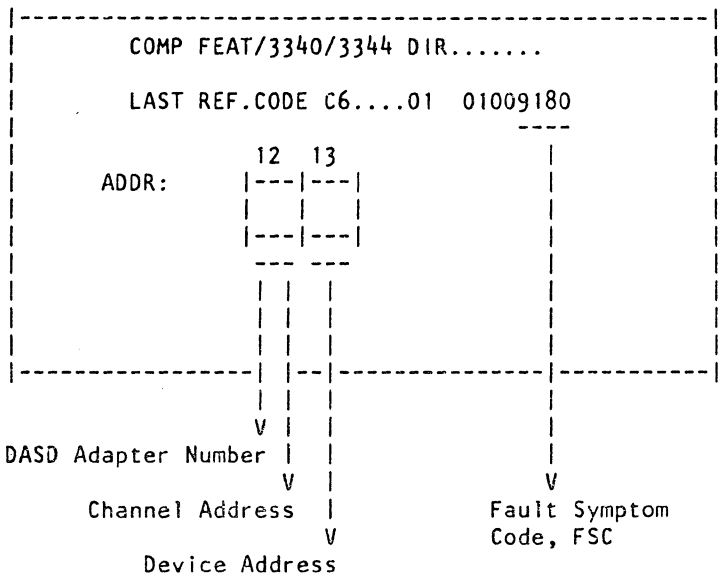
012
Go to Page 7. Step 021, Entry Point TZ.

013
Contact the customer for repetition of formatting the disk pack.

014
Go to Page 6, Step 015, Entry Point W.

015
(Entry Point W)

Select the FTA log. Press ENTER to get the COMP FEAT/3340/3344 Direct Attachment Log DISPLAY.



Is the FSC shown in the log display?
Y N

016
Go to Page 7, Step 018, Entry Point WW.

017
Use the FSC and go to the documentation of the I/O. The address of the I/O you see in byte 12 and 13 of the log display.

Repair successful?
Y N

018
(Entry Point WW)

Take device address and run the inline routines with this device.

Any error?
Y N

019
(Entry Point VZ)

Run FTA 3 test.

Any error?
Y N

020
Run CTLI (wrap) 3 test.

Attention:

Power down the control units during the test run.

Start the test by putting the wrap plugs in the first control unit after the processor, then in the most distant control unit.
By systematically putting the wrap plugs in the other control units the area in which the fault lies is approached.

Any error?
Y N

021
(Entry Point TZ)

Call for support.
As soon as the support structure gets involved, information concerning the following subjects should be made available:

1.Machine configuration.
2.EC REA status and installed MCTF(s).
3.Attached I/O units and associated unit addresses.
4.Software environment (release numbers, if applicable).
5.Number of 3340/3344 FTA buffers specified at IPL time, also numbers of compatibility feature buffers specified at IPL time.
(Step 021 continues)

(Step 021 continued)

6.Recovery actions done so far (according to above scheme).
7.All existing log areas belonging to reference code C600XX01.
8.I/O units running concurrently at the time the logs occurred
9.Frequency of logs with reference code C600XX01.

Go To Map 0001, Entry Point O.

022
Go To Map C380, Entry Point A.

023
Go To Map C680, Entry Point A.

024
Go to respective MAP.

025
Go To Map 0001, Entry Point A.

FTA 3 Test MAP

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
CXXX	A	1	001
C380	A	1	001
C600	A	1	001
C602	A	1	001
RFCA	A	1	001
0C00	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
1	003	0001	A

001
(Entry Point A)

Are you led to this MAP by the REFCODE ANALYSIS?
Y N

002
Select the IBM MAINTENANCE AND SERVICE SELECTION PROGRAM.

Invoke the REFCODE ANALYSIS.

Key in the reference code from the FTA3 test.
Go to Step 003, Entry Point P.

003
(Entry Point P)

PREREQUISITES:

Make sure that there isn't any wrap connector left in the system.
Do now the repair as told
---
by the REFCODE ANALYSIS.

After the repair
Go To Map 0001, Entry Point A.

Ref.Code directory

PAGE 1 OF 1

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0C00	A	1	001
0020	A	1	001
0060	A	1	001

001
(Entry Point A)

REFERENCE CODE DIRECTORY

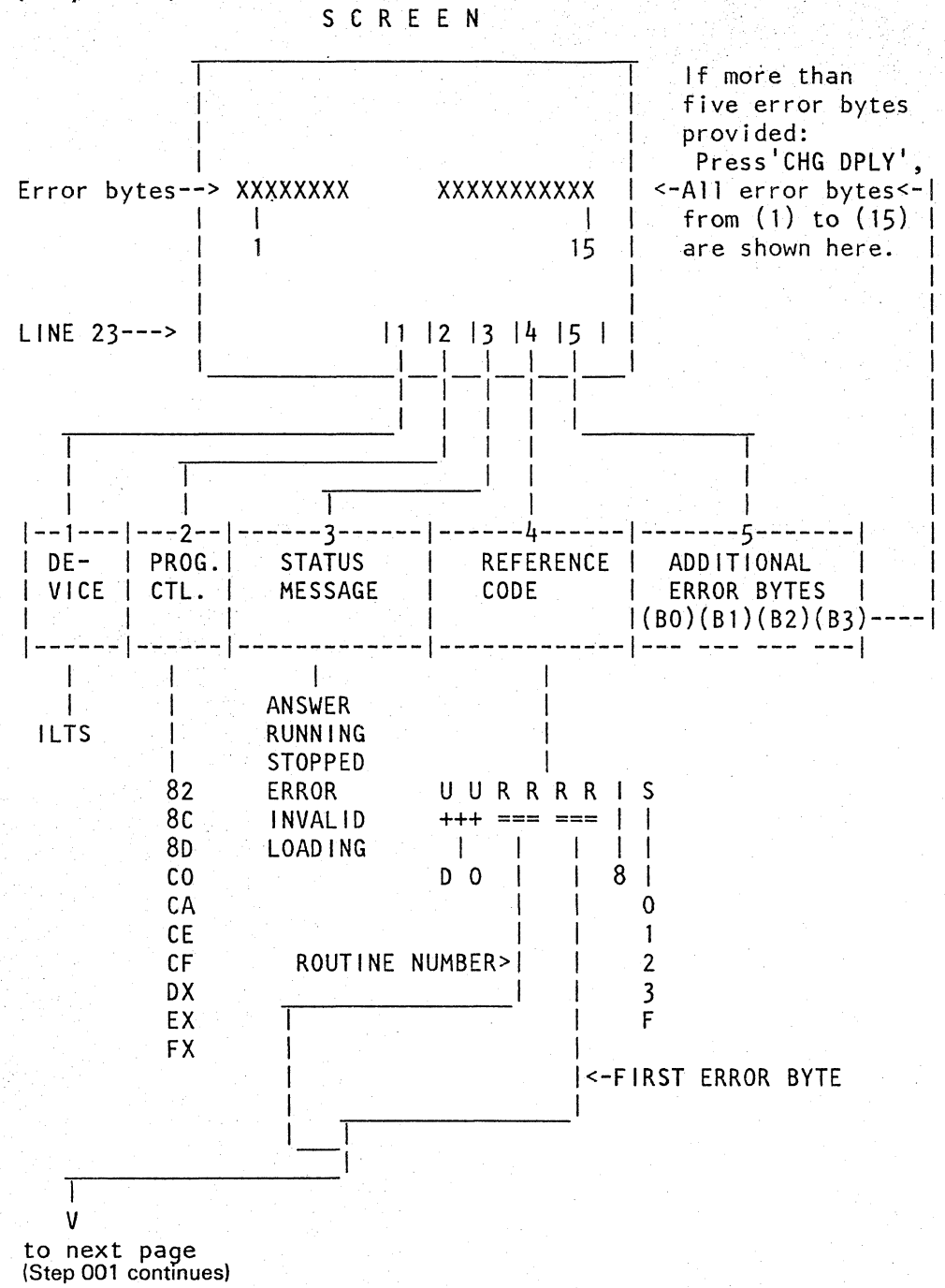
Reference Code	Title	Goto MAP
D0XXXX81*	Disk/Tape ILT Monitor	D080
D8XXXX81*	Link to 8809 MAPs	D870
DAXXXX81*	Link to 3340 MAPs	DA70
DBXXXX81*	Link to 3344 MAPs	DB70
DDXXXX81*	Link to 3310 MAPs	DD70
DEXXXX81*	Link to 3370 MAPs	DE70

DISK/TAPE ILTS MONITOR

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
DXXX	A	2	001

001
(Entry Point A)



to next page
(Step 001 continues)

(Step 001 continued)
HOW TO USE THE FOLLOWING TABLES:
==========

Find the reference code in column 1 of the following tables.
Read the information and perform the recommended action in column 2
or follow the reference given in colunm 3.

Column 1	Column 2	Column 3
Reference Code	Reason and Recommended Action	Go to
D00X0081	Try to rerun the inline tests of the attached controllers units and I/Os If this does not help go to EXIT MAP---------->	See Vol.13, STM, Section: 4 Inline Tests Handling 0001 ENTRY POINT 0
D01X0081	Handling Error! Recommended Action: Repeat your key board or CE panel entry! Read the ILT handling description. Error Description: X = 0: Invalid I/O address (general test of address validity) X = 1: Invalid I/O address if CE-Mode (3310, 8809) or invalid channel address if activate CE alert (334X, NFP) X = 2: Invalid I/O address in case of set forced error logging mode X = 3: Invalid I/O address in case of reset forced error logging mode	

(Step 001 continues)

(Step 001 continued)

Column 1	Column 2	Column 3
Reference Code	Reason and Recommended Action	Go to
D01X0081 cont'd	X = 4: Device busy or contingent connection (in case of set CE-Mode) X = 5: Not used X = 6: Not used X = 7: Not used X = 8: Invalid run or control option entered X = 9: Invalid routine IC entered	
D02X0081 D03X0081 D04X0081 D05X0081 D06X0081	Try to rerun the inline tests of the attached controllers units and I/Os If this does not help go to EXIT MAP---------->	See Vol.13, STM, Section 4: Inline Tests Handling 0001 ENTRY POINT 0

(Step 001 continues)

(Step 001 continued)

Column 1	Column 2	Column 3
Reference Code	Reason and Recommended Action	Go to
D0700081	FTA timeout 25 SEC! The FTA has been requested for ILT but it has not been serviced within 25 seconds. * Reasons for timeout (consider priority): 1.The functional microcode handels a retryable data check on tape and keeps busy. Wait until the job is finished and start ILTs again. 2.A selector mode operation takes place. (Command chaining or read/ write records.) Wait until the job is finished and restart the ILT operation manually. 3.The FTA hardware is out of order Run respective FTA test. 4.A program error occured. Go to EXIT MAP---------->	0001 ENTRY POINT 0

(Step 001 continues)

(Step 001 continued)

Column 1	Column 2	Column 3
Reference Code	Reason and Recommended Action	Go to
D0710081	1. Ignore the problem for the time being and try to restart the inline tests. For test handling see Vol.13, STM, Section 4: Disk/Tape Inline Test Handling. If the problem repeats, continue with step 2. 2. Suspect an FTA hardware error. Run the respective FTA test. If the FTA test doesn't find an error, continue with step 3. 3. Replace the three cards of the failing FTA. Do the replacement step by step in the following sequence: - FTA card 2 - FTA card 3 - FTA card 1 For card locations see Vol.13, STM, Section 1: Card Locations. Run the tests again. If the problem still exists, continue with step 4. 4. Suspect a control program error. Go to EXIT MAP --------> Any good FRU that was removed should be returned to the machine.	0001, ENTRY POINT 0.

(Step 001 continues)

(Step 001 continued)

Column 1	Column 2	Column 3
Reference Code	Reason and Recommended Action	Go to
D0720081	'Tag Valid' from 3370 is missing You need the MD for trouble shooting in the 3370. To decide if it is an intermittent hardware error or not, run inline test routine B3 (for 3340/44 only) to fetch and analyse the sense bytes or to get a symptom code. In case of hardware malfunctions either a 'Bus Out Parity Check' or 'Tag Bus Parity Check' may be indicated. If a control information error is suspected. Go to EXIT MAP-------->	0001, ENTRY POINT 0
D0780081	Handling error. As long as the maintenance device, MD is running, it is not possible to handle inline tests from the console. Remove the signal cable to the MD If the error comes again the 'CE Alert' signal is erroneously on. In this case you need the MD for trouble shooting in the 3370.	

(Step 001 continues)

(Step 001 continued)

Column 1	Column 2	Column 3
Reference Code	Reason and Recommended Action	Go to
D07C0081	Long busy timeout (during 3370 string switch support). 1) Possible reasons for timeout (consider priority) 1.1.The opposite system seized the 3370 string because the machine configurator of the opposite system does not include string switch feature. 1.2.3370 string switch hardware left in busy condition. 2) Recommended actions: 2.1.If the timeout occured during ILT invokement phase, perform system reset to clear the inline mode. 2.2.If the timeout occured during ILT execution phase, terminate ILT's using option 30. 2.3.Change the machine configurator at the opposite system to allow 3370 string switch operation. 2.4.Power down - Power up the 3370 string in use. 2.5.Select the 3370 ILT's at the console for re-invokement. If this does not help go to EXIT MAP.---------->	0001 ENTRY POINT 0

(Step 001 continues)

(Step 001 continued)

Column 1	Column 2	Column 3
Reference Code	Reason and Recommended Action	Go to
D07X0081	Try to rerun the inline tests of the attached controllers and I/Os. If this does not help go to EXIT MAP ----->	See Vol.13, STM, Section 4: Inline Test Handling 0001 ENTRY POINT 0

(Step 001 continues)

(Step 001 continued)

Column 1	Column 2	Column 3
Reference Code	Reason and Recommended Action	Go to
D08X0081	Program Error or Hardware Error! Recommended Action: Run respective FTA test if recommended below or proceed directly with the EXIT MAP---------->	0001 ENTRY POINT 0
	In any case try to rerun the inline tests for the attached controllers and I/Os! Error Description: X = 0: Undefined load return parameter of control information X = 1: Hardware check during FTA load of control information Run respective FTA test. X = 2: FTA did not stop for load of control information Run respective FTA test. X = 3: Timeout during load of control information Run respective FTA test X = 4: Mismatch of control information ID X = 5: Control information dedected error Run respective FTA test. X = 6: Protection check during loading X = 7: Control information address erroneously zero	

(Step 001 continues)

(Step 001 continued)

Column 1	Column 2	Column 3
Reference Code	Reason and Recommended Action	Go to
D0930081	No bit significant controller address on CTLI 'Bus In' after 'Poll Controller' operation. Any line of the CTLI 'Bus In' cable is open. Run CTLI test. Important: The controllers must be switched off. Start the test in putting the wrap plugs in the first controller after the processor, then put them in the most distant controller, e.t.c. If the CTLI test runs error free, suspect the 'Bus In' driver card of any controller.	
D0960081	Any line of the CTLI 'Bus In' is erroneously active. Run CTLI test. Important: The controllers be switched off. Start the test in putting the wrap plugs in the first controller after the processor, then put them in the most distant controller, e.t.c. If the CTLI test runs error free, suspect the 'Bus In' driver card of any controller.	

(Step 001 continues)

(Step 001 continued)

Column 1	Column 2	Column 3
Reference Code	Reason and Recommended Action	Go to
D09X0081	Malfunction of disk or tape drive/controller connected to FTA via CTLI or FTA Hardware error or ILT Control information error! Control Information Recommended Action: Run respective FTA test. Run respective CTLI Director-controller Interface Test Try also to rerun the inline tests of the attached controller and I/Os. If all this does not help go to EXIT MAP---------->	See Vol.13, STM, Section 4: Inline Test Handling 0001 ENTRY POINT 0
D0AX0081 D0BX0081	Try to rerun the inline tests of the attached controllers and I/Os. If this does not help go to EXIT MAP---------->	See Vol.13, STM, Section 4: Inline Test Handling 0001 ENTRY POINT 0

(Step 001 continues)

(Step 001 continued)

D0XXXX80 Reference codes issued in case of invalid CE entry:

a)Format of inline status displ on CE panel (3340) and MD (3370):

```
CO  XX ..... high displ + low displ
      ||
  ||<<<<<<<<<<<<||
  ||
  ||
  ||     b)Format of reference code in line 23 on screen:
  ||       DX........ Groupcode of disk/ tape inline tests
  ||       D0........ Groupcode of disk/ tape inline monitor
  ||
  ||     D0XX0080
  ||       ||
  ||<<<<<<<||
  ||
  XX       PU inline monitor detected handling errors:
```

Suspected.....: Disk/tape inline monitor detected error
..... handling error

Recommended action: Repeat your keyboard or CE-panel entry.
Read the ILT handling description.

Error description : XX = 10: Invalid I/O address
(General test of address validity)

XX = 11: Invalid I/O address if set CE-mode (3310, 8809) or invalid channel address if activ.
CE alert (334X, 3370)

XX = 12: Invalid I/O address in case of set forced error logging mode (N/A for 3340 and 3344)

(Step 001 continues)

(Step 001 continued)

XX = 13: Invalid I/O address in case of reset forced error logging mode (N/A for 3340 and 3344)

XX = 14: Device busy or contingent connection (In case of set CE-mode)

XX = 15: Not used

XX = 16: Not used

XX = 17: Not used

XX = 18: Invalid run or control option entered

XX = 40..FF: Invalid routine ID
Value is equal to CE-entry
(Wrong RTN ID.)

XX = C0: Run routine EF first, before you start the MD.
Otherwise no system - MD communication possible
(MD will time out).
System will display:
'3370 C0 INVALID D0C0XXXX'
on line 23. To recover:
Press the PF-key on the maintenance device keyboard. Enter and run routine 'EF from the system console
again.

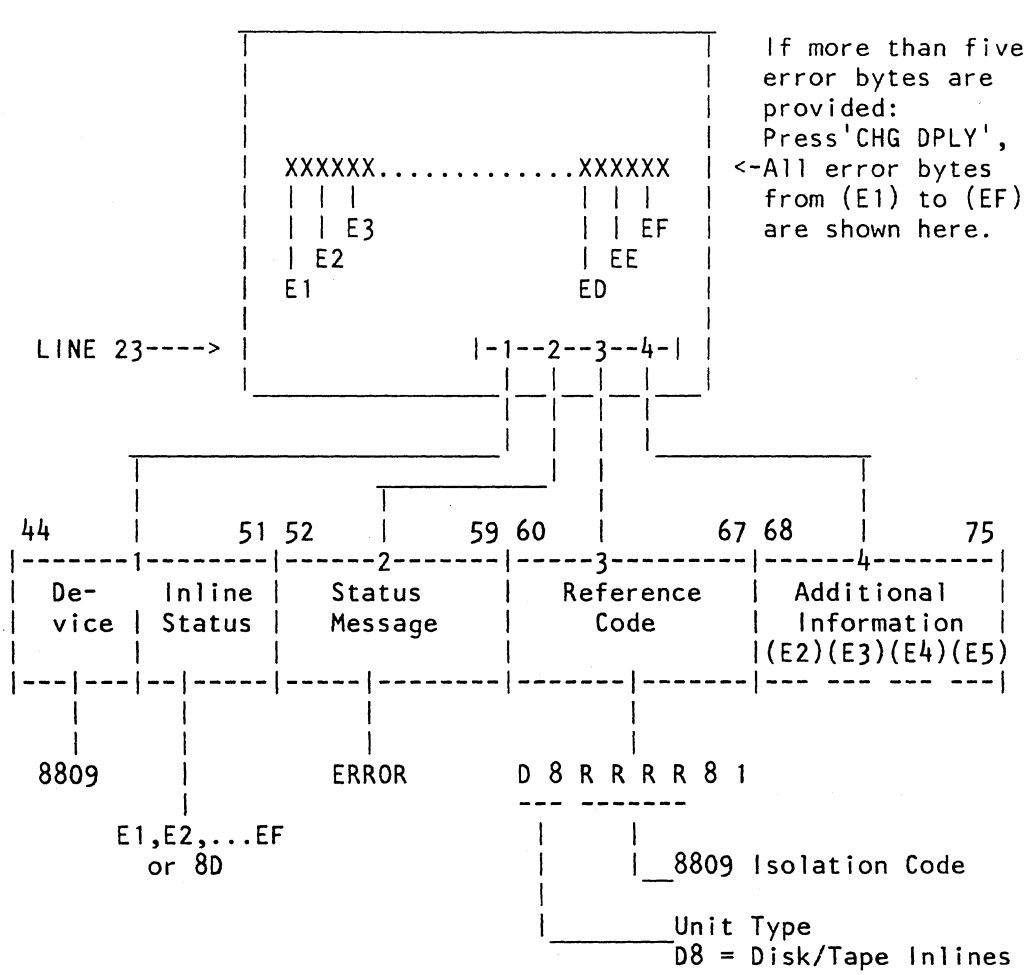
ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
DXXX	A	2	001

001

(Entry Point A)
****

Link to the 8809 MAPs



Write down the 8809 Isolation Code
(see RRRR-field of the reference code)
and go to the
8809 Start Map 0001, Entry Point A.

3340 CONTROL+DRIVES

ENTRY POINTS

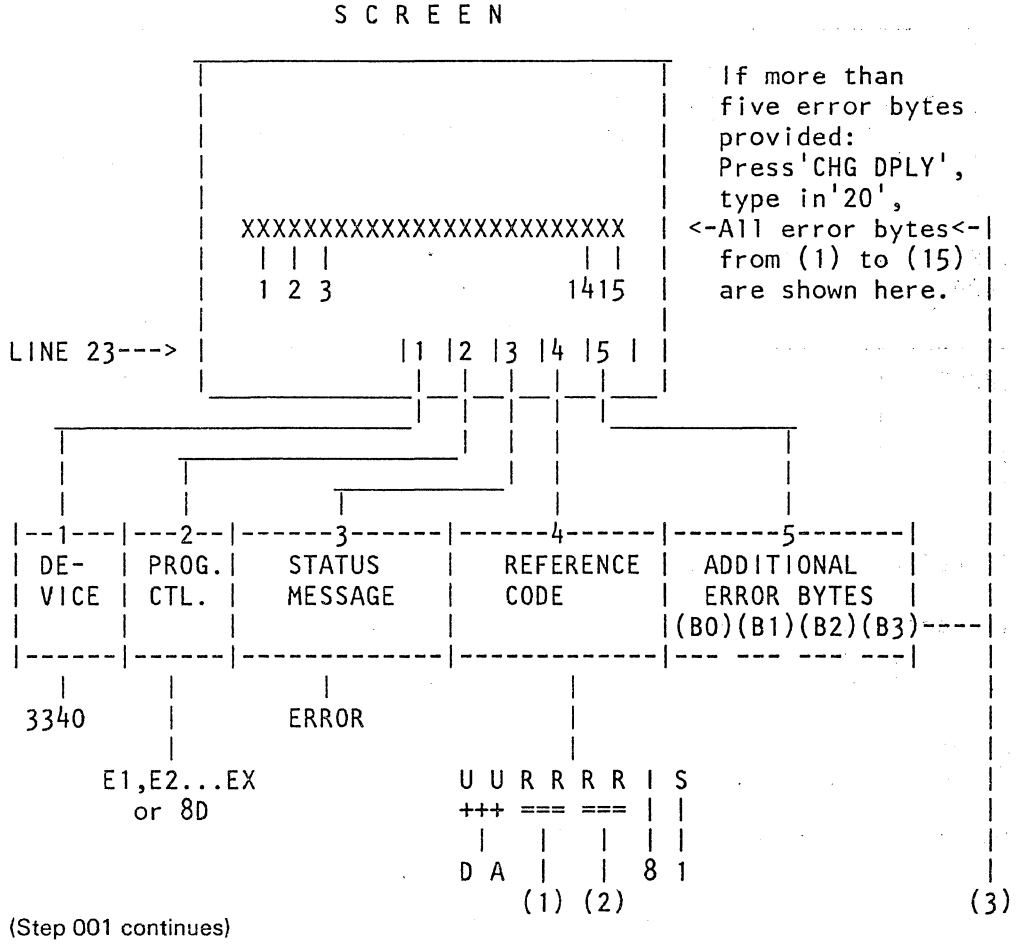
FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
DXXX	A	1	001
RFCA	V	3	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	002	0001	A

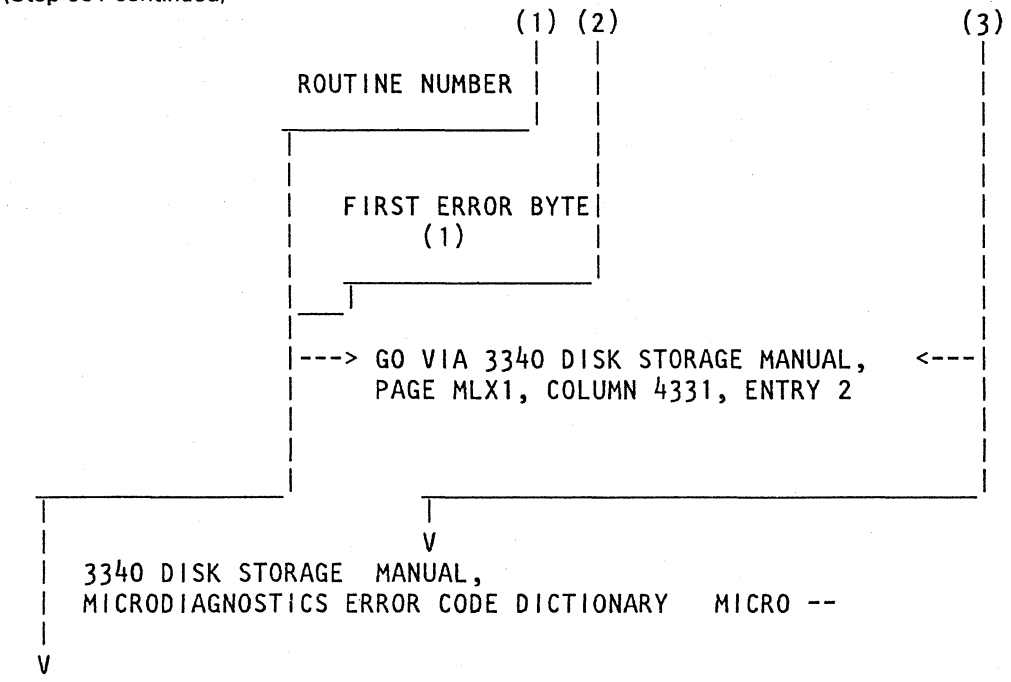
001
(Entry Point A)

Link to 3340 MAPs



(Step 001 continues)

(Step 001 continued)



ERROR CODE	ERROR DESCRIPTION	CE PANEL LAMP DISPLAY		MAINTENANCE ANALYSIS PROCEDURE
		BYTE	DESCRIPTION	
RRRR		2		References to the 3340 MAP Charts
		3		
		4		
		5		

If reference code DA000081 go to EXIT MAP 0001, ENTRY POINT Y.

If reference code DAFFFF81 go to CTLR I- 271, ENTRY B,
if not successfull, go to CTLR I- 270, ENTRY E,
if not successfull, go to DATA-110, ENTRY POINT A.

Note:
The cause may be a timeout waiting for TAG VALID during execution of any CTLR/DEV command, which was previously tested for proper function, or an unexpected SYNC IN CHECK.
To decide if it is an intermittent hardware error, run routine "B3" to fetch and analyse the sense bytes or to get a symptom code
In case of hardware malfunctions either a BUS-OUT parity check

(Step 001 continues)

(Step 001 continued)
or TAG-BUS parity check has been indicated.
If so, do the action according to the 3340 MLM.

(Entry Point V)
****

IMPORTANT:

Run the FTA test and CTLI test.

Any reference code?
Y N

002
Proceed with the I/O documentation.

After the repair.

Go To Map 0001, Entry Point A.

003
Go to appropriate MAP.

ENTRY POINTS

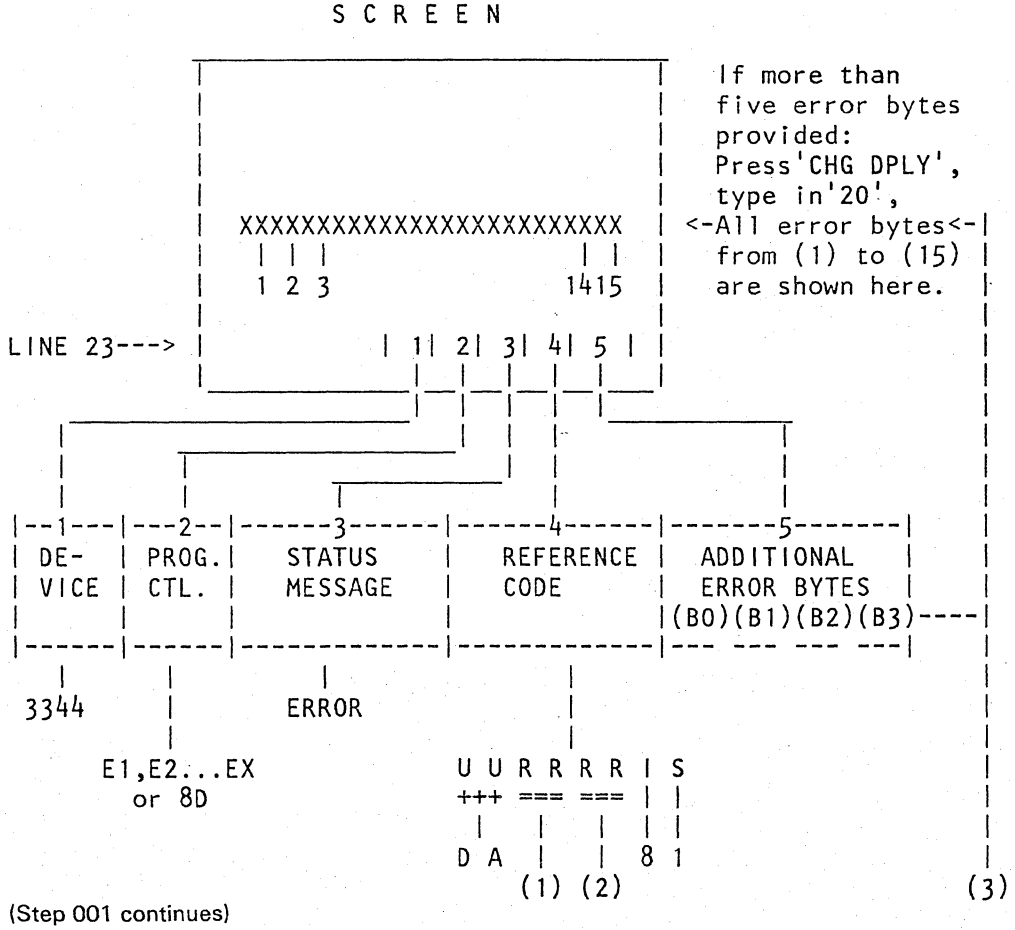
FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
DXXX	A	1	001
RFCA	V	3	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	002	0001	A

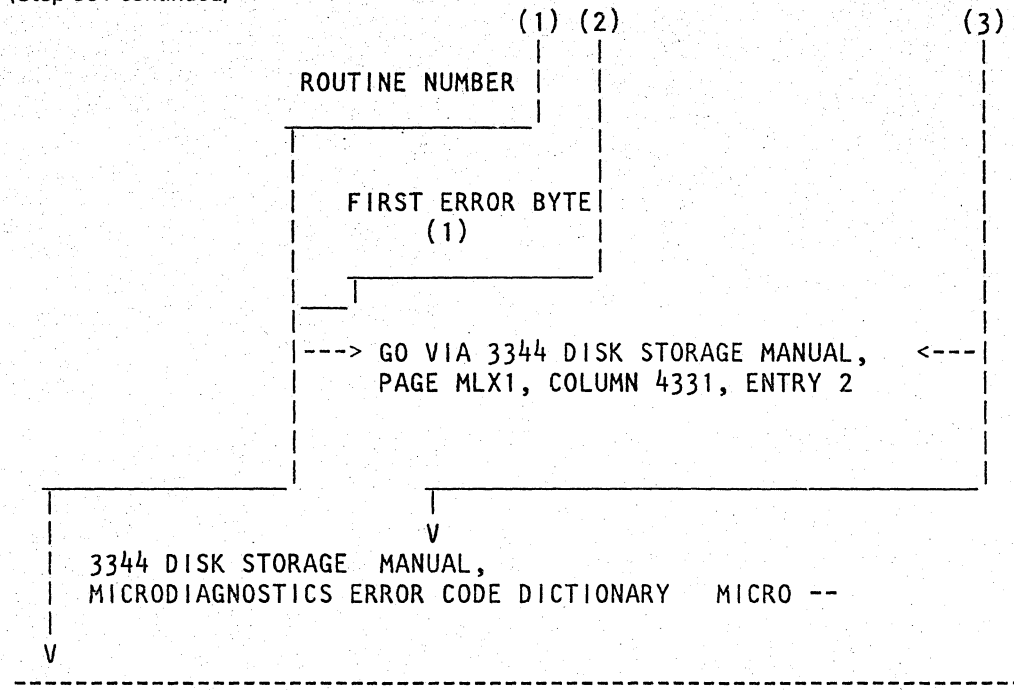
001
(Entry Point A)

Link to 3344 MAPs



(Step 001 continues)

(Step 001 continued)



ERROR CODE	ERROR DESCRIPTION	CE PANEL LAMP DISPLAY		MAINTENANCE ANALYSIS PROCEDURE
		BYTE	DESCRIPTION	
RRRR		2		References to the 3340 MAP Charts
		3		
		4		
		5		

If reference code DB000081 go to EXIT MAP 0001, ENTRY POINT Y.

If reference code DBFFFF81 go to CTLR I- 271, ENTRY B, if not successfull, go to CTRL I- 270, ENTRY E, if not successfull, go to DATA-110, ENTRY A.

Note:
The cause may be a timeout waiting for TAG VALID during execution of any CTLR/DEV command, which was previously tested for proper function, orn an unexpected SYNC in CHECK.
To decide if it is an intermittent headware error, run routine "B3" to fetch and analyse the sense bytes or to get a symptom code.

(Step 001 continues)

(Step 001 continued)
In case of hardware malfunctions either an BUS-OUT parity check or TAG-BUS parity check has been indicated.
If so, do the action according to the 3340 MLM.

(Entry Point V)
****

IMPORTANT:

Run the FTA test and CTLI test.

Any reference code?
Y N

002
Proceed with the I/O documentation.

After the repair.
Go To Map 0001, Entry Point A.

003
Go to appropriate MAP.

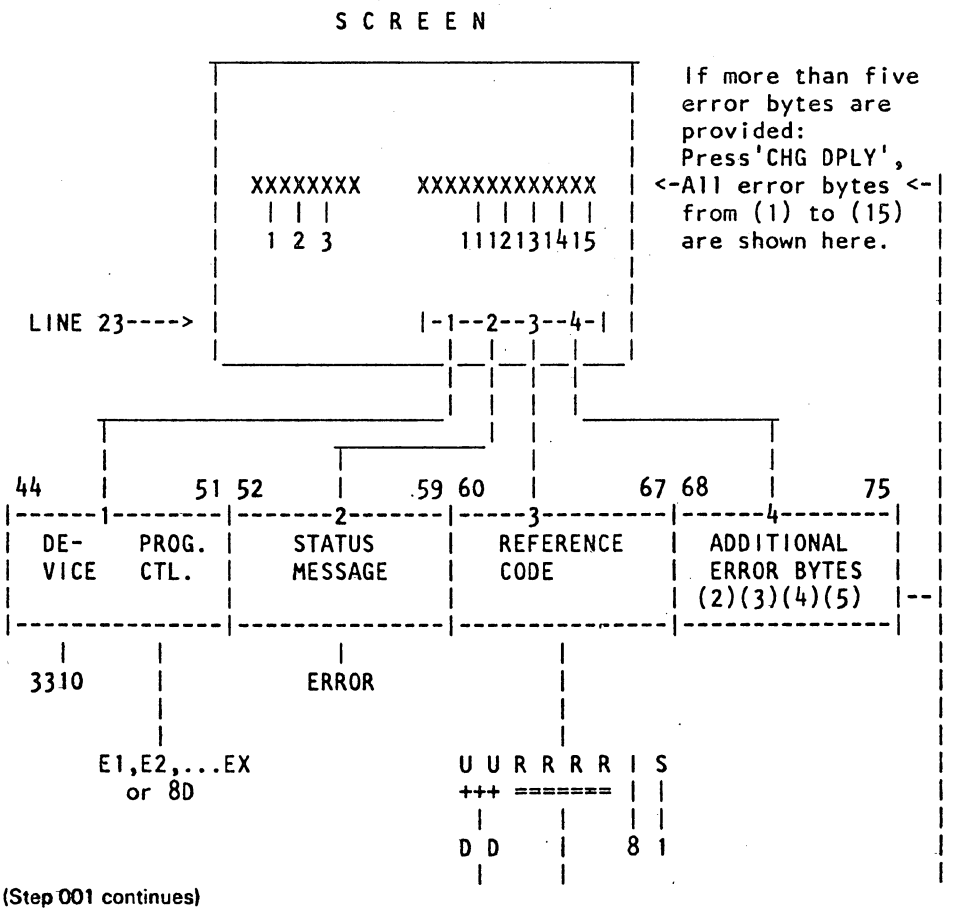
ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
DXXX	A	1	001
RFCA	V	2	001

EXIT POINTS

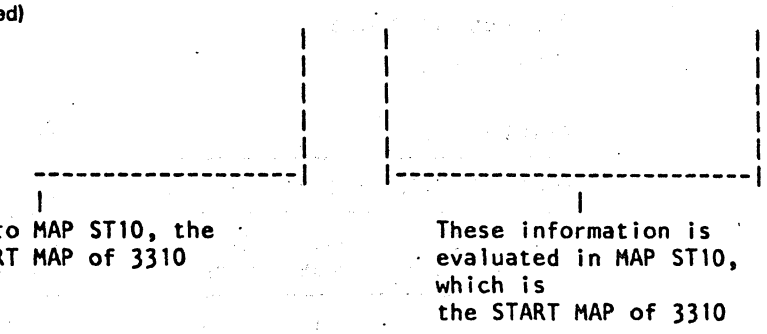
EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	002	0001	A

001
(Entry Point A)



(Step 001 continues)

(Step 001 continued)



(Entry Point V)

IMPORTANT:

Run the FTA test and CTLI test.

Any reference code?
Y N

002
Proceed with the I/O documentation.

After the repair,
Go To Map 0001, Entry Point A.

003
Go to appropriate MAP.

ENTRY POINTS

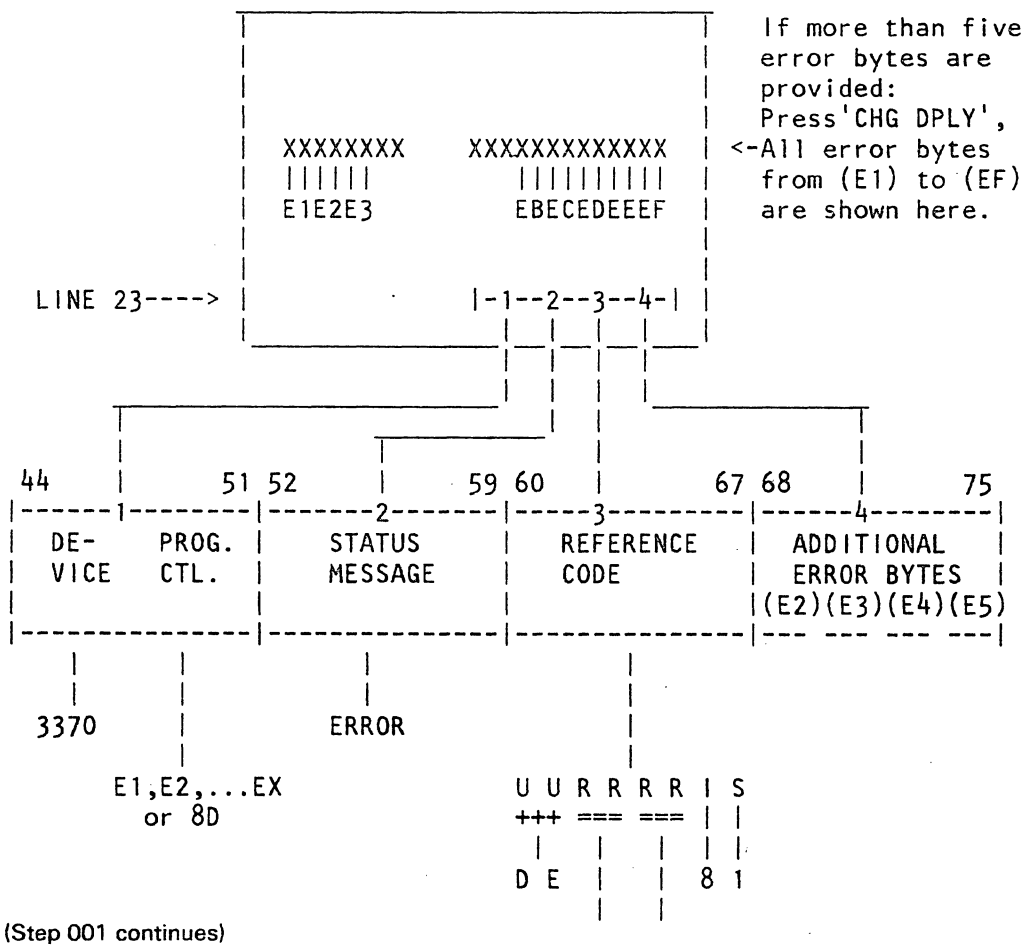
FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
DXXX	A	1	001
RFCA	V	3	002

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	003	0001	A

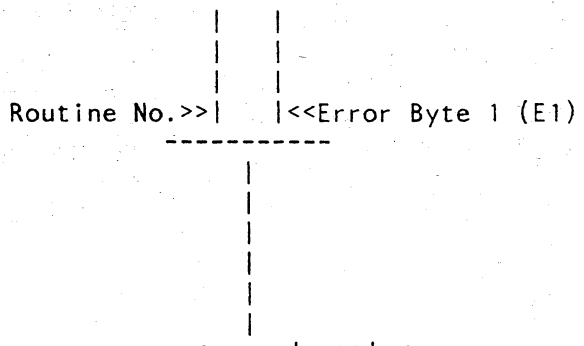
001
(Entry Point A)
Link to the 3370 MAPs

S C R E E N



(Step 001 continues)

(Step 001 continued)



Go to '3370' documentation via MLX pages of '3370' documentation, entry 2.

For further error analysis you need a maintenance device (MD).

002
(Entry Point V)

IMPORTANT:

Run the FTA test and CTLI test.

Any reference code?
Y N

003
Proceed with the I/O documentation, and the MD.

Ignore temporary error messages displayed on line 23 of console screen during run of 3370 inline tests controlled by the MD. See Vol.13, STM, Section 4: Diagnostic Run Procedures (Disk/Tape Inline Test - General).

After the repair
Go To Map 0001, Entry Point A.

004
Go to appropriate MAP.

REF.CODE directory

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0001	A	1	001
0020	A	1	001

001
(Entry Point A)

REFERENCE CODE DIRECTORY

Ref. Code	Title	Go to MAP
E0040F01	IML problems, IOC load (detailed)	E008
E004XX01	IML problems, IOC load	E002
E005XX01	BSM/Array problems	E003
E006XX01	IML problems, PU load	E004
E011XX01	Support proc. problems	E006
E019XX01	Diskette drive problems	0402 Entry point N
E01C4001	Wrong diskette installed	E005
E01XXX01	Diskette drive problems	0401 Entry point T
E02XXX01	I/O SS problems	E008 Entry point BB
E03XXX01	IML, support subsystem problem	E001
E086XX01	IML problems, PU load	E004
E1000001	Timer error	E100
E4XXXX01	Check stop MAP	E400
E6XXXX81	Customer manual operation	E680
E8XXXXXX	Directory	E8XX
EAXXXX01	PU detected control info. error	EA00

IML, SUPPORT SUBSYSTEM

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
EXXX	A	1	001
RFCA	A	1	001
RFCA	V	2	010

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	016	0001	A
2	015	0001	0
5	018	0001	0
2	006	0020	A
1	004	0400	R
2	012	0400	R

001
(Entry Point A)
****

Are you led to this MAP by the REFCODE ANALYSIS?
Y N

002
Perform IML.

IML is performed successfully. When the PROGRAM LOAD picture appears on screen.

Is IML successful?
Y N

003
Any ref.code?
Y N

004
Go To Map 0400, Entry Point R.

005
Any E03XXX01 reference code?
Y N

2 2 2 2
A B C D

006
Go to map 0020, ENTRY POINT A, respectively use REFCODE ANALYSIS.

Go To Map 0020, Entry Point A.

007
Go to Page 3, Step 017, Entry Point AA.

008
The error was intermittent, therefore you may proceed as follows:

Select the IBM MAINTENANCE and SERVICE PROGRAM SELECTION.

Invoke the REFCODE ANALYSIS.

Key in the reference code from the IML, Support Subsystem problems.
Go to Step 009, Entry Point P.

009
(Entry Point P)
****

Do now the repair as told by the REFCODE ANALYSIS.

After the repair do the verification.
Go to Step 010, Entry Point V.

010
(Entry Point V)
****

Verification:
After a FRU replacement perform IML with FU1.

IML is performed successfully when the PROGRAM LOAD picture appears on screen.

Is IML Successful?
Y N

011
Any ref.code?
Y N

012
Go To Map 0400, Entry Point R.

013
Same ref.code as before?
Y N

014
Go to appropriate MAP.

015
Go To Map 0001, Entry Point O.

016
Go To Map 0001, Entry Point A.

017
(Entry Point AA)
****

Look up the reference code and perform the repair action.

Reference Code	XXX	Suspect:
E03XXX01	01X	SBA card ; 01A-A2Q2
	02X	
	031	
	032	1.SBA card ; 01A-A2Q2 2.BSM card 1 ; 01A-B1H2, if 4321 or 4331-1 PU card 5 ; 01A-B1G2, if 4331-2 or 4331-11 3.SCL card 1 ; 01A-A1B2 4."Power complete" LED on console
	033	SBA card ; 01A-A2Q2
	041	
	042	1.SBA card ; 01A-A2Q2 2.BSM card 1;01A-B1H2, if 4321 or 4331-1 PU card 5;01A-B1G2, if 4331-2 or 4331-11
	043	SBA card ; 01A-A2Q2
	05X	
	06X	
	07X	

(Step 017 continues)

(Step 017 continued)

Reference Code	XXX	Repair Action / Suspect:
E03XXX01	081	1.SBA card ; 01A-A2Q2 2.BSM card 1;01A-B1H2, if 4321 or 4331-1 PU card 5;01A-B1G2, if 4331-2 or 4331-11
	083	SBA card ; 01A-A2Q2
	084	SCL card 1; 01A-A1B2
	085	BSM card 1; 01A-B1H2, if 4321 or 4331-1 PU card 5; 01A-B1G2, if 4331-2 or 4331-11
	086	SBA card ; 01A-A2Q2
	091 092 093 094 095 096	BSM card 1; 01A-B1H2, if 4321 or 4331-1 PU card 5; 01A-B1G2, if 4331-2 or 4331-11
	097	1.BSM card 1; 01A-B1H2, if 4321 or 4331-1 PU card 5; 01A-B1G2, if 4331-2 or 4331-11 2.Clock card; 01A-B1B2
	098 099	Clock card; 01A-B1B2
	09A	BSM card 1; 01A-B1H2, if 4321 or 4331-1 PU card 5; 01A-B1G2, if 4331-2 or 4331-11
	0A1	SBA card ; 01A-A2Q2
	0A2	SCL card 1; 01A-A1B2

(Step 017 continues)

(Step 017 continued)

Reference Code		Repair Action
E03XXX01	XXX	Suspect:
	0A3	BSM card 1; 01A-B1H2, if 4321 or 4331-1 PU card 6; 01A-B1G2, if 4331-2 or 4331-11
	0A4	1.SBA card ; 01A-A2Q2 2.BSM card 1; 01A-B1H2, if 4321 or 4331-1 PU card 5; 01A-B1G2, if 4331-2 if 4331-11 3.SCL card 1; 01A-A1B2
	4XX 8XX	SBA card ; 01A-A2Q2

Reference Code found?
Y N

018
Go To Map 0001, Entry Point O.

019
Do the repair as told by the above table, then
Go to Page 2, Step 010, Entry Point V.

IML Problems, IOC load

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
EXXX	A	1	001
RFCA	A	1	001
RFCA	B	2	004
RFCA	V	3	007

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	010	0001	A
3	005	0001	0
3	009	0400	R

001
(Entry Point A)

Are you led to this MAP by the REFCODE ANALYSIS?
Y N

002
Select the IBM MAINTENANCE and SERVICE SELECTION PROGRAM.

Invoke the REFCODE ANALYSIS.

Key in the reference code from the IML Problems, IOC load.
Go to Step 003, Entry Point P.

003
(Entry Point P)

Do now the repair as told by the REFCODE ANALYSIS.

After the repair do the verification.
Go to Page 3, Step 007, Entry Point V.

004
(Entry Point B)

Reference Code	Recommended Action	Goto MAP
E0040701	If the diskette which caused the error is new, then return it and use the old one. If the diskette was good before, perform IML! If a hardware EC was installed before and the old diskette probably does not match it go to EXIT MAP	0001 ENTRY POINT 0
E0040901	Insert a spare diskette and try again the same application which caused the ref.code E0040901. If this reference code comes up as well, go to EXIT MAP If the spare diskette is alright order a new dikette to replace the defective one.	0001 ENTRY POINT Z
E0041001	If this error comes up during IML from the DIAG diskette, this DIAG diskette may have a wrong configuration. Perform "copy configurator" If this error comes up during IML from the CMTRL diskette, suspect: IOC card 4; 01A-A1F2 IOC card 5; 01A-A1G2	FE90 ENTRY POINT DD
E0041101	Like ref.code E0041001, but suspect only IOC card 5; 01A-A1G2	
E0041201	Like ref.code E0041001, but suspect only IOC card 6; 01A-A1H2	

(Step 004 continues)

(Step 004 continued)

Reference Code found?
Y N

005
Go To Map 0001, Entry Point O.

006
Go to MAP as shown in above table.

007
(Entry Point V)

VERIFICATION:

After FRU replacement perform IML with the CNTRL diskette FU1.

Any reference code?
Y N

008
IML successful?
Y N

009
Go To Map 0400, Entry Point R.

010
Go To Map 0001, Entry Point A.

011
Go to appropriate MAP, respectively use the REFCODE ANALYSIS.

IML,BSM/ARRAY PROBLEMS

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
EXXX	A	1	001
RFCA	A	1	001
RFCA	B	2	004

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
1	003	0001	A
3	005	0001	0

001
(Entry Point A)
****

Are you led to this MAP by the REFCODE ANALYSIS?
Y N

002
Select the IBM MAINTENANCE and SERVICE PROGRAM SELECTION.

Invoke the REFCODE ANALYSIS.

Key in the reference code from the IML, BSM/Array Problems.
Go to Step 003, Entry Point P.

003
(Entry Point P)
****

Do now the repair as told by the REFCODE ANALYSIS.

After the repair
Go To Map 0001, Entry Point A.

004
(Entry Point B)
****

Look up the reference code and perform the recommended action.

Reference Code	Recommended Action	Goto
E0050X01 E0052101	1. Insert DIAG diskette and press IML button. 2. Run PU/BSM Test. 3. If the system is a 4321 or a 4331-1, run DM test of Array-Tool with address given and try to repair solid error in that address by setting a redundant bit. (The address you see in byte 0 to 3 on the lower lefthand side of the IML log display. Perform IML! If the same error happens again, replace respective BSM card. If the tests don't find an error and the problem will repeat, suspect clock card 01A-B1B2. Any good FRU that was removed before should be returned to the machine.	Vol.13, STM, Sect.4: Array Tool
E005C001 E005C101	1. Insert DIAG diskette and press IML button. 2. Run PU/BSM Test. Run CS test (selection CT) in Array-Tool (if 4321 or 4331-1) or PU/BSM (if 4331-2 or 4331-11) for more information.	Vol.13, STM, Sect.4: Array Tool

(Step 004 continues)

(Step 004 continued)

Reference Code	Recommended Action	Goto
E005CE01	1.Insert DIAG diskette and press IML button. 2.Run PU/BSM Test. 3.Run CS test (selection CT) in Array-Tool (if 4321 or 4331-1) or suspect the following FRUs: If the address is below '4000' suspect 1.PU Card 2, 01A-B1D2 If the address is equal or above '4000' suspect 1.PU Card 1, 01A-B1C2 (The address you see in byte 0 and 1 on the lower lefthand side of the display of the CS test.) NOTE: If only one card is plugged in the positions 01A-B1C2/D2, replace this one.	Vol.13, STM, Sect.4: Array Tool
E005EX01 E005F001 E005F101	Insert DIAG diskette and press IML button. Run test chaining. Go to appropriate MAP, if an error is detected, otherwise go to EXIT MAP 0001, ENTRY POINT P.	Vol.13, STM, Sect.4: Test Chaing. Select.

Reference code found ?
Y N

005
Go To Map 0001, Entry Point O.

006
Proceed as shown in the above table.

IML, PU LOAD PROBLEMS

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
EXXX	A	1	001
RFCA	A	1	001
RFCA	B	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
4	038	0001	A
5	039	0001	A
7	042	0001	A
9	051	0001	A
10	054	0001	A
11	057	0001	A
12	062	0001	A
8	046	0001	0
7	043	0001	U
8	048	0400	R
11	059	0400	R

001
(Entry Point A)

(Entry Point B)

IML, PU LOAD PROBLEMS
==========

General note:
SP card 5: 01A-C2H2 may not be installed

Reference Code
E0860101
E0860201
E0860401?
Y N

002
E0860501?
Y N

003
E0860701
E0860801?
Y N

4 4 4 2
A B C D

004
E0860901?
Y N

005
E0860B01?
Y N

006
E0860C01?
Y N

007
E0860D01?
Y N

008
E0860F01?
Y N

4 4 4 3 3
E F G H J K

009
E0861101?
Y N

010
E0861201?
Y N

011
E0861301?
Y N

012
E0861401?
Y N

013
E0861501?
Y N

3 3 3 3 3 3
L M N P Q R

014
E0861601?
Y N

015
E0861701?
Y N

016
E0861801?
Y N

017
E0861901?
Y N

018
E0861A01?
Y N

019
Any other reference code
E086XX01
Go to Page 6, Step 040,
Entry Point TT.

020
Go to Page 5, Step 039,
Entry Point PT.

021
Go to Page 4, Step 038,
Entry Point IT.

022
Go to Page 12, Step 061,
Entry Point QT.

023
Go to Page 8, Step 045, Entry Point ST.

024
Go to Page 6, Step 040, Entry Point TT.

025
Go to Page 8, Step 045, Entry Point ST.

026
Go to Page 6, Step 040,
Entry Point TT.

027
Go to Page 13, Step 064,
Entry Point MT.

028
Go to Page 8, Step 045, Entry Point ST.

029
Go to Page 11, Step 056, Entry Point RT.

030
Go to Page 10, Step 053, Entry Point LT.

031
Go to Page 6, Step 040, Entry Point TT.

IML, PU LOAD PROBLEM

032
Go to Page 10, Step 053, Entry Point LT.

033
Go to Page 8, Step 045, Entry Point ST.

034
Go to Page 11, Step 056, Entry Point RT.

035
Go to Page 8, Step 045, Entry Point ST.

036
Go to Page 9, Step 050, Entry Point KT.

037
Go to Page 6, Step 040, Entry Point TT.

038
(Entry Point IT)

Replace 01A-B1C2.

After the repiacement.
Go To Map 0001, Entry Point A.

039
(Entry Point PT)

If the customer calls for this reference code, tell him that he can continue his job.

There is no severe machine malfunction.

If this reference code is on, IML and PU/BSM tests will only need more time. No log will be stored in this case.

Replace 01A-B1C2
as soon as possible, when the customer will be visited anyhow.

If any other ref.code E0....01 does also come up
(IML not successful),
replace 01A-B1C2 immediately.
After the repair
Go To Map 0001, Entry Point A.

040
(Entry Point TT)

Recommended action:

1. Try again IML with CNTRL diskette FU 1!
2. If the error comes up again, do IML with DD1.
3. Run PU/BSM test!
4. Run and loop routine CS in PU/BSM test.

See Vol.13, STM, Section 4: Diagnostic Run Procedures (PU/BSM Test).

Any error?
Y N

041
(Entry Point FT)

If not yet already done, check the configuration of the control storage and main storage.

See Vol.13,STM, Section 6: Configure Procedures.

Select the MES UPDATE to see the storage configuration which is written on diskette, and compare it with the actually installed storage cards.

Any mismatch?
Y N

7 7 7
S T U

042
It is obviously an intermittent problem.

Replace now the FRUs according to the priority shown:

1.Card 01A A2Q2
2.Card 01A-B1G2
3.Card 01A-B1C2
  Card 01A-B1D2.....D2 may not be installed

4.Cable 01A-A2YF to 01A-B1A3 (C)

Also possible FRUs:

5.ENDCN 01A-A2Q3-X
6.XOVER 01A-C2E2-W to 01A-C2F2
  XOVER 01A-C2E5-Z to 01A-C2F5

7.Cards 01A-C2D2 to J2.....01A-C2H2 may not be installed.

After replacement
Go To Map 0001, Entry Point A.

043
Invoke your support structure.
Go To Map 0001, Entry Point U.

044
Go to appropriate MAP.

045
(Entry Point ST)

Recommended action:

If the diskette which caused the error is new,
then return it and use the old diskette.
If the diskette was good before, try IML.

Any error?
Y N

046
Go To Map 0001, Entry Point 0.

047
Any reference code?
Y N

048
Go To Map 0400, Entry Point R.

043
Go to appropriate MAP.

050
(Entry Point KT)

Recommended action:

Check for correct configuration, CS (control storage) type etc.

See Vol.13, STM, Section 6: Configure Procedures.

1.Perform IML with FU1!
2.If the error comes up again, do IML with DD1.
3.Run PU/BSM test!
4.Run and loop routine CS in PU/BSM test.

See Vol.13, STM, Section 4: Diagnostic Run Procedures (PU/BSM Test).

Any ref. code?
Y N

051
Suspect:
1.Card 01A-A2Q2,
2.Card 01A-B1G2,
3.Card 01A-B1C2/D2 (may be one of the two cards is not installed).
When the replacement is done
Go To Map 0001, Entry Point A.

052
Go to appropriate MAP.

053
(Entry Point LT)

Recommended action:

1.Try IML with FU1!
2.If the error comes again, do IML with DD1.
3.Run PU/BSM test!
4.Run and loop routine CS in PU/BSM test. See Vol.13, STM, Section 4: Diagnostic Run Procedures (PU/BSM Test).

Any ref. code?
Y N

054
Suspect:
1.Card 01A-A2Q2
2.Card 01A-B1G2
3.Card 01A-B1C2
Card 01A-B1D2.....D2 may not be installed

After replacement
Go To Map 0001, Entry Point A.

055
Go to appropriate MAP.

056
(Entry Point RT)

Probable reason:

The IML key was hit too early after the patch program or a configurator program was used.

Recommended action:

Repeat the patching or the configurator update. Wait until the message DO NOT INTERRUPT DISKETTE UPDATE UNTIL COMPLETION disappears from the screen, before you press the IML key.

Any error?
Y N

057
Go To Map 0001, Entry Point A.

058
Any ref. code?
Y N

059
Go To Map 0400, Entry Point R.

060
Go to appropriate MAP.

061
(Entry Point QT)

Recommended Action:

If the diskette which caused the error is new then return it and take the old diskette.

Then:
1. Perform IML with the CNTRL diskette FU1!
2. If the error comes up again, do IML with DD1.
3. Run PU/BSM test!
4. Run and loop routine CS in PU/BSM test.

See Vol.13, STM, Section 4: Diagnostic Run Procedures (PU/BSM Test).

Any error?
Y N

062
Order a new diskette if necessary!

Go To Map 0001, Entry Point A.

063
Go to appropriate MAP

064
(Entry Point MT)

Insert the backup diskette and try again IML.
If the error comes up again,
1.Try IML with DD1.
2.Run PU/BSM test.
3.Run and loop routine CS in PU/BSM test.

Any error?
Y N

065
Go to Page 6, Step 041, Entry Point FT.

066
(Entry Point SK)

Go to appropriate MAP

Wrong diskette installed

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
EXXX	A	1	001

001
(Entry Point A)

Suspected: Wrong diskette in drive 1.

Recommended Action:
Insert correct diskette (FU1 or DD)!

SUPPORT PROCESSOR PROBLEMS

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
EXXX	A	1	001
RFCA	A	1	001
RFCA	V	3	007

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	013	0001	A
3	012	0001	0
1	004	0400	R
3	009	0400	R

001

(Entry Point A)
****

Make sure that you have traced the START MAP 0000 precisely. Another reference code may be more important than the one you have got first.

Are you led to this MAP by the REFCODE ANALYSIS?
Y N

002
Perform IML.

Is IML successful?
Y N

IML is performed successfully when the PROGRAM LOAD picture appears on screen.

003
Any reference code?
Y N

004
Go To Map 0400, Entry Point R.

3 3 2
A B C

005

(Entry Point AA)
****

HOW TO USE THE TABLES BELOW:

Look up the reference code in column 1.

Find the suspected FRUs in column 2,
indicated by FRU numbers in priority sequence.

Take the FRU number and find in the FRU table the names
and the location of the FRUs.

Column 1	Column 2
Reference Code	Suspected FRUs (Priority sequence) 1, 2, 3, 4, 5, 6
E0110001	1 2 3 4 7 8
E0112X01	1 2 3 7 8
E0113X01	1 2 3 7 8
E0114X01	1 2 3 7 8
E0115X01	1 2 3 7 8
E0116X01	1 2 3 7 8
E0117X01	1 2 3 7 8
E0118X01	1 2 3 7 8
E0119X01	1 2 3 4 7 8
E011AX01	1 2 3 4 7 8
E011BX01	4 1 2 3 7 8
E011C101	5 4
E011C201	5 4
E011C301	6 5

F R U T A B L E

FRU Number	Card Name	Card Location
1	SP Card 1	01A-C2D2
2	SP Card 2	01A-C2E2
3	SP Card 3	01A-C2F2
4	SP Card 4	01A-C2G2
5	SP Card 5	01A-C2H2
6	SP Card 6	01A-C2J2
7	SCL Card 4	01A-C2B4
8	SCL Card 3	01A-C2C2

After a FRU replacement,
Go to Page 3, Step 007, Entry Point V.

006
The error was intermittent, therefore proceed as follows:

Select *IBM MAINTENANCE AND SERVICE PROGRAM SELECTION*.

Invoke *REFCODE ANALYSIS*.

Key in the reference code from the Support Processor LOG.
Go to Step 007, Entry Point P.

007

(Entry Point P)
****

Do now the repair as told by the reference code analysis program.

After the repair do the verification.

(Entry Point V)
****

Verification:

After a FRU replacement perform IML with the CNTRL diskette FU1!

Does the *PROGRAM LOAD* picture appear on screen?
Y N

008
Any reference code on screen?
Y N

009
Go To Map 0400, Entry Point R.

010
Same reference code as before?
Y N

011
Go to MAP according to the reference code, respectively use the REFCODE ANALYSIS.

012
Go To Map 0001, Entry Point O.

013
Go To Map 0001, Entry Point A.

GZ = 426378

IOC LOAD (DETAILED)

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
EXXX	A	1	001
EXXX	BB	8	018
FSC	BB	8	018
FXXX	YY	10	025
RFCA	A	1	001
RFCA	B	1	001
RFCA	V	15	053
RFCA	BB	8	018
RFCA	YY	10	025

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
7	009	0001	A
12	045	0001	A
15	055	0001	A
10	034	0001	0
7	008	0400	R
12	044	0400	R
15	058	0400	R

001

(Entry Point A)
****

(Entry Point B)
****

First read this important note before you start with the MAP on Page 2, ENTRY POINT JJ.

If any one of the cards listed beside is to be replaced, first swap this card with the appropriate card from the MSSS.
See the *Card Where Used List* PA013 in Vol. 30.
To check whether the swapped card is defective or not
press the IML key. If a defective card from IOC is in the MSSS, then the IML picture will not appear.

IOC FRU List:

IOC Card1 01A-A1C2
IOC Card2 01A-A1D2
IOC Card3 01A-A1E2
IOC Card4 01A-A1F2
IOC Card5 01A-A1G2
IOC Card6 01A-A1H2
SCL Card1 01A-A1B2
SCL Card2 01A-A1A4
BBA Card2 01A-A2U2

(Step 001 continues)

(Step 001 continued)
Attention:
If the loop adapter is installed, the IOC cards 5 and 6 have to be suspected as soon as the IOC card 4 is suspected.

(Entry Point JJ)
****

Is Reference Code E0040F01 still on screen?
Y N

002

(Entry Point TB)
****

Is IML log with Reference Code E0040F01 stored?
Y N

003
This MAP handles RC E0040F01. You are probably in the wrong MAP.

004
Invoke the MAINTENANCE AND SERVICE PROGRAM SELECTION.

Display last IML log with reference code E0040F01 and take the ADDR of IOC IAR and scan the ADDR table below to find a match between the IAR and the ADDR column.

Replace the suspected FRUs if shown, then go to
EXIT MAP 0001, ENTRY POINT A.
Otherwise follow the reference code shown below the matching address:

(Step 004 continues)

(Step 004 continued)

(Entry Point AA)
****

If no address match is found in any of the following tables,
GO TO Page 12, ENTRY POINT HH
(see note at the end of the tables for page and step numbers.

ADDR	Ref.Code
1048	E0200101
105E	E0200201
1062	E0200301
1066	E0200401
106A	E0200501
1072	E0200601
1078	E0200701
107E	E0200801
1082	E0200901
1088	E0201001
1090	E0201101
1098	E0201201
10A2	E0201301
10AA	E0201401
10B2	E0201501
10BC	E0201601
10C2	E0201701
10CA	E0201801
10D4	E0201901
10E0	E0202001
10EC	E0202101
10F8	E0202201
110A	E0202301
110E	E0202401
1112	E0202501
1118	E0202601
111E	E0202701
1122	E0202801
1126	E0202901
1132	E0203001
113A	E0203101
1148	E0203201
1154	E0203301

Suspected FRUs:
1.IOC Card 1,2,3
01A-A1C2 to E2
2.IOC Card 4,
01A-A1F2
3.SCL Card 2,
01A-A1A4

(Step 004 continues)

(Step 004 continued)

ADDR	Ref.Code
117E	E0223401
1184	E0223501
1198	E0223601
119E	E0223701

Suspected FRUs:
1.IOC Card 4;
01A-A1F2
2.IOC Card 1,2,3
01A-A1C2 to E2

ADDR	Ref.Code
11AA	E0203801
11AE	E0203901
11B6	E0204001
11B8	E0204101
11BE	E0204201
11C2	E0204301
11C4	E0204401
11CA	E0204501
11D0	E0204601
11D2	E0204701
11D6	E0204801
11DA	E0204901
11DE	E0205001
11E8	E0205101
11EA	E0205201
11EE	E0205301
11F2	E0205401
11FC	E0205501
120A	E0205601
1210	E0205701
121E	E0205801

Suspected FRUs:
1.IOC Card 1,2,3
01A-A1C2 to E2
2.IOC Card 4
01A-A1F2

ADDR	Ref.Code
1262	E0226301
1274	E0226001
1286	E0226401
1298	E0226501
129E	E0226601

Suspected FRUs:
1.IOC Card 4,
01A-A1F2
2.IOC Card 1,2,3
01A-A1C2 to E2

(Step 004 continues)

(Step 004 continued)

ADDR Ref.Code

12B2	E0207001
12B4	E0207101
12B8	E0207201
12BA	E0207301
12BE	E0207401
12C2	E0207501
12C6	E0207601
12DC	E0207801
12E0	E0207901
12E6	E0208101

Suspected FRUs:
1.IOC Card 1,2,3
01A-A1C2 to E2
2.IOC Card 4
01A-A1F2

ADDR Ref.Code

12F8	E0248401
12FA	E0248501

Suspected FRUs:

1.SCL Card 1
01A-A1B2
2.IOC Card 1,2,3
01A-A1C2 to E2

ADDR Ref.Code

130C	E0260601
130E	E0260701
1320	E0260801
1322	E0260901
1334	E0261001
1336	E0261101
1350	E0261201
1352	E0261301
1360	E0261401
1362	E0261501

Go to Page 8, Step 018, Entry Point BB.

(Step 004 continues)

(Step 004 continued)

ADDR	Ref.Code
1392	E0260101
1394	E0260201
1396	E0260301

Go to Page 8, Step 018, Entry Point BB.

ADDR	Ref.Code	Suspected FRUs:
13EE	E0280001	1.SCL Card 2 01A-A1A4

ADDR	Ref.Code	Suspected FRUs:
13F0	E0280201	1.SBA Card 01A-A2Q2 2.Support bus, cable #14 01A-A1ZE to 01A-A2YE 3.SCL Card 2 01A-A1A4

ADDR	Ref.Code
17D4	F1031802
17D8	F1021202
17DA	F1011002
17DE	F1063802
17E2	F1053202
17E4	F1043002
17EC	F1092802
17F0	F1082202
17F2	F1072002
17FA	F0118802
17FC	F0108002
1804	F0124002
1806	F0134802
180A	F1140802
180E	F1150002
1810	F1160002

Go to Page 10, Step 025, Entry Point YY.
(Step 004 continues)

(Step 004 continued)

If no address match was found in any of the above tables
Go to Page 12, Step 042, Entry Point HH.

005
Are IML symptom code data still on screen?
Y N

006
Is the CE MODE switch on the SP display in normal position?
Y N

007
Turn CE switch to NORMAL position.

Re-IML.

IML successful?
Y N

008
Go To Map 0400, Entry Point R.

009

(Entry Point Z)
****

Go To Map 0001, Entry Point A.

010
Go to Page 2, Step 002, Entry Point TB.

011
Save this data,
if console printer is available
press COPY key.

Is CE MODE switch of SP display in normal position?
Y N

B C

012
Turn CE MODE switch to NORMAL position.
Go to Step 013, Entry Point CJ.

013

(Entry Point CJ)
****

Re-IML.

Same reference code as before?
Y N

014

(Entry Point C)
****

Use the saved data to scan the address table.
Use the address (IOC/IAR) displayed in position 48 and 49 of the screen layout.
Go to Page 3, Step 004, Entry Point AA.

015
IML log available?
Y N

016
Go to Step 014, Entry Point C.

017
Go to Page 2, Step 002, Entry Point TB.

018

(Entry Point BB)
****

This part of the MAP is entered if an IOC processor bus error is suspected.

Note: The MFCU Adapter and the Loop Adapter are mutually exclusive features on the IOC processor bus.

To further analyze this error, it is necessary to disconnect all adapters from the IOC processor by the following procedures:

Turn power off at the system.

See Vol. 13, STM, Section 1: Locations (Cabling Layout on Gate 01A).

Disconnect the following cable connectors on board 01A-A1
1.ZG (Processor bus)
2.ZH (Processor bus)

Disconnect MFCU Card 1,
01A-A1R2
and associated Top connectors,

or, disconnect Loop Adapter cards
01A-A1J2, L2, N2, Q2.

Turn power on.

Wait until a reference code appears on screen.

Is the reference code E0040F01?
Y N

9
D E

E 1838 MAP E008-8

019
Turn power off.

Reconnect MFCU Card 1,
01A-A1R2, and Top connectors,

or, reconnect Loop Adapter cards
01A-A1J2, L2, N2, Q2.

Turn power on, Re-IML.

Is the reference code E0040F01?
Y N

020
Turn power off.

Reconnect IOC processor cables
01A-A1 ZG and ZH.

Disconnect BBA1 Card 01A-A2U2
Turn power on, re IML.

Is the reference code E0040F01?
Y N

021
Suspected FRUs:
BBA1 Card ; 01A-A2U2

Go to Page 7, Step 009, Entry Point Z.

022
Suspected FRUs:
1.IOC processor bus cables.
2.Board 01A-A2

Go to Page 7, Step 009, Entry Point Z.

9
F

023

Suspected FRUs:
1.MFCU Card 1
01A-A1R2,
or Loop Adapter cards 01A-A1J2, L2, N2, Q2.

Note: Do not swap (interchange) Loop Adapter HPCA cards. Instead use a new HPCA card for FRU replacement. Swapping HPCA cards can produce unreliable results.

After you have replaced the failing FRU with a new FRU, turn power off.
Reconnect IOC processor cables 01A-A1 ZG and ZH. Turn power on and try IML again.
Go to Page 7, Step 009, Entry Point Z.

024

(Entry Point DD)
****

Suspected FRUs:

```
1.SCL Card1    ; 01A-A1B2
2.IOC Card2    ; 01A-A1D2
3.IOC Card1,3  ; 01A-A1C2, E2
4.SCL Card2    ; 01A-A1A4
5.IOC Card4    ; 01A-A1F2
6.IOC Card5    ; 01A-A1G2
7.IOC Card6    ; 01A-A1H2
8.Board        ; 01A-A1
```

After you have replaced the failing FRU with a new FRU, turn power off.
Reconnect IOC processor cables 01A-A1 ZG and ZH. Turn power on and try IML again.

Go to Page 7, Step 009, Entry Point Z.

025

(Entry Point YY)
****

F0XXXX02?
Y N

026
F1072002?
Y N

027
F1082202?
Y N

028
F1021202?
Y N

029
F1011002
F1043002
F1053202?
Y N

1 1 1
1 1 1
G H J K L M

K L M 1838 MAP E008-10

030
F1150002?
Y N

031
FXXXX802?
Y N

032

(Entry Point E)
****

Suspected FRUs:
1.IOC Card 1,2,3
01A-A1C2 to E2
2.IOC Card 4
01A-A1F2

Go to Page 7, Step 009,
Entry Point Z.

033
Error during cycle steal operation.
Suspected FRUs:
1.BBA1 Card; 01A-A2U2
2.MFCU Card1 ; 01A-A1R2, or Loop
Adapter cards 01A-A1J2, L2, N2, Q2.
3.SCL Card 1; 01A-A1B2
4.Board 01A-A1

Go to Page 7, Step 009, Entry Point Z.

034
Go To Map 0001, Entry Point O.

035
Go to Step 032, Entry Point E.

036
Does the error occur with a new diskette only?
Y N

1 1
1 1
N P

037
Suspected FRUs:
1.IOC Cards 1,2,3
01A-A1C2 to E2
2.IOC Card 4
01A-A1F2

Go to Page 7, Step 009, Entry Point Z.

038
This is probable a diskette problem. Return new diskette and use old diskette.

Go to Page 7, Step 009, Entry Point Z.

039
Suspected FRUs:
IOC Card 4; 01A-A1F2

Go to Page 7, Step 009, Entry Point Z.

040
Suspected FRUs:
IOC Card 4 ; 01A-A1F2

Go to Page 7, Step 009, Entry Point Z.

041
Error during processor bus operation.

Suspected FRUs:
1.BBA1 Card ; 01A-A2U2
2.MFCU Card 1; 01A-A1R2, or Loop Adapter cards 01A-A1J2, L2, N2, Q2.
3.SCL Card 1; 01A-A1B2
4.SCL Card 2; 01A-A1A4
5.Board 01A-A1
Go to Page 7, Step 009, Entry Point Z.

042

(Entry Point HH)
****

No Address Match.

First time at this point?
Y N

043
Try IML again.

Is IML sucessful?
Y N

044
Go To Map 0400, Entry Point R.

045
Go To Map 0001, Entry Point A.

046
Connect logic probe to 01A-A1E2S08 (IOC restart signal)

For logic probe desciption see General System Information, Section 4: Tools.

Set up the logic probe as follows:
Level: MULTI
LATCH: NONE, then switch to DOWN position
GATE: GND

Connect the power leads of the CE probe as follows:
Red lead to:
01A-A2E2D03 (+5V)
Black lead to:
01A-A2E2D08 (GND)

(Step 046 continues)

(Step 046 continued)
Hit the IML Key on the operator control panel and wait until the IML picture appears on the screen.

The IOC restart signal should go for a short time to a down level. Both up and down lights should be on after screen message 'IOC LOAD'

Note:
The IOC restart signal is now checked for proper switching. This signal starts the IOC diagnostic tests and the IOC load. The 'IOC restart' is activated when the Power On sequence is completed.

Down light on?
Y N

047
Replace PCS Card1 01A-A2D2

Does the IOC restart signal now switch properly?
Y N

048
Trace the IOC restart signal called Reset I/O Controller from
01A-A2D2J10 to
01A-A1E2S08

Note:
The signal should switch at all test points as described above.

Suspected FRUs:
1.Signal cable from board
01A-A2YE to
01A-A1ZE
2.SCL Card2 01A-A1A4

Go to Page 7, Step 009, Entry Point Z.

049
Problem is corrected; restart IML, then
Go to Page 7, Step 009, Entry Point Z.

050
Connect logic probe to 01A-A2E2U10
(I Fetch signal)

Hit IML key and wait until the IML picture appears on the screen.

Set up the logic probe as follows:
Level: MULTI
LATCH: NONE
GATE: GND

Is the I Fetch signal pulsing?
Y N

Notes:
The I Fetch signal should start pulsing when the PC power on picture appears on the screen.
Be sure that the I-Fetch signal is continuously pulsing.

051
Suspected FRUs:
IOC Card's 1, 2, 3;
01A-0A1C2 to E2.

Go to Page 7, Step 009, Entry Point Z.

052
Go to Page 8, Step 018, Entry Point BB.

053

(Entry Point V)
****

Verifications:

After repair perform IML with the CNTRL diskette FU1.

Any error?
Y N

054
Run the test chaining.

Any reference code?
Y N

055
Go To Map 0001, Entry Point A.

056
Go to Step 059, Entry Point K.

057
Any reference code?
Y N

058
Go To Map 0400, Entry Point R.

059

(Entry Point K)
****

Go to appropriate MAP.

Timer Damage

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
EXXX	A	1	001
RFCA	B	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
1	001	0001	A

001
(Entry Point A)

(Entry Point B)

If this log appears after 'power on' or 'partial power on' or right after IML, then ignore it.

If this log appears after the 'time of day' has been set, the timer is failing.

Suspect PU card 3, 01A-B1E2,
Pu card 4, 01A-B1F2
then
Go To Map 0001, Entry Point A.

CHECK STOPS MAP

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
EXXX	A	2	001
RFCA	A	2	001
RFCA	B	2	001
RFCA	P	9	019
RFCA	S	5	002
RFCA	KS	9	017
0000	A	2	001
0020	A	2	001
0020	P	9	019
4900	A	2	001
4900	P	9	019

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
11	022	0001	A
13	025	0001	A
9	016	0001	A
9	017	0001	A
5	010	0001	A
5	009	0001	0

001
(Entry Point A)

(Entry Point B)

PREREQUISITE ACTION :

Do the following:

1. Press the 'COPY' key to get a printout from screen or
   write down the reference code and extensions that
   appeared on screen:

   E4XXXX01 ZZZZ AAAA
   ---- | |
   | | |_____last branch of control information
   | |
   | |_____last CSAR address where the stop occured.
   |
   |_____stop number fetched from DLS position 30.

   Save it for use in case of support!

2. Invoke the 'IBM MAINTENANCE AND SERVICE PROGRAM LELECTION'.

3. Select the 'MANUAL OPERATIONS'.

4. Select the 'PU MANUAL OPERATIONS'.

5. Enter 'T' (Nonsequ./Sequ.-Address-Trace)
   to get a trace of the last instructions.
   Press COPY if possible or write it down.
   Save the printout for use in case of support!

6. Do a reference code search to obtain a possible
   MAP FIX or MCTF(patch).

7. Now look up the reference code which you got from
   the defective machine in the following table
   and do the recommended action, respectively
   go to the indicated MAP:

Go to Page 3, Step 002, Entry Point C.

002

(Entry Point C)
****

Ref.code	Recommended Action	Go to MAP
E4010200	See reference code E4010201	
E4010201	Machine check. PSW not enabled. Operating System Problem. Look for Operating System messages. Suspect also a possible control information problem. Invoke your support structure.	0E00, ENTRY POINT A 0001 ENTRY POINT 0
E4010401	CPU stopped due to CHECK CONTROL = HARD STOP	0E00, ENTRY POINT A
E4010501	Unplug the coax cables from the DCA. Try to isolate a possible failing device. If no success, invoke your support structure.	0001, ENTRY POINT 0
E4020301	CPU stopped due to CHECK CONTROL = HARD STOP. An adapter error was detected. Run adapter tests to locate the faulty adapter. When a reference code comes up, go to corresponding MAP. This reference code can also come up during customer manual operation Press cancel key! If any reference code comes up, go to appropriate MAP, otherwise go to EXIT MAP	0001, Entry POINT 0

(Step 002 continues)

(Step 002 continued)

Ref.code	Recommended	Go to MAP
E4020401 E4020501 E4021101 E4021201	Error probably caused by a previous machine check.	Go to ENTRY POINT S after this table.
E4030101	CPU stopped due to CHECK CONTROL = HARD STOP	
E4049001	Probably a handling error for the FRIEND command PRINTLOG.	
E4084X01	Probably a handling error during FTA Trace, for ex. no buffer area specified.	
E4090201	Check whether the jumper from 01A-A2V2S09 to 01A-A2V2U08 is missing. This jumper should have been installed during conversion from 4321/4331-1 to 4331-2 or 4331-11 (See also page PA201 of Vol. 30). Missing this jumper causes this ref.code when a write operation to the console occurs with certain data length specified. If the jumber is ok, suspect the FRUs as indicated by the REFCODE ANALYSIS for this reference code. After the repair go to EXIT MAP.....	0001, ENTRY Pt.A
E4FECE01	This reference code can only come up when STOP BEFORE LOG was set via CE manual operations. See Vol.13, STM, Section 4: Diagnostic Run Procedure (Stop Before Log), then go to EXIT MAP.....	0001 Entry Pt.U

(Step 002 continues)

(Step 002 continued)

(Entry Point S)
****

Have you found the reference code in the above table ?
Y N

003
If not yet done, select the REFCODE ANALYSIS.

Key in the ref. code E4....01.

Proceed as told by the REFCODE ANALYSIS.

004
Was it reference code E4020401 or E4020501 or E4021201?

Y N

005
Was it reference code E4021101 ?
Y N

006
Was it ref. code E40B0301 or E40B0401 ?
Y N

007
Was it any reference code E40BXX01 ?
Y N

9 9 9
A B C D E

D E 1850 MAP E400-5

008

(Entry Point AB)
****

Invoke the IBM MAINTENANCE AND SERVICE PROGRAM SELECTION.

Select the REFCODE ANALYSIS.

Key in the reference code from the CHECK STOP, E4....01.

Reference code found in the REFCODE ANALYSIS ?
Y N

009
Invoke your support structure.
Go To Map 0001, Entry Point O.

010
Do the repair as told by the REFCODE ANALYSIS, then
Go To Map 0001, Entry Point A.

011
E40BXX01

The High Speed Channel (HSC) control program detected a machine malfunction which has not been indicated by any hardware check (such as parity check, time out etc). Run the test chaining to checkout the PU, IC-Bus, and the HSC.

Any reference code ?
Y N

9 6
F G

012
The tests run error free.

Have you already replaced FRUs as indicated by the REFCODE ANALYSIS?
Y N

013
Invoke the IBM MAINTENANCE AND SERVICE PROGRAM SELECTION.

Select the REFCODE ANALYSIS.

Key in the reference code E40B....

Replace the FRUS that are indicated by the REFCODE ANALYSIS.

(Entry Point K)
****

If the replacement of the suspected FRUs does not solve the problem, go to the table for the specific reference codes E40B0001 through E40B0501 beginning on the next page.
(Step 013 continues)

(Step 013 continued)

Ref.code	Recommended	Go to MAP
E40B0001	If the replacement of the suspected FRUs that are indicated by the REFCODE ANALYSIS does not solve the problem suspect further: Wiring of IC Bus 0 star lines. For signal flow see Supplement to MAPs, section 1: Locations (IC Bus 0 Star Lines IC Bus cable number 9 for version 3). After the repair go to MAP	0001, ENTRY POINT A

(Step 013 continues)

(Step 013 continued)

Ref.code	Recommended	Go to MAP
E40B0101 E40B0201	If the replacement of the suspected FRUs that are indicated by the REFCODE ANALYSIS does not solve the problem suspect further: 1.Wiring of IC Bus 0 star lines: o -IC Trap 1 Request Adapter 0 o -IC Trap 2 Request Adapter 0 For signal flow see Supplement to MAPs, section 1: Locations (IC Bus 0 Star Lines IC Bus cable number 9 for version 3). 2.Wiring of IC Bus 0 cable No 12. For signal flow see Supplement to MAPs, Section 1: Locations (IC Bus 0 stub lines, IC Bus cable number 12, version 3). After the repair go to MAP	0001, ENTRY POINT A
E40B0501	There are no FRUs to be replaced. Reason for this error: A channel check occured while Check Control has been set to "Hard stop". To get a detailed log when this check reoccures set Check Control to "Normal" and have the application program restarted. After the repair go to MAP	0001, ENTRY POINT A

014

Go to Page 6, Step 013, Entry Point K.

015
Go to appropriate MAP, respectively use the REFCODE ANALYSIS.

016
Replace the FRUs,if suspected by the REFCODE ANALYSIS.
After the repair
Go To Map 0001, Entry Point A.

017

(Entry Point KS)
****

This ref. code followed another one which has already been logged on the diskette.
The E4021101 states, that any adapter of the IOC (if inst.)or MSSS was not reset after a hardware failure had been logged.
Do a log display to get the preceding log.
It must be a log from the BBA, SP or IOC.

Go to appropriate MAP, respectively use the REFCODE ANALYSIS
After the repair
Go To Map 0001, Entry Point A.

018
Go to Step 019, Entry Point P.

019

(Entry Point P)
****

Do a log display to see, if there is any log other than E4XXXX01 stored within the same time frame (last log -1).

Any other log available?
Y N

020
Is the system a 4331-2 or 4331-11?
Y N

021

The system is a 4331-1.

Select 'MAINTENANCE AND SERVICE PROGRAM SELECTION'

Select 'B3' (PU Man. Op.)

Stop the PU
(Enter 'H' in FUNCTION position on display.)

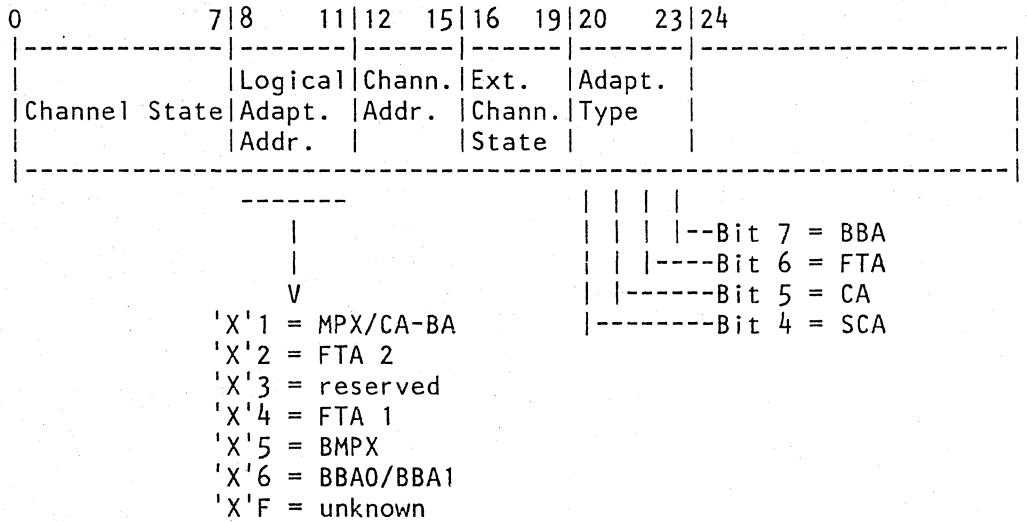
Look for the display item 'LSAR0/1'. The leftmost character shown in LSAR0/1 will be the value we need for the next step.

To display DLS 1 Register:

Enter 'L' in FUNCTION position.

Enter 'A' plus the value from the LSAR0/1 in ADDRESS position (left justified).

Analyse the content of the DLS 1 Register to find the failing adapter:



Replace the FRUs of the indicated adapter:

(Step 021 continues)

(Step 021 continued)

Logical Adapter Address	Adapter	FRUs
'X'1	MPX/CA-BA	01A-B2V2/W2/U2/T2
'X'2	FTA 2	01A-B2K2/L2/M2
'X'4	FTA 1	01A-B2E2/F2/G2
'X'5	BMPX	01A-B2D2/E2/C2
'X'6	BSU (BBA0 + BBA1)	01A-A2V2/T2/U2

Perform IML with the DIAG diskette.

>>Run the TEST CHAINING.<<

Any reference code?
Y N

022
Go To Map 0001, Entry Point A.

023
Go to appropriate MAP, respectively use the REFCODE ANALYSIS.

024

Select MAINTENANCE AND SERVICE PROGRAM SELECTION

Select 'B3' (PU Man. Op.)

Stop the PU
(Enter 'H' in FUNCTION position on display.)

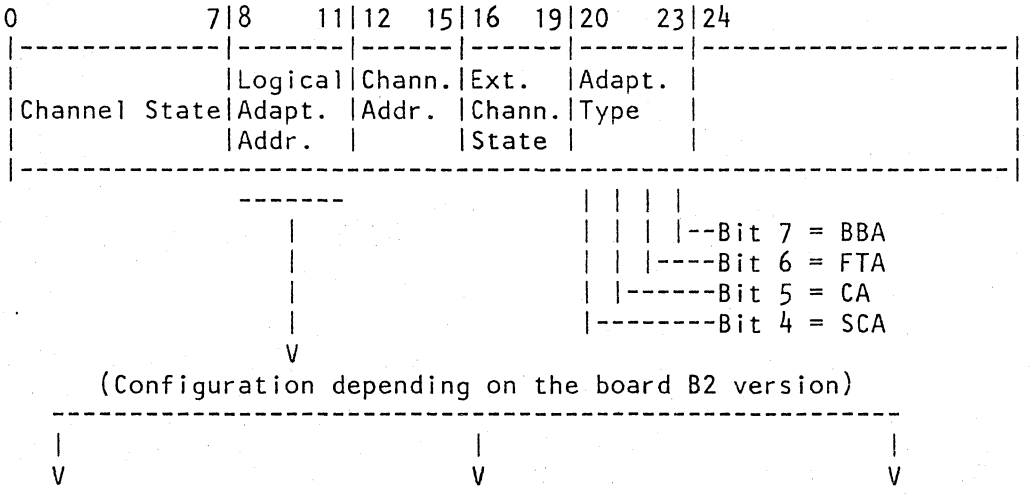
Look for the display item 'LSAR0/1'. The leftmost character shown in LSAR0/1 will be the value we need for the next step.

To display DLS 1 Register:

Enter 'L' in FUNCTION position.

Enter 'A' plus the value from the LSAR0/1 in ADDRESS position (left justified).

Analyse the content of the DLS 1 Register to find the failing adapter:



(Step 024 continues)

(Step 024 continued)

'X'3 = MPX/CA-BA	'X'3 = MPX/CA-BA	'X'3 = MPX/CA-BA
'X'4 = FTA 1	'X'4 = FTA 1	'X'4 = FTA 1
'X'5 = BMPX 1	'X'5 = BMPX 1	'X'5 = BMPX 1
'X'6	'X'6	'X'6
'X'7 = BBA0, BBA1	'X'7 = BBA0, BBA1	'X'7 = BBA0, BBA1

Replace the FRUs of the indicated adapter:

Logical Adapter Address	ADAPTER	FRUS
'X'0	HSC	Cards in 01A-B2P2/Q2/R2
'X'1	FTA 3	Cards in 01A-B2P2/Q2/R2
'X'2	FTA 2/BMPX 2	Cards in 01A-B2/L2/M2/N2
'X'3	MPX/CA-BA	Cards in 01A-B2V2/W2/U2/T2
'X'4	FTA 1	Cards in 01A-B2E3/F2/G2
'X'5	BMPX 1	Cards in 01A-B2D2/B2/C2
'X'7	BSU(BBA0 + BBA1)	Cards in 01A-A2V2/T2/U2

Perform IML with the DIAG diskette DD1.

>>Run the TEST CHAINING.<<

Any reference code?

Y N

025
Go To Map 0001, Entry Point A.

026
Go to respective MAP, respectively use the REFCODE ANALYSIS.

027
Go to appropriate MAP, respectively use the REFCODE ANALYSIS.

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
EXXX	A	1	001
RFCA	A	1	001
RFCA	B	1	001
RFCA	P	15	070
RFCA	AA	8	055
0001	SC	7	053
0020	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
7	052	0E00	A
21	094	0000	A
5	030	0001	A
21	093	0001	A
3	015	0001	0
5	031	0001	0
22	105	0001	0
22	106	0001	0
4	018	0001	Y
7	044	0020	A
7	047	0020	A
5	032	0020	A
5	025	0020	A
4	017	0020	A
12	064	0020	A
22	099	0020	A
6	042	0020	XZ
21	097	0400	R

001
(Entry Point A)
****
(Entry Point B)
****

Write down the reference code (and its extension if any).

****
* General Note: *
* Card position 01A-B1C2 *
* or D2 may be empty. *
* Also card position *
* 01A-C2H2 may be empty. *
****

Any Reference Code E6100081, E6200081?
Y N

002
Reference Code E6202081?
Y N

7 7 2
A B C

003
Any Reference Code
E6100181,
E6100281,
E6200181,
E6200281,
E6200381?
Y N

004
Reference Code E6100681?
Y N

005
Any Reference Code
E6100481,
E6300781,
E6300881?
Y N

006
Reference Code E6100X81?
Y N

007
Any Reference Code
E611XX81,
E621XX81,
E631XX81,
E6400181,
E6400281?
Y N

008
Reference Code E6201081?
Y N

009
Reference Code E6201581?
Y N

010
Reference Code E620XX81?
Y N

011
Reference Code E630XX81?
Y N

012
Any Reference Code E6400381,
E6500081,
E6500181?
Y N

013
Reference Code E6400481?
Y N

014
Any Reference Code E670XX81?
Y N

015
(Entry Point C)
****

The Error may
be intermittent.
Suspect the following FRU's.

1. For 4321 or 4331-1:
   PU Card 5; 01A-B1G2
   BSM Card 1; 01A-B1H2

   For 4331-2 or 4331-11:
   PU Card 6 and 7; 01A-B1H2/J2
   BSM Card 1; 01A-B1K2

2. SBA Card; 01A-A2Q2
3. PU Card 1; 01A-B1C2
4. PU Card 2; 01A-B1D2
5. PU Card 3; 01A-B1E2
6. PU Card 4; 01A-B1F2
7. PU Card 5; 01A-B1G2 if 4331-2 or 4331-11

If the repair does not help,
Go To Map 0001, Entry Point O.

016

E6700181 Invalid device specification in configuration
E6700281 Invalid keyboard language specification in configuration
E6700381 Invalid language table 1 specification in configuration
E6700481 Invalid language table 2 specification in configuration
E6700581 No operator console on 1.port in configuration specified
E6700681 EBCDIC to hex conversion error
E6700781 Cursor value conversion error
E6700881 Duplicate diskette addresses in configuration
E6701181 No operator console on 1.port
E6701281 Language error mismatch of translate table and language specification in corresponding port
E6701381 Diskette module too small for generation of DCB's
E6701481 Special features mismatch in corresponding port
E6701681 Duplicate device address. microcode error was before when setting configuration
E6701781 No system diskette in configuration specified
E6701881 Device address out of range
E6702081 Invalid user diskette spec. in configuration
E6702181 EBCDIC to hex conversion error
E6702281 Cursor value conversion error
E6705581 Error during diskette operations, look also for a SP log.

for each of these reference codes
Go to Page 5, Step 026, Entry Point F.

017

This reference code must have an extension which itself is also a reference code.
Follow this reference code (extension), therefore
Go To Map 0020, Entry Point A.

018

Go To Map 0001, Entry Point Y.

019

Go to Page 5, Step 026, Entry Point F.

020
Go to Step 026, Entry Point F.

021
This reference code also comes up, if any empty tape is mounted for IPL.

Is the correct tape mounted?
Y N

022
Mount the correct tape.
Do again IPL.

023
Go to Page 6, Step 033, Entry Point CK.

024
Write down:
PU card 5 ; 01A-B1G2, if 4321 or 4331-1
PU card 7 ; 01A-B1J2, if 4331-2 or 4331-11
This FRU is suspected if all other repairs recommended by this map will fail.
Go to Page 3, Step 015, Entry Point C.

025
(Entry Point SP)
****

Be sure that the control diskette is installed.

Press cancel key.

Follow to the reference code that comes up now,
Go To Map 0020, Entry Point A.

026
(Entry Point F)
****

Press cancel key.

Any log in process?
Y N

027
Did the error occur after installing a new diskette or a new set of diskettes?
Y N

028
Go to Page 6, Step 034, Entry Point K.

029
Check the configuration.
Does the diskette configuration match with the actual machine configuration?
Y N

030
Correct configuration. Then
Go To Map 0001, Entry Point A.

031
Suspect a control-information- or link problem.
Go To Map 0001, Entry Point O.

032
Go To Map 0020, Entry Point A.

033
(Entry Point CK)
****

Make sure that the correct control diskette is installed.

Press cancel key.

Any log in process?
Y N

034
(Entry Point K)
****

This Reference Code may also come up after program load was started.

Suspect:

1. Malfunction of processing unit or support-bus-adapter.
2. No IPL record on tape.
3. Device problem of the IPL device.
4. Any interface problem.
5. Device problem of any other device.

Run test chaining.

Any reference code?
Y N

035
Did the message *IPL error* appear on the screen?
Y N

036
Go to Page 3, Step 015, Entry Point C.

037
Run interface (wrap) test for the interface to the IPL device.

ATTENTION:

Power down the control units/controllers during the test run.
Start the tests by putting the wrap plugs in the first control unit/controller after the processor then in the most distant control unit/controller. By systematically putting the wrap plugs in the other control units/controllers the area in which the fault lies is approached.

Any reference code?
Y N

038
Run inline tests for the IPL device.

Any reference code?
Y N

039
Go to Page 3, Step 015, Entry Point C.

040
Go to appropriate map via the reference code directory.

041
Go to appropriate map via the reference code directory.

042
Go To Map 0020, Entry Point XZ.

043
Any reference code 49000001 or 4B000101?
Y N

044
Go To Map 0020, Entry Point A.

045
The PU may be stopped or in a loop due to an handling error.
Write down the reference code for later use.

Run test chaining.

Any reference code?
Y N

046
Install control diskette.
Perform IML and the customer manual operation, that causes the error.

Same error (reference code) again?
Y N

047
If any other ref.code E6XXXX81,
Go to Page 1, Step 001, Entry Point A.

If any other ref.code,
Go To Map 0020, Entry Point A.

048
Use the previously saved reference code for further analysis.
Proceed with the respective map for the PU log, respectively use the REFCODE ANALYSIS.

049
Go to appropriate map via the reference code directory.

050
Wrong storage size.
Correct the VSE storage size in the IPL specification picture, then do IPL again.

051
Make sure that there is not any wrap connection left in the system.
Go to Page 6, Step 033, Entry Point CK.

052
Go To Map 0E00, Entry Point A.

053
(Entry Point SC)
****

This reference code must have a four byte extension field (symptom code XXXXXXXX)
E6....81 XXXXXXXX

Write down this Reference Code for further trouble analysis.

Is the first byte of symptom code (reference code extension) X'00' or X'BB'?
Y N

054
Is the first byte of symptom code (reference code extension) X'10' ?
Y N

055
(Entry Point AA)
****

HOW TO USE THE FOLLOWING TABLES
==========

1.Look up the symptom code (reference code extension) in column 1.
2.Perform the recommended action in column 2.
If a test detects an error, proceed with the reference code from the test.
If a test does not find an error or the recommended action does not fix the problem, proceed with the MAP as indicated in column 3.

Is the first byte of the symptom code X'40'?
Y N

056

Column 1	Column 2	Column 3
Symp. Codes for FTA	Recommended action	Go to map
20 14 1Y XX (Note) 20 22 1Y XX (Note)	1. Run and loop IC-Bus test 2. Run and loop FTA test	0001, Entry Point A
20 20 1Y XX	Check 8809 configuration. (STRING NOT CONTIGUOUS) AND CORRECT IT, IF REQUIRED.	0001, Entry Point A
20 25 1Y XX (Note) 20 27 1Y XX (Note)	Suspect failing I/O. Run inline test to the attached I/O's.	0001, Entry Point A
20 30 1Y XX (Note)	Suspect diskette or I/O configuration problem. Check for mismatch between Diskette- and I/O configuration on FTA and correct it if required.	0001, Entry Point A
20 31 1Y 00 20 31 1Y 08 20 31 1Y 20	Perform IML. If a reference code comes up proceed with MAP 0020, ENTRY POINT A. If you get a hang, proceed with MAP 0400, ENTRY POINT R	

(Step 056 continues)

(Step 056 continued)

** NOTE ** for system 4321 or 4331:
Y = 2 = FTA 2
Y = 4 = FTA 1

for system 4331-2 or 4331-11:
Y = 2 = FTA 2
Y = 4 = FTA 1
Y = 1 = FTA 3

Power down the controllers before starting the test, except for the inline tests.

For CTLI-test: Start the test by putting the wrap plugs in the controller next to the processor and then into the most distant controller. by systematically putting the wrap plugs in the other controllers the area in which the fault lies is approached.

057

Column 1	Column 2	Column 3
Symptom Codes for CA	Recommended action	Go to MAP
40 01 1X 00 40 01 1X 40 40 02 1X 00 40 02 1X 40 40 03 1X 00 40 03 1X 40	Replace FRUs as told by the REFCODE ANALYSIS. HINT: In order to find out the faulty CCA card invoke the "customer manual operations"- take out one CCA card after the other and perform always "program reset" in between. Caution, at least one CCA Card has always to be kept INSTALLED. As soon as the same error does not come up anymore when a CCA card is out, replace that card. If the same error always happens independently from any CCA card removal, replace the FRU that is suspected with the next priority.	0001, ENTRY POINT 0

Symptom code found?
Y N

058
Go to Page 15, Step 070, Entry Point P.

059
Do the recommended action.

060
Be sure that the correct control diskette is installed.

Press cancel key.

Any log in process?
Y N

061
Is the last byte in the symptom code (ZZZZZYXX) 'XX=00'?
Y N

062
Go to Page 15, Step 070, Entry Point P.

063
Replace FRUs as told by the REFCODE ANALYSIS.

064
Go To Map 0020, Entry Point A.

065
(Entry Point AB)
****

HOW TO USE THE FOLLOWING TABLE:
==========

1. Look up the symptom code (reference code extension) in column 1.

2. Perform the recommended action in column 2.
   If the recommended action does not find the problem, proceed with the MAP as indicated in column 3.

Column 1	Column 2	Column 3
Symptom codes for Common I/O Reset	Recommended action	Go to MAP
00 01 1F 00	Suspect incorrect configuration or incorrect diskette. Therefore do the following: If IML was done from the Diag diskette, run the "Copy configurator program, see MAP FE90 ENTRY POINT DD.	
	If IML was done from the control diskette FU1, invoke your support structure	0001, ENTRY POINT U

(Step 065 continues)

(Step 065 continued)

Column 1	Column 2	Column 3
Symptom codes for Common I/O Reset	Recommended action	Go to MAP
00 02 1F 00	Perform IML. If a reference code comes up proceed with MAP 0020, ENTRY POINT A. If you get a hang, proceed with MAP 0400, ENTRY POINT R.	
00 03 1F 00	Go directly to -->	0001 ENTRY POINT 0
00 04 1F 00 BB 00 00 01 BB 00 00 02	Suspect incorrect adapter configuration, therefore do the following: If IML was done from the Diag diskette, run the "Copy configuration program" see MAP FE90, ENTRY POINT DD If IML was done from the control diskette FU1, invoke your support structure	0001, ENTRY POINT U

Symptom code found?

Y N

066

Had you already invoked the REFCODE ANALYSIS before?

Y N

067
Insert DIAG diskette DD2 if 4331-2/11.
Select the IBM MAINTENANCE AND SERVICE PROGRAM SELECTION.

Invoke the REFCODE ANALYSIS.

If the message INFO BOX is shown, have also a look there for any information.

There might be important hints to this problem.

When you have read the information, select the REFCODE ANALYSIS (IRECA) again.

Key in the reference code from the customer manual operation, E6....81.

Also key in the symptom code (reference code extension).

Go to Step 068, Entry Point BB.

068
(Entry Point BB)
****

Follow the instructions given by the REFCODE ANALYSIS. After the repair, do the verification.
Go to Page 21, Step 090, Entry Point V.

069
Follow the reference in Column 3 of the table above, then do the verification.
Go to Page 21, Step 090, Entry Point V.

070
(Entry Point P)
****

Check the last byte (XX) of the symptom code (reference code extension) ZZZZZYXX.

Each bit of byte XX that is *ON* indicates an adapter in error during the reset sequence.

Is only one bit on in byte XX?
Y N

071
There is more than one bit on in byte XX; more than one adapter is suspected.

Now look at the rightmost halfbyte (Y) of the third byte of the symptom code ZZZZZYXX.

The value Y indicates the address of the first failing adapter.

Look up the Y value in the following table.
Go to Page 17, Step 072, Entry Point PX.

072

Look up the value of byte XX in the following table.

(Entry Point PP)

****

1. Identify the failing adapter(s), see XX in the symptom code field (ZZZZZYXX).
   A failing adapter is indicated by a one-bit (1) in byte XX.

Byte XX Bit Pos.	Meaning for 4321/4331-1	Meaning for 4331-2/11
0	not used	HSC
1	MPX/CA-BA	FTA 3
2	FTA 2	BMPX 2
3	not used	MPX/CA-BA
4	FTA 1	FTA 1
5	BMPX 1	BMPX 1
6	BBA0/BBA1	not used
7	not used	BBA0/BBA1

2. Identify the f i r s t failing adapter, see Y in the symptom code field (ZZZZZYXX).

   Note: The adapters are reset in a predifined sequence. The first adapter in the sequence that fails is indicated by a certain hex value in the symptom code field (see Y).

(Step 072 continues)

(Step 072 continued)

(Entry Point PX)
****

Y Hex Value	Meaning for 4321/4331-1	Meaning for 4331-2/11
0	not used	HSC
1	MPX/CA-BA	FTA 3
2	FTA 2	BMPX 2
3	not used	MPX/CA-BA
4	FTA 1	FTA 1
5	BMPX 1	BMPX 1
6	BBA0/BBA1	not used
7	not used	BBA0/BBA1
F	Failure detected by: - Common I/O Reset, or - Common Reset Routine, or - EMU/FA Reset	

Write down the hex value (y) of the failing adapter(s) for later use.

Refer to Y in the symptom code field (ZZZZZYXX).

Is Y = F ?
Y N

073
Try to recreate the error!

Perform IML or repeat the customer manual operation that caused the failure.

Does the failure occur again?
Y N

074
Go to Page 20, Step 079, Entry Point D.

2 1
0 8
A A
H J

075
Disconnect the flatcables for the adapter(s) indicated by the step before from the serpent connector in the tailgate 01D.

See Vol.13, STM, Section 1: LOCATIONS (Cable Locations).

Perform IML or the customer manual operation that causes this failure.

Same Reference Code?
Y N

076
Go to Page 21, Step 085, Entry Point X.

077
The error is probably within the indicated adapter(s)
Action:

1.Reconnect removed flatcables.

2.Check for a configuration mismatch between the adapters that are physically installed and the configuration on diskette.

To check the configuration: Make sure that the CNTRL diskette (FU1) is installed.

Select the IBM MAINTENANCE AND SERVICE PROGRAM SELECTION. Select *C* UTILITIES/REMOTE. Select *9* Display Diskette* and then *C* HARDWARE CONFIGURATION* or select immediately *C9C*.

Read the information on the configuration screen and compare the configuration shown on screen with the actually installed parts.

(Step 077 continues)

(Step 077 continued)
3.Make sure that the terminator card(s) are plugged in the correct position.

Terminator card(s):

4321/4331-1: 01A-B2X2

4331-2/4331-11:
IC-BUS0: 01A-B2X2
IC-BUS1: 01A-B2YL,YM

4.Perform IML with the DIAG diskette DD1.

Run test chaining.

Any reference code?
Y N

078

Run also Interface Wrap Test for the indicated adapter(s).

Fail Adapt. hex value (Y)	Interface Test for 4321/4331-1	Interface Test for 4331-2/4331-11
0	not used	HSC (stand. interf. test)
1	MPX (stand. interf. test	FTA3 (CTLI-3 test)
2	FTA2 (CTLI-2 test)	BMPX2 (stand.interf.test)
3	not used	MPX (stand. interf. test)
4	FTA1 (CTLI-1 test)	FTA1 (CTLI-1 test)
5	BMPX1 (stand.interf.test)	BMPX1 (stand.interf.test)

ATTENTION:
Power down the control units/controllers before starting the test run. Start the tests by putting the wrap plugs in the first control unit/controller after the processor, then in the most distant one. By systematically putting the wrap-plugs in the other control units/controllers the area in which the fault lies is approached.

(Step 078 continues)

(Step 078 continued)

Any Reference Code?
Y N

079
(Entry Point D)
****

Were you led to this MAP by the REFCODE ANALYSIS?
Y N

080
Insert DIAG diskette DD2 if 4331-2/11.

Select the IBM MAINTENANCE AND SERVICE PROGRAM SELECTION.

Invoke the REFCODE ANALYSIS.

If the message INFO-BOX is shown, have also a look there for any information. There might be important hints to this problem. When you have read the information, select the REFCODE ANALYSIS (IRECA) again.

Key in the reference code from the customer manual operations. Key in also the four byte refcode extension into the symptom field.

Since you followed this MAP up to here, you can replace now the FRUs immediately.
Go to Step 081, Entry Point Q.

A A A A 1860 MAP E680-20
H K L M
1 1
7 9

081
(Entry Point Q)
****

Replace the FRUs which are shown by the REFCODE ANALYSIS starting with the highest priority.

After the FRU replacement,
Go to Page 21, Step 090, Entry Point V.

082
Go to appropriate MAP.

083
(Entry Point L)
****

Note the reference code and the first symptom code, if any.

Invoke the REFCODE ANALYSIS. (Use DIAG diskette DD2 if 4331-2/11.)

Do the repair action as given in REFCODE ANALYSIS.

After the repair
Go to Page 21, Step 090, Entry Point V.

084
Go to Page 13, Step 065, Entry Point AB.

A A
L M

085
(Entry Point X)
****

Reconnect the previously removed flatcables. Now power down the I/O devices attached to the failing adapter(s) ONE at a time and try to recreate the error until the error does not come up again.

The last I/O that was powered down is suspected to cause the error.

Is the error still coming up, although all I/Os are powered down?
Y N

086
Failure is caused by the last I/O that was powered down. Go to its I/O Documentation.

087
Check Interface Terminators.
Run appropriate Interface (Wrap) Test.

Any Reference Code?
Y N

088
Failure may be intermittent.
Run and loop appropriate I/O Inline Tests or OLTEP or ST4300.

089
Go to appropriate MAP via reference code directory.

090
(Entry Point V)
****

Verification:

Perform IML with the control diskette FU1.

Any error?
Y N

091
Perform IPL or the customer manual operation that causes the problem.

Any reference code?
Y N

092
Any other error indication?
Y N

093
Go To Map 0001, Entry Point A.

094
Go To Map 0000, Entry Point A.

095
Go to Page 22, Step 098, Entry Point M.

096
Any reference code?
Y N

097
Go To Map 0400, Entry Point R.

098
(Entry Point M)
****

Same reference code E6....81 ZZZZZYXX again?
Y N

099
(Entry Point VS)
****
Go To Map 0020, Entry Point A.

100
Are all FRUs replaced as suspected by the REFCODE ANALYSIS?
Y N

101
Replace the FRUs suspected with the next higher priority, then
Go to Page 21, Step 090, Entry Point V.

102
Was only *ONE* failing adapter indicated by the procedure on page 15, step 070, ENTRY POINT P?
Y N

103
Are all suspected adapters replaced?
Y N

104
Now replace the cards for the second failing adapter. (For Card Location see STM, Vol.13, Page 1050).

After FRU replacement,
Go to Page 21, Step 090, Entry Point V.

105
Invoke your support structure.
Go To Map 0001, Entry Point O.

106
Go To Map 0001, Entry Point O.

REF.CODE DIRECTORY

001

ENTRY POINTS

FROM MAP NUMBER	ENTER THIS MAP: ENTRY POINT	PAGE NUMBER	STEP NUMBER
EXXX	A	2	001
0001	A	2	001
0020	A	2	001

```
######################################################################
#                                                                    #
#     R E F E R E N C E   C O D E   D I R E C T O R Y   F O R        #
#                                                                    #
#      *        4 3 3 1   P R O C E S S O R                         #
#     * *                                                            #
#    *   *      M O D E L   G R O U P   1 / 2                       #
#   *******                                                          #
# *       *     P O W E R  D E S I G N  L E V E L  4 / 5            #
#                                                                    #
######################################################################
```

(Step 001 continues)

(Step 001 continued)

(Entry Point A)

REFERENCE CODE DIRECTORY

REFERENCE CODE	SYMPTOM	GO TO MAP
E8000101	ESD level 1 incident, temperature normal	E800
E8000201	ESD level 2 incident, temperature normal	E800
E8000301	ESD level 3 incident, temperature normal	E800
E8000401	ESD level 4 incident, temperature normal	E800
E80E1201	ESD level 2 incident and ESD latch 1 missing	E8E0
E80E1301	ESD level 3 incident and ESD latch 1 missing	E8E0
E80E1401	ESD level 4 incident and ESD latch 1 missing	E8E0
E80E2301	ESD level 3 incident and ESD latch 2 missing	E8E0
E80E2401	ESD level 4 incident and ESD latch 2 missing	E8E0
E80E3401	ESD level 4 incident and ESD latch 3 missing	E8E0
E8B00001	Ambient temperature went back to normal, D04	E8B0
E8B00101	ESD level 1 incident & temp. warning switched off	E800
E8B00201	ESD level 2 incident & temp. warning switched off	E800
E8B00301	ESD level 3 incident & temp. warning switched off	E800
E8B00401	ESD level 4 incident & temp. warning switched off	E800
E8BE1201	ESD lvl 2 inc. & lvl 1 latch miss & temp. normal	E8E0
E8BE1301	ESD lvl 3 inc. & lvl 1 latch miss & temp. normal	E8E0
E8BE1401	ESD lvl 4 inc. & lvl 1 latch miss & temp. normal	E8E0
E8BE2301	ESD lvl 3 inc. & lvl 2 latch miss & temp. normal	E8E0
E8BE2401	ESD lvl 4 inc. & lvl 2 latch miss & temp. normal	E8E0
E8BE3401	ESD lvl 4 inc. & lvl 3 latch miss & temp. normal	E8E0
E8F00001	Ambient temperature exeeded upper limit, D04	E8F0
E8F00101	ESD level 1 incident & temp. warning switched on	E800
E8F00201	ESD level 2 incident & temp. warning switched on	E800
E8F00301	ESD level 3 incident & temp. warning switched on	E800
E8F00401	ESD level 4 incident & temp. warning switched on	E800
E8FE1201	ESD lvl 2 inc. & lvl 1 miss & temp. warning sw. on	E8E0
E8FE1301	ESD lvl 3 inc. & lvl 1 miss & temp. warning sw. on	E8E0
E8FE1401	ESD lvl 4 inc. & lvl 1 miss & temp. warning sw. on	E8E0
E8FE2301	ESD lvl 3 inc. & lvl 2 miss & temp. warning sw. on	E8E0
E8FE2401	ESD lvl 4 inc. & lvl 2 miss & temp. warning sw. on	E8E0
E8FE3401	ESD lvl 4 inc. & lvl 3 miss & temp. warning sw. on	E8E0

E S D PROBLEM

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
E8XX	A	2	002
0001	A	2	002

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
6	030	E8F0	A
4	010	0001	A

001

SYMPTOM:
ANY ELECTROSTATIC DISCHARGE (ESD) INCIDENT LEVEL 1 TO 4.

IF ANY OF THE FOLLOWING LISTED REFERENCE CODES IS DISPLAYED,
GO TO THE CORRESPONDING MAP ACCORDING TO THE TABLE ON THE NEXT PAGE.

Go to Page 2, Step 002, Entry Point A.

002

(Entry Point A)

REFERENCE CODE	S Y M P T O M	GO TO MAP
E80E1201	ESD level 2 incident and ESD latch 1 missing	E8E0
E80E1301	ESD level 3 incident and ESD latch 1 missing	E8E0
E80E1401	ESD level 4 incident and ESD latch 1 missing	E8E0
E80E2301	ESD level 3 incident and ESD latch 2 missing	E8E0
E80E2401	ESD level 4 incident and ESD latch 2 missing	E8E0
E80E3401	ESD level 4 incident and ESD latch 3 missing	E8E0
E8B00001	Ambient temperature went back to normal, D04	E8B0
E8BE1201	ESD lvl 2 inc. & lvl 1 latch miss & temp. normal	E8E0
E8BE1301	ESD lvl 3 inc. & lvl 1 latch miss & temp. normal	E8E0
E8BE1401	ESD lvl 4 inc. & lvl 1 latch miss & temp. normal	E8E0
E8BE2301	ESD lvl 3 inc. & lvl 2 latch miss & temp. normal	E8E0
E8BE2401	ESD lvl 4 inc. & lvl 2 latch miss & temp. normal	E8E0
E8BE3401	ESD lvl 4 inc. & lvl 3 latch miss & temp. normal	E8E0
E8F00001	Ambient temperature exeeded upper limit, D04	E8F0
E8FE1201	ESD lvl 2 inc. & lvl 1 miss & temp. warning sw. on	E8E0
E8FE1301	ESD lvl 3 inc. & lvl 1 miss & temp. warning sw. on	E8E0
E8FE1401	ESD lvl 4 inc. & lvl 1 miss & temp. warning sw. on	E8E0
E8FE2301	ESD lvl 3 inc. & lvl 2 miss & temp. warning sw. on	E8E0
E8FE2401	ESD lvl 4 inc. & lvl 2 miss & temp. warning sw. on	E8E0
E8FE3401	ESD lvl 4 inc. & lvl 3 miss & temp. warning sw. on	E8E0

(Step 002 continues)

(Step 002 continued)

THIS MAP IS VALID FOR THE FOLLOWING LISTED REFERENCE CODES:

REFERENCE CODE	S Y M P T O M
E8000101	ESD level 1 incident, temperature normal
E8000201	ESD level 2 incident, temperature normal
E8000301	ESD level 3 incident, temperature normal
E8000401	ESD level 4 incident, temperature normal
E8B00101	ESD level 1 incident & temp. warning switched off
E8B00201	ESD level 2 incident & temp. warning switched off
E8B00301	ESD level 3 incident & temp. warning switched off
E8B00401	ESD level 4 incident & temp. warning switched off
E8F00101	ESD level 1 incident & temp. warning switched on
E8F00201	ESD level 2 incident & temp. warning switched on
E8F00301	ESD level 3 incident & temp. warning switched on
E8F00401	ESD level 4 incident & temp. warning switched on

	Suspected errors or FRUs (including intermittent errors)
1	Ambient conditions as floor material, air humidity.
2	Grounding and shielding problems if machine errors appear at the same time.
3	ESD monitor card in position 01A-A2A5.

Is the ESD monitor card installed in position 01A-A2A5?

Y **N**

4 4
A B

003
Ensure that the current ESD sense level is set to zero (see book MI POWER in Vol. 16).
Switch machine power off.
Switch machine power on.
If the problem is not solved, return to the MAP you came from or call your Field Support Center for support.

004
(Entry Point G)

1.Press power-off switch.
2.Connect CE-meter (range 1.5VDC) to
01A-A2A5-D07 (+)
'(Test point for reference voltage)'
and to any D08 pin
'DC-GND'
3.Press power-on switch.

Is the ESD monitor reference voltage 0.8VDC?
Y N

005
Adjust the ESD monitor reference voltage to 0.8VDC. Use the potentiometer on the ESD monitor card in position 01A-A2A5 for adjustment.
If the potentiometer is sealed, please remove the sealing before adjustment.

Is the ESD monitor reference voltage 0.8VDC?
Y N

006
1.Press power-off switch.
2.Replace the ESD monitor card in position 01A-A2A5.
Go to Step 004, Entry Point G.

007
(Entry Point H)

Use the Ambient Recording Log Display and read the current ESD sense level.

Is the current ESD sense level equal 0?
Y N

008
Note:
This MAP asks for certain reference codes containing the letter X.
The letter X stands for any hex digit 0 to F.
Use the ambient recording log display and check for ESD logs.

Note:
Write down the current ESD sense level.
This information may be required later.
Are ESD-logs available?
Y N

009
Is the minimum ESD-sense level equal 1 ?
Y N

010
1.Increase the sensitivity of the ESD monitor program by setting next lower ESD sense level.

Note:
Level 1 is the most sensitive level.

If the new ESD sense level is correct, change also the ESD sense level on the second control diskette.

2.Check in a few hours or days for ESD logs.

(Entry Point Z)

Go To Map 0001, Entry Point A.

REF.CODE E8X00X01

E S D PROBLEM

011
Suspect other than ESD problems.
Go to Page 4, Step 010, Entry Point Z.

012
Is the last ambient log E8B00X01?
(Temperature returned to normal)
Y N

013
Is the last ambient log E8F00X01?
(Ambient temperature exeeded upper limit)
Y N

014
(Entry Point B)

1.Display the last 5 machine logs.
2.Compare the time stamps of these logs with the time stamps of the ESD logs.

Are there coincidences within a time frame of 3 minutes between certain machine logs and the ESD logs.
Y N

015
Are there more than 20 ESD incidents per day?
Y N

016
No further ESD actions required.
Go to Page 4, Step 010, Entry Point Z.

017
Use the ambient recording log display and check the sensitivity of the ESD monitor.

Is the ESD sense level set to 4 ?
Y N

018
Set next higher ESD sense level on both control diskette.
Note: Sense level 1 is the most sensitive level.
Go to Page 4, Step 010, Entry Point Z.

019
Does customer complain of performance degradation which could be caused by high freqently ESD logs?
Y N

020
Go to Step 022, Entry Point F.

021
1.Disable the ESD monitor by setting the minimum ESD sense level to 0.
Go to Page 6, Step 028, Entry Point D.

022
(Entry Point F)

Have you alredy done the ESD checks?
Y N

023
Do the following listed ESD checks:

1.Cover gasket must have sufficient contact to the machine frame. There should be no gap. The covers must be adjusted to get a good frame contact along the total gasket length.

2.The gate cover must be installed.

3.The shield of all external cables must be grounded next to the cable entry. The ground leads have usually slip on connectors. Check each cable.

4.Aluminium plated connectors must be installed for the standard interface (MPX, BMPX) and for FTA interface. The plating
(Step 023 continues)

(Step 023 continued)
quality may be significantly degraded by climatic stress (dark surface of plating material). Perform a visual inspection.

Connector blocks for the MFCU are not interchangeable with other connector blocks. MFCU interface signals will be grounded if other connector blocks are used for the MFCU.
MFCU connector blocks have no red dots at their short side.

Metallic dummy blocks (fillers) must be installed in each unused I/O interface connector position.

5.Ensure that a sufficient contact exists between all connector blocks and dummy blocks (if present) if the cover of gate 01D is closed.

6.Ensure that the screws of the ground strap between gate 01A (hinge side) and machine frame are tight.

Any error detected and repaired?
Y N

024
Go to Step 026, Entry Point E.

025
Go to Page 4, Step 010, Entry Point Z.

026
(Entry Point E)

Have you already replaced the ESD monitor card in position 01A-A2A5?
Y N

P Q

027
1.Press power-off switch.
2.Replace the ESD monitor card in position 01A-A2A5.
Go to Page 4, Step 010, Entry Point Z.

028
(Entry Point D)

Fill in the form sheet for support calls. Call your Field Support Center for support.

029
There was an ESD incident of any level 1 to 4 and the ambient temperature warning is switched on. Normally there is no correlation between both events.

Is the environment temperature above 36 degrees centigrade (95 degrees F)?
Y N

030
Go To Map E8F0, Entry Point A.

031
(Entry Point C)

1.Advise the customer to keep the environment temperature within the specified limits.
2.Take care of the ESD incident and
Go to Page 5, Step 014, Entry Point B.

032
There was an ESD incident of any level 1 to 4 and the ambient temperature went back to normal. Normally there is no correlation between both events.
Go to Step 031, Entry Point C.

033
1.Set the current ESD sense level to 3.
2.Press power-off switch.
3.Press power-on switch and wait approximately one minute.

Is any reference code displayed?
Y N

034
Trouble shooting should be stopped here. Further ESD incidents will be logged and may be used later in case of system problems without error isolation.
Go to Page 4, Step 010, Entry Point Z.

035
Go to MAP for displayed reference code.

036
Go to Page 4, Step 007, Entry Point H.

THERMAL PROBLEM

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
EXXX	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
1	001	0204	A

001

Symptom:

Air inlet temperature returned to normal, D04.

Suspected errors or FRU's (including intermittent errors)	
1.	Dirty air filters.
2.	Defective blower.

(Entry Point A)

NOTE:

The environment temperature exeeded 35 degrees centigrade (97 degrees F) and went back to normal (temperature below 35 degrees C or 97 degrees F).
Both events, exeeding upper limit and returning to normal, are logged with time stamps.
You can display both logs and compare the time staps.
The difference of both time stamps indicates the duration of high ambient temperature.
To prevent overheating, ensure that all blowers are running and all air filters are clean.
To check the air filters visually, you have to remove at least one spring which holds the airfilter in its position.
NOTE: The airflow is from top to bottom.
If necessary the airfilter must be cleaned or replaced.
The customer must keep the environment temperature within the specified limits.

Go To Map 0204, Entry Point A.

POWER PROBLEM

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
No entries in this table			

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	010	0204	A

001
Symptom:
Any ESD hardware failure after power on.

	Suspected errors or FRU's (including intermittent errors)
1	ESD monitor card 01A-A2A5.
2	PC sense card 01A-A2D2.
3	PC sense card 01A-A1C2.
4	Wiring from ESD monitor card to power controller card 01A-A2D2.

(Entry Point A)

Note: This MAP asks for ESD error logs. EDS error logs are part of the ambient recording log display and are intensified displayed. An ESD error log shows any ESD incident level 2 to 4 and any lower ESD level is missing. For more details see ambient recording log display in book MI POWER.
1.Press power-off switch.
2.Press power on switch and wait approximately one minute.

Is any reference code displayed?
Y N

3 2
A B

002
Use the ambient recording log display and check for ESD error logs.

Note: ESD error logs are intensified displayed.

Is any ESD error log available?
Y N

003
Retry power off/power on several times and use the ambient recording log display and check for ESD error logs.

(Entry Point B)

Is any ESD error log available?
Y N

004
Is any reference code displayed?
Y N

005
Suspect intermittent error. Replace the parts listed on top of this MAP step by step. Wait until the error occurs again before replacing the next listed part
Go to Step 010, Entry Point Z.

006
Go to corresponding MAP.

007
Is any reference code of format F708XX81 displayed?
Y N

C D E

008
(Entry Point D)

1.Press power off switch.
2.Replace the ESD monitor card 01A-A2A5.
3.Press power on switch and wait approximately one minute.
4.Use the ambient recording log display and check for ESD error logs.

Is any ESD error log available?
Y N

009
1.Retry power off/power on several times.
2.Use the ambient log display and check for ESD error logs.

Is any ESD error log available?
Y N

010
(Entry Point Z)

Go To Map 0204, Entry Point A.

011
(Entry Point C)

1.Replace PC sense card(s) 1 and/or 2 in positions 01A-A2D2 and 01A-A2C2 step by step.
Go to Step 010, Entry Point Z.

012
Go to Step 010, Entry Point Z.

013
Go to corresponding MAP.

014
Go to Step 008, Entry Point D.

015

Go to corresponding MAP.

THERMAL PROBLEM

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
EXXX	A	2	002
E800	A	2	002

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	006	0200	A
6	029	0202	A
6	028	0204	A
4	018	0215	A

001

Symptom:

Air inlet temperature too high, D04.

	Suspected errors or FRUs (including intermittent errors)
1	Blower problem.
2	Air filter problem.
3	High ambient temperature.
4	Component overheating.
5	+24VDC PS103 or PS104 distribution.
6	BPC card 01A-A2B2.
7	PC sense card 01A-A2D2.
8	Defective thermal switch TH109.
9	Thermal switch wiring.
10	D04 sense wiring.

Go to Page 2, Stop 002, Entry Point A.

002

(Entry Point A)

NOTE 1:
Opening of the thermal switch TH109 generates an ambient log. The log is accessible to the CE via the Ambient Recoding Log Display.

NOTE 2:
To prevent overheating, ensure that all blowers are running and that all air filters are clean. To check the air filters visually, you have to remove at least one spring which holds the airfilter in its position. The airflow is from top to bottom. If necessary the airfilter must be cleaned or replaced. The customer must keep the environment temperature within the specified limits.

NOTE 2:
3. The letter X within a reference code stands for any digit or character.

Is the ambient temperature above 36 degrees centigrade (95 degrees F)?

Y N

003

1.Connect CE-meter (range 5VDC)
-lead to 01A-A2D2-G03
'-Inlet TH failed D04'
(ALD-YB641)
+lead to 01A-A2D2-D03
'(+5V)'
2.Observe your meter and press the power-on switch.
Is 5VDC present?

Y N

6 6 3
A B C

004
Wait approximately two minutes. Use the ambient recording log display and check for a temperature log generated during the last two minutes.

Is a new temperature log present?
Y N

005
Is the "power complete" indicator on?
Y N

006
(Entry Point B)

Go To Map 0200, Entry Point A.

007
Was the last reference code E8XXXX01?
Y N

008
Suspect an intermittent overheating problem. Check all blowers for correct operation and the air filters in the machine covers.
Go to Page 6, Step 028, Entry Point Z.

009
The ambient temperature went back to normal.
Ensure that all blowers are running and that the airfilters are clean.
The customer must keep the ambient temperature within the specified limits.
Go to Page 6, Step 028, Entry Point Z.

010
Was the last reference code E8FXXX01?
Y N

011
Go to corresponding MAP.

012
(Entry Point C)

Connect CE-meter (range 50VDC)
+lead to TH109-COM
'+24V PS103 to thermals'or
'+24V PS104 to thermals'
(ALD-YA341)
-lead to any DC-GND.

Is 24VDC present?
Y N

013
1.Press power-off key.
2.Connect CE-meter
(range 50VDC)
+lead to 01A-A2C1-A06
'+24V PS103 to thermals'or
'+24V PS104 to thermals'
(ALD-YB221)
-lead to any D08 pin.
3.Observe your meter and press and hold power-on switch.

Is 24VDC present?
Y N

014
1. Press power-off switch.
2.Check and repair +24V wiring
from 01A-A2B3-F14 to
01A-A2C1-A06
'+24V PS103 to thermals'or
'+24V PS104 to thermals'
(ALD-YB221)
Go to Page 6, Step 028, Entry Point Z.

015
1.Press power-off switch.
2.Check and repair wiring from
01A-A2C1-A06 to TH107-NCL.
'+24V PS103 to thermals'or
'+24V PS104 to thermals'
(ALD-YA341)
Go to Page 6, Step 028, Entry Point Z.

016

1.Connect CE-meter (range 50VDC)
+lead to TH109-NCL
'-Inlet TH failed D04'
(ALD-YA341)
-lead to any DC-GND.

Is 24VDC present?

Y N

017

Thermal switch TH109 is open.

Are the blowers AMD101, AMD102 and AMD103 running?

Y N

018

Suspect overheating caused by failing blower.
Repair failing blower according to Map 0215.
Go To Map 0215, Entry Point A.

019

Check for clean airfilters in the machine covers.

Are the airfilters ok?

Y N

020

Clean the airfilters or replace them.
Go to Page 6, Step 028, Entry Point Z.

021

1.Press power-off switch.
2.Replace thermal switch TH109.
Go to Page 6, Step 028, Entry Point Z.

022

1.Press power-off switch.
2.Press power on switch and wait approximately one minute. Use the ambient recording log display and check for the last reference code.

Was the last reference code E8FXXX01?

Y N

023

Overheating condition does not exist anymore.
Ensure that all blowers are running and that all airfilters are clean.
Go to Page 6, Step 028, Entry Point Z.

024

1.Press power-off key.
2.Remove cards from
01A-A2B2 and 01A-A2D2.
3.Perform wiring check for the following nets.
Apply the wiring check procedure shown in book
Maintenance Information (MI) POWER.

```
|------|
| CARD |*| 01A-A2B2-S05 (ALD-YB421)
|------| |
        | Board wiring
|------| |
| CARD |=| 01A-A2D2-G03 (ALD-YB641)
|------| |
```

*'-Inlet TH failed D04'

```
|------|
| CARD |*| TH109-NCL (ALD-YA341)
|------| |
        | Wiring
|------| |
| CONN |=| 01A-A2B1-D08 (ALD-YB221)
|------| |
        | Board wiring
|------| |
| CARD |=| 01A-A2B2-U02 (ALD-YB423)
|------|
```

*'-Inlet TH failed D04'

Any wiring error detected and repaired?

Y N

REF.CODE E8FXXX01
THERMAL PROBLEM

025

1. Reinstall the BPC card into posiiton 01A-A2B2.
2. Replace the PC sense card 1 which was previously removed from position 01A-A2D2.
3. Press the power on switch and wait approximately one minute.
4. Display the ambient recording logs.

Was the last reference code E8FXXX01?

Y N

026
Go to Page 3, Step 006, Entry Point B.

027

1. Press power-off switch.
2. Reinstall the previously replaced PC sense card 1 into position 01A-A2D2.
3. Replace the BPC card in position 01A-A2B2.
4. Press power on switch and wait approximately one minute.
5. Display the ambient recording logs.

Was the last reference code E8FXXX01?

Y N

028
(Entry Point Z)

Go To Map 0204, Entry Point A.

029

Suspect diskette problem.
Use the diagnostic diskette and retry power on.
If any reference code E8FXXX01 is still generated.
Go To Map 0202, Entry Point A.

030

Go to Step 028, Entry Point Z.

031

Go to Page 3, Step 012, Entry Point C.

032

Customer must keep the ambient temperature within the specified limits. No machine problem exists.
Go to Step 028, Entry Point Z.

PU DETECTED CTL INFO ERRORS

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
EXXX	A	1	001
FE90	A	1	001
RFCA	A	1	001
RFCA	B	5	020
RFCA	P	1	003
RFCA	V	10	023
0020	A	1	001
8200	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
10	026	0001	A
4	018	0001	0
4	017	0001	U
11	029	0001	U

001
(Entry Point A)
****

Make sure that you have traced the START MAP 0000 precisely. Another reference code may be more important than the one you have got first.

Are you led to this MAP by the REFCODE ANALYSIS?
Y N

002
Go to Step 003, Entry Point P.

003
It is necessary to do first the following prerequisites before using the REFCODE ANALYSIS:

(Entry Point P)
****

PREREQUISITES:

Most times the reference codes EA..... are caused by control information problems.

(Step 003 continues)

(Step 003 continued)
Therefore invoke your support structure and do first a problem search, before you replace any FRU.
Write down the suspected FRUs, when indicated by the REFCODE ANALYSIS.

Use the remote support facility, if available.

Is there any problem description/ solution/ MCTF (patch) provided?
Y N

004
Did the error come up after having used a new CNTRL diskette or when running a new customer's application program?
Y N

005
Did the system run error free up to now under the same conditions?
Y N

006
See the log summary (log distribution statistics).

Refer to Vol. 13, STM Section 4: Diagnostic Run Procedures (Reference Code Log)

Are there previous logs that may originate from the same error source?
Y N

007
Run test chaining.

Any error?
Y N

4A 4B 3C 3D 3E 3F

008
(Entry Point AA)
****

Have you already invoked the REFCODE ANALYSIS ?
Y N

009
Select the IBM MAINTENANCE and SERVICE SELECTION PROGRAM.

Invoke the REFCODE ANALYSIS.

(Entry Point Z)
****

Key in the reference code from the PU detected control information error, EA.....

Go to Step 012, Entry Point J.

010
Are there suspected FRUs indicated by the REFCODE ANALYSIS ?
Y N

011
Look up the reference code EA..... in column 1 of the following table.

The suspected area is indicated in column 2.

Perform the recommended action in column 3.
Go to Page 5, Step 020, Entry Point B.

012
(Entry Point J)
****

Do now the repair as told
---
by the REFCODE ANALYSIS.

After the repair, do the verification.
Go to Page 10, Step 023, Entry Point V.

013
Go to appropriate MAP, respectively use the REFCODE ANALYSIS. After the repair,
Go to Page 4, Step 017, Entry Point C.

014
Do the repair according to this (these) reference codes.
Then
Go to Page 4, Step 017, Entry Point C.

015
Are there other logs that may lead to the problem (compare the time stamps)?
Y N

016
Look up the reference code EA..... in column 1 of the following table.

The suspected area is indicated in column 2.

Perform the recommended action in column 3.
Go to Page 5, Step 020, Entry Point B.

017
In this case use the other error log(s) for the repair action.
Go to the appropriate MAP and then return to here again.

(Entry Point C)
****

After the repair, inform your support structure immediately about all details of the error, therefore
Go To Map 0001, Entry Point U.

018
(Entry Point T)
****

The problem is probably a control information error.
Go To Map 0001, Entry Point O.

019
Proceed as indicated by the problem description.
Go to Step 017, Entry Point C.

020
(Entry Point B)
****

Column 1	Column 2	Column 3
Ref. Code	Suspected Areas:	Recommended Action:
EA00AX01	For 4321/4331-1: MPX, BMPX, FTA1, FTA2, PU For 4331-2/4331-11: MPX, HSC/FTA3 FTA2/BMPX2, FTA1, BMPX1, PU	Replace FRUs as indicated by the REFCODE ANALYSIS. If this does not help, go to MAP 0001, ENTRY POINT U.
EA00CX01 EA00DX01 EA00EX01 EA00FX01	Error probably caused by a previous machine check.	Please select the last log and go to MAP according to the last logged reference code. If no last log is stored, look for further logs in the log summary. If there are further logs, write them down and continue with MAP 0001, ENTRY POINT X.
EA09XX01	The BBA control code in the PU has detected an abnormal condition which led to a machine check	Replace FRUs as indicated by the REFCODE ANALYSIS. If this does not help, go to MAP 0001, ENTRY POINT U.
EA0A0101	Control info. error	Go to MAP 0001, ENTRY POINT 0.

(Step 020 continues)

PU DETECTED CTL INFO

(Step 020 continued)

Column 1	Column 2	Column 3
Ref. Code	Suspected Areas:	Recommended Action:
EA10XX01	Reason: The MPX/BMPX control information in the PU has detected a abnormal condition which leads to a machine check.	Proceed with the reference code shown below according to the value of XX: XX = Ref. code 00 84113101 10 80113101 20 81113101 01 84219101 11 80219101 21 81219101 02 84221101 12 80221101 22 81221101 03 84335101 13 80335101 23 81335101 04 84AA2101 14 80AA2101 24 81AA2101 05 84AA4101 15 80AA4101 25 81AA4101 06 84FF0101 16 80FF0101 26 81FF0101

(Step 020 continues)

(Step 020 continued)

Column 1	Column 2	Column 3
Ref. Code	Suspected Areas:	Recommended Action:
		07 84FF1101 17 80FF1101 27 81FF1101 08 84FF2101 18 80FF2101 28 81FF2101 09 84FFF101 19 80FFF101 29 81FFF101 Go to appropriate MAP via reference code directory 8XXX, ENTRY POINT A
EA20XX01	For 4321/4331-1: FTA1, FTA2, IC-Bus, DATA MOVER For 4331-2/4331-11: FTA1, FTA2, FTA3, IC-bus 0, IC-bus 1, DATA MOVER.	Replace FRUs as indicated by the REFCODE ANSLYSIS. If this does not help, go to MAP 0001, ENTRY POINT U.
EA300501 EA300901 EA302401 EA302501 EA302601 EA302701	Note: Error detected during data transfer between HSC and DATA MOVER.	Run PU/BSM test. Suspect PU card 7; 01A-B1J2 If no success go to MAP 0001, ENTRY POINT 0.
EA302801 EA302901	Control information error (High Speed Channel)	Go to MAP 0001, ENTRY POINT 0

(Step 020 continues)

(Step 020 continued)

Column 1	Column 2	Column 3
Ref. Code	Suspected Areas:	Recommended Action:
EA304201	Control information error (High Speed Channel)	Go to MAP 0001,ENTRY POINT 0
	I/O Control Unit(s) connected to HSC	Run HSC standard Interface Test). See Vol.13, STM, Section 4: Standard Interface Test. (A failing "Request In" signal from attached I/O control unit(s) is suspected.)
EA304401 EA304501 EA305001	Control information error (High Speed Channel)	Go to MAP 0001, ENTRY POINT 0
EA4XXX01	PU	Look for a PU stop log. If there is no PU stop log go to MAP 0001, ENTRY POINT 0
EA637001		If this ref. code comes up, you have probably inserted a diskette the EC level of which is below EC 364300. If not, go to MAP 0001, ENTRY POINT 0.

(Step 020 continues)

(Step 020 continued)

Column 1	Column 2	Column 3
Ref. Code	Suspected Areas:	Recommended Action:
EAFXXX01	An error was detected during the copy operation of the loop adapter configurator.	Suspected areas of error: 1.A handling error was made during copy configuration (for example the IML key has been pressed during the copy operation). Recommended action: Repeat the copy configurator procedure. 2.An undetected diskette write error occured during the copy operation. Recommended action: Repeat the copy configurator procedure. 3.If the diskette is used for the first time (new diskette) suspect a diskette link error. Recommended action: A new, corrected diskette is required. Contact your support function. Go to MAP 0001, ENTRY POINT U.
EAXXXX01		Go to MAP 0001, ENTRY POINT 0

Have you found the reference code in the above table ?

Y N

021
Go to Page 4, Step 018, Entry Point T.

022
Follow the recommended action as shown in the table of this MAP.
After the repair do the verification.
Go to Step 023, Entry Point V.

023
(Entry Point V)
****
VERIFICATION:

Run the test chaining.

Any reference code?
Y N

024
Run the interface (wrap) tests for MPX, HSC, BMPX1 and 2, FTA1, FTA2, FTA3.

Attention:

Power down the control units before the test run.

Start the tests by putting the wrap plugs in the first control unit after the processing unit.
By systematically putting the wrap plugs in the other control units the area in which the fault lies is approached.

Any error?
Y N

025
If possible run the application which caused the error.

Does the error appear again?
Y N

026
Go To Map 0001, Entry Point A.

027
Are all suspected FRUs replaced as indicated by the REFCODE ANALYSIS?
Y N

028
Replace the next FRU. Then
Go to Page 10, Step 023, Entry Point V.

029
Invoke your support structure.
Go To Map 0001, Entry Point U.

030
(Entry Point K)
****

Go to respective MAP, respectively use the REFCODE ANALYSIS. After the repair
Go to Page 4, Step 017, Entry Point C.

031
Go to Step 030, Entry Point K.

Ref.code directory

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0000	A	1	001
0001	A	1	001
0010	A	1	001
0020	A	1	001

001
(Entry Point A)

REFERENCE CODE DIRECTORY

Reference Code	Title	Go to MAP
F0XXXX01	SP-MCPC hangs	0400 ENTRY POINT GG
F0XXXX02	I/OSS problems	E008 ENTRY POINT YY
F1CXXX01	SP-Machine Check	F100
F1XXXX01	SP-MCPC hangs	0400 ENTRY POINT GG
F1XXXX02	I/OSS problems	E008 ENTRY POINT YY
F2000081	BBA0 Test MAP	F280
F2XXXX01	BBA0 Log MAP,	F200

(Step 001 continues)

(Step 001 continued)

	BBA of support subsystem	
F3XXXX01	SBA errors	F300
F3XXXX81	SBA test	F380
F4XXXX01	Transmit/receive error log	F400
F5XXXX01	SPIL program MAP	F500
F7XXXXXX	Directory (Power)	F7XX
FCXXXX01	Log in and idle problems	FC00
F80XXX81	Remote TP link	F880
F9XXXX01	DCA-I/O Counter Overflow	F900
FD001081	User diskette entry MAP	FD70
FD002081	User diskette not ready MAP	FD72
FD004081	User diskette seek error MAP	FD74
FD006081	User diskette read error MAP	FD76
FDXXXX01	System diskette error MAP	FD00
FDXXXX81	User diskette error MAP	FD60
FD000081	53FD Entry MAP	FD80
FD000281	Not ready MAP	FD82
FD000481	Seek error MAP	FD84
FD000681	Read error MAP	FD86
FE519X8X	Initialization of CNTRL diskette FU2	FE50
FE620X81	MCTF program errors	FE70
FE621081	Copy system configurator	FE90
FE621180	Copy system configurator	FE92
FE621280	Copy system configurator	FE94
FE621380	Copy system configurator	FE96
FE6XXX80	M/S selection MAP	FE80
FE700X8X	Diskette Handling MAP	FEA0

(Step 001 continues)

Ref.code directory

(Step 001 continued)

FXXXXX01	SP-MCPC hangs	0400 ENTRY POINT GG
FXXXXX02	I/OSS problems	E008 ENTRY POINT YY

SP-MACHINE CHECK

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
FXXX	A	1	001
RFCA	A	1	001
RFCA	B	9	008
RFCA	V	10	017

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
13	029	0001	A
13	030	0001	A
11	026	0001	A
1	003	0400	R
10	019	0400	R

001
(Entry Point A)
****

Perform IML with the CNTRL diskette (FU1).

IML is performed successfully when the PROGRAM LOAD picture appears on screen.

IML successful?
Y N

002
Any ref.code?
Y N

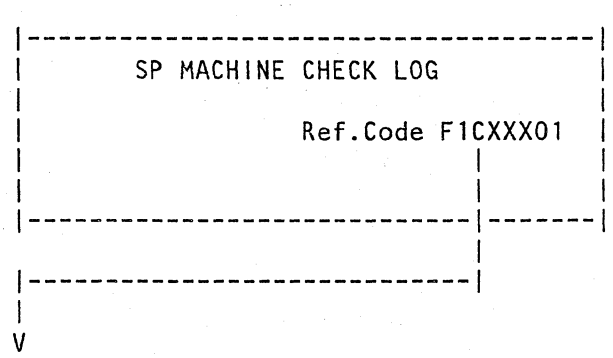
003
Go To Map 0400, Entry Point R.

004
Any reference code F1CXXX01?
Y N

005
Go to appropriate MAP, respectively use the REFCODE ANALYSIS.

006
(Entry Point AA)
****

SP Machine Check Log Display (Example)



To column 1 of the following table.

Look up the reference code in column 1.

Find the FRUs (indicated by FRU numbers) which are suspected in a given priority in column 2 of the table below.

The names and the positions of the FRUs you will find in the FRU table of this MAP, which you will find on page 7, step 006, Entry POINT T.

Do the recommended action shown in column 3 or follow the reference shown in column 4.

(Step 006 continues)

(Step 006 continued)
TABLE:
======

COLUMN 1	COLUMN 2								COLUMN 3	COL.4
Reference CODE	Suspected FRUs PRIORITY								Recommended Action	GO TO MAP
	1	2	3	4	5	6	7	8		
F1C10101	4									
F1C10201	6									
F1C10301	5	4								
F1C20201	13	12	20	21						
F1C20A01	13	12	20	21						
F1C21201	13	12	20	21						
F1C21601	14	20	21							
F1C21701	7									
F1C21A01	13	12	20							
F1C22201	13	12	20	21						
F1C22301	17	20	21							
F1C22401	18	19	20	21						
F1C22601	15	20	21							
F1C22A01	13	12	20	21						
F1C23201	13	12	20	21						
F1C23A01	13	12	20	21						
F1C24201	13	12	20	21						
F1C24A01	13	12	20	21						
F1C25201	13	12	20	21						
F1C25A01	13	12	20	21						
F1C26201	13	12	20	21						
F1C26A01	13	12	20	21						
F1C27201	13	12	20	21						
F1C27A01	13	12	20	21						
F1C28501	11	20	21							
F1C28701	16	20	21							

(Step 006 continues)

(Step 006 continued)

COLUMN 1	COLUMN 2								COLUMN 3	COL.4
Reference CODE	Suspected FRUs PRIORITY								Recommended Action	GO TO MAP
	1	2	3	4	5	6	7	8		
F1C30201	13	12	20	21						
F1C30A01	13	12	20	21						
F1C31201	13	12	20	21						
F1C31601	14	20	21							
F1C31701	7									
F1C31A01	13	12	20	21						
F1C32201	13	12	20	21						
F1C32301	17	20	21							
F1C32401	18	19	20	21						
F1C32601	15	20	21							
F1C32A01	13	12	20	21						
F1C33201	13	12	20	21						
F1C33A01	13	12	20	21						
F1C34201	13	12	20	21						
F1C34A01	13	12	20	21						
F1C35201	13	12	20	21						
F1C35A01	13	12	20	21						
F1C36201	13	12	20	21						
F1C36A01	13	12	20	21						
F1C37201	13	12	20	21						
F1C37A01	13	12	20	21						
F1C38501	11	20	21							
F1C38701	16	20	21							

(Step 006 continues)

(Step 006 continued)

COLUMN 1	COLUMN 2								COLUMN 3	COL.4
Reference CODE	Suspected FRUs PRIORITY								Recommended Action	GO TO MAP
	1	2	3	4	5	6	7	8		
F1C4XX01 F1C5XX01										0001 ENTRY POINT 0
F1C60201 F1C60A01 F1C61201 F1C61601 F1C61A01 F1C62201 F1C62301 F1C62601 F1C62A01 F1C63201 F1C63A01 F1C64201 F1C64A01 F1C65201 F1C65A01 F1C66201 F1C66A01 F1C67201 F1C67A01	13 13 13 14 13 13 17 15 13 13 13 13 13 13 13 13 13 13 13	12 12 12 20 12 12 20 20 12 12 12 12 12 12 12 12 12 12 12	20 20 20 21 20 20 21 21 20 20 20 20 20 20 20 20 20 20 20	21 21 21 21 21 21 21 21 21 21 21 21 21 21 21 21					Write down the FRU numbers. Before FRU replacement Go to page 9, step 008, ENTRY POINT B.	
F1C6XX01	17	13	12	14 15	13 2	1 7	8	20 21		
F1C70001	3	2	1						If the replacement does not help,------>	0400, ENTRY P. BB
F1CA1001 F1CA1101 F1CA1201 F1CA2101 F1CA2201	13 13 13 13 13	12 12 12 12 12	20 20 20 20 20	21 21 21 21 21						

(Step 006 continues)

(Step 006 continued)

COLUMN 1	COLUMN 2								COLUMN 3	COL.4
Reference CODE	Suspected FRUs PRIORITY								Recommended Action	GO TO MAP
	1	2	3	4	5	6	7	8		
F1CA2301	13	12	20	21					Write down the FRU numbers. Before FRU replacement Go to page 9, step 008, ENTRY POINT B.	
F1CA3001	13	12	20	21						
F1CA3101	13	12	20	21						
F1CA3201	13	12	20	21						
F1CA8201	13	12	1	2	3					
F1CAXX01	1	2	3	4	5	6				
F1CCXX01										0001 ENTRY POINT
F1CDXX01										
F1CEXX01	4	5	6						If the replacement does not help, --->	0
F1CF0001										

(Step 006 continues)

(Step 006 continued)

(Entry Point T)
****

FRU Table
=========

No.	Name	Position
1	SP-card 1	01A-C2D2
2	SP-card 2	01A-C2E2
3	SP-card 3	01A-C2F2
4	SP-card 4	01A-C2G2
5	SP-card 5	01A-C2H2
6	SP-card 6	01A-C2J2
7	SCL-card 3	01A-C2C2
8	SCL-card 4	01A-C2B4
9	PSC-card 2	01A-A2C2
10	PSC-card 1	01A-A2D2
11	PCI-card 1	01A-A2E2
12	DCA-card 1,2	01A-A2J4,J2
13	DCA-card 3	01A-A2K2 <---Important Note
14	CDF1-card 1,2	01A-A2R2,S2
15	CDF2-card 1,2	01A-A2N2,P2
16	SBA-card	01A-A2Q2
17	BBA0-card	01A-A2T2
18	RLK-card 1	01A-A2W2
19	RLK-card 2	01A-A2X4
20	Processor bus cable	01A-A2YM to 01A-C2YJ
21	Processor bus cable	01A-A2YD to 01A-C2YK

Important Note:
Check if DCA card 3 (01A-A2K2) is at latest EC.

See Vol.30, Plug List of board A2 (page PA220).

Compare the listed P/N with the P/N of the card installed in location 01A-A2K2.

(Step 006 continues)

(Step 006 continued)

Replace the card with the P/N
(latest EC) given in the plug list.

After the repair,
Go to Page 10, Step 017, Entry Point V.

007
The error was obviously intermittent.

Go to Page 2, Step 006, Entry Point AA.

008
(Entry Point B)
****

Is the reference code F1C6XX01?
Y N

009

(Entry Point X)
****

Check the following suspected FRUs:

1.COAX-cable and its connector to the I/O unit.
Check the COAX-cable for continuity.
COAX-cable resistance is approximately 1.0 ohm/10 meter (0.3 ohm/10 feet).
Verify proper COAX-cable connection.
Check display-cable from board 01A-A2ZD to coaxial connectors.

Note:

REMEMBER,
when working on a terminal or coax-cable, the DCA can loose the DCA-device communication and turn on the disable latch on the driver card (01A-A2J2,J4).
In this case the terminal can no longer be serviced by the application and there is no way to put the Display Station in service by the software. This is only possible via power on reset or by switching from NORMAL to TEST mode and back to NORMAL from the Display Station.

2.Missing *ground* for COAX-connector plate. Check pin 01A-A2ZDD08 for proper *ground*.

Do the following:

2.1 Remove COAX-connector plate.
(Step 009 continues)

C

(Step 009 continued)
Keep it isolated from machine frame!

2.2 Measure with CE meter the resistance between the connector plate and machine frame or any D08-pin.

The resistance should be zero ohm.

3.Check also electrical grounding on all DCA connected I/Os as described in the I/O Maintenance Documentation.

Is any problem found?
Y N

010
Replace the FRUs (one at a time) as told before by this MAP or by the REFCODE ANALYSIS.

After the repair do the Verification,
Go to Page 10, Step 017, Entry Point V.

011
Do the repair as told by the maintenance documentation of the I/O.

012
Press 'CHANGE DISPLAY' key.

Does reference code F1C6XX01 appear?
Y N

013
Is only the top half of the IML screen displayed?
Y N

014
Go to Step 009, Entry Point X.

015
Replace SP card 4; 01A-C2G2.

After the repair do the Verification,
Go to Page 10, Step 017, Entry Point V.

016
Repalce
SP card 5 01A-C2H2
SP card 6 01A-C2J2

After the repair do the Verification,
Go to Step 017, Entry Point V.

017
(Entry Point V)
****

Verification:

After a FRU replacement perform IML with the CNTRL diskette FU1 !

(IML is completed successfully when the PROGRAM LOAD picture appears on the screen.)

IML successful?
Y N

018
Any reference code?
Y N

019
Go To Map 0400, Entry Point R.

020
Same ref.code as before?
Y N

021
Go to appropriate MAP, respectively use the REFCODE ANALYSIS.

022
Go to Page 12, Step 028, Entry Point Z.

023
Run BBA 0 Test,
BBA 1 Test (if BBA1 is installed),
and SBA Test.

Any reference code?
Y N

024
Is this the first time you have been called for this trouble?
Y N

025
Go to Page 9, Step 009, Entry Point X.

026

(Entry Point W)

Go To Map 0001, Entry Point A.

027
Go to corresponding MAP, respectively use the REFCODE ANALYSIS.

028
(Entry Point Z)
****

From now on proceed in accordance with your support structure.

Reseat and check the following cables:

```
Processor  bus cable  01A-A2YM to
                      01A-C2YJ
Processor  bus cable  01A-A2YD to
                      01A-C2YK
```

Is problem found?
Y N

029
Now suspect each adapter on this bus.

Suspected FRUs:

```
DCA-card 3          01A-A2K2 <---Important Note:
DCA-card 1, 2       01A-A2J4,J2
PSC-card 2          01A-A2C2
PSC-card 1          01A-A2D2
PCI-card 1          01A-A2E2
CDF1-card 1,2       01A-A2R2,S2
CDF2-card 1,2       01A-A2N2,P2
SBA-card            01A-A2Q2
BBA0-card           01A-A2T2
RLK-card 1          01A-A2W2
RLK-card 2          01A-A2X4

                    Important Note:
                    Check if DCA card 3 (01A-A2K2) is at
                    latest EC.

                    See Vol.30, Plug List of board A2
                    (page PA220).
                    Compare the listed P/N with the P/N
                    of the card installed in location 01A-A2K2.

                    Replace the card with the P/N (latest EC)
                    given in the plug list.
```

(Step 029 continues)

(Step 029 continued)
After the repair
Go To Map 0001, Entry Point A.

030
Repair as required,then
Go To Map 0001, Entry Point A.

BBA0 LOG MAP

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
FXXX	A	1	001
RFCA	A	1	001
RFCA	B	3	003
0C00	AA	2	002
0C00	MM	6	014
4902	MM	6	014

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
3	005	0001	A
5	007	0001	A
6	016	0001	A
6	015	0001	0

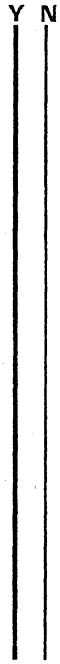
001

(Entry Point A)
****

Make sure that you have traced the START MAP 0000 precisely. Another reference code may be more important than the one you have got first.

Are you led to this MAP by the REFCODE ANALYSIS?

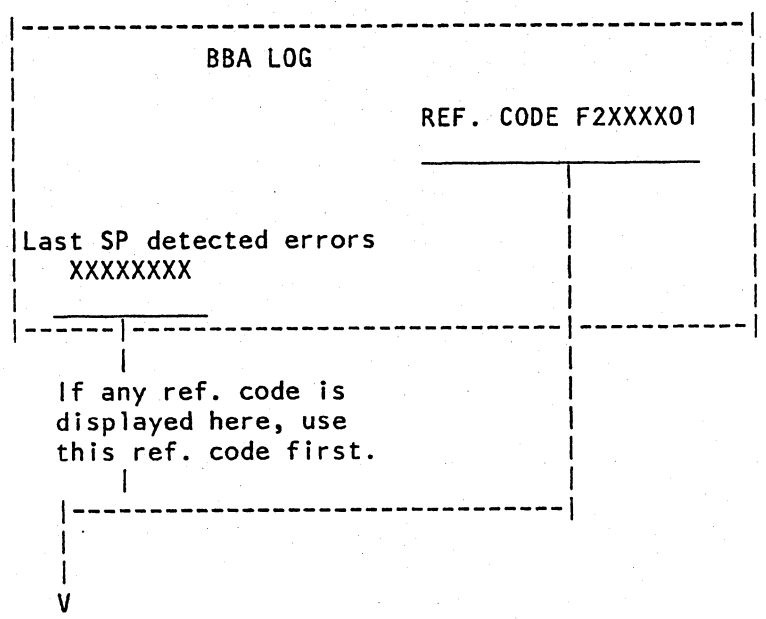
Y N



3 2
A B

(Entry Point AA)
****

BSU Log Display (Example)
==========



Write down the reference code from the BBA 0 LOG.

Go to Page 3, Step 003, Entry Point B.

003

(Entry Point B)
****

General note:
SP card 5; 01A-C2H2 may not be installed.

Look first for an IC-bus log.

Any IC-bus log?
Y N

004

(Entry Point K)
****

Is the reference code from the BBA 0 log F2FXXX01?
Y N

005
Invoke the REFCODE ANALYSIS.
Replace FRUs as indicated by the REFCODE ANALYSIS for the BBA 0 log.
After the repair
Go To Map 0001, Entry Point A.

006

REFERENCE CODE	REASON
F2FXXX01	A conversation between the PU and the BBA0 was not completed. The keyboard may not have been functional for about 32 sec before any of these logs was taken.

Did a PU and/or IC-bus log occur before any of the reference codes F2FXXX01 was logged?

Y N

5E 5F

007

(Entry Point BA)
****

REFERENCE CODE	Suspect the following:
F2F0XX01	1.BBA0 card 01A-A2T2 2.ACC card 3 01A-A2V2
F2F1XX01 F2F2XX01	1.BBA0 card 01A-A2T2 2.ACC card 3 01A-A2V2 3.PU: Select the LOG DISTRIBUTION STATISTICS or the REFERENCE CODE LOG. If there is a log before the last log, follow this one, also. Go to appropriate MAP, respectively use the REFCODE ANALYSIS. 4.Timeout problem Go to MAP 0001, ENTRY POINT 0.

After the repair
Go To Map 0001, Entry Point A.

008
Is there an IC-bus log?
Y N

009
Keep the PU log for possible later use.
Go to Step 007, Entry Point BA.

010
Suspect the IC-bus.
Go to appropriate MAP, respectively use the REFCODE ANALYSIS.

011
Is the time stamp about the same as for the BBA 0 log (within 1 hour)?
Y N

012
Go to Page 3, Step 004, Entry Point K.

013
Follow the reference code from the IC-bus log. Go to appropriate MAP, respectively use the REFCODE ANALYSIS.

014

(Entry Point MM)
****

Suspect the following FRUs;
replace one at a time:
BBA0 card 1: 01A-A2T2
ACC card 3: 01A-A2V2
Processor Bus for MSSS:
01A-C2YJ to 01A-A2YM
and 01A-C2YK to 01A-A2YD

Successful?
Y N

015
Go To Map 0001, Entry Point O.

016
Go To Map 0001, Entry Point A.

BBA0 TEST MAP

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
FXXX	A	1	001
RFCA	A	1	001
0C00	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
1	003	0001	A

001

(Entry Point A)
****

Are you led to this MAP by the REFCODE ANALYSIS?
Y N

002
Select *IBM MAINTENANCE AND SERVICE PROGRAM SELECTION*.

Invoke *REFCODE ANALYSIS*.

Key in the reference code from the BBA0 test.
Key in also the symptom code.
Go to Step 003, Entry Point P.

003

(Entry Point P)
****

Do now the repair as told by the REFCODE ANALYSIS.

After the repair
Go To Map 0001, Entry Point A.

SBA Error Log

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
FXXX	A	1	001
RFCA	A	1	001
4900	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
1	003	0001	A

001
(Entry Point A)

Are you led to this MAP by the REFCODE ANALYSIS?
Y N

002
Select the IBM MAINTENANCE and SERVICE SELECTION PROGRAM.

Invoke the REFCODE ANALYSIS.

Key in the reference code from the SBA Error LOG.
Go to Step 003, Entry Point P.

003
(Entry Point P)

Do now the repair as told by the REFCODE ANALYSIS.

After the repair
Go To Map 0001, Entry Point A.

SBA Test

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
FXXX	A	1	001
RFCA	A	1	001
4900	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
1	003	0001	A

001
(Entry Point A)

Are you led to this MAP by the **REFCODE ANALYSIS?**
Y N

002
Select the IBM MAINTENANCE and SERVICE SELECTION PROGRAM.

Invoke the REFCODE ANALYSIS.

Key in the reference code from the SBA test.
Go to Step 003, Entry Point P.

003
(Entry Point P)

Do now the repair as told by the REFCODE ANALYSIS.

After the repair
Go To Map 0001, Entry Point A.

Transmit/Receive Error Log

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
FXXX	A	1	001
RFCA	A	1	001
RFCA	B	1	003
4900	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
2	004	0001	A

001
(Entry Point A)

Are you led to this MAP by the REFCODE ANALYSIS?
Y N

002
Select the IBM MAINTENANCE and SERVICE SELECTION PROGRAM.

Invoke the REFCODE ANALYSIS.

Key in the reference code from the Transmit/Receive Error LOG.
Go to Step 003, Entry Point B.

003
(Entry Point B)

Prerequisites:

IML must have been performed completely with the CNTRL diskette (FU1).
'IML complete' is indicated by the load picture on the screen.

Reference Code F4042E01?
Y N

2 2
A B

004
Do now the repair as told by the REFCODE ANALYSIS.

After the repair,
Go To Map 0001, Entry Point A.

005
If by mistake the test loader for ST 4300 was selected, and then FRIEND was selected a CLEAR RESET must have been done in between. The same is required if first FRIEND was selected and then the ST 4300 test loader.

SPIL Program MAP

PAGE 1 OF 1

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
FXXX	A	1	001

EXIT POINTS

EXIT THIS MAP		TO	
PAGE NUMBER	STEP NUMBER	MAP NUMBER	ENTRY POINT
1	001	0001	Y

001
(Entry Point A)

Reason: A Program check was detected.
Fix: Write down log information.
Go To Map 0001, Entry Point Y.

If all testing (by MAP 0001, Entry Point Y) does not find an error, card 01A-C2E2 could possibly have caused the problem.