EC 826380			PN 2597098
27MAY83			

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0199	A	1	001
5000	A	1	001
9500	A	1	001
9700	A	1	001

001
(Entry Point A)

MAP DESCRIPTION:
Intermittent introduction and index.

START CONDITIONS:
none

The maintenance strategy for intermittent failures is to start with the S/36 reference codes which you can obtain from the customer, from the error logs, or during recreate.

- See the S/36 reference code list (MAP 0113, 0114, 0115, 0116) to determine the failing FRU, FRU group, or MAP entry point.
- You should replace the FRU(s) indicated by the S/36 reference code list or go to the MAP entry point for tests to determine the correct FRU to replace.
- When the use of the S/36 reference code does not result in correction of the problem, go to the intermittent MAPs (table A), and follow the directions given there.

If you use the error history tables as the source for obtaining the S/36 reference codes, you will have to determine which error(s) listed in the logs are the ones that initiated the customer call. The time and dates in the error logs will be helpful in determining which error(s) caused the call.

- When the use of the S/36 reference codes or the intermittent MAPs fails to supply direction to the failing FRU, attempt to recreate the error by using one or more of the following methods:

- When the failing area or device of the system is not known, you should run SYSTEST and select all devices to be exercised.

Note: SYSTEST requires a dedicated system. SYSTEST will operate the system hardware in an overlapped mode and will generate S/36 reference codes as in a customer environment, which are to be used as given.
SYSTEST 'stop on error' option can be selected. It will stop program execution and permit you to review system status, to execute ERAP at the end of the run, and to display the error data logged during the run.

Once the failing system area or device is known or suspected, you can use SYSTEST to operate that device or area at a higher rate by selecting only those devices to test. For example, if the work stations are determined to be the problem, select only the work stations and they can be tested at a higher rate.

When the failing device has concurrent diagnostic capabilities, test it using these diagnostics so that you can permit the customer to do some productive work.

You can run the MDIs, but because of the frequency of the failure, the MDIs may not find the intermittent failure each time they are run. Also, they may mislead you if the intermittent failure occurs after you have gone past the faulty FRU with the MDIs. However, these options can be useful in isolating failures of a device or function known to be failing:

- Use the step mode to observe the logic flow of the MDI MAPs with the results of each TU.

- Use the TU Select option to select and execute any

TU that is called out by the MDI MAPs, or by the S/36 reference code list, during which a detailed description of the TUs function and results are displayed.

- Use the MDI special option to specify an MDI logic path to execute once (or loop for probing) and to stop on a 'yes' or 'no' decision.

- When the failure is of the type that occurs during CSIPL, use the different options and methods of executing the CSIPL tests. These can be selected using the data/address input keys at CSIPL time (see General MIM 01-410).

-- Loop on first load
-- Loop on the first two loads
-- Loop on the third load

When the failing device is known you should select the exercisers and diagnostics for that device to aid in determining the failing FRU. General MIM 01-700 has the procedures on how to run the exercisers and diagnostics.

- When you have used all the resources available and have not determined the problem, call for aid.
  The level of aid requested will depend on the severity of the problem.
  The first level will be the field support center.
The second level will be the support level CE/CSR or branch technical support representative (TSR).
  The third level will be the regional support specialist (RSS).
  The field support center, on an as required basis, can contact the correct programming or engineering department for comments.

T A B L E A

MAP	Description
03XX	INTERMITTENT MAPs
0300	Intermittent Introduction and Index
0301	CSP Intermittent Failure MAP
0309	Electrostatic Discharge (ESD)
0310	MSP Intermittent MAP 1
0312	MSP Intermittent MAP 2
0350	3262 Printer Intermittent MAP
0370	Workstation Intermittent MAP
0391	Diskette Intermittent MAP
0395	21ED Intermittent MAP
0397	10SR Intermittent MAP

ENTRY POINTS			
FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0113	A	1	001
0300	A	1	001

001
(Entry Point A)
MAP DESCRIPTION:

This MAP points to FRUs based on CSP proc error byte, ECC error byte, channel error byte, channel register and status bytes 4 and 5 in the ERAP display. This MAP should only be used after MAP 0113, 0114, 0115 and 0116 is used to translate the system reference code.

The following tables list the bits in the various error bytes and the associated probabilites that each FRU caused that bit to be set. If more than one bit is on in these bytes, the probabilities for each FRU can be added together.
- Replace the FRU with the highest combined probabilty.

START CONDITIONS:
The system reference code in the display on the control panel or displayed as a result of running 'ERAP' is 10FF or 16FF.

NOTE:
Refer to the General MIM for procedure to display the error bytes.

FRUs PARTIALLY TESTED:
None

If SRC is 10FF (Stage 1 CSP), then use tables 1 through 5.
If SRC is 16FF (Stage 2 CSP), then use tables 6 through 9.

Table 1 - CSP Proc Error Byte

Check	Bit	FRU	% probability
SDR P Check	0	A-A1M2	33
		A-A1N2	33
		A-A1L2	25
		Main store	6
		A-A1Q2	2
		Other	1
MOR P Check	1	A-A1N2	87
		A-A1M2	12
		Other	1
Memory Time-out	2	A-A1M2	90
		Other	10
X-Reg P Check	3	A-A1M2	95
		Other	5
Invalid CS Address	4 not 5	A-A1M2	95
		Other	5
Micro Loop Time-out	5 not 4	A-A1M2	62
		A-A1Q2	18
		A-A1L2	17
		A-A1P2	3
CS SAR P Check	4 and 5	A-A1M2	100
Channel Check	6	See table 3 (channel error byte) for FRU call-out and probabilities.	
MSP Error or	7	See tables 4 and 5 MSP status bytes and	

ECC Check		table 2 (ECC Check) for FRU call-out & probabilities

Table 2 - ECC Error Byte

Check	Bit	FRU	% probability
Reserved	0 - 4		
Single Bit Error	5	A-A1M2 A-A1N2*	95 5
Uncorrectable Error	6	A-A1N2* A-A1M2	99 1
Write Parity Error	7	A-A1N2* A-A1M2	99 1
		*Note: If the control storage card is non-ECC and any of these bits are on the failing FRU A-A1M2.	

Table 3 - Channel Error Byte

Check	Bit	FRU	% probability
DB0 P Chk	0	Note 1	50
		Any chan device	40
		A-A1L2	10
Invalid Device Address	1	Note 1	80
		Any chan device	10
		A-A1L2	10
DB1 P Chk	2	Note 1	80
		Any chan device	10
		A-A1L2	10
I/O Time out	3	Note 1	80
		A-A1M2	10
		A-A1L2	10
Invalid Main Store Address	4	A-A1M2	30
		A-A1L2	30
		A-A1P2	10
		Note 1	30
System Bus Parity Check	5	A-A1M2	25
		A-A1L2	25
		A-A1N2	25
		A-A1P2	25
Cycle Steal Operation	6	Operation Indicator	

Note 1: The chan register contains the device address, cycle steal ID or interrupt

address of the I/O device that the CSP was communicating with at the time of the channel check. (Refer to 10-512, 615 of the processing unit and channel MIM for chan register information.)

Before using table 5, determine the card type (128 Kb or 256 Kb or 512 Kb) of all cards in main storage (see MIM 10-230). Run ERAP and find the failing 2 K page number. Use table 4 to determine which main store card is involved.

Table 4

Fail 2K value	Largest card 128 Kb Failing card	Largest card 256 Kb Failing card	Largest card 512 Kb Failing card
00 to 3F	A-A1U2	A-A1U2	A-A1U2
40 to 7F	A-A1T2	A-A1U2	A-A1U2
80 to BF	A-A1S2	A-A1T2	A-A1U2
C0 to FF	A-A1R2	A-A1T2	A-A1U2
100 to 17F		A-A1S2	A-A1T2
180 to 1FF		A-A1R2	A-A1T2
200 to 2FF			A-A1S2
300 to 3FF			A-A1R2

In table 5, use the column listing for the type of main store card involved (as found by using MIM 10-230 and table 4).

Table 5

status byte 4 bit	FRU	128 Kb card % probability	256 KB card % probability	512 KB card % probability
0	A-A1Q2 or	57	77	88
	main store*	39	19	9
	or			
	A-A1P2 or	2	2	2
	A-A1L2 or	1	1	
	A-A1M2	1	1	
1	A-A1P2 or	98	98	98
	A-A1Q2	2	2	2
2	A-A1P2 or	99	99	99
	A-A1Q2	1	1	1
3	main store*	89	87	66
	or			
	A-A1Q2 or	6	8	19
	A-A1P2	5	5	14
4	main store*	59	18	9
	or			
	A-A1Q2 or	29	68	80

	A-A1L2 or	4	1	
	A-A1M2 or	4	5	
	A-A1P2	4	8	10
5	main store*	98	99	99
	or			
	A-A1Q2	1	1	1
6 or 7	A-A1Q2 or	76	76	76
	A-A1M2 or	20	20	20
	A-A1L2 or	2	2	2
	A-A1P2	2	2	2

status byte 5 bit	FRU	128 Kb card % probability	256 KB card % probability	512 KB card % probability
0	A-A1Q2 or	52	74	87
	main store*	47	25	11
	or			
	A-A1P2	1	1	1
1	A-A1Q2 or	52	74	86
	main store*	47	25	12
	or			
	A-A1P2	1	1	1

*A-A1U2 or A-A1T2 - as found in table 4. The failing 2 K MS entry in the ERAP display is not valid unless one of the following bits is set: status byte 4 bit 0, 3, 4 or 5 or status byte 5 bit 0 or 1.

Stop - Tables 6 through 9 are for systems with Stage 2 CSP.

This is the starting point for systems with Stage 2 CSP.

Table 6 - CSP Proc Error Byte

Check	Bit	FRU	% probability
Stg Check	0	A-A1N2	85
		A-A1Q2	10
		Other	5
	1		
4 Sec Time-out	2	A-A1N2	90
		Other	10
LSR P Check	3	A-A1N2	95
		Other	5
Proc Check	4		
3 Sec Time-out	5	A-A1N2	80
		A-A1Q2	15
		Other	5
	6		
MSP Check	7	If bit 0 (storage check) is active,	

		the A-A1Q2 (85%) and A-A1N2 (10%). Otherwise, see tables 8 and 9.

Table 7 - Channel Error Byte

Check	Bit	FRU	% probability
DBO P Chk	0	Note 1	50
		Any chan device	40
		A-A1N2	10
Invalid Device Address	1	Note 1	80
		Any chan device	10
		A-A1N2	10
DBI P Chk	2	Note 1	80
		Any chan device	10
		A-A1N2	10
I/O Time-out	3	Note 1 A-A1N2	80 20
	4 - 5		
Cycle Steal Operation	6	Operation Indicator	
SILSB Op	7	Operation Indicator	

Note 1: The chan register contains the device address, the cycle steal ID or interrupt address of the I/O device that the CSP was communicating with at the time of the channel check. (Refer to 10-512, 615 of the processing unit and channel MIM for chan register information.)

Before using table 9, determine the card type (128 Kb or 256 Kb or 512 Kb) of all cards in main storage (see MIM 10-230). Run ERAP and find the failing 2 K page number. Use table 8 to determine which main store card is involved.

Table 8

Fail 2K value	Largest card 128 Kb Failing card	Largest card 256 Kb Failing card	Largest card 512 Kb Failing card
00 to 3F	A-A1U2	A-A1U2	A-A1U2
40 to 7F	A-A1T2	A-A1U2	A-A1U2
80 to BF	A-A1S2	A-A1T2	A-A1U2
C0 to FF	A-A1R2	A-A1T2	A-A1U2
100 to 17F		A-A1S2	A-A1T2
180 to 1FF		A-A1R2	A-A1T2
200 to 2FF			A-A1S2
300 to 3FF			A-A1R2

- In table 9, use the column listing for the type of main store card involved (as found by using MIM 10-230 and table 8).

Table 9

status byte 4 bit	FRU	128 Kb card % probability	256 KB card % probability	512 KB card % probability
0	A-A1Q2 or	66	77	88
	main store*	30	19	9
	or			
	A-A1P2 or	2	2	2
	A-A1N2	2	2	
1	A-A1P2 or	98	98	98
	A-A1Q2	2	2	2
2	A-A1P2 or	99	99	99
	A-A1Q2	1	1	1
3	main store*	89	87	66
	or			
	A-A1Q2 or	6	8	19

	A-A1P2	5	5	14
4	main store*	59	18	9
	or			
	A-A1Q2 or	29	68	80
	A-A1N2 or	8	6	
	A-A1P2	4	8	10
5	main store*	98	99	99
	or			
	A-A1Q2	1	1	1
6 or 7	A-A1Q2 or	76	76	76
	A-A1N2 or	22	22	22
	A-A1P2	2	2	2

status byte 5 bit	FRU	128 Kb card % probability	256 KB card % probability	512 KB card % probability
0	A-A1Q2 or	65	74	87
	main store*	35	25	11
	or			
	A-A1P2	1	1	1
1	A-A1Q2 or	65	74	86
	main store*	35	25	12
	or			
	A-A1P2	1	1	1

*A-A1U2, A-A1T2, A-A1S2 or A-A1R2 - as found in table 8. The failing 2K MS entry in the ERAP display is not valid unless one of the following bits is set: status byte 4 bit 0, 3, 4 or 5 or status byte 5 bit 0 or 1.

5360 Systems Unit

PAGE 1 OF 1

ENTRY POINTS

FROM MAP NUMBER	ENTER THIS MAP: ENTRY POINT	PAGE NUMBER	STEP NUMBER
01XX	A	1	001

001
(Entry Point A)

- To find an intermittant power fault, perform the following steps:

- Press the Power Status key and record the power status lights.

- Find in Table 1 of MAP 0503 the corresponding power status code and note the MAP indicated on that line.

- Use the FRUs partially tested list in the heading of the MAP.
- Set CB1 to the Off position (05-215).
- Disconnect each connector and inspect the connectors for bent, loose or damaged pins and repair if necessary and tighten all screw connections and terminals on all FRUs listed. Inspect all of these FRUs for bad solder connection and tighten the screws on the DC ground board.
- Set CB1 to the On position (05-215).

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER

001
(Entry Point A)

MAP DESCRIPTION:
Electrostatic discharge checkout procedure

START CONDITIONS:
none

LOGIC CARDS TESTED:
none

Under some local conditions, such as high temperature and low humidity, a machine may receive an ESD (electrostatic discharge) from personnel or from office equipment making contact with the machine covers. Various levels of discharge intensity may cause intermittent system failures that might be displayed in one of the following ways:

The ERAP may contain several temporary disk errors such as: sector checks, sector sync checks, PLO (phase lock oscillator) checks, CRC (cyclic redundance checks), off track checks, and disk seek errors.

Intermittent processor checks may occur that are not associated with specific programs. There will possibly be some hardware checks but normally a sofware check will be displayed as 1111 in the 08 register of the LSR (local storage register). The checks usually will be 0CXX or 1dXX in the 02 register of the LSR.

There may be messages to the operator that there is not valid data on the disk. This must be cleared by running the BUILD procedure (see SSP Procedures chapter in the IBM System/36 System Support Reference Manual, SC21-9020).

If the conditions of the environment are severe and the ESD level is high, even a correctly assembled and adjusted machine may have failures. If the adjustments are correct, possibly the only way to decrease the effect on machine performance is to decrease or remove the source of the static (use antistatic solutions on floor coverings; keep office equipment from rubbing or hitting the system covers, etc).

The following check and adjustment procedures identifies methods of correcting those areas of the machine that are affected by an electrostatic discharge.

DANGER

- Disconnect the line cord plug before checking the screws holding the the line cord wires.

_____
_____
_____
_____

- Check all of the screws in the power compartment for tightness. If any screw hole is damaged, the suitable changes must be made to correct the damage (swap parts, use nut inserts, or larger size screws).

- The mounting screws that mount the line filter box must be tight (see reference drawing in paragraph 05-220 MIM).

- The screws holding the line cord wires to the line filter and filter assembly must be tight (see reference drawing in paragraph 05-220 MIM).

- Ensure that the system frame is grounded to a service ground. This must not be conduit ground at the outlet. Ensure that the AC input voltage is inside the tolerance given. See IBM System/36 Installation Manual.

- Physical Planning, GA21-9435 for proper grounding and voltage information.

Keep power cables in the power supply assemblies and those distributing power to the gates away from covers or external frame parts.

Cables to a thermal must follow a path separate from other cables where possible.

Covers and Frame for ESD

- Check all of the mechanical mounting screws in the system for tightness. If any screw holes are damaged, use a larger size screw or a nut insert.

- Tighten the screws that fasten the internal shields in place behind the customer access cover. The shields cover the power supply assemblies, and the cable tower connection area. See Mechanical Assembly in the Parts Catalog.

Tighten the screws that hold the ground straps. Place the large washer between the screw head and the strap to force the largest surface area of the ground strap against the frame, cover, or unit. Ground straps are located in

the following places:
- From the gates to the frame at each hinge point.
- From each of the external covers to the frame.
- From each disk assembly casting to the frame.
- From each external I/O device cable to the I/O tower.

- Ensure that the gate latches on the A-gate are adjusted to prevent contact of the latch plates with the end cover.

- Adjust the cover latches to hold the covers as close to the frame as possible. See Cover, Mounting Hardware, and Frame Assembly in the Parts Catalog.

- The covers must be adjusted correctly for good pressure contact of the finger stock with the striker plate or frame channel.

I/O Devices and Cables for ESD:

- Ensure that the internal cables are in correct position in the channels and kept away from external covers and the frame parts.

- Ensure that the cables between the A-A1 and A-A2 and A-A3 boards do not touch the cover or the vertical post at the hinge point.

You may have to reseat the cards and cable connectors to give better contact points. High resistance contacts can cause electrical noise.

Work stations:

- Ensure that the shield on the internal work station cable is grounded at each port position and at the end of the cable that goes into the A-A1 board.

- Ensure that the twinaxial cables that connect the system I/O tower to the work stations are tight and in the correct position (not made into a coil or hung on a wall, etc).

- Ensure that the work stations are grounded to a service ground.

Printers:

- Ensure that the cables in the line printer are seated for correct system performance when the printer is printing. The extra length of the cable should not be made into a coil and placed inside the printer covers.

- Ensure that the line printer is grounded to a service ground.

- Ensure that the wing screw, connecting the ground strap of the printer I/O cable at the system end, is very tight. There must be a flat washer between the wing screw and the ground strap.

- Ensure that the internal printer cables are against the frame wall (as far across the machine as possible) before they drop down to the I/O cable tower.

Diskette:

- Correct diskette head alignment is important to the diskette performance.

- Check the head(s) for contamination. Clean head(s) if necessary.

- Keep diskettes in their plastic envelopes except when in use.

Communications:

- Ensure that external modems are connected to grounded outlets.

21ED disk:

There are no special ESD needs for the 21ED disk drive.

10SR Disk:

There are no special ESD needs for the 10SR disk drive.

Cards:

All cards are known to be sensitive to electrostatic discharge (ESD).
- To prevent damage when you work with cards, observe the instructions in MIM 01-050.

8809 Tape Drive:

- Check to ensure the ground strap wing screws for the two I/O cables to the tape drive are secure at both ends.

- Reseat the two I/O cables at both the tape drive and the system cable tower compartment.

- Reseat the two flat ribbon cables between 0A-A2U4/U5 and the system cable tower compartment.

- Check the routing of the two I/O cables between the system and the tape drive.
  These cables should be routed so they do not contact other remote devices or furniture. These cables should not cross, or run parallel with, primary AC power distribution lines. The latter is most frequently encountered in raised floor installations.

- Check the interface cable terminator assemblies on model 1C or 2C tape drives to make sure the terminator assemblies are securely fastened.

- Check the system and the tape drive power cords, especially the ground lead, for tight connections and proper grounding.

- the building ground to make sure that the service outlet ground meets the requirement of the installation/planning manual.

- Refer to 8809 tape drive MIM for further ESD considerations.

ENTRY POINTS			
FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0300	A	1	001

001
(Entry Point A)

MAP DESCRIPTION:
This MAP attempts to find intermittent errors in the main storage and main storage processor.

START CONDITIONS:
None

Run ERAP.
- See the general MIM (01-360).
- Look for entries in the main storage processor error history table. Errors in the main storage processor or main storage can also be recorded in the control storage processor error history table. Use MAP 0113 and 0312 and the Processing Unit and Channel MIM (10-500 and 10-550) to analyze the error history table information.
- Run SYSTEST for 10 minutes with the main storage and main storage processor selected.
- See the general MIM (01-720). Use ERAP to analyze any errors.

- If no errors are found by SYSTEST, IPL the system from the DIAG21/41 diskette using CSIPL load option FC03.
- See the general MIM (01-410).
- Run this test for 10 minutes.

- Perform the procedure in the Processing Unit and Channel MIM (10-315).

- If any FRU is exchanged, verify correct system operation by running SYSTEST for 10 minutes.

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0113	A	1	001
0310	A	1	001

001
(Entry Point A)

MAP DESCRIPTION:
This MAP points to FRUs based on status bytes 4 and 5 in the ERAP MSP display. This MAP should only be used after MAP 0113 is used to translate the system reference code.

START CONDITIONS:
The system reference code in the display on the control panel, displayed with a message on the system console or displayed as a result of running 'ERAP' is 12XX.

FRUs PARTIALLY TESTED:
A-A1L2, A-A1M2, A-A1P2, A-A1Q2,
main storage cards

- Determine the card type (128 Kb, 256 Kb, 512 Kb,1 Meg or 2 Meg) of all cards in main storage (see MIM 10-230).
- Run ERAP and find the failing 2 K page number.
- Use the following table to determine which main store card is involved.

Table 1

	Largest card 128 Kb	Largest card 256 Kb	Largest card 512 Kb	Largest card 1Meg	Largest card 2Meg
Fail 2K value	Failing card	Failing card	Failing card	Failing card	Failing card
00 to 3F	A-A1U2	A-A1U2	A-A1U2	A-A1U2	A-A1U2
40 to 7F	A-A1T2	A-A1U2	A-A1U2	A-A1U2	A-A1U2
80 to BF	A-A1S2	A-A1T2	A-A1U2	A-A1U2	A-A1U2
C0 to FF	A-A1R2	A-A1T2	A-A1U2	A-A1U2	A-A1U2
100 to 17F		A-A1S2	A-A1T2	A-A1U2	A-A1U2
180 to 1FF		A-A1R2	A-A1T2	A-A1U2	A-A1U2
200 to 2FF			A-A1S2	A-A1T2	A-A1T2
300 to 3FF			A-A1R2	A-A1T2	A-A1T2
400 to 5FF				A-A1S2	A-A1S2
600 to 7FF				A-A1R2	A-A1R2
800 to 9FF					A-A1U2
A00 to BFF					A-A1T2
C00 to DFF					A-A1S2
E00 to FFF					A-A1R2

Table 2 lists various bits in status bytes 4 and 5 and the associated probabilites that each FRU caused that bit to be set.

- If more than one bit is on in these status bytes, the probabilities for each FRU can be added together.
- Replace the FRU with the highest combined probability.
- Use the column listing for the type of main storage card involved (as found by using MIM 10-230 and table 1).

Table 2

status byte 4 bit	FRU	128 Kb card % probability	256 KB card % probability	512 KB card % probability	1 MB card % probability	2 MB card % probability
0	A-A1Q2 or	66	77	88		
	main store*	30	19	9		
	or					
	A-A1P2 or	2	2	2		
	A-A1N2	2	2			
1	A-A1P2 or	98	98	98	95	95
	A-A1Q2	2	2	2		
	A-A1N2				5	5
2	A-A1P2 or	99	99	99	95	95
	A-A1Q2	1	1	1		
	A-A1N2				5	5
3	main store*	89	87	66		
	or					
	A-A1Q2 or	6	8	19		
	A-A1P2	5	5	14	90	90
	A-A1N2				10	10
4	main store*	59	18	9	80	80
	or					
	A-A1Q2 or	29	68	80		
	A-A1N2 or	8	6			
	A-A1P2	4	8	10	20	20
5	main store*	98	99	98	80	80
	or					
	A-A1Q2	1	1	1		
	A-A1P2	1	1	1	20	20

6	A-A1Q2 or	76	76	76		
	A-A1N2 or	22	22	22		
	A-A1P2	2	2	2		
7	main store*				70	70
	A-A1Q2 or	76	76	76		
	A-A1N2 or	22	22	22	5	5
	A-A1P2	2	2	2	25	25

status byte 5 bit	FRU	128 Kb card % probability	256 KB card % probability	512 KB card % probability	1MB card % probability	2MB card % probability
0	A-A1Q2 or	65	74	87		
	main store*	35	25	11	40	40
	or					
	A-A1P2	1	1	1	60	60
1	A-A1Q2 or	65	74	86		
	main store*	35	25	12	40	40
	or					
	A-A1P2	1	1	1	60	60
3	A-A1P2				50	50
	main store*				30	30
	A-A1N2				20	20
7	A-A1P2				70	70
	A-A1N2				30	30

*A-A1U2, A-A1T2, A-A1S2 or A-A1R2
as found in table 1.

**A-A1N2 if card in slot A-A1M2 is a 2-wide card.
A-A1M2 or A1L2 if card in slot A-A1M2 is a 4-wide card.

3262 Printer Intermittent MAP

5360 Systems Unit

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0300	A	1	001

001
(Entry Point A)

MAP DESCRIPTION:
This MAP provides information for fixing an intermittent 3262 printer problem.

START CONDITIONS:
Must come from MAP 0300.

FRUs PARTIALLY TESTED:
None

Do you have a system reference code (1Exx) indicating a 3262 printer problem?
Y N

002
- Obtain the system reference code from the customer or look at ERAP or recreate the problem using 'SYSTEST' (if you obtain a system reference code indicating that the failing area is not the 3262 printer then use MAP 0113, 0114, 0115 or 0116 and the table in MAP 0300 to determine the correct MAP you should go to).

Do you have a system reference code?
Y N

003
Go to Page 2, Step 007, Entry Point C.

004
Go to Page 2, Step 005, Entry Point B.

005

(Entry Point B)

- Use the system reference code list (MAP 0113, 0114, 0115 or 0116) and replace the card or cards listed in the FRU group.

Note: If the error does not occur frequently (once per 15 minutes) go to Entry Point C of this MAP.

- Run 'SYSTEST' to determine if the problem is fixed.

Does a printer error still occur?

Y N

006
The problem is fixed.

007

(Entry Point C)

- Replace the following cards, if you have not already done so:
  A-A2R2
  A-A2S2
  A-A2T2

- Run 'SYSTEST' to determine if the problem is fixed.

Does a printer error still occur?

Y N

008
The problem is fixed.

009

Go to the 3262 printer entry MAP 0010, Entry Point A.

Note: The following list provides probe points, scope procedures and scope points, and additional information that might aid you in finding the failure if the 3262 printer MAPs do not fix the problem.

****

1E11 | A-A2R2G11 (+ 8.5V), ESD problems could cause this error.
     | See MAP 0309.
     |
1E12 | Top card connector X position for cards at A-A2R2, S2.

(Step 009 continues)

(Step 009 continued)

1E13	A-A2R2G11, T2M11, and T2S11 (+ 8.5V). ESP problems could cause this error. See MAP 0309.
1E26	Program error.
1E28	Program error.
1E29	Program error.
1E30	See scoping procedure 50-320.
1E31	See scoping procedure 50-330.
1E32	See scoping procedure 50-320.
1E33	A-A2V3D10 (- Carriage pedestal check)
1E34	See scoping procedure 50-340 or 50-350.
1E35	See scoping procedure 50-330.
1E36	A-A2V3D12 (- Belt go), A-A2V3B12 (- Belt up to speed)
1E37	A-A2V3D12 (- Belt go), A-A2V3B12 (- Belt up to speed)
1E38	A-A2V3D13 (- Printer busy)
1E39	See scoping procedure 50-310, A-A2V4D05 (- Data parity check)
1E40	See scoping procedure 50-340 or 50-350.
1E41	See scoping procedure 50-340 or 50-350.
1E42	See scoping procedure 50-340 or 50-350.
1E43	A-A2V3B06 (- Forms pulse)
1E49	ESD problems could cause this error. See MAP 0309.
1E50	A-A2V3B02 (+ End of forms)
1E51	A-A2V3B12 (- Stop/reset key)

(Step 009 continues)

(Step 009 continued)

1E52	A-A2V3B11 (- CE switch on)
1E53	A-A2V3B04 (- Throat closed switch)
1E61	Program error.
1E62	Program error.
1E80	Cable interlock: A-A2V2D04, V2B13, V3D05, V3B13, V4D03, V4B13.
1E81	A-A2V2B03 (- Thermal check 1)
1E82	A-A2V2D05 (- Thermal check 2)
1E83	A-A2V2B02 (- Printer power on), A-A2V2B08 (- printer power complete)
1E84	Program error.
1E89	A-A2V3B09 (- Ribbon check)

ENTRY POINTS

FROM MAP NUMBER	ENTER THIS MAP ENTRY POINT	PAGE NUMBER	STEP NUMBER
0300	A	1	001

001
(Entry Point A)

MAP DESCRIPTION:
Workstation maintenance strategy for detecting intermittent failures.

START CONDITIONS:
Known workstation attachment symptom.

System Reference Code (SRC)

- If you have a valid SRC, go to the SRC list (MAP 0115 or 0116) to determine the failing FRU, FRU group or MAP entry point.

- If the SRC code fails to call out the failing FRU then reseat the A-A1H2, A-A1J2 cards and the A-A1V4 cable (1st WSC) and A-A3S2, A-A3T2 cards and the A-A3V4 cable (2nd WSC expansion). Replace these FRUs if not already replaced via the SRC list.

- If you suspect a bad twinax cable or IBM cabling system, check both ends for a good connection or obvious cable deterioration.

- If you suspect the workstation (display or printer) see the appropriate workstation service manuals for failure information.

It is possible to receive a false workstation symptom which could be caused by some other device on the system channel.

Diskette Intermittent MAP

5360 Systems Unit

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0300	A	1	001

001
(Entry Point A)
The system reference code is most important to the diskette drive intermittent strategy. The CE/CSR must attempt to obtain a system reference code when the diskette drive is failing by runing SYSTEST.

MAP DESCRIPTION:
This is the diskette intermittent failure MAP. This MAP will use the diskette MIM and ERAP to identify action.

START CONDITIONS:

FRUs PARTIALLY TESTED:
None

Do you have a system reference code?
Y N

002
- Study the ERAPs for direction to a possible fault.

003
The MAPs and MDIs may be used to provide additional isolation to the FRUs called out by the system reference code.

CAUTION

When the failure is intermittent the MDIs may give wrong FRUs.

The following list of conditions should be checked:
1.Head Load Bail Assembly Check (MIM 91-313 or 93-406)
2.Switch filter incorrect (MIM 91-720 or 93-720)
3.Inner tracks incorrect (MIM 91-720 or 93-720)
4.Head always loaded (check visually)
5.Head dirty (MIM 91-309 or 93-392)
(Step 003 continues)

(Step 003 continued)
6.Head resolution (MIM 91-351 or 93-419)

- Replace FRUs in accordance with the percentages given with the system reference code (MAP 0115). Verify that the system is repaired and return the system to the system operator.

21ED Intermittent MAP

5360 Systems Unit

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
0114	A	1	001
0116	A	1	001
9500	A	1	001

001
(Entry Point A)

MAP DESCRIPTION:
This is the 21ED intermittent failure and 21ED system reference code MAP.

START CONDITIONS:

FRUs PARTIALLY TESTED:
None

Do you have any system reference codes (19xx) indicating a 21ED disk problem?
Y N

002
The system reference code is an important part for the isolation of intermittent disk errors.
- Obtain the system reference code from the customer and from ERAP (01-360). When obtaining it from ERAP, select the error history for the time period around which you are interested in.
- Be sure to identify which disk drive each of the system reference codes are associated with.

Are there any system reference codes available?
Y N

2A 2B 2C

003

- Attempt to seperate a system reference code by running 'SYSTEST' (01-720) for 10 minutes with the disk drive(s) selected.
- Use ERAP to obtain the system reference code(s).

Were any new system reference codes available?

Y N

004

Go to Page 3, Step 014, Entry Point F.

005

Go to Step 007, Entry Point B.

006

Go to Step 007, Entry Point B.

007

(Entry Point B)

The disk drive associated with each system reference code (SRC) will be needed. If the disk drive was not identified for an SRC, then obtain the drive by comparing the SRC with the error history from ERAP (01-360).

Is there more than one SRC (19xx) available?

Y N

008

- Replace FRU(s) listed or perform any corrective action listed for this system reference code.

- Verify that the system is repaired by running 'SYSTEST' or performing operations that the disk was failing on.

Does the disk error still occur?

Y N

009

- Return the system to the system operator.

010

Go to Page 3, Step 014, Entry Point F.

D

011

(Entry Point C)

- Attempt to identify which of the disk system reference codes (19xx) will be most helpful in correcting the problem on the selected disk drive.

Permanent disk errors are:

191x where 'x' is 0-9, A-F
192x
193x
194x
195x
196x
197x

Do you have any of the above SRCs for the disk drive you are now working on?

Y N

012

(Entry Point D)

Temporary disk errors are:

199x where 'x' is 0-9, A-F
19Ax
19Bx
19Cx
19Dx
19Ex
19Fx

Do you have any of the above SRCs for the disk drive you are now working on?

Y N

4 4 3
E F G

013
(Entry Point E)

Permanent disk errors that forced a 'Processor Check' or appear with system messages are:
190x where 'x' is 0-9, A-F
Do you have any of the above SRCs that are associated with the disk drive you are working on that you haven't tried yet?
Y N

014
(Entry Point F)
The disk MDIs did not correct the failure, and the system reference codes were either not available or did not help on the selected disk drive.

Items that may be helpful to support freelance determination of the failure are:

SYSTEST (01-720)

Disk I/O Exerciser (01-735)

Disk Utilities -Initialization,Sector recover,Pack Analysis (01-735)

TU Select, MDI Special (01-713,01-717)

SYSTEST allows more random operations to be performed on a subsystem. Disk I/O Exercisers allow specific functions to be tested while operating on a small section of the disk.

015
Are there any corrective actions listed that haven't been tried yet or FRUs listed that haven't already been replaced?
Y N

4 4
H J

016
- Remove this system reference code from the list.

Go to Page 3, Step 013, Entry Point E.

017
- Perform the corrective action or replace the FRU(s).

- Verify that the system is repaired by running 'SYSTEST' or performing the operations that the disk was failing on.

Does the disk error still occur?

Y N

018
Go to Page 5, Step 030, Entry Point G.

019
- Remove this system reference code from the list.

Go to Page 3, Step 013, Entry Point E.

020
- Add the percent probable for each of the FRUs in the temporary disk SRCs to make a combined percent probable FRU list for the disk drive you are now working on.

Are there any corrective actions listed that have not been performed yet, or FRUs listed that have not already been exchanged?

Y N

021
- Remove these SRCs from the list.

Go to Page 2, Step 012, Entry Point D.

K

022
- Perform the corrective actions and/or replace the FRU(s) starting with the FRU with the highest combined total that has not yet been exchanged.
- Verify that the system is repaired by running 'SYSTEST' or performing the operations that the disk was failing on.

Does the disk error still occur?

Y N

023
Go to Page 5, Step 030, Entry Point G.

024
- Remove this system reference code from the list.

Go to Page 2, Step 012, Entry Point D.

025
- Add the percent probable for each of the FRUs in the permanent disk SRCs to make a combined percent probable FRU list for the disk drive you are now working on.

Are there any corrective actions listed that haven't been tried yet or FRUs listed that haven't already been replaced?

Y N

026
- Remove this system reference code from the list.

Go to Page 2, Step 011, Entry Point C.

027
- Perform the corrective actions and/or replace the FRU(s) starting with the FRU with the highest combined total that has not yet been exchanged.
- Verify that the system is repaired by running 'SYSTEST' or performing the operations that the disk was failing on.

Does the disk error still occur?

Y N

028
Go to Page 5, Step 030, Entry Point G.

029

- Remove this system reference code from the list.

Go to Page 2, Step 011, Entry Point C.

030

(Entry Point G)

Is there another disk drive that needs to be corrected?

Y N

031

- Return the system to the system operator.

032

Go to Page 2, Step 011, Entry Point C.

ENTRY POINTS

FROM	ENTER THIS MAP		
MAP NUMBER	ENTRY POINT	PAGE NUMBER	STEP NUMBER
9700	A	1	001

001
(Entry Point A)

*** Notice ***
When the covers are open and the disk drives are in the open position, Radio Frequency Interference (RFI) may cause intermittent failures on the disk drives. All system covers must be in place and closed before system check out if RFI is suspected.

Do you have any system reference codes (1Axx) indicating a 10SR disk problem?
Y N

002
The system reference code is an important part for the isolation of intermittent disk errors.
- Obtain the system reference code from the customer and from ERAP (MIM 01-360). When obtaining it from ERAP, select the error history for only the time period around that which you want to check.
- Identify which disk drive each of the system reference codes are associated with.

Are there any system reference codes available?
Y N

2A 2B 2C

MAP DESCRIPTION:
This is the 10SR intermittent failure and 10SR system reference code MAP.

START CONDITIONS:

FRUs PARTIALLY TESTED:
None

003
- Attempt to generate a system reference code by running 'SYSTEST' (MIM 01-720) for 10 minutes with the disk drive(s) selected.
- Use ERAP to obtain the system reference code(s).

Were any new system reference codes available?
Y N

004
Go to Page 3, Step 014, Entry Point F.

005
Go to Step 007, Entry Point B.

006
Go to Step 007, Entry Point B.

007
(Entry Point B)
The disk drive associated with each system reference code (SRC) will be needed.
- If the disk drive was not identified for an SRC, then obtain the drive by comparing the SRC with the error history from ERAP (MIM 01-360).

Is there more than one SRC (1Axx available?
Y N

008
- Replace FRU(s) listed or perform any corrective action listed for this system reference code.

- Verify that the system is repaired by running 'SYSTEST' or performing operations that the disk was failing on.

Does the disk error still occur?
Y N

009
- Return the system to the system operator.

010
Go to Page 3, Step 014, Entry Point F.

D

011
(Entry Point C)
- Attempt to identify which of the disk SRCs (1Axx) will best aid you in correcting the problem.

Permanent disk error SRCs will be used first.

Permanent disk error SRCs are:
1A1x where 'x' is 0-9, A-F
1A2x
1A3x
1A4x
1A5x
1A6x
1A7x

Do you have any of the above SRCs?
Y N

012
(Entry Point D)

The temporary disk error SRCs will now be used.

Temporary disk error SRCs are:
1A9x where 'x' is 0-9, A-F
1AAx
1ABx
1ACx
1ADx
1AEx
1AFx

Do you have any of the above SRCs?
Y N

4 3 3
E F G

013
(Entry Point E)

Permanent disk errors that forced a 'Processor Check' or appear with system messages are:
1A0x where 'x' is 0-9, A-F

Do you have any of the above system reference codes that have not been used yet?
Y N

014
(Entry Point F)
The disk MDIs did not correct the failure, and the system reference codes were either not available or were not useful.

Items that may aid the free-lance problem determination are: 'SYSTEST','Disk I/O Exerciser','Pack Analysis','TU Select'

015
Are there any corrective actions listed that have not been performed yet or FRUs listed that have not already been exchanged?
Y N

016
- Remove this system reference code from the list.
Go to Step 013, Entry Point E.

017
- Perform the corrective action or exchange the FRU(s).

- Verify that the system is repaired by running 'SYSTEST' or performing the operations that the disk was failing on.

Does the disk error still occur?
Y N

018
- Return the system to the system operator.

019
- Remove this system reference code from the list.
Go to Step 013, Entry Point E.

020
- Add the percent probable for each of the FRUs in the temporary disk SRCs to make a combined percent probable FRU list.

Are there any corrective actions listed that have not been performed yet, or FRUs listed that have not already been exchanged?
Y N

021
- Remove these SRCs from the list.
Go to Step 013, Entry Point E.

022
- - Perform the corrective actions and/or exchange the FRU(s) starting with the FRU with the highest combined total that has not been exchanged yet.

- Verify that the system is repaired by running 'SYSTEST' or performing the operations that the disk was failing on.

Does the disk error still occur?
Y N

023
- Return the system to the system operator.

024
- Remove these SRCs from the list.
Go to Step 013, Entry Point E.

025

- - Add the percent probable for each of the FRUs in the permanent disk SRCs to make a combined percent probable FRU list.

Are there any corrective actions listed that have not been performed yet or FRUs listed that have not already been exchanged?

Y N

026

- Remove these SRCs from the list.

Go to Page 2, Step 012, Entry Point D.

027

- - Perform the corrective actions and/or exchange the FRU(s) starting with the FRU with the highest combined total that has not been exchanged yet.

- Verify that the system is repaired by running 'SYSTEST' or performing the operations that the disk was failing on.

Does the disk error still occur?

Y N

028

- Return the system to the system operator.

029

- Remove these SRCs from the list.

Go to Page 2, Step 012, Entry Point D.

001
(Entry Point A)

MAP DESCRIPTION:

FRUs PARTIALLY TESTED:
A-A2J2
A-A2K2
A-A2L2
A-A2E2
A-A2F2

Does the failure occur only during IPL?
Y N

002
Is a 1Bxx SRC displayed?
Y N

003
(Entry Point B)
- Run SYSTEST, select all devices.
- (Use a scratch tape and diskette.)
- Check recorded errors.

Is the tape the only failing device?
Y N

004
Are all recorded errors to tape, disk or diskette?
Y N

005
1. If running SYSTEST for 15 minutes produced no errors, the failure may only occur while running a specific customer job. Try a different customer operation to determine if the problem is associated with a customer operation, program, or tape reel.
2. Go to the MAP for the device with the most recorded temporary errors or first permanent error from SYSTEST.

2A 2B 2C 2D

006
Bad card:
A2J2
A2E2
A2K2
A2F2.

007
- Select mode 6.
- Press the Power key (power off).
- Swap 01A-A2E2 and A2K2.
- Press the Power key (power on).
- Run SYSTEST, select all devices.
- Check recorded errors.

Is tape the only failing device?
Y N

008
Bad card:
A2K2 (now plugged into A2E2).

009
Bad card:
A2L2.

010
Have all FRUs listed in MAP 0115, 0114 and SRC FRU group been replaced?
Y N

011
- Replace all FRUs listed in MAP 0114 and 0115 FRU group for failing SRC.

012
Is the SRC 1b65 or 1bff?
Y N

013
Is the SRC 1bCA, 1bA0, 1bd6 or 1bd7?
Y N

E F G

014
Is the SRC 1b50 thru 1bd8?
Y N

015
Go to Page 1, Step 003, Entry Point B.

016
- Run tape MDIs. If MDIs run without errors, Go to 8809 tape drive MIM, Start section.

017
- Clean tape head.
- Check tape for creases, scratch marks, curlled edges.
- Check tape skew.
- Ref: 8809 MIM.
- Retry. If failure repeats, go to 8809 tape drive MIM, Start section.

018
Is the 8809 tape drive ready?
Y N

019
Go to 8809 tape drive MIM, Start section.

020
- Reseat cables 1A-A2U4/U5 and I/O cables to drive.
- Retry. If failure repeats, go to 8809 tape drive MIM, Start section.

021
Is a tape IPL SRC (cbxx) displayed for each failure?
Y N

022
Does the failure occur without a SRC (Cxxx) being posted?
Y N

3 3 3
H J K

023

- List all failure codes posted (there may be more than one).
- Refer to MAP 0116 and identify the FRUs listed for each code.
- Select a FRU with the highest probability percentage (repeated the most, with the highest percentage) to replace first and retry.
- Then select a FRU with the 2nd highest percentage to replace and retry. Continue until the problem FRU is identified and replaced.

024

Will the system IPL from disk without failing if wraps are bypassed (FF00)?

Y N

025

1. Remove tape (A2K2, A2L2) and try to IPL from disk (bypass wraps).
2. Remove diskette (A2F2) and try to IPL from disk (bypass wraps).
3. Remove 2nd disk file DLC if installed (A2D2) and try to IPL from disk (bypass wraps).
4. Replace A2J2, A2E2, and A2C2. Try to IPL from disk (bypass wraps).

026

- Systematically reconfigure the system to delete one device at a time.
- After each reconfigure, run customize then try to IPL with wraps.

The device that when deleted from machine configuration allows you to IPL without failure is the source of the problem.

The cause of the problem may be hardware or microcode. First reload the microcode and IPL the system.

- If the failure continues, attempt to isolate the problem by replacing hardware for the device that causes the failure.

027

Have all FRUs listed in MAP 0116 FRU group been replaced?

Y N

028

- Replace all FRUs listed MAP 0116 FRU group for the IPL SRC displayed.

029

- Select mode E.
- Enter FF00.
- Press the IPL key.
- Run the 8809 tape MDIs from DIAG22/42 including Data Storage Controller and Data Storage Adapter.

Did the MDIs locate the problem?

Y N

030

- Select mode 6.
- Press the Power key (power off).
- Remove A2K2 and A2L2 cards.
- Press the Power key (power on).
- Reconfigure the system and delete 8809 tape.
- Run Customize.
- Select mode 0.
- Enter 0000.
- Press the IPL key.

Did the SSP screen appear?

Y N

031

The tape is not causing the IPL problem.

With the A2K2 and A2L2 cards removed and the system reconfigured without tape, the tape hardware cannot cause the IPL failure.

- Leave A2K2 and A2L2 removed from the system. Go to MAP 0159, Entry Point A and follow the diagnostic procedure. Reinstall A2K2 and A2L2 and reconfigure the system when the problem has been corrected.

032

- Select mode E.
- Enter 0000.
- Press the IPL key.

Did the DCP screen appear?

Y N

033

The tape attachment is not causing the IPL problem.

- Leave A2K2 removed from the machine and go to MAP 0179, Entry Point A to locate the problem.
- When the problem has been corrected, reinstall A2K2 and A2L2 and reconfigure the system.

034

Bad card:

A2K2

---or---

A2L2.

- Reconfigure the system and retry.

035

- Verify that IPL from both disk and diskette are without errors with wraps (0000).