PRELIMINARY SERVICE CHECKS

This data provides the user with a time-saving service tool which is designed for quick isolation and repair of Computer system malfunctions.

Check all interconnecting cables for good connections and correct hook-up before making service checks.

Disconnect all external peripherals from the Computer system to eliminate possible external malfunctions.

Replacement or repair of the Power Supply Board, System Board, Keyboard, GMS Board, GGS Board, Disk Drives or connectors may be necessary after the malfunction has been isolated.

TEST EQUIPMENT AND TOOLS

TEST EQUIPMENT	TOOLS
Digital Volt/Ohm Meter	Low Voltage Soldering Iron
Logic Probe	Desoldering Tool
	Hex Socket (7/32 Inch)
	Disk Drive Head Cleaning Diskette
	Contact Cleaner

REPLACEMENT PARTS AND DESCRIPTION

ITEM	PART NO.	DESCRIPTION
POWER SUPPLY BOARD		
F1	X502018010	Fuse, AC, 3A
SYSTEM BOARD		
16B	X400072010	IC, Protocol Controller, D7201C
18B	X400082550	IC, Printer Interface, D8255AC-5
21B		IC, Real Time Clock, HD146818P
10E	X400082591	IC, Interrupt Controller, D8259AC
12E	X400082591	IC, Controller, D8259AC
14E	X400082530	IC, Timer, D8253C-5
16E	X400082530	IC, Timer, D8253C-5
14H	X400007650	IC, Disk Controller, D765AC
17J	X400007801	IC, CPU, D780C-1
19J	X400082371	IC, DMA Controller, D8237AC-5
21J	X400082371	IC, DMA Controller, D8237AC-5
14M	Y130801401	IC, EPROM, D2116D
16M		IC, RAM, M16010C
DISK DRIVE		
207-4	Y310502112	Belt, Drive
GGS BOARD		
1A Thru 8A		IC, Video RAM, D4164C-3
1B Thru 8B		IC, Video RAM, D4164C-3
9B	X400072200	IC, Graphics Display Controller, D7220D-1
9D	Y130801301	IC, Character Attribute Generator, E02041HA
5E	Y130800701	IC, Character ROM, MBM2732A-20-QGA1
GMS BOARD		
2A Thru 9A		IC, Video RAM, D4164C-2
10A	X400072200	IC, Graphics Display Controller, D7220D-1
1B Thru 8B		IC, Video RAM, D4164C-2
2E	Y130800701	IC, Character ROM, MBM2732A-20
MONITOR BOARD		
F901	Y130213039	Fuse, DC, 1.6A

CSCS4 EPSON MODEL QX-10

SAMS™ Howard W. Sams & Co., Inc.
4300 West 62nd Street, P.O. Box 7092, Indianapolis, Indiana 46206 U.S.A.

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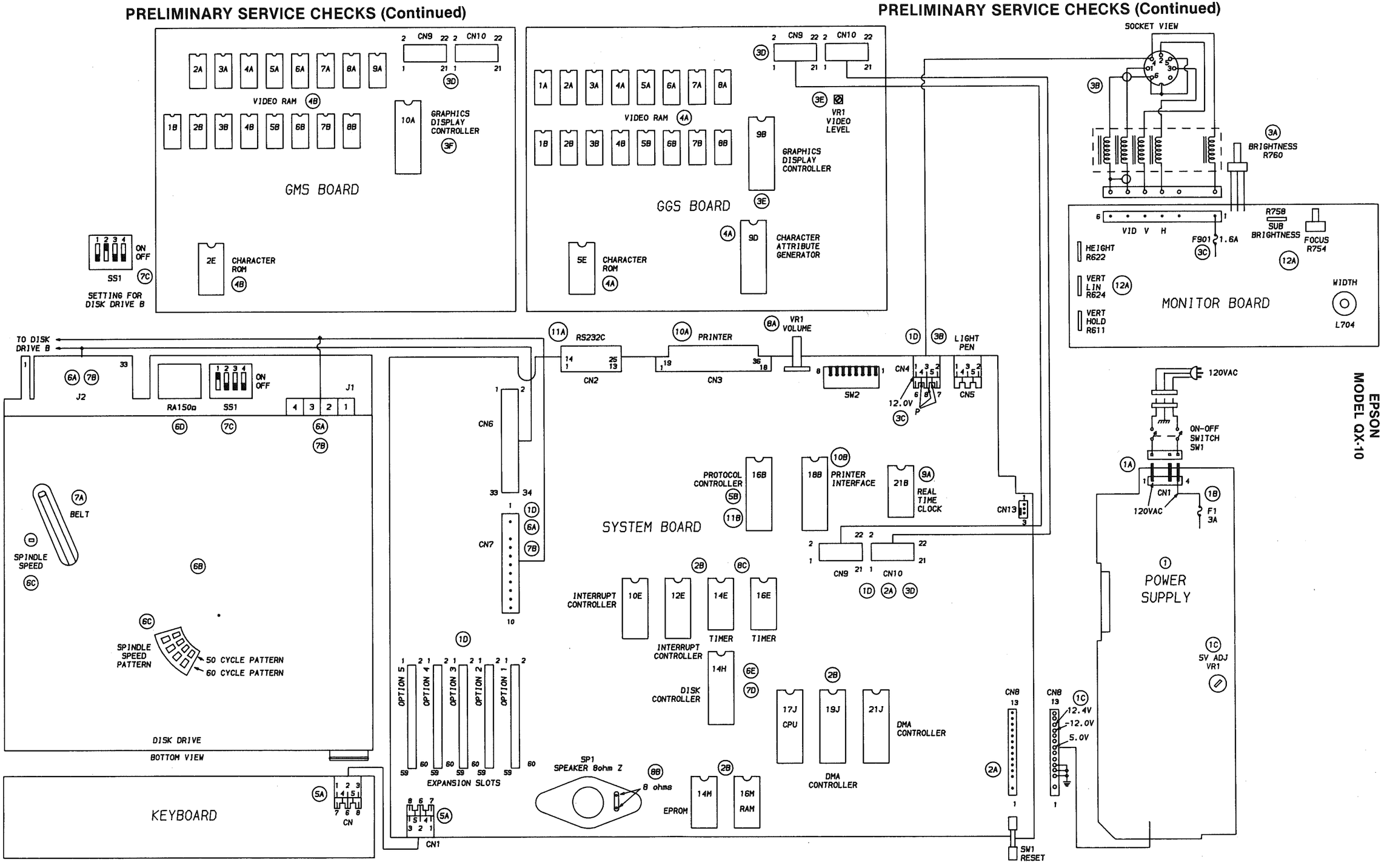
PRELIMINARY SERVICE CHECKS (Continued)



EPSON
MODEL QX-10

INTERCONNECTING DIAGRAM

INTERCONNECTING DIAGRAM

PRELIMINARY SERVICE CHECKS (Continued)

GENERAL OPERATING INSTRUCTIONS

BOOT UP

To boot up on CP/M (or any bootable program on diskette), put a diskette containing CP/M in Disk Drive A and turn On the Computer, or by pressing the Reset button if the Computer is already On. Loading of CP/M has been completed when the prompt A> appears on the Monitor screen.

RESET BUTTON

Pressing the Reset Button on the Computer will reset the Computer but any program in memory will be lost. The Reset Button is located under Disk Drive B on the front panel.

MBASIC™

To load MBASIC from CP/M, place a diskette containing MBASIC into Disk Drive A, type MBASIC and press the RETURN key. To load a program from a diskette, type LOAD and the name of the program enclosed in quotes, then press the RETURN key. To save a program on a diskette, type SAVE and the name of the program enclosed in quotes, then press the RETURN key. To list the programs on the diskette in the current Disk Drive, type FILES and press the RETURN key. Use FILES "A:*.*" for Disk Drive A or FILES "B:*.*" for Disk Drive B if that drive is not the current drive. To get back to CP/M from MBASIC, type SYSTEM and press the RETURN key.

CP/M

To list the programs on the diskette in the current Disk Drive, type DIR and press the RETURN key. Use DIR A: for Disk Drive A or DIR B: for Disk Drive B if that drive is not the current drive.

The type of data stored on a diskette is identified by the three letters after the program name (ASM = Assembly Language, BAS = Basic Program, COM = Command File, DAT = Data File, etc. . .)

To make Disk Drive B the current drive, type B: and press the RETURN key. To make Disk Drive A the current drive again, type A: and press the RETURN key. To load a program, type the name of the program and press the RETURN key.

FORMATTING A DISKETTE

A blank diskette must be formatted before it can be used to save data. Boot up on CP/M and use the Format section of the Copy Disk program to format a new diskette.

DISK DRIVE SELECT SWITCHES

On the back of each Disk Drive is a 4 Section DIP Switch (SS1) used to select the drive number (0 thru 3). Use the following chart to determine the proper switch setting.

	SS1	
	ON	OFF
Drive 0 (A)	1	2,3,4
Drive 1 (B)	2	1,3,4
Drive 2 (C)	3	1,2,4
Drive 3 (D)	4	1,2,3

DISASSEMBLY INSTRUCTIONS

MAIN UNIT

Remove two screws located at rear of cabinet that hold access cover for optional circuit boards. Remove access cover and disconnect Connectors CN6 and CN7 from SYM Board. Using a screwdriver, remove two screw hole caps located on the right side of cabinet top. Remove four screws holding cabinet top. Lift cabinet top and flip over so cabinet top and bottom are facing each other. NOTE: Cabinet top and bottom are connected together with a ground strap.

To remove GGS Board, remove four screws holding board and lift straight up to disconnect Connectors CN9 and CN10.

To remove SYM Board, first remove GGS Board. Disconnect Connectors (CN8, CN12 and CN13), and ground strap. Remove seven screws holding SYM Board to cabinet bottom. Release four plastic claws holding board at the side and lift board from cabinet bottom.

To remove Power Supply Board, disconnect AC input Connector CN1 and Connector CN8 on the SYM Board. Remove four screws holding board to cabinet bottom and lift board from cabinet.

To remove disk drives, disconnect two connectors at the rear of each drive. Remove three screws holding each drive. Slide drive through the front of cabinet.

KEYBOARD

Remove six screws from bottom of keyboard and lift bottom cover from keyboard. To replace a defective key, remove nineteen screws holding circuit board to button assembly. Lift button assembly from circuit board. Unsolder and replace defective keyswitch on circuit board.

PRELIMINARY SERVICE CHECKS (Continued)

SERVICE CHECKS

SEE INTERCONNECTING DIAGRAM AND PHOTOS TO MATCH THE NUMBER IN THE CIRCLES WITH THOSE IN THE FOLLOWING DATA FOR SERVICE CHECKS TO BE PERFORMED.

(1) POWER SUPPLY

(A) Check for 120V AC between pin 1 and pin 4 of Connector CN1. If 120V AC is missing, check Connector CN1 for good connections and also check Power Switch (SW1) and AC Power Cord.

(B) Check Fuse F1 and replace if open.

(C) If Fuse F1 is open, disconnect Connector CN8 from the System Board, turn On the power supply and check for 5.0V at pin 7, – 12.0V at pin 10 and 12.4V at pin 11 of Connector CN8. If the voltages are low, check the adjustment of the 5V ADJ Control (VR1), see "5V ADJ" section of Miscellaneous Adjustments. If the voltages are missing, replace or troubleshoot the power supply.

(D) If the power supply checks good, turn Off the power and disconnect Disk Drives, Monitor, Video Display Board and any expansion boards. With the power turned Off, reconnect the devices one at a time, turning on the power after each device is reconnected and checking Fuse F1. Replace or troubleshoot the device or expansion board which causes the fuse to blow.

(2) COMPUTER DOES NOT COME UP PROPERLY

(A) Check Connectors CN8, CN9 and CN10 for good connections.

(B) Check CPU IC (17J), DMA Controller ICs (19J and 21J), Eprom IC (14M), RAM IC (16M), Interrupt Controller ICs (10E and 12E), and Timer ICs (14E and 16E) by substitution.

(3) NO VIDEO

(A) Check the adjustment of the Brightness Control (R760) on the Monitor. It may be set too low.

(B) Check the Monitor Connector CN4 for good connections and check the Monitor cable for open circuits.

(C) Check for pulses at pins 4, 5 and 8 of Connector CN4 and check for 12.0V at pin 1 of Connector CN4. If the readings are good, check Fuse F901 on the Monitor board.

(D) If pulses are missing at pins 4, 5 and 8 of Connector CN4, check Connectors CN9 and CN10 for good connections.

(E) If the GGS Board is used, check the adjustment of the Video Level Control (VR1), see the "Video Level (GGS Board)" section of Miscellaneous Adjustments. Also check ICs Graphics Display Controller IC (9B) and Character Attribute Generator IC (9D) by substitution.

(F) If the GMS Board is used, check Graphics Display Controller IC (10A) by substitution.

(4) CHARACTERS WRONG ON MONITOR SCREEN

(A) If GGS Board is used, check Character Rom IC (5E), Character Attribute Generator IC (9D), and Video Ram ICs (1A thru 8A and 1B thru 8B) by substitution.

(B) If GMS Board is used, check Character Rom IC (2E), Video Ram ICs (2A thru 9A and 1B thru 8B) by substitution.

(5) KEYBOARD DEAD

(A) Check Connectors CN1 and CN for good connections and check the Keyboard cable for open circuits.

(B) Check Protocol Controller IC (16B) by substitution.

(6) DISK DRIVE OPERATION ERRATIC

(A) Check Connectors CN6, CN7, J1 and J2 for good connections and also check the Disk Drive cables for open circuits.

(B) Clean the heads with a non-abrasive cleaning diskette.

(C) Check the spindle speed for wrong or erratic speed, see "Speed Adjustment" section of Miscellaneous Adjustments.

(D) Check Resistor Pack RA150 on Disk Drive B for good connections.

(E) Check Disk Controller IC (14H) by substitution.

(7) DISK DRIVE WILL NOT RUN

(A) Check the Disk Drive Belt.

(B) Check Connectors CN6, CN7, J1 and J2 for good connections and check the Disk Drive cables for open circuits.

(C) Check Disk Drive Select Switches (SS1) for correct settings. Refer to "Disk Drive Select Switches" section of the General Operating Instructions.

(D) Check IC 14H by substitution.

(8) NO SOUND

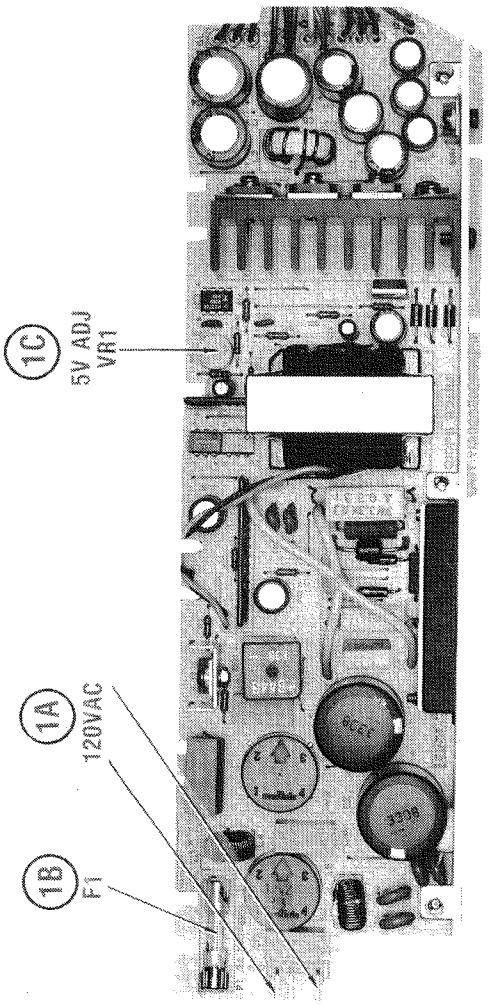
(A) Check the setting of the Volume Control (VR1).

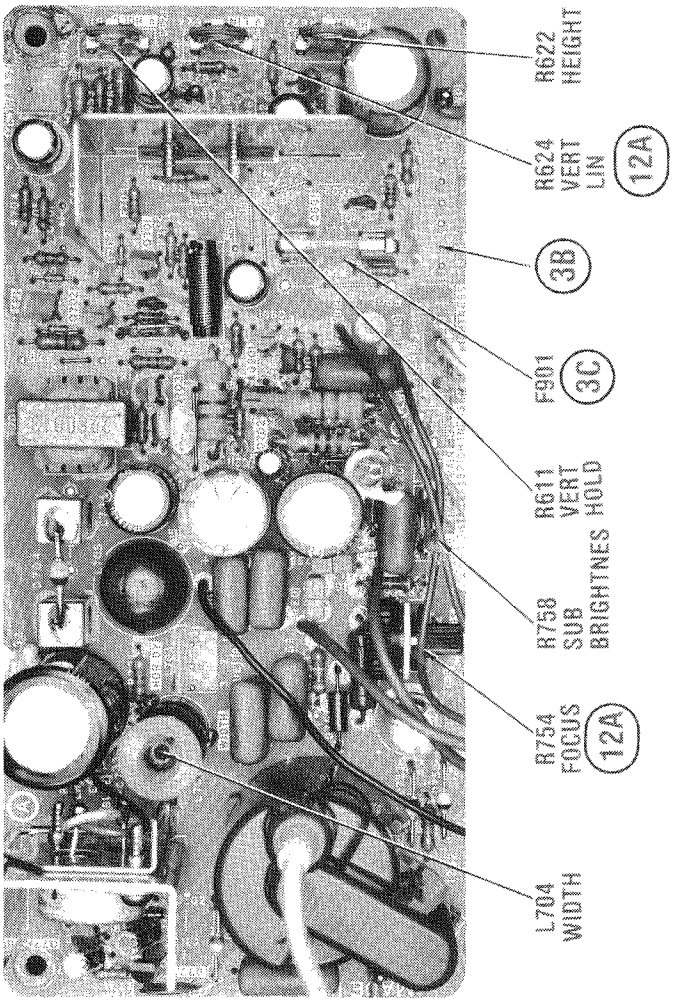
(B) Check Speaker resistance for 8 Ohms.

(C) Check Timer ICs (14E and 16E) by substitution.

(9) TIME OF DAY CLOCK DOES NOT WORK

(A) Check Real Time Clock IC (21B) by substitution.





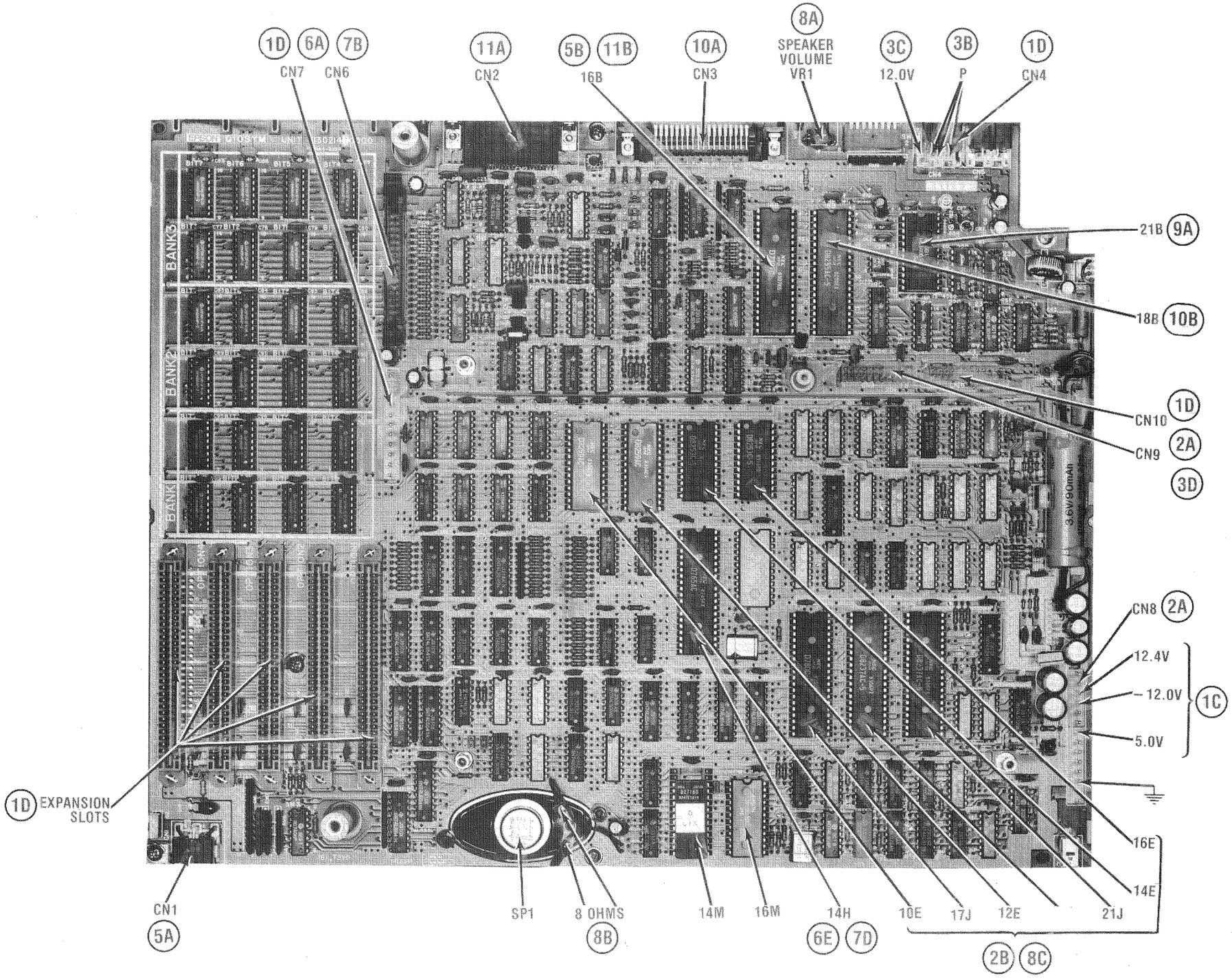
CSCS4

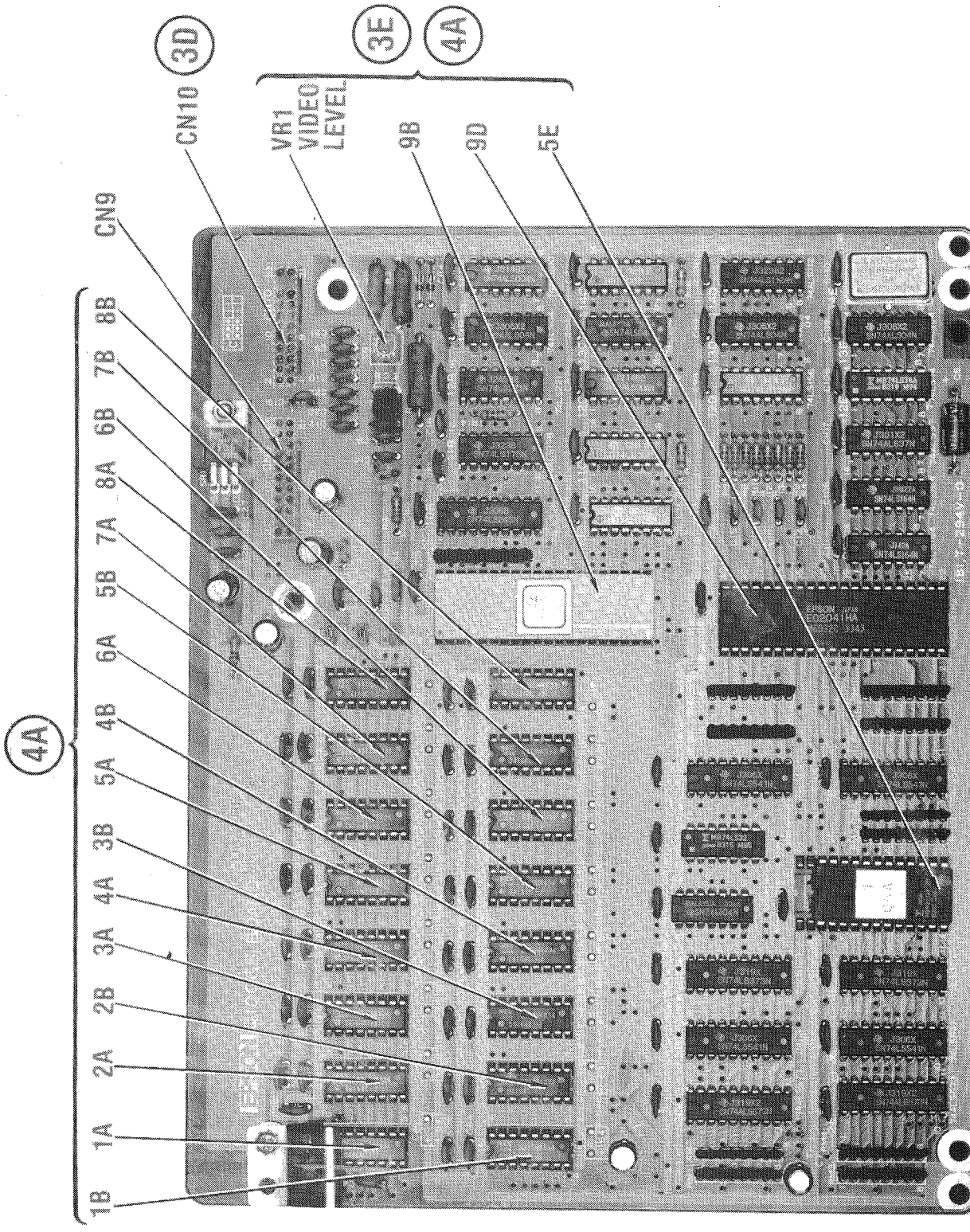
EPSON
MODEL QX-10

POWER SUPPLY BOARD

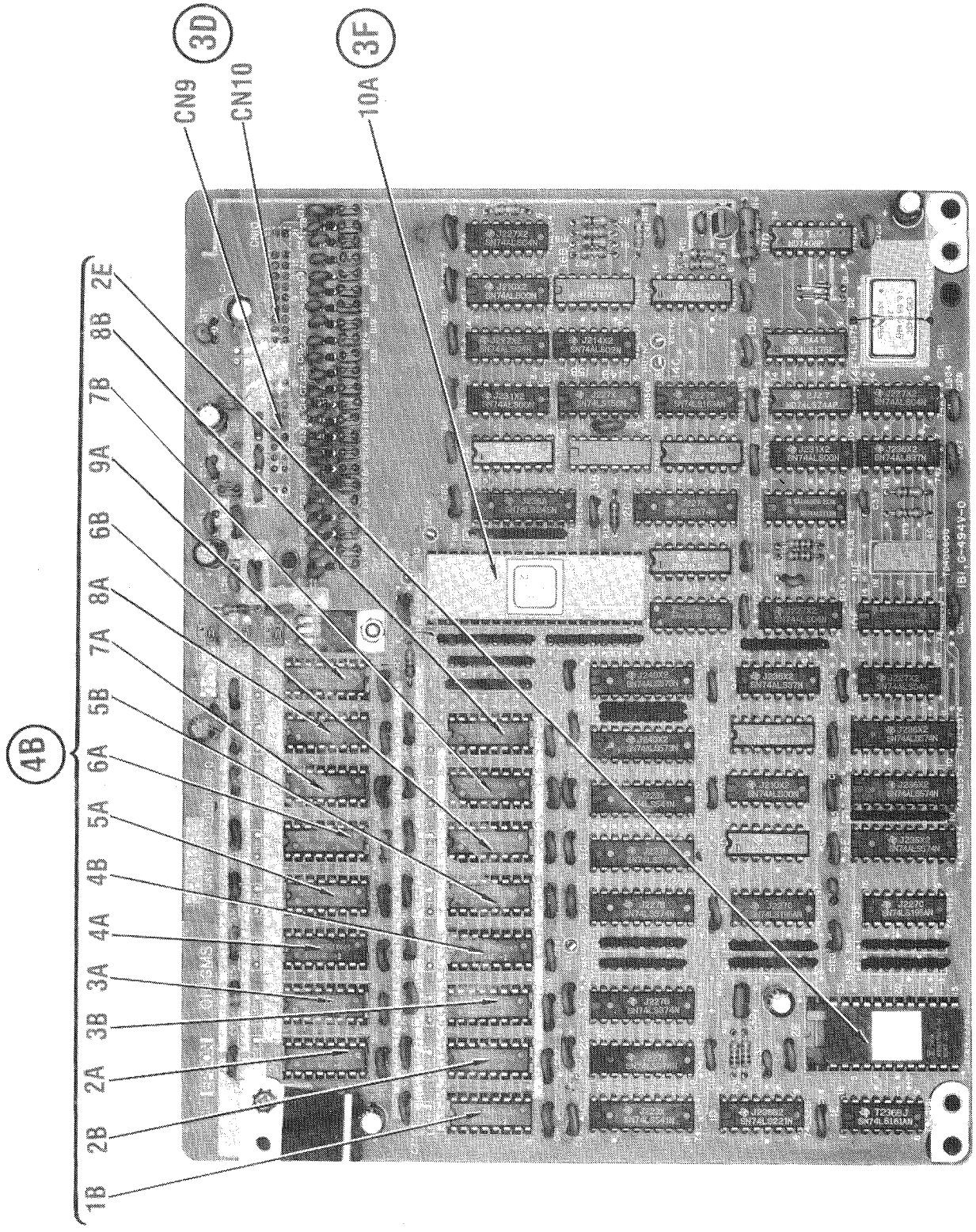
MONITOR BOARD

PRELIMINARY SERVICE CHECKS (Continued)




3D
CN10
3E
4A
VR1
VIDEO
LEVEL
9B
9D
5E
CN9
8B
7B
6B
8A
7A
5B
6A
4B
5A
3B
4A
3A
2B
2A
1A
1B
4A

GGS BOARD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3F
CN9
CN10
10A
4B
2E
8B
7B
9A
6B
8A
7A
5B
6A
5A
4B
4A
3A
3B
2A
2B
1B

GMS BOARD

PRELIMINARY SERVICE CHECKS (Continued)

SERVICE CHECKS (Continued)

(10) PRINTER DOES NOT OPERATE PROPERLY

(A) Check printer Connector CN3 for good connections and check printer cable for open circuits.

(B) Check Printer Interface IC (18B) by substitution.

(11) SERIAL INTERFACE (RS232C)

(A) If a device plugged into the RS232C Socket CN2 and does not work, check Connector CN2 for good connections and check the cable for open circuits.

(B) Check Protocol Controller IC (16B) by substitution.

(12) INITIAL MONITOR TEST

(A) Turn On Monitor. Adjust the Brightness Control for the best display. Check the adjustment of the Vertical Hold, Vertical Linearity, Height and Focus Controls. If any of these controls produce erratic operation, clean that control with a spray contact cleaner and recheck.

MISCELLANEOUS ADJUSTMENTS

5V ADJ (POWER SUPPLY BOARD)

Connect the input of a voltmeter to pin 7 of Connector CN8. Adjust the 5V ADJ Control (VR1) for 5.0V.

REAL TIME CLOCK OSCILLATOR

Connect the input of a Frequency Counter to pin 12 of IC (22B). Adjust the Oscillator Trimmer Capacitor (CV1) for a frequency of 32.768kHz.

ALIGNMENT TOOLS **GC ELECTRONICS**

CV1 ..... 5000, 8376, 9089

VIDEO LEVEL (GGS BOARD)

Connect the input of a scope to pin 6 of Connector CN10. Turn the computer on with no diskette in the disk drives (INSERT DISKETTE will appear on the monitor screen). Adjust VR1 on the GGS Board for a waveform of 4 volts peak to peak.

SPINDLE SPEED ADJUSTMENT

Insert a blank diskette into the Disk Drive and close the door. Turn the Disk Drive on its side so the pattern wheel on the fly wheel is visible. Adjust the Speed Control (VR2) until the 60Hz pattern appears to stand still under a 60Hz fluorescent light. If 50Hz fluorescent lighting is used, use the 50Hz pattern on the pattern wheel.

If a Disk Drive Tester is being used, which provides a readout of the speed in rpm, adjust VR2 for a speed of 300rpm ± 1.5%.

HEAD CLEANING

Use a non-abrasive cleaning diskette to clean the disk drive heads.

PREVENTATIVE MAINTENANCE

ENVIRONMENT

Computers perform best in a clean, cool area that is below 80 degrees Fahrenheit and free of dust and smoke particles. Even though home Computers are not affected by cigarette smoke as much as commercial Computers are affected, it is better to maintain a smoke-free area around the Computer. Do not block cabinet vents of any of the Computer system; Computer, Monitor, Printer, or other power devices.

ELECTRICAL POWER

Variations in the line voltage can affect the Computer. Try to avoid these fluctuations by using an AC receptacle that is on a power line not used by appliances or other heavy current demand devices. A power-surge protector, power-line conditioner, or non-interruptable power supply may be needed to cure the problem. **Do not** switch power On and Off frequently.

KEYBOARD

Liquids spilled into the Keyboard can ruin it. Immediately after a spill occurs, disconnect the Computer power plug from AC power outlet. Then, if circuitry or contacts are contaminated, disassemble the Keyboard and carefully rinse the Keyboard printed circuit board with distilled water and let it dry. Use a cotton swab to clean between the keys. Use a non-abrasive contact cleaner and lint-free wipers on accessible connectors and contacts.

DISK DRIVES

Clean the read/write heads of the Disk Drives about once a month or after 100 hours usage. Use only an approved head cleaning kit.

Handle carefully to preserve proper disk head alignment. A sudden bump or jolt to the Disk Drives can knock the disk head out of alignment. If the disk drive must be transported, place an old disk in slot and close door during transport.

Store disks in their protective covers and never touch the disk surface. Observe the disk handling precautions usually found on the back of disk protective covers.

PRINTERS

Carefully vacuum the Printer regularly. Wipe surface areas clean using a light all-purpose cleaner. Do not oil the machine. The oil will collect abrasive grit and dust. The dust will act as a blanket. This can cause components to overheat and fail.

STATIC ELECTRICITY

Static electricity discharge can affect the Computer. In order to minimize the possibility, use anti-static mats, sprays, tools and materials, and maintain good humidity in the Computer environment.

MONITOR

Use an isolation transformer with any Monitor that does not come as part of the system since some Monitors use a HOT chassis (chassis connected to one side of the AC line). The face of the Monitor should never be left on for long periods of time at high brightness level except when pattern is being changed periodically. Use caution when cleaning anti-glare screens, to preserve the glare-reduction feature.