

# COMPUTER:

RADIO SHACK TRS-80® MODEL III  
(CATALOG NUMBER 26-1063)



TECHNICAL SERVICE DATA FOR YOUR COMPUTER

## PRELIMINARY SERVICE CHECKS

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

Check all interconnecting cables for good connection and correct hookup before making service checks.

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

Replacement or repair of the Power Supply Board, System board, Disk Interface board, Disk Drive, RS-232 Serial Interface Board, Monitor board, keyboard, or connectors may be necessary after the malfunction has been isolated.

## TEST EQUIPMENT AND TOOLS

### TEST EQUIPMENT

Digital Volt/Ohm Meter  
Logic Probe

### TOOLS

Low Wattage Soldering Iron  
Desoldering Equipment  
Head Cleaning Equipment  
Switch Cleaner (non-spray type)  
Phillips Screwdriver  
Flat Blade Screwdriver

## REPLACEMENT PARTS AND DESCRIPTION

### IDENT PART NO. DESCRIPTION

#### DISK DRIVE

M1 AM4545 Motor, Drive  
AB6443 Belt, Drive

#### DISK DRIVE INTERFACE BOARD

U2 802-0245 IC, Data Buffer, 74LS245  
U7 AXX3041 IC, Floppy Disk Controller, WD1793  
U11 AMX4471 IC, Floppy Support Logic, WD1691  
U13 AMX4472 IC, Clock Generator, WD2143-01

#### POWER SUPPLY BOARD

DB1 Bridge Rectifier, W06  
R25 Fuse Resistor, 2 Ohm, 2W

### IDENT PART NO. DESCRIPTION

#### RS-232 SERIAL INTERFACE BOARD

U1 AMX3921 IC, Baud Rate Generator, BR1941-L  
U2 AMX3865 IC, UART, TR1602B

#### SYSTEM BOARD

K1 AR8130 Relay, Cassette  
U7 AXX3021 IC, RAM, 416  
thru  
U14  
U36 AXX3040 IC, Character Generator, MCM68A316E  
U77 AMX3586 IC, CPU, Z80  
U81, U82 AXX3038 IC, Video RAM, MCM2114  
U104 AXX3039 IC, ROM A, MCM364  
U105 AXX3037 IC, ROM B, MCM332  
U106 AMX4642 IC, ROM C, MCM68A

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CSCS5

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# 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 COMPUTER DEAD

- (A) Check for 120VAC from pin L to pin N of Connector SK1 on the System board Power Supply. If 120V AC is missing check the AC cord and Power Switch (SW1).
- (B) Check for 5V at pin 4, 12V at pin 2 and - 12V at pin 1 of Connector SK2 on the System board Power Supply. If the voltages are missing, check Fuse Resistor R25. If R25 is bad, replace and check for shorts at Bridge Rectifier DB1 before turning On Computer. If shorts are present, replace or repair the Power Supply.
- (C) If Fuse Resistor R25 is good, disconnect connectors SK2, SK3 and SK4. Recheck the source voltages at Connector SK2. If the voltages return to normal, reconnect the connectors one at a time until the Connector is found that shuts down the Power Supply. Replace or troubleshoot the board it connects to.
- (D) Check the CPU IC (U77), ROM IC's (U104, U105 and U106), RAM IC's (U7 thru U14) and Data Bus Buffer IC (U90) by substitution.

### ② VIDEO DISPLAY

- (A) No Video. Check connector J5 on the System board and connector J101 on the Monitor board for good connections.
- (B) Check Fuse F101 on the Monitor board.
- (C) Check the Character Generator ROM IC (U36), Video RAM IC's (U81 and U82) and Video Data Buffer IC (U67) by substitution.
- (D) Characters are not correct on the Monitor screen. Check the Character Generator ROM IC (U36) and Video RAM IC's (U81 and U82) by substitution.
- (E) Display size is not correct or display is unstable. Check vertical size, Width and Vertical and Horizontal Hold adjustments, see "Miscellaneous Adjustments". Also check the display jumpers on the System board see "50/60Hz Monitor Display Jumpers".

### ③ KEYBOARD

- (A) Keyboard is dead or one group of keys does not work. Check the Keyboard ribbon cable for open circuits and connectors J1 and J6 for good connections.
- (B) One key does not work or is erratic, clean the bad key with contact cleaner.

- (C) Wrong character appears on the Monitor screen when a key is pressed. Check the Character Generator ROM IC (U36) and Video RAM IC's (U81 and U82) by substitution.

### ④ DISK DRIVE AND INTERFACE

- (A) Disk Drives are dead. Check for 12V at pin 2 and 5V at pin 4 of connector SK2 on the Disk Drives and Disk Drive Interface Power Supply. If the voltages are missing, check connector SK1 for good connection and check Fuse Resistor R25. If R25 is bad, replace and check for shorts at Bridge Rectifier (DB1) before turning On Computer. If shorts are present, replace or repair the Power Supply.

#### WARNING

It is possible for a defective Disk Drive to write on or erase information on a diskette even when the diskette is write protected. Check a questionable Disk Drive by first using a diskette that contains programs that have been duplicated on another diskette.

- (B) Disk Drive operation is erratic. Check connector J7 on the System board, J2, J3 and J4 on the Disk Drive Interface board and J1, J3 and J4 on Disk Drive boards for good connections.
- (C) Clean the head and check the Spindle Speed Adjustment (R4), see "Miscellaneous Adjustments".
- (D) Will not write. Check connector P8 on the Disk Drive for good connections. Check the Write Protect Switch (S1) for shorted or sticking contacts with an ohmmeter from pin 1 to pin 2 of connector P8.
- (E) Writes on write protected diskette. Insert a write protected diskette into the Disk Drive and check for continuity at pins 1 and 2 of connector P8 on the Disk Drive. If it checks open, check the Write Protect Switch (S1). Check Floppy Disk Controller IC (U7) by substitution.
- (F) Will not write or read. Check the Floppy Disk Controller IC (U7), Floppy Support Logic IC (U11), Clock Generator IC (U13) and Data Buffer IC (U2) by substitution.

- (G) Disk Drive will not run. Check connectors P13 on the Disk Drive Board and P20 and P21 on the Drive Motor Control board for good connections.

- (H) Check for possible broken or binding Drive Belt. Connect a jumper from pin 2 of connector P21 on the Drive Motor Control board to ground. If the Drive Motor does not start running and 12.0V is present at pin 3 of connector P21, check the motor by substitution.

# PRELIMINARY SERVICE CHECKS (Continued)

## GENERAL OPERATING INSTRUCTIONS

### POWER UP SEQUENCE

1. Turn On all peripherals.
2. With no diskettes in the Disk Drives, turn On the Computer.
3. When the Disk Drives stop running, insert a TRS-80 Disk Operating System diskette in Disk Drive 0. Close the drive door and press the RESET button. The Computer will come up asking for the Date and Time. After the Date and Time are entered the Computer will come up with TRSDOS Ready on Monitor screen. Note: If no Disk Drives are installed the Computer will come up with CASS? on the Monitor screen. Type L to get 500 Baud Cassette operation or H to get 1500 Baud. The Computer will then ask for Memory Size?, press the ENTER key and the Computer will come up ready to program in Basic.

### RESET

Hold the BREAK key down and press the RESET button to reset the Computer to Cassette Basic. If Disk Drives are installed, press the RESET button only, to reboot the Computer from a system diskette in Disk Drive 0.

### DISK OPERATING SYSTEM (TRDOS)

Type DIR and press the ENTER key to display the directory of the diskette in Disk Drive 0. If the directory of a diskette is desired other than drive 0, type DIR : and the Disk Drive number desired (example DIR :1 for Drive 1).

To load a program from a diskette while in DOS, type the program name and press the ENTER key. Use a colon and the number of the Drive after the program name to load a program from any Disk Drive other than drive 0. NOTE: Programs written in Basic cannot be loaded while in DOS. See the "BASIC" section of the "General Operating Instructions" for instructions on loading programs written in Basic.

To display a list of special programs on the system diskette type LIB and press the ENTER key.

### BASIC

To load Disk Basic into the Computer, boot up on DOS, put a diskette in Drive 0 with Disk Basic on it, type BASIC and press the ENTER key. To go from Disk Basic back to DOS, type CMD "S" and press the ENTER key.

To display the directory of the diskette in Disk Drive 0 type CMD "D:0" and press the ENTER key. For Disk Drive 1 type CMD "D:1" and press the ENTER key.

To load a program from a diskette in Disk Drive 0, type LOAD and the program name enclosed in quotes and press the ENTER key. To load a program from a Disk Drive other than Disk Drive 0 add a colon and the Disk Drive number at the end of the program name. Example LOAD "SAMS:1"

To save a program to a diskette in Disk Drive 0, type SAVE and the program name enclosed in quotes and press the ENTER key. To save a program to a diskette in a Disk Drive other than Disk Drive 0, add a colon and the Disk Drive number at the end of the program name. Example SAVE "SAMS:1".

### USING A BLANK DISKETTE

A blank diskette must be either formatted or have the DOS copied to it before it can be used to save data. NOTE: Disk Drive 0 must always contain a diskette with DOS on it. A formatted diskette may be used in Disk Drives 1, 2 or 3.

To copy DOS on a diskette, load DOS into the Computer, put a diskette in Disk Drive 0 with the BACKUP program on it, type BACKUP and press the ENTER key. Follow the instructions that come up on the Monitor screen.

To format a diskette, load DOS into the Computer, put a diskette in Disk Drive 0 with the FORMAT program on it, type FORMAT and press the ENTER key. Follow the instructions that come up on the Monitor screen.

### CASSETTE OPERATION

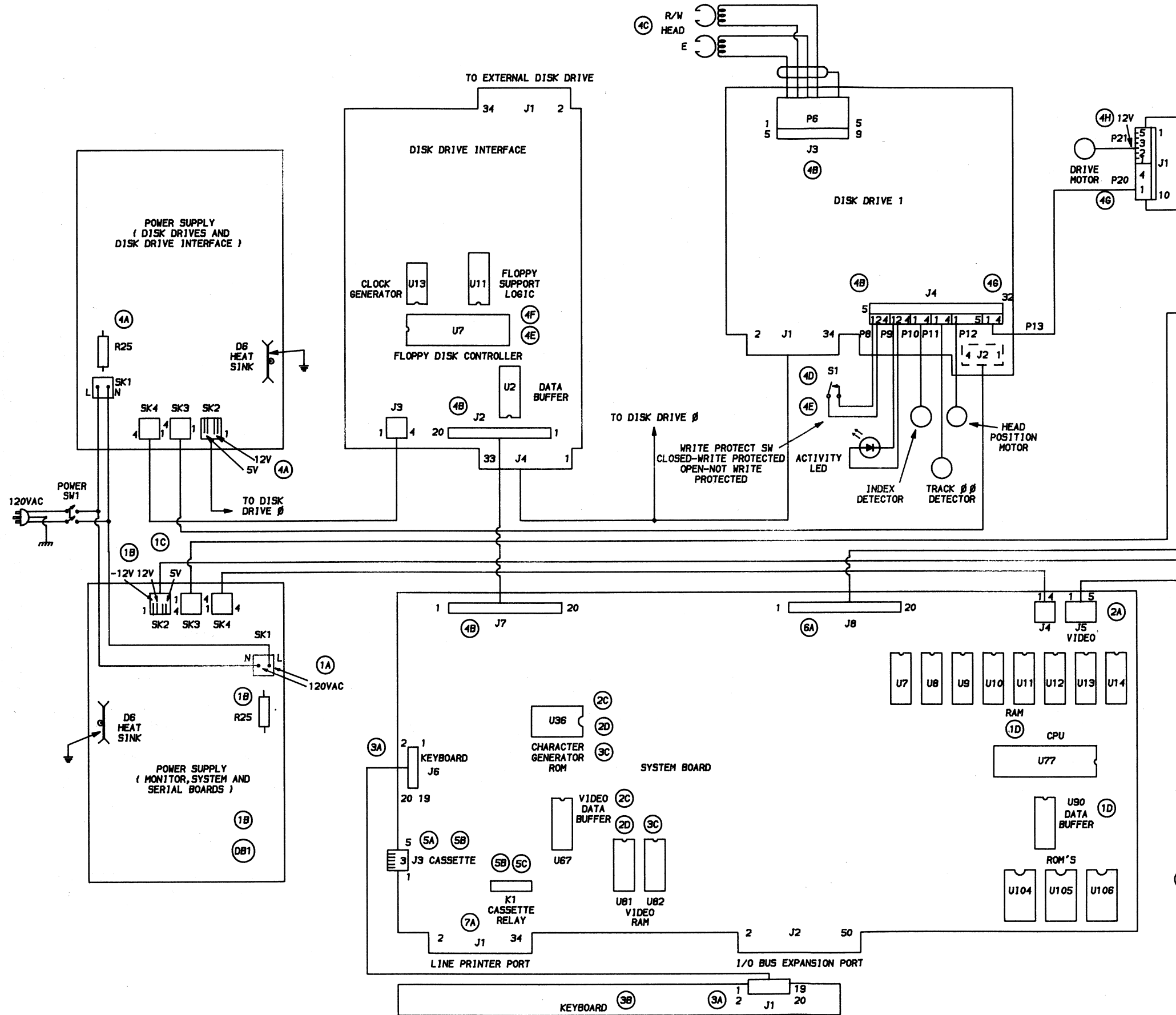
To load a program from Cassette tape, type CLOAD (with or without the program name enclosed in quotes), put the recorder in play mode and press the ENTER key.

To save a program to Cassette tape, type CSAVE (with or without the program name enclosed in quotes), put the recorder in record mode and press the ENTER key.

CSCS5

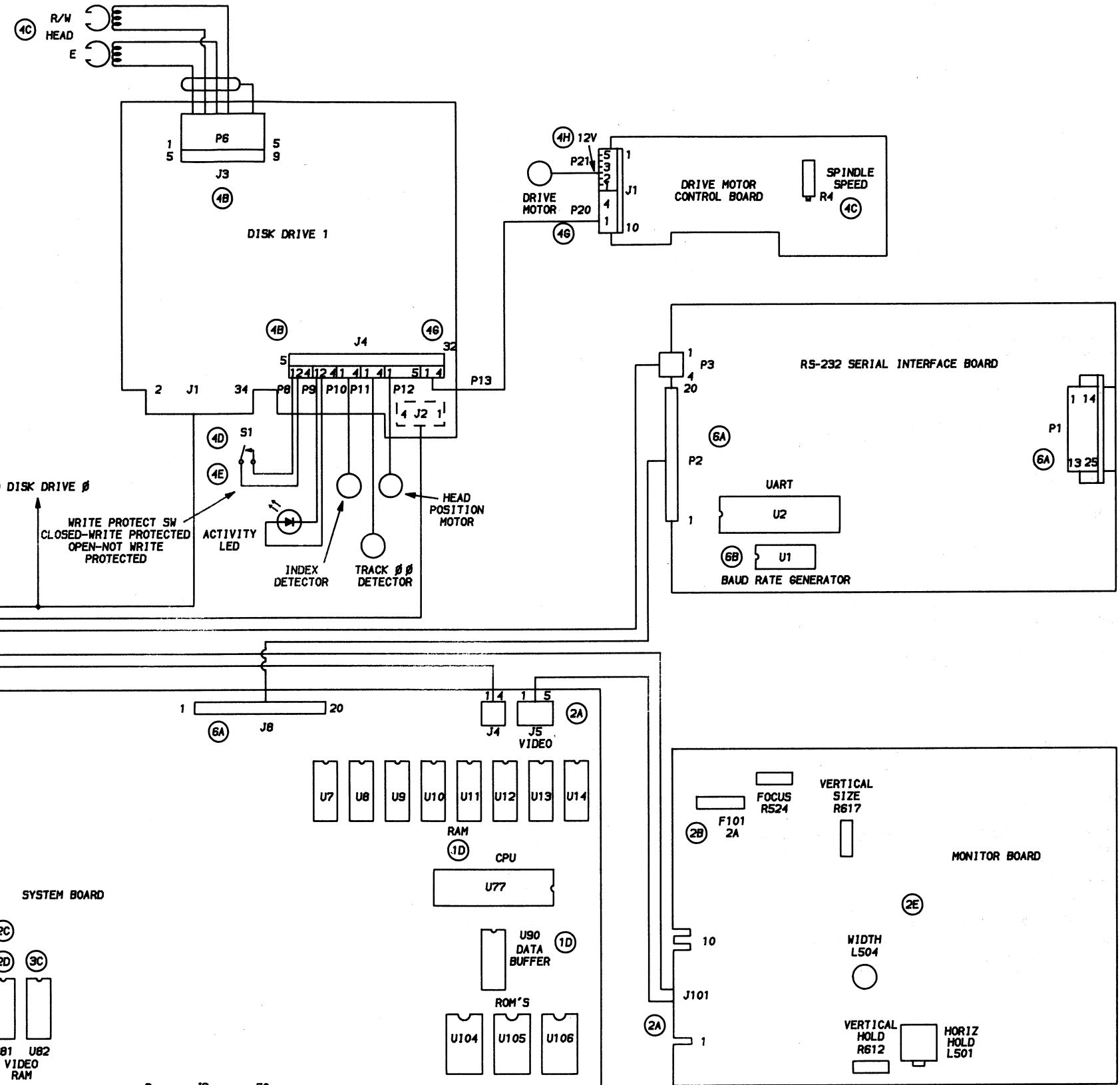
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PRELIMINARY SERVICE CHECKS (Continued)



INTERCONNECTING DIAGRAM

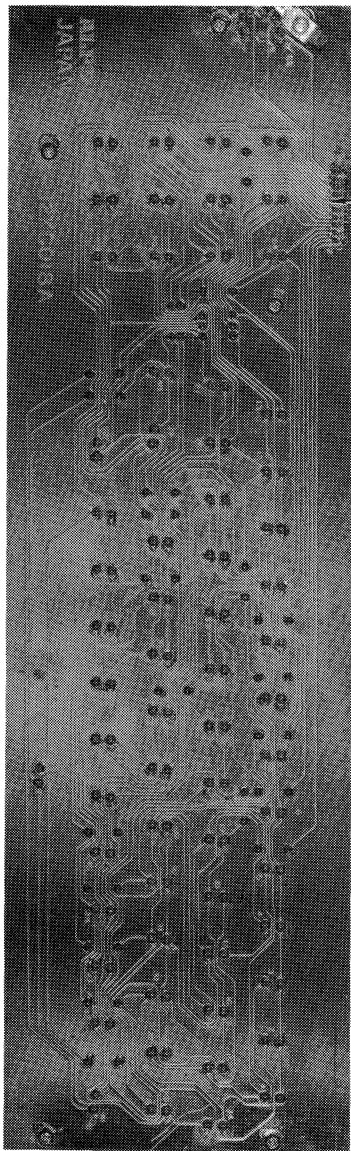
PRELIMINARY SERVICE CHECKS (Continued)



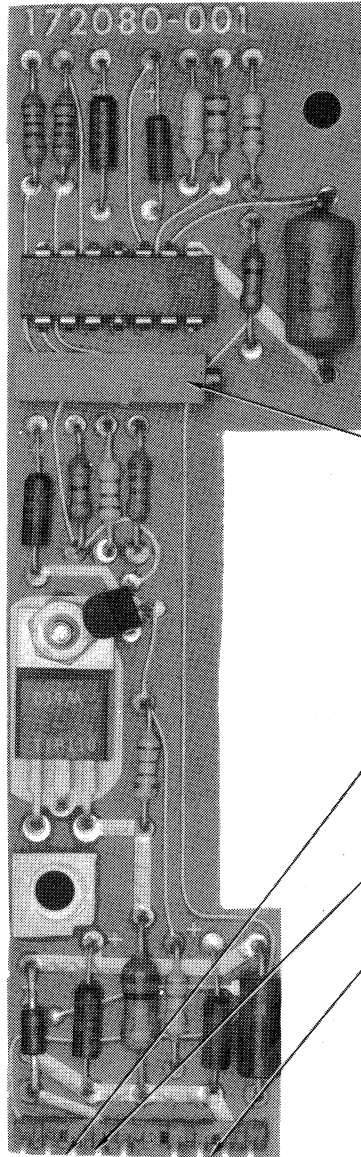
INTERCONNECTING DIAGRAM

# PRELIMINARY SERVICE CHECKS (Continued)

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J1 (3A)



R4 SPINDLE SPEED (4C)

PIN 3 12V (4H)

PIN 2 P21

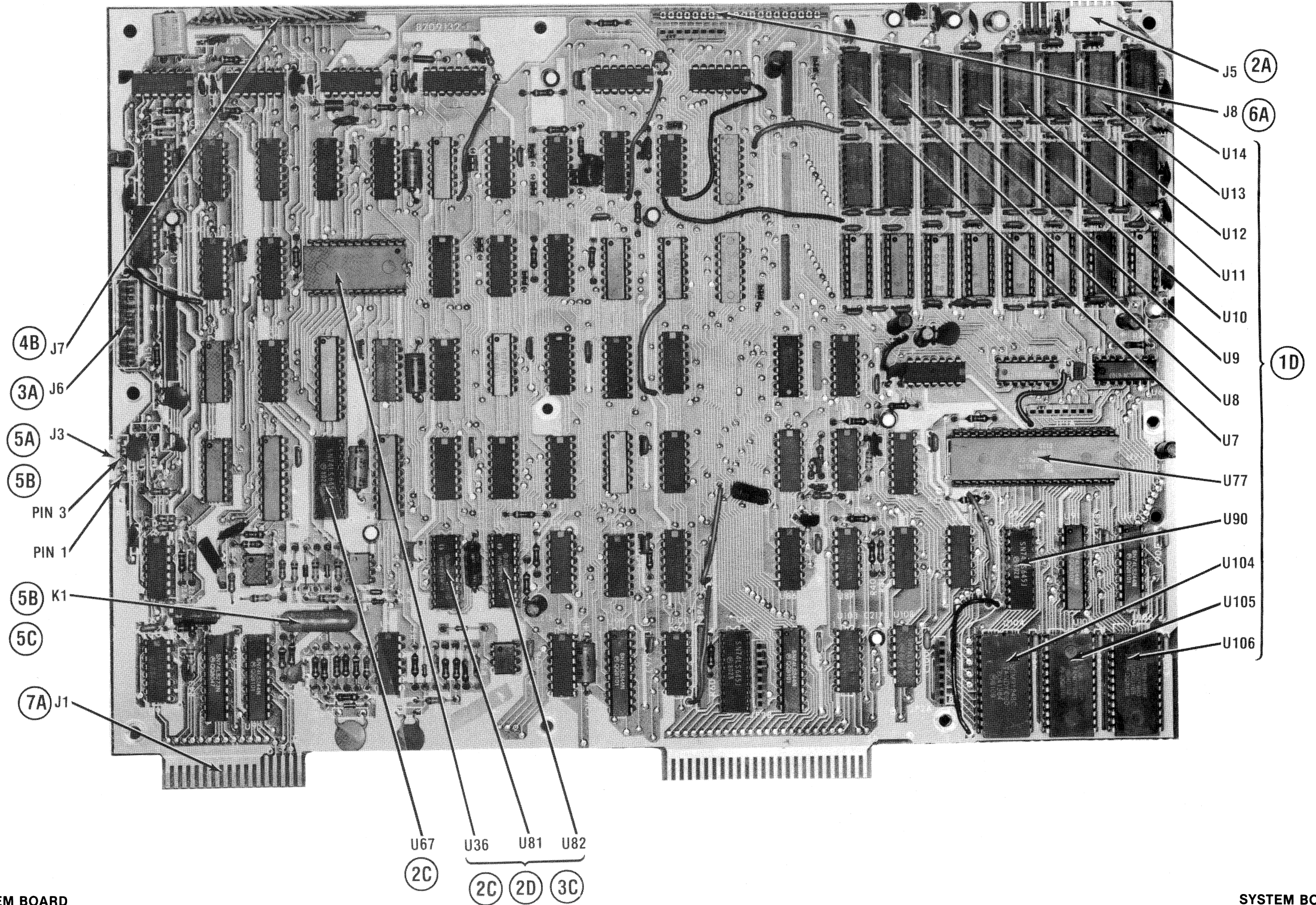
P20 (4G)

KEYBOARD

DISK DRIVE MOTOR CONTROL BOARD

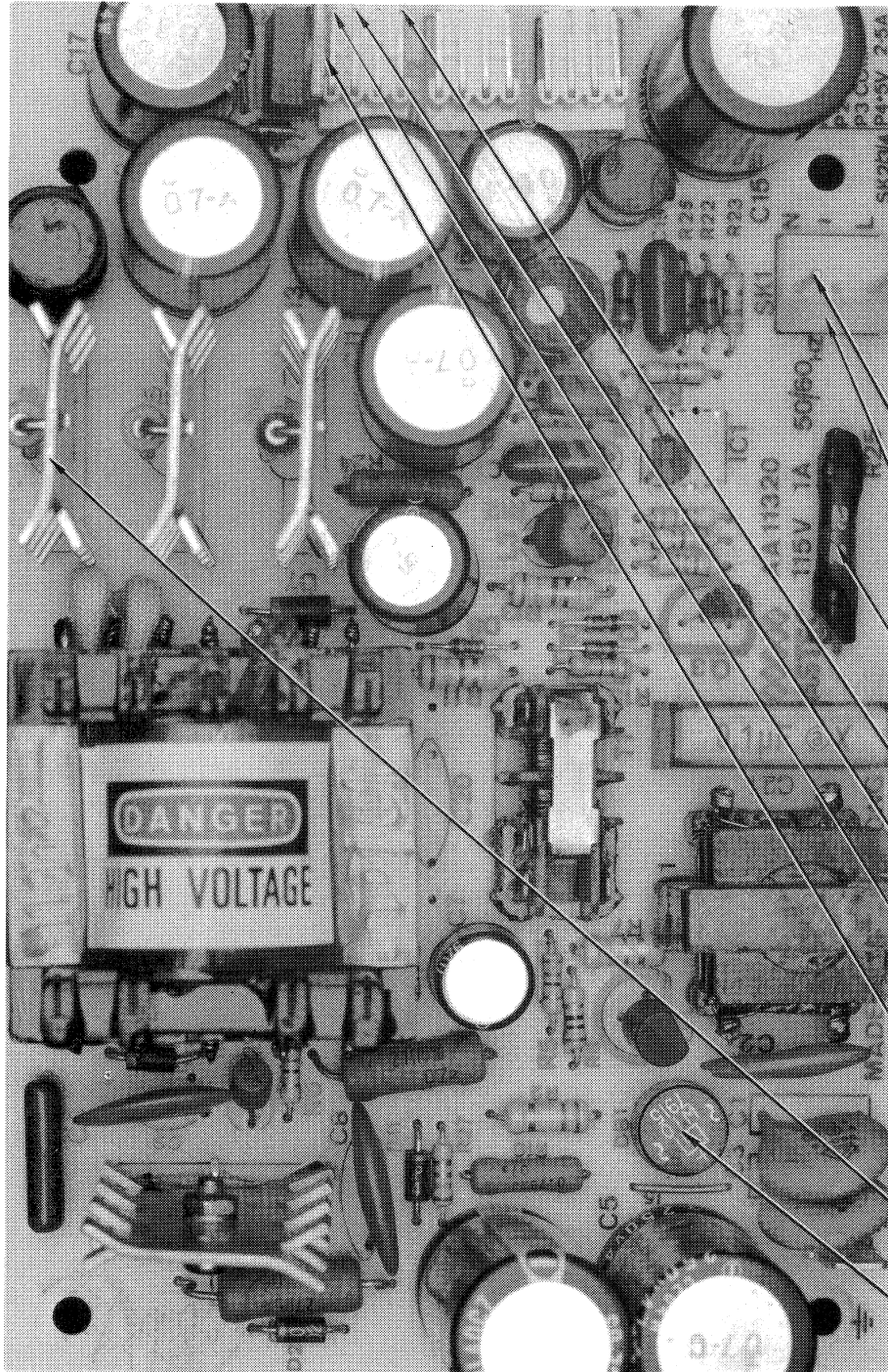
PRELIMINARY SERVICE CHECKS (Continued)

PRELIMINARY SERVICE CHECKS (Continued)



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# PRELIMINARY SERVICE CHECKS (Continued)



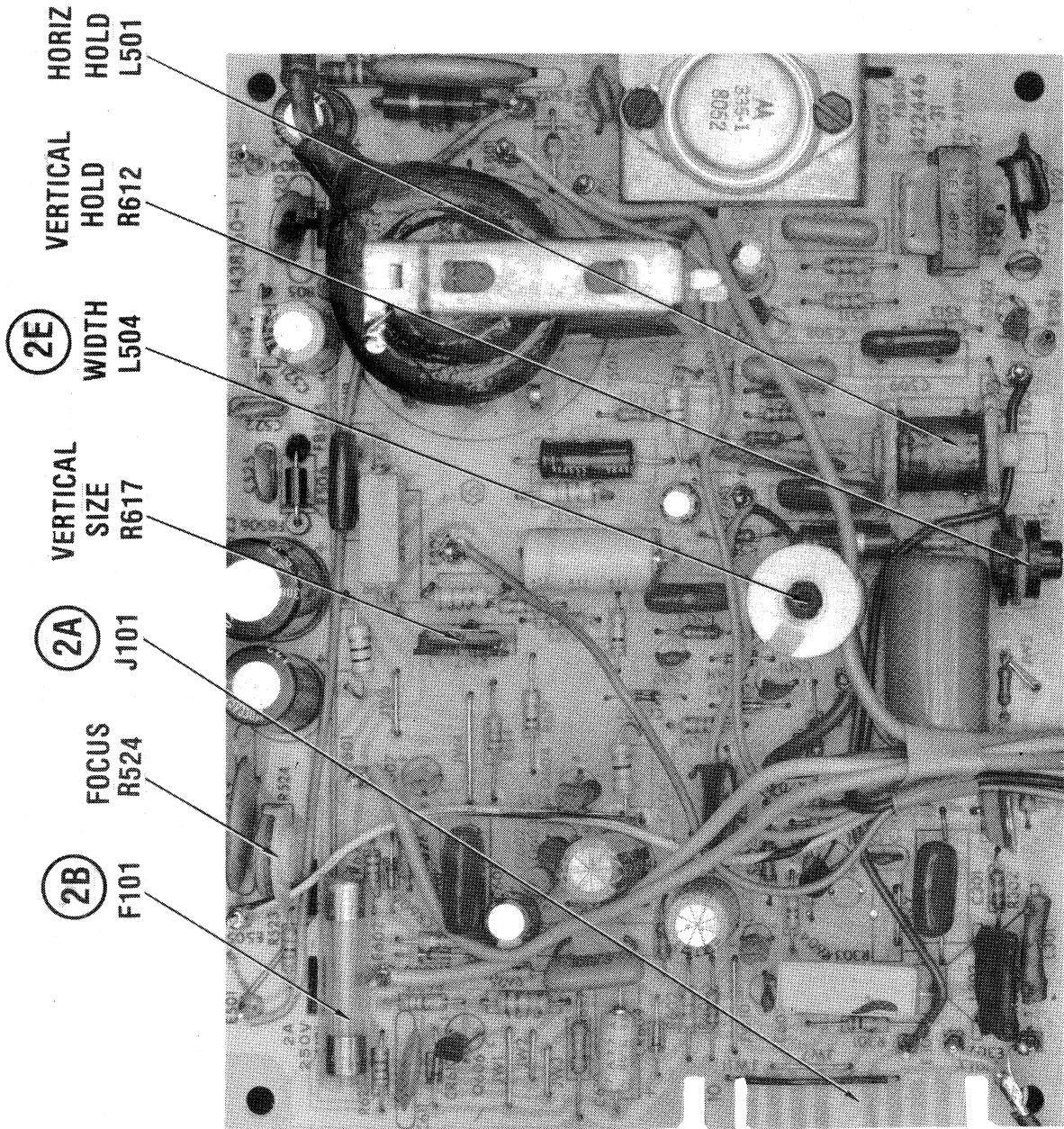
- 120VAC (1A)
- SK1 (4A)
- R25 (1B)
- 5V (4A)
- 12V (1C)
- 12V (1B)
- SK2
- DB1

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**POWER SUPPLY BOARD**

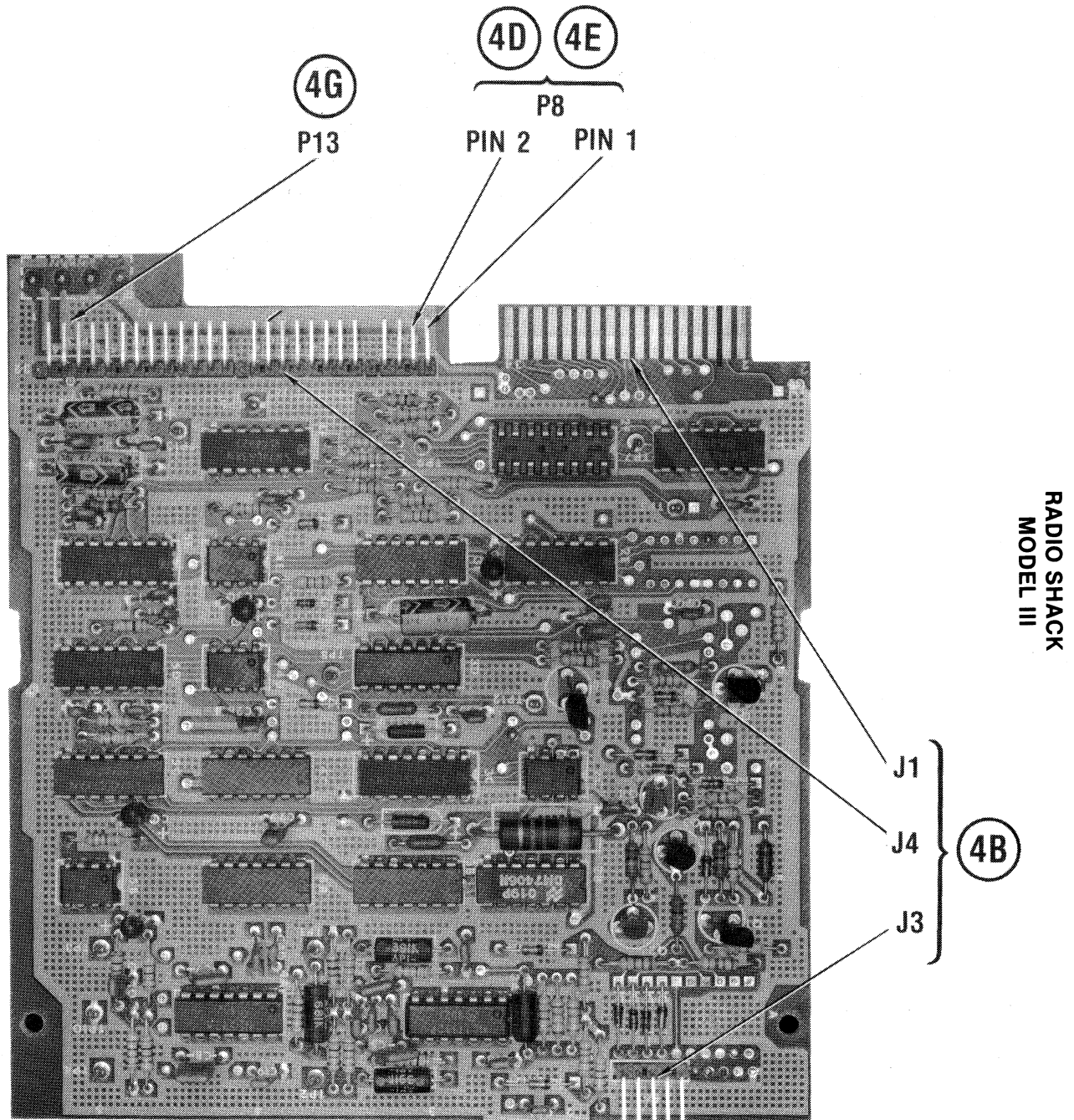


# PRELIMINARY SERVICE CHECKS (Continued)



MONITOR BOARD

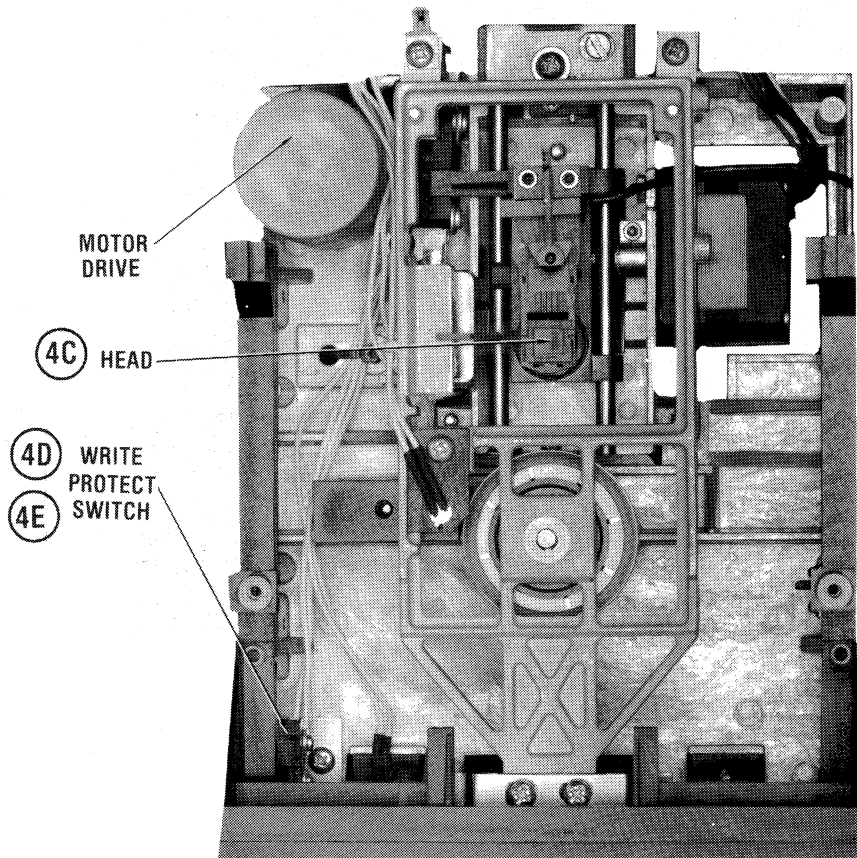
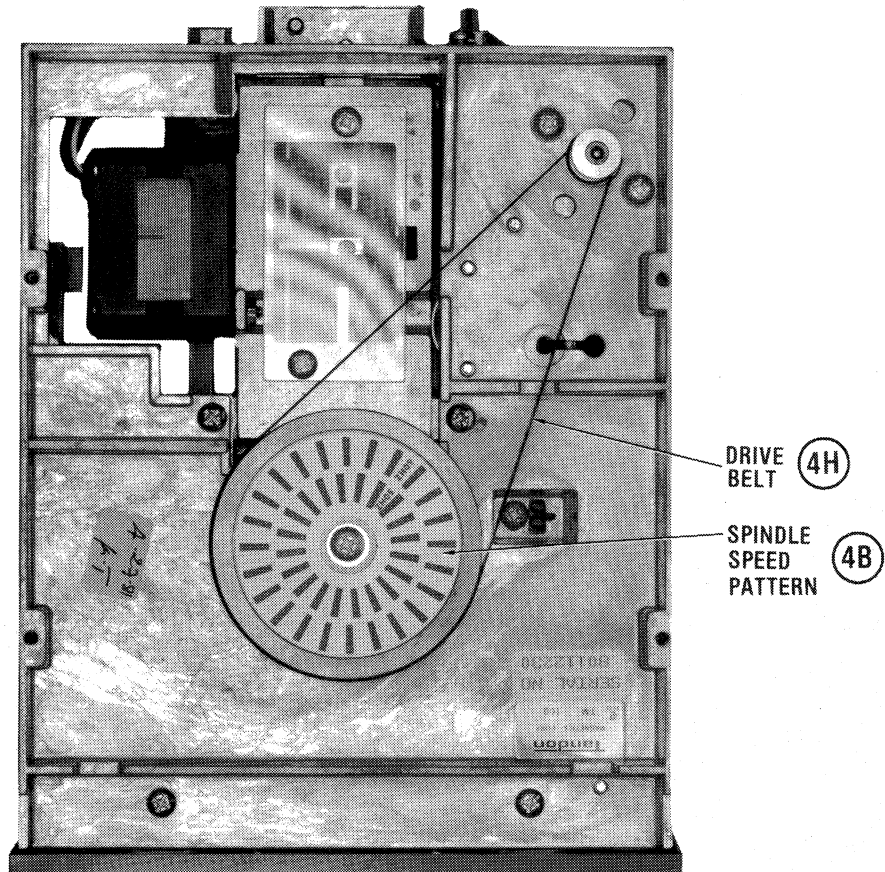
# PRELIMINARY SERVICE CHECKS (Continued)



DISK DRIVE BOARD

# PRELIMINARY SERVICE CHECKS (Continued)

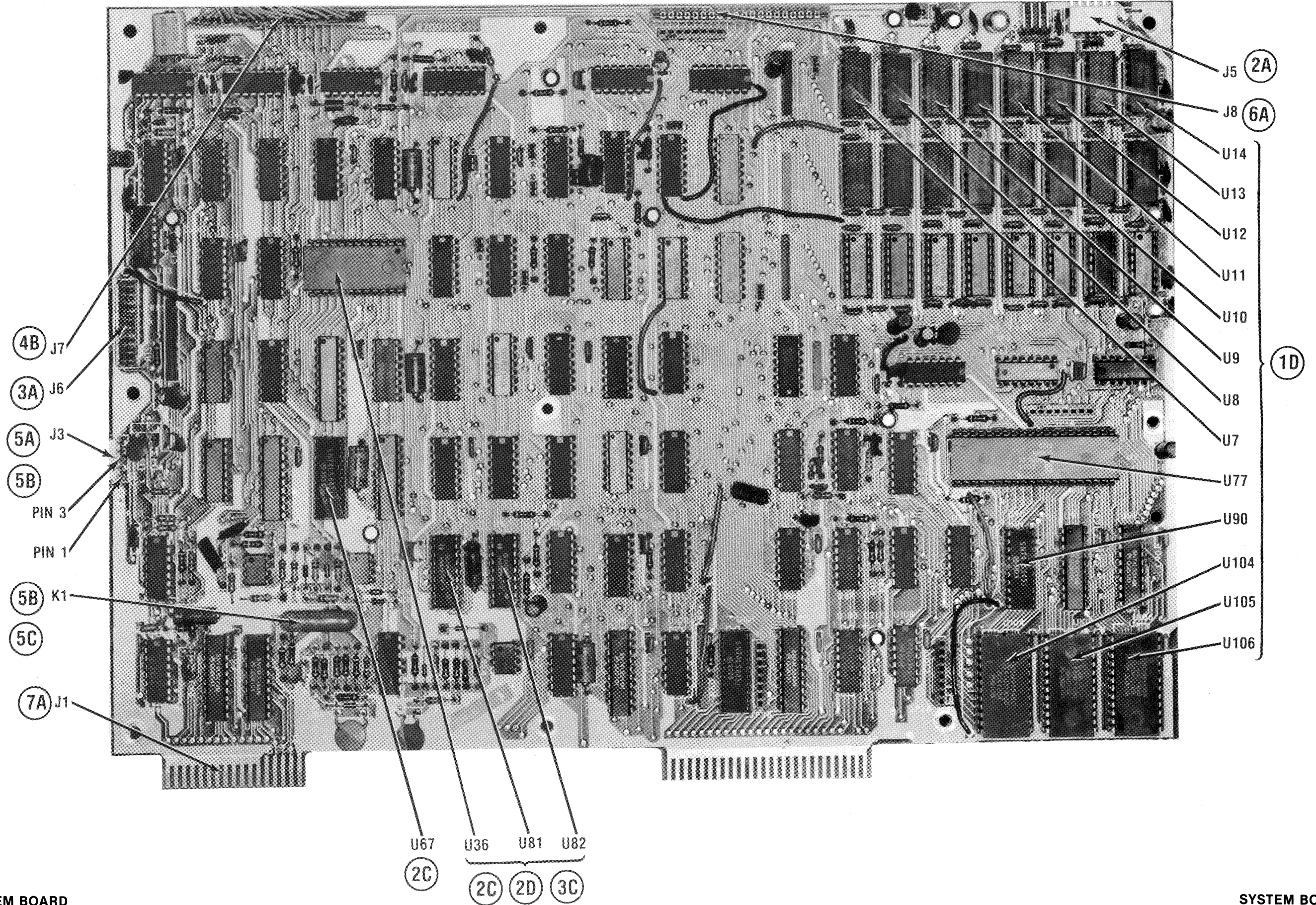
## MECHANICAL BOTTOM



## MECHANICAL TOP

PRELIMINARY SERVICE CHECKS (Continued)

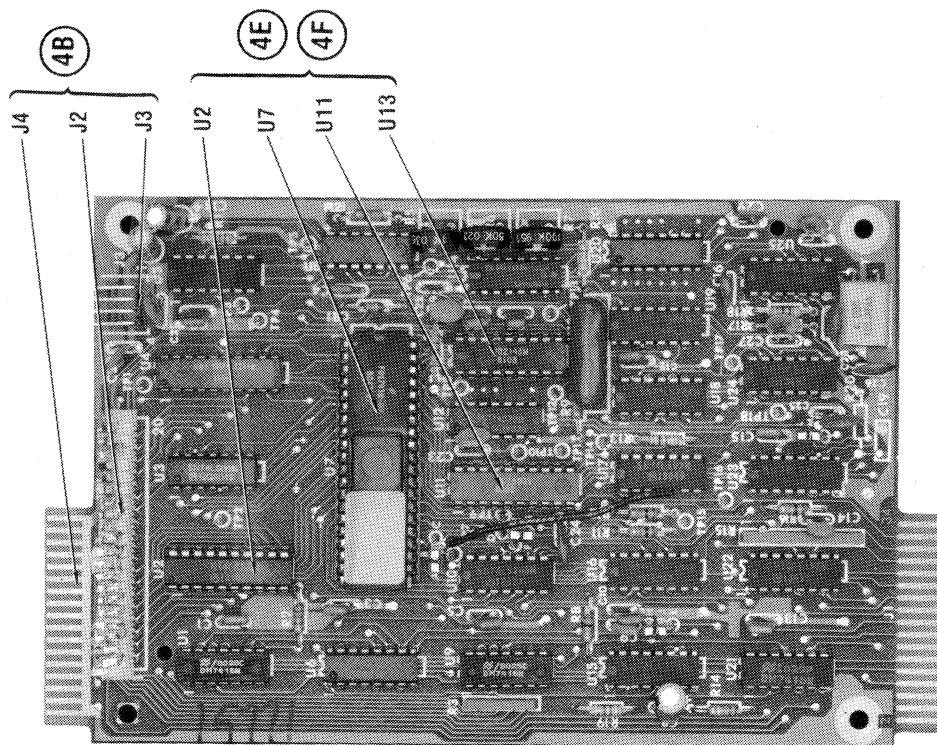
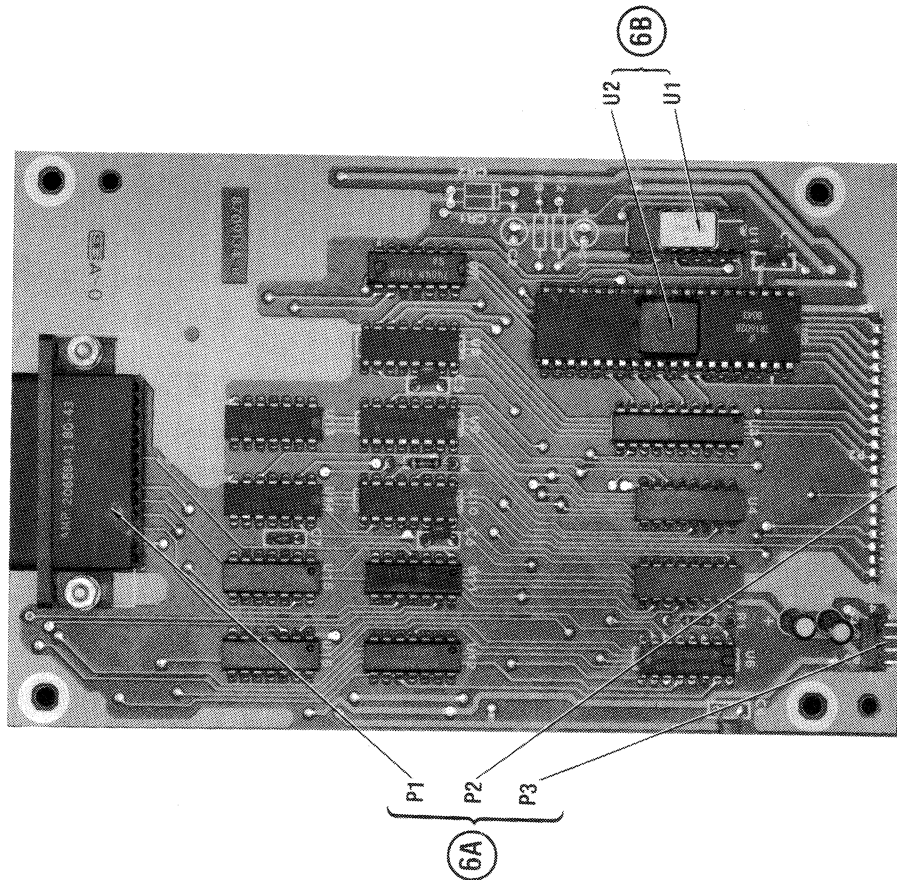
PRELIMINARY SERVICE CHECKS (Continued)



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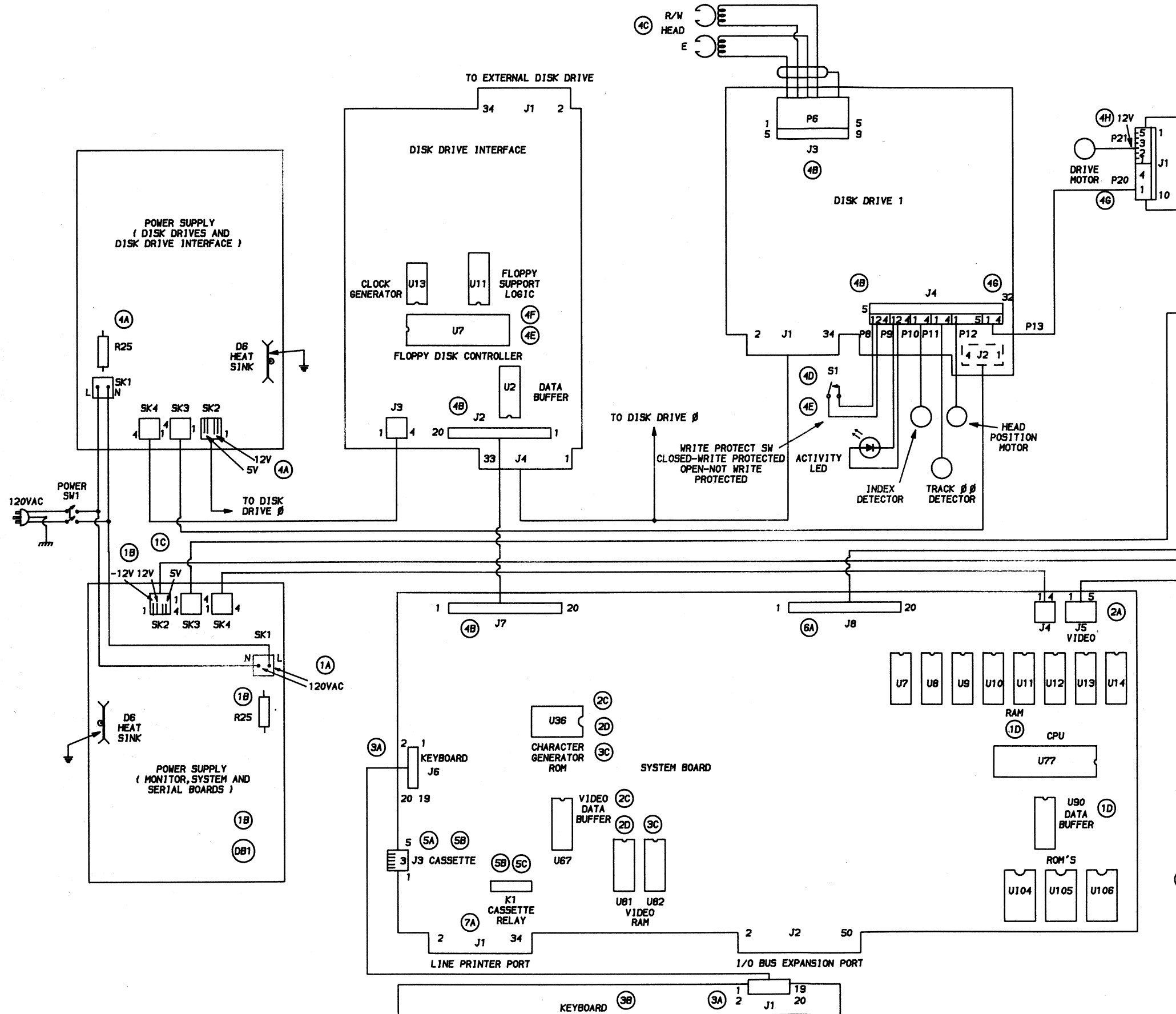
# PRELIMINARY SERVICE CHECKS (Continued)

## RS-232 SERIAL INTERFACE BOARD



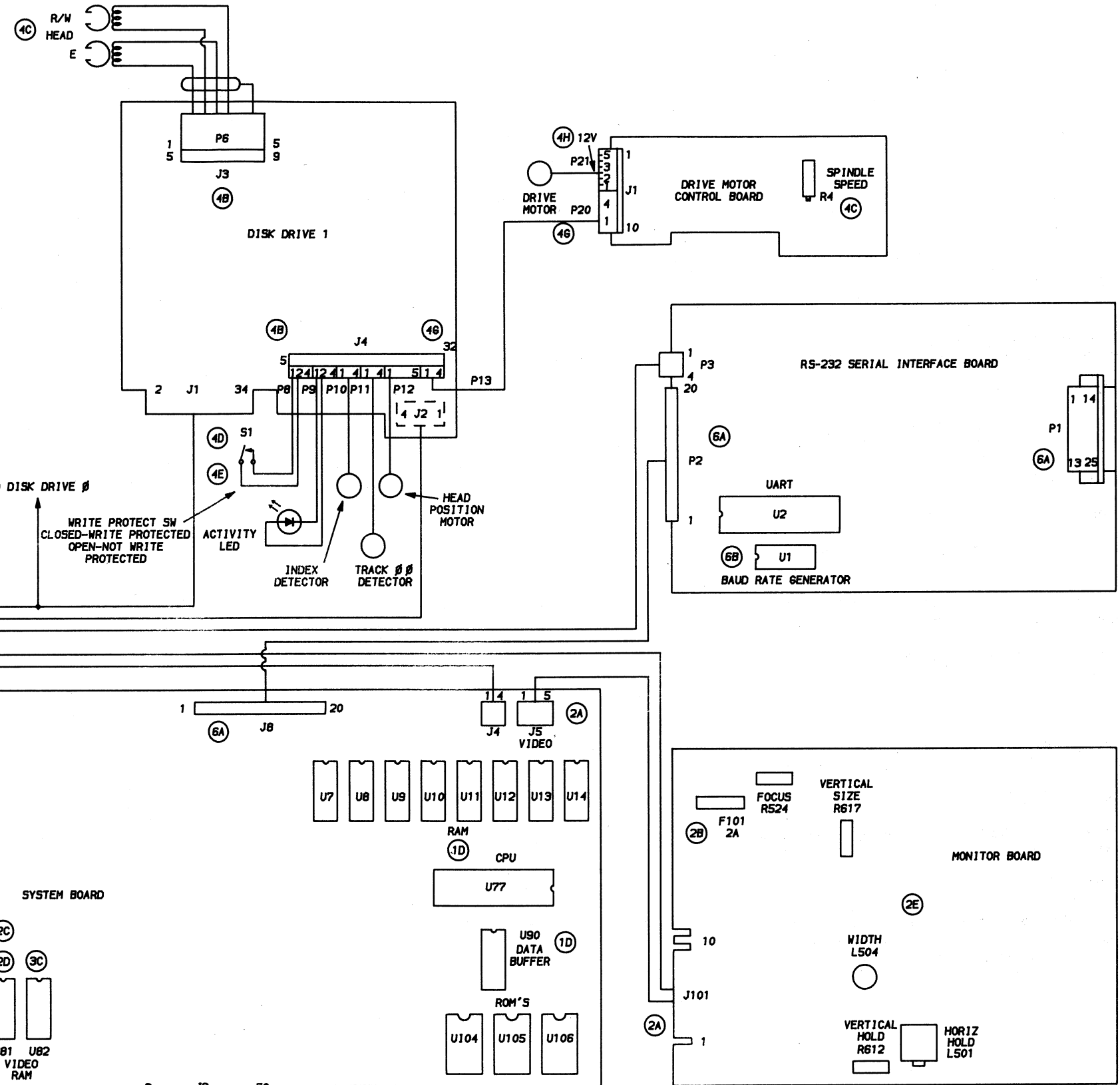
DISK DRIVE INTERFACE BOARD

PRELIMINARY SERVICE CHECKS (Continued)



INTERCONNECTING DIAGRAM

PRELIMINARY SERVICE CHECKS (Continued)



INTERCONNECTING DIAGRAM

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# PRELIMINARY SERVICE CHECKS (Continued)

## 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-interruptible 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.

# PRELIMINARY SERVICE CHECKS (Continued)

## 5 CASSETTE

- (A) Cassette will not save or load. Check connector J3 on the System board for good connections.
- (B) Cassette motor will not start running. Check Relay K1 contacts (pin 1 to pin 3 of connector J3) for continuity while saving or loading a program.
- (C) Cassette motor will not stop running. Check Relay K1 contacts (pin 1 to pin 3 of Plug J3) for shorted contacts.

## 6 SERIAL PORT

- (A) Serial port does not work. Check connector J8 on the System board and connectors P1, P2 and P3 on the RS-232 Serial Interface board for good connections.
- (B) Check the Baud Rate Generator IC (U1) and UART IC (U2) by substitution.

## 7 PRINTER PORT

- (A) Printer does not work. Check connector J1 on the System board for good connections.

## MISCELLANEOUS ADJUSTMENTS

TOOLS	GC ELECTRONICS
L501	9300, 9302, 9304
L504	9440, 8282, 8606

### VERTICAL SIZE ADJUSTMENT

Adjust the Vertical Size Control (R617) for a display height of about 6 inches.

### HORIZONTAL LINEARITY

Loosen the deflection yoke clamp and slide the Horizontal Linearity sleeve located on the CRT neck forward or backward until the character spacing on the left side matches the character spacing on the right side of the Monitor screen.

### WIDTH

Note: Check the Horizontal Linearity adjustment before doing the width adjustment. Adjust the Width Coil (L504) for a display width of about 8 inches.

### HORIZONTAL HOLD

Adjust the Horizontal Hold Coil (L501) for a stable display.

### FOCUS

Adjust the Focus Control (R524) for best focus.

### CENTERING

Adjust the two magnetic rings located on the yoke rear cover to center the display on the screen.

### 50/60Hz MONITOR DISPLAY JUMPERS

Use the following charts to determine the proper jumper connections to use according to the frequency of the AC power being used.

	50 Hz Power	60 Hz Power
Vertical Frame Rate	B to A	B to C
Vertical Position	L to M H to G D to E	L to K H to J D to E
Horizontal Position	W to V BB to CC	W to V BB to CC

Note: The display can be shifted one character to the right by moving the W to V jumper to the W to X position.

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### RAM JUMPERS

Use the following chart to determine the proper jumper connections to use according to the amount of RAM installed.

4K RAM	16K RAM or more
T to U	T to S
P to N	P to R
FF to GG	FF to EE

### 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 (R4) 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 R4 for a speed of 300rpm  $\pm$  5rpm.



# PRELIMINARY SERVICE CHECKS (Continued)

## DISASSEMBLY INSTRUCTIONS

### CABINET REMOVAL

Place Computer on its side. Remove ten screws from cabinet bottom. Carefully place Computer in upright position. Remove one remaining screw from rear of cabinet. Very carefully remove CRT and cabinet top, lifting straight up and setting it aside to the left (if facing CRT). Be careful not to exceed the length of the video cable.

### BOARD REMOVAL

Remove six screws holding metal shield over System board at rear of Computer. Remove shield from System board. Remove seven screws holding System board to chassis. Disconnect connectors J3 thru J8 on System board and remove board from chassis.

### DISK DRIVE INTERFACE BOARD REMOVAL

Remove System board. Remove four screws holding Disk Drive Interface board. Disconnect all cables from board and remove board from chassis.

### RS-232 BOARD REMOVAL

Remove System board. Remove four screws holding Disk Drive Interface board. Disconnect all cables from board and remove board from chassis.

### MAIN POWER BOARD REMOVAL

Remove two screws holding Disk Drive chassis to rear chassis. Remove six screws holding rear chassis to cabinet bot-

tom. Disconnect Disk Drive connectors and ground leads from rear chassis. Lay chassis down and remove four screws holding main power supply board to chassis.

### DISK DRIVE POWER BOARD REMOVAL

Remove four screws holding power board to side of Disk Drive chassis. Disconnect all connectors from board and remove board from Computer.

### DISK DRIVES REMOVAL

**TOP DISK DRIVE:** Disconnect ribbon cable from rear of Disk Drive board. Remove four screws, two on each side holding Drive assembly to chassis. Disconnect connector J1 from power supply board. Disk Drive may now be lifted out of Computer.

**BOTTOM DISK DRIVE:** Remove Disk Drive power supply board. Remove four screws, two on each side holding Drive assembly to chassis. Disconnect connector P1 thru P4 from power supply board. Disk Drive may now be removed out the front of chassis.

### MONITOR BOARD REMOVAL

Disconnect CRT socket, HV anode lead, deflection yoke leads, and ground lead. Remove two screws holding Monitor board to side of cabinet top.

To remove CRT, remove four nuts holding CRT to cabinet front. Note: Make sure to hold on to CRT while removing nuts to avoid breaking CRT.

**DISK DRIVE/  
DISK DRIVE INTERFACE**

See Folder CSCS5-B

**KEYBOARD, POWER SUPPLY,  
RS232 SERIAL INTERFACE,  
SYSTEM BOARD**

**MONITOR**

See Folder CSCS5-A

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CSCS5



CSCS5

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**SAFETY PRECAUTIONS**

See page 44.

**PRELIMINARY SERVICE CHECKS**

ENCLOSED

**INDEX**

	Page		Page
Block Diagram	38	Photos	
Disassembly Instructions	16	Keyboard	26
General Operating Instructions	10	Power Supply Board	24,36,37
GridTrace Location Guide		RS-232 Serial Interface Board	25,35
Power Supply Board	24	System Board	18,21, 22,39,40,43
RS-232 Serial Interface Board	25	Safety Precautions	44
System Board	23	Schematics	
IC Pinouts and Terminal Guides		Power Supply Board	7,54
Power Supply Board	45	RS-232 Serial Interface Board	8,9,53
RS-232 Serial Interface Board	42	System Board	2 thru 6, 55 thru 61
System Board	19,20,41	Schematic Notes	17
Line Definitions	46,47	Test Equipment	11
Logic Charts	48 thru 52	Troubleshooting	11 thru 15
Parts List	27 thru 34		

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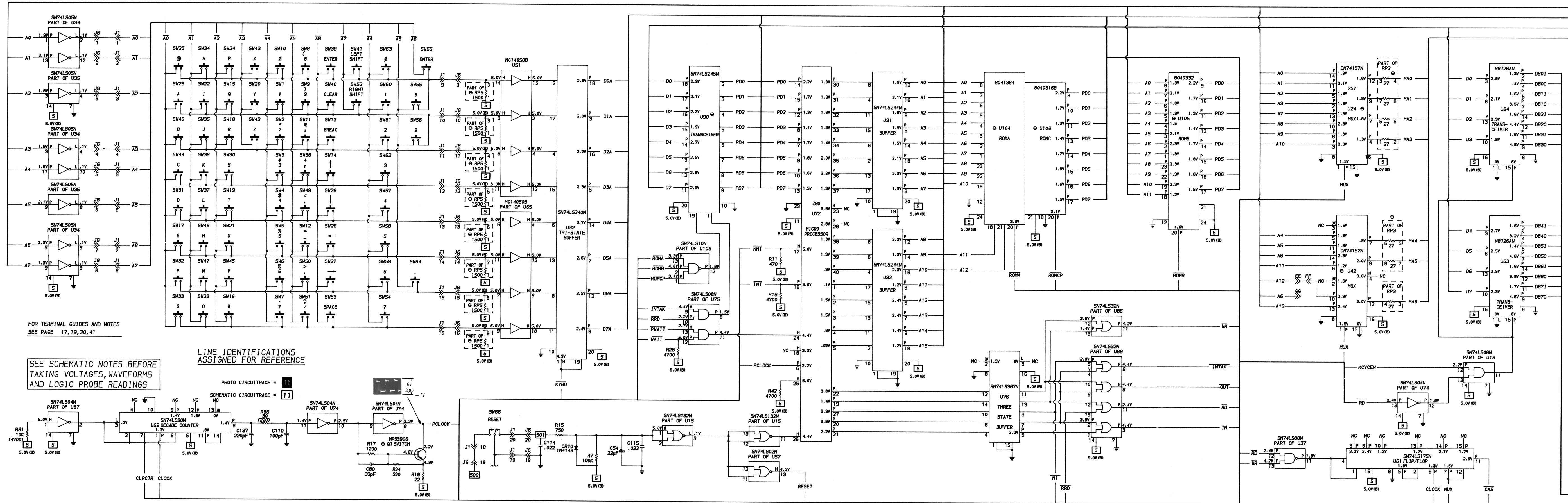
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**DATE 5-85**

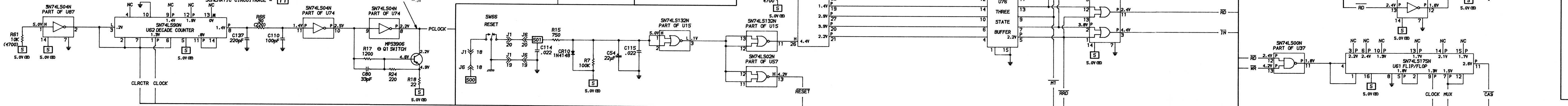


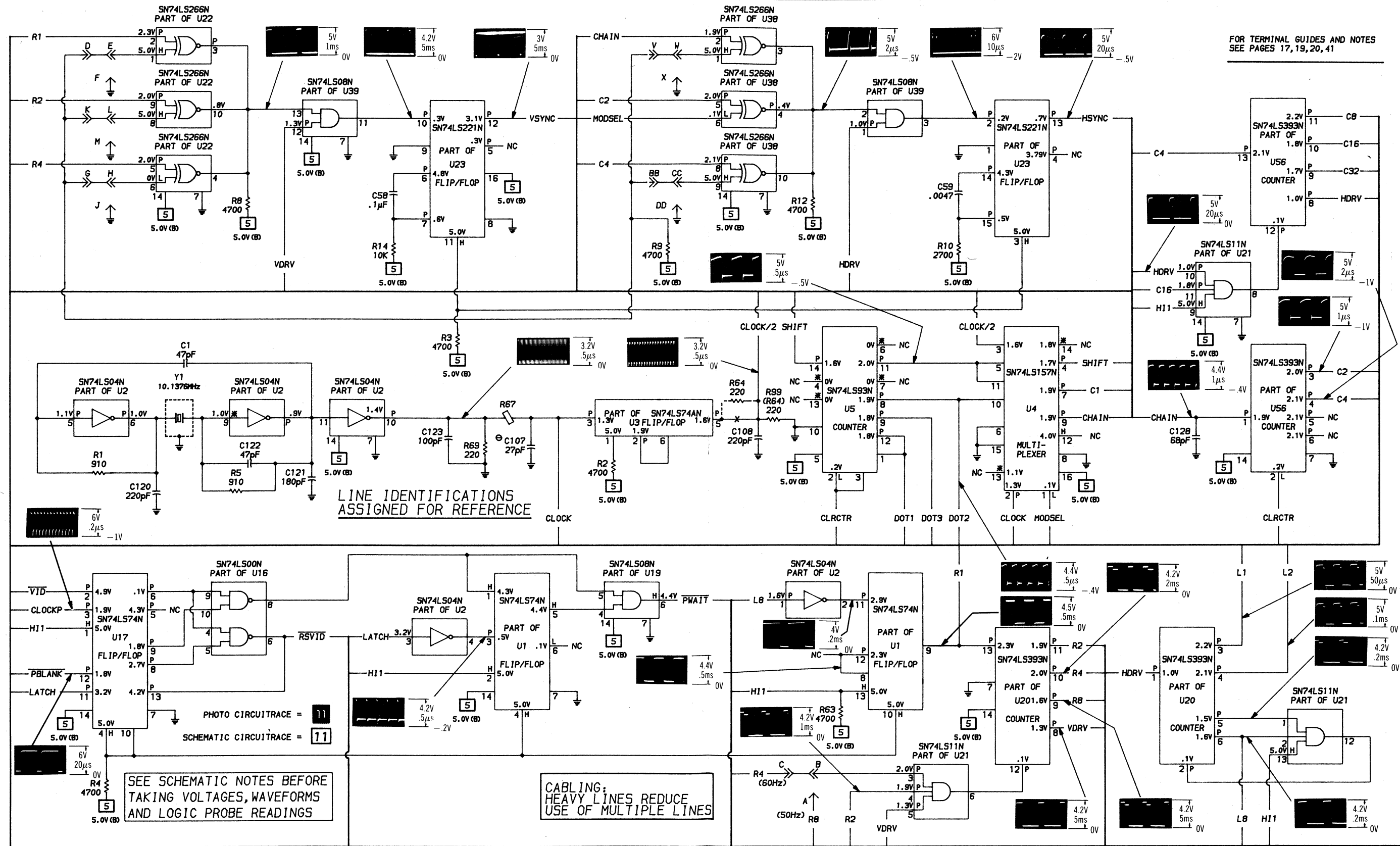
FOR TERMINAL GUIDES AND NOTES  
SEE PAGE 17, 19, 20, 41

SEE SCHEMATIC NOTES BEFORE  
TAKING VOLTAGES, WAVEFORMS  
AND LOGIC PROBE READINGS

LINE IDENTIFICATIONS  
ASSIGNED FOR REFERENCE

PHOTO CIRCUITRACE = 11  
SCHEMATIC CIRCUITRACE = 11





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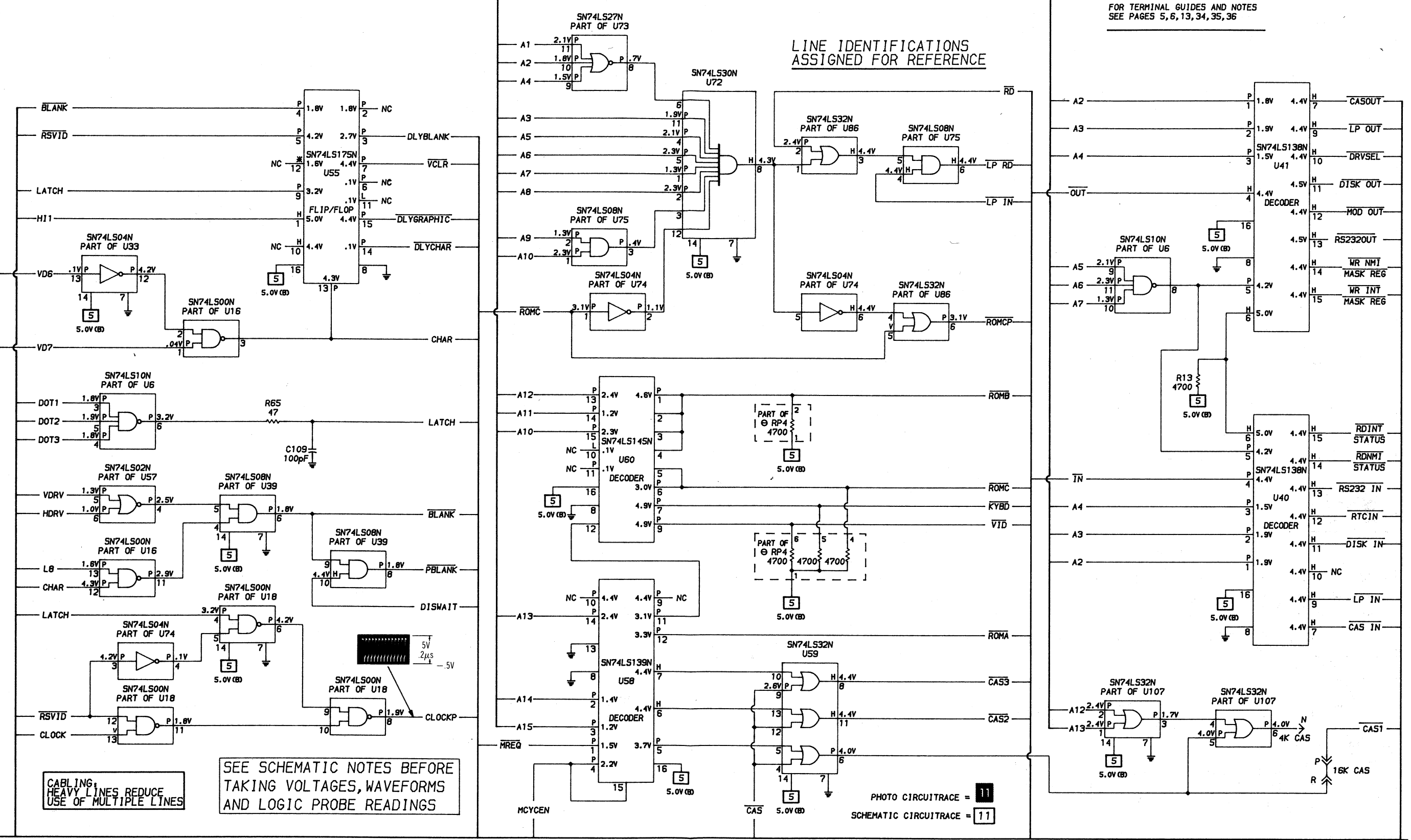
A PHOTOFAC STANDARD NOTATION SCHEMATIC  
 WITH **CIRCUITRACE**

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**SYSTEM BOARD**

**SYSTEM BOARD**

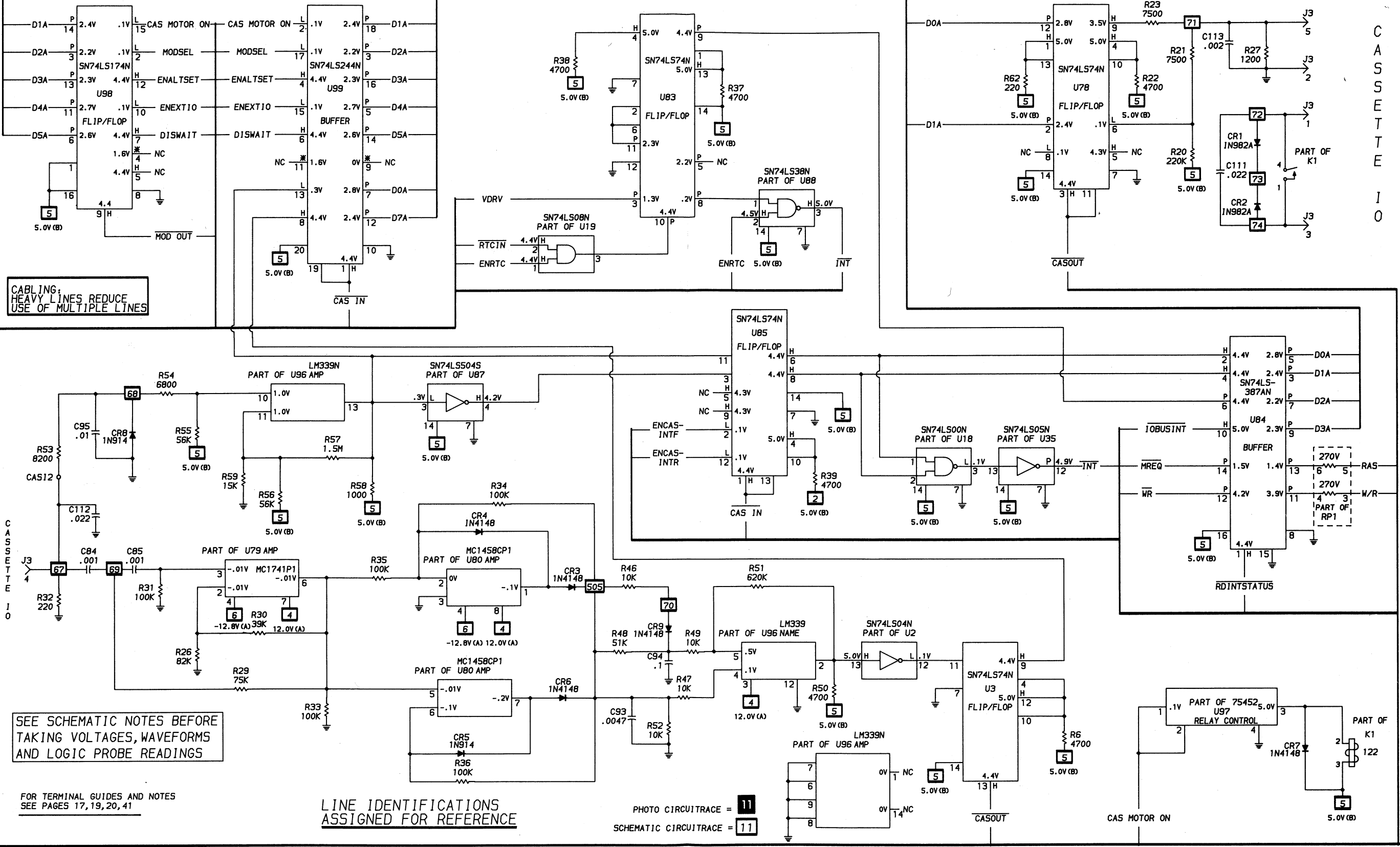
FOR TERMINAL GUIDES AND NOTES  
SEE PAGES 5, 6, 13, 34, 35, 36



A PHOTOFACIT STANDARD NOTATION SCHEMATIC  
WITH CIRCUITRACE  
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SYSTEM BOARD

SYSTEM BOARD



CABLING:  
HEAVY LINES REDUCE  
USE OF MULTIPLE LINES

SEE SCHEMATIC NOTES BEFORE  
TAKING VOLTAGES, WAVEFORMS  
AND LOGIC PROBE READINGS

FOR TERMINAL GUIDES AND NOTES  
SEE PAGES 17, 19, 20, 41

LINE IDENTIFICATIONS  
ASSIGNED FOR REFERENCE

PHOTO CIRCUITRACE = 11  
SCHEMATIC CIRCUITRACE = 17

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WITH **CIRCUITRACE**  
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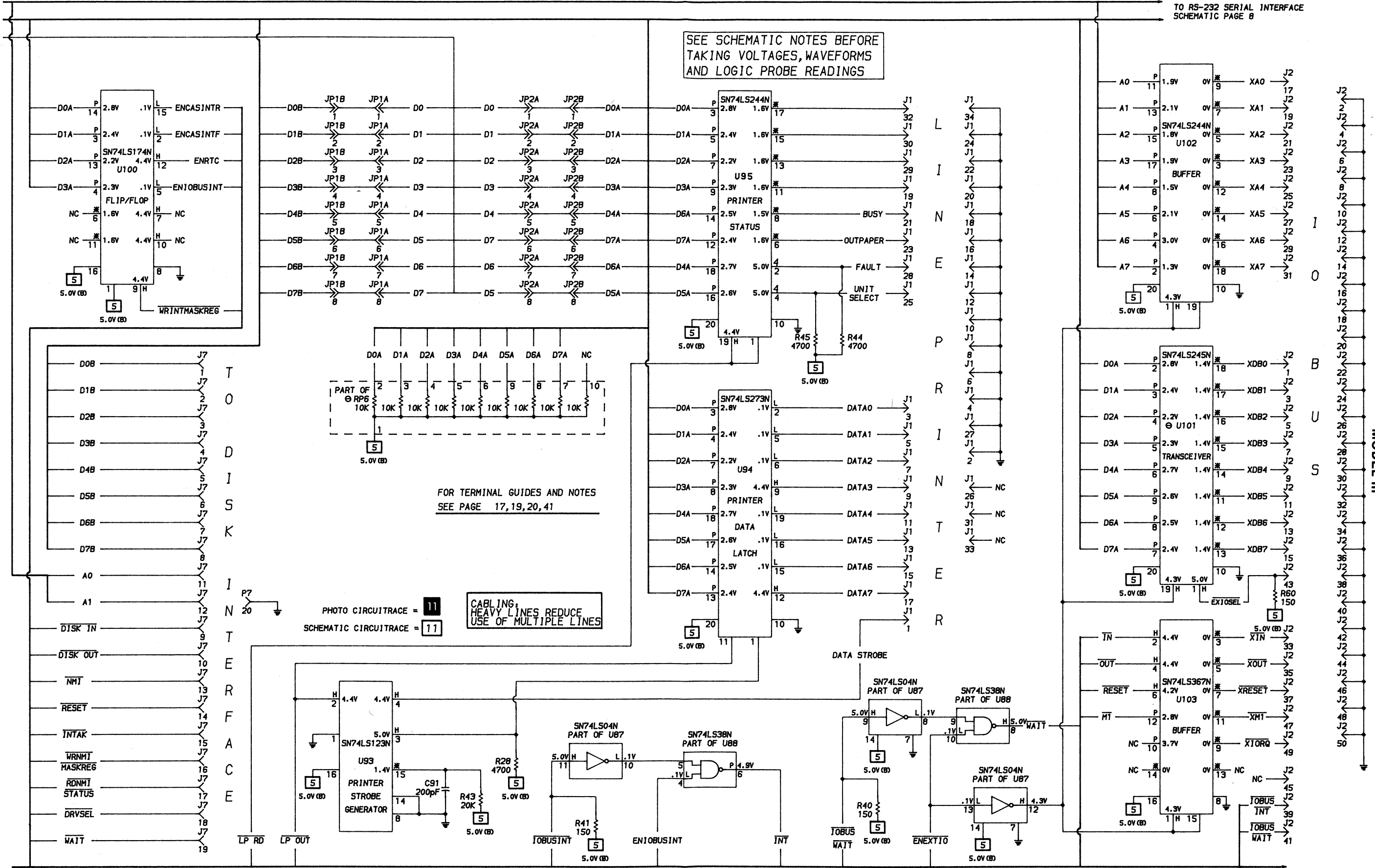
**SYSTEM BOARD**

**SYSTEM BOARD**

**CSCS5**  
**RADIO SHACK**  
**MODEL III**

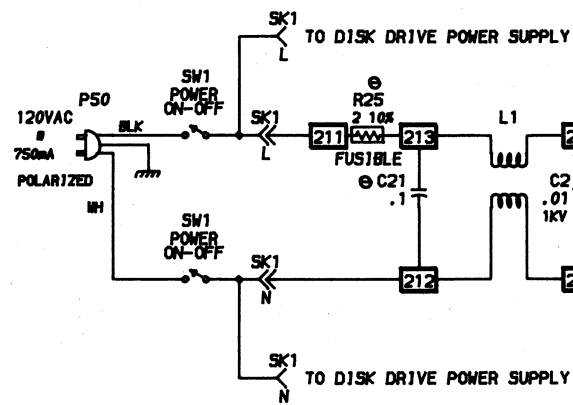
C A S S E T T E  
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SEE SCHEMATIC NOTES BEFORE  
TAKING VOLTAGES, WAVEFORMS  
AND LOGIC PROBE READINGS



FOR TERMINAL GUIDES AND NOTES  
SEE PAGE 17, 19, 20, 41

PHOTO CIRCUITACE = 11  
SCHEMATIC CIRCUITACE = 11  
CABLING: HEAVY LINES REDUCE  
USE OF MULTIPLE LINES



SEE PINOUTS, TERMINAL GUIDES AND SCHEMATIC NOTES PAGES

SEE SCHEMATIC NOTES BEFORE TAKING VOLTAGES, WAVEFORMS AND LOGIC PROBE READINGS

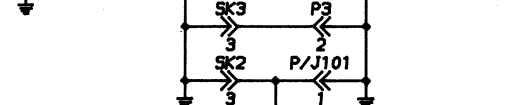
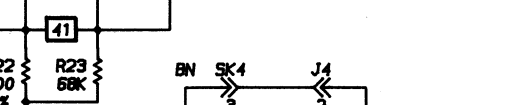
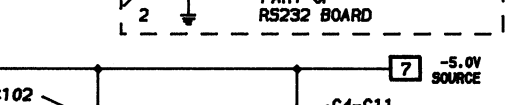
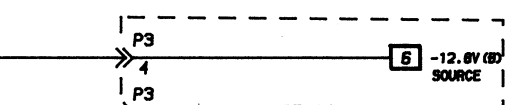
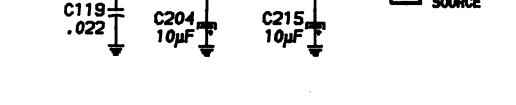
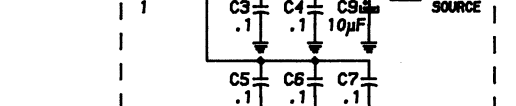
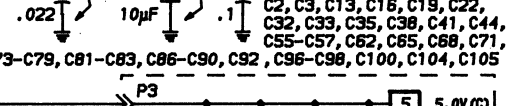
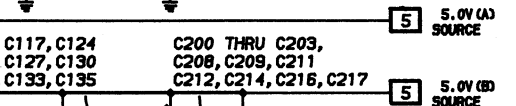
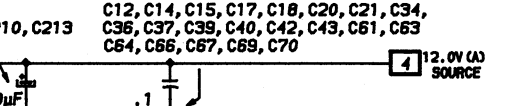
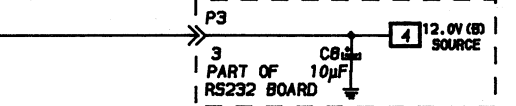
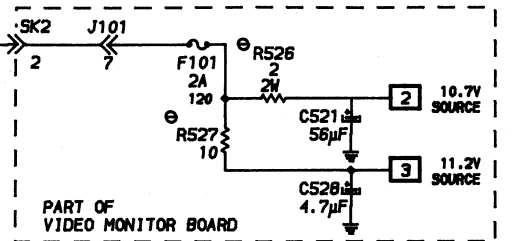
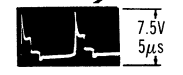
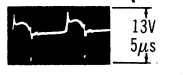
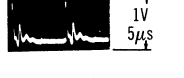
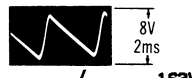
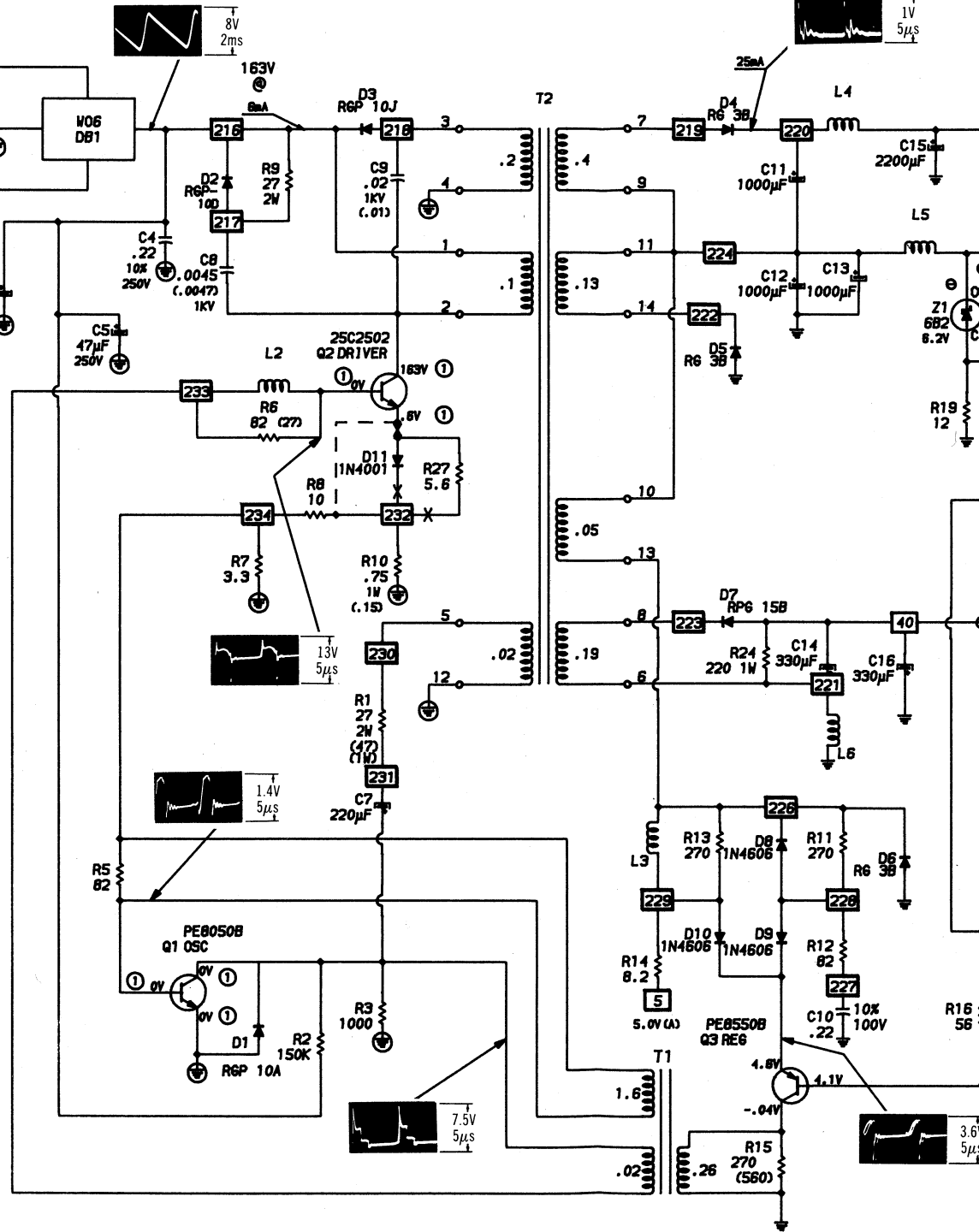
① MEASURED FROM

PHOTO CIRCUITRACE = 11  
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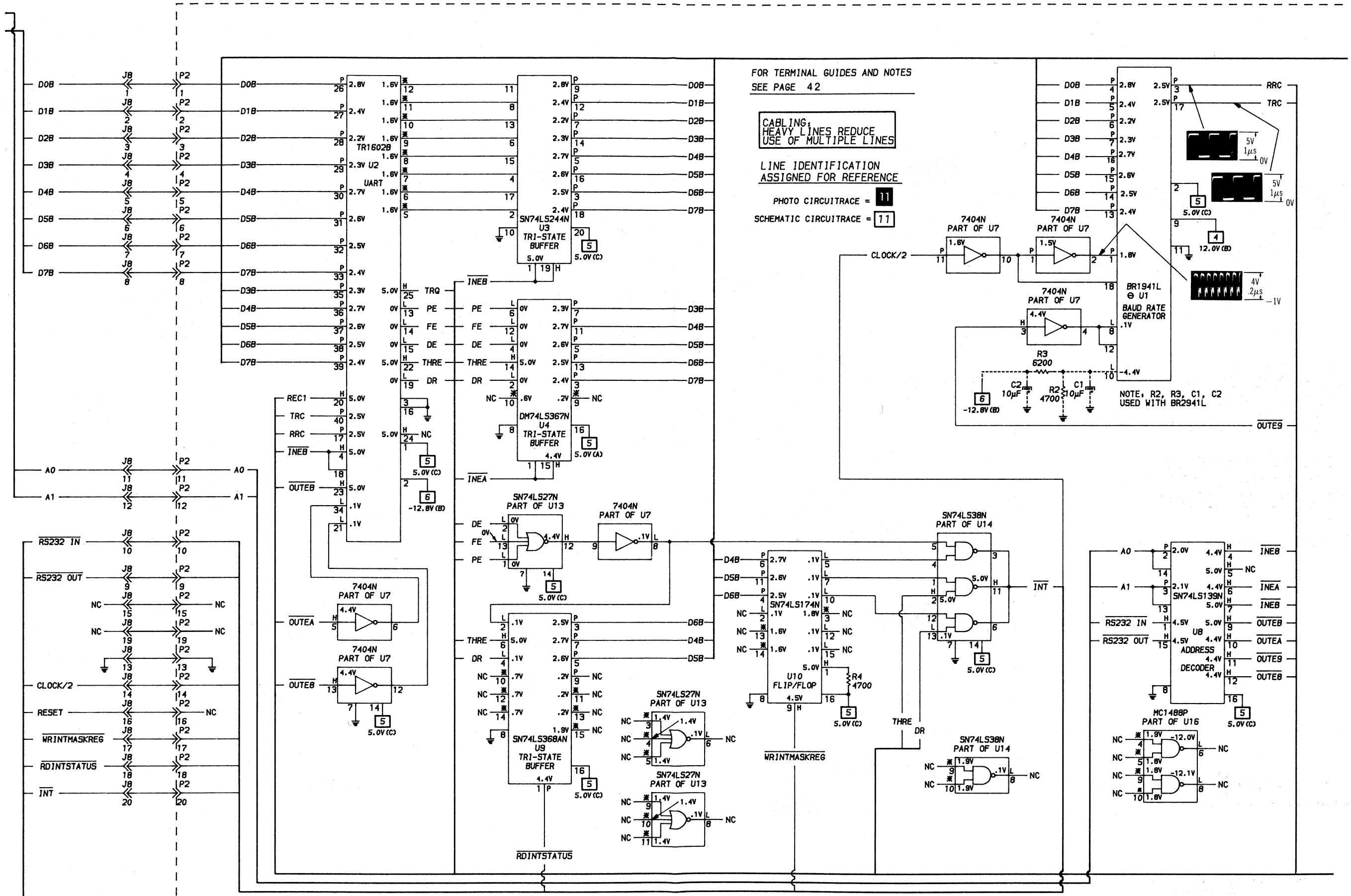
POWER SUPPLY BOARD



CSCS5 RADIO SHACK MODEL III

POWER SUPPLY BOARD



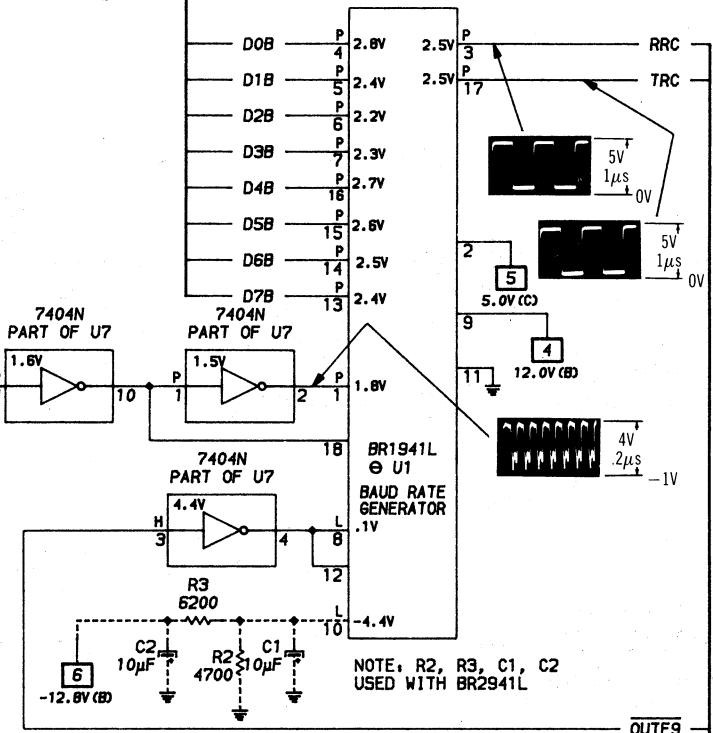


FOR TERMINAL GUIDES AND NOTES  
SEE PAGE 42

CABLING:  
HEAVY LINES REDUCE  
USE OF MULTIPLE LINES

LINE IDENTIFICATION  
ASSIGNED FOR REFERENCE

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SCHEMATIC CIRCUITRACE = 11



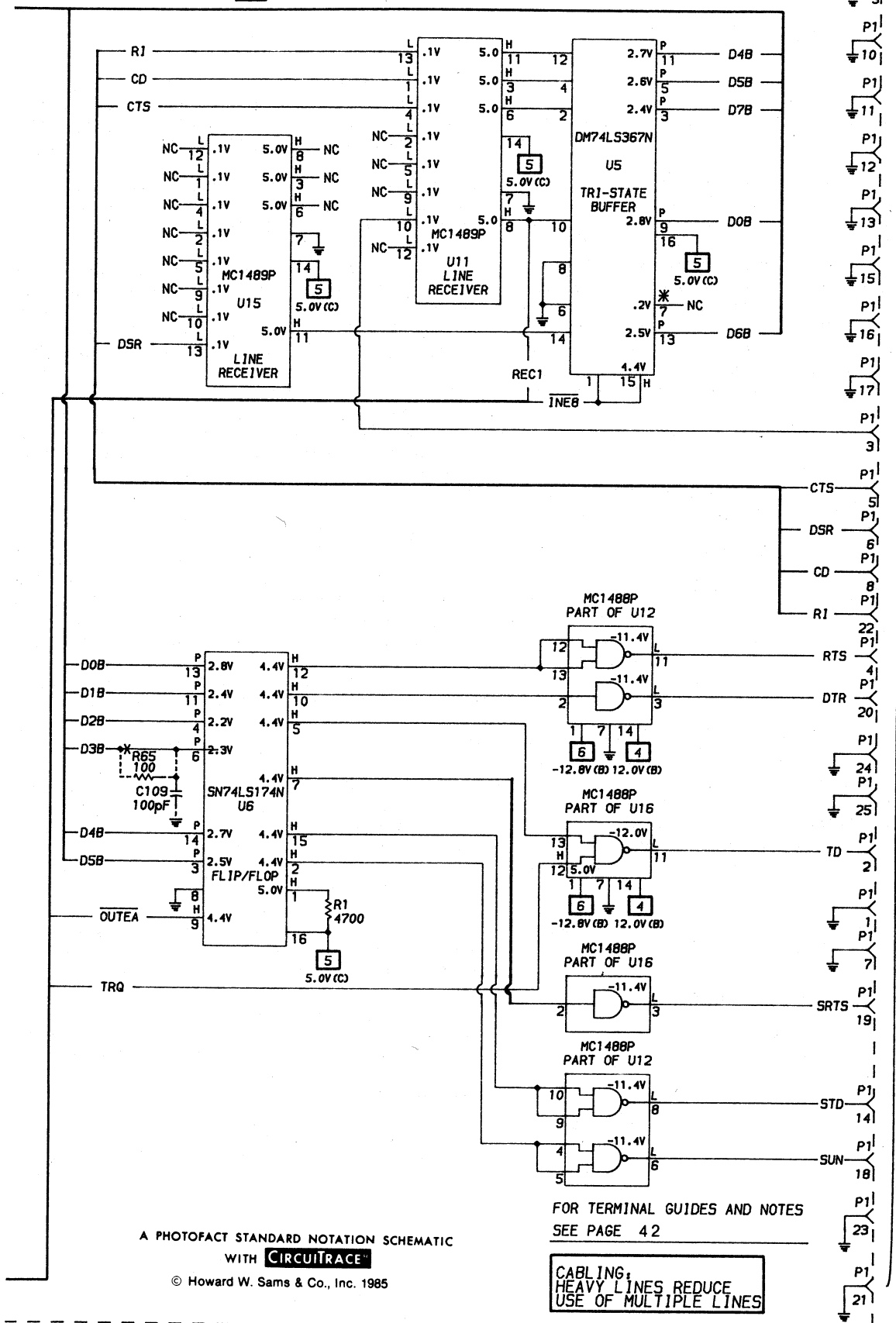
A PHOTOFACIT STANDARD NOTATION SCHEMATIC  
WITH CIRCUITRACE

RS-232 SERIAL INTERFACE BOARD

RS-232 SERIAL INTERFACE BOARD

PHOTO CIRCUITRACE = **11**  
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LINE IDENTIFICATION  
 ASSIGNED FOR REFERENCE



**CSCCS5**  
 RADIO SHACK  
 MODEL III

RS232  
 SERIAL  
 PORT

A PHOTOFAC STANDARD NOTATION SCHEMATIC  
 WITH **CIRCUITRACE**  
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FOR TERMINAL GUIDES AND NOTES  
 SEE PAGE 42

**CABLING:**  
 HEAVY LINES REDUCE  
 USE OF MULTIPLE LINES

**RS-232 SERIAL INTERFACE BOARD**

# GENERAL OPERATING INSTRUCTIONS

## POWER UP SEQUENCE

1. Turn On all peripherals.
2. With no diskettes in the Disk Drives, turn On the Computer.
3. When the Disk Drives stop running, insert a TRS-80 Disk Operating System diskette in Disk Drive 0. Close the drive door and press the RESET button. The Computer will come up asking for the Date and Time. After the Date and Time are entered the Computer will come up with TRSDOS Ready on Monitor screen. Note: If no Disk Drives are installed the Computer will come up with CASS? on the Monitor screen. Type L to get 500 Baud Cassette operation or H to get 1500 Baud. The Computer will then ask for Memory Size?, press the ENTER key and the Computer will come up ready to program in Basic.

## RESET

Hold the BREAK key down and press the RESET button to reset the Computer to Cassette Basic. If Disk Drives are installed, press the RESET button only, to reboot the Computer from a system diskette in Disk Drive 0.

## DISK OPERATING SYSTEM (TRDOS)

Type DIR and press the ENTER key to display the directory of the diskette in Disk Drive 0. If the directory of a diskette is desired other than drive 0, type DIR : and the Disk Drive number desired (example DIR :1 for Drive 1).

To load a program from a diskette while in DOS, type the program name and press the ENTER key. Use a colon and the number of the Drive after the program name to load a program from any Disk Drive other than drive 0. NOTE: Programs written in Basic cannot be loaded while in DOS. See the "BASIC" section of the "General Operating Instructions" for instructions on loading programs written in Basic.

To display a list of special programs on the system diskette type LIB and press the ENTER key.

## 50/60Hz MONITOR DISPLAY JUMPERS

Use the following charts to determine the proper jumper connections to use according to the frequency of the AC power being used.

	50 Hz Power	60 Hz Power
Vertical Frame Rate	B to A	B to C
Vertical Position	L to M H to G D to E	L to K H to J D to E
Horizontal Position	W to V BB to CC	W to V BB to CC

Note: The display can be shifted one character to the right by moving the W to V jumper to the W to X position.

## BASIC

To load Disk Basic into the Computer, boot up on DOS, put a diskette in Drive 0 with Disk Basic on it, type BASIC and press the ENTER key. To go from Disk Basic back to DOS, type CMD "S" and press the ENTER key.

To display the directory of the diskette in Disk Drive 0 type CMD "D:0" and press the ENTER key. For Disk Drive 1 type CMD "D:1" and press the ENTER key.

To load a program from a diskette in Disk Drive 0, type LOAD and the program name enclosed in quotes and press the ENTER key. To load a program from a Disk Drive other than Disk Drive 0 add a colon and the Disk Drive number at the end of the program name. Example LOAD "SAMS:1"

To save a program to a diskette in Disk Drive 0, type SAVE and the program name enclosed in quotes and press the ENTER key. To save a program to a diskette in a Disk Drive other than Disk Drive 0, add a colon and the Disk Drive number at the end of the program name. Example SAVE "SAMS:1".

## USING A BLANK DISKETTE

A blank diskette must be either formatted or have the DOS copied to it before it can be used to save data. NOTE: Disk Drive 0 must always contain a diskette with DOS on it. A formatted diskette may be used in Disk Drives 1, 2 or 3.

To copy DOS on a diskette, load DOS into the Computer, put a diskette in Disk Drive 0 with the BACKUP program on it, type BACKUP and press the ENTER key. Follow the instructions that come up on the Monitor screen.

To format a diskette, load DOS into the Computer, put a diskette in Disk Drive 0 with the FORMAT program on it, type FORMAT and press the ENTER key. Follow the instructions that come up on the Monitor screen.

## CASSETTE OPERATION

To load a program from Cassette tape, type CLOAD (with or without the program name enclosed in quotes), put the recorder in play mode and press the ENTER key.

To save a program to Cassette tape, type CSAVE (with or without the program name enclosed in quotes), put the recorder in record mode and press the ENTER key.

## RAM JUMPERS

Use the following chart to determine the proper jumper connections to use according to the amount of RAM installed.

4K RAM	16K RAM or more
T to U	T to S
P to N	P to R
FF to GG	FF to EE

## TEST EQUIPMENT

Test Equipment listed by Manufacturer illustrates typical or equivalent equipment used by SAMS' Engineers to obtain measurements and is compatible with most types used by field service technicians.

### TEST EQUIPMENT (COMPUTERFACTS)

Equipment Name	B & K Precision Equipment No.	Simpson Equipment No.		
OSCILLOSCOPE	1570A,1590A,1596	454		
LOGIC PROBE	DP51			
LOGIC PULSER	DP101			
DIGITAL VOM	2830	463,467,470,474		
ANALOG VOM	277	260-7		
ISOLATION TRANSFORMER	TR110,1604,1653,1655			
FREQUENCY COUNTER	1803,1805	710		
COLOR BAR GENERATOR	1211A,1248,1251,1260	431		
DISK DRIVE ANALYZER				
FUNCTION GENERATOR	3020	420A,420D		
HI-VOLTAGE PROBE	HV-44	248		

## TROUBLESHOOTING

### POWER SUPPLY

NOTE: Use an isolation transformer when servicing the power supply. Disconnect Connectors SK2, SK3 and SK4 to avoid possible damage to the Computer from high voltages that may be produced while servicing the power supply.

Check Fuse Resistor R25. If R25 is open check for shorts at the Bridge Rectifier (DB1). Check for a possible shorted Driver Transistor (Q2). If R25 is good apply 120V AC power and check for 120V AC across Capacitor C2. If 120V AC is missing check the Line Choke (L1), Power Switch (SW1) and check connector SK1 for good connections. If 120V AC is present at Capacitor C2, check for 163V at the cathode of Diode D2 (use emitter of Oscillator Transistor Q1 as reference). If 163V is missing, check the Bridge Rectifier (DB1). If 163V is present, check the waveforms at the base of Oscillator Transistor (Q1) and Driver Transistor (Q2) to determine if the power supply is oscillating. If the power supply is not oscillating check the voltages and components associated with Transistors Q1 and Q2, check Diodes D1, D2 and D3 and check for possible open windings on Transformers T1 and T2. If the power supply is oscillating, check the source voltages at Connector SK2 (-12.8V at pin P1, 12.0V at pin P2 and 5.0V at pin P4). If the voltages are not regulated, check the voltages and components associated with the Regulator IC (IC1) and Regulator Transistor (Q3). Check Transformer T1 for possible open windings. If the 12V source is missing, check Diode D4, Coil L4, Electrolytics C11 and C15 and check the winding from pin 7 to pin 9 of Transformer T2. If the 5.0V source is missing, check Diode D5 and D6, Coil L5. Electrolytics C12, C13 and C17 and check the windings from pins 10 to 13 and 11 to 14 of Transformer T2. If the -12.8V source is missing, check Diode D7, Coil L6, Electrolytics C14 and C16 and check the winding from pin 6 to 8 of Transformer T2.

### MICROPROCESSOR OPERATION

Check the operation of the microprocessor reset (pin 26 of Microprocessor IC U77) with a logic probe while turning On the Computer or while pressing the Reset button (SW66). The logic reading should be logic Low for about .1 second then go logic High and stay High. If the logic reading is correct when turning On the Computer but not correct when pressing the Reset button, check the Reset button (SW66), Capacitor C114, Resistor R15 and check pins 19 and 20 of Connector P6 for good connections. If the logic reading is not correct when turning On the Computer or when pressing the Reset button, check Resistor R7, Diode CR10, Capacitors C54 and C115 and check IC U15 by substitution.

If the microprocessor reset pin is operating properly, check the 2.02752MHz clock waveform at pin 6 of IC U77. If the clock waveform is missing refer to the "Clock and Dividers" section of this Troubleshooting guide.

Check pins 17, 24 and 25 of IC U77 for problems that could keep the microprocessor IC (U77) from operating properly. Pins 17, 24 and 25 should measure a logic High.

Check the logic readings on the address pins (pins 1 thru 5 and 30 thru 40 of IC U77) and data pins (pins 7 thru 10 and 12 thru 15 of IC U77) while holding the RESET button down. All the pins should read a logic open. If any of the pins read logic High or Low, check, by substitution, the IC's connected to the pin with the bad logic reading.

Check for a High logic reading on pins 19 thru 23 of IC U77 while holding the RESET button down. If any of the logic readings are not correct check IC U77 by substitution.

Check for pulses on Data pins (pins 7 thru 10 and 12 thru 15 of IC U77) immediately after turning On the Computer. If pulses appear then suddenly stop, check for problems at ROM IC's (U104, U105 and U106) and RAM IC's (U7 thru U14).

## TROUBLESHOOTING (Continued)

### CLOCK AND DIVIDERS

Check for a clock frequency of 10.1376MHz at pin 8 of IC U2. If the clock is off frequency or is not working, check Capacitors C1, C120 and C122, Crystal Y1 and IC U2.

Check the waveforms at pins 3 and 5 of Flip/Flop IC (U3). If the waveform is missing at pin 3 of IC U3, check Capacitors C107 and C123 and IC U2. If the waveform is present at pin 3 of IC U3 and missing at pin 5 of IC U3 check IC U3.

Check for a frequency of 2.02752MHz at pin 11 of IC U74. If the signal is off frequency or missing check for a Low logic reading at pin 2 of Decade Counter IC (U62). If the reading is not correct at pin 2 of IC U62 check Resistor R61 and IC U87. If the reading is Low at pin 2 of IC U62, check Capacitors C110 and C137, Resistor R66 and IC U62. If the signal is good at pin 11 of IC U74, check the waveform at pin 8 of IC U74. If the waveform is missing, check Capacitor C80, Resistors R17, R18 and R24, Switch Transistor (Q1) and IC U74.

### KEYBOARD

If the Keyboard is dead check the ribbon cable going from the Keyboard to the system board for open circuits and check the Keyboard Connectors for good connections. If the Keyboard cable checks good, check for pulses at pin 7 of Decoder IC (U60). If pulses are missing check IC U60 by substitution.

If one group of Keys does not work check the Input Buffer (IC's U34 and U35) and Output Buffer IC's U51, U65 and Tri-State Buffer IC (U66) that are connected to the Keys that do not work. Also check the Keyboard cable for open circuits and Keyboard Connectors for good connections.

If one Key does not work, check the Key contacts with an ohmmeter. If a Key is erratic in operation, clean the contacts of the Key.

If a wrong character is displayed on the Monitor screen when a Key is pressed, check the Video RAM, see the "Video" section of this Troubleshooting guide and check Character ROM IC (U36) and Latch IC (U68) by substitution.

### VIDEO

No video. Check Connector J5 on the System board and Connector J101 on the Video Monitor board for good connections.

Check the video waveform at pin 13 of IC U52 on the System board. If the waveform is present, check the voltages and components associated with the Video Amp Transistor (Q302) on the Video Monitor Board and the CRT (V101) and check the CRT. If the waveform is missing at pin 13 of Shift Register IC (U52), check the waveforms at pins 7 and 15 of IC U52 and check for pulses at pins 2 thru 5, 10, 11, 12 and 14 of IC U52. If the waveforms and logic readings check good, check IC U52 by substitution. If the waveform is missing at pin 7 of IC U52 check Multiplexer IC (U4), Counter IC (U5), and IC U33 by substitution. If the waveform is missing at pin 15 of IC U52 and the waveforms at pins 1 and 2 of IC U52 check good, check IC U52 by substitution.

If the wrong character appears on the Monitor screen when a Key is pressed, check Latch IC (U68) and Character ROM IC (U36) by substitution.

If the Computer displays alpha characters but does not display graphics characters on the Monitor screen, check IC's U16, U33, Flip/Flop IC (U55) and Video RAM IC (U82) by substitution.

If the video display will not switch from 64 characters to 32 characters or from 32 characters to 64 characters, type in and run the following program.

```
10 OUT 236,4: OUT 236,0: GOTO 10
```

While the program is running, check for pulses at pin 12 of Decoder IC (U41). If pulses are missing check IC U41 by substitution. If pulses are present at pin 12 of IC U41, check for pulses at pin 2 of Flip/Flop IC (U98). If pulses are missing at pin 2 of IC U98 check IC U98 by substitution. If pulses are present at pin 2 of IC U98 check Multiplexer IC (U4) by substitution.

If a character appears at one location on the Monitor screen and does not move or change, check Video RAM IC's (U81 and U82).

The following program can be used to check Video RAM IC's (U81 and U82).

```
10 DATA 1, 2, 4, 8, 16, 32, 64, 128
20 FOR X = 15360 TO 16383
30 FOR Y = 0 TO 7
40 READ Z: POKE X, Z
50 IF (PEEK (X) AND Z) <> Z THEN 110
60 POKE X, 0
70 IF (PEEK (X) AND Z) <> 0 THEN 110
80 NEXT Y
90 RESTORE: NEXT X
100 PRINT "VIDEO MEMORY CHECKS GOOD": END
110 IF Y < 4 THE A$ = "U81" ELSE A$ = "U82"
120 PRINT "BIT"; Y; "OF IC"; A$; "CHECKS BAD"
130 GOTO 80
```

NOTE: If printer output is desired, change the word PRINT to LPRINT in lines 100 and 120.

### VIDEO SYNC

If there is no vertical sync, check the waveform at pin 12 of Flip/Flop IC (U23) on the System board. If the waveform is present check the voltages and components associated with the Sync Amp Transistor (Q601) on the Video Monitor board. If the waveform is missing at pin 12 of IC U23, check the waveform at pin 10 of IC U23. If the waveform is good at pin 10 of IC U23 check Electrolytic C58, Resistor R14 and IC U23. If the waveform is missing at pin 10 of IC U23, check the waveforms at pins 12 and 13 of IC U39. If the waveforms check good at pins 12 and 13 of IC U39 check IC U39 by substitution. If the waveform is missing at pin 12 of IC U39, check Flip/Flop IC (U1), IC U2, Counter IC (U20), and IC U21. If the waveform is missing at pin 13 of IC U39 check IC U22.

## TROUBLESHOOTING (Continued)

If there is no horizontal sync, check the waveform at pin 13 of Flip/Flop IC (U23). If the waveform is good, check the voltages and components associated with the Horizontal Sync Transistor (Q701) and check Diodes CR501, CR502 and associated components on the Video Monitor board. If the waveform is missing at pin 13 of IC U23, check the waveform at pin 2 of IC U23. If the waveform is good at pin 2 check Capacitor C59, Resistor R10 and IC U23. If the waveform is missing at pin 2 of IC U23 check the waveforms at pins 1 and 2 of IC U39. If the waveforms at pins 1 and 2 are good, check IC U39. If the waveform is missing at pin 1 of IC U39 check IC U21 and Counter IC (U56). If the waveform is missing at pin 2 of IC U39 check IC U38.

### CASSETTE

Cassette motor is not being turned On. Type in and run the following Basic program.

```
10 OUT 236,2: OUT 236,0: GOTO 10
```

While the program is running, check for pulses at pins 9 and 15 of IC U98. If pulses are missing at pin 9 of IC U98, check Decoder IC (U41) by substitution. If pulses are present at pin 9 and missing at pin 15 of U98, check IC U98 by substitution. If pulses are present at pin 15 of IC U98, check for pulses at pin 3 of Relay Control IC (U97). If pulses are missing at pin 3 of IC U97 check IC U97, Diode CR7 and Relay K1.

Cassette motor will not turn Off. Check Relay K1 for sticking contacts and check Diodes CR1 and CR2 for possible shorts.

Computer will not save programs to tape. Type in and run the following Basic program:

```
10 CSAVE "$": GOTO 10
```

While the program is running, check for pulses at pin 3 of Flip/Flop IC (U78). If pulses are missing check Decoder IC (U41) by substitution. If pulses are present at pin 3 of IC U78, check for a High logic reading at pins 1 and 10 of IC U78. If the logic reading is not High at pin 1 of IC U78 check Resistor R62 and IC U78. If the logic reading is not High at pin 10 of IC U78, check Resistor R22 and IC U78. If the logic readings check High at pins 1 and 10 of IC U78, check for pulses at pins 6 and 9 of IC U78. If pulses are missing at pin 6 or 9 of IC U78, check IC U78. If pulses are present at pins 6 and 9 of IC U78 check for 1.0 volt peak to peak pulses at pin 5 of Connector J3. If the pulses are missing check Capacitor C113 and Resistors R20, R21, R23 and R27.

Computer will not load programs from tape at 500 baud speed. Inject a 2.0 volt peak to peak 1kHz square wave at pin 4 of Connector J3. Check the waveform (see figure 1) at pin 6 of IC U79. If the waveform is missing check the voltages and components associated with pins 2, 3, 4, 6 and 7 of IC U79. If the waveform is good, check the waveform (see figure 2) at the cathode of Diode CR3. If the waveform is missing check the voltages and components associated with pins 1, 2 and 4 thru 8 of IC U80. If the waveform is good at Diode CR3, check the waveform (see figure 3) at pin 2 of IC U96. If the waveform is missing at pin 2 check the voltages and components associated with pins 2 thru 5 of IC U96. If the waveform is good at pin 2 of IC U96 check for pulses at pin 12 of IC U2. If pulses are missing at pin 12, check IC U2 by substitution. If pulses are present at pin 12 of IC U2, type in and run the following Basic program.

```
10 OUT 255,3: X = INP(255): GOTO 10
```

While the program is running (do not disconnect the 1kHz signal being injected at pin 4 of Connector J3), check for pulses at pins 13 and 9 of Flip/Flop IC (U3) and pin 1 of Buffer IC (U99). If pulses are missing at pin 13 of IC U3, check Decoder IC (U41) by substitution. If pulses are present at pin 13 and missing at pin 9 of IC U3, check IC U3 by substitution. If pulses are missing at pin 1 of IC U99, check IC U40 by substitution. If pulses are present at pins 13 and 9 of IC U3 and pin 1 of IC U99, check IC U99 by substitution.



Figure 1



Figure 2



Figure 3

Computer will not load programs from tape at 1500 baud speed. Inject a 2.0 volt peak to peak 1kHz square wave at pin 4 of Connector J3. Check for pulses at pin 13 of IC U96. If pulses are missing check the voltages and components associated with pins 10, 11 and 13 of IC U96. If pulses are present at pin 13 of IC U96, type in and run the following Basic program.

```
10 X = INP(255): GOTO 10
```

While the program is running, check for pulses at pin 1 of IC U99. If pulses are missing at pin 1 check Decoder IC (U40) by substitution. If pulses are present at pin 1 check IC U99 by substitution. If the 1500 baud rate load still doesn't work, type in and run the following Basic program.

```
10 OUT 224,3: OUT 224,0: X = INP(224):GOTO 10
```

While the program is running and the 1kHz square wave is being injected at pin 4 of Connector J3, check for pulses at pin 15 of IC U41. If pulses are missing at pin 15 of IC U41, check IC U41 by substitution. If pulses are present at pin 15 of IC U41, check for pulses at pins 2 and 15 of Flip/Flop IC (U100). If pulses are missing at pin 2 or 15 of IC U100, check IC U100 by substitution. If pulses are present at pins 2 and 15 of IC U100, check for pulses at pins 3, 6 and 8 of Flip/Flop IC (U85). If pulses are missing at pin 3 of IC U85, check IC

## TROUBLESHOOTING (Continued)

U87 by substitution. If pulses are missing at pin 6 or 8 of IC U85, check IC U85 by substitution. If pulses are present at pins 6 and 8 of IC U85, check for pulses at pin 3 of IC U18. If pulses are missing at pin 3 of IC U18, check IC U18 by substitution. If pulses are present at pin 3 of IC U18, check for pulses at pin 1 of Buffer IC (U84). If pulses are missing at pin 1 of IC U84, check Decoder IC (U40) by substitution. If pulses are present at pin 1 of IC U84, check IC's U84 and U35 by substitution.

### LINE PRINTER PORT

To check the operation of the Printer Data Latch IC (U94) and Printer Strobe Generator IC (U93), type in and run the following Basic program. Note: Do not connect a printer to the printer port.

```
10 OUT 248,255: OUT 248,0: GOTO 10
```

While the program is running check for pulses at pins 2 and 4 of IC U93. If pulses are present at pin 2 and missing at pin 4 check Capacitor C91, Resistor R43 and IC U93. If pulses are missing at pin 2 of IC U93, check Decoder IC (U41). The pulse width at pin 4 of IC U93 should be about 2 $\mu$ Sec. If the pulse width is not correct check Capacitor C91 and IC U93. Check for pulses at pins 2, 5, 6, 9, 12, 15, 16 and 19 of IC U94. If any of the pulses are missing check IC U94.

To check the operation of the Printer Status Buffer IC (U95), type in and run the following Basic program. Note: Do not connect a printer to the printer port.

```
10 X = INP (248)
20 PRINT "X = "; X
30 FOR T = 1 TO 200: NEXT T
40 GOTO 10
```

While the program is running, check for pulses at pin 1 of IC U95. If pulses are missing check Decoder IC (U40). If pulses are present at pin 1 of IC U95, connect a jumper from ground to the pin of IC U95 given in the chart below and note the value of the number X that appears on the Monitor screen. Note: Connect only one pin of IC U95 to ground at a time. Check to see if the number X is the same as given in the chart below. If any of the numbers are not correct check IC U95.

U95 PIN #	VALUE OF X
2	239
4	223
6	191
8	127
11	247
13	251
15	253
17	254

### SERIAL PORT (RS-232 BOARD)

Check for -12.8V at pin 4, 12.0V at pin 3 and 5.0V at pin 1 of Connector P3 on the Serial Interface board. If any of the voltages are not correct, refer to the "POWER SUPPLY" section of this Troubleshooting Guide. Check Connector P2 on the Serial Interface board and Connector J8 on the System board for good connections and check the ribbon cable for possible breaks.

To check the Serial Interface board, connect a 5 volt, 5000Hz square wave from the TTL output of a Function Generator to pin 10 of Line Receiver IC (U11). Type in and run the following Basic program.

```
10 OUT 233,85: X = INP(233): OUT 232,255
20 OUT 234,255: OUT 234,0: X = INP(234)
30 OUT 235,0: X = INP(235)
40 OUT 224,0: X = INP(224)
50 X = INP(232): PRINT "X = "; X
60 FOR T = 1 TO 50: NEXT T
70 GOTO 10
```

While the program is running, check for pulses at pins 1, 4 thru 7, 9 thru 12 and 15 of the Address Decoder IC (U8). If pulses are missing at pin 1 of IC U8, check Decoder IC (U40) on the System board. If pulses are missing at pin 15 of IC U8, check Decoder IC (U41) on the System board. If pulses are missing at pins 4 thru 7 or 9 thru 12 of IC U8, check IC U8.

Check for pulses at pins 1, 2 and 4 of IC U7. If pulses are missing at pins 1, 2 or 4 of IC U7, check IC U7. If pulses are present at pins 1, 2 and 4 of IC U7, check for 4800Hz pulses at pins 3 and 17 of the Baud Rate Generator IC (U1). If pulses are missing or the frequency is not correct at pin 3 or 17 of IC U1, check IC U1. Note: The above program sets the baud rate to 300 baud. To change the baud rate, change the number 85 in line 10 of the above program to the number given under the NUMBER column for the desired baud rate in the following chart. The frequency at pins 3 and 17 of IC U1 should change to the frequency given in the chart for the baud rate used.

BAUD RATE	NUMBER	FREQUENCY U1 PINS 3 AND 17
600	102	9600 Hz
1200	119	19.2kHz
2400	170	38.4kHz
4800	204	76.8kHz
9600	238	153.6kHz

Check for pulses at pins 2, 5, 7, 10, 12 and 15 of Flip/Flop IC (U6). If pulses are missing at any of the pins check IC U6. If pulses are present at pins 2, 5, 7, 10, 12 and 15 of IC U6, check for pulses at pins 3, 6, 8 and 11 of IC U12. If pulses are missing at any of the pins check IC U12. If pulses are present at pins 3, 6, 8 and 11 of IC U12, check for pulses at pin 3 of IC U16. If pulses are missing at pin 3 check IC U16.

## TROUBLESHOOTING (Continued)

Check for pulses at pins 5 thru 15, 19, 21, 22, 25 and 34 of UART IC (U2). If pulses are missing at pins 21 or 34 of IC U2 check IC U7. If pulses are missing at pins 5 thru 15, 19, 22 or 25 of IC U2, check IC U2. If pulses are present at pins 5 thru 15, 19, 21, 22, 25 and 34 of IC U2 check for pulses at pin 11 of IC U16. If pulses are missing at pin 11 check IC U16.

Check for pulses at pin 9 of Flip/Flop IC (U10) and pin 1 of Tri-State Buffer IC (U9). If pulses are missing at pin 9 of IC U10, check Decoder IC (U41) on the System board. If pulses are missing at pin 1 of IC U9, check Decoder IC (U40) on the System board.

To check the RS-232 input lines (pins 3, 5, 6, 8 and 22 of Connector P1), remove the 5000Hz signal from pin 10 of IC U11. Use the following chart and connect 5.0V to the pin given for Line Receiver ICs U11 or U15 and observe the number X that appears on the Monitor screen. If the number is not the same as the number given in the chart check the buffer IC

being tested (IC U11 or U15) and check Tri-State Buffer (U5).  
Note: Connect only one pin at a time to 5.0V.

CONNECT 5.0V TO	X =
U11, pin 10	254
U11, pin 13	239
U11, pin 1	223
U11, pin 4	127
U15, pin 13	191

To check the interrupt select lines, pins 5, 7 and 10 of Flip/Flop IC (U10), stop the above program (press the BREAK key), type OUT 224,112 and press the ENTER key. Check for a High logic reading at pins 5, 7 and 10 of IC U10. If any of the logic readings are not correct, check IC U10. NOTE: The Computer will lock up after OUT 224,112 is entered. Press the RESET button to reset the Computer.

**CSCS5**

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# DISASSEMBLY INSTRUCTIONS

## CABINET REMOVAL

Place Computer on its side. Remove ten screws from cabinet bottom. Carefully place Computer in upright position. Remove one remaining screw from rear of cabinet. Very carefully remove CRT and cabinet top, lifting straight up and setting it aside to the left (if facing CRT). Be careful not to exceed the length of the video cable.

## BOARD REMOVAL

Remove six screws holding metal shield over System board at rear of Computer. Remove shield from System board. Remove seven screws holding System board to chassis. Disconnect connectors J3 thru J8 on System board and remove board from chassis.

## DISK DRIVE INTERFACE BOARD REMOVAL

Remove System board. Remove four screws holding Disk Drive Interface board. Disconnect all cables from board and remove board from chassis.

## RS-232 BOARD REMOVAL

Remove System board. Remove four screws holding Disk Drive Interface board. Disconnect all cables from board and remove board from chassis.

## MAIN POWER BOARD REMOVAL

Remove two screws holding Disk Drive chassis to rear chassis. Remove six screws holding rear chassis to cabinet bot-

tom. Disconnect Disk Drive connectors and ground leads from rear chassis. Lay chassis down and remove four screws holding main power supply board to chassis.

## DISK DRIVE POWER BOARD REMOVAL

Remove four screws holding power board to side of Disk Drive chassis. Disconnect all connectors from board and remove board from Computer.

## DISK DRIVES REMOVAL

**TOP DISK DRIVE:** Disconnect ribbon cable from rear of Disk Drive board. Remove four screws, two on each side holding Drive assembly to chassis. Disconnect connector J1 from power supply board. Disk Drive may now be lifted out of Computer.

**BOTTOM DISK DRIVE:** Remove Disk Drive power supply board. Remove four screws, two on each side holding Drive assembly to chassis. Disconnect connector P1 thru P4 from power supply board. Disk Drive may now be removed out the front of chassis.

## MONITOR BOARD REMOVAL

Disconnect CRT socket, HV anode lead, deflection yoke leads, and ground lead. Remove two screws holding Monitor board to side of cabinet top.

To remove CRT, remove four nuts holding CRT to cabinet front. Note: Make sure to hold on to CRT while removing nuts to avoid breaking CRT.

# SCHEMATIC NOTES

- \*— Circuitry not used in some versions
- Circuitry used in some versions
- See parts list
- ± Ground
- ≡ Chassis
- ▽ Common tie point

Waveforms and voltages taken from ground, unless noted otherwise.

Voltages, Waveforms and Logic probe readings taken with computer turned On, no keys pressed, unless otherwise noted.

Waveforms taken with triggered scope and Sweep/Time switch in Calibrate position, scope input set for DC coupling on 0 reference voltage waveforms. Switch to AC input to view waveforms after DC reference is measured when necessary. Each waveform is 7 cm. width with DC reference voltage given at the bottom line of each waveform.

Time in  $\mu$ sec. per cm, given with p-p reading at the end of each waveform.

Item numbers in rectangles appear in the alignment/adjustment instructions.

Supply voltages maintained as shown at input.

Voltages measured with digital meter, no signal.

Controls adjusted for normal operation.

Terminal identification may not be found on unit.

Capacitors are 50 volts or less, 5% unless noted.

Electrolytic capacitors are 50 volts or less, 20% unless noted.

Resistors are  $\frac{1}{2}$ W or less, 5% unless noted.

Value in ( ) used in some versions.

Measurements with switching as shown, unless noted.

Voltages, Waveforms and Logic Probe readings for Disk Drive and Disk Drive Interface board taken while running the following Basic program.

```
10 OPEN "0", 1, "SAMS:1"  
20 FOR X = 1 TO 300  
30 PRINT #1, "THIS IS A TEST"  
40 NEXT X  
50 CLOSE 1  
60 GOTO 10
```

1. Probe indicates P when Head Position motor is operating.
2. Probe indicates H when Head is moving in and L when Head is moving out from center of diskette.
3. Probe indicates L when Head is moving in and H when Head is moving out from center of diskette.
4. Probe indicates H if diskette is write protected.
5. Probe indicates L if diskette is write protected.
6. Probe indicates H when Head is on track 00, 01 or 02.
7. Probe indicates L when Head is on track 00, 01 or 02.
8. Logic reading not taken.

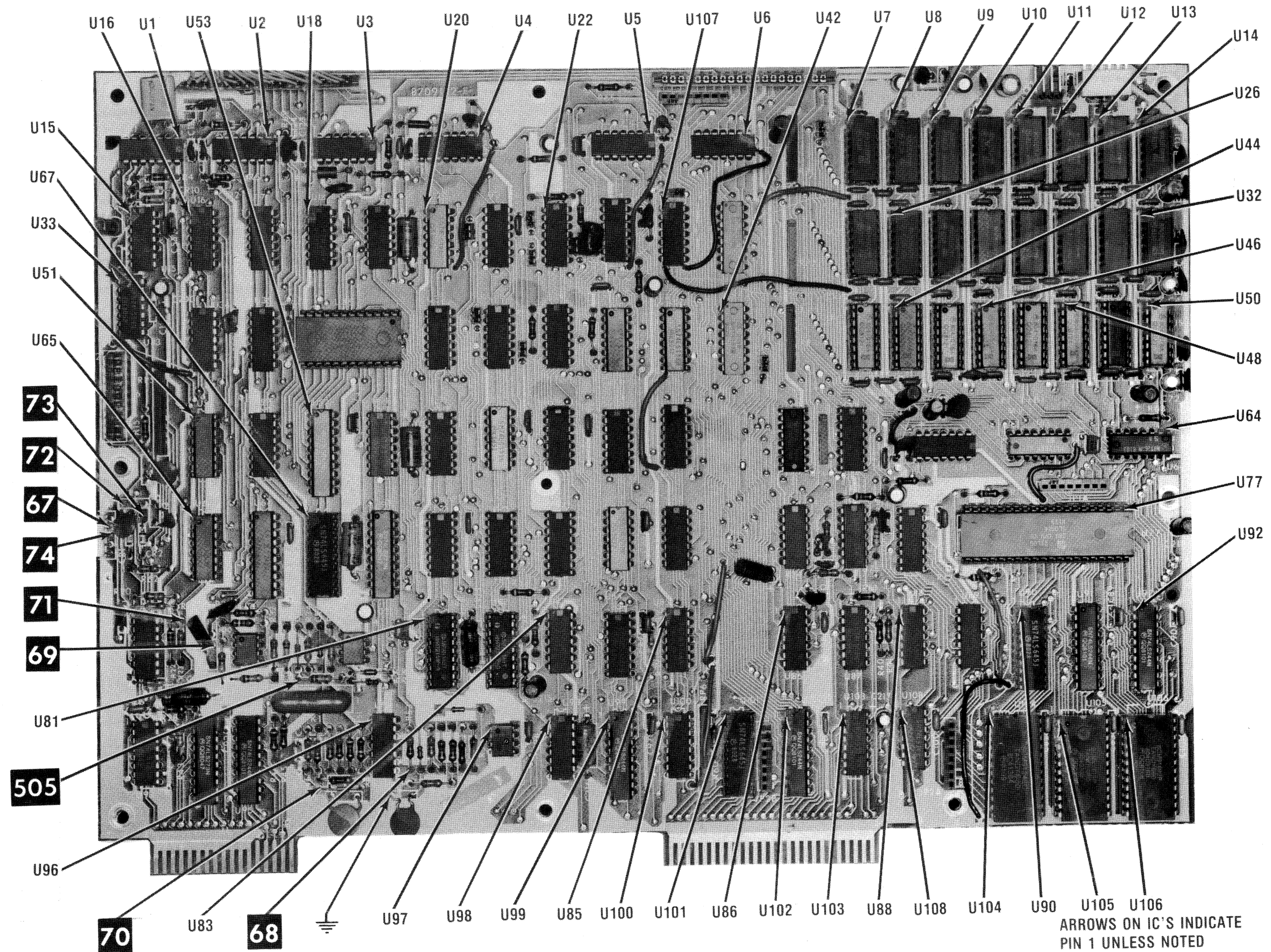
## Logic Probe Display

L = Low

H = High

P = Pulse

\* = Open (No light On)

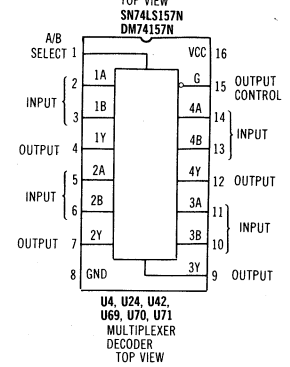
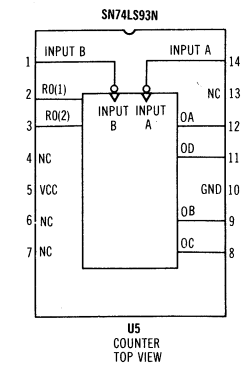
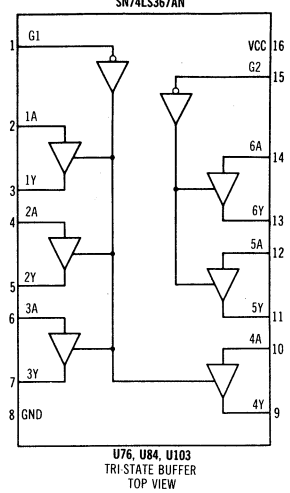
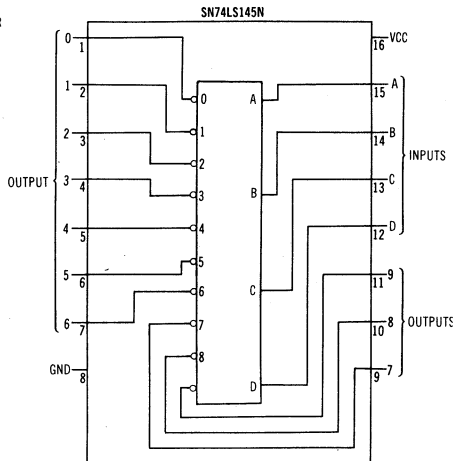
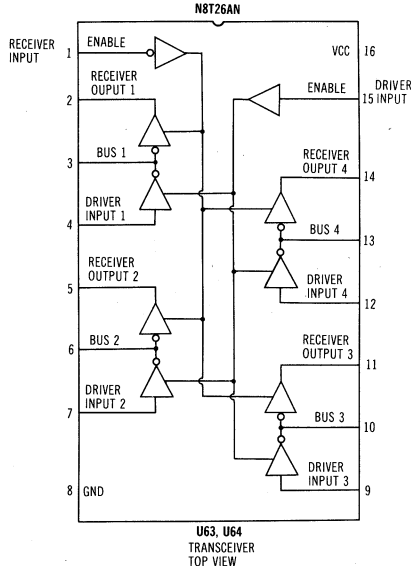
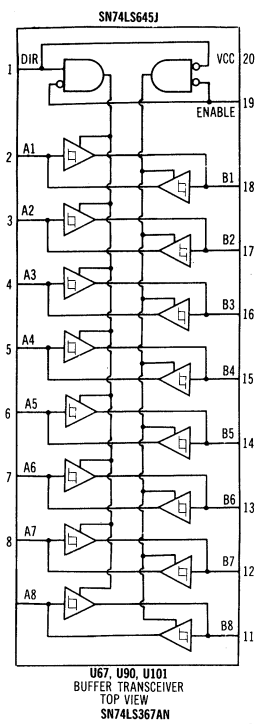
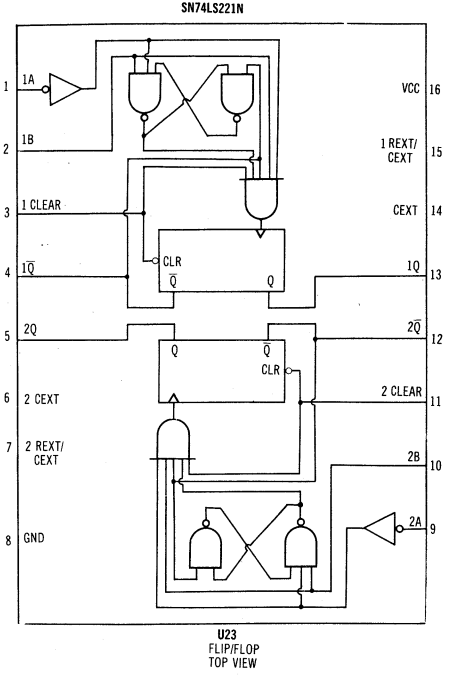
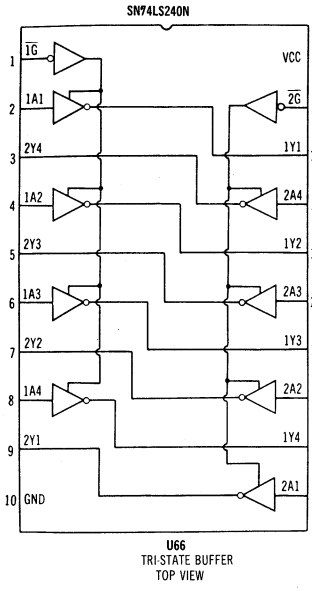
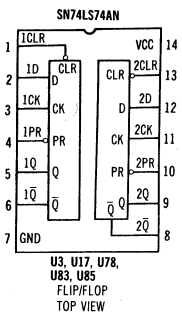
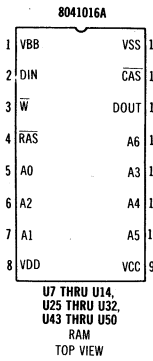


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MODEL III

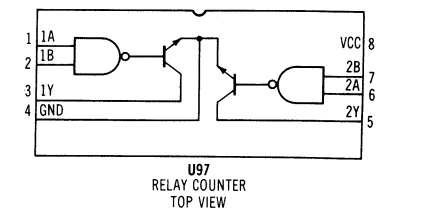
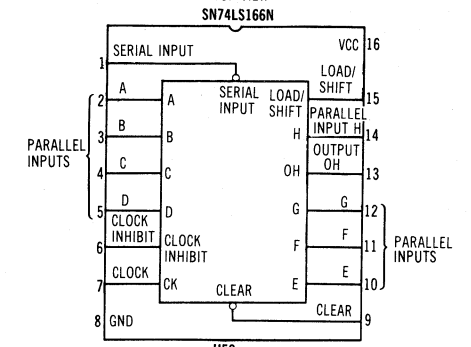
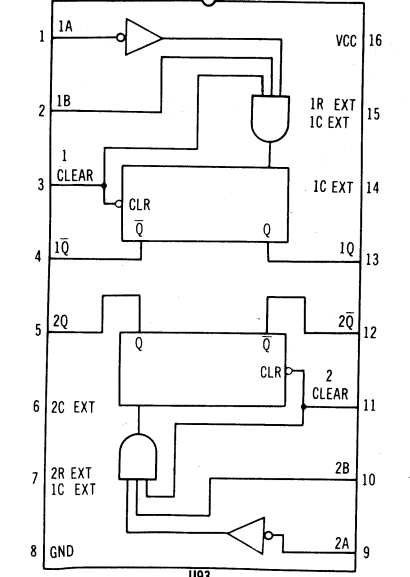
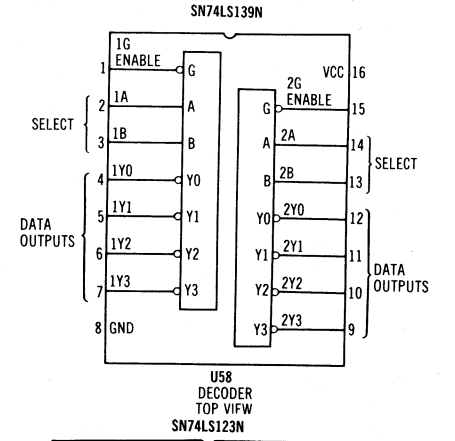
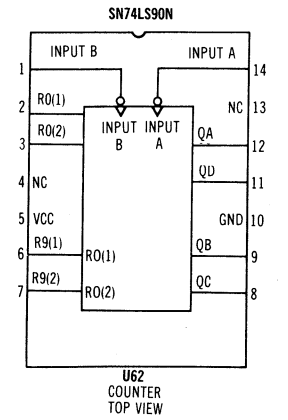
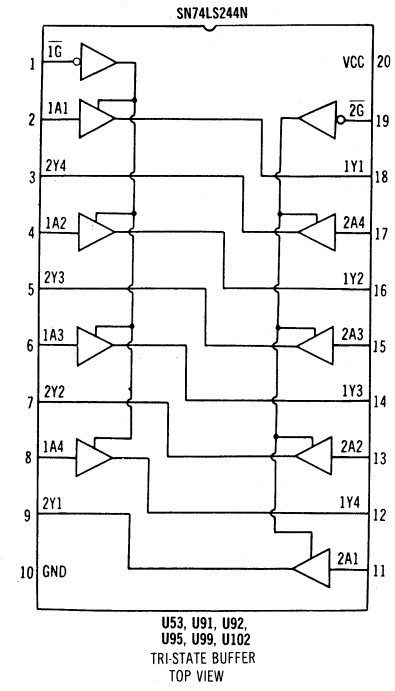
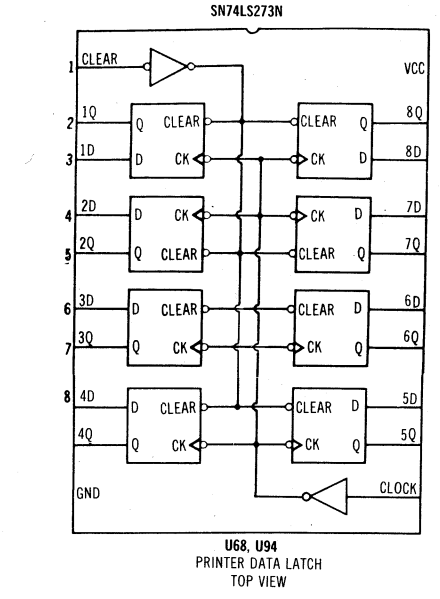
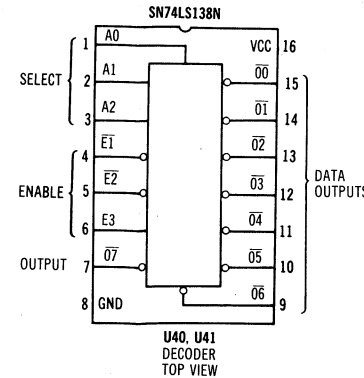
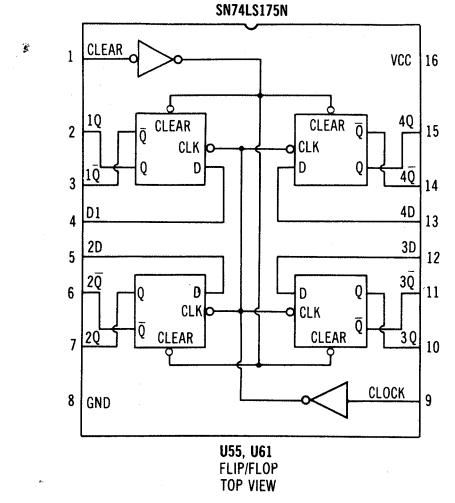
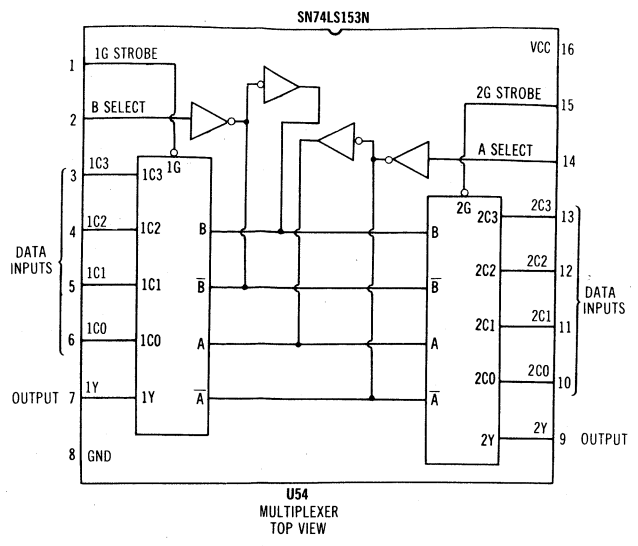
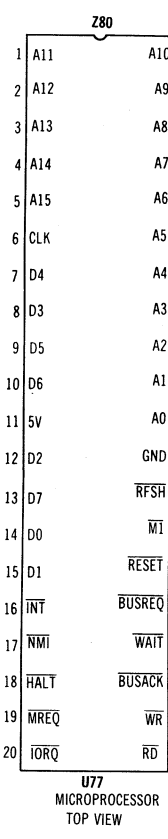
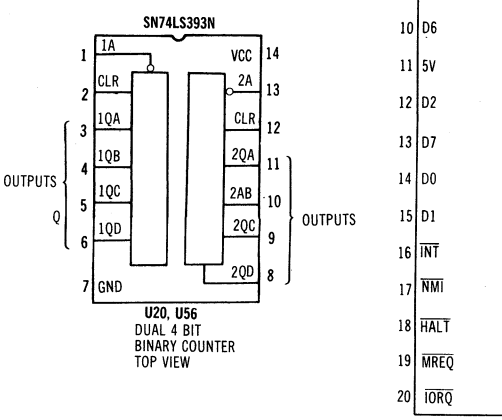
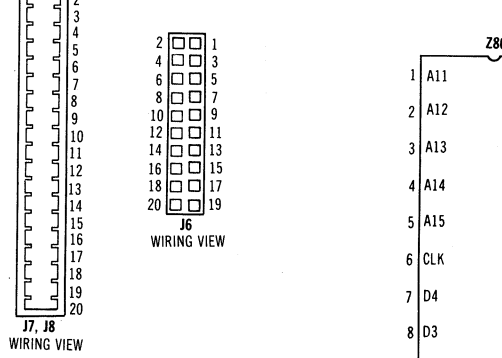
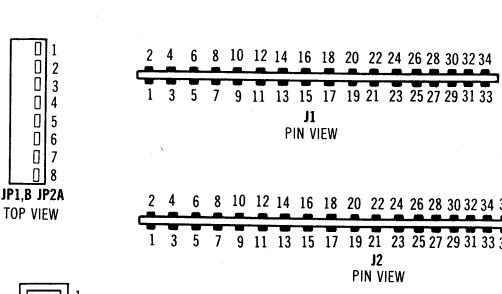
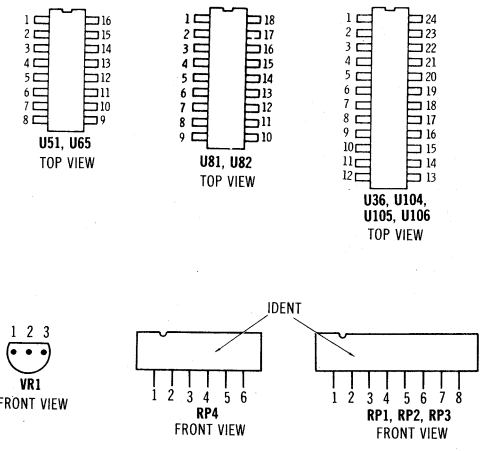
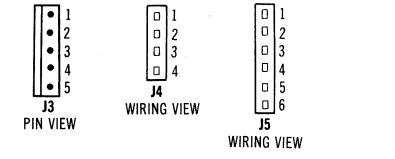
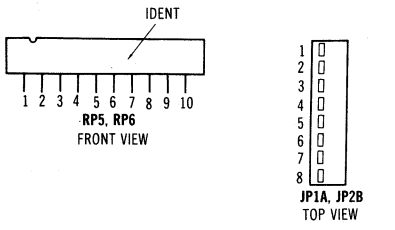
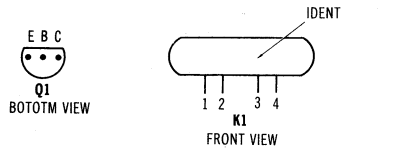
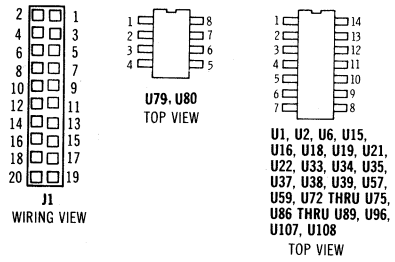
# IC PINOUTS & TERMINAL GUIDES

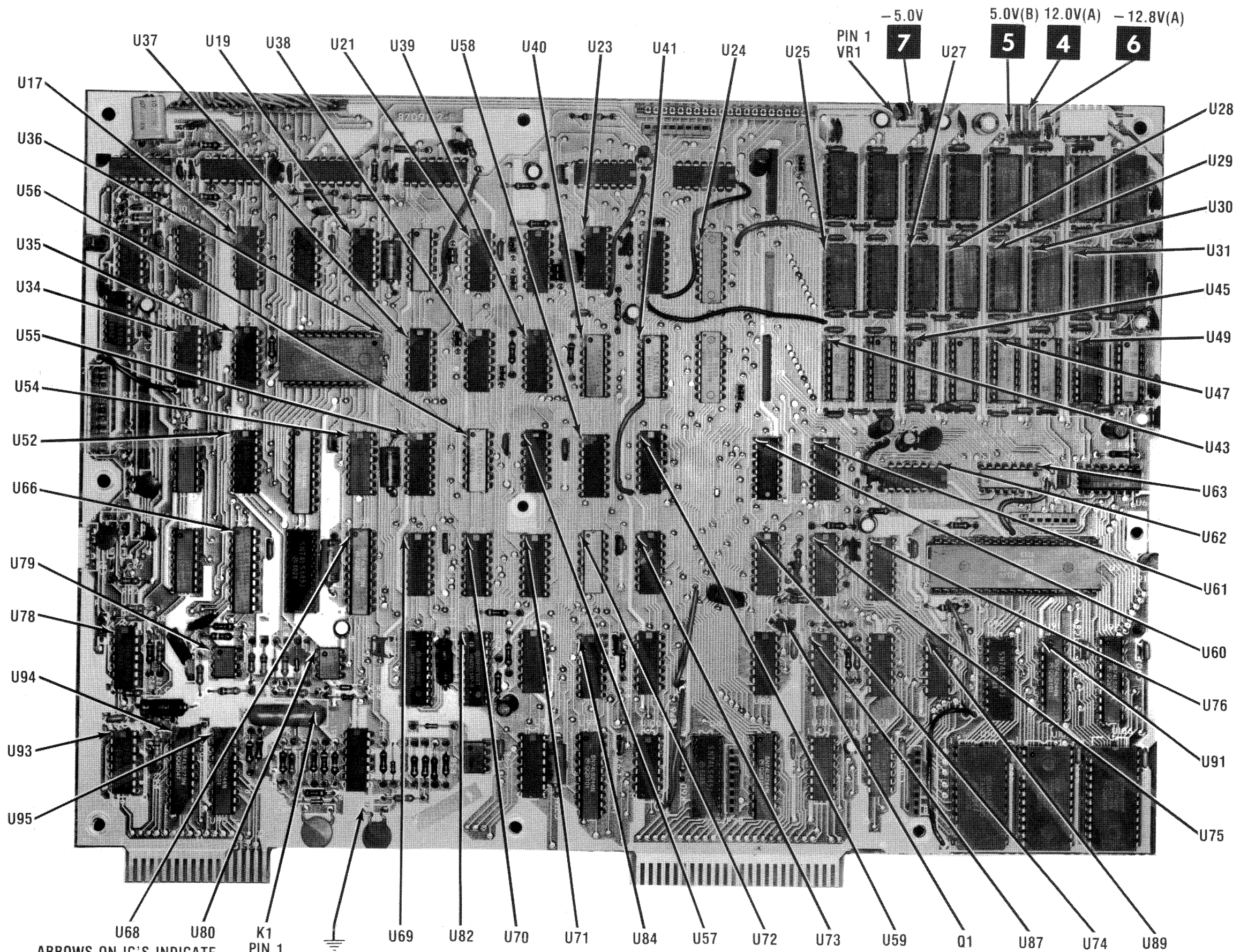
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# IC PINOUTS & TERMINAL GUIDES





ARROWS ON IC'S INDICATE  
PIN 1 UNLESS NOTED

K1  
PIN 1

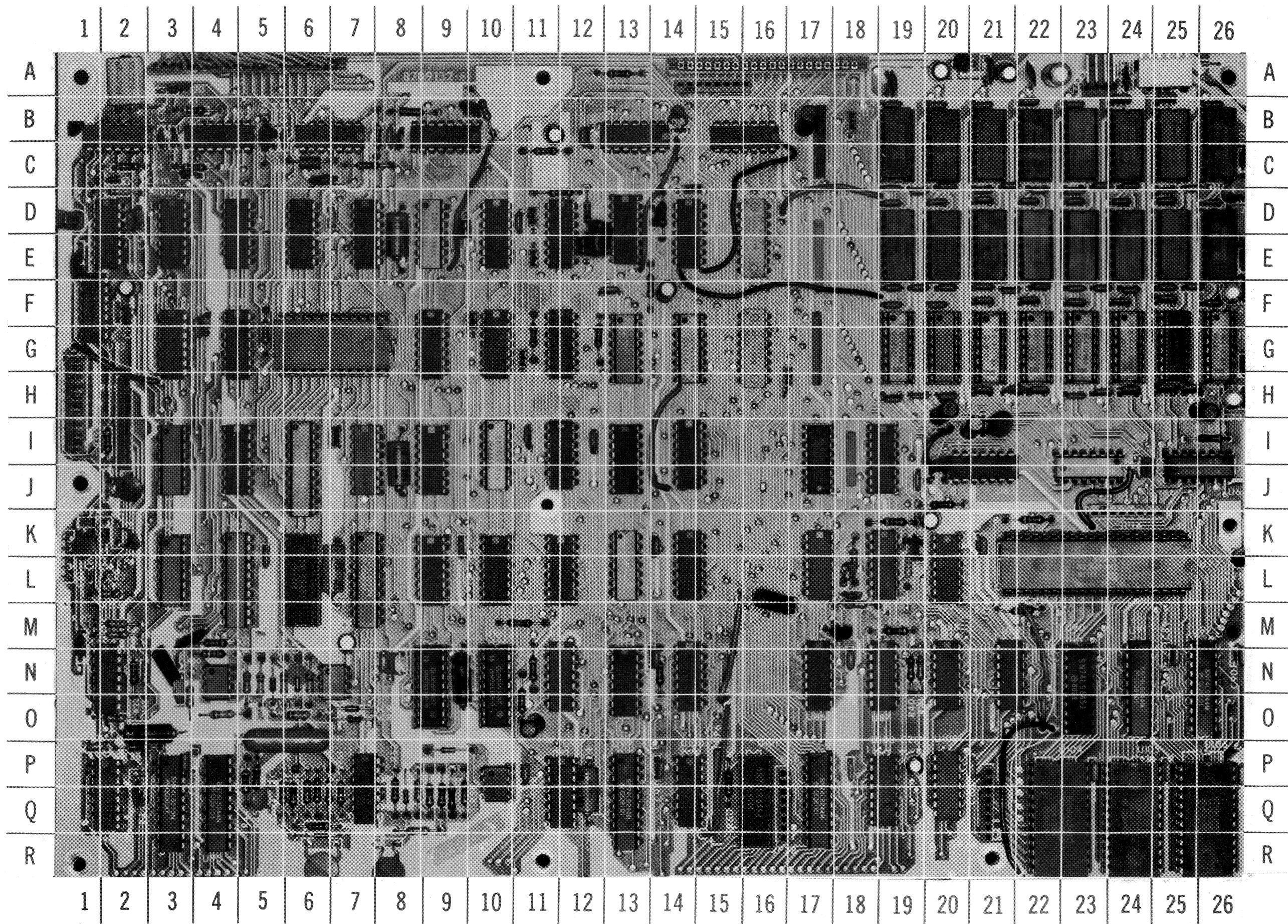
SYSTEM BOARD

A Howard W. Sams **CIRCUITRACE** Photo

**CSCS5**

HAJIO SHACK  
MODEL III

SYSTEM BOARD



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MODEL III

**SYSTEM BOARD GridTrace LOCATION GUIDE**

C1	B-3	C75	J-19	C214	T-9	R48	Q-6	U47	G-23
C2	B-8	C76	J-24	C215	Q-11	R49	Q-6	U48	Q-24
C3	B-12	C77	L-5	C216	P-12	R50	Q-6	U49	Q-25
C4	B-19	C78	K-9	C217	P-19	R51	Q-7	U50	Q-26
C5	B-20	C79	K-14	CR1	L-1	R52	Q-6	U51	I-3
C6	B-21	C80	L-18	CR2	L-2	R53	Q-8	U52	I-4
C7	B-22	C81	K-21	CR3	T-5	R54	Q-8	U53	I-6
C8	B-23	C82	P-23	CR4	T-6	R55	Q-9	U54	I-7
C9	B-24	C83	P-25	CR5	Q-7	R56	Q-9	U55	I-9
C10	B-25	C84	M-3	CR6	Q-7	R57	Q-9	U56	I-10
C11	B-26	C85	N-3	CR7	P-9	R58	Q-9	U57	I-12
C12	C-19	C86	N-8	CR8	Q-8	R59	Q-8	U58	I-13
C13	C-19	C87	N-14	CR9	R-6	R60	P-15	U59	I-14
C14	C-20	C88	N-18	CR10	C-2	R61	M-19	U60	I-17
C15	C-21	C89	N-25	J1	R-3	R62	L-2	U61	I-19
C16	C-21	C90	N-26	J2	R-16	R63	M-11	U62	I-21
C17	C-22	C91	Q-2	J3	K-1	R65	A-13	U63	J-23
C18	C-23	C92	P-3	J4	A-23	R66	J-20	U64	J-25
C19	C-23	C93	Q-5	J5	A-25	R67	C-6	U65	L-3
C20	C-24	C94	R-6	J6	H-1	R68	I-26	U66	L-4
C21	C-25	C95	R-8	J7	A-5	R69	B-5	U67	L-6
C22	C-25	C96	P-11	J8	A-16	R99	B-10	U68	L-7
C23	D-26	C97	P-14	JP1A	J-24	RP1	B-17	U69	L-9
C24	D-19	C98	P-18	JP1B	A-15	RP2	E-17	U70	L-10
C25	D-20	C100	P-21	JP2A	Q-21	RP3	G-17	U71	L-12
C26	D-21	C101	P-26	JP2B	Q-16	RP4	I-18	U72	L-13
C27	D-22	C102	A-20	K1	P-6	RP5	H-2	U73	L-14
C28	D-23	C103	A-21	Q1	M-18	RP6	P-15	U74	L-17
C29	D-24	C104	I-11	R1	B-4	U1	B-2	U75	L-19
C30	D-25	C105	P-1	R2	B-8	U2	B-4	U76	L-20
C31	D-26	C107	C-6	R3	C-11	U3	B-6	U77	L-23
C32	F-4	C108	B-10	R4	C-2	U4	B-9	U78	T-2
C33	F-13	C109	B-14	R5	C-4	U5	B-13	U79	T-4
C34	F-19	C110	L-18	R6	C-7	U6	B-15	U80	T-7
C35	F-19	C111	K-1	R7	D-2	U7	B-19	U81	T-9
C36	F-20	C112	M-1	R8	D-12	U8	B-20	U82	T-10
C37	F-21	C113	K-2	R9	D-12	U9	B-21	U83	T-12
C38	F-21	C114	J-2	R10	D-14	U10	B-22	U84	T-13
C39	F-22	C115	E-1	R11	G-5	U11	B-23	U85	T-14
C40	F-23	C116	A-24	R12	G-11	U12	B-24	U86	T-17
C41	F-23	C117	A-22	R13	G-12	U13	B-25	U87	T-19
C42	F-24	C118	A-19	R14	F-14	U14	B-26	U88	T-20
C43	F-25	C119	A-21	R15	I-2	U15	D-2	U89	T-21
C44	F-25	C120	A-3	R17	L-18	U16	D-3	U90	T-23
C45	F-26	C121	B-3	R18	L-19	U17	D-4	U91	T-24
C46	F-19	C122	C-3	R19	K-22	U18	D-6	U92	T-26
C47	F-20	C123	B-5	R20	M-2	U19	D-7	U93	Q-2
C48	F-21	C124	B-5	R21	M-2	U20	D-9	U94	Q-3
C49	F-22	C125	F-2	R22	N-2	U21	D-10	U95	Q-4
C50	F-23	C126	I-21	R23	N-2	U22	D-11	U96	Q-7
C51	F-24	C127	I-21	R24	M-18	U23	D-13	U97	P-10
C52	F-25	C128	B-8	R25	K-19	U24	D-16	U98	Q-12
C53	F-26	C129	K-20	R26	Q-3	U25	E-19	U99	Q-13
C54	D-1	C130	K-19	R27	Q-2	U26	E-20	U100	Q-14
C55	D-2	C131	C-26	R28	P-2	U27	E-21	U101	Q-16
C56	D-7	C132	D-26	R29	M-4	U28	E-22	U102	Q-17
C57	D-11	C133	E-26	R30	T-4	U29	E-23	U103	Q-19
C58	D-12	C134	F-26	R31	Q-4	U30	E-24	U104	Q-22
C59	D-14	C135	G-26	R32	T-5	U31	E-25	U105	Q-24
C60	A-22	C136	H-26	R33	T-5	U32	E-26	U106	Q-26
C61	H-19	C137	J-20	R34	T-6	U33	F-1	U107	D-14
C62	H-19	C200	F-2	R35	T-6	U34	G-3	U108	Q-20
C63	H-20	C201	D-8	R36	Q-6	U35	G-4	VR1	A-20
C64	H-21	C202	B-11	R37	Q-11	U36	G-6	Y1	A-2
C65	H-21	C203	B-17	R38	T-11	U37	G-9		
C66	H-22	C204	F-14	R39	N-14	U38	G-10		
C67	H-23	C206	H-20	R40	T-19	U39	G-12		
C68	H-23	C207	H-26	R41	N-19	U40	G-13		
C69	H-24	C208	I-8	R42	M-22	U41	G-14		
C70	H-25	C209	L-7	R43	P-2	U42	G-16		
C71	H-25	C210	L-16	R44	P-5	U43	G-19		
C72	H-26	C211	L-26	R45	P-5	U44	G-20		
C73	I-7	C212	O-3	R46	Q-5	U45	G-21		
C74	I-12	C213	M-7	R47	Q-6	U46	G-22		

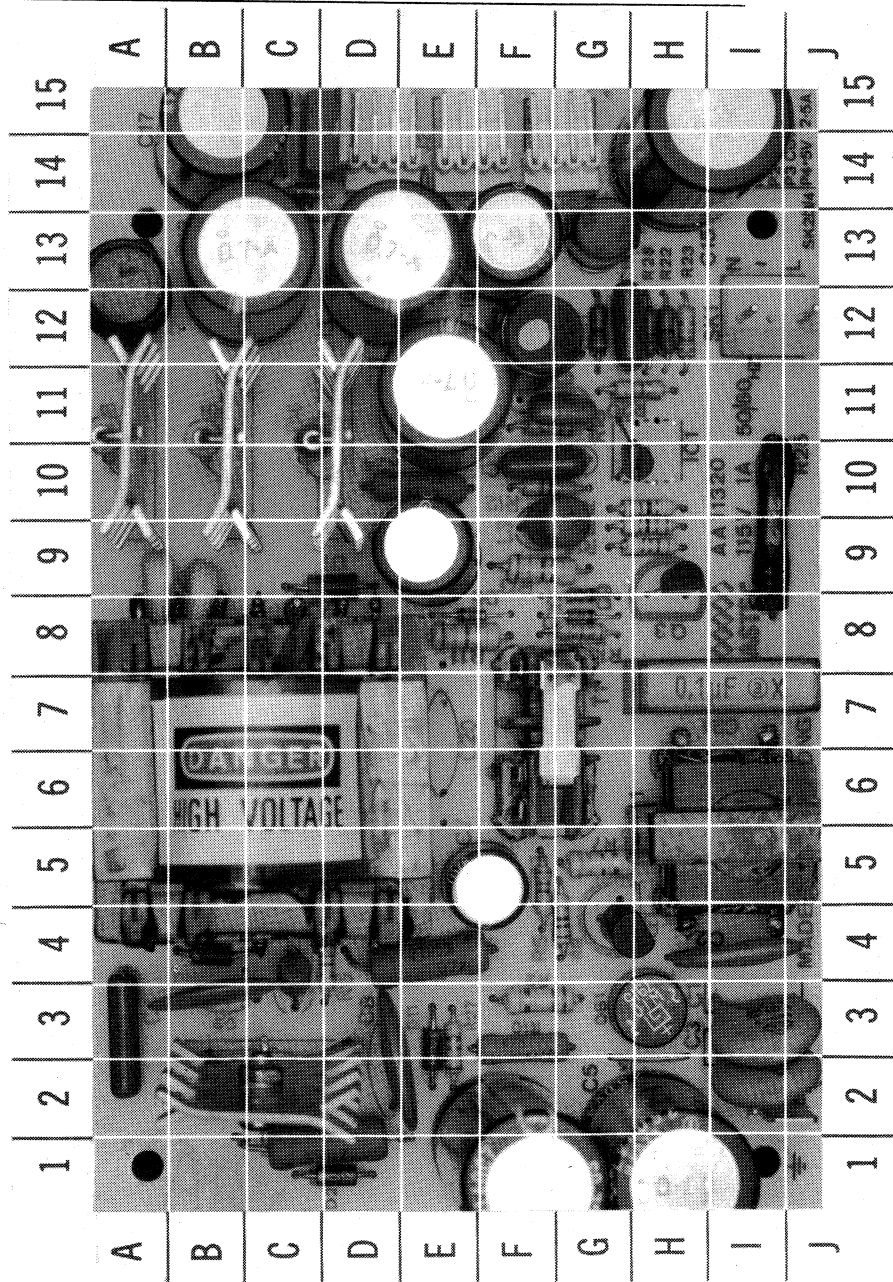
**CSCS5**

**RADIO SHACK  
MODEL III**

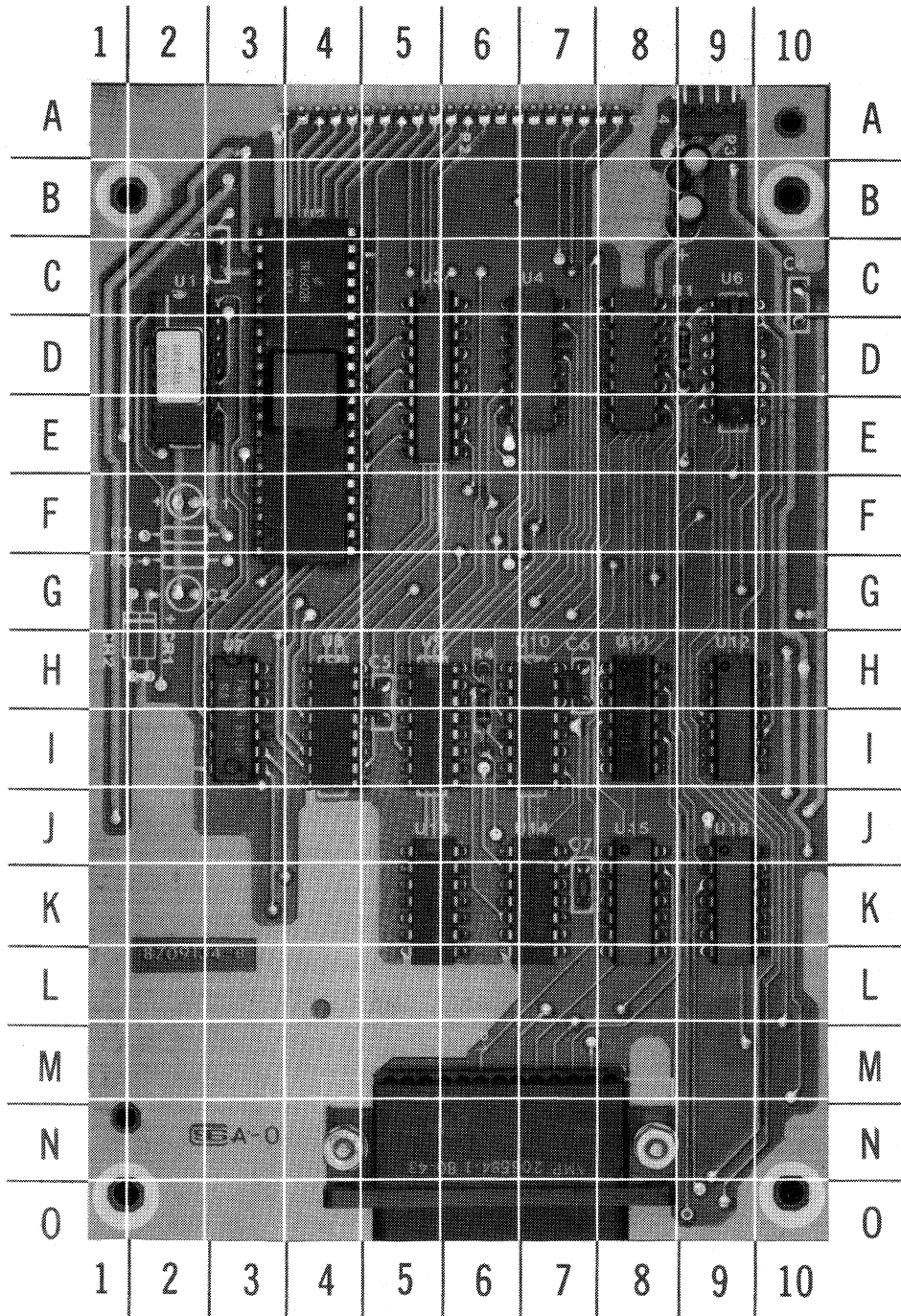


**SYSTEM POWER SUPPLY BOARD**  
**GridTrace LOCATION GUIDE**

C1	L6	G-13
C2	Q1	G-4
C3	Q2	C-2
C4	Q3	H-9
C5	R1	E-4
C6	R2	F-3
C7	R3	E-5
C8	R5	F-5
C9	R6	D-4
C10	R7	G-5
C11	R8	G-4
C12	R9	D-1
C13	R10	F-3
C14	R11	E-8
C15	R12	F-10
C16	R13	F-9
C17	R14	H-9
C18	R15	G-8
C19	R16	H-9
C21	R17	H-10
D1	R18	F-11
D2	R19	C-13
D3	R20	G-11
D4	R21	G-12
D5	R22	H-12
D6	R23	H-12
D7	R24	E-10
D8	R25	I-9
D9	R26	H-12
D10	R27	E-3
D11	SCR1	C-14
DB1	SK1	I-12
IC1	SK2	D-14
L1	SK3	E-14
L2	SK4	G-14
L3	T1	F-7
L4	T2	C-6
L5	A-13	C-14



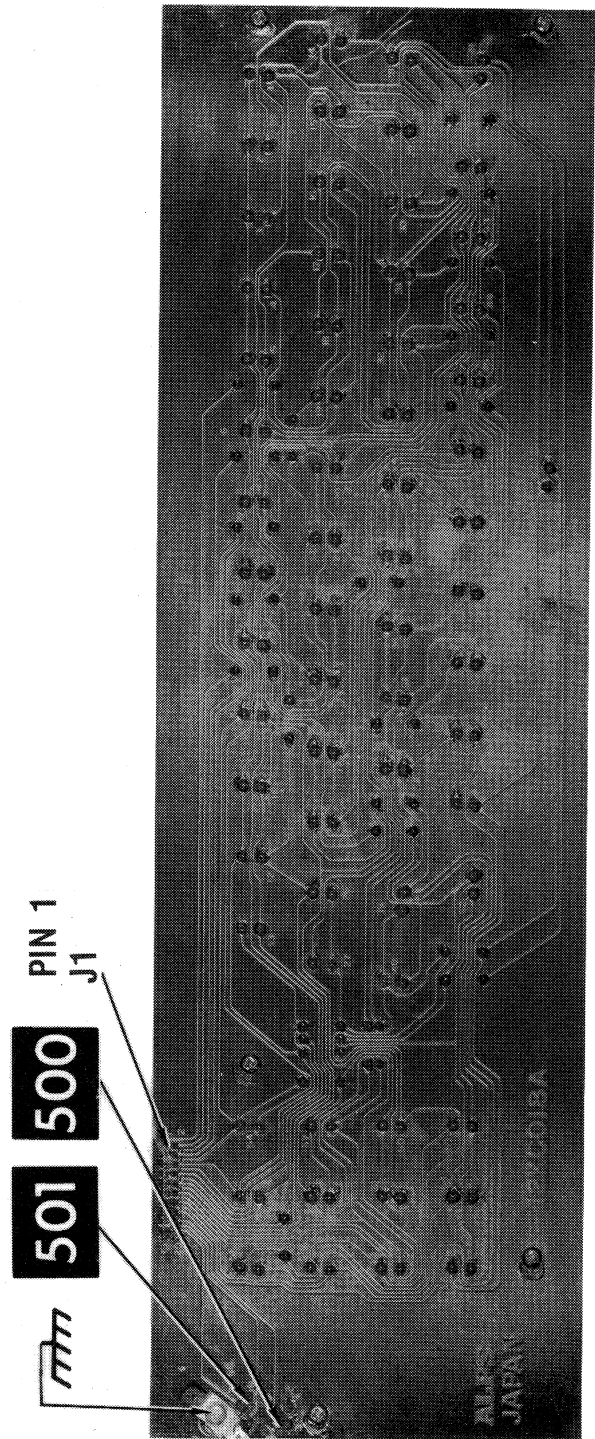
RS-232 SERIAL INTERFACE BOARD  
GridTrace LOCATION GUIDE



- |     |      |
|-----|------|
| C3  | C-3  |
| C4  | C-10 |
| C5  | H-5  |
| C6  | H-7  |
| C7  | K-7  |
| C8  | B-9  |
| C9  | B-9  |
| P1  | N-6  |
| P2  | A-6  |
| P3  | A-9  |
| R1  | D-9  |
| R4  | H-6  |
| U1  | D-2  |
| U2  | D-4  |
| U3  | D-5  |
| U4  | D-7  |
| U5  | D-8  |
| U6  | D-9  |
| U7  | H-3  |
| U8  | H-4  |
| U9  | H-5  |
| U10 | H-7  |
| U11 | H-8  |
| U12 | H-9  |
| U13 | K-5  |
| U14 | K-7  |
| U15 | K-8  |
| U16 | K-9  |

**CSCS5**

**RADIO SHACK  
MODEL III**



# PARTS LIST AND DESCRIPTION

When ordering parts, state Model, Part Number, and Description

## SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA						
			GENERAL ELECTRIC PART No.	NTE PART No.	PHILIPS ECG PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.	
<b>POWER SUPPLY BOARD</b>									
D1	RGP10A		GE-511	NTE552	EG552	SK5014	WEP172/506	103-287	
D2	RGP10D		GE-511	NTE552	EG552	SK5014	WEP172/506	103-287	
D3	RGP10J		GE-511	NTE552	EG552	SK3318A	WEP172/506	103-287	
D4 thru D7	RG3B			NTE580	EG580	SK5032			
D8 thru D10	RGP15B		GE-511	NTE552	EG552	SK5014	WEP172/506	103-287	
D11	1N4506		GE-300	NTE177	EG177	SK9091/177	WEP1062/177	103-131	
DB1	1N4001		GE-504A	NTE116	EG116	SK3311	WEP154	212-76-02	
IC1	W06		GEBR-600	NTE305	EG5305	SK3676/5305	WEP1054/169	212-Z9002	
Q1	TL431CLP PE8050B		GE-47*	NTE293*	EG293*	SK3849/293*	WEP912/293*	121-Z9066*	
Q2	2SC2502		GE-48*	NTE379	EG379	SK9085/379	WEP379/379	121-Z9111	
Q3	PE8550B		C122F1	NTE294*	EG294*	SK3841/294*	WEP916/294*	121-Z9067*	
SCR1	C122UX5		C122F1	NTE5461	EG5461	SK9290/5461	WEP6251/5461		
Z1	C122F		C122F1	NTE5461	EG5461	SK9290/5461	WEP6251/5461		
	6B2 5.6V		GEZD-6.2 GEZD-5.6	NTE137A NTE136A	EG137A EG136A	SK6V2/137A SK5V6/136A	WEP1154/137 WEP1104/136	103-Z9008 103-Z9007	

\* Lead configuration may vary from original.

**CSCS5**

**RADIO SHACK  
MODEL III**

**PARTS LIST AND DESCRIPTION (Continued)**

When ordering parts, state Model, Part Number, and Description

**SEMICONDUCTORS (Select replacement transistor for best results)**

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA						ZENITH PART No.
			GENERAL ELECTRIC PART No.	NTE PART No.	PHILIPS ECG PART No.	RCA PART No.	WORKMAN PART No.		
		<b>RS-232 SERIAL INTERFACE BOARD</b>							
U1	BR1941L	AMX3921							
U2	BR2941L	AMX3865							
U3	TR1602B	AMX3864							
U4,5	SN74LS244N DM74LS367N	AMX3567	74LS244 74LS367A	NTE74LS244 NTE74LS367	ECG74LS244 ECG74LS367	SK74LS244 SK74LS367			HE-443-791 HE-443-857
U6	SN74LS174N	AMX3565	74LS174	NTE74LS174	ECG74LS174	SK74LS174			HE-443-879
U7	7404N	AMX3655	GE-7404	NTE7404	ECG7404	SK7404			221-Z9076
U8	SN74LS139N	AMX3800	74LS139	NTE74LS139	ECG74LS139	SK74LS139			HE-443-822
U9	SN74LS368AN	AMX3568	74LS368A	NTE74LS368	ECG74LS368				
U10	SN74LS174N	AMX3565	74LS174	NTE74LS174	ECG74LS174	SK74LS174			HE-443-879
U11	MC1489P	AMX3868		NTE75189	ECG75189	SK5189/75189			HE-443-795
U12	MC1488P	AMX3867		NTE75188	ECG75188	SK5188/75188			HE-443-794
U13	SN74LS27N	802-0027	74LS27	NTE74LS27	ECG74LS27	SK74LS27			
U14	SN74LS38N	AMX4328	74LS38	NTE74LS38	ECG74LS38	SK74LS38			HE-443-800
U15	MC1489P	AMX3868		NTE75189	ECG75189	SK5189/75189			HE-443-795
U16	MC1488P	AMX3867		NTE75188	ECG75188	SK5188/75188			HE-443-794

## PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

### SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFG. PART No.	REPLACEMENT DATA						
			GENERAL ELECTRIC PART No.	NTE PART No.	PHILIPS ECG PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.	
<b>SYSTEM BOARD</b>									
CR1,2	1N982A	ADX1103	GEZD-75	NTE5046A	ECG5046A	SK75A/5046A	WEP1452/5046		
CR3 thru CR10	1N4148	ADX1152	GE-514	NTE519	ECG519	SK3100/519	WEP925/519		103-131
Q1	MPS3906 2N3906	AMX3584	GE-82 GE-82	NTE159 NTE159	ECG159 ECG159	SK3466/159 SK3466/159	WEP62/159 WEP62/159		121-Z9003 121-Z9003
U1	SN74LS74AN	AMX3558	74LS74A	NTE74LS74A	ECG74LS74A	SK74LS74A			HE-443-730
U2	SN74LS04N	AMX3552	74LS04	NTE74LS04	ECG74LS04	SK74LS04			HE-443-755
U3	SN74LS74AN	AMX3558	74LS74A	NTE74LS74A	ECG74LS74A	SK74LS74A			HE-443-730
U4	SN74LS157N	AMX3563	74LS157	NTE74LS157	ECG74LS157	SK74LS157			HE-443-799
U5	SN74LS93N	AMX3560	74LS93	NTE74LS93	ECG74LS93	SK74LS93			
U6	SN74LS10N	AMX3898	74LS10	NTE74LS10	ECG74LS10	SK74LS10			HE-443-797
U7 thru U14	8041016A 416	AMX3021							
U15	SN74LS132N	AMX3561	74LS132	NTE74LS132	ECG74LS132	SK74LS00			HE-443-792
U16	SN74LS00N	AMX3550	74LS00	NTE74LS00	ECG74LS00	SK74LS00			HE-443-728
U17	SN74LS74AN	AMX3558	74LS74A	NTE74LS74A	ECG74LS74A	SK74LS74A			HE-443-730
U18	SN74LS00N	AMX3550	74LS00	NTE74LS00	ECG74LS00	SK74LS00			HE-443-728
U19	SN74LS08N	AMX3698	74LS08	NTE74LS08	ECG74LS08	SK74LS08			HE-443-780
U20	SN74LS393N	AMX3706	74LS393	NTE74LS393	ECG74LS393	SK74LS393			
U21	SN74LS11N	AMX3554	74LS11	NTE74LS11	ECG74LS11	SK74LS11			HE-443-864
U22	SN74LS266N	802-0266	74LS266	NTE74LS266	ECG74LS266	SK74LS266			HE-443-719
U23	SN74LS221N	AMX3810		NTE74LS221	ECG74LS221	SK74LS221			
U24	DM74157N			NTE74157	ECG74157	SK74157			
U25 thru U32	74LS157 8041016A 416	AMX3563 AMX3021	74LS157	NTE74LS157	ECG74LS157	SK74LS157			HE-443-799

## PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

## SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFGR. PART No.	REPLACEMENT DATA						
			GENERAL ELECTRIC PART No.	NTE PART No.	PHILIPS ECG PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.	
U33	SN74LS04N	AMX3552	74LS04	NTE74LS04	ECG74LS04	SK74LS04			HE-443-755
U34, 35	SN74LS05N	AMX3553	74LS05	NTE74LS05	ECG74LS05	SK74LS05			HE-443-818
U36	8044316	SOM91665P (1)							
	MCM68A316E	AXX3040							
U37	SN74LS00N	AMX3550	74LS00	NTE74LS00	ECG74LS00	SK74LS00			HE-443-728
U38	SN74LS266N	AMX4660	74LS266	NTE74LS266	ECG74LS266	SK74LS266			HE-443-719
U39	SN74LS08N	AMX3698	74LS08	NTE74LS08	ECG74LS08	SK74LS08			HE-443-780
U40, 41	SN74LS138N	AMX4583	74LS138	NTE74LS138	ECG74LS138	SK74LS138			HE-443-877
U42	DM74157N			NTE74157	ECG74157	SK74157			
	74LS157	AMX3563	74LS157	NTE74LS157	ECG74LS157	SK74LS157			HE-443-799
U43 thru	8041016A								
U50	416	AXX3021							
U51	MC14050B	AMX4584	GE-4050	NTE4050B	ECG4050B	SK4050B			221-29163
U52	SN74LS166N	AMX3564	74LS166	NTE74LS166	ECG74LS166				HE-443-892
U53	SN74LS244N	AMX3864	74LS244	NTE74LS244	ECG74LS244	SK74LS244			HE-443-791
U54	SN74LS153N	AMX3562	74LS153	NTE74LS153	ECG74LS153	SK74LS153			
U55	SN74LS175N	AMX3566	74LS175	NTE74LS175	ECG74LS175	SK74LS175			HE-443-752
U56	SN74LS393N	AMX3706	74LS393	NTE74LS393	ECG74LS393	SK74LS393			
U57	SN74LS02N	AMX3551	74LS02	NTE74LS02	ECG74LS02	SK74LS02			HE-443-779
U58	SN74LS139N	AMX3800	74LS139	NTE74LS139	ECG74LS139	SK74LS139			HE-443-822
U59	SN74LS32N	AMX3557	74LS32	NTE74LS32	ECG74LS32	SK74LS32			HE-443-875
U60	SN74LS145N	AMX4659	74LS145	NTE74LS145	ECG74LS145				HE-443-889
U61	SN74LS175N	AMX3566	74LS175	NTE74LS175	ECG74LS175	SK74LS175			HE-443-752
U62	SN74LS90N	AMX3804	74LS90	NTE74LS90	ECG74LS90	SK74LS90			HE-443-813
U63, 64	N8T26AN	AMX4261		NTE6880	ECG6880				
U65	MC14050B	AMX4584	GE-4050	NTE4050B	ECG4050B	SK4050B			221-29163
U66	SN74LS240N	AMX4225	74LS240	NTE74LS240	ECG74LS240	SK74LS240			HE-443-754
U67	SN74LS645J			NTE74LS645	ECG74LS645				
	74LS245	AMX4470	74LS245	NTE74LS245	ECG74LS245	SK74LS245			HE-443-885
U68	SN74LS273N	AMX4227	74LS273	NTE74LS273	ECG74LS273	SK74LS273			HE-443-805

## PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

### SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFGR. PART No.	REPLACEMENT DATA						
			GENERAL ELECTRIC PART No.	NTE PART No.	PHILIPS ECG PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.	
U69 thru	SN74LS157N	AMX3563	74LS157	NTE74LS157	ECG74LS157	SK74LS157			HE-443-799
U71	SN74LS30N	AMX3556	74LS30	NTE74LS30	ECG74LS30	SK74LS30			HE-443-732
U72	SN74LS27N	AMX4658	74LS27	NTE74LS27	ECG74LS27	SK74LS27			HE-443-800
U74	SN74LS04N	AMX3552	74LS04	NTE74LS04	ECG74LS04	SK74LS04			HE-443-755
U75	SN74LS08N	AMX3698	74LS08	NTE74LS08	ECG74LS08	SK74LS08			HE-443-780
U76	SN74LS367AN	AMX3567	74LS367A	NTE74LS367	ECG74LS367	SK74LS367			HE-443-857
U77	Z80	AMX3586		NTE3880	ECG3880	SK2880/3880			HE-443-881
U78	SN74LS74AN	AMX3598	74LS74A	NTE74LS74A	ECG74LS74A	SK74LS74A			HE-443-730
U79	MC1741P1	AMX4258		NTE941M	ECG941M	SK3552/941M		WEP933/941M	HE-442-22
U80	MC1458CP1	AMX4661		NTE778A	ECG778A	SK3465/778A		WEP2053/778	221-29034
U81, 82	HM472114P-3		GEIC-220	NTE2114	ECG2114	SK2214/2114			HE-443-764
U83	MCM2114	AXX3038		NTE2114	ECG2114	SK2214/2114			HE-443-764
U84	SN74LS74AN	AMX3598	74LS74A	NTE74LS74A	ECG74LS74A	SK74LS74A			HE-443-730
U85	SN74LS367AN	AMX3567	74LS367A	NTE74LS367	ECG74LS367	SK74LS367			HE-443-857
U86	SN74LS74AN	AMX3558	74LS74A	NTE74LS74A	ECG74LS74A	SK74LS74A			HE-443-730
U87	SN74LS32N	AMX3557	74LS32	NTE74LS32	ECG74LS32	SK74LS32			HE-443-875
U88	SN74LS04N	AMX3552	74LS04	NTE74LS04	ECG74LS04	SK74LS04			HE-443-755
U89	SN74LS38N	AMX4328	74LS38	NTE74LS38	ECG74LS38	SK74LS38			HE-443-875
U90	SN74LS32N	AMX3557	74LS32	NTE74LS32	ECG74LS32	SK74LS32			HE-443-875
U91, 92	SN74LS645N	AMX3558	74LS645	NTE74LS645	ECG74LS645	SK74LS645			HE-443-885
U93	74LS245	AMX4470	74LS245	NTE74LS245	ECG74LS245	SK74LS245			HE-443-791
U94	SN74LS244N	AMX3864	74LS244	NTE74LS244	ECG74LS244	SK74LS244			HE-443-942
U95	SN74LS123N	AMX4227	74LS123	NTE74LS123	ECG74LS123	SK74LS123			HE-443-805
U96	SN74LS273N	AMX4227	74LS273	NTE74LS273	ECG74LS273	SK74LS273			HE-443-791
U97	SN74LS244N	AMX3864	74LS244	NTE74LS244	ECG74LS244	SK74LS244			221-121
U98	LM339N	AMX4200		NTE834	ECG834	SK3569/834			HE-443-74
U99	MC75452P1	AMX3573		NTE75452B	ECG75452B				HE-443-879
	SN74LS174N	AMX3565	74LS174	NTE74LS174	ECG74LS174	SK74LS174			HE-443-791
	SN74LS244N	AMX3864	74LS244	NTE74LS244	ECG74LS244	SK74LS244			



## 3 PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

### SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA					
			GENERAL ELECTRIC PART No.	NTE PART No.	PHILIPS ECG PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.
U100	SN74LS174N	AMX3565	74LS174	NTE74LS174	ECG74LS174	SK74LS174		HE-443-879
U101	SN74LS645N 74LS245	AMX4470 AMX3864	74LS245 74LS244	NTE74LS645 NTE74LS245	ECG74LS645 ECG74LS245	SK74LS245		HE-443-885
U102	SN74LS244N	AMX3567	74LS244	NTE74LS244	ECG74LS244	SK74LS244		HE-443-791
U103	SN74LS367AN		74LS367A	NTE74LS367	ECG74LS367	SK74LS367		HE-443-857
U104	8041364	SCM91248C (1)						
U105	MCM364 8040332	AXX3039 SCM91619P (1)						
U106	MCM332 8040316B MCM68A	AXX3037 SCM91692P (1) AMX4642						
U107	SN74LS32N	AMX3557	74LS32	NTE74LS32	ECG74LS32	SK74LS32		HE-443-875
U108	SN74LS10N	AMX3898	74LS10	NTE74LS10	ECG74LS10	SK74LS10		HE-443-797
VR1	MC79L05ACP MC7905C	AMX4260	GE-961	NTE961	ECG1917 ECG961	SK9219/1917 SK3671/961		HE-442-630

(1) Number on unit.

# PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

## CAPACITORS

ITEM No.	RATING	MFGR. PART No.
C1	<b>POWER SUPPLY BOARD</b>	
	.0022 400VAC .0022 250VAC	
C107	<b>SYSTEM BOARD</b>	
	27 N750 50V 10%	830-0274

ITEM No.	RATING	MFGR. PART No.
C3	.0022 400VAC	
C21	.0022 250VAC	
	.1 250VAC	

## RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFGR. PART No.	NTE PART No.	WORKMAN PART No.
R21 R22 R25 R26	<b>POWER SUPPLY BOARD</b>			
	4700 2% 1/4W Metal Film		QW247	22-2249
	2700 2% 1/4W Metal Film		QW227	22-2246
	2 10% 2W WW (1)		F2W2D0	
R26	22K 2% 1/4W Metal Film		QW322	22-2256
	<b>SYSTEM BOARD</b>			
RP1	Resistor Network (1)	829-0009		
RP2	Resistor Network (1)	829-0009		
RP3	Resistor Network (1)	829-0009		
RP4	Resistor Network (2)	829-3247		
RP5	Resistor Network (3)	829-0015		
RP6	Resistor Network (4)	829-0010		

RADIO SHACK  
MODEL III

- (1) Contains four (4 ea.) 27.
- (2) Contains five (5 ea.) 4700.
- (3) Contains nine (9 ea.) 1500.
- (4) Contains nine (9 ea.) 10K.

## COILS (RF-IF)

ITEM No.	FUNCTION	MFGR. PART No.
<b>POWER SUPPLY BOARD</b>		
L1	RF Choke	TF-20200010
L2	RF Choke	328-00100030

ITEM No.	FUNCTION	MFGR. PART No.
L3	RF Choke	328-00100010
L4	RF Choke	TF-20100010
L5	RF Choke	TF-10100370
L6	RF Choke	328-00100060

## PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

### TRANSFORMER POWER SUPPLY BOARD

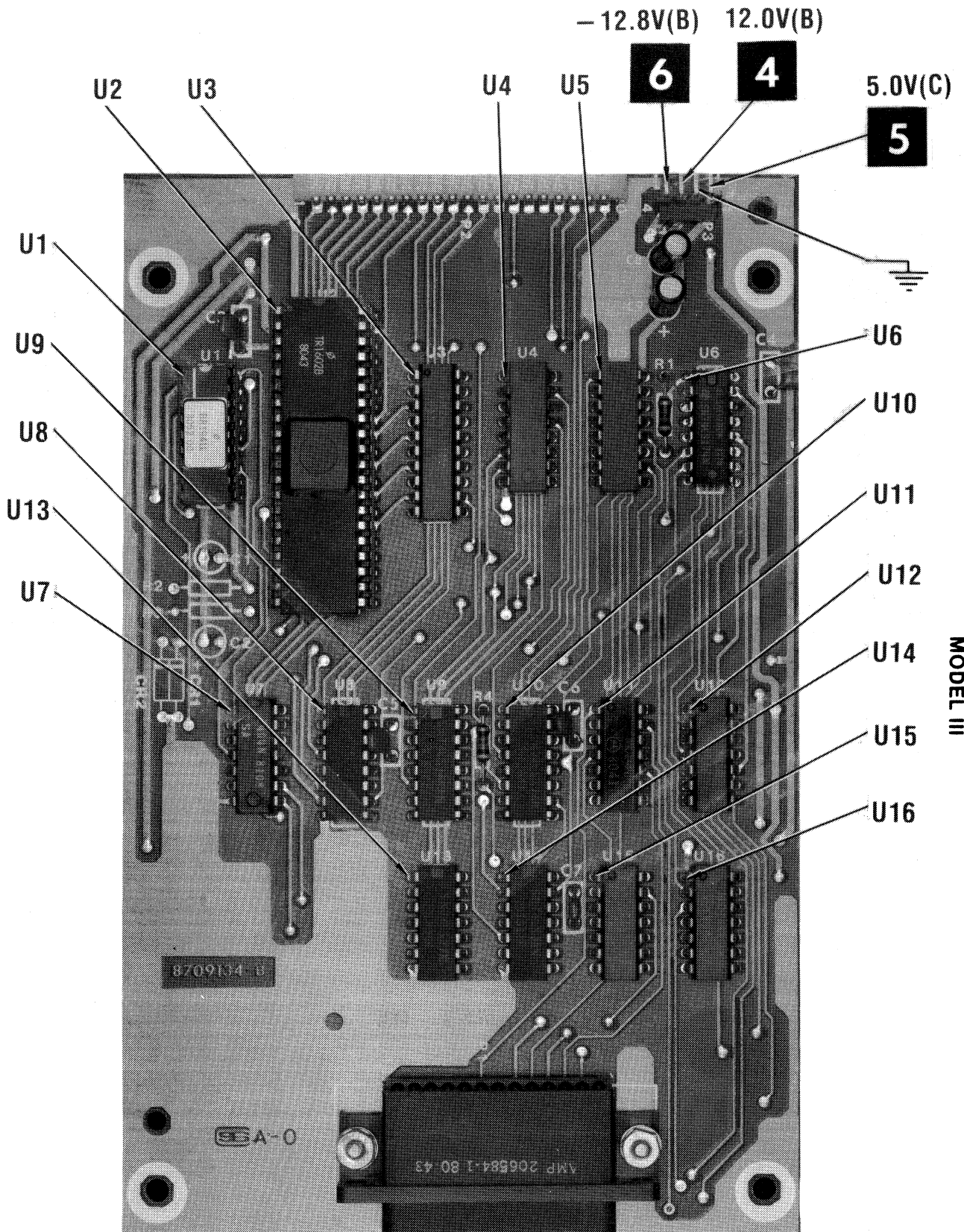
ITEM No.	IMPEDANCE		REPLACEMENT DATA		NOTES
	PRI.	SEC.	MFGR. PART No.		
T1	Switching		TF-4491		
T2	Switching		TF-4441		

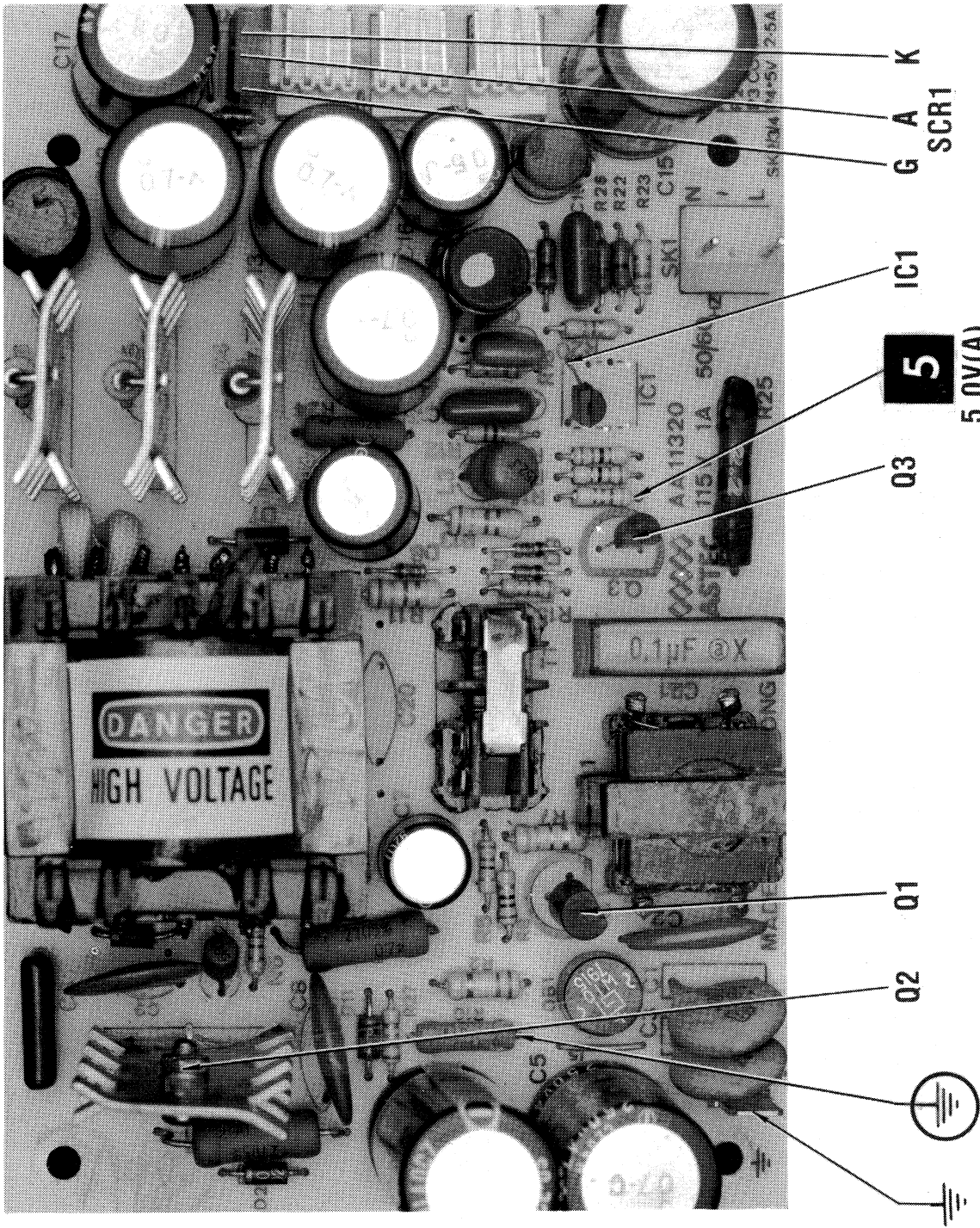
### MISCELLANEOUS

ITEM No.	PART NAME	MFGR. PART No.	NOTES
SW101 thru SW165	Switch		Key
	Keyboard	AXX0205	65 Keys
K1	Relay	AR8130	
SW1	Switch	AS0693	Power
SW2	Switch		Reset
Y1	Crystal	8409007	10.1376MHz
	Cord	AW2540	Power
	P.C. Board	AXX0507	System
	P.C. Board	AXX6005	Power
	P.C. Board	AXX0511	RS-232 Serial Interface

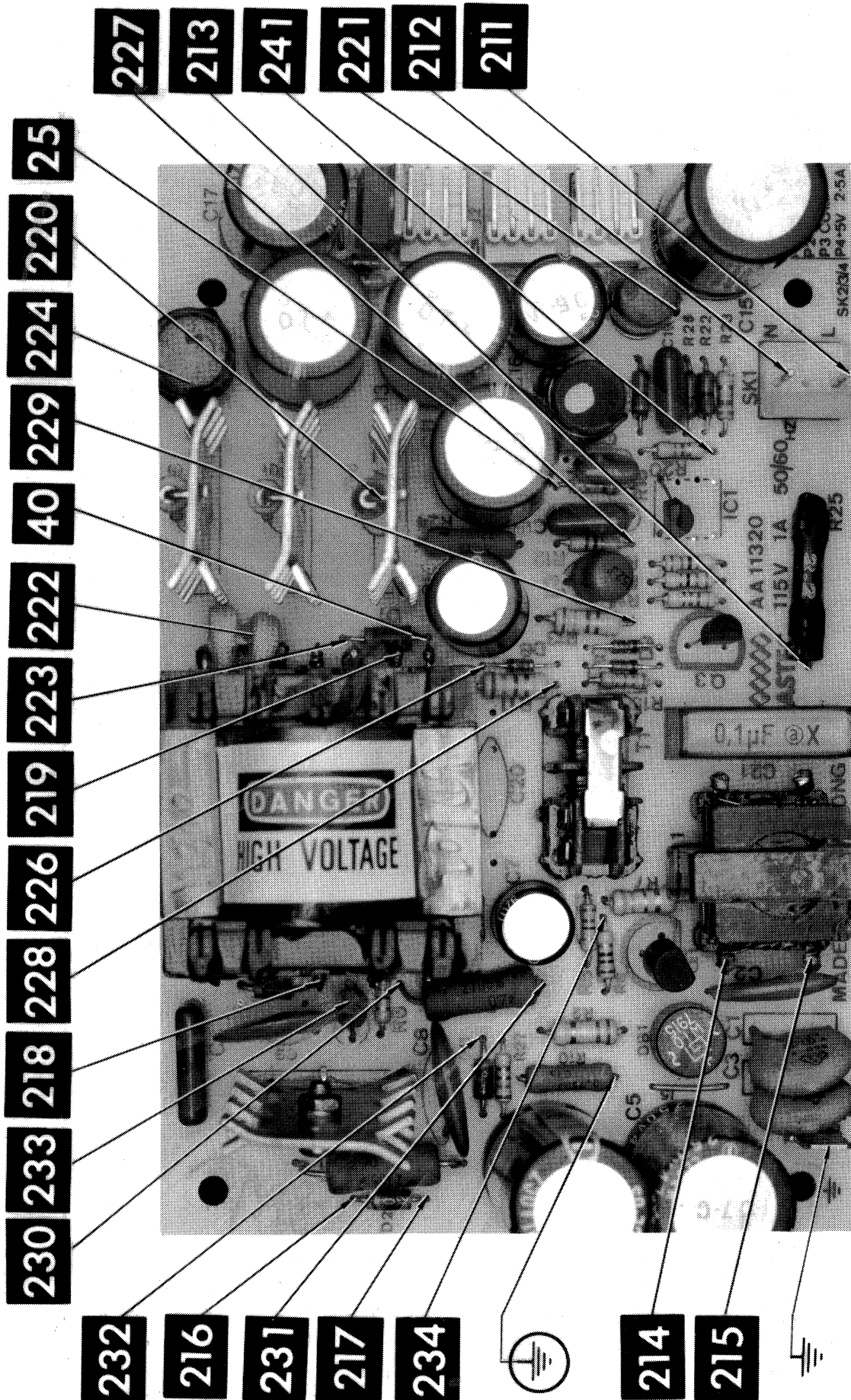
### WIRING DATA

Shielded Hook-up Wire .....	Use BELDEN No. 8401 or 8421 (Single-Conductor)
	8208 (Two-Conductor)
General-use Unshielded Hook-up Wire .....	Use BELDEN No. 8529 (Solid) Available in 13 Colors
	8522 (Stranded) Available in 13 Colors





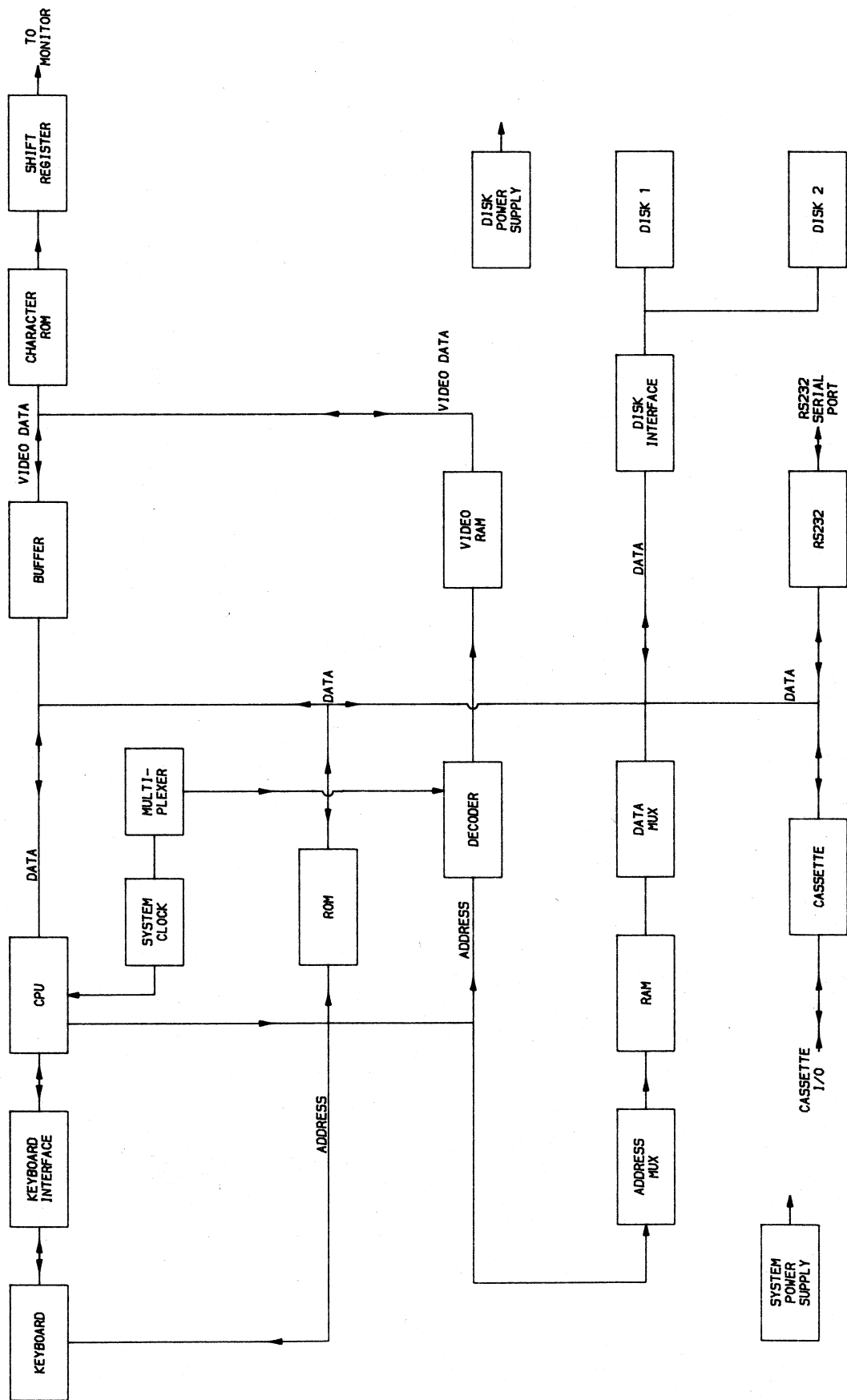
ARROWS ON IC'S INDICATE PIN 1 UNLESS NOTED



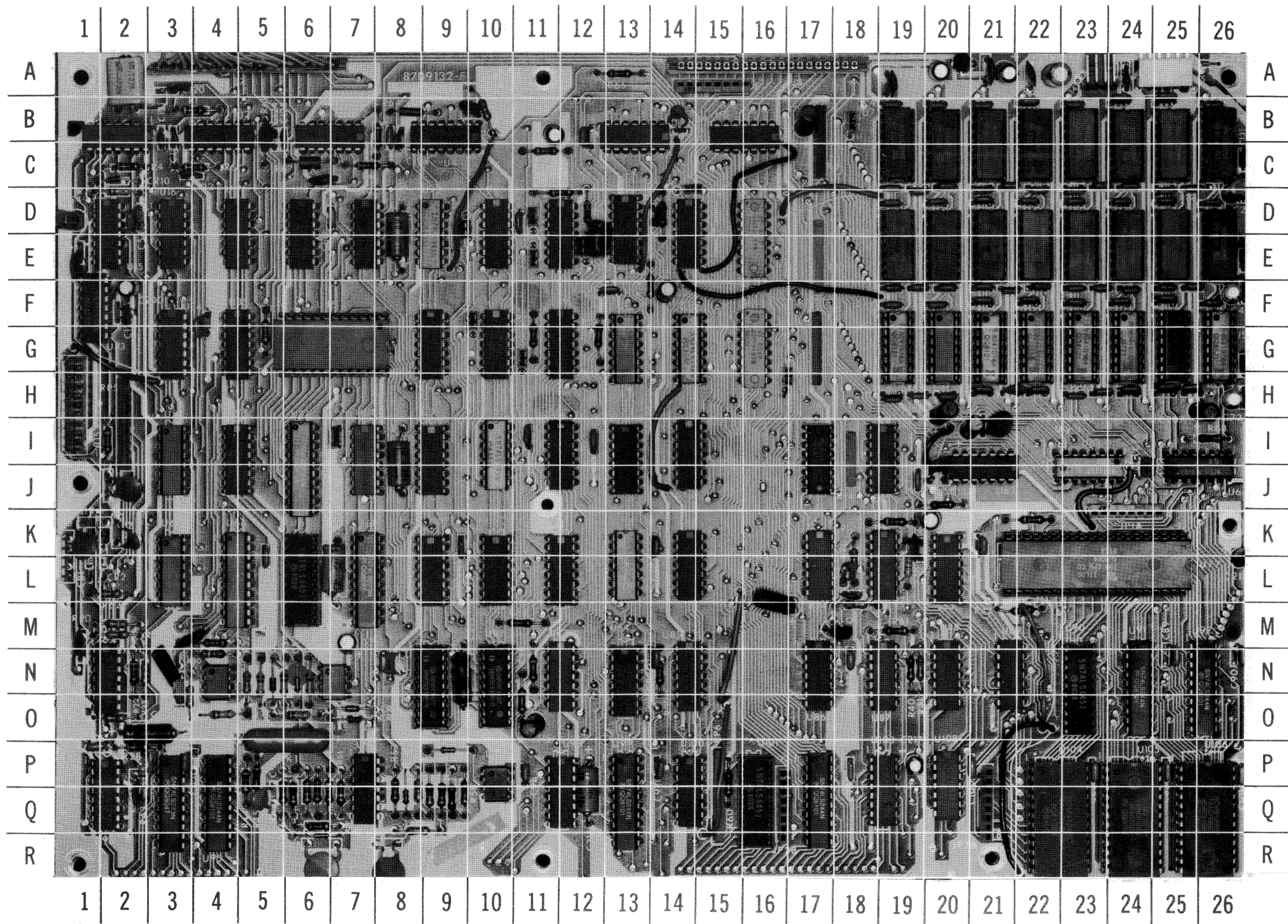
**RADIO SHACK  
MODEL III**

A Howard W. Sams **CIRCUITRACE** Photo

**POWER SUPPLY BOARD**

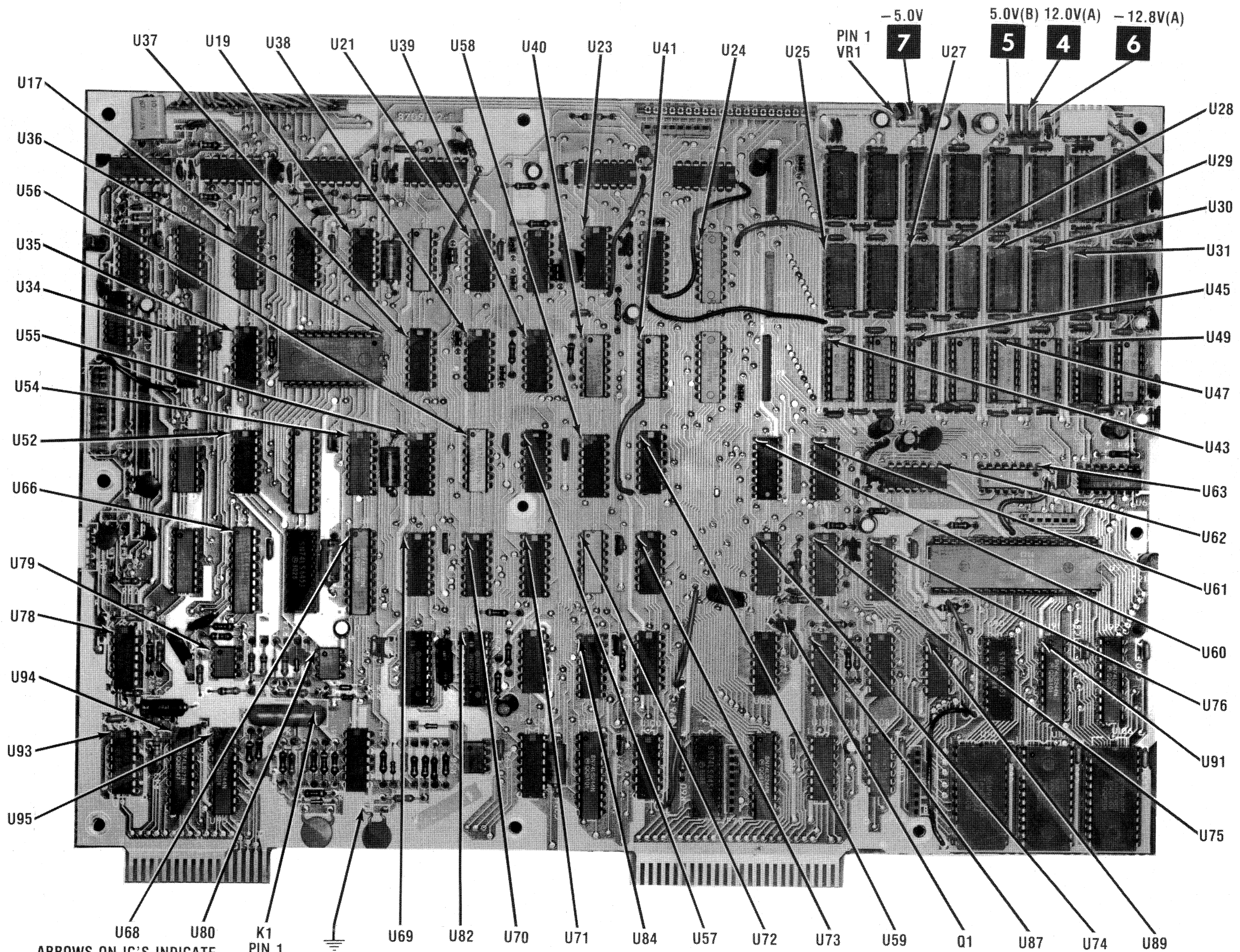


BLOCK DIAGRAM



RADIO SHACK  
MODEL III





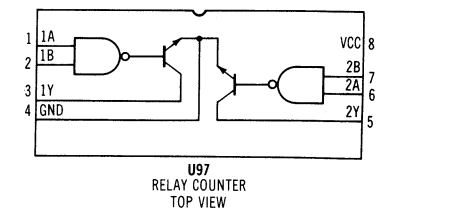
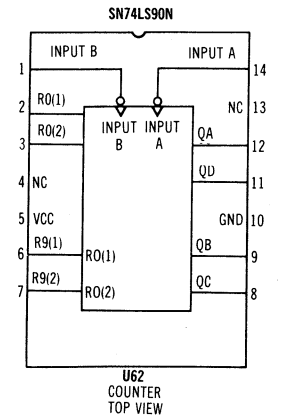
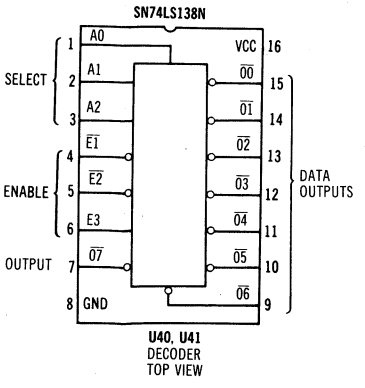
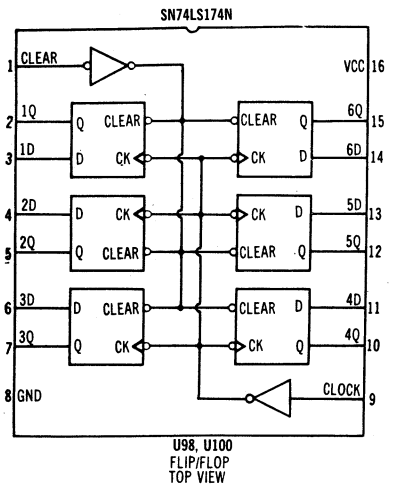
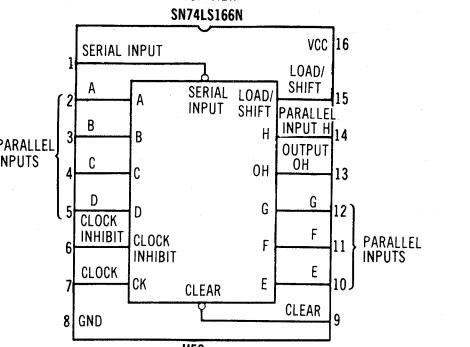
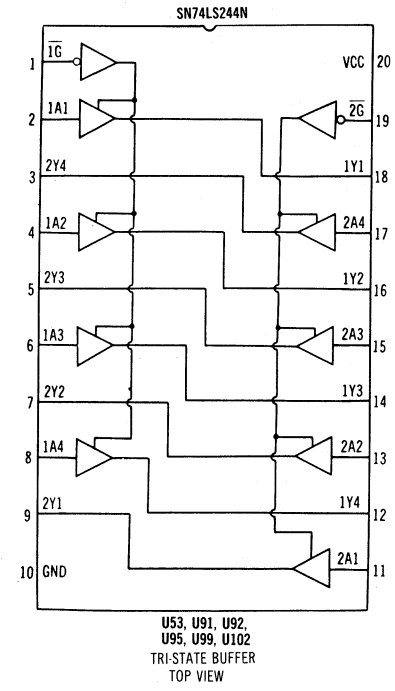
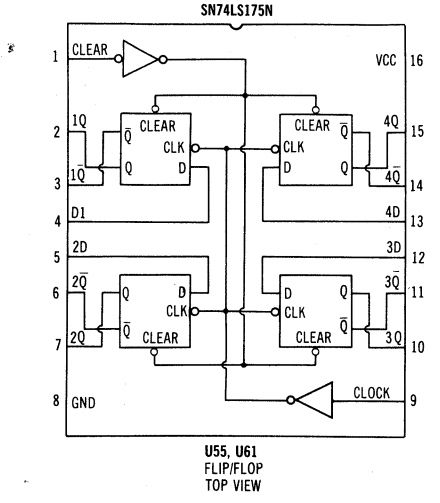
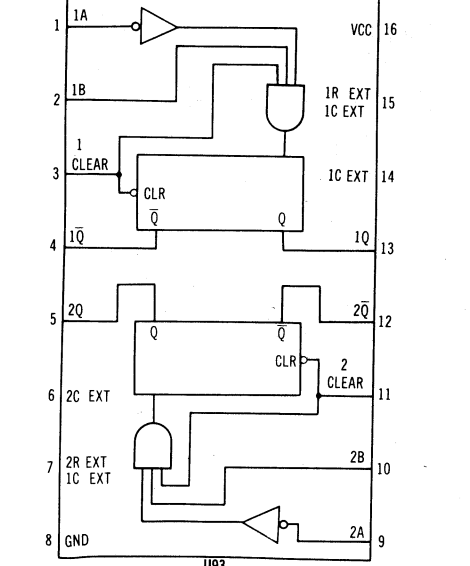
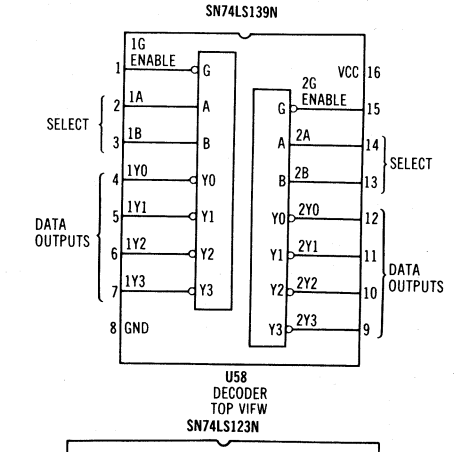
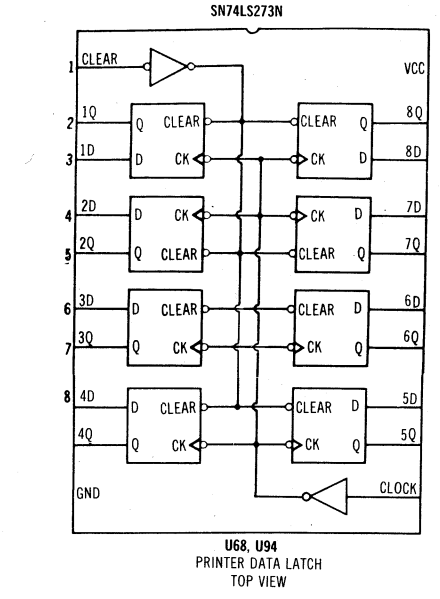
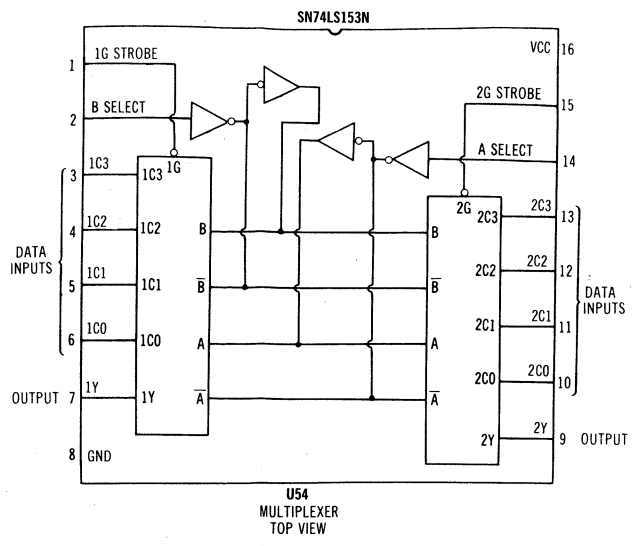
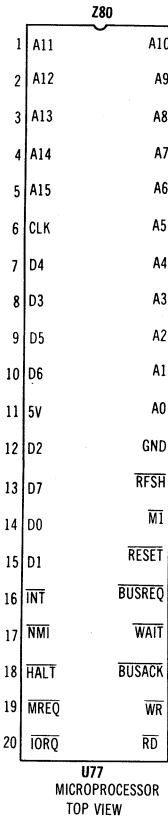
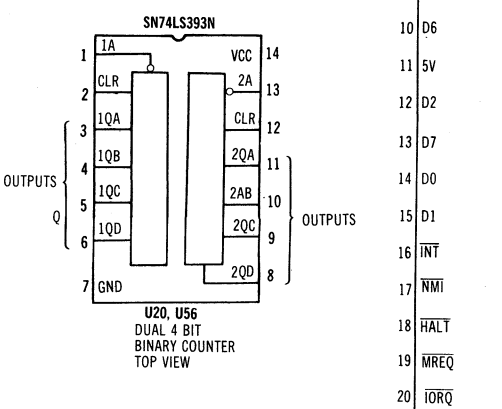
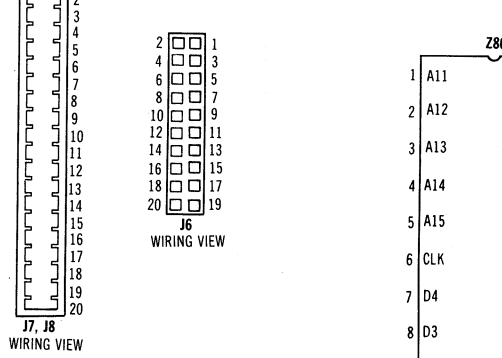
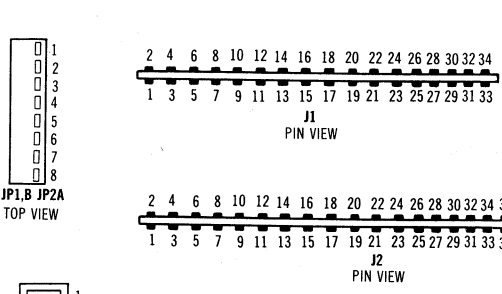
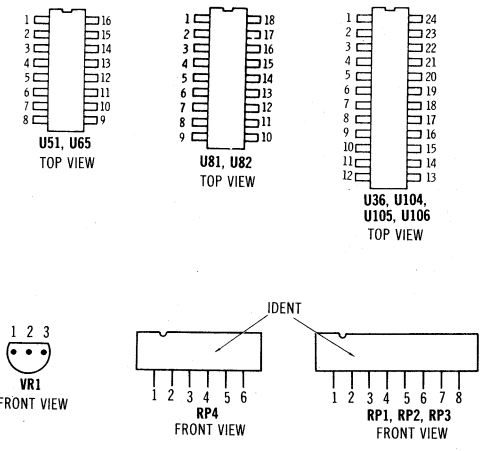
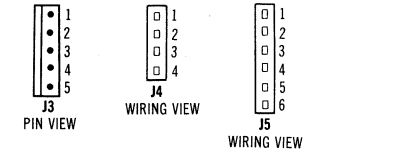
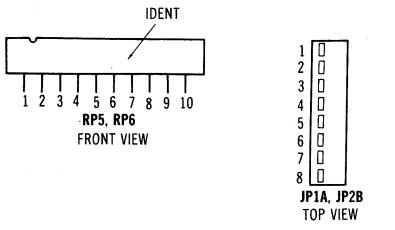
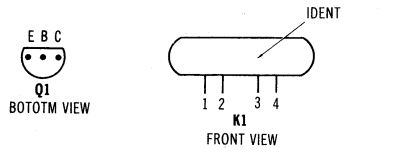
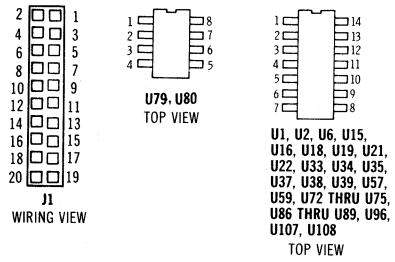
ARROWS ON IC'S INDICATE  
PIN 1 UNLESS NOTED

K1  
PIN 1

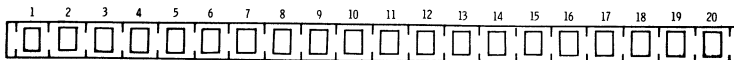
SYSTEM BOARD

SYSTEM BOARD

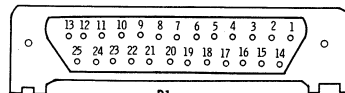
# IC PINOUTS & TERMINAL GUIDES



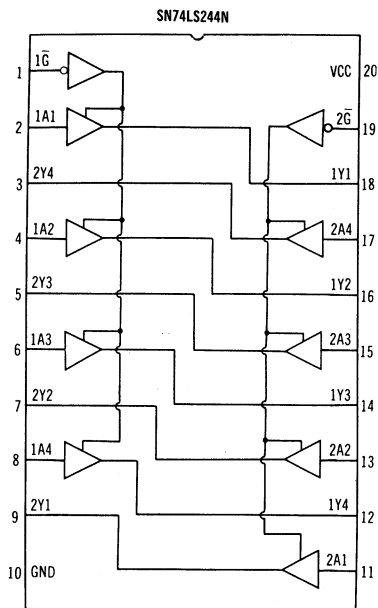
# IC PINOUTS & TERMINAL GUIDES



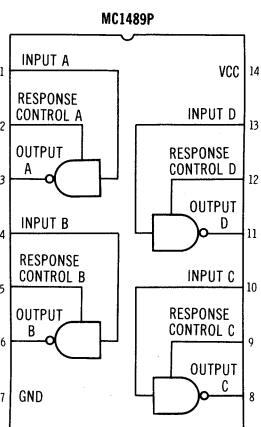
P2  
FRONT VIEW



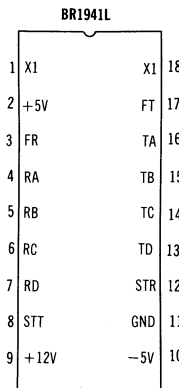
P1  
FRONT VIEW



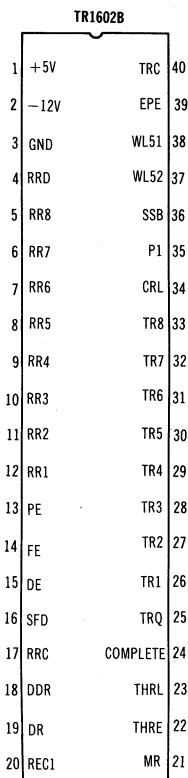
U3  
TRI-STATE BUFFER  
TOP VIEW



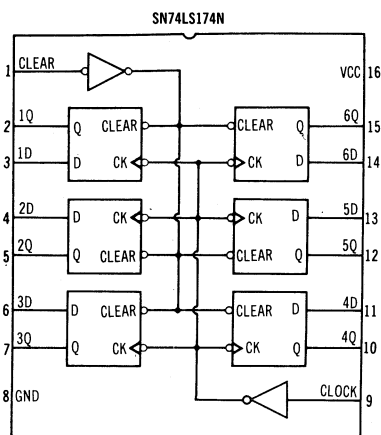
U11, U15  
LINE RECEIVER  
TOP VIEW



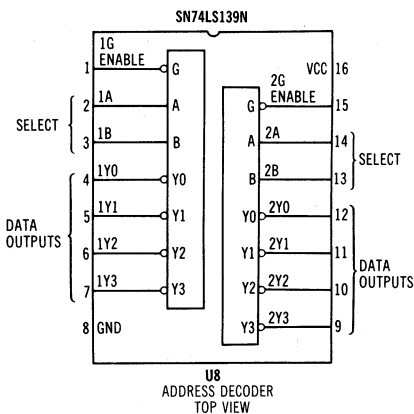
U1  
BAUD RATE GENERATOR  
TOP VIEW



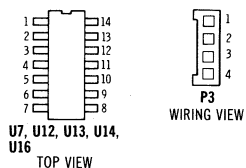
U2  
UART  
TOP VIEW



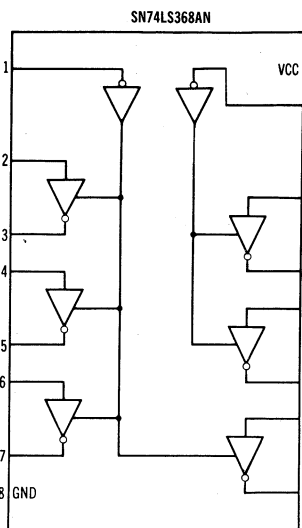
U6, U10  
FLIP/FLOP  
TOP VIEW



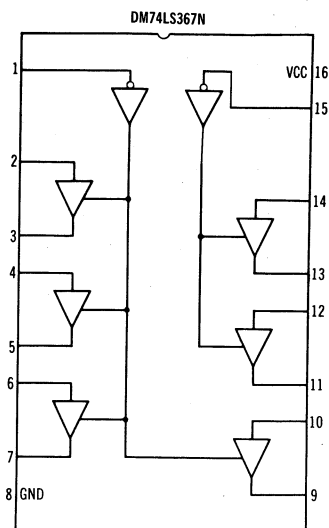
U8  
ADDRESS DECODER  
TOP VIEW



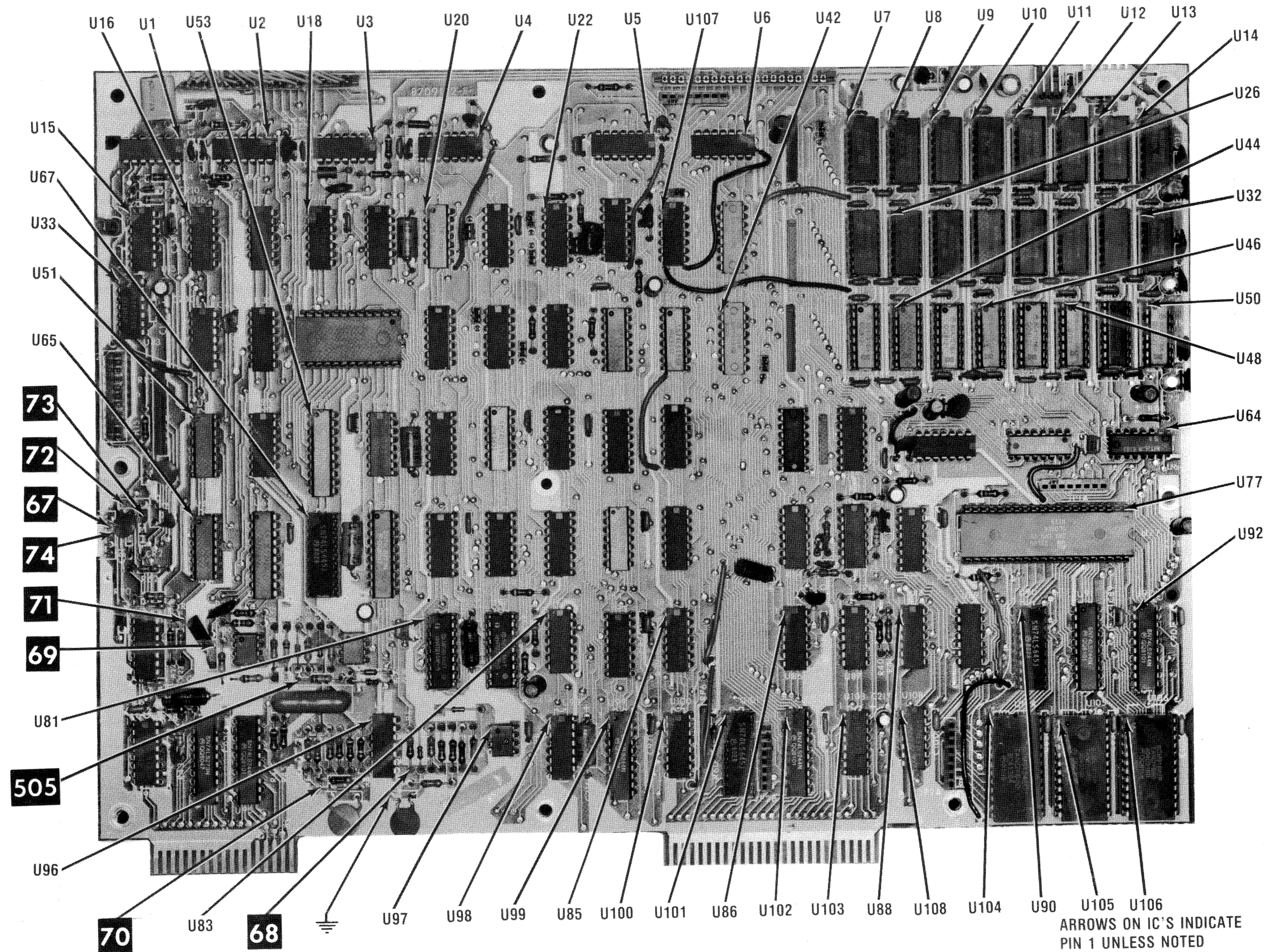
U7, U12, U13, U14,  
U16  
TOP VIEW



U9  
TRI-STATE BUFFER  
TOP VIEW



U4, U5  
TRI-STATE BUFFER  
TOP VIEW

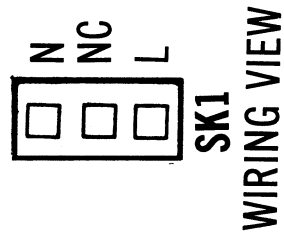
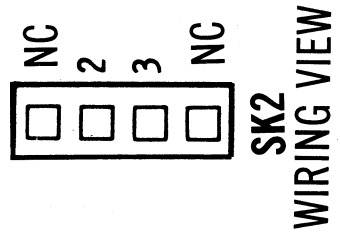
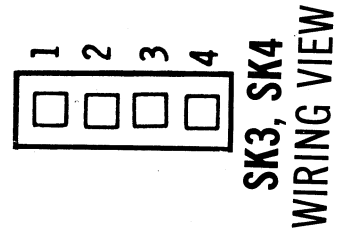
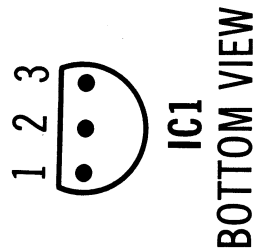
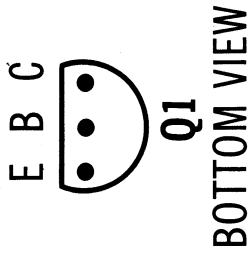
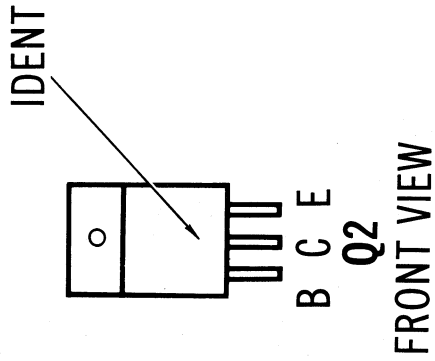
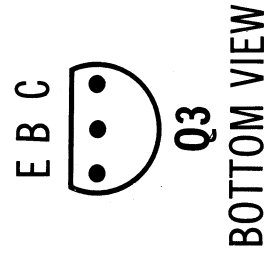
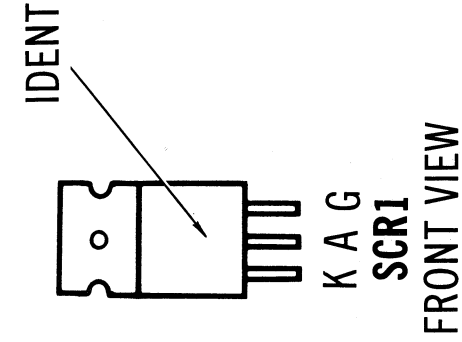


RADIO SHACK  
MODEL III

## **SAFETY PRECAUTIONS**

1. Use an isolation transformer for servicing.
2. Maintain AC line voltage at rated input.
3. Remove AC power from the computer system before servicing or installing electrostatically sensitive devices. Examples of typical ES devices are integrated circuits and semiconductor "chip" components.
4. Use extreme caution when handling the printed circuit boards. Some semiconductor devices can be damaged easily by static electricity. Drain off any electrostatic charge on your body by touching a known earth ground. Wear a commercially available discharging wrist strap device. This should be removed prior to applying power to the unit under test.
5. Use a grounded-tip, low voltage soldering iron.
6. Use an isolation (times 10) probe on scope.
7. Do not remove or install boards, floppy disk drives, printers, or other peripherals with computer system AC power On.
8. Do not use freon-propelled sprays. These can generate electrical charges sufficient to damage semiconductor devices.
9. This computer system is equipped with a grounded three-pronged AC plug. This plug must fit into a grounded AC power outlet. Do not defeat the AC plug safety feature.
10. Periodically examine the AC power cord for damaged or cracked insulation.
11. The computer system cabinet is equipped with vents to prevent heat build-up. Never block, cover, or obstruct these vents.
12. Instructions should be given, especially to children, that objects should not be dropped or pushed into the vents of the cabinet. This could cause shock or equipment damage.

IC PINOUTS & TERMINAL GUIDES



## LINE DEFINITIONS

<b>A0 Thru A15</b> .....	Address Lines	<b>DATA STROBE</b>	
<b>BLANK</b>		<b>DATA0 Thru DATA7</b>	
<b>BUSY</b>		<b>DB0I</b>	
<b>C1, C2, C4, C8, C16, C18, C32</b>		<b>DB0O</b>	
<b>CAS</b> .....	Column Address Strobe	<b>DB1I</b>	
<b>CAS IN</b> .....	Cassette Input	<b>DB1O</b>	
<b>CAS MOTOR ON</b> .....	Cassette Motor On	<b>DB2O</b>	
<b>CASOUT</b> .....	Cassette Output	<b>DB3I</b>	
<b>CAS1</b>		<b>DB3O</b>	
<b>CAS2</b>		<b>DB4I</b>	
<b>CAS3</b>		<b>DB4O</b>	
<b>CHAIN</b>		<b>DB5I</b>	
<b>CHAR</b> .....	Character	<b>DB5O</b>	
<b>CLOCK</b> .....	Clock	<b>DB6I</b>	
<b>CLOCK/2</b>		<b>DB6O</b>	
<b>CLOCKP</b>		<b>DB7I</b>	
<b>CLRCTR</b> .....	Clear Counter	<b>DB7O</b>	
<b>D0</b> .....	Data Line	<b>DISK IN</b> .....	Read Disk Control Register
<b>D0A</b> .....	Data Line	<b>DISK OUT</b> .....	Write To Disk Control Register
<b>D0B</b> .....	Data Line	<b>DISWAIT</b> .....	Disable Video Wait
<b>D1</b> .....	Data Line	<b>DLYBLANK</b> .....	Delay Blank
<b>D1A</b> .....	Data Line	<b>DLYCHAR</b> .....	Delay Character
<b>D1B</b> .....	Data Line	<b>DLYGRAPHIC</b> .....	Delay Graphic
<b>D2</b> .....	Data Line	<b>DOT1</b>	
<b>D2A</b> .....	Data Line	<b>DOT2</b>	
<b>D2B</b> .....	Data Line	<b>DOT3</b>	
<b>D3</b> .....	Data Line	<b>DRVSEL</b> .....	Drv Select
<b>D3A</b> .....	Data Line	<b>ENALTSET</b> .....	Enable Alternate Character Set
<b>D3B</b> .....	Data Line	<b>ENCASINTF</b> .....	Enable Cassette Interrupt (Falling Edge)
<b>D4</b> .....	Data Line	<b>ENCASINTR</b> .....	Enable Cassette Interrupt (Rising Edge)
<b>D4A</b> .....	Data Line	<b>ENEXTIO</b> .....	Enable External Input/Output
<b>D4B</b> .....	Data Line	<b>ENIOBUSINT</b> .....	Enable Input/Output Bus Interrupt
<b>D5</b> .....	Data Line	<b>ENRTC</b> .....	Enable Real Time Clock Interrupt
<b>D5A</b> .....	Data Line	<b>EXIOSEL</b> .....	External Input/Output Select
<b>D5B</b> .....	Data Line	<b>FAULT</b>	
<b>D6</b> .....	Data Line	<b>HDRV</b> .....	Horizontal Drive
<b>D6A</b> .....	Data Line	<b>HI</b> .....	High
<b>D6B</b> .....	Data Line	<b>HI1</b> .....	High One
<b>D7</b> .....	Data Line	<b>HSYNC</b> .....	Horizontal Sync
<b>D7A</b> .....	Data Line	<b>IN</b> .....	Input
<b>D7B</b> .....	Data Line	<b>INT</b> .....	Interrupt

## LINE DEFINITIONS (Continued)

**INTAK** ..... Interrupt Acknowledge  
**IOBUS** ..... Input/Output Bus  
**IOBUSINT** ..... Input/Output Bus Interrupt Request  
**IOBUSWAIT** ..... Buffered Input/Output Bus Wait  
**IORQ** ..... Input/Output Request  
**KYBD** ..... Keyboard  
**LATCH** ..... Latch  
**LP IN** ..... Read Line Printer Port Status  
**LP OUT** ..... Write Line Printer Output Data Port  
**LP RD**  
**L1, L2, L4, L8**  
**MA0 Thru MA6**  
**MCYCEN** ..... Machine Cycle Enable  
**MOD OUT** ..... Mode Out  
**MODSEL** ..... Mode Select  
**MERQ** ..... Memory Request  
**MUX** ..... Multiplex  
**M1** ..... Machine Cycle One  
**NMI** ..... Non-maskable Interrupt  
**OUT** ..... Output  
**OUTPAPER**  
**PBLANK**  
**PCLOCK**  
**PD0 Thru PD7**  
**PWAIT**  
**RAS** ..... Row Address Strobe  
**RD** ..... Read  
**RDINTSTATUS** ..... Read Input Status  
**RDNMISTATUS** ..... Read Non-maskable Interrupt Status  
**RESET** ..... Reset  
**ROMA**

**ROMB**  
**ROMC**  
**ROMCP**  
**RRD**  
**RS232 IN** ..... Read Uart Registers  
**RS232 OUT** ..... Uart, Modem, Baud Rate Controls  
**RSVID**  
**RTCIN** ..... Clear Real Time Clock Interrupt  
**R1, R2, R4, R8**  
**SHIFT** ..... Shift  
**UNIT SELECT**  
**VA0 Thru VA9**  
**VCLR** ..... Vertical Clear  
**VDRV** ..... Vertical Drive  
**VD0 Thru VD7**  
**VID** ..... Video  
**VRD**  
**VSYNC** ..... Vertical Sync  
**VWR**  
**W/R** ..... Write/Read  
**WAIT** ..... Wait  
**WR** ..... Write  
**WRINTMASKREG** ..... Write Input Mask Register  
**WRNMIMASKREG**  
 ..... Write Non-Maskable Interrupt Mask Register  
**XA0 Thru XA7** ..... Buffered Address Lines  
**XDB0 Thru XDB7** ..... Buffered Data Lines  
**XIN** ..... Buffered Input  
**XIORQ** ..... Buffer Input/Output Request  
**XM1** ..... Buffered Machine Cycle One  
**XOUT** ..... Buffered Output  
**XRESET** ..... Buffered Reset

Any Bar above any alphabetical or numerical combination indicates line active in a Low (0) state.

**RADIO SHACK  
MODEL III**



## LOGIC CHART RS-232 SERIAL INTERFACE BOARD

PIN NO.	IC U1	PIN NO.	IC U2	PIN NO.	IC U2	PIN NO.	IC U3	IC U4	IC U5	IC U6	IC U7
1	P	1	H	21	L	1	H	H	H	H	P
2	H	2	L	22	H	2	*	L	H	L	P
3	P	3	L	23	H	3	P	L	H	P	H
4	P	4	H	24	H	4	*	L	H	P	L
5	P	5	*	25	H	5	P	P	P	L	H
6	P	6	*	26	P	6	*	L	L	L	L
7	P	7	*	27	P	7	P	L	*	L	L
8	L	8	*	28	P	8	*	L	L	L	L
9	H	9	*	29	P	9	P	*	P	H	H
10	L	10	*	30	P	10	L	*	H	L	P
11	L	11	*	31	P	11	*	P	H	L	P
12	L	12	*	32	P	12	P	L	H	L	L
13	P	13	L	33	P	13	*	P	P	P	H
14	P	14	L	34	L	14	P	H	H	P	H
15	P	15	L	35	L	15	*	H	H	P	H
16	P	16	L	36	P	16	P	H	H	P	H
17	P	17	P	37	P	17	*				
18	P	18	H	38	P	18	P				
		19	L	39	P	19	H				
		20	H	40	P	20	H				
PIN NO.	IC U8	IC U9	IC U10	IC U11	IC U12	IC U13	IC U14	IC U15	IC U16		
1	H	P	H	L	L	L	L	L	L		
2	P	L	L	L	L	L	H	L	L		
3	P	P	*	H	H	*	H	H	P		
4	H	L	P	L	L	*	L	L	*		
5	H	P	L	L	L	*	L	L	*		
6	H	H	P	H	H	L	H	L	L		
7	H	P	L	L	L	L	L	L	L		
8	L	L	L	H	H	L	L	H	L		
9	H	P	H	L	L	*	*	L	*		
10	H	*	L	L	L	*	*	L	*		
11	H	*	P	H	H	*	H	L	L		
12	H	*	L	L	L	H	L	L	H		
13	P	*	*	L	L	L	L	L	H		
14	P	*	*	H	H	H	H	H	H		
15	H	*	L								
16	H	H	H								

Logic Probe Display

L = Low

H = High

P = Pulse

\* = Open (No light On)

Note: Logic probe readings taken with computer turned On, no keys pressed, unless otherwise noted.

**LOGIC CHART (Continued)**  
**SYSTEM BOARD**

PIN NO.	IC U1	IC U2	IC U3	IC U4	IC U5	IC U6	IC U7	IC U8	IC U9	IC U10	IC U11	IC U12	IC U13	IC U14
1	H	P	H	L	P	*	L	L	L	L	L	L	L	L
2	H	P	P	P	L	*	P	P	P	P	P	P	P	P
3	H	P	P	P	L	*	P	P	P	P	P	P	P	P
4	H	P	P	P	L	*	P	P	P	P	P	P	P	P
5	H	P	P	P	L	*	P	P	P	P	P	P	P	P
6	L	P	P	L	H	*	P	P	P	P	P	P	P	P
7	L	P	P	L	H	*	P	P	P	P	P	P	P	P
8	L	P	P	L	H	*	P	P	P	P	P	P	P	P
9	P	*	H	P	P	P	H	H	H	H	H	H	H	H
10	H	P	H	P	L	P	P	P	P	P	P	P	P	P
11	P	P	L	H	P	P	P	P	P	P	P	P	P	P
12	P	P	L	H	P	P	P	P	P	P	P	P	P	P
13	H	H	H	*	*	*	P	P	P	P	P	P	P	P
14	H	H	H	*	*	*	P	P	P	P	P	P	P	P
15				L			P	P	P	P	P	P	P	P
16				H			L	L	L	L	L	L	L	L

PIN NO.	IC U15	IC U16	IC U17	IC U18	IC U19	IC U20	IC U21	IC U22	IC U23	IC U24	IC U25	IC U26	IC U27	IC U28
1	H	P	H	H	H	P	P	H	L	P	L	L	L	L
2	H	P	P	H	L	P	P	P	P	H	P	P	P	P
3	L	P	P	L	P	P	P	P	P	P	P	P	P	P
4	*	P	H	P	H	P	P	P	P	P	P	P	P	P
5	*	P	P	P	H	P	P	P	P	P	P	P	P	P
6	L	P	P	L	L	P	P	P	P	P	P	P	P	P
7	L	P	P	L	L	P	P	P	P	P	P	P	P	P
8	L	P	P	L	L	P	P	P	P	P	P	P	P	P
9	*	P	P	P	P	P	H	P	L	L	H	H	H	H
10	*	P	H	P	P	P	P	P	P	P	P	P	P	P
11	*	P	P	P	P	P	P	P	P	P	P	P	P	P
12	H	P	P	P	P	P	P	*	L	H	P	P	P	P
13	L	P	P	P	P	P	H	L	P	P	P	P	P	P
14	H	H	H	H	H	H	H	H	P	P	P	P	P	P
15									P	P	P	P	P	P
16									H	H	L	L	L	L

**RADIO SHACK  
MODEL III**

## LOGIC CHART (Continued) SYSTEM BOARD

PIN No.	IC U29	IC U30	IC U31	IC U32	IC U33	IC U34	IC U35	IC U36	IC U37	IC U38	IC U39	IC U40	IC U41
1	L	L	L	L	*	P	*	P	P	*	P	P	P
2	P	P	P	P	L	L	L	P	P	P	P	P	P
3	P	P	P	P	*	L	L	P	P	P	P	P	P
4	P	P	P	P	L	L	L	P	P	P	P	P	H
5	P	P	P	P	*	P	L	P	P	P	P	P	P
6	P	P	P	P	L	L	*	P	P	L	P	P	H
7	P	P	P	P	L	L	L	P	P	L	P	H	H
8	H	H	H	H	L	L	L	P	L	P	P	H	H
9	H	H	H	H	P	P	L	P	P	H	P	H	H
10	P	P	P	P	L	L	*	P	P	P	P	H	H
11	P	P	P	P	*	P	L	P	P	L	P	H	H
12	P	P	P	P	P	L	P	L	P	*	P	H	H
13	P	P	P	P	P	H	H	L	P	H	*	H	H
14	P	P	P	P	H	H	L	H	P	H	H	H	H
15	P	P	P	P	H	H	L	H	P	H	H	H	H
16	L	L	L	L	H	H	L	H	P	H	H	H	H
17									P				
18									L				
19									P				
20									P				
21									H				
22									P				
23									P				
24									H				

PIN No.	IC U42	IC U43	IC U44	IC U45	IC U46	IC U47	IC U48	IC U49	IC U50	IC U51	IC U52	IC U53	IC U54
1	P	L	L	L	L	L	L	L	L	H	L	P	L
2	*	P	P	P	P	P	P	P	P	H	P	P	P
3	*	P	P	P	P	P	P	P	P	H	P	P	*
4	H	P	P	P	P	P	P	P	P	H	P	P	P
5	P	P	P	P	P	P	P	P	P	H	P	P	P
6	P	P	P	P	P	P	P	P	P	L	P	P	P
7	P	P	P	P	P	P	P	P	P	L	P	P	P
8	L	H	H	H	H	H	H	H	H	L	P	P	L
9	P	H	H	H	H	H	H	H	H	L	H	P	P
10	P	P	P	P	P	P	P	P	P	L	P	P	P
11	P	P	P	P	P	P	P	P	P	L	P	P	P
12	P	P	P	P	P	P	P	P	P	H	P	P	P
13	P	P	P	P	P	P	P	P	P	L	P	P	*
14	P	P	P	P	P	P	P	P	P	H	P	P	P
15	L	L	L	L	L	L	L	L	L	H	P	P	L
16	H	L	L	L	L	L	L	L	L	H	H	P	H
17												P	
18												P	
19												P	
20												H	

## LOGIC CHART (Continued) SYSTEM BOARD

PIN NO.	IC U55	IC U56	IC U57	IC U58	IC U59	IC U60	IC U61	IC U62	IC U63	IC U64	IC U65	IC U66	IC U67
1	H	P	L	P	P	P	P	P	L	L	H	H	P
2	P	L	*	P	P	P	P	L	P	P	L	H	P
3	P	P	*	P	P	P	P	L	P	P	L	H	P
4	P	P	P	P	P	P	P	L	P	P	H	H	P
5	P	P	P	P	P	P	P	H	P	P	H	P	P
6	P	P	P	P	P	P	P	L	P	P	H	H	P
7	P	P	P	P	P	P	P	L	P	P	H	H	P
8	L	L	*	L	L	L	L	P	L	L	L	H	P
9	P	P	*	P	P	P	P	P	P	P	H	P	P
10	H	P	L	P	P	L	P	L	P	P	H	L	L
11	L	P	L	P	H	P	P	L	P	P	H	H	P
12	*	P	L	P	H	P	P	L	P	P	H	H	P
13	P	P	H	L	H	P	*	P	P	P	*	H	P
14	P	H	H	P	H	P	P	P	P	H	L	H	P
15	P			P		P	P			P	L	P	P
16	H			H		H	H			H	*	H	P
17												H	P
18												P	P
19												H	P
20												H	H

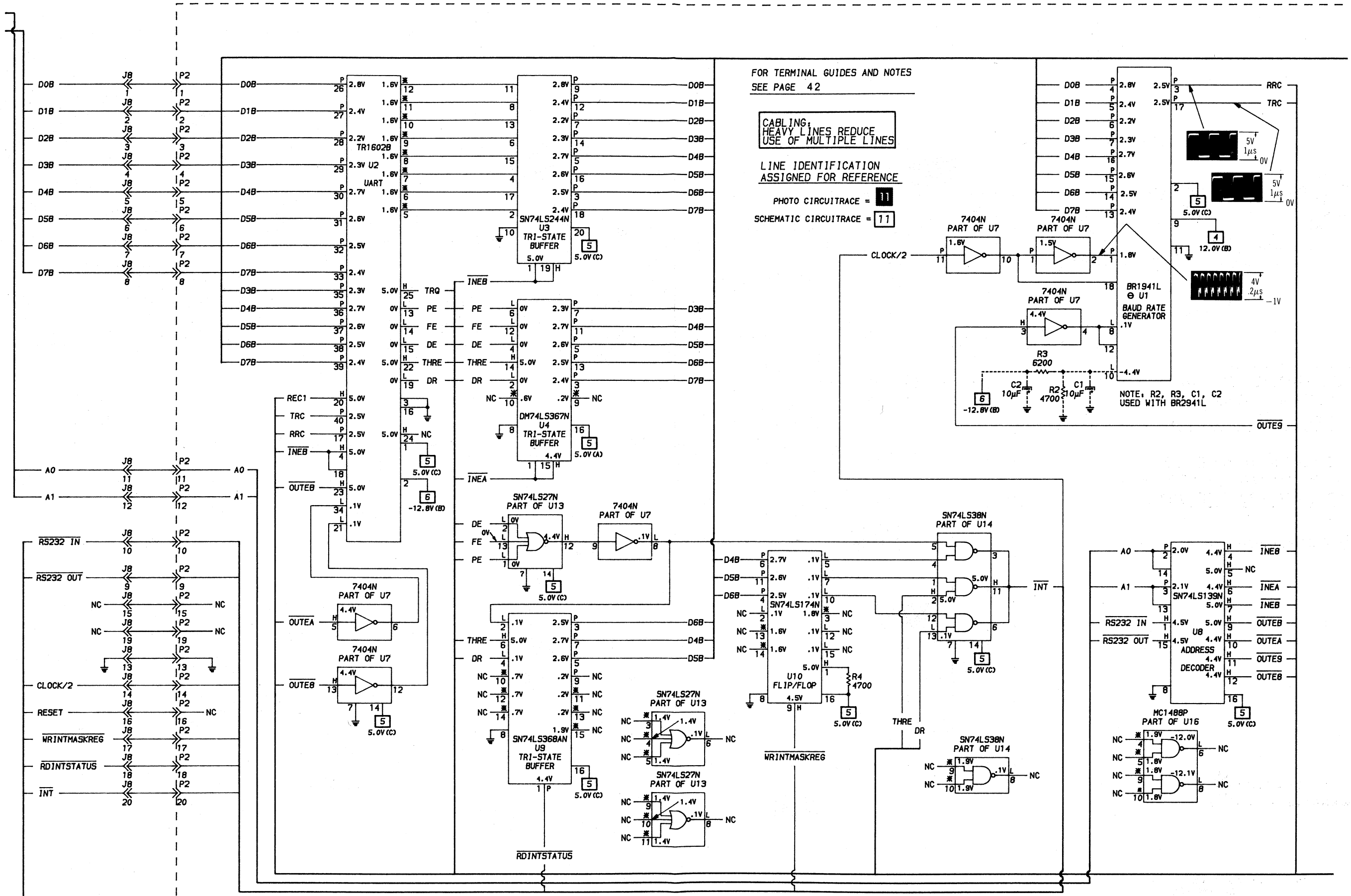
  

PIN NO.	IC U68	IC U69	IC U70	IC U71	IC U72	IC U73	IC U74	IC U75	IC U76	PIN NO.	IC U77	PIN NO.	IC U77
1	P	P	P	P	P	*	P	P	L	1	P	21	P
2	P	P	P	P	P	*	P	P	* H	2	P	22	P
3	P	P	P	P	P	*	P	P	H P	3	P	23	H
4	P	P	P	P	P	*	P	H		4	P	24	H
5	P	P	P	P	P	*	H	H	P	5	P	25	H
6	P	P	P	P	P	L	L	H	P	6	P	26	H
7	P	P	P	P	P	L	L	L	P	7	P	27	H
8	P	P	P	P	P	L	L	L	P	8	P	28	P
9	P	P	P	P	L	P	P	H	P	9	P	29	L
10	L	P	P	P	L	P	P	P	P	10	P	30	P
11	P	P	P	P	L	P	P	P	P	11	H	31	P
12	P	P	P	P	P	L	P	H	P	12	P	32	P
13	P	P	H	P	L	*	P	P	P	13	P	33	P
14	P	P	P	P	H	H	H	H	L	14	P	34	P
15	P	P	L	P					P	15	P	35	P
16	P	H	H	H					H	16	P	36	P
17	P									17	H	37	P
18	P									18	H	38	P
19	P									19	P	39	P
20	H									20	P	40	P

RADIO SHACK  
MODEL III

## LOGIC CHART (Continued) SYSTEM BOARD

PIN NO.	IC U78	IC U81	IC U82	IC U83	IC U84	IC U85	IC U86	IC U87	IC U88	IC U89	IC U90	IC U91	IC U92	
1	H	P	P	H	P	H	H	H	P	P	P	L	L	
2	P	P	P	P	H	L	P	L	H	P	P	P	P	
3	H	P	P	P	P	L	H	L	H	P	P	P	P	
4	H	P	P	H	H	H	L	H	L	P	P	P	P	
5	H	P	P	P	P	H	P	*	L	P	P	P	P	
6	L	P	P	P	P	L	P	L	L	P	P	P	P	
7	L	P	P	L	P	L	L	L	L	P	P	P	P	
8	L	L	L	P	P	L	L	L	L	L	P	P	P	
9	H	L	L	P	P	H	H	*	H	L	P	P	P	
10	H	P	P	P	H	L	L	L	L	L	L	L	L	
11	H	P	P	P	P	L	L	L	L	L	L	L	L	
12	H	P	P	L	P	L	L	L	*	P	P	P	P	
13	H	P	P	H	H	H	H	L	H	H	P	P	P	
14	H	P	P	H	P	H	P	L	H	H	P	P	P	
15		P	P		P	L	H				P	P	P	
16		P	P		P	L	H				P	P	P	
17		P	P								P	P	P	
18		H	H								P	P	L	
19											P	P	L	
20											H	H	H	
PIN NO.	IC U93	IC U94	IC U95	IC U98	IC U99	IC U100	IC U101	IC U102	IC U103	IC U104	IC U105	IC U106	IC U107	U108
1	L	H	H	H	H	H	H	H	H	P	P	P	P	P
2	H	L	H	L	L	L	P	P	H	P	P	P	P	P
3	H	P	P	*	H	P	P	*	H	P	P	P	P	*
4	H	P	H					P	H	P	P	P	P	*
5	L	L	P	H	P	L	P	*	*	P	P	P	P	*
6	L	L	*	P	H	*	H	P	H	P	P	P	P	L
7	L	L	P	H	P	H	L	P	*	P	P	P	P	L
8	L	P	*	L	H	L	L	P	L	P	P	P	P	L
9	H	H	L	H	*	H	H	*	*	P	P	P	P	*
10	L	L	L	L	L	L	L	L	L	P	P	P	P	*
11	H	H	P	H	*	H	H	*	*	P	P	L	L	*
12	H	H	P	H	P	H	H	*	*	P	L	L	L	*
13	L	P	*	P	L	P	L	*	*	P	P	P	P	*
14	L	P	P	L	L	L	L	*	*	P	P	P	P	H
15	L	L	*	L	L	L	L	*	*	P	P	P	P	
16	H	L	P	H	L	H	H	*	H	P	P	P	P	
17		P	*				*	P		P	P	P	P	
18		P	P		L		*	*		P	P	P	L	
19		L	H		H		H	H		P	P	P	L	
20		H	H		H		H	H		P	P	P	P	
21										P	H	H	H	
22										P	P	H	P	
23										P	P	H	P	
24										H	P	H	P	



FOR TERMINAL GUIDES AND NOTES  
SEE PAGE 42

CABLING:  
HEAVY LINES REDUCE  
USE OF MULTIPLE LINES

LINE IDENTIFICATION  
ASSIGNED FOR REFERENCE

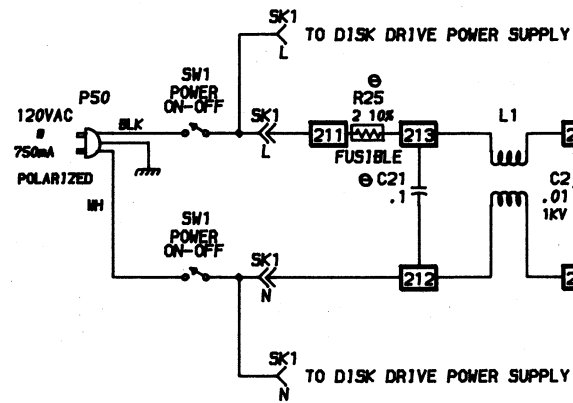
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SCHEMATIC CIRCUITTRACE = **11**

RADIO SHACK  
MODEL III

A PHOTOFACIT STANDARD NOTATION SCHEMATIC  
WITH **CIRCUITTRACE**

RS-232 SERIAL INTERFACE BOARD

RS-232 SERIAL INTERFACE BOARD



SEE PINOUTS, TERMINAL GUIDES AND SCHEMATIC NOTES PAGES

SEE SCHEMATIC NOTES BEFORE TAKING VOLTAGES, WAVEFORMS AND LOGIC PROBE READINGS

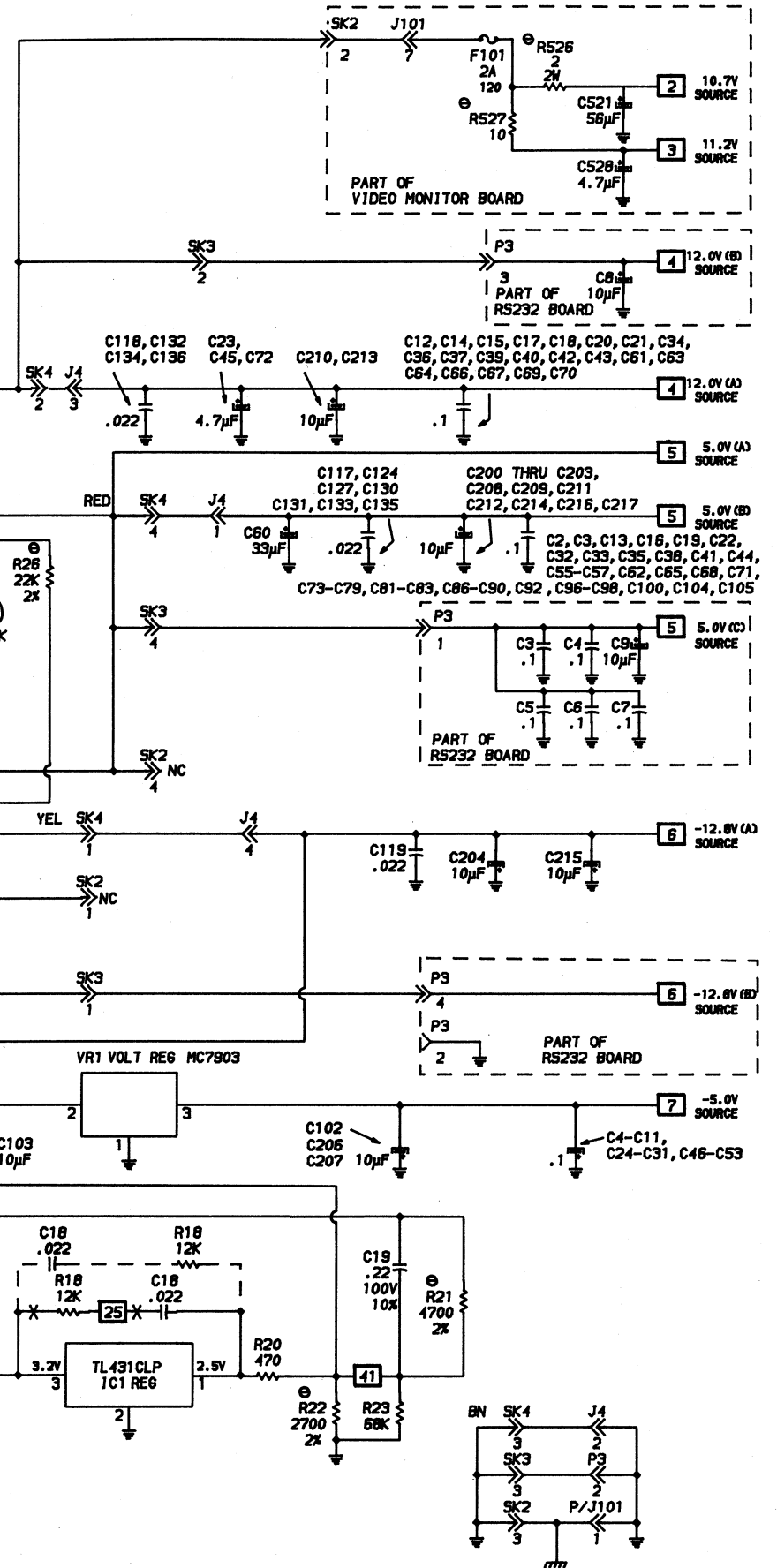
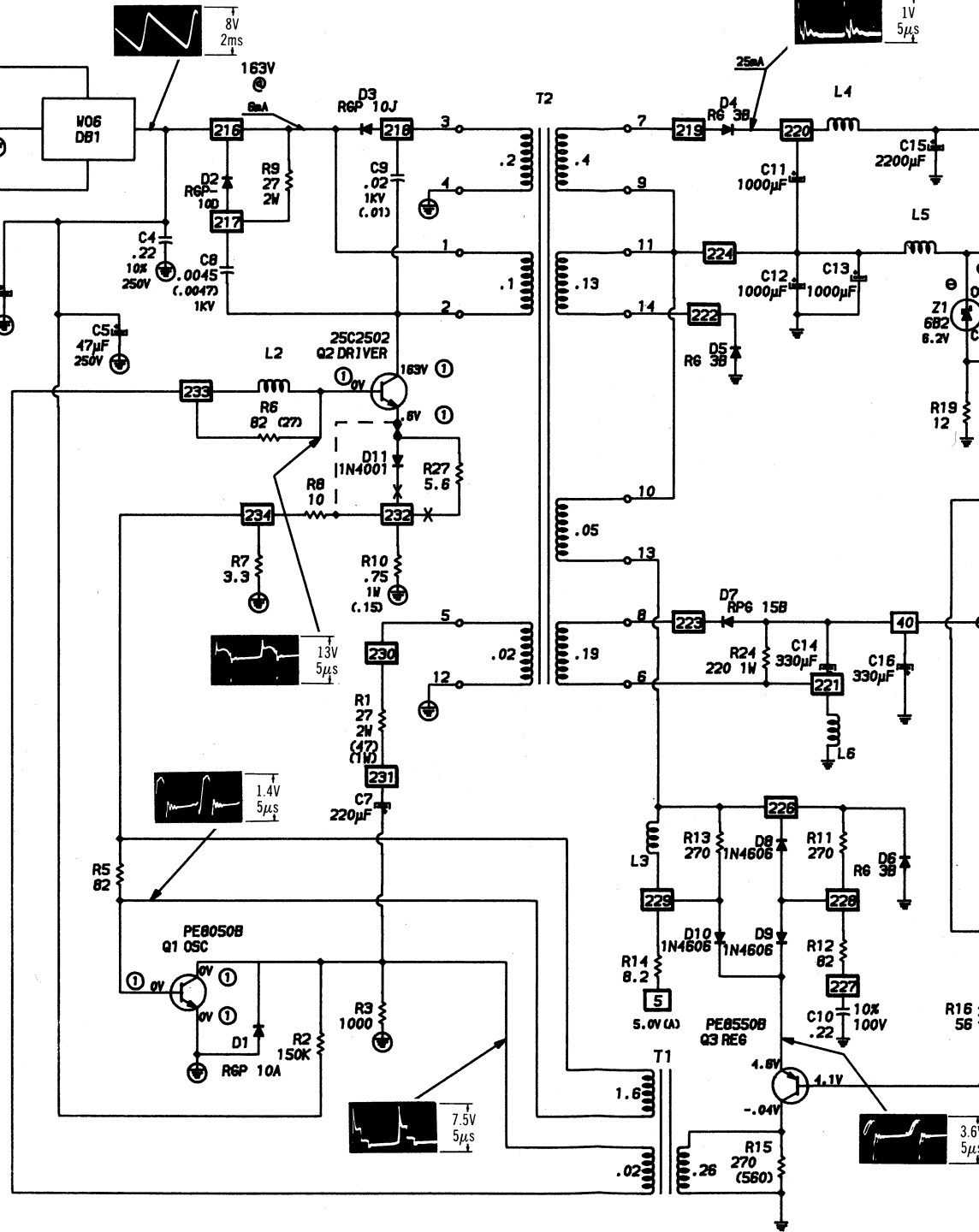
① MEASURED FROM

PHOTO CIRCUITRACE = 11  
SCHEMATIC CIRCUITRACE = 11

A PHOTOFACIT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE

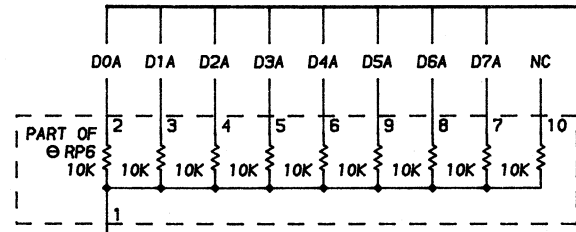
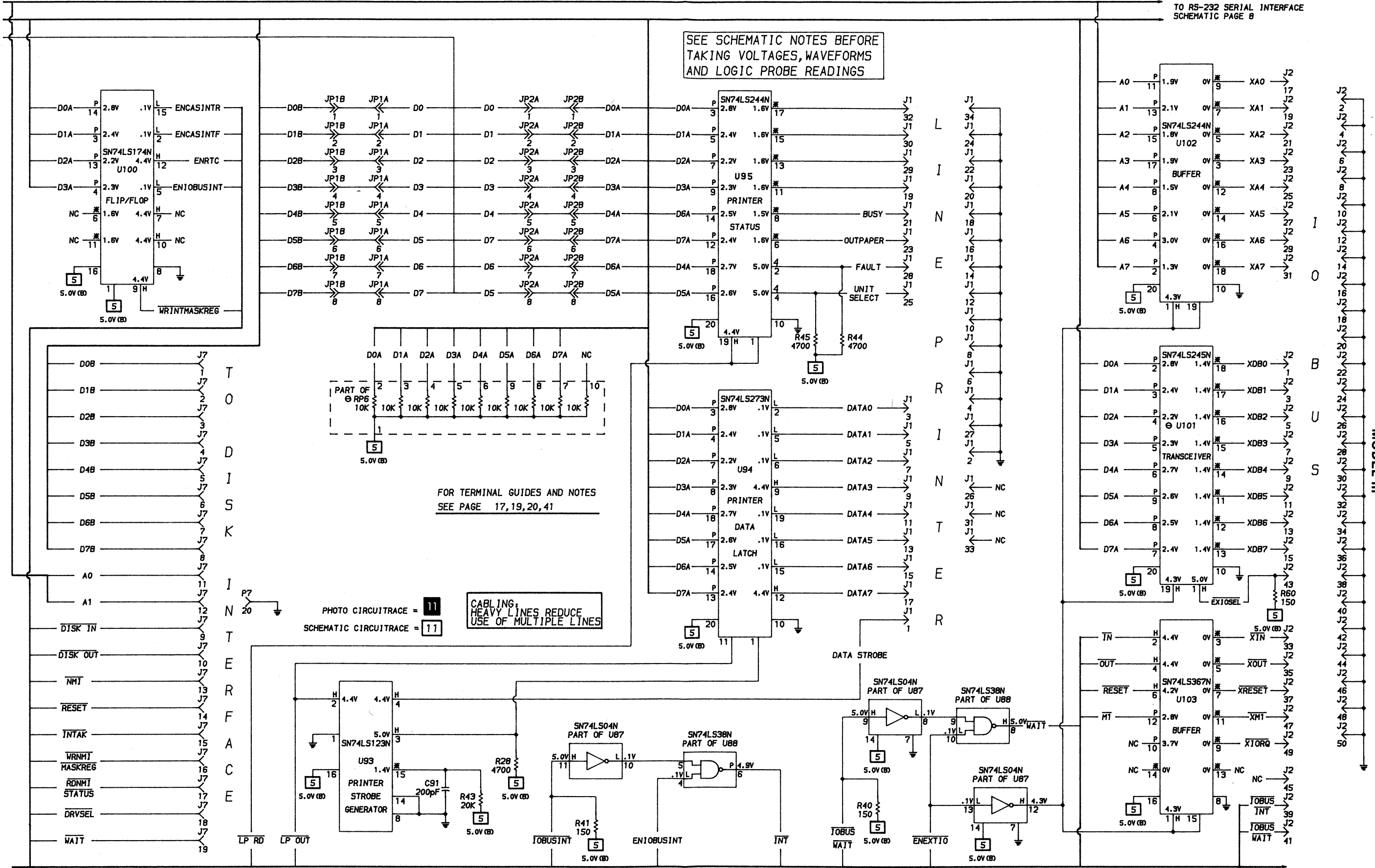
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POWER SUPPLY BOARD



POWER SUPPLY BOARD

SEE SCHEMATIC NOTES BEFORE  
TAKING VOLTAGES, WAVEFORMS  
AND LOGIC PROBE READINGS



FOR TERMINAL GUIDES AND NOTES  
SEE PAGE 17, 19, 20, 41

PHOTO CIRCUITACE = 11  
SCHEMATIC CIRCUITACE = 11

CABLING:  
HEAVY LINES REDUCE  
USE OF MULTIPLE LINES

A PHOTOFAC STANDARD NOTATION SCHEMATIC  
WITH CIRCUITACE

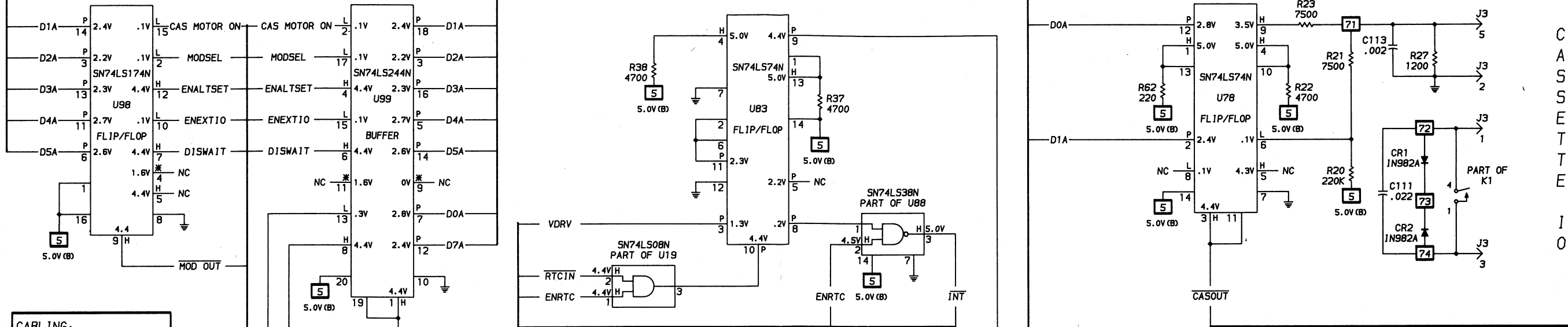
SYSTEM BOARD

TO RS-232 SERIAL  
INTERFACE SCHEMATIC  
PAGE 8

SYSTEM BOARD

RADIO SHACK  
MODEL III

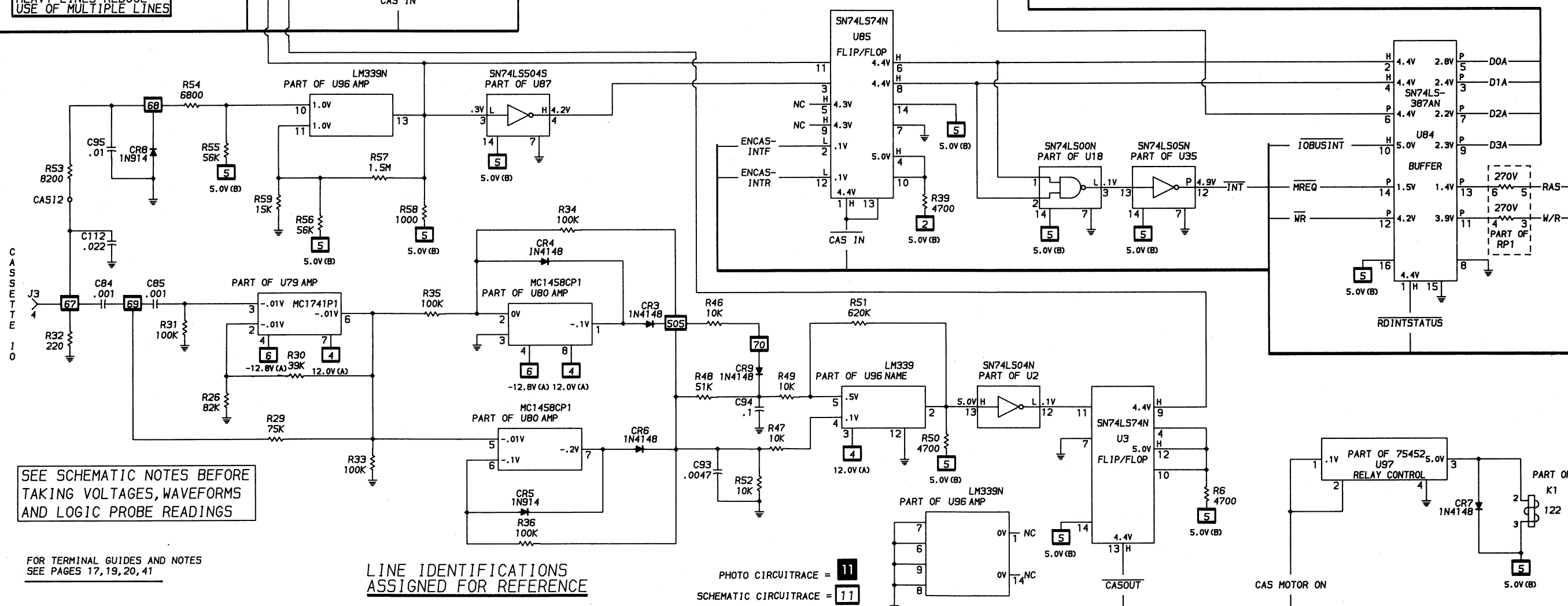




CASSETTE I/O

CSCS5 RADIO SHACK MODEL III

CABLING: HEAVY LINES REDUCE USE OF MULTIPLE LINES



SEE SCHEMATIC NOTES BEFORE TAKING VOLTAGES, WAVEFORMS AND LOGIC PROBE READINGS

FOR TERMINAL GUIDES AND NOTES SEE PAGES 17, 19, 20, 41

LINE IDENTIFICATIONS ASSIGNED FOR REFERENCE

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SCHEMATIC CIRCUITRACE = 11

A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE

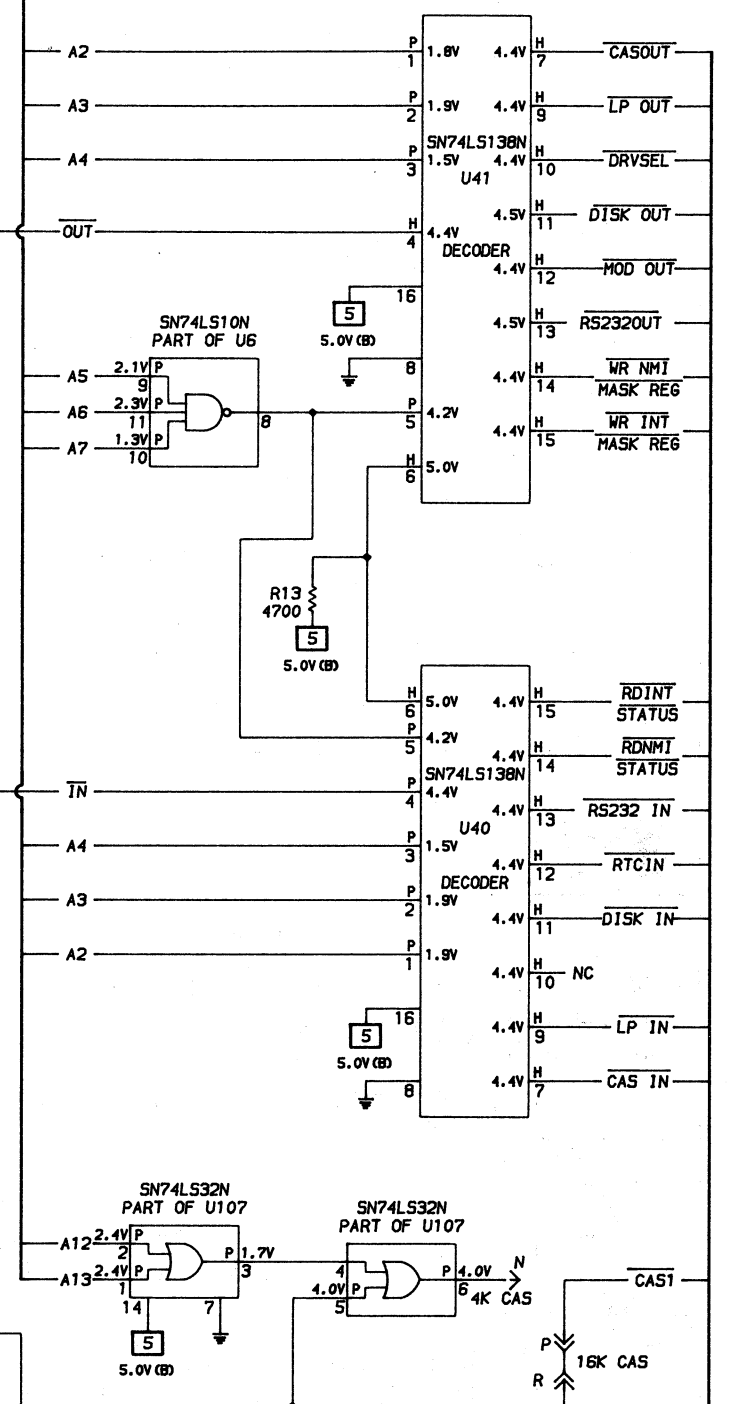
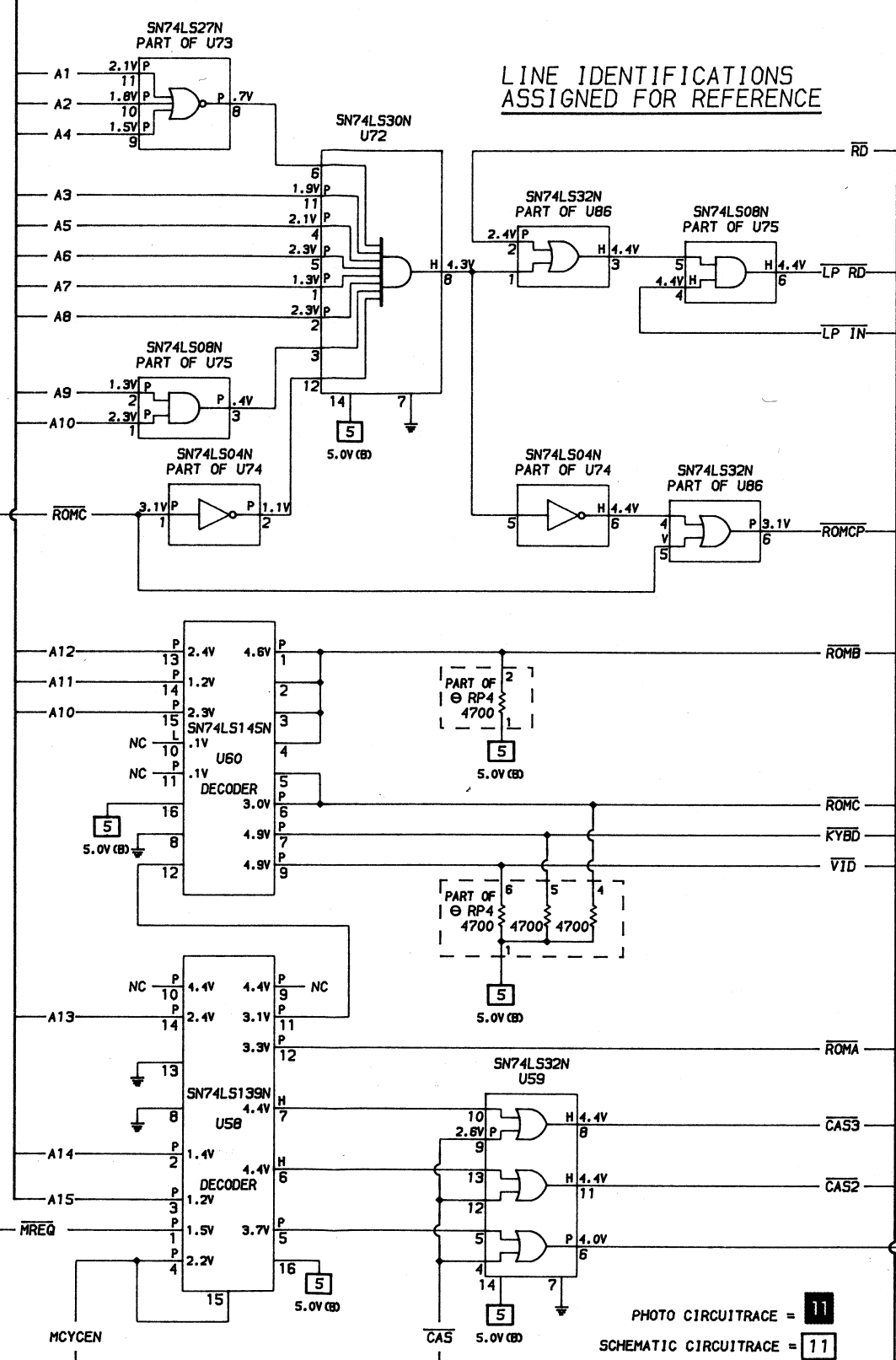
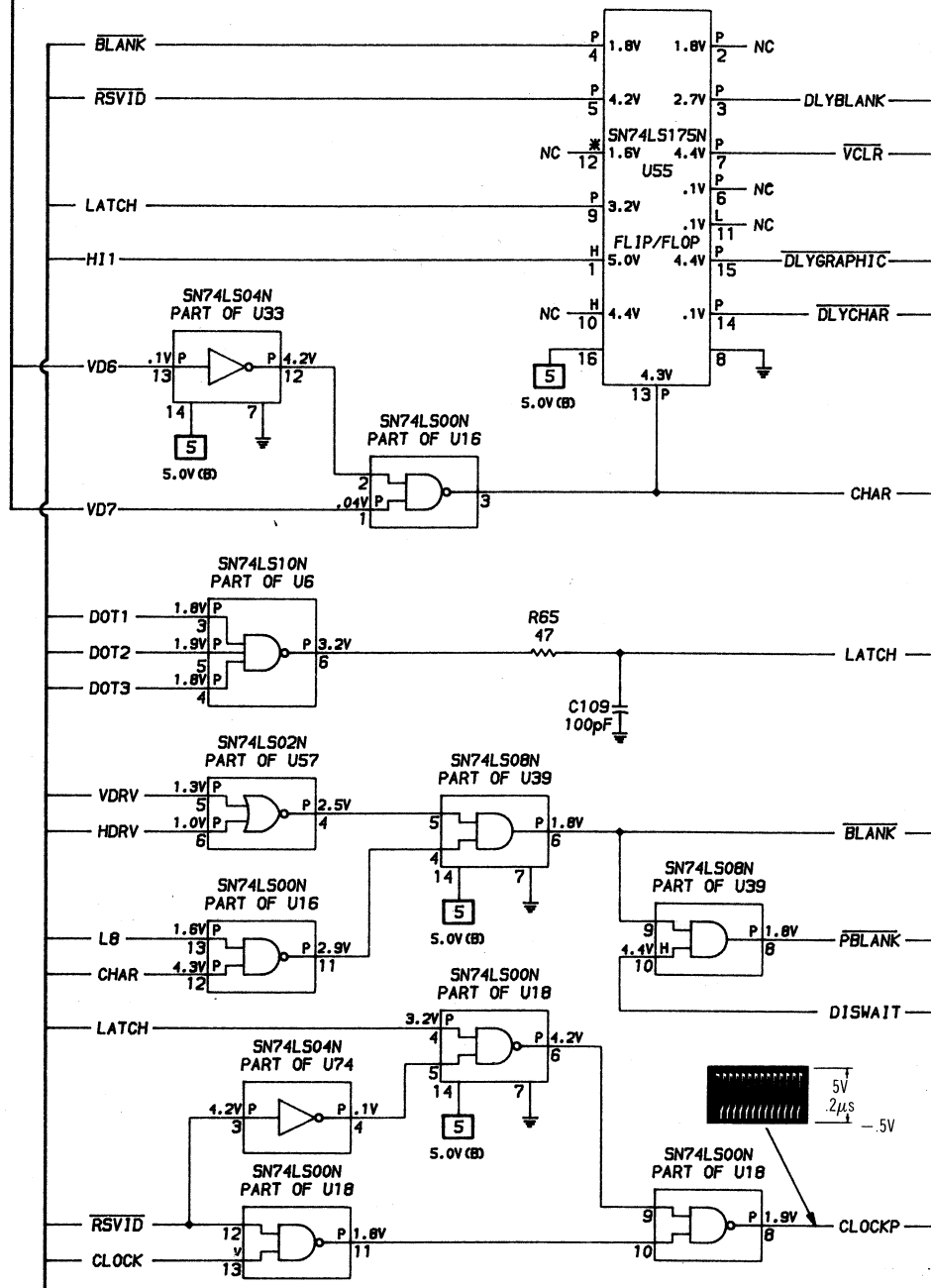
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SYSTEM BOARD

SYSTEM BOARD

FOR TERMINAL GUIDES AND NOTES  
SEE PAGES 5, 6, 13, 34, 35, 36

LINE IDENTIFICATIONS  
ASSIGNED FOR REFERENCE

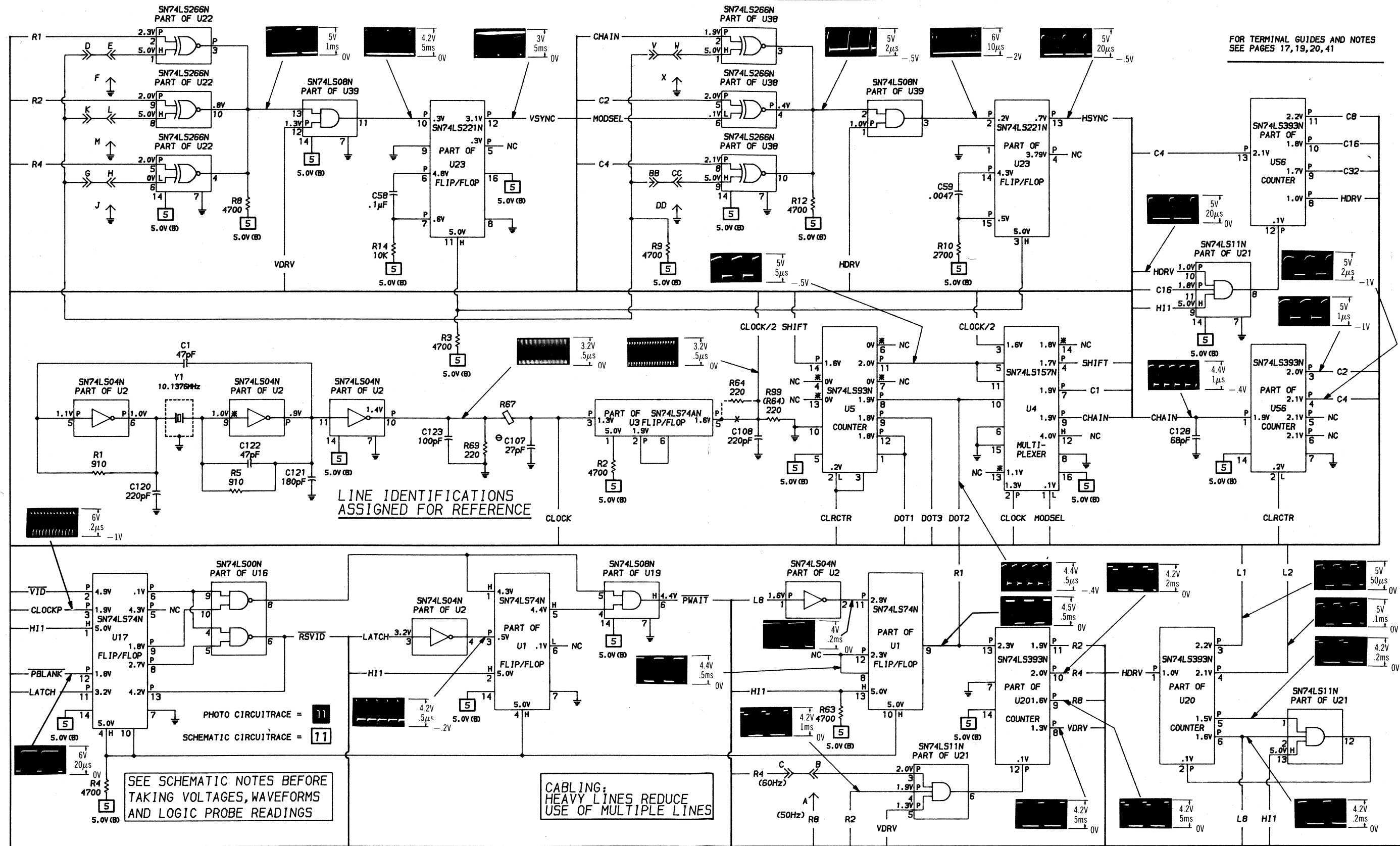


SEE SCHEMATIC NOTES BEFORE  
TAKING VOLTAGES, WAVEFORMS  
AND LOGIC PROBE READINGS

CABLING  
HEAVY LINES REDUCE  
USE OF MULTIPLE LINES

PHOTO CIRCUITRACE = 11  
SCHEMATIC CIRCUITRACE = 11

RADIO SHACK  
MODEL III



A PHOTOFACT STANDARD NOTATION SCHEMATIC  
WITH CIRCUITRACE

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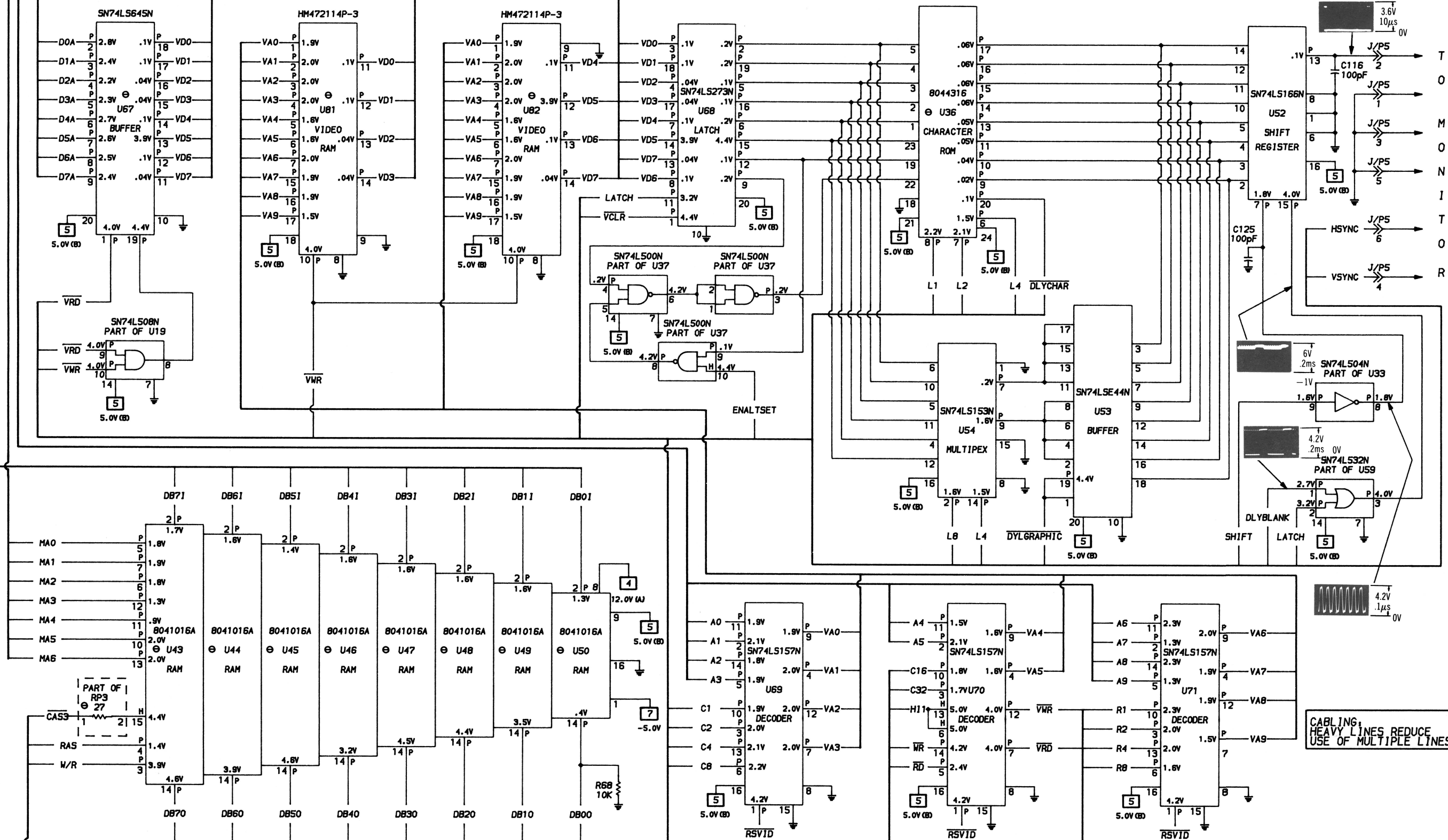
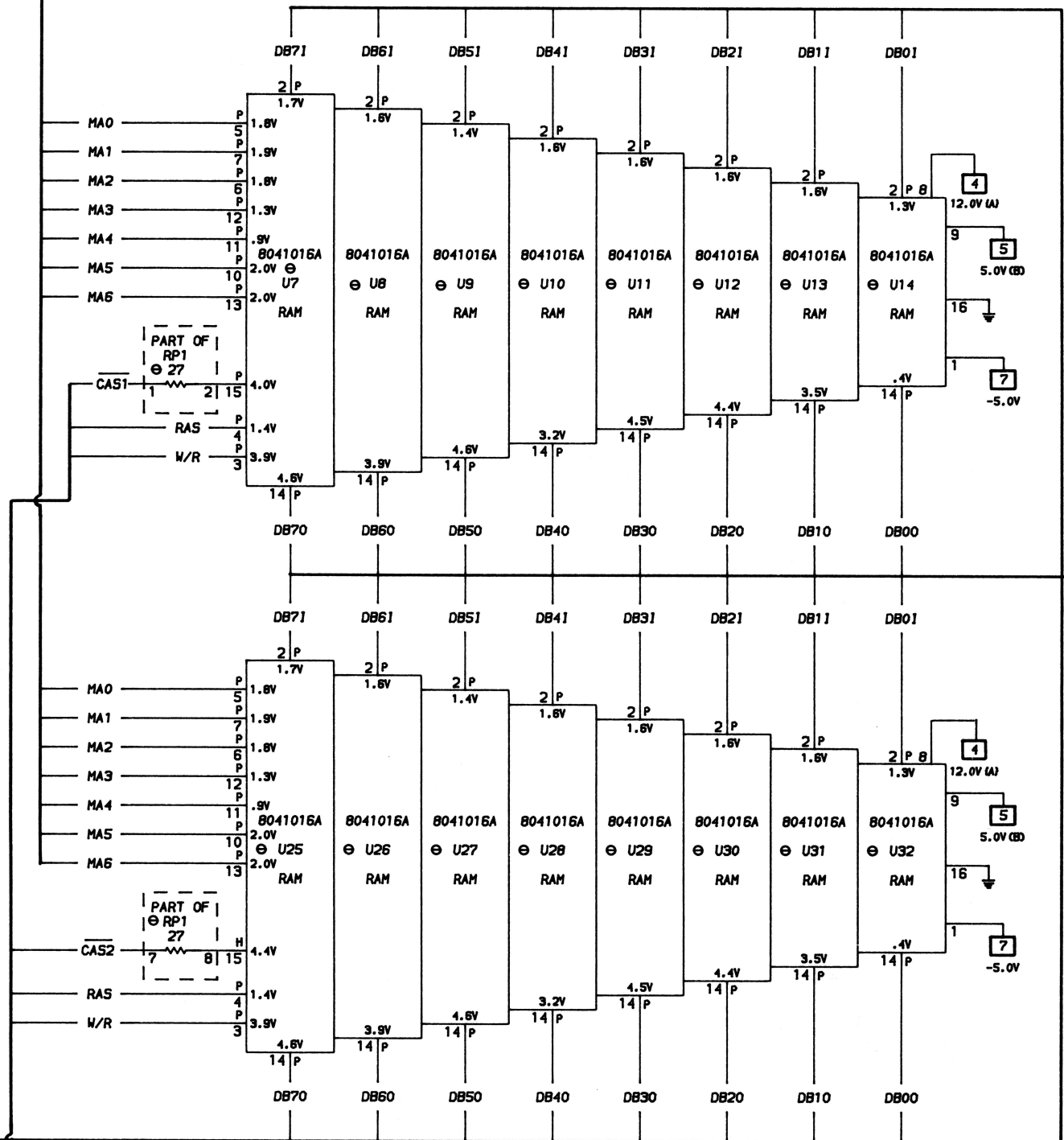
SYSTEM BOARD

SYSTEM BOARD

SEE SCHEMATIC NOTES BEFORE  
TAKING VOLTAGES, WAVEFORMS  
AND LOGIC PROBE READINGS

LINE IDENTIFICATIONS  
ASSIGNED FOR REFERENCE

PHOTO CIRCUITRACE = 11  
SCHEMATIC CIRCUITRACE = 11



FOR TERMINAL GUIDES AND NOTES  
SEE PAGES 17, 19, 20, 41

CABLING,  
HEAVY LINES REDUCE  
USE OF MULTIPLE LINES

RADIO SHACK  
MODEL III

**CSCS5-A**

**DISK DRIVE/  
DISK DRIVE INTERFACE**

See Folder CSCS5-B

**KEYBOARD/POWER SUPPLY/  
RS232 SERIAL INTERFACE/  
SYSTEM BOARD**

See Folder CSCS5

**CSCS5-A**

RADIO SHACK  
MODEL III

**INDEX**

	Page		Page
GridTrace Location Guide		Monitor Board	4,9,10
Monitor Board	5	Resistance Measurements	5
Miscellaneous Adjustments	3	Schematics	2
Parts List	6,7,8	Terminal Guides	3
Photos		Servicing in the Field	3
Cabinet View	12		

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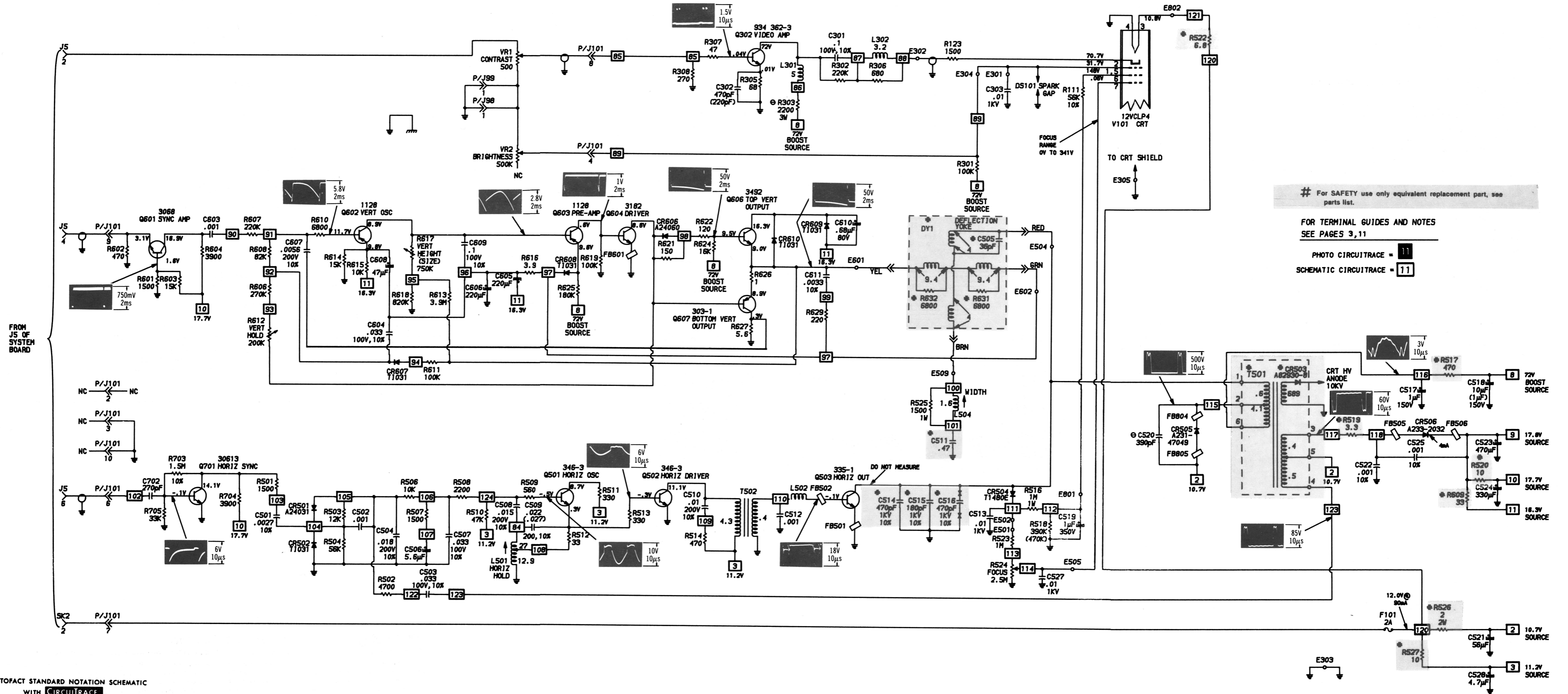
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**85CS14950**

**DATE 5-85**



A PHOTOFAC STANDARD NOTATION SCHEMATIC  
WITH CIRCUITRACE  
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MONITOR BOARD

MONITOR BOARD RADIO SHACK MODEL III

# ADJUSTMENTS

TOOLS	GC ELECTRONICS
L501	9300, 9302, 9304
L504	9440, 8282, 8606

## VERTICAL SIZE ADJUSTMENT

Adjust the Vertical Size Control (R617) for a display height of about 6 inches.

## HORIZONTAL LINEARITY

Loosen the deflection yoke clamp and slide the Horizontal Linearity sleeve located on the CRT neck forward or backward until the character spacing on the left side matches the character spacing on the right side of the Monitor screen.

## WIDTH

Note: Check the Horizontal Linearity adjustment before doing the width adjustment. Adjust the Width Coil (L504) for a display width of about 8 inches.

## HORIZONTAL HOLD

Adjust the Horizontal Hold Coil (L501) for a stable display.

## FOCUS

Adjust the Focus Control (R524) for best focus.

## CENTERING

Adjust the two magnetic rings located on the yoke rear cover to center the display on the screen.

# SERVICING IN THE FIELD

## CRT IMPLOSION PROTECTION AND CLEANING

Implosion protection is an integral part of the picture tube, cleaning accomplished without CRT removal.

## FUSE DEVICES

A 2-amp fuse is used for low-voltage power-supply protection.

## HORIZONTAL OSCILLATOR

Adjustment of the horizontal hold is accomplished by the proper setting of the Horiz. Osc. Coil.

## WIDTH

The width may be varied by adjusting the width coil (L504).

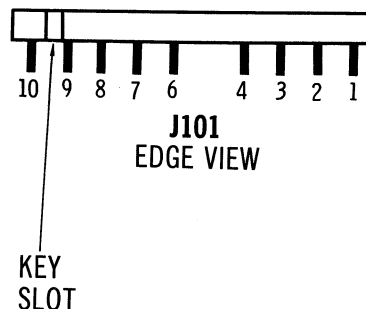
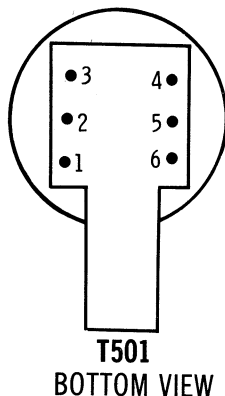
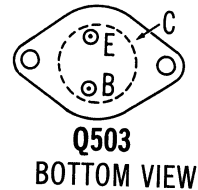
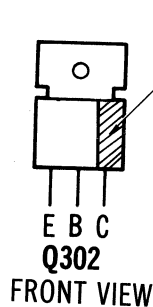
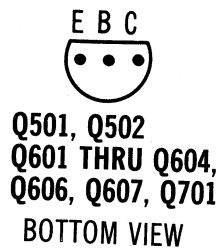
## FOCUS

The focus may be varied by a focus control.

## CENTERING

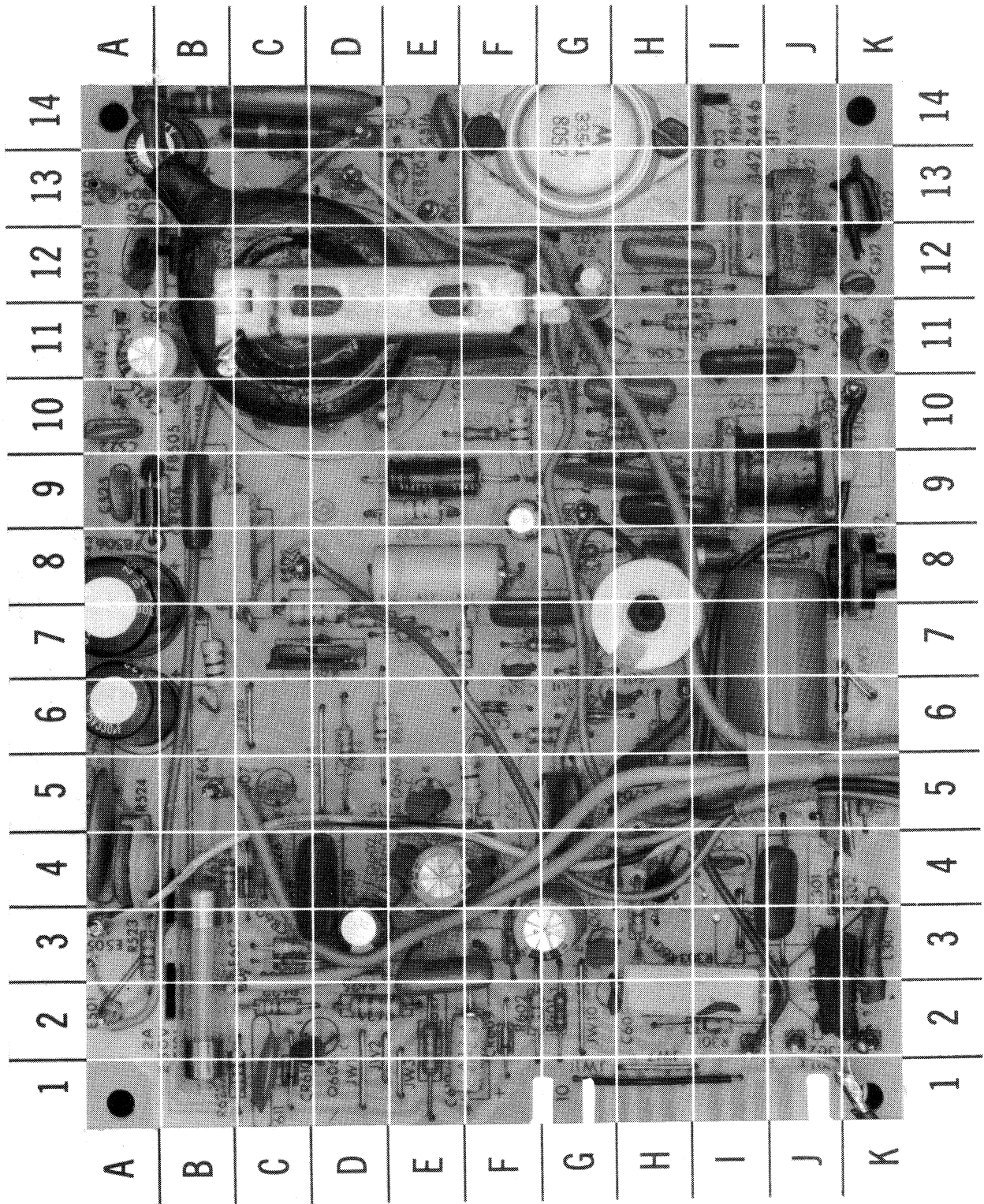
Centering is accomplished by proper adjustment of two magnetic rings located on the yoke rear cover.

# IC PINOUTS & TERMINAL GUIDES



**CSCS5-A**

**RADIO SHACK  
MODEL III**



**MONITOR BOARD**

A Howard W. Sams **GRIDTRACE™** Photo



**MONITOR BOARD GridTrace LOCATION GUIDE**

C301	J-4	C523	A-6	CR610	C-1	Q607	C-5	R518	B-14	R617	C-7
C302	I-5	C524	A-7	F101	B-2	Q701	H-4	R519	A-11	R618	D-7
C303	H-9	C525	A-9	FB501	G-14	R301	I-2	R520	B-7	R619	D-6
C501	H-6	C527	A-4	FG502	G-13	R302	J-4	R522	C-7	R621	B-4
C502	F-7	C528	G-12	FB505	A-9	R303	H-2	R523	A-3	R622	C-2
C503	B-9	C603	G-2	FB506	A-8	R305	J-5	R524	A-4	R624	D-2
C504	F-7	C604	G-5	FB601	E-5	R306	K-2	R525	H-8	R625	D-3
C506	F-9	C605	E-4	FB804	B-13	R307	K-5	R526	B-8	R626	C-4
C507	H-9	C606	G-3	FB805	B-11	R308	K-6	R527	F-10	R627	E-2
C508	H-10	C607	E-3	J101	J-1	R501	H-5	R601	G-2	R629	B-1
C509	I-11	C608	D-3	L301	K-3	R502	F-10	R602	F-2	R703	H-4
C510	H-12	C609	D-4	L302	J-2	R503	G-7	R603	F-2	R704	H-5
C511	J-7	C610	E-1	L501	J-9	R504	G-6	R604	G-4	R705	H-4
C512	K-12	C611	C-1	L502	K-13	R506	G-9	R606	H-3	T501	C-12
C513	C-14	C702	I-4	L504	H-7	R507	G-8	R607	J-8	T502	J-12
C514	F-12	CR501	G-7	Q302	J-5	R508	H-10	R608	F-3		
C515	F-12	CR502	G-6	Q501	G-11	R509	H-10	R609	G-5		
C516	E-14	CR504	E-13	Q502	K-11	R510	H-10	R610	F-5		
C517	E-9	CR505	B-12	Q503	G-14	R511	G-10	R611	E-3		
C518	E-8	CR506	B-9	Q601	G-3	R512	J-10	R612	E-7		
C519	A-14	CR606	C-4	Q602	D-4	R513	J-11	R613	K-8		
C520	A-12	CR607	F-6	Q603	E-4	R514	H-12	R614	E-7		
C521	A-11	CR608	C-3	Q604	E-5	R516	C-14	R615	D-6		
C522	A-10	CR609	F-2	Q606	C-2	R517	E-9	R616	E-5		

**RESISTANCE MEASUREMENTS**

MEASUREMENTS TAKEN WITH LOW POWER OHMS METER														
ITEM	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9	PIN 10	PIN 11	PIN 12	PIN 13	PIN 14
V101	110K(1)	460K	FIL	FIL	110K	412K	297							
ITEM	E	B	C		ITEM	E	B	C		ITEM	E	B	C	
Q302	68	176	INF		Q601	477	1500	10K(1)		Q606	1.8M	280K(1)	INF	
Q501	45	33K	385		Q602	8500(1)	INF	1.2M		Q607	1.8M	280K(1)	5.6	
Q502	0	376	41		Q603	460K(1)	1.2M(1)	100K(1)		Q701	0	33K	30K(1)	
Q503	0	1.2	INF		Q604	0	100K	280K(1)						

(1) Reading may vary according to the condition of the electrolytic in the circuit.

## 6 PARTS LIST AND DESCRIPTION

When ordering parts, state Model, Part Number, and Description

### SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFGR. PART No.	REPLACEMENT DATA						
			GENERAL ELECTRIC PART No.	NTE PART No.	PHILIPS ECG PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.	
CR501	MONITOR								
CR502	A24031		GE-300	NTE177	ECG177	SK9091/177	WEP1062/177	103-131	
CR503	T1031		GE-511	NTE506	ECG506	SK3998/506	WEP172/506	103-287	
CR504	A82930-8								
CR505	T1480E								
CR506	A-231-47049								
CR606	A-233-2032								
CR607	A24060		GE-300	NTE177	ECG177	SK9091/177	WEP1062/177	103-131	
thru	T1031								
CR610									
Q302	934362-3		GE-27	NTE171	ECG171	SK3201/171	WEP702/171	121-822	
Q501,2	346-3		GE-123AP	NTE123AP	ECG123AP	SK3854/123AP	WEP736/123A	121-Z9000A	
Q503	335-1		GE-38	NTE165	ECG165	SK3115/165	WEP740B/165	121-1029	
Q601	3068		GE-123AP	NTE123AP	ECG123AP	SK3854/123AP	WEP736/123A	121-Z9000A	
Q602,3	1128		GE-82	NTE159	ECG159	SK3466/159	WEP62/159	121-Z9003	
Q604	3182		GE-220	NTE194	ECG194	SK3479	WEP64/194	121-881	
Q606	3492		GE-123AP	NTE123AP	ECG123AP	SK3854/123AP	WEP736/123A	121-Z9000A	
Q607	303-1		GE-82	NTE159	ECG159	SK3466/159	WEP62/159	121-Z9003	
Q701	30613		GE-123AP	NTE123AP	ECG123AP	SK3854/123AP	WEP736/123A	121-Z9000A	

# For SAFETY use only equivalent replacement part.

## PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

### CAPACITORS

ITEM No.	RATING	MFGR. PART No.
# C505	36 N750 5%	
# C511	.47 200V 10%	
# C514	470 1KV 10%	
# C515	180 1KV 10%	
	470 1KV 10%	

ITEM No.	RATING	MFGR. PART No.
# C516	470 1KV 10%	
	180 1KV 10%	
C520	390 N1500 10%	

# For SAFETY use only equivalent replacement part.

### RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFGR. PART No.	NTE PART No.	WORKMAN PART No.
R303	2200 3W WW	1420347-157 (1)		
# R517	470 5% 1/2W Carbon Film			
# R519	3.3 5% 1/2W Carbon Film		HW147	22-2088
# R520	10 5% 1/2W Carbon Film		HW3D3	22-2036
# R522	6.8 5% 1/2W Carbon Film		HW010	22-2048
# R526	2 5% 2W WW	946023-332 (1)	HW6D8	22-2044
# R527	10 5% 1/2W Carbon Film			
# R531	6800 5% 1/2W Carbon Film		HW010	22-2048
# R532	6800 5% 1/2W Carbon Film		HW268	22-2116
# R609	33 5% 1/2W Carbon Film		HW268	22-2116
			HW033	22-2060

# For SAFETY use only equivalent replacement part.

(1) Number on unit.

### CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM NO.	FUNCTION	RESISTANCE	MFGR. PART NO.	NOTES
R524	Focus	2.5M	1473359-26 (1)	
R612	Vertical Hold	200K	1496161-10 (1)	
R617	Vertical Height	750K	1473359-47 (1)	
VR1	Contrast	500	BA08116816 (1)	
			1348111 (1)	
VR2	Brightness	500k	BA08116817 (1)	
			1348112 (1)	

(1) Number on unit.

### COILS (RF-IF)

ITEM No.	FUNCTION	MFGR. PART No.
L301	RF Choke	
L302	RF Choke	

ITEM No.	FUNCTION	MFGR. PART No.
L502	Choke	

RADIO SHACK  
MODEL III

## PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

### COILS & TRANSFORMERS (Sweep Circuits)

ITEM No.	FUNCTION	MFGR. PART No.	OTHER IDENTIFICATION	NOTES
# DY1	yoke 90°		2748105-3	
L501	Horiz Oscillator			
L504	Width			
# T501	Horiz Output		1465974-506	
T502	Horiz Driver		1479977-3	

# For SAFETY use only equivalent replacement part.

### FUSE DEVICES

ITEM NO.	DESCRIPTION	MFGR. PART NO.		NOTES
		DEVICE	HOLDER	
# F101	2A @ 250V Fast-Acting Pigtail			

# For SAFETY use only equivalent replacement part.

### MISCELLANEOUS

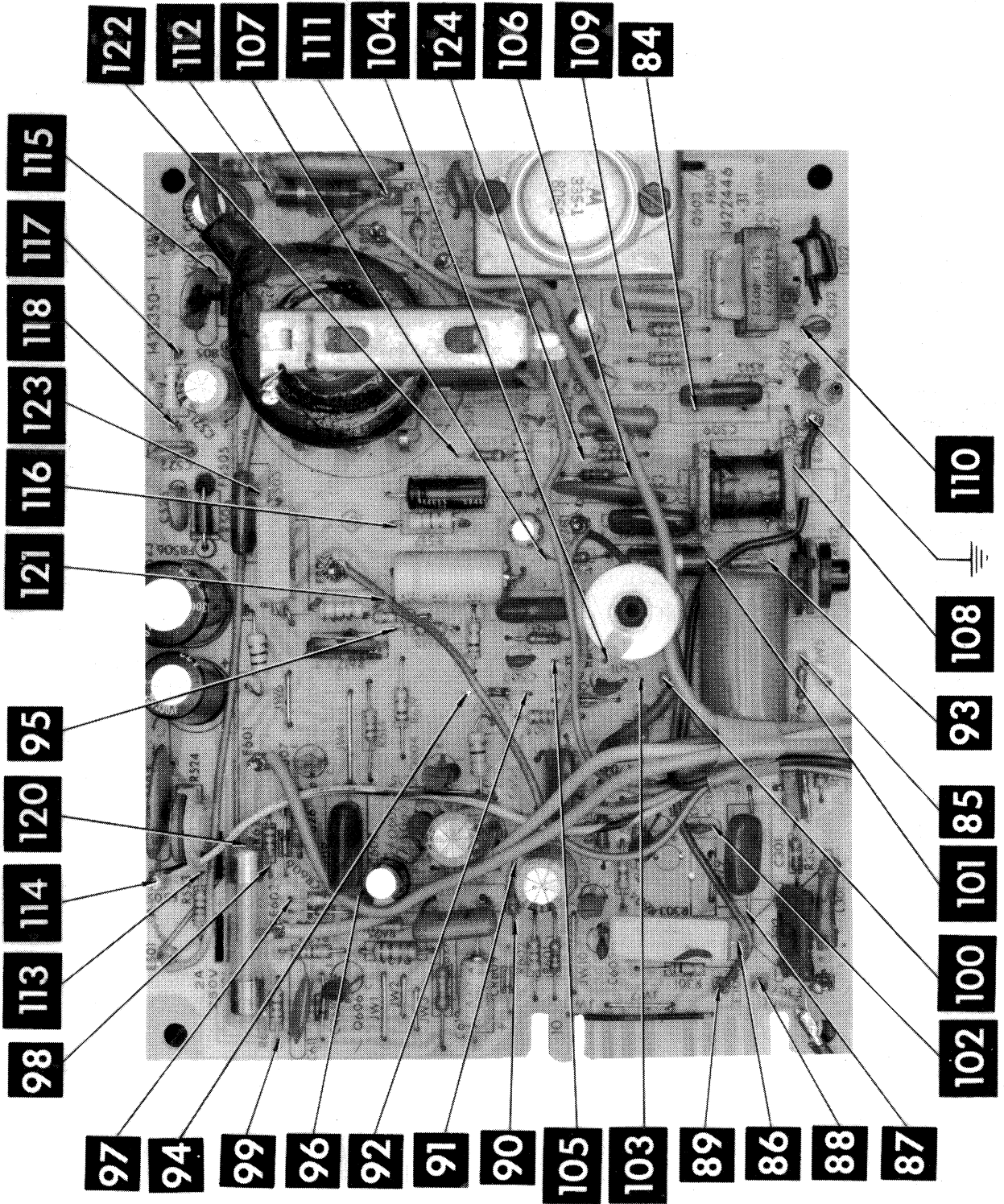
ITEM No.	PART NAME	MFGR. PART No.	NOTES
V101	CRT P.C. Board	12VCLP4 AXX8010	Main

### CABINETS & CABINET PARTS (When ordering specify model, chassis & color)

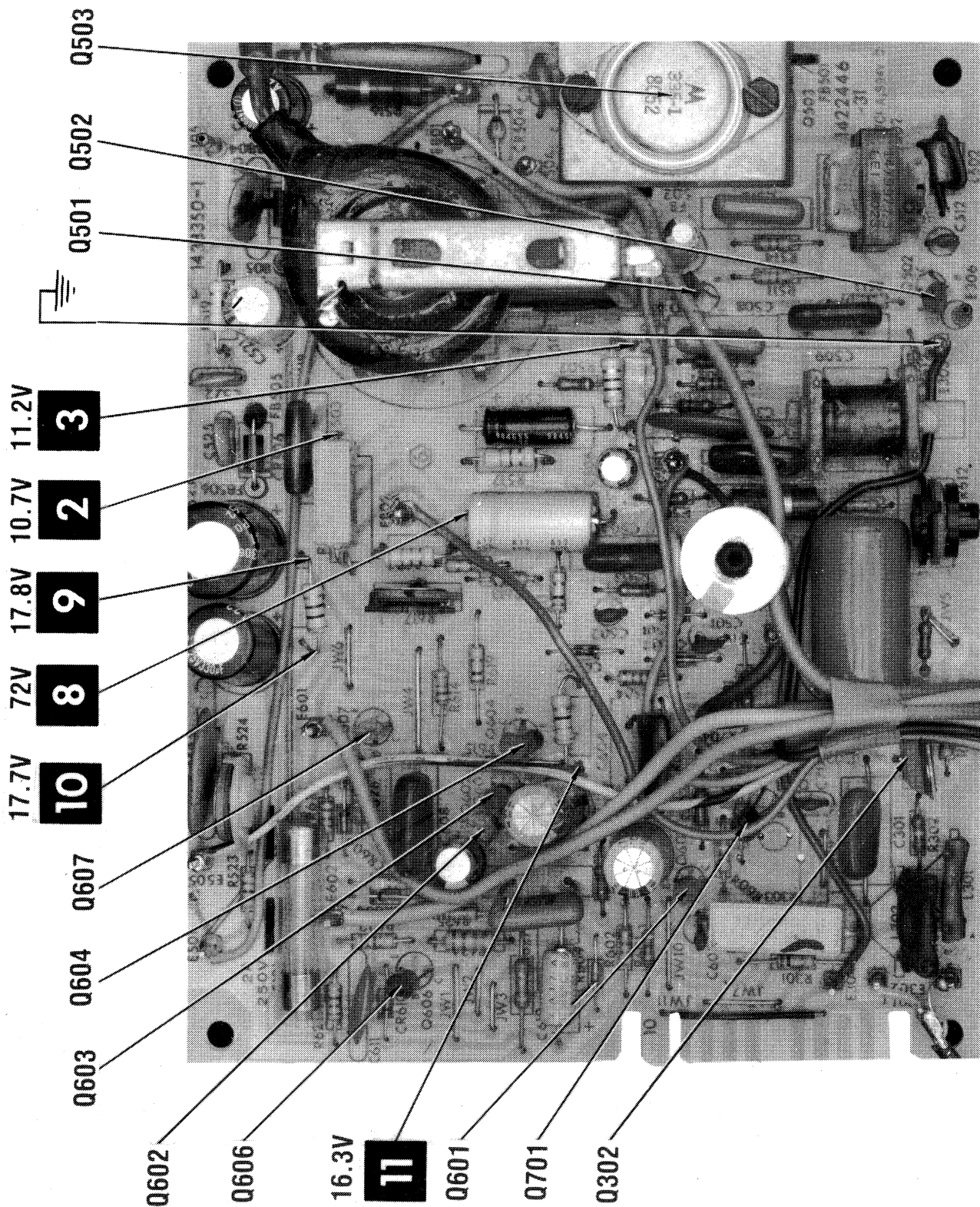
ITEM	PART No.	ITEM	PART No.
Cabinet Top	AZ5689	Knob, Thumbwheel	AK4298

### WIRING DATA

High Voltage Lead .....	Use BELDEN No. 8869 (17 KV)
Shielded Hook-up Wire .....	Use BELDEN No. 8401 or 8421 (Single-Conductor) 8208 (Two-Conductor)
General-use Unshielded Hook-up Wire .....	Use BELDEN No. 8529 (Solid) Available in 13 Colors 8522 (Stranded) Available in 13 Colors



RADIO SHACK  
MODEL III



MONITOR BOARD

A Howard W. Sams **CIRCUITRACE**® Photo

## SCHEMATIC NOTES

—\*— Circuitry not used in some versions

--- Circuitry used in some versions

◊ See parts list

⊕ Ground

⏏ Chassis

▽ Common tie point

Waveforms and voltages taken from ground, unless noted otherwise.

Voltages, Waveforms and Logic probe readings taken with computer turned On, no keys pressed, unless otherwise noted.

Waveforms taken with triggered scope and Sweep/Time switch in Calibrate position, scope input set for DC coupling on 0 reference voltage waveforms. Switch to AC input to view waveforms after DC reference is measured when necessary. Each waveform is 7 cm. width with DC reference voltage given at the bottom line of each waveform.

Time in  $\mu\text{sec.}$  per cm, given with p-p reading at the end of each waveform.

Item numbers in rectangles appear in the alignment/adjustment instructions.

Supply voltages maintained as shown at input.

Voltages measured with digital meter, no signal.

Controls adjusted for normal operation.

Terminal identification may not be found on unit.

Capacitors are 50 volts or less, 5% unless noted.

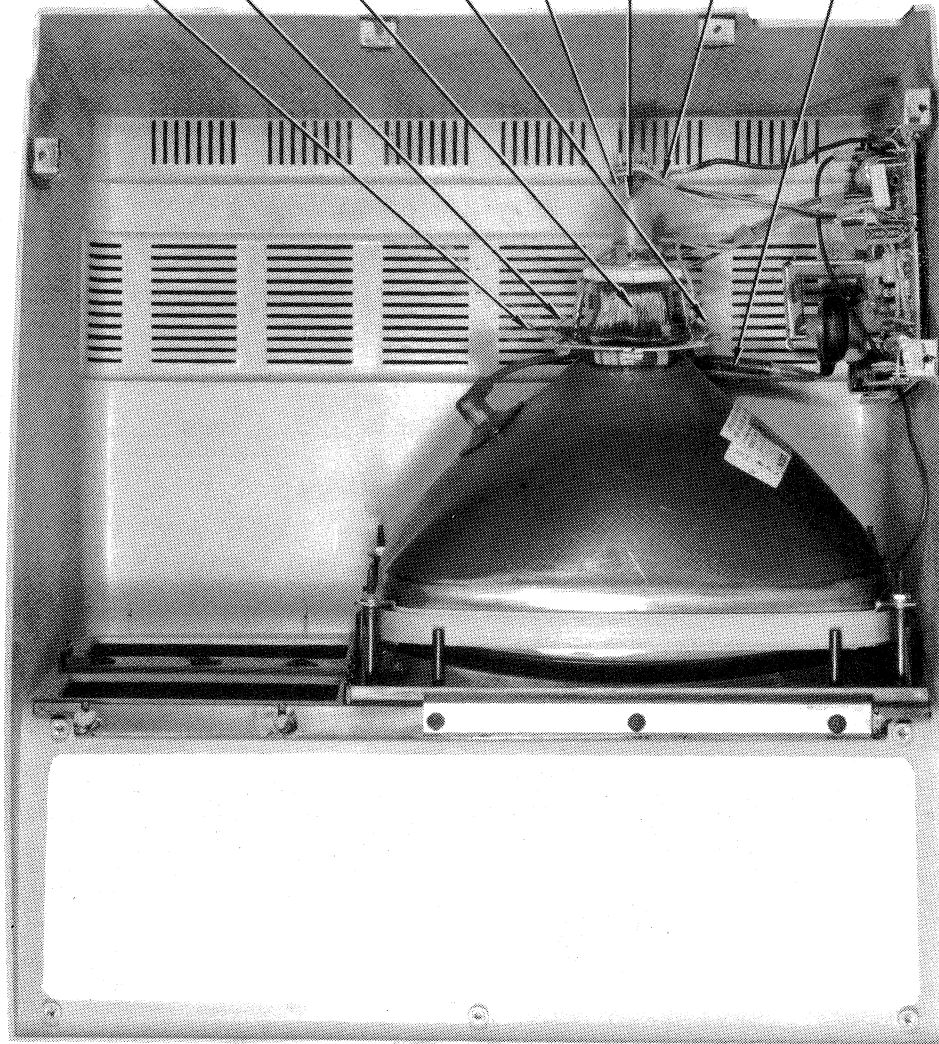
Electrolytic capacitors are 50 volts or less, 20% unless noted.

Resistors are  $\frac{1}{2}W$  or less, 5% unless noted.

Value in ( ) used in some versions.

Measurements with switching as shown, unless noted.

C505 R631 DY1 YOKE R632 R111 DS101 R123 CR503



CABINET



**DISK DRIVE,  
DISK DRIVE INTERFACE**RADIO SHACK  
MODEL III**CSCS5-B****KEYBOARD/POWER SUPPLY/  
RS232 SERIAL INTERFACE/  
SYSTEM BOARD**

See Folder CSCS5

**MONITOR**

See Folder CSCS5-A

**CSCS5-B**RADIO SHACK  
MODEL III**INDEX**

	Page		Page
GridTrace Location Guide		Photos (Continued)	
Disk Drive Board .....	14	Mechanical Bottom .....	31
Disk Drive Interface Board .....	15	Non Linear Servo Board .....	29
Power Supply Board .....	16	Power Supply Board .....	16,24,25
Logic Chart .....	32,33	Schematics	
Miscellaneous Adjustments .....	11,12	Disk Drive Board .....	2
Parts List .....	17 thru 23	Disk Drive Interface Board .....	3,38,39,40,41
Photos		Power Supply Board .....	4,37
Disk Drive Board .....	14,26,27	Schematic Notes .....	13
Disk Drive Interface Board .....	15,28	Terminal Guides .....	5,6,34,35,36
Mechanical Top .....	30	Troubleshooting .....	7 thru 10

**SAMS**™**Howard W. Sams & Co., Inc.**

4300 West 62nd Street, P.O. Box 7092, Indianapolis, Indiana 46206 U.S.A.

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed.

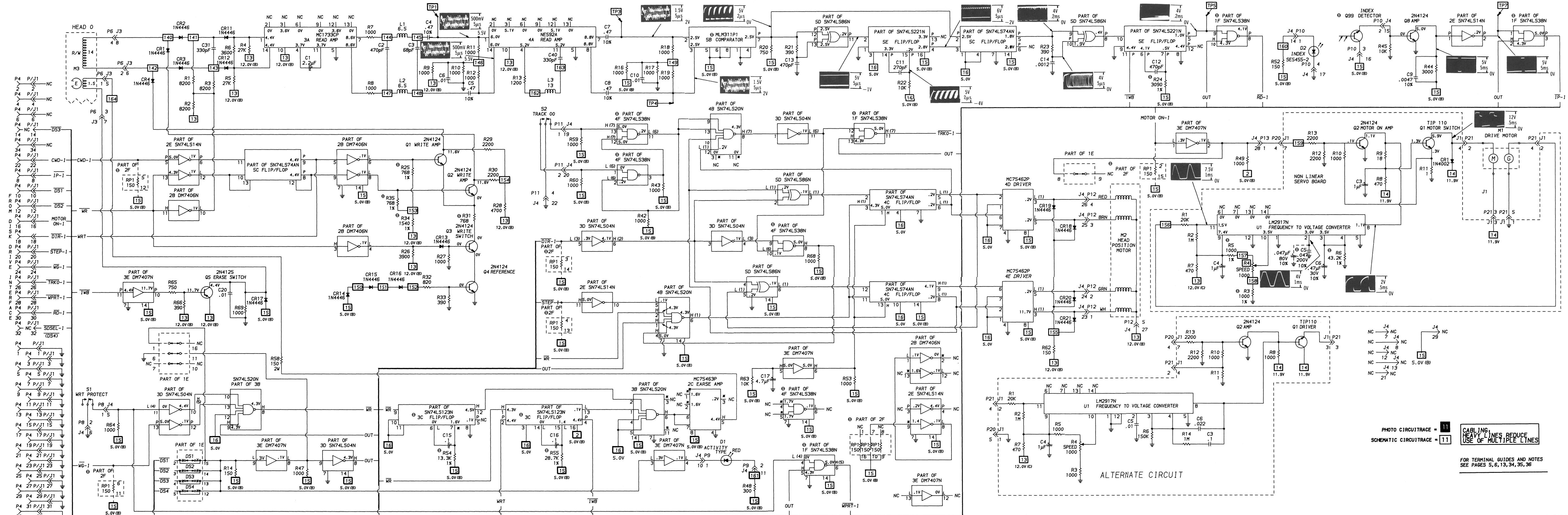
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**85CS14950****DATE 5-85**



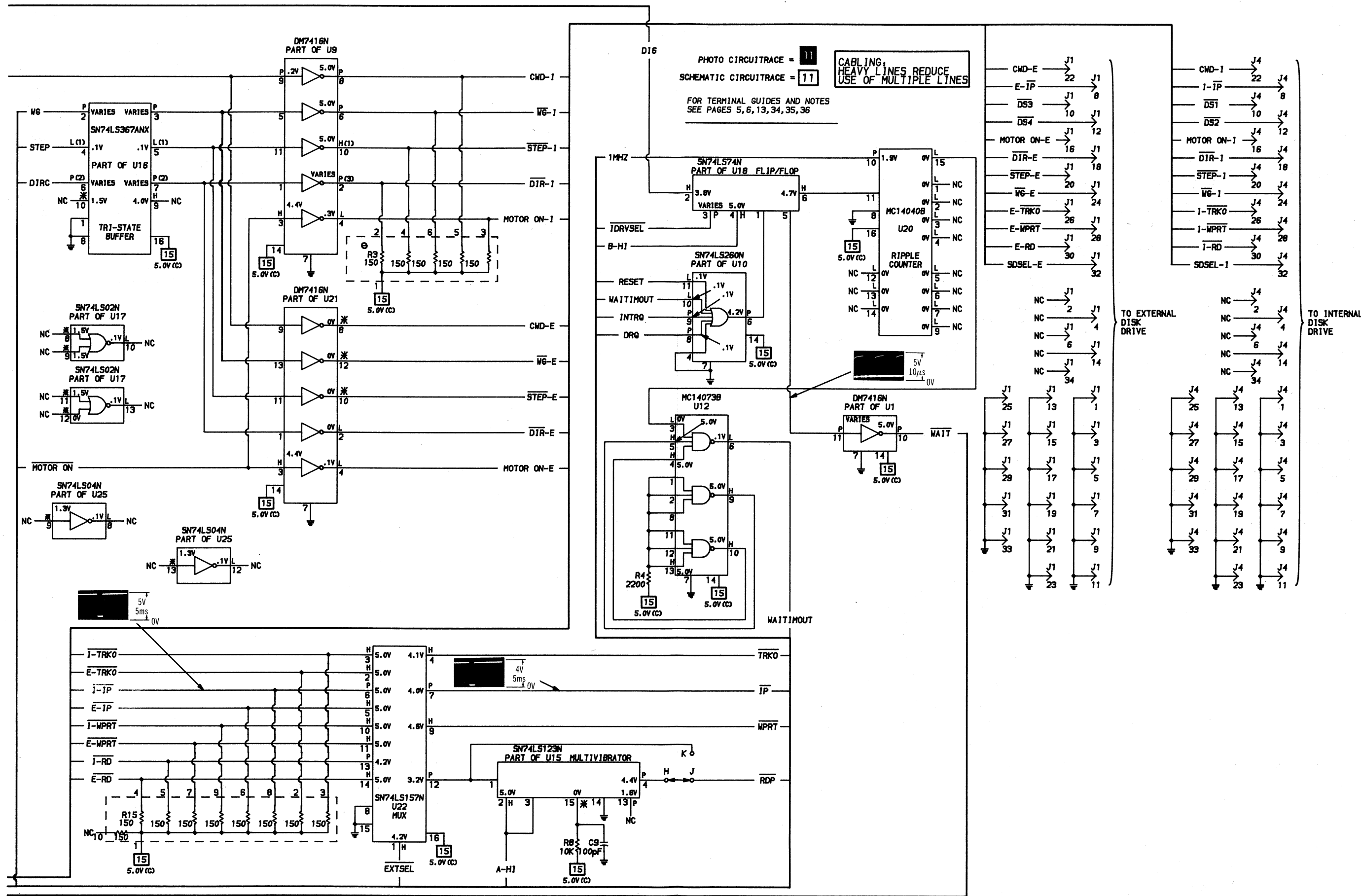
A PHOTOFAC STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE  
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**DISK DRIVE BOARD**

PHOTO CIRCUITRACE = **11**  
SCHEMATIC CIRCUITRACE = **11**

CABLING HEAVY LINES REDUCE USE OF MULTIPLE LINES

FOR TERMINAL GUIDES AND NOTES SEE PAGES 5, 6, 13, 34, 35, 36



A PHOTOFAC STANDARD NOTATION SCHEMATIC  
WITH **CIRCUITRACE**

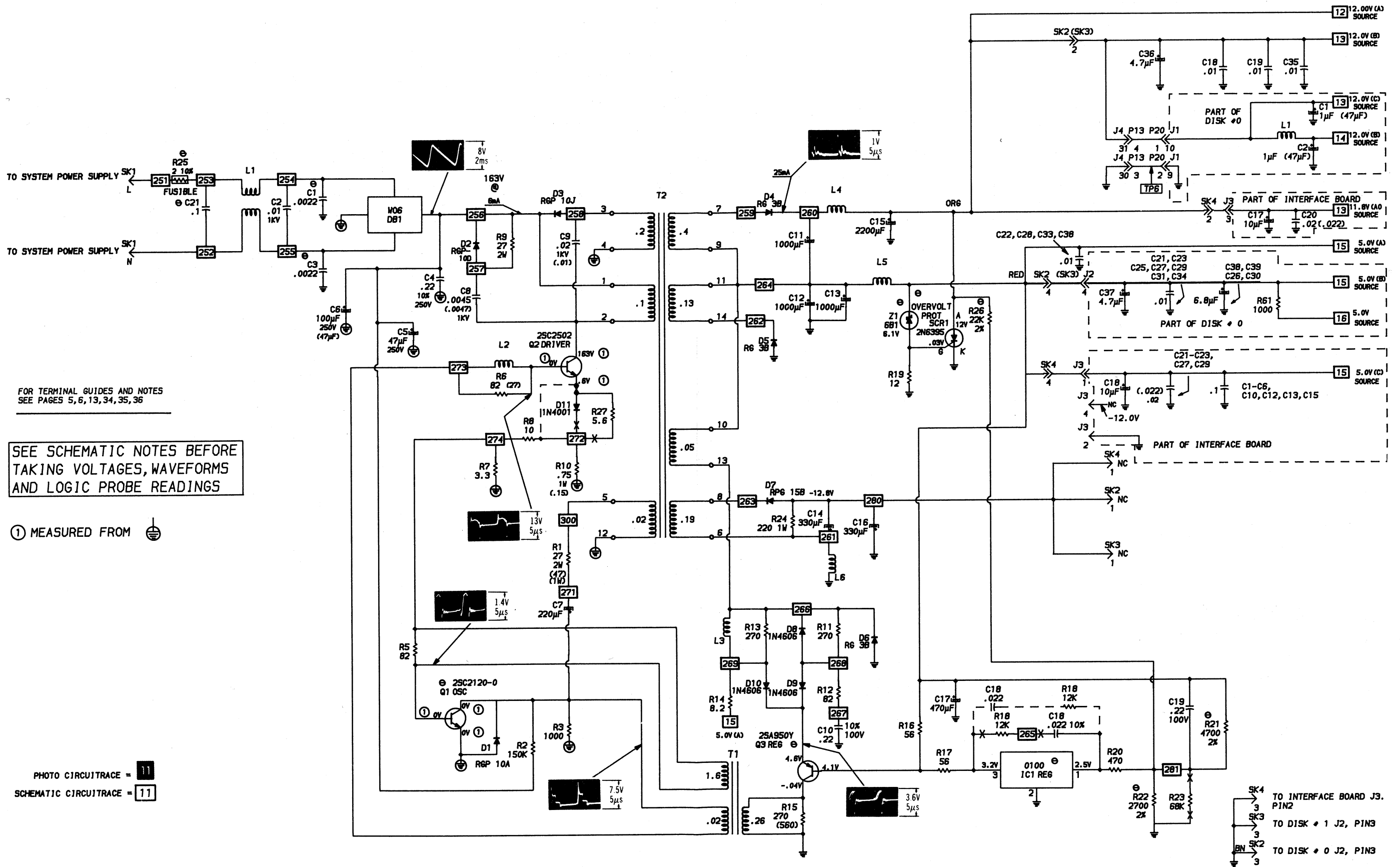
### DISK DRIVE INTERFACE BOARD

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### DISK DRIVE INTERFACE BOARD

**CSCS-5-B**

RADIO SHACK  
MODEL III



FOR TERMINAL GUIDES AND NOTES  
SEE PAGES 5, 6, 13, 34, 35, 36

SEE SCHEMATIC NOTES BEFORE  
TAKING VOLTAGES, WAVEFORMS  
AND LOGIC PROBE READINGS

① MEASURED FROM

PHOTO CIRCUITTRACE =

SCHEMATIC CIRCUITTRACE =

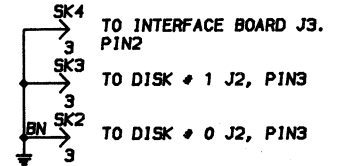
A PHOTOFACIT STANDARD NOTATION SCHEMATIC  
WITH **CIRCUITRACE**

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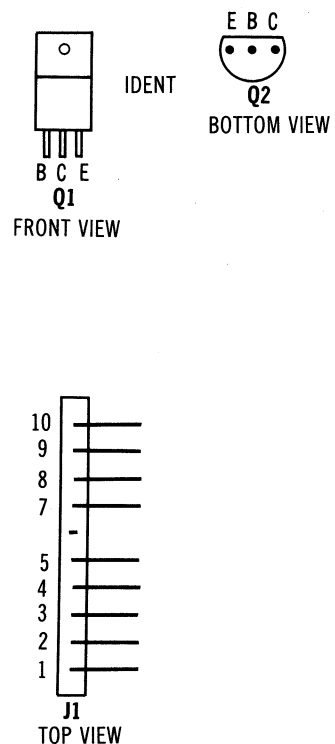
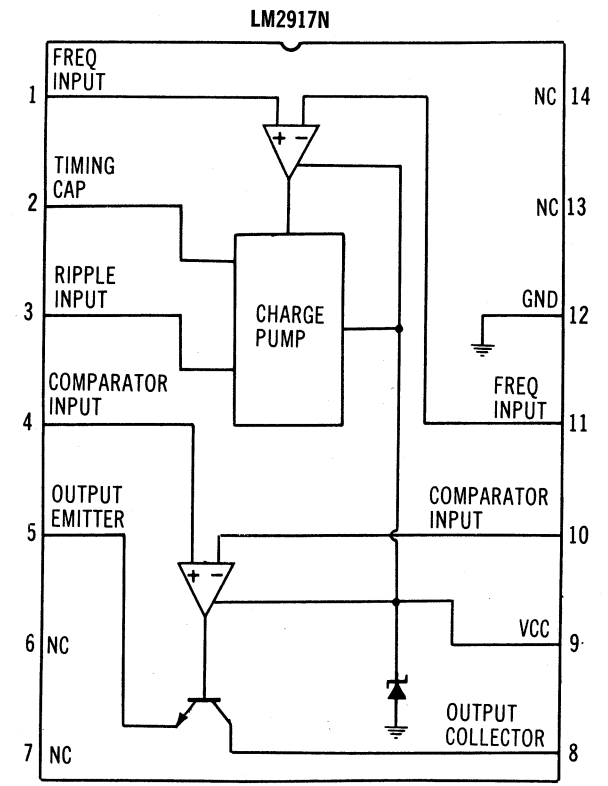
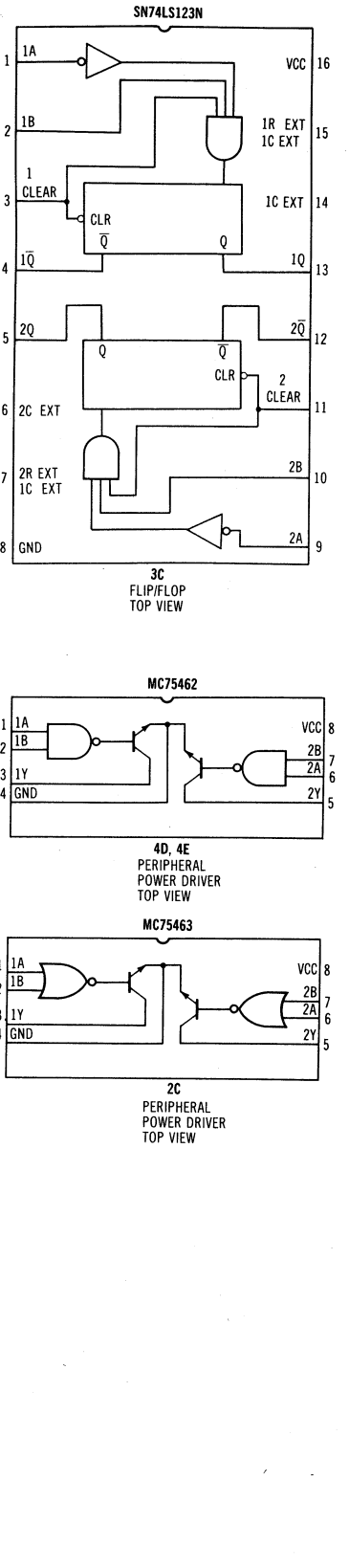
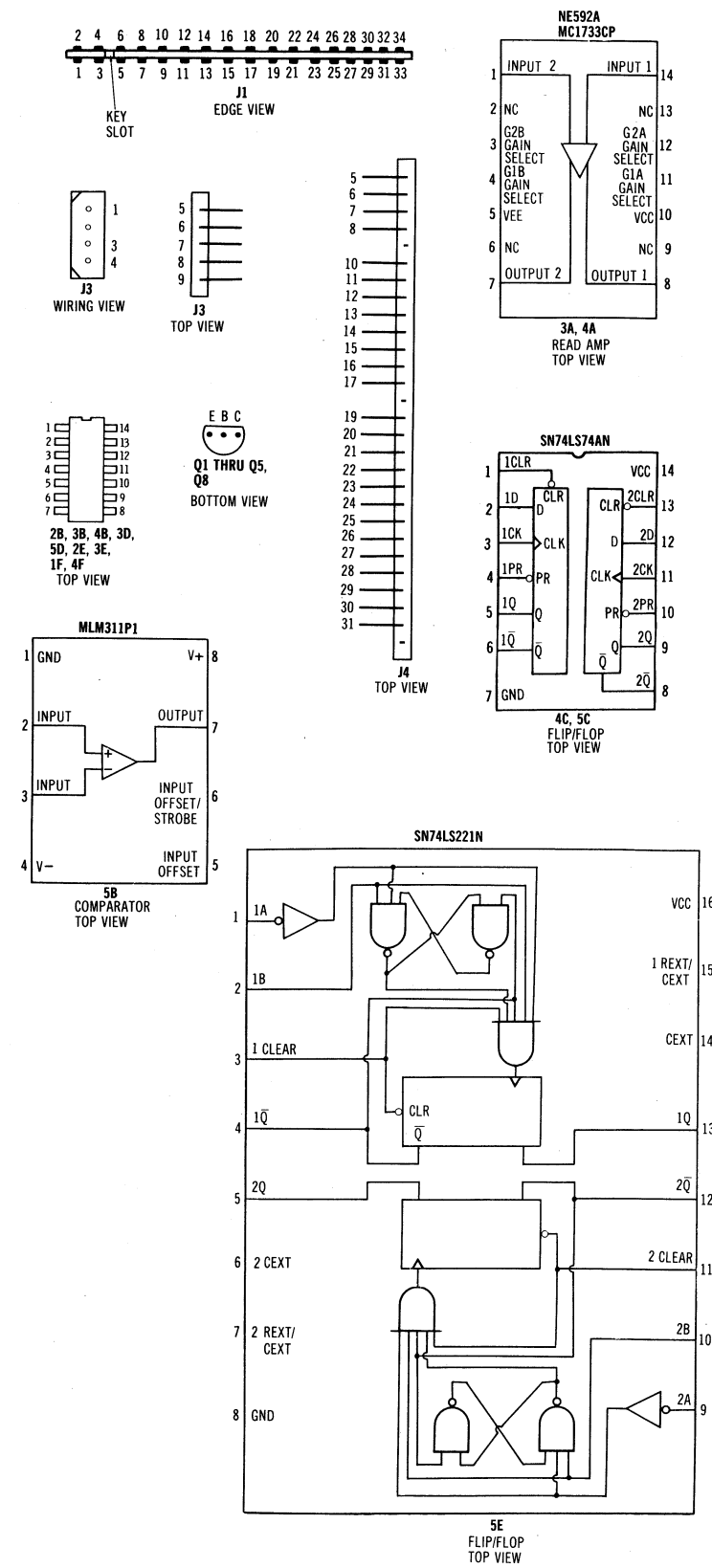
DISK DRIVE POWER SUPPLY BOARD

DISK DRIVE POWER SUPPLY BOARD

RADIO SHACK  
MODEL III



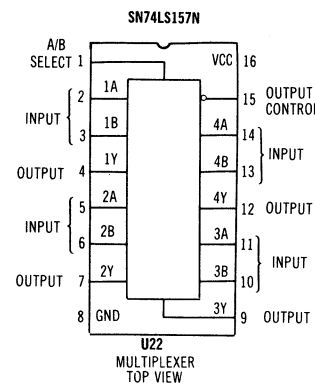
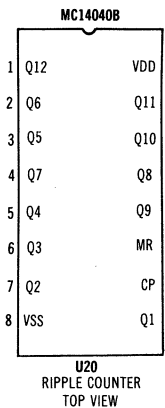
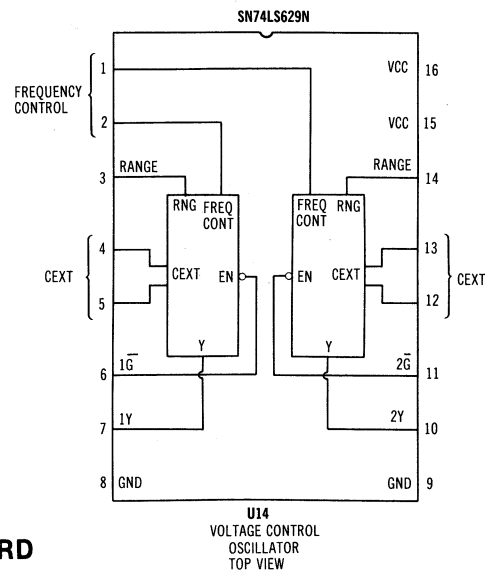
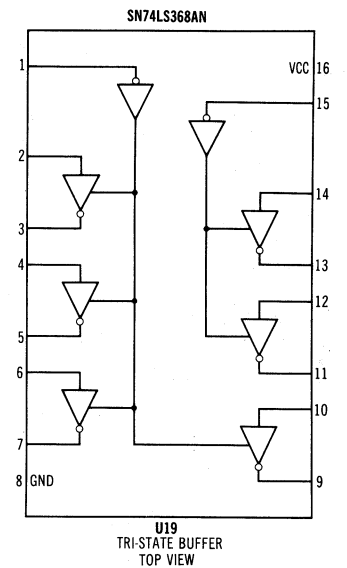
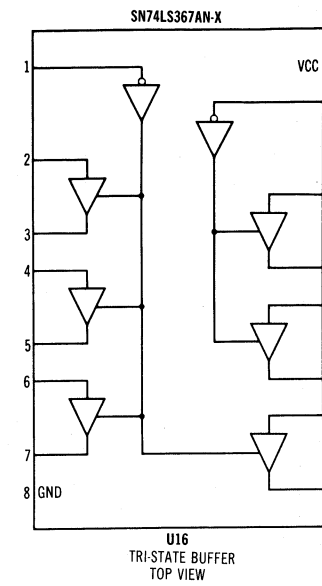
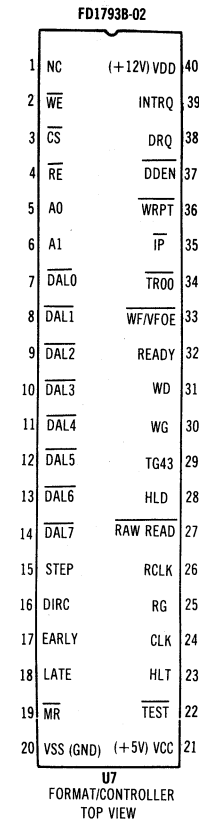
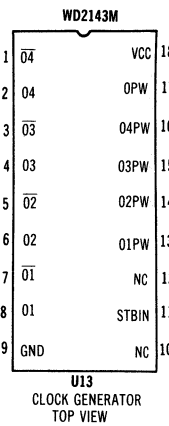
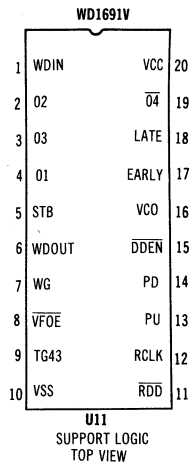
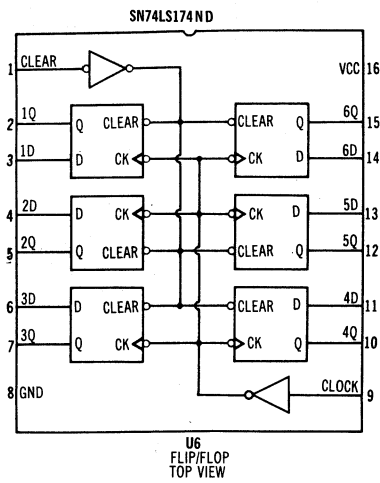
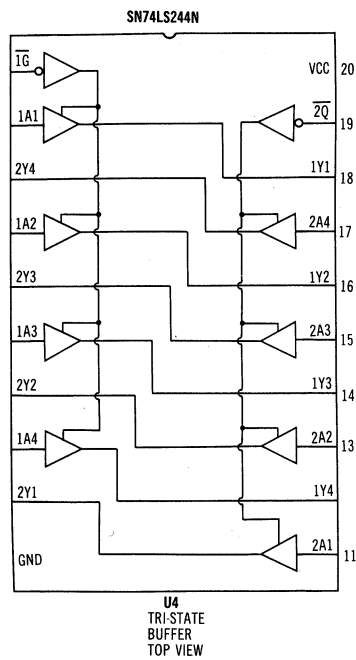
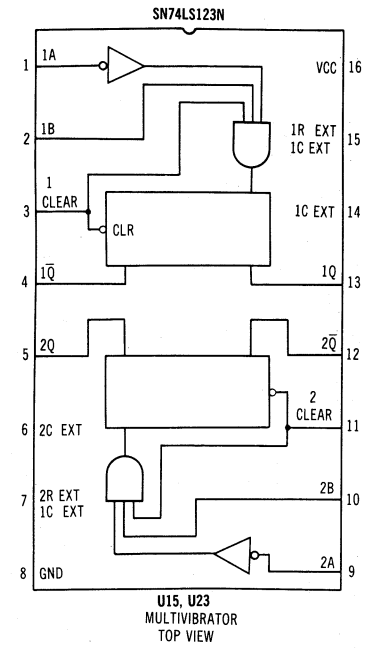
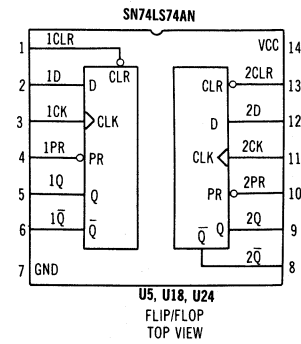
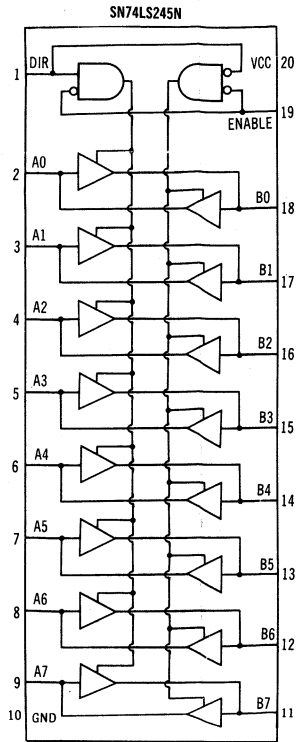
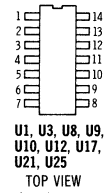
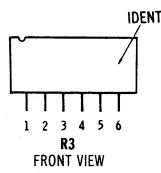
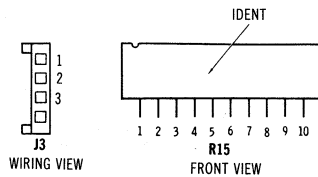
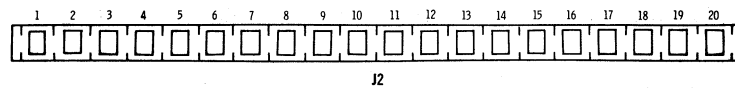
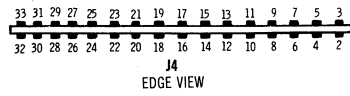
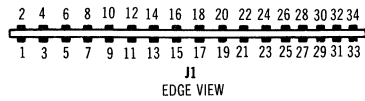
# IC PINOUTS & TERMINAL GUIDES



DISK DRIVE BOARD

NON LINEAR SERVO BOARD

# IC PINOUTS & TERMINAL GUIDES



RADIO SHACK  
MODEL III

# TROUBLESHOOTING

## TEST SETUP

Connect a Disk Drive known to be operating properly to the Computer as Disk Drive 0. Connect the defective Disk Drive as Disk Drive 1. Use Disk Drive 0 to load any alignment or test program needed to check the defective Disk Drive.

**WARNING:** It is possible for a defective Disk Drive to write on or erase information on a diskette, even if the diskette is write protected. Check the Disk Drive by first using a diskette that has programs that have been backed up on another diskette. Do not leave the alignment diskette in the drive while checking voltages and waveforms unless specified in the alignment procedures. The test equipment may cause the Disk Drive circuits to erase sections of the alignment diskette even if the diskette is write protected.

## HEAD CLEANING INSTRUCTIONS

Use a cotton swab or lint free cloth dampened with 91% isopropyl alcohol and dry with a lint free cloth or use a single sided non-abrasive cleaning diskette.

## CONTINUOUS OPERATION OF DISK DRIVE

The following Basic program will make Disk Drive 0 run continuously in the read mode. Change the number 1 in the program to number 2 to make Disk Drive 1 run continuously.

```
10 OUT 244,1: GOTO 10
```

## DRIVE OPERATION ERRATIC

If the Disk Drive operation is erratic, clean the drive head, see "Head Cleaning Instructions". Check the Disk Drive Motor Speed and Disk Drive Alignment, refer to the "Disk Drive Alignment".

## DISK DRIVE INTERFACE OSCILLATOR AND VCO OSCILLATOR

Verify that the Drive Interface Oscillator is working by checking for 4.0MHz at pin 3, 2.0MHz at pin 6 and 1.0MHz at pin 8 of Flip/Flop IC (U24). If the 4.0MHz signal is missing, check Crystal Y1, Capacitors C16, C28 and C30, Resistors R17 and R18 and IC U25. If the 2MHz or 1MHz signal is missing, check Capacitors C25 and C26 and IC U24.

Verify that the VCO oscillator is working by checking for 2.0MHz signal at TP13, pin 7 of VCO IC (U14). If the frequency is not correct, check the Voltage Level (R7) and VCO Frequency (R6) adjustments, refer to the "Disk Drive Interface Adjustments". If 2.0MHz is missing at pin 7 of IC U14, check Capacitors C7 and C11, Resistors R9, R10 and R13, Controls R6 and R7 and IC's U14 and U11.

## DRIVE SELECT MALFUNCTION

Verify the Drive Select circuit is working by using the program given in "Continuous Operation of Disk Drive" to keep the Disk Drive running. Check for a High logic reading at pin 8 of IC 3D on the Disk Drive board. **NOTE:** If the Drive motor is not turning On refer to the "Drive Motor Malfunctions" section of this troubleshooting guide.

If the logic reading is not correct, check for a High logic reading on the Drive Interface board, at pin 2 of Flip/Flop IC (U6) for Disk Drive 0, pin 5 of IC U6 for Disk Drive 1. If the logic reading is not correct check IC U6. If the logic reading is correct at pin 2 or 5 of IC U6, check for a Low logic reading at pin 4 of IC U1 for Disk Drive 0, pin 2 of IC U1 for Disk Drive 1. If the logic reading is not correct at pin 4 or 2 of IC U1, check IC U1. If the logic reading is correct at pin 4 or 2 of IC U1, check for a Low logic reading at pin 9 of IC 3D on the Disk Drive board. If the reading is not correct at pin 9 of IC 3D, check Resistors R14 and R47 and IC 3E. If the reading is correct at pin 9 of IC 3D, check IC 3D.

If the Disk Drive Activity LED does not turn On check pins 1 and 2 of Connector P9 for good connections. Check the Activity LED, Resistor R48 and IC 3E.

## WILL NOT READ

Verify the Index Detector circuit is working, refer to the "Index Detector" section of this Troubleshooting guide. Check the alignment of the Disk Drive, refer to the "Disk Drive Alignment." To check the operation of the read circuits, type in and run the following Basic program. Insert a diskette that as a 125kHz (2F) pattern on track 00 into the Disk Drive and close the door. **NOTE:** The Dysan 224/2A Analog Alignment Diskette has a 125kHz pattern on track 00. The program will turn On Drive 1, set the head to track 00, continuously read the track and display the number that is read, which should be 255. To turn On Drive 0, change OUT 244,2 in lines 10 and 30 to OUT 244,1. Press the Break key to stop the program.

```
10 OUT 244,2: OUT 240,3
20 FOR T = 1 TO 600: NEXT T
30 OUT 244,2: OUT 240,228: PRINT INP(243): GOTO 30
```

If the number displayed on the Monitor screen is not 255, check the waveforms at pins 26 and 27 of Format/Controller IC (U7) on the Drive Interface board. See Figure 7. If the waveforms are correct check IC U7. If the waveform is missing at pin 26 of IC U7, check the logic readings on pins 1 thru 20 of Support Logic IC (U11) and pins 1 thru 16 of VCO IC (U14). If the waveform is missing at pin 27 of IC U7, check for 125kHz waveforms at pins 1 and 14 of Read Amp IC (4A) on the Disk Drive board. If the waveforms are missing at

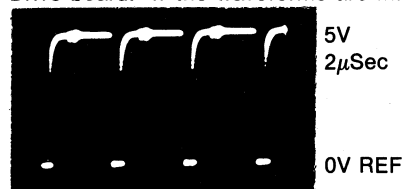


Figure 7

CSCS5-B

RADIO SHACK  
MODEL III

## TROUBLESHOOTING (Continued)

pins 1 and 14 of IC 4A check for a Low logic reading at pin 10 of IC 2B. If pin 10 of IC 2B does not read logic Low and pin 11 of IC 2B checks a logic High, check IC 2B. If pin 11 of IC 2B does not check logic High, refer to the "Write Protect Will Not Work" section of this Troubleshooting guide. If pin 10 of IC 2B checks a logic Low, check the voltages and components associated with pins 1, 4, 7, 8, 10, 11 and 14 of Read Amp IC 3A, check the Read/Write Head for continuity at pins 2 and 4 of Connector P6. Check Connector P6 for good connections. If the waveforms check good at pins 1 and 14 of IC 4A, check the 125kHz waveforms at pins 2 and 3 of Comparator IC (5B). If the waveforms are missing at pins 2 and 3 of IC 5B, check the voltages and components associated with pins 1, 4, 7, 8, 10, 11 and 14 of IC 4A. If the waveforms check good at pins 2 and 3 of IC 5B, check the waveform at pin 7 of IC 5B while opening and closing the Drive door. The waveform should change from random pulses when the Drive door is open to 125kHz pulses (See Figure 8) when the Drive door is closed. NOTE: The random pulses are present in the Read circuits from pin 7 of IC 5B to pin 5 of IC 5E even when the drive is not running. If the waveform does not change from random pulses with the Drive door open to 125kHz pulses with the Drive door closed or the pulses are missing, check IC 5B.

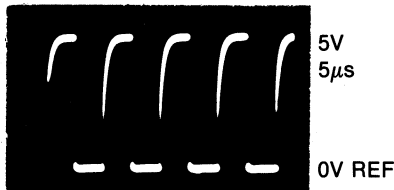


Figure 8

If the waveform checks good at pin 7 of IC 5B, check for pulses at pin 11 of IC 5D. If pulses are missing at pin 11 of IC 5D check Capacitor C13, Resistor R21 and IC 5D. If pulses are present at pin 11 of IC 5D, check for pulses at pin 4 of Flip/Flop IC (5E). If pulses are missing at pin 4 of IC 5E, check Capacitor C11, Resistor R22 and IC 5E. If pulses are present at pin 4 of IC 5E, check for pulses at pin 5 of Flip/Flop IC (5C). If pulses are missing at pin 5 of IC 5C, check IC 5C. If pulses are present at pin 5 of IC 5C, check for pulses at pin 8 of IC 5D. If pulses are missing at pin 8 of IC 5D, check Capacitor C14, Resistor R23 and IC 5D. If pulses are present at pin 8 of IC 5D, check for pulses at pin 5 of Flip/Flop IC (5E). If pulses are missing at pin 5 of IC 5E, check Capacitor C12, Resistor R24 and IC 5E. If pulses are present at pin 5 of IC 5E, check for pulses at pin 8 of IC 1F. If pulses are missing at pin 8 of IC 1F check IC 1F. If pulses are present at pin 8 of IC 1F check for pulses at pin 12 of MUX IC (U22) on the Disk Drive Interface board. If pulses are missing at pin 12 of IC U22 check pin 30 of Connector J4 on the Disk Drive Interface board and J1 on the Disk Drive board for good connections and check IC U22. If pulses are present at pin 12 of IC U22, check for pulses at pin 4 of Multivibrator IC (U15). If pulses are missing at pin 4 of IC U15, check Capacitor C9, Resistor R8 and IC U15.

### WILL NOT WRITE

Check connectors J4 on the Disk Drive Interface board and J1 on the Disk Drive board for good connections. To check the write circuits on the Disk Drive Interface board and Disk Drive board, ground pin 13 of IC 3D on the Disk Drive board, use a Logic Pulser and inject pulses at pin 31 of Format/Controller IC (U7) on the Disk Drive Interface board.

Use the following program to keep Drive 1 running continuously. Change the number 1 after the comma to 2 to keep Drive 0 running.

```
10 OUT 244,1: GOTO 10
```

Check for write pulses at pin 6 of Support Logic IC (U11) on the Drive Interface board. If pulses are missing, check the logic readings on pins 1 thru 20 of IC U11, pins 1 thru 11 of VCO IC (U14) and pins 2 and 17 of Clock Generator IC (U13). If any of the logic readings are not correct check the IC with the bad logic reading and check any components associated with that IC. If pulses are present at pin 6 of IC U11, check for pulses at pin 5 of IC U23. If pulses are missing at pin 5 of IC 23, check Capacitor C14, Resistor R16 and IC U23. If pulses are present at pin 5 of IC U23, check for pulses at pin 8 of IC U9. If pulses are missing at pin 8 of IC U9, check IC U9. If pulses are present at pin 8 of IC U9, check for pulses at pin 6 of IC 2E on the Disk Drive board. If pulses are missing at pin 6 of IC 2E, check IC 2E. If pulses are present at pin 6 of IC 2E, check for a Low logic reading at pin 13 of IC 2E. If the logic reading is not correct at pin 13 of IC 2E refer to the "Write Protect Will Not Work" section of this Troubleshooting guide. If the reading is correct at pin 13 of IC 2E, check for a High logic reading at pin 12 of IC 2E. If pin 12 of IC 2E does not read logic High, check IC 2E. If pin 12 of IC 2E reads logic High, check for pulses at pins 8 and 9 of Flip/Flop IC (5C). If pulses are missing at pin 8 or 9 of IC 5C, check IC 5C. If pulses are present at pins 8 and 9 of IC 5C, check for pulses at pins 6 and 8 of IC 2B. If pulses are missing at pins 6 or 8 of IC 2B, check IC 2B. If pulses are present at pins 6 and 8 of IC 2B, check for 1.5V at pin 4 of IC 2B. If pin 4 of IC 2B does not check 1.5V, check IC 2B, Diode CR13 and Resistor R26. If pin 4 of IC 2B checks 1.5V, check for pulses at the collectors of Write Amp Transistors (Q1 and Q2). If pulses are missing at Transistor Q1 or Q2, check the voltages and components associated with Transistors Q1 thru Q4. If pulses are present at the collectors of Transistors Q1 and Q2, check Diodes CR1 thru CR4, check the Read/Write Head for continuity at pins 2 and 4 of Connector P6.

Check for erase pulses at pin 13 of Flip/Flop IC (3C). If pulses are missing at pin 13 of IC 3C, check Capacitor C16, Resistor R55 and IC 3C. If pulses are present at pin 13 of IC 3C, check for a High logic reading at pin 12 of IC 3C. NOTE: When the program to keep the Disk Drive running is started, a pulse should occur at pin 12 of IC 3C, then pin 12 should go High and stay High. If the logic reading at pin 12 of IC 3C is not correct, check Capacitor C15, Resistor R54 and IC 3C. If the reading is correct at pin 12 of IC 3C, check for pulses at pin 6 of IC 3B. If pulses are missing at pin 6 of IC 3B, check IC 3B. If pulses are present at pin 6 of IC 3B, check for pulses at pin 5 of Erase Amp IC (2C). If pulses are missing at pin 5 of IC 2C, check IC 2C. If pulses are present at IC 2C, check for pulses at pins 1 and 3 of Connector P6. If pulses are missing at pin 1 of Connector P6, check Resistor R58. If pulses are missing at pin 3 of Connector P6, check the Erase Head for continuity at pin 1 and 3 of Connector P6 and check Capacitor C20, Diode CR17 and Resistor R69.

If the write and erase circuits check good, check Format/Controller IC (U7) on the Disk Drive Interface board by substitution and check the oscillators, refer to the "Disk Drive Interface Oscillator and VCO Oscillator" section of this Troubleshooting guide.



## TROUBLESHOOTING (Continued)

### WRITE PROTECT WILL NOT WORK

If a write protected diskette is being written on, use the program given in "Continuous Operation of Disk Drive" to keep the Disk Drive running. Insert a write protected diskette into the Disk Drive. Check for a High logic reading at pin 11 of IC 3D on the Disk Drive board. If the logic reading is not correct check the Write Protect Switch (S1), pins 1 and 2 of Connector P8 for good connections, and Resistor R64. If the logic reading is High at pin 11 of IC 3D, check for a Low logic reading at pin 10 of IC 3D and a High logic reading at pin 8 of IC 3B. If the logic reading is not correct at pin 10 of IC 3D, check IC 3D. If the logic reading is Low at pin 10 of IC 3D and not correct at pin 8 of IC 3B, check IC 3B. If the logic readings are Low at pin 10 of IC 3D and High at pin 8 of IC 3B, check for a Low logic reading at pin 6 of IC 1F. If the logic reading is not correct at pin 6 of IC 1F check IC 1F. If the logic reading is Low at pin 6 of IC 1F, check for a Low logic reading at pin 9 of MUX IC (U22) on the Disk Drive Interface board. If the reading is not correct at pin 9 of IC U22, check pin 28 of Connector J4 on the Disk Drive Interface board and Connector J1 on the Disk Drive Board for good connections and check IC U22. If the logic reading is Low at pin 9 of IC U22, check Format Controller IC (U7).

### DRIVE MOTOR MALFUNCTIONS

Check Connectors P13, P20, P21 and J2 for good connections. Check for 12.0V at pin 1 of Connector J2 on the Disk Drive board. If 12.0V is missing refer to the "Power Supply" section of this Troubleshooting Guide.

Type in and run the program given under "Continuous Operation of Disk Drive". Check for a Low logic reading at pin 16 of Connector J1 on the Disk Drive board. If the logic reading is Low check for a High logic reading at pin 2 of IC 2E on the Disk Drive board. If the reading at pin 2 of IC 2E is not correct, check IC 2E. If the reading is High at pin 2 of IC 2E, check for a High logic reading at pin 7 of Connector J1 on the Non Linear Servo board. If the reading is not correct at pin 7 of Connector J1 check pin 4 of Connector P20 and pin 1 of Connector P13 for good connections. If the reading is High at pin 7 of Connector J1, check for 12.0V at pin 10 of Connector J1 on the Non Linear Servo board. If 12.0V is missing check pin 1 of Connector P20, pin 4 of Connector P13 and pin 1 of Connector J2 for good connections. If the connections check good, refer to the "Power Supply" section of this Troubleshooting Guide. If 12.0V is present at pin 10 of Connector J1 check the voltages, waveforms and components associated with pins 1 thru 5 and 8 thru 12 of Frequency to Voltage Converter IC (U1). Check Motor On Transistor (Q2) and Motor Switch Transistor (Q1). Also check the Drive Motor (M1) and check Connector P21 for good connections.

If pin 16 of Connector J1 on the Disk Drive board does not check a logic Low, check pin 16 of Connector J1 on the Disk Drive board and Connector J4 on the Disk Drive Interface board for good connections. If the connections are good check for a High logic reading at pin 5 of Multivibrator IC (U15) on the Disk Interface board. If pin 5 reads logic High, check IC U9. If pin 5 of IC U15 does not read logic High, check for pulses at pin 9 and a High logic reading at pin 11

of IC U15. If the logic readings are good check IC U15. If the logic reading is not correct at pin 11 of IC U15 check Resistor R19. If pulses are not present at pin 9 of IC U15, check for pulses at pin 6 of Tri-State Buffer IC (U4). If pulses are present at pin 6 of IC U4, check IC U4. If pulses are missing at pin 6 of IC U4, check Decoder IC (U41) on the System board.

### TRACK 00 DETECTOR

To verify the track 00 detector circuit is working, push the Disk Drive head away from track 00 before turning On the Computer. Connect a Logic Probe to pin 34 of Format Controller IC (U7) on the Disk Drive Interface board. Turn On the Computer. Type in and run the following Basic program. The program turns On Drive 1, moves the head back to track 00 and two numbers appear on the Monitor screen. The first number appears when the head is off track 00 and should be 2, the second number appears when the head is on track 00 and should be 6. Do not put a diskette in the Disk Drive.

```
10 OUT 244,2: PRINT INP(240): OUT 240,3
20 FOR T = 1 TO 600: NEXT T: PRINT INP(240)
```

NOTE: If the head does not move when the program is running refer to the "Head Position Motor Malfunctions" section of this Troubleshooting guide. The Logic Probe should read logic High while the head is off track 00 and change to logic Low when the head is ON track 00. If the logic probe readings are correct but the numbers that appear on the Monitor screen are not correct, check IC U7.

If the logic readings are not correct at pin 34 of IC U7, check for a High logic reading at pin 11 of IC 4F on the Disk Drive board when the head is on tracks 00, 01 or 02. Check for a Low logic reading when the head is on track 03 or higher. If the logic readings are not correct check Connector P11 for good connections and check the Track 00 Switch (S2), Resistors R43, R59 and R60 and IC 4F. If the logic reading is High at pin 11 of IC 4F, check for a Low logic reading at pin 8 of IC 4B when the head is on track 00 and a High logic reading when the head is off track 00. If the logic reading is not correct at pin 8 of IC 4B and pins 10 and 12 of IC 4B read a logic High when the head is on track 00, check IC 4B. If the logic reading is Low at pin 8 of IC 4B, check for a High logic reading at pin 2 of IC 3D when the head is on track 00 and a Low logic reading when the head is off track 00. If the logic readings are not correct at pin 2 of IC 3D, check IC 3D. If the logic reading is correct at pin 2 of IC 3D, check for a Low logic reading at pin 11 of IC 1F when the head is on track 00 and High logic reading when the head is off track 00. If the readings are not correct and pin 13 of IC 1F reads a logic High when the Disk Drive is running, check IC 1F. If pin 13 of IC 1F does not read logic High when the Disk Drive is running refer to the "Disk Drive Select Malfunction" section of this Troubleshooting guide. If the logic reading is Low at pin 11 of IC 1F, check pin 26 of Connector J1 for good connections, on the Disk Drive board and Connector J4 on the Disk Drive Interface board. If the connections are good, check for a High logic reading at pin 1 of MUX IC (U22) on the Disk Drive Interface board. If the logic reading at 1 of IC U22 is not correct and pins 2 and 3 of IC U17 check a logic Low, check IC U17. If pins 2 or 3 of IC U17 do not check a logic Low, check Flip/Flop IC (U6). If the reading is High at pin 1 of IC U22, check IC U22.

## TROUBLESHOOTING (Continued)

### INDEX DETECTOR

To check the Index Detector, type in and run the following Basic program. Connect a Logic Probe to pin 35 of Format Controller IC (U7) on the Disk Drive Interface board.

```
10 OUT 244,2: PRINT INP(240): GOTO 10
```

This program will keep Disk Drive 1 running and continuously display a number on the Monitor screen. The number should be 6 and the logic probe should read logic Low with no diskette in the Disk Drive. The number should change to 4 and the logic probe should read logic High when a 3 x 5 card is inserted in the Index Detector. If the Logic Probe readings are correct but the number that appears on the Monitor screen is not correct check IC U7. If the logic probe readings are not correct, insert a diskette into the Disk Drive and close the door.

Check for pulses at the base of Index Detector Transistor (Q8) on the Disk Drive board. If pulses are missing, check the Index Detector assembly, Connector P10, Resistors R45 and R52 and Transistor Q8. If pulses are present at the base of Transistor Q8, check for pulses at pin 1 of IC 2E. If pulses are missing at pin 1 of IC 2E, check Transistor Q8, Capacitor C9 and Resistor R44. If pulses are present at pin 1 of IC 2E, check for pulses at pin 2 of IC 2E. If pulses are missing at pin 2 of 2E, check IC 2E. If pulses are present at pin 2 of IC 2E check for pulses at pin 3 of IC 1F. If pulses are missing at pin 3 of IC 1F, check IC 1F. If pulses are present at pin 3 of IC 1F, check for pulses at pin 7 of MUX IC (U22) on the Disk Drive Interface board. If pulses are missing at pin 7 of IC U22 and pin 1 of IC U22 reads a logic High, check pin 8 of Connector J4 for good connections and check IC U22.

### HEAD POSITION MOTOR MALFUNCTIONS

Check Connector J4 on the Disk Drive Interface board and Connectors J1 and J4 on the Disk Drive board for good connections.

The following Basic program can be used to keep the Head Position motor circuits operating while tests are being made. The program moves the head back and forth between tracks 00 and 40. Press the BREAK key to stop the program.

```
10 OUT 244,2: OUT 240,3  
20 FOR T=1 TO 700: NEXT T  
30 OUT 244,2: OUT 243,40: OUT 240,19  
40 FOR T=1 TO 700: NEXT T: GOTO 10
```

NOTE: If the head stays at track 00 or track 40 and keeps hitting the stop, check the operation of the Track 00 Detector circuit refer to the "Track 00 Detector" section of this Troubleshooting guide.

Check for stepping pulses on the Disk Drive Interface board at pin 15 of Format Controller IC (U7), pin 5 of Tri-State Buffer IC (U16) and pin 10 of IC's U9 and U21. If pulses are missing at pin 15 of IC U7, check IC U7. If pulses are present at pin 15 of IC U7 and missing at pin 5 of IC U16, check IC U16. If pulses are present at pin 5 of IC U16 and missing at pin 10 of IC U9, check IC U9. If pulses are missing at pin 10 of IC U21, check IC U21.

If the stepping pulses check good, check the Direction Control logic levels on the Disk Drive Interface board at pin 16 of IC U7 and pin 7 of IC U16. The logic reading should be High when the head is moving toward the spindle and Low when the head is moving away from the spindle. If the logic readings are not correct at pin 16 of IC U7, check IC U7. If the logic readings are correct at pin 16 of IC U7 and not correct at pin 7 of IC U16, check IC U16. If the logic readings are correct at pin 7 of IC U16, check the logic readings at pin 2 of IC's U9 and U21. The logic reading should be Low when the head is moving toward the spindle and High when the head is moving away from the spindle. If the logic readings are not correct at pin 2 of IC U9, check IC U9. If the logic readings are not correct at pin 2 of IC U21, check IC U21.

If the signals check good on the Disk Drive Interface board, check for Step Control pulses at pin 10 of IC 2E and pin 6 of IC 4B on the Disk Drive Board. If pulses are missing at pin 10 of IC 2E, check IC 2E. If pulses are present at pin 10 of IC 2E and missing at pin 6 of IC 4B and pins 1, 2 and 4 of IC 4B, read logic High, check IC 4B. Note: pin 4 of IC 4B should read logic Low when the head is on track 00.

If pulses are present at pin 6 of IC 4B, check for a Low logic reading at pin 4 of IC 3D when the head is moving towards the spindle and a High logic reading when the head is moving away from the spindle. If the readings are not correct at pin 4 of IC 3D, check IC 3D. If the readings are correct at pin 4 of IC 3D, check for a High logic reading at pin 6 of IC 3E. If pin 6 of IC 3E does not read logic High check Electrolytic C17, Resistors R53 and R63 and IC3E. If pin 6 of IC 3E reads a logic High, check for pulses at pins 5, 6, 8 and 9 of Flip/Flop IC (4C). If pulses are missing at pin 5, 6, 8 or 9 of IC 4C check Driver IC's (4C and 5D). If pulses are present at pins 5, 6, 8 and 9 of IC 4C check IC's 4D and 4E, Resistor R62, Diodes CR18 thru CR20 and the Head Position Motor (M2).

# ADJUSTMENTS

## VOLTAGE LEVEL

Connect the input of a voltmeter to TP12 (pin 2 of IC U14). Adjust the Voltage Level Control (R7) for 1.4V when the Disk Drive is not running.

## VCO FREQUENCY ADJUSTMENT

Connect the input of a frequency counter to TP13 (pin 16 of IC U11). Adjust the VCO Frequency Control (R6) for a frequency of 2.0MHz when the Disk Drive is not running.

## WRITE PRECOMPENSATION ADJUSTMENT

Connect the input of a scope to TP14 (pin 4 of IC U11). Set the scope sweep to  $.1\mu\text{Sec}$ , trigger to negative slope and voltage range to the 2V range. Use the FORMAT program to format a blank diskette see "General Operating Instructions". While the FORMAT program is formatting track 21 or a higher track, adjust the Write Precompensation Control (R5) for a pulse width of 200nSec at pin 4 of IC U11.

## EQUIPMENT REQUIRED

A test program or a Disk Drive Tester is required which will turn On the Disk Drive and step the head to the track specified in the alignment procedures. Use a Dysan Analog Alignment Diskette 224/2A when an Alignment Diskette is specified in the alignment procedures. NOTE: This alignment diskette has only alignment patterns on it and does not contain any alignment programs.

## TEST SETUP

Connect a Disk Drive known to be operating properly to the Computer as Disk Drive 0. Connect the defective Disk Drive as Disk Drive 1. Use Disk Drive 0 to load any alignment or test program needed to check the defective Disk Drive.

**WARNING:** It is possible for a defective Disk Drive to write on or erase information on a diskette, even if the diskette is write protected. Check the Disk Drive by first using a diskette that has programs that have been backed up on another diskette. Do not leave the alignment diskette in the drive while checking voltages and waveforms unless specified in the alignment procedures. The test equipment may cause the Disk Drive circuits to erase sections of the alignment diskette even if the diskette is write protected.

## 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 (R4) 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 R4 for a speed of  $300\text{rpm} \pm 5\text{rpm}$ .

## SPEED VARIATION CHECK

Connect the input of a scope to TP5, pin 9 of IC 1F. Set the scope sweep time to  $2\mu\text{Sec}$ , trigger to positive slope and voltage range to 2V. Insert a blank diskette in Disk Drive and write a 125kHz (2F) pattern on any track, then read that track (or use an alignment diskette that has 125kHz pattern on one track). The leading edge of the third pulse should be  $8\mu\text{Sec} \pm 240\text{nSec}$  from the leading edge of the trigger pulse (the leading edge jitter of the third pulse should be less than 480nSec). See Figure 6.

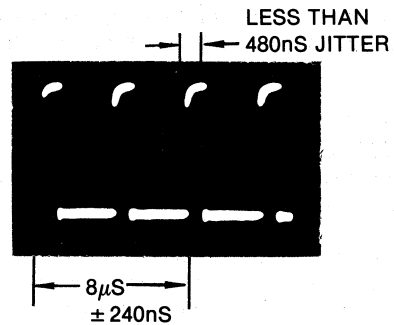


Figure 6

If the jitter is out of tolerance check the Disk Drive belt, Disk Drive motor (M1), motor speed control circuit (IC U1 and Transistors Q1 and Q2) and spindle mechanism.

## RADIAL HEAD ALIGNMENT (HEAD POSITION)

Connect the channel A input of a dual trace scope to TP3, channel B input to TP4, the external trigger input to TP7 and connect the scope ground to TP6. Set the scope to add mode with channel B inverted, sweep time to 20ms, AC input, trigger to positive slope and voltage to  $.2\text{V}$  range. Insert the Alignment Diskette, turn On the Disk Drive and set the head to track 16. Observe the cats-eye pattern, see Figure 4. The lobes should be within 75% of each other. If the lobes are out of tolerance, loosen the two head module retaining screws on the bottom of the Disk Drive and one screw on the top next to the Radial Head Alignment screw, see Disk Drive Mechanical - Top View Photo. Turn the Radial Head Alignment Screw until the lobes are within 80% of each other and retighten the three retaining screws.

Move the head to track 39 and back to track 16, then to track 00 and back to track 16, verifying that the lobes are within tolerance when the head is on track 16.

EQUAL AMPLITUDE

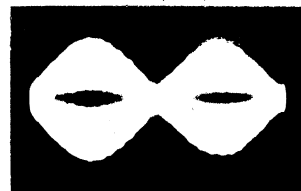


Figure 4

CSCS5-B

RADIO SHACK  
MODEL III

## ADJUSTMENTS (Continued)

### TRACK 00 ADJUSTMENT

Insert the Alignment Diskette into the Disk Drive and close the door. Turn On the Disk Drive and set the head to track 16. Confirm that the head is on track 16 by observing the cats-eye pattern, see the "Radial Head Alignment" in this Alignment guide. If the cats-eye pattern is not correct, perform the Radial Head Alignment.

To adjust the Track 00 Switch (S2), set the head to track 02. Loosen the retaining screw at the base of the Track 00 switch bracket and turn the Track 00 Switch Adjustment Screw Maximum counter-clockwise, see Disk Drive Mechanical Photo, Top View. Turn the screw clockwise until a "click" is heard and then turn the screw clockwise one half turn more. Retighten the Track 00 switch bracket retaining screw.

Verify the Track 00 Switch (S2) adjustment by setting the head on track 03 and checking for 5.0V at pin 1 of Connector P11, then set the head back to track 02, the reading at pin 1 of P11 should be 0V.

To adjust the Track 00 Stop Adjustment Screw, connect the input of a scope to TP1 and set the sweep time to  $10\mu\text{s}$  and the voltage range to .5V. Insert the Alignment Diskette and close the door. Turn On the drive and set the head to track 00. A 125kHz sine wave of about .6V peak to peak should appear on the scope. Turn the Track 00 Stop Adjustment Screw clockwise until the amplitude of the 125kHz signal just starts to decrease then turn the screw counterclockwise 1/2 turn, see Disk Drive Mechanical - Top View Photo. Apply a small amount of cement to the screw to keep it in place.

### INDEX SENSOR ADJUSTMENT

Connect the channel A input of a dual trace scope to TP3, channel B input to TP7 (index pulse) and the scope ground to TP6. Set the scope display to channel A with the voltage range set to 20mV and the sweep time to  $50\mu\text{s}$ . Set the channel B input to noninverting mode and trigger the scope on channel B with the trigger set to positive slope.

Insert the Alignment Diskette in the Disk Drive and close the door. Turn On the Disk Drive and set the head to track 01. Confirm that the leading edge of the burst occurs  $200\mu\text{s} \pm 50\mu\text{s}$  after the leading edge of the index pulse, see Figure 5. If the index sensor is out of adjustment, loosen the index sensor retaining screw on the bottom of the Disk Drive and use a flat blade screwdriver placed in the slots on the chassis and index sensor to adjust for  $200\mu\text{s} \pm 50\mu\text{s}$ , see Disk Drive Mechanical, Bottom View Photo.

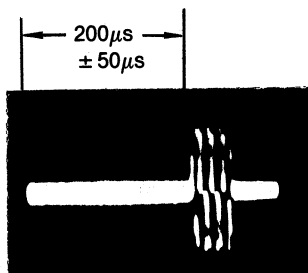


Figure 5

### AZIMUTH CHECK

Connect the channel A input of a dual trace scope to TP3, channel B input to TP4, external trigger input to TP7 and connect the scope ground to TP6. Set the scope to add mode with channel B inverted, sweep time to .5ms, AC input, trigger to positive slope and voltage to .1V range.

Insert the Alignment Diskette, turn On the Disk Drive and set the head to track 34. Confirm that the pattern appears as shown in Figure 3. The amplitude of bursts 1 and 4 must be equal to or less than the amplitude of bursts 2 and 3.

No adjustment is provided for the head azimuth. If the azimuth is out of tolerance, the head may need replacement.

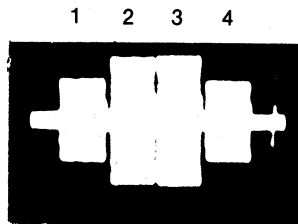


Figure 3

## SCHEMATIC NOTES

--- Circultry not used in some versions

--- Circultry used in some versions

• See parts list

⊕ Ground

⌞ Chassis

Voltages, Waveforms and Logic Probe readings for Disk Drive and Disk Drive Interface board taken while running the following Basic program.

10 OPEN "0", 1, "SAMS:1"

20 FOR X = 1 TO 300

30 PRINT #1, "THIS IS A TEST"

40 NEXT X

50 CLOSE 1

60 GOTO 10

1. Probe indicates P when Head Position motor is operating.
2. Probe indicates H when Head is moving in and L when Head is moving out from center of diskette.
3. Probe indicates L when Head is moving in and H when Head is moving out from center of diskette.
4. Probe indicates H if diskette is write protected.
5. Probe indicates L if diskette is write protected.
6. Probe indicates H when Head is on track 00, 01 or 02.
7. Probe indicates L when Head is on track 00, 01 or 02.
8. Logic reading not taken.

Resistors are ½W or less, 5% unless noted.

Value in ( ) used in some versions.

Measurements with switching as shown, unless noted.

Waveforms taken with triggered scope and Sweep/Time switch in Calibrate position, scope input set for DC coupling on 0 reference voltage waveforms. Switch to AC input to view waveforms after DC reference is measured when necessary. Each waveform is 7 cm. width with DC reference voltage given at the bottom line of each waveform.

Time in  $\mu$ sec. per cm, given with p-p reading at the end of each waveform.

Item numbers in rectangles appear in the alignment/adjustment instructions.

Supply voltages maintained as shown at input.

Voltages measured with digital meter, no signal.

Controls adjusted for normal operation.

Terminal identification may not be found on unit.

Capacitors are 50 volts or less, 5% unless noted.

Electrolytic capacitors are 50 volts or less, 20% unless noted.

Logic Probe Display

L = Low

H = High

P = Pulse

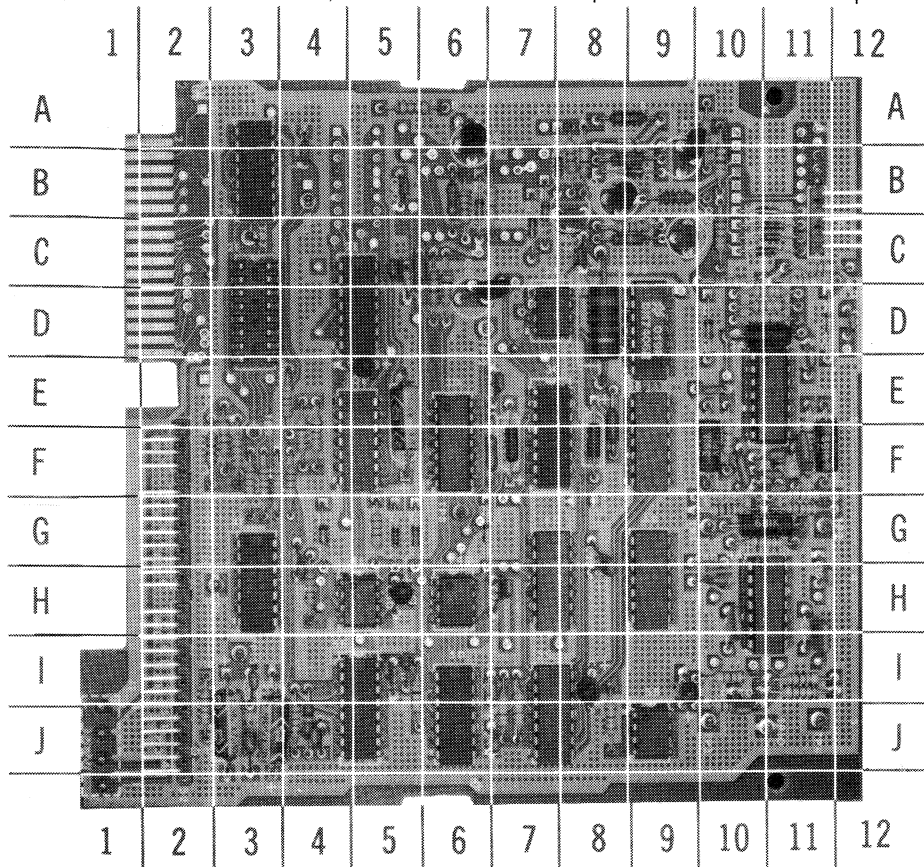
\* = Open (No light On)

CSCS5-B

RADIO SHACK  
MODEL III

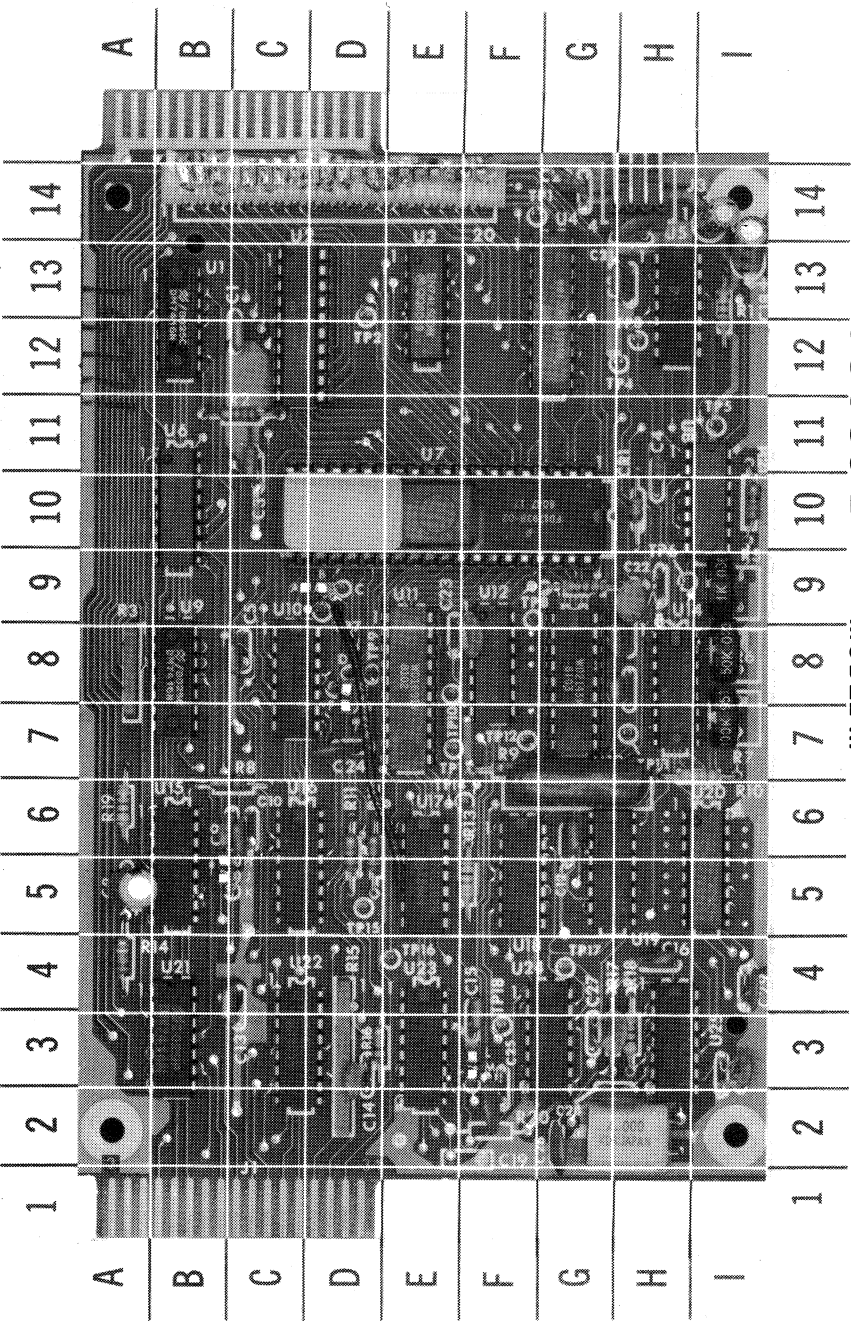
# DISK DRIVE BOARD GridTrace LOCATION GUIDE

C1	D-11	C40	G-10	R9	G-11	R59	F-4
C2	F-11	C41	D-12	R10	G-10	R60	F-3
C3	F-11	CR1	C-11	R11	G-10	R61	J-4
C4	F-10	CR2	C-11	R12	G-11	R62	F-3
C5	F-11	CR3	C-11	R13	G-11	R63	F-4
C6	F-11	CR4	B-11	R14	A-5	R64	F-4
C7	H-10	CR11	D-10	R16	J-10	R65	B-6
C8	I-11	CR12	D-11	R17	I-11	R66	B-7
C9	C-6	CR13	B-9	R18	I-10	R68	H-4
C10	J-10	CR14	C-7	R19	I-11	R69	B-6
C11	I-5	CR15	B-7	R20	J-8	1F	B-3
C12	J-4	CR16	B-8	R21	J-7	2B	D-9
C13	I-7	CR17	B-6	R22	I-5	2C	D-7
C14	J-7	CR18	G-6	R23	J-7	2E	D-5
C15	F-7	CR19	G-5	R24	J-4	2F	D-3
C16	F-8	CR20	G-5	R25	B-9	3A	E-11
C17	E-5	CR21	G-4	R26	B-9	3B	F-9
C18	E-11	J1	C-2	R27	C-9	3C	F-7
C19	H-11	J2	J-1	R28	A-10	3D	F-6
C20	B-5	J3	C-11	R29	B-10	3E	F-5
C21	E-10	J4	G-2	R30	C-10	4A	H-11
C22	H-10	L1	F-10	R31	B-9	4B	H-9
C23	C-8	L2	F-11	R32	B-8	4C	H-7
C25	G-8	L3	G-11	R33	B-8	4D	H-6
C26	I-8	Q1	B-9	R34	A-9	4E	H-5
C27	E-7	Q2	C-9	R35	C-9	4F	H-3
C28	H-7	Q3	B-9	R42	F-3	5B	J-9
C29	C-5	Q4	C-8	R43	F-3	5C	I-7
C30	H-5	Q5	A-6	R44	D-6	5D	I-6
C31	I-5	Q8	D-6	R45	D-6	5E	I-5
C32	B-4	R1	C-10	R47	G-5		
C33	H-4	R2	C-11	R48	F-2		
C34	I-3	R3	C-11	R49	J-2		
C35	J-3	R4	D-11	R52	F-3		
C36	J-3	R5	D-11	R53	F-4		
C37	J-3	R6	D-11	R54	F-7		
C38	E-5	R7	F-10	R55	F-8		
C39	I-9	R8	F-11	R58	D-8		



# DISK DRIVE INTERFACE BOARD GridTrace LOCATION GUIDE

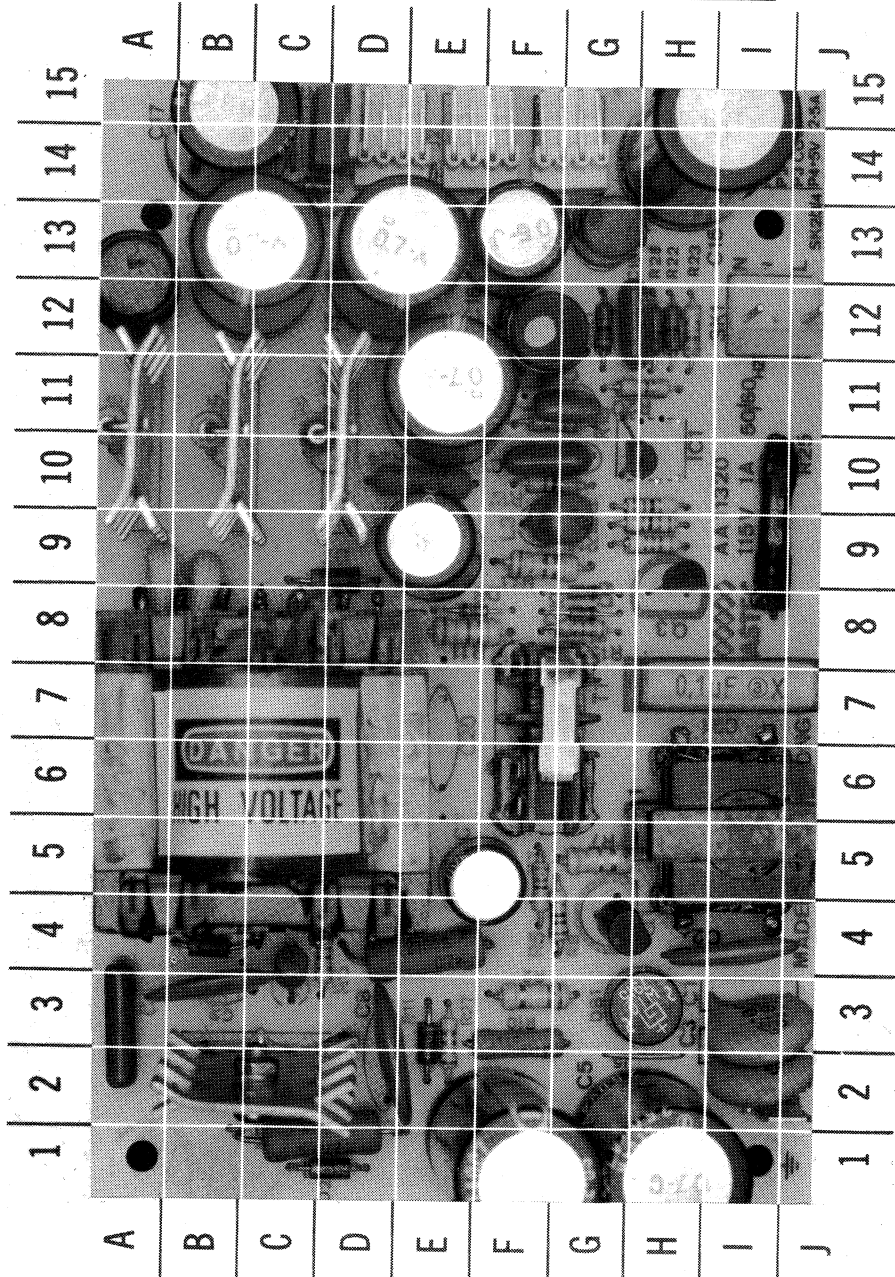
C1	C17	I-14	J3	B-14	R15	D-3	U11	E-8
C2	C18	I-14	J4	H-14	R16	D-3	U12	F-8
C3	C20	G-14	R1	I-13	R17	G-3	U13	G-8
C4	C21	H-14	R2	C-11	R18	H-3	U14	H-8
C5	C22	H-9	R3	A-8	R19	A-6	U15	B-6
C6	C23	F-8	R4	G-9	R21	I-10	U16	C-6
C7	C24	D-7	R5	I-9	U1	B-13	U17	E-6
C8	C25	F-2	R6	I-8	U2	C-13	U18	F-6
C9	C26	G-2	R7	I-7	U3	E-13	U19	G-6
C10	C27	G-3	R8	B-6	U4	G-13	U20	I-6
C11	C28	H-2	R9	F-7	U5	H-13	U21	B-4
C12	C29	I-4	R10	I-7	U6	B-10	U22	C-4
C13	C30	I-3	R11	D-6	U7	F-10	U23	E-4
C14	CR1	H-10	R12	D-6	U8	I-10	U24	G-4
C15	J1	C-1	R13	F-5	U9	B-8	U25	H-4
C16	J2	B-15	R14	A-4	U10	C-8	Y1	H-2



**CSCS5-B**  
RADIO SHACK  
MODEL III

**POWER SUPPLY BOARD**  
GridTrace LOCATION GUIDE

C1	I-3	L6	G-13
C2	I-4	Q1	G-4
C3	I-2	Q2	C-2
C4	A-3	Q3	H-9
C5	H-1	R1	E-4
C6	F-1	R2	F-3
C7	F-5	R3	E-5
C8	D-3	R5	F-5
C9	B-3	R6	D-4
C10	F-10	R7	G-5
C11	E-11	R8	G-4
C12	C-13	R9	D-1
C13	D-13	R10	F-3
C14	E-9	R11	E-8
C15	H-14	R12	F-10
C16	F-13	R13	F-9
C17	B-15	R14	H-9
C18	G-11	R15	G-8
C19	G-12	R16	H-9
C21	I-7	R17	H-10
D1	E-5	R18	F-11
D2	D-1	R19	C-13
D3	B-4	R20	G-11
D4	C-11	R21	G-12
D5	B-11	R22	H-12
D6	A-11	R23	H-12
D7	D-9	R24	E-10
D8	E-8	R25	I-9
D9	G-8	R26	H-12
D10	G-8	R27	E-3
D11	E-3	SCR1	C-14
DB1	H-3	SK1	I-12
IC1	H-10	SK2	D-14
L1	I-5	SK3	E-14
L2	C-4	SK4	G-14
L3	G-9	T1	F-7
L4	F-12	T2	C-6
L5	A-13	Z1	C-14



**POWER SUPPLY BOARD**

A Howard W. Sams **GRIDTRACE™** Photo



# PARTS LIST AND DESCRIPTION

When ordering parts, state Model, Part Number, and Description

## SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFGR. PART No.	REPLACEMENT DATA						
			GENERAL ELECTRIC PART No.	NTE PART No.	PHILIPS ECG PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.	
	<b>DISK DRIVE POWER SUPPLY BOARD</b>								
D1	RG10A		GE-511	NTE552	ECG552	SK5014	WEP172/506	103-287	
D2	RG10D		GE-511	NTE552	ECG552	SK5014	WEP172/506	103-287	
D3	RG10J		GE-511	NTE552	ECG552	SK318A	WEP172/506	103-287	
D4 thru D6	RG3B			NTE580	ECG580	SK5036/580			
D7	RG15B		GE-511	NTE552	ECG552	SK5014	WEP172/506	103-287	
D8 thru D10	1N4606		GE-300	NTE177	ECG177	SK9091/177	WEP1062/177	103-131	
D11	1N4001		GE-504A	NTE116	ECG116	SK3311	WEP154	212-76-02	
DB1	W06		GEBR-600	NTE5305	ECG5305	SK3676/5305	WEP1054/169	212-Z9002	
IC1	0100 TL431CLP								
Q1	2SC2120-0		GE-289A	NTE289A	ECG289A	SK3849/293	WEP914/297	921-1114	
Q2	PE8050B		GE-47*	NTE293*	ECG293*	SK3849/293*	WEP912/293*	121-Z9066*	
	2SC2502			NTE379	ECG379	SK9085/379	WEP379/379	121-Z9111	
Q3	2SA950Y		GE-269	NTE290A	ECG290A	SK3841/294	WEP911/290A	121-Z9003	
	PE850B		GE-48*	NTE294*	ECG294*	SK3841/294*	WEP916/294*	121-Z9067*	
	2N6395		2N6395	NTE5552	ECG5552	SK3574			
SCR1	C122F		C122F1	NTE5461	ECG5461	SK9290/5461	WEP6251/5461		
	6B1		GEZD-6.2	NTE137A	ECG137A	SK6V2/137A	WEP1154/137	103-Z9008	
Z1	5.6V		GEZD-5.6	NTE136A	ECG136A	SK5V6/136A	WEP1104/136	103-Z9007	

\* Lead configuration may vary from original.

**CSCS-5-B**

**RADIO SHACK  
MODEL III**

# PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

## SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA					
			GENERAL ELECTRIC PART No.	NTE PART No.	PHILIPS ECG PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.
	<b>DISK DRIVE INTERFACE BOARD</b>							
CR1	MZ4682	ADX1518	GE-7416	NTE5002A	ECG5002A	SK2A7/5002A	WEPI402/5002	903-454
U1	DM7416N	800-0016	74LS245	NTE7416	ECG7416	SK7416		HE-443-73
U2	SN74LS245N	802-0245	74LS245	NTE74LS245	ECG74LS245	SK74LS245		HE-443-885
U3	SN74LS00N	AMX3550	74LS00	NTE74LS00	ECG74LS00	SK74LS00		HE-443-728
U4	SN74LS244N	AMX3864	74LS244	NTE74LS244	ECG74LS244	SK74LS244		HE-443-791
U5	SN74LS74AN	AMX3558	74LS74A	NTE74LS74A	ECG74LS74A	SK74LS74A		HE-443-730
U6	SN74LS174ND	AMX3565	74LS174	NTE74LS174	ECG74LS174	SK74LS174		HE-443-879
U7	FD1793B-02	WD1793						
U8	SN74LS38N	AXX3041	74LS38	NTE74LS38	ECG74LS38	SK74LS38		HE-443-73
U9	DM7416N	800-0016	GE-7416	NTE7416	ECG7416	SK7416		
U10	SN74LS260N	802-0260			ECG74LS260			
U11	WD1691V	AMX4471						
U12	MC14073B	803-0073			ECG4073B	SK4073B		
U13	WD2143M							
U14	WD2143-01	AMX4472						
U15	SN74LS629N	AMX4663	74LS123	NTE74LS629	ECG74LS629	SK74LS123		HE-443-942
U16	SN74LS123N	AMX3803		NTE74LS123	ECG74LS123			
U17	SN74LS367AN-X	AMX3567	74LS367A	NTE74LS367	ECG74LS367	SK74LS367		HE-443-857
U18	SN74LS02N	AMX3551	74LS02	NTE74LS02	ECG74LS02	SK74LS02		HE-443-779
U19	SN74LS74AN	AMX3558	74LS74A	NTE74LS74A	ECG74LS74A	SK74LS74A		HE-443-730
U20	SN74LS368AN	AMX3568	74LS368A	NTE74LS368	ECG74LS368			
U21	MC14040B	AMX4666	GE-4040	NTE4040B	ECG4040B	SK4040B		HE-443-760
U22	DM7416N	800-0016	GE-7416	NTE7416	ECG7416	SK7416		HE-443-73
U23	SN74LS157N	AMX3563	74LS157	NTE74LS157	ECG74LS157	SK74LS157		HE-443-799
U24	SN74LS123N	AMX3803	74LS123	NTE74LS123	ECG74LS123	SK74LS123		HE-443-942
U25	SN74LS74AN	AMX3558	74LS74A	NTE74LS74A	ECG74LS74A	SK74LS74A		HE-443-730
U25	SN74LS04N	AMX3552	74LS04	NTE74LS04	ECG74LS04	SK74LS04		HE-443-755

# PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

## SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFG. PART No.	REPLACEMENT DATA						
			GENERAL ELECTRIC PART No.	NTE PART No.	PHILIPS ECG PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.	
<b>NON LINEAR SERVO BOARD</b>									
CR1	1N4002	ADX1148	GE-504A	NTE116	ECG116	SK3111	WEP155	212-76-02	
Q1	T1P110	AMX4331	GE-345	NTE261	ECG261	SK3180/263	WEP261/261	121-Z9085	
Q2	2N4124	AMX4178	GE-123AP	NTE123AP	ECG123AP	SK3854/123AP	WEP736/123A	121-Z9000A	
U1	LM2917N	AMX4181		NTE995	ECG995	SK9209/995			
<b>LINEAR SERVO BOARD</b>									
Q1	T1P110	AMX4331	GE-345	NTE261	ECG261	SK3180/263	WEP261/261	121-Z9085	
Q2	2N4124	AMX4178	GE-123AP	NTE123AP	ECG123AP	SK3854/123AP	WEP736/123A	121-Z9000A	
U1	LM2917N	AMX4181		NTE995	ECG995	SK9209/995			
<b>DISK DRIVE BOARD</b>									
CR1 thru CR4	1N4446	ADX1364	GE-514	NTE519	ECG519	SK3100/519	WEP925/519	103-131	
CR11 thru CR21	1N4446	ADX1364	GE-514	NTE519	ECG519	SK3100/519	WEP925/519	103-131	
Q1 thru Q4	2N4124	AMX4178	GE-123AP	NTE123AP	ECG123AP	SK3854/123AP	WEP736/123A	121-Z9000A	
Q5	2N4125	AMX4330	GE-82	NTE159	ECG159	SK3466/159	WEP62/159	121-Z9003	
Q8	2N4124	AMX4178	GE-123AP	NTE123AP	ECG123AP	SK3854/123AP	WEP736/123A	121-Z9000A	
Q99		ART2739(1) ART2895(1)(2)							
1F	SN74LS38N 7438	AMX3683	74LS38	NTE74LS38 NTE7438	ECG74LS38 ECG7438	SK74LS38 SK7438		HE-443-77	
2B	DM7406N	AMX3675	GE-7406	NTE7406	ECG7406	SK7406		HE-443-698	
2C	MC75463P	AMX4329							
2E	SN74LS14N	AMX3716	74LS14	NTE74LS14	ECG74LS14	SK74LS14		HE-443-872	
3A	MC1733CP	AMX4326		NTE927D	ECG927D	SK7617/927D			
3B	SN74LS20N	AMX3555	74LS20	NTE74LS20	ECG74LS20	SK74LS20		HE-443-798	

## 8 PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

### SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA						ZENITH PART No.
			GENERAL ELECTRIC PART No.	NTE PART No.	PHILIPS ECG PART No.	RCA PART No.	WORKMAN PART No.		
3C	SN74LS123N 74123	AMX3955	74LS123	NTE74LS123	ECG74LS123	SK74LS123		HE-443-942	
3D	SN74LS04N	AMX3552	GE-74123	NTE74123	ECG74123	SK74123		221-Z9086	
3E	DM7407N	AMX3684	74LS04	NTE74LS04	ECG74LS04	SK74LS04		HE-443-755	
4A	NE592A	AMX3688		NTE7407	ECG7407	SK7407			
				NTE927D	ECG927D	SK7617/927D			
4B	SN74LS20N	AMX3555	74LS20	NTE74LS20	ECG74LS20	SK74LS20		HE-443-798	
4C	SN74LS74AN	AMX3558	74LS74A	NTE74LS74A	ECG74LS74A	SK74LS74A		HE-443-730	
4D,E	MC75462P	AMX4321							
4F	SN74LS38N 7438	AMX3683	74LS38	NTE74LS38	ECG74LS38	SK74LS38		HE-443-77	
5B	MLM311P1								
	MSM311EL	AMX4327		NTE922M	ECG922M	SK3668/922M		HE-442-75	
5C	SN74LS74AN	AMX3558	74LS74A	NTE74LS74A	ECG74LS74A	SK74LS74A		HE-442-75	
5D	SN74LS86N	AMX3701	74LS86	NTE74LS86	ECG74LS86	SK74LS86		HE-443-730	
5E	SN74LS221N	AMX3810		NTE74LS221	ECG74LS221	SK74LS221		HE-443-891	

(1) Index assembly, includes Q99 w/mounting, D2 w/mounting and wiring harness w/connectors.

(2) Gold band around photo transistor.

# PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING	MFGR. PART No.
<b>NON LINEAR SERVO BOARD</b>		
C5	.047 80V 10%	ACC473KKTA

## CAPACITORS

ITEM No.	RATING	MFGR. PART No.
<b>DISK DRIVE INTERFACE BOARD</b>		
C24	180 N330 50V 5%	
C25	180 N330 50V 5%	
C26	180 N330 50V 5%	
C28	180 N330 50V 5%	

ITEM No.	RATING	MFGR. PART No.
<b>POWER SUPPLY BOARD</b>		
C1	.0022 400VAC	
	.0022 250VAC	
C3	.0022 400VAC	
	.0022 250VAC	
C21	.1 250VAC	

## RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFGR. PART No.	NTE PART No.	WORKMAN PART No.
<b>DISK DRIVE INTERFACE BOARD</b>				
R3	Resistor Network (1)	ARX0241		
R15	Resistor Network (2)	ARX0242		
<b>DISK DRIVE BOARD</b>				
R24	3090 1% 1/4W Metal Film			
	3090 5% 1/4W Metal Film			
R25	768 1% 1/4W Metal Film	AN0575BEC		
R31	768 1% 1/4W Metal Film	AN0572BEC		
R34	1540 1% 1/4W Metal Film	AN0573BEC		
R35	768 1% 1/4W Metal Film	AN0572BEC		
R54	13.3K 1% 1/4W Metal Film	AN0574BEC		
R55	28.7K 1% 1/4W Metal Film	AN0318BEC		
RP1	Resistor Network (4)	ARX0181		
<b>NON LINEAR SERVO BOARD</b>				
R3	1000 1% 1/4W Metal Film			
	1000 5% 1/4W Carbon Film	AN0196EEC	QW210	22-1096
R5	1000 1% 1/4W Metal Film			
	1000 5% 1/4W Carbon Film	AN0196EEC	QW210	22-1096
R6	43.2K 1% 1/4W Metal Film	AN0576BEC		
<b>POWER SUPPLY BOARD</b>				
R21	4700 2% 1/4W Metal Film		QW247	22-2249
R22	2700 2% 1/4W Metal Film		QW227	22-2246
R25	2 10% 2W WW (3)		F2W2DO	
R26	22K 2% 1/4W Metal Film		QW322	22-2256

(1) Contains five (5 each) 150.

(2) Contains nine (9 each) 150.

(3) Used as a fuse.

(4) Contains eight (8 ea.) 150, used in some versions.

RADIO SHACK  
MODEL III

## PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

### COILS (RF-IF)

ITEM No.	FUNCTION	MFGR. PART No.
<b>DISK DRIVE BOARD</b>		
L1	RF Choke (390uH)	ACA8058
L2	RF Choke (390uH)	ACA8058
L3	RF Choke (680uH)	ACA8057
<b>POWER SUPPLY BOARD</b>		
L1	RF Choke	TF-20200010
L2	RF Choke	328-00100030

ITEM No.	FUNCTION	MFGR. PART No.
L3	RF Choke	328-00100010
L4	RF Choke	TF-20100010
L5	RF Choke	TF-10100370
L6	RF Choke	328-00100060
<b>NON LINEAR SERVO BOARD</b>		
L1	RF Choke (3.3uH)	ACA8059

### CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM NO.	FUNCTION	RESISTANCE	MFGR. PART NO.	NOTES	
<b>DISK DRIVE INTERFACE BOARD</b>					
R5	Write Precompensation	1000	AP7167 AP7168		
R6	VCO Frequency Adj	10K			
R7	Voltage Level	50K 100K			
<b>LINEAR SERVO BOARD</b>					
R4	Motor Speed	1000	AP7058		
<b>NON LINEAR SERVO BOARD</b>					
R4	Motor Speed	1000	AP7058		

### TRANSFORMER POWER SUPPLY BOARD

ITEM No.	IMPEDANCE		REPLACEMENT DATA		NOTES
	PRI.	SEC.	MFGR. PART No.		
T1	Switching		TF-4491		
T2	Switching		TF-4441		

### MISCELLANEOUS

ITEM No.	PART NAME	MFGR. PART No.	NOTES	
<b>DISK DRIVE</b>				
D1	LED	AL1127	Activity Index Drive Head Position Read/Write Write Protect Track 00 Complete Disk Drive Main Power Supply Servo, Non-Linear	
D2	LED			
M1	Motor	AM4545		
M2	Motor			
M3	Head			
S1	Switch			
S2	Switch			
	Disk Drive	AXX5019		
	PC Board	AXX0317		
	PC Board	AXX6005		
	PC Board	AXX0316		
<b>DISK DRIVE INTERFACE BOARD</b>				
Y1	Crystal PC Board	AMX2804 AXX0510		4MHz Disk Drive Interface

## MECHANICAL PARTS LIST

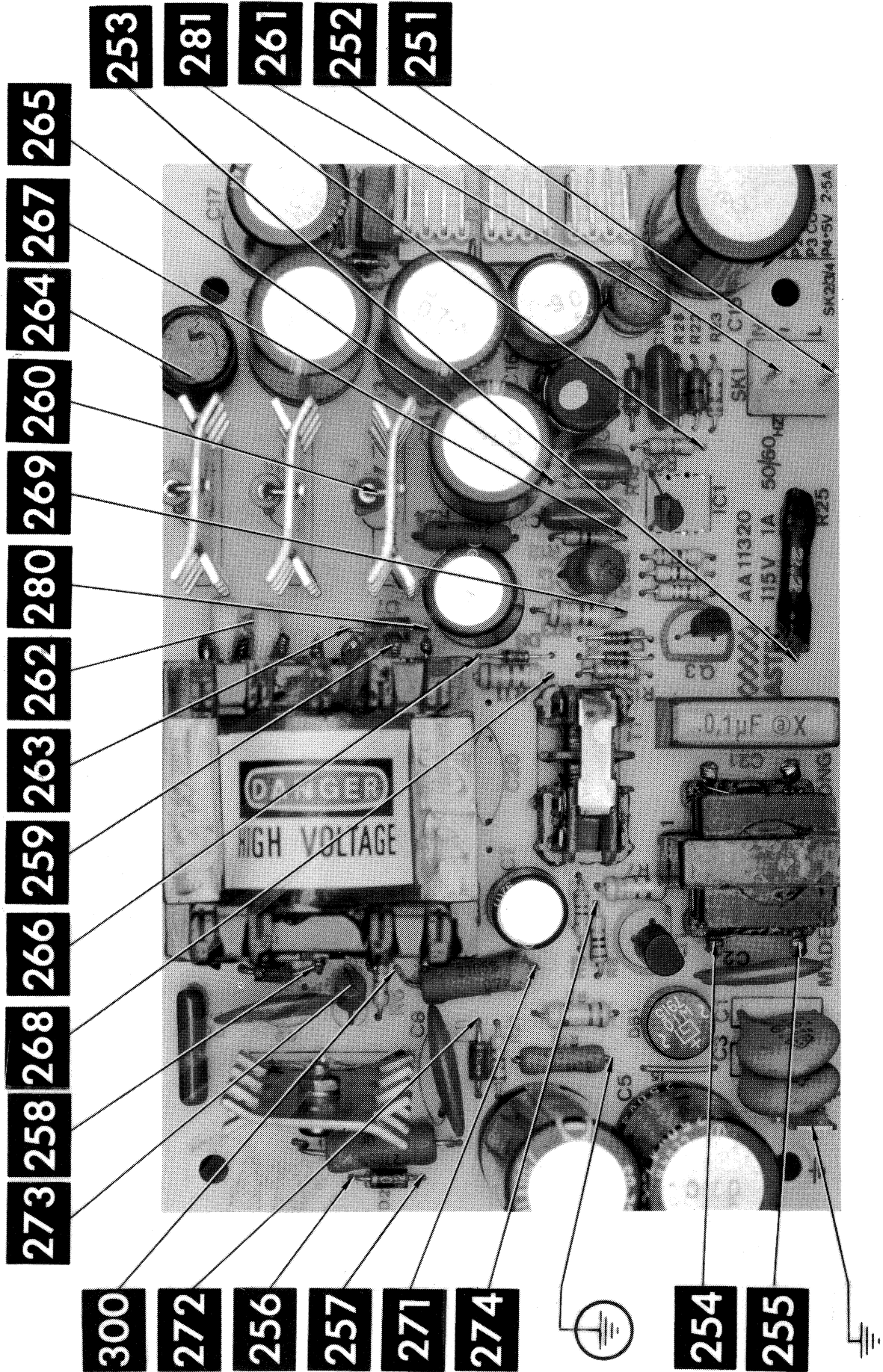
REF. NO.	PART NO.	DESCRIPTION
7	ART2739	Index Assembly, Type I
	ART2895	Index Assembly, Type II*
10	ARB6845	SSR Spring
13	AB6443	Belt, Drive
24	ART2740	Cone Assembly

REF. NO.	PART NO.	DESCRIPTION
26	ADA0303	Latch Assembly
33	AH4403	Head Carriage Assembly
35	ART2746	Drive Band (Stepper)
37	ART3004	Track 00 Stop Kit

\* Type II Assemblies have a gold band around photo transistor.

## WIRING DATA

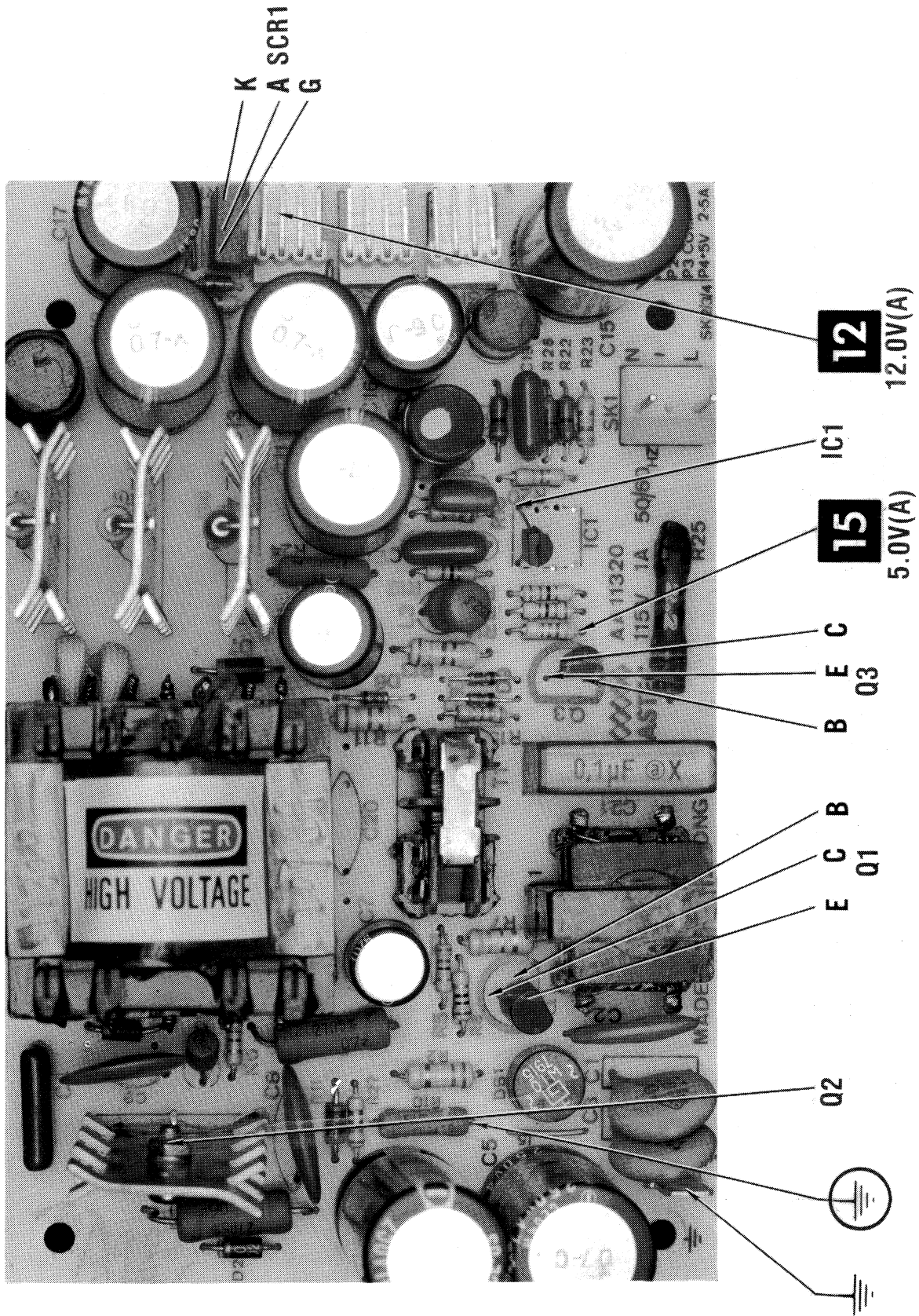
Shielded Hook-up Wire .....	Use BELDEN No. 8401 or 8421 (Single-Conductor) 8208 (Two-Conductor)
General-use Unshielded Hook-up Wire .....	Use BELDEN No. 8529 (Solid) Available in 13 Colors 8522 (Stranded) Available in 13 Colors
Shielded Disk Drive Head Cable .....	Use BELDEN No. 9534 (Four-Conductor)



POWER SUPPLY BOARD

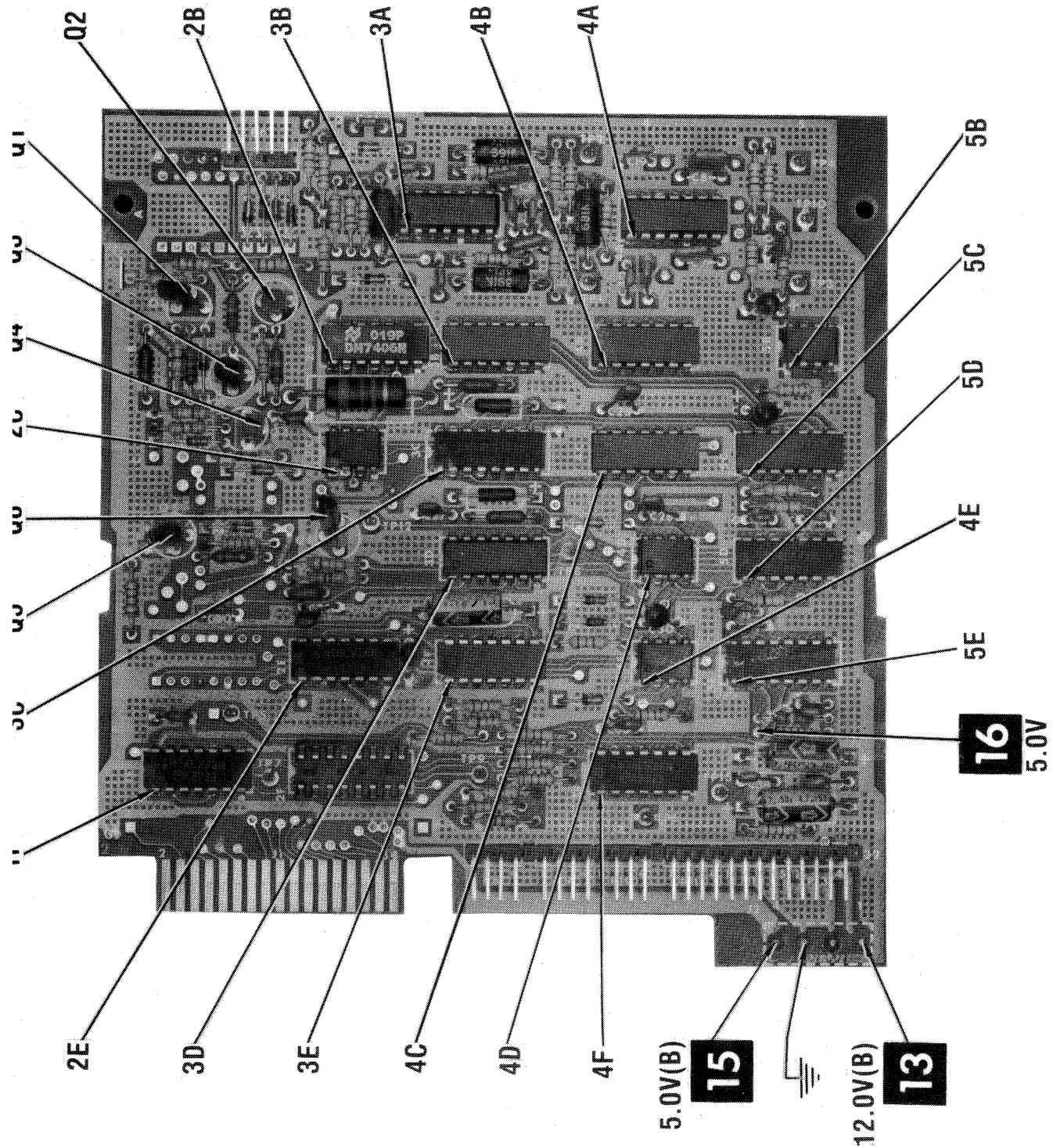
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ARROWS ON IC'S INDICATE PIN 1 UNLESS NOTED

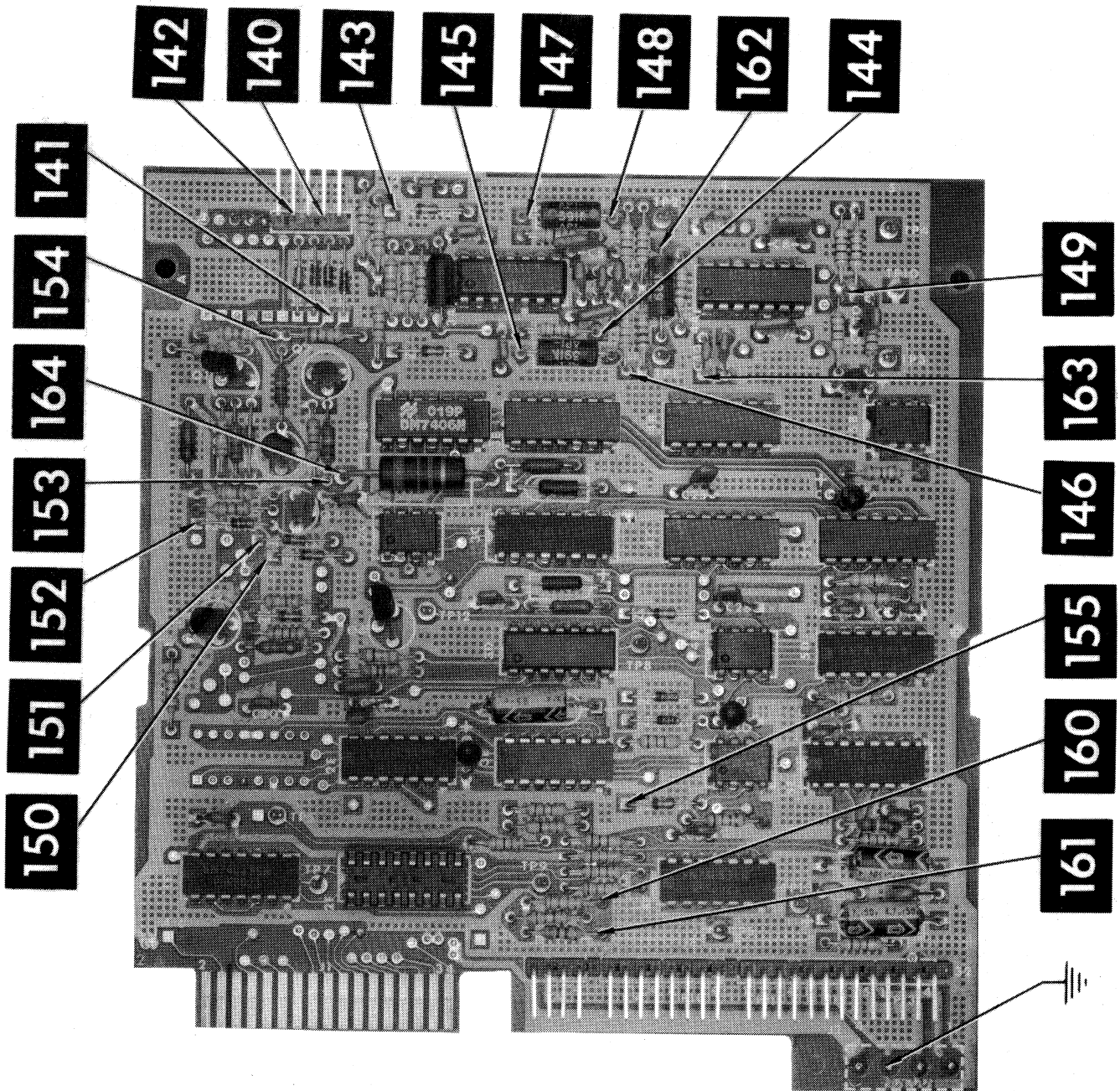
RADIO SHACK  
MODEL III



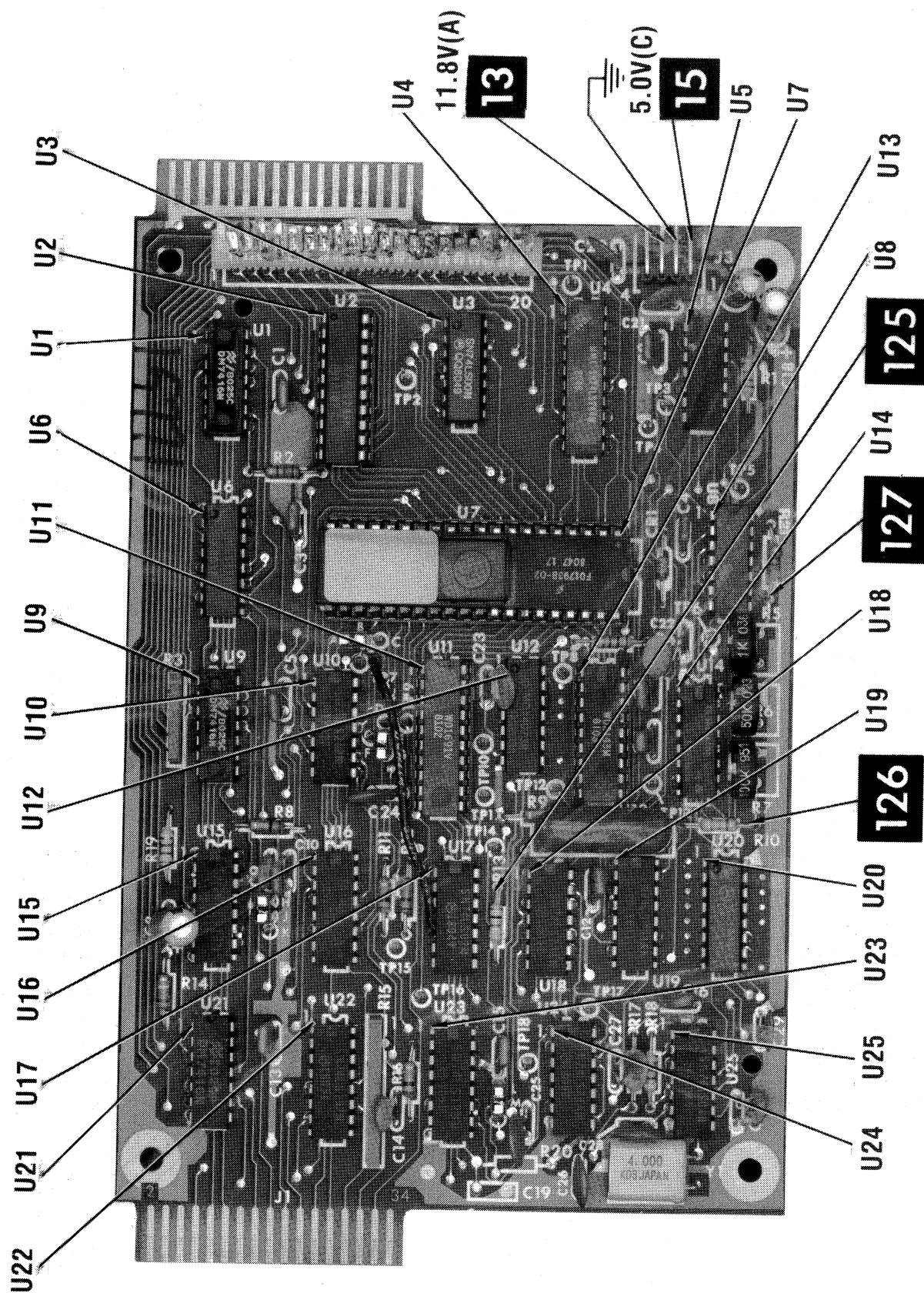
ARROWS ON IC'S INDICATE PIN 1 UNLESS NOTED

DISK DRIVE BOARD

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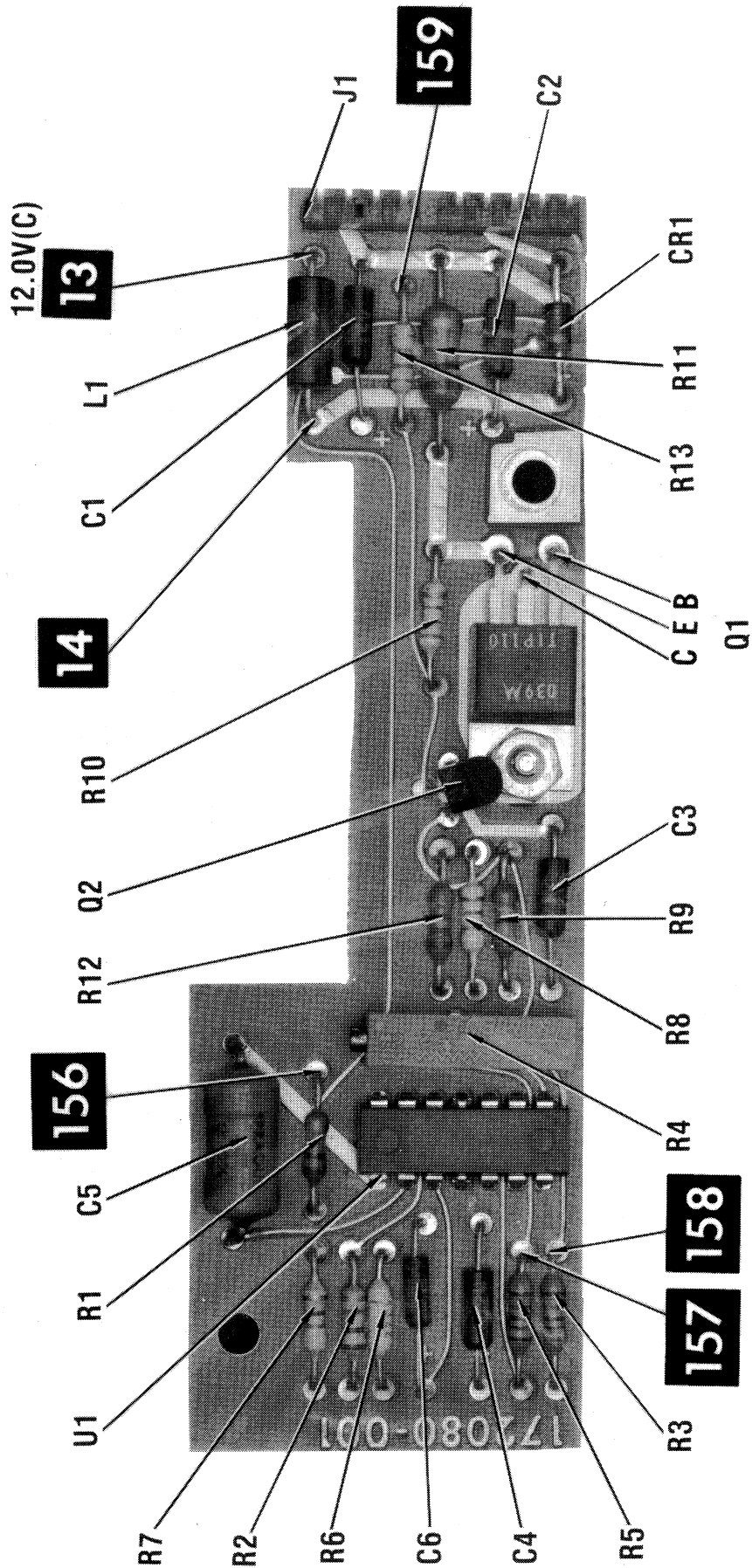
RADIO SHACK  
MODEL III



ARROWS ON IC'S INDICATE PIN 1 UNLESS NOTED

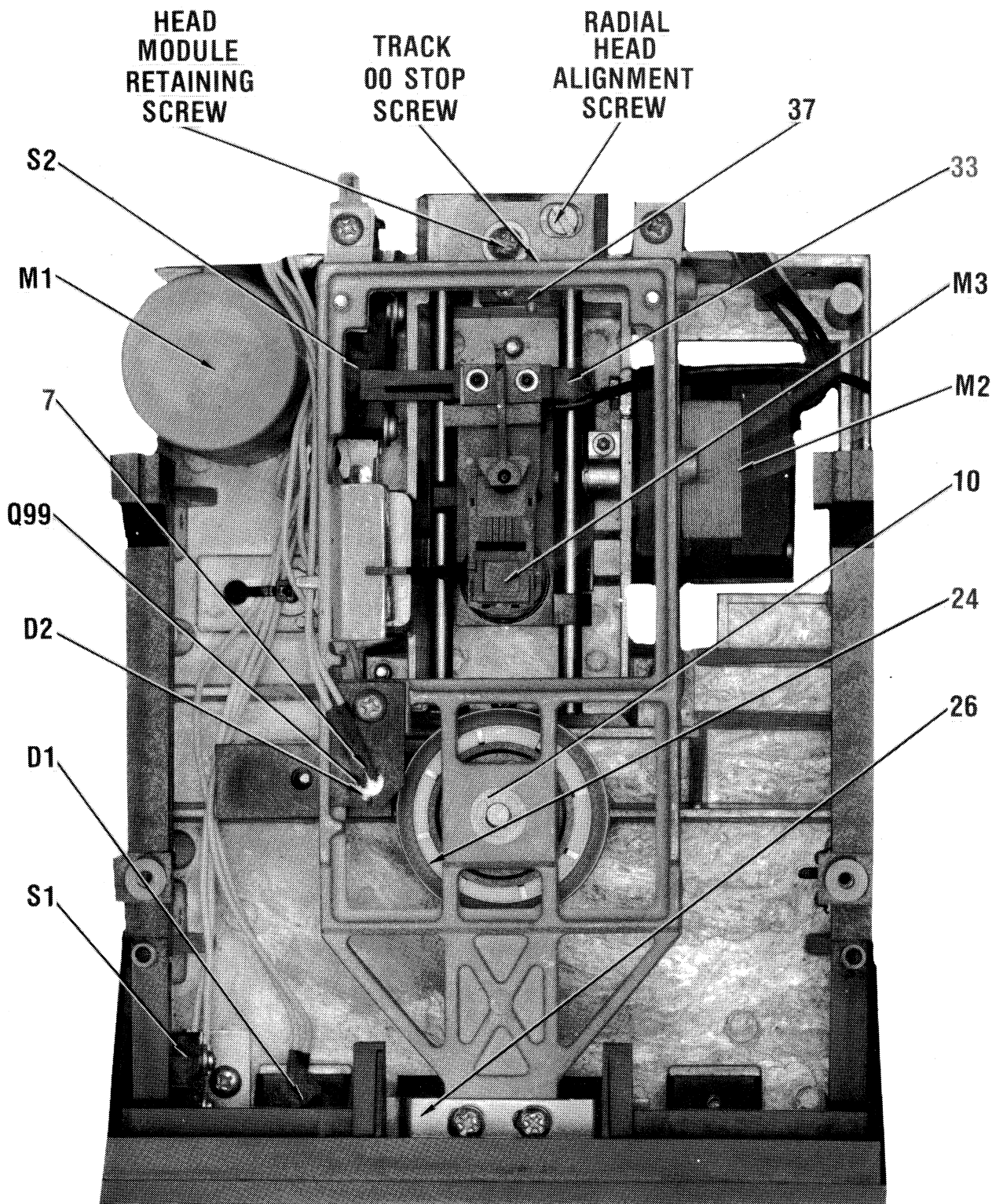
DISK DRIVE INTERFACE BOARD

A Howard W. Sams CIRCUITRACE® Photo

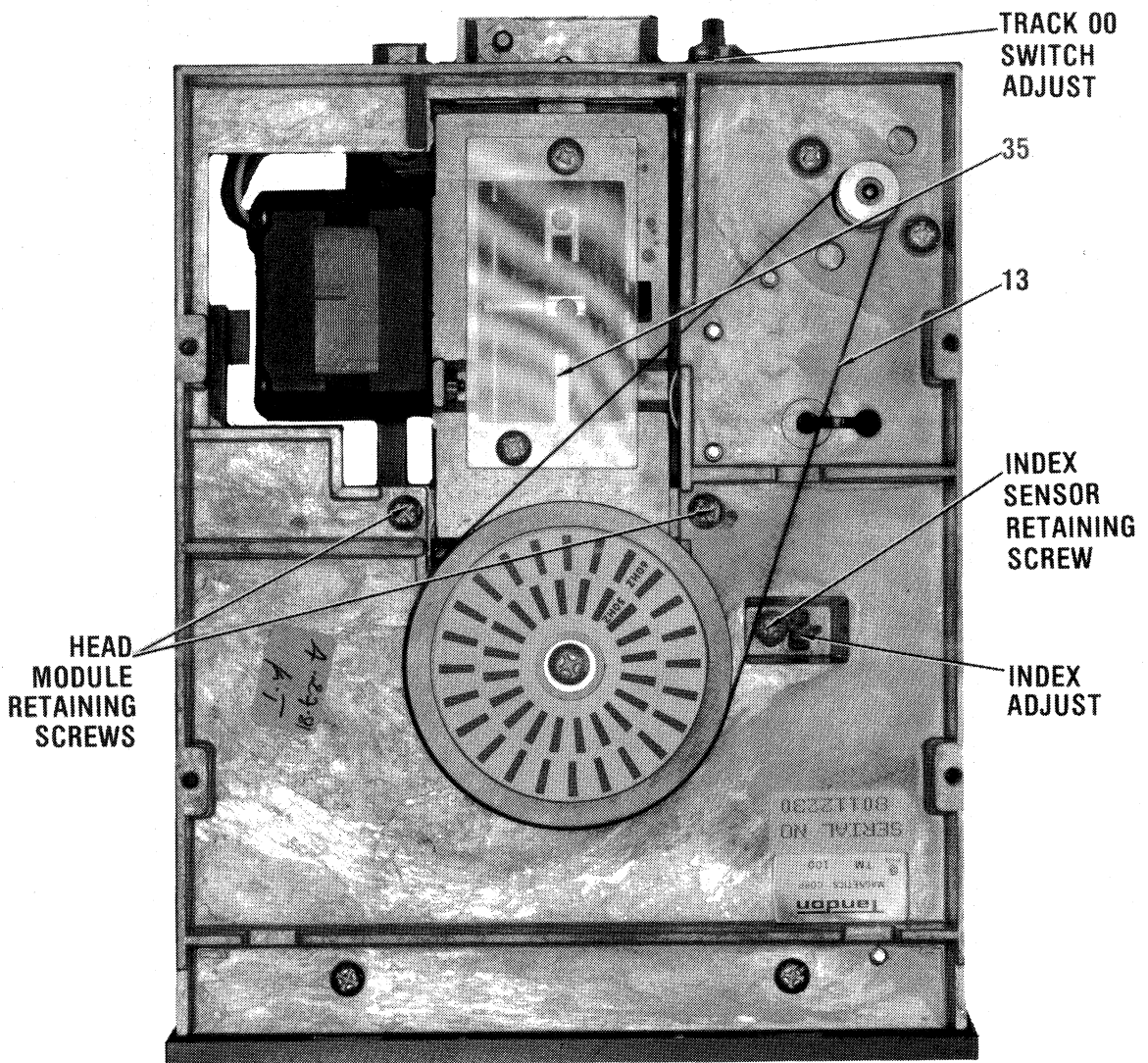


ARROWS ON IC'S INDICATE PIN 1 UNLESS NOTED

RADIO SHACK  
MODEL III



**MECHANICAL TOP**



**RADIO SHACK  
MODEL III**

**MECHANICAL BOTTOM**

## LOGIC CHART DISK DRIVE BOARD

PIN NO.	IC(8) 3A	IC(8) 4A	IC 2B	IC 3B	IC 4B	IC 5B	IC 2C	IC 3C	IC 4C	IC 5C
1			L	L	L	L	*	H	H	H
2			*	H	H	(8)	*	P	L(1)	P
3			H	*	*	(8)	*	H	H(1)	P
4			L	H	H	(8)	L	P	H	H
5			P	H	L	(8)	H	P	L(1)	P
6			L	H	H(1)	(8)	H	L	L(1)	P
7			L	L	L	P	H	*	L	L
8			L	H	H(7)	(8)	H	L	L(1)	P
9			P	H	L(6)			P	H(1)	P
10			L	H	L(1)			H	H	P
11			H	*	*			H	H(1)	L
12			L	H	L			H	P(1)	P
13			*	P	L			P	H	P
14			H	H	H			L		H
15								L		
16								H		
PIN NO.	IC 3D	IC 4D	IC 5D	IC 2E	IC 3E	IC 4E	IC 5E	IC 1F	IC 4F	
1	H(7)	H	L(1)	P	L	H	L	P	L(6)	
2	L(6)	L(1)	H(2)	P	L	L(1)	P	H	L(6)	
3	H(2)	L(1)	L(1)	P	L	H(1)	H	P	H(7)	
4	L(3)	L	H(2)	P	L	L	P	L(4)	*	
5	L(3)	L(1)	L(1)	P	H	L(1)	P	H	*	
6	H(2)	H(1)	L(1)	P	H	H(1)	P	H	L	
7	L	H	L	L	L	H	P	L	L	
8	H	H	P	L	L	H	L	P	H	
9	L	L	P	*	L		L	P	L(3)	
10	H(5)		P	L	P		P	H	L	
11	L(4)		P	H	P		P	H(7)	L(6)	
12	P		P	L	L		P	L(6)	H(7)	
13	P		P	H	L		P	H	H(7)	
14	H		H	H	H		P	H	H	
15							P			
16							H			



**LOGIC CHART (Continued)**  
**DISK DRIVE INTERFACE BOARD**

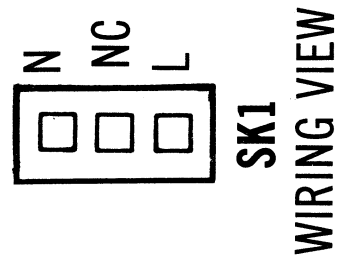
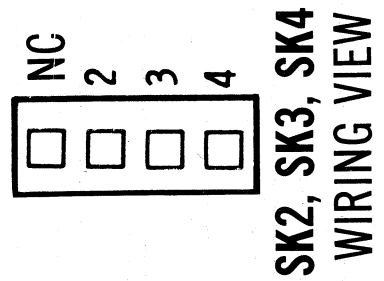
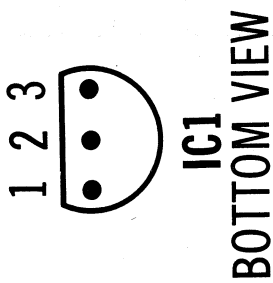
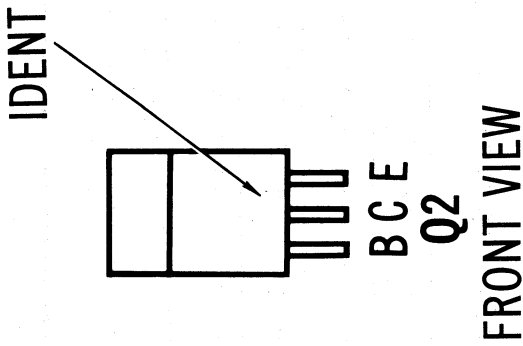
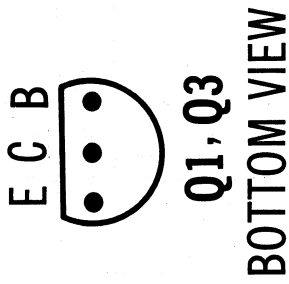
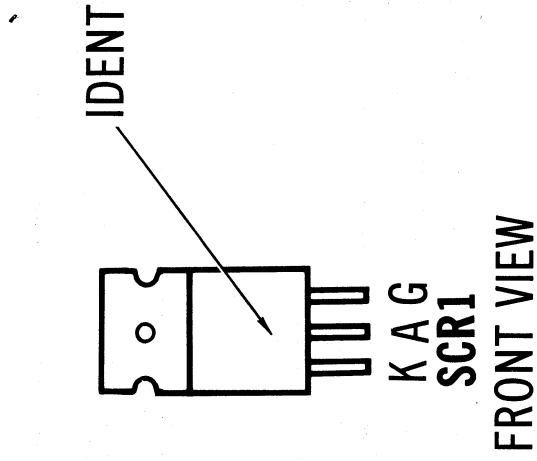
PIN NO.	IC U1	IC U2	IC U3	IC U4	IC U5	IC U6	PIN NO.	IC U7	PIN NO.	IC U7	PIN NO.	IC U8	IC U9	IC U10	IC U11
1	L	P	H	L	H	H	1	L	21	H	1	P	P(2)	L	P
2	*	P	H	H	P	H	2	P	22	H	2	P	P(3)	L	P
3	H	P	L	H	P	P	3	L	23	H	3	P	H	L	P
4	P	P	L	H	H	P	4	P	24	P	4	P	L	L	P
5	P	P	L	H	P	L	5	P	25	P	5	L	P	L	P
6	L	P	H	P	P	L	6	P	26	P	6	P	P	L	P
7	L	P	L	P	L	L	7	P	27	P	7	L	L	L	P
8	H	P	L	H	P	L	8	P	28	H	8	L	P	L	P
9	L	P	*	P	P	P	9	P	29	L	9	*	P	P	L
10	P	L	*	L	H	L	10	P	30	P	10	*	H(1)	L	L
11	P	P	L	P	P	L	11	P	31	P	11	L	L(1)	L	P
12	P	P	H	P	P	L	12	P	32	H	12	*	P	L	P
13	L	P	H	P	H	P	13	P	33	P	13	H	L	H	P
14	H	P	H	P	H	P	14	P	34	H	14	H	H	H	P
15		P		P		P	15	L(1)	35	P					P
16		P		P		H	16	P(2)	36	H					P
17		P		P			17	L	37	L					P
18		L		H			18	P	38	P					P
19		H		L			19	H	39	P					P
20				H			20	L	40	H					H

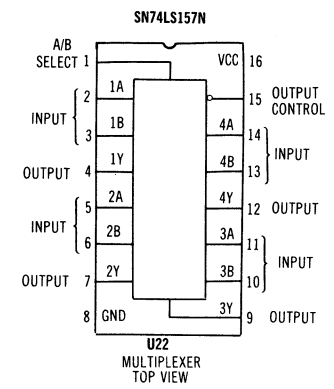
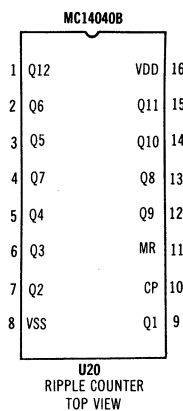
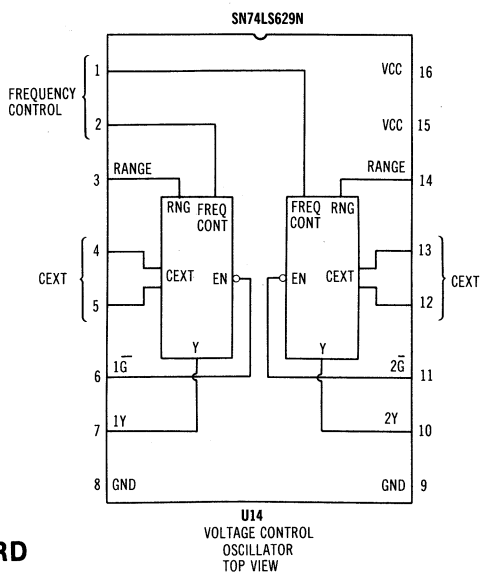
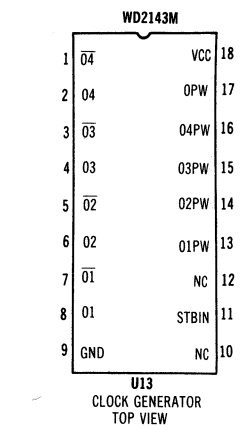
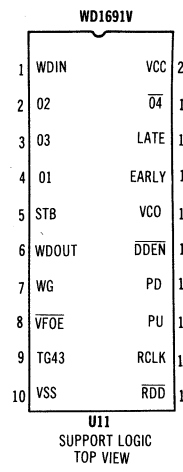
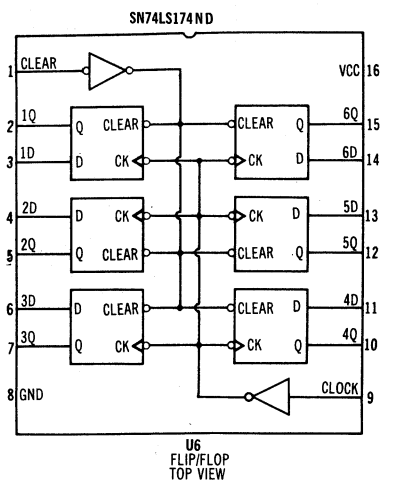
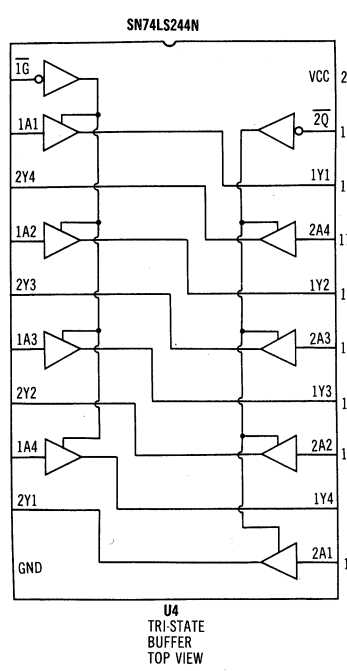
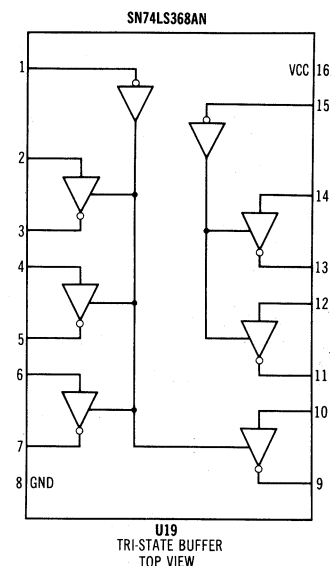
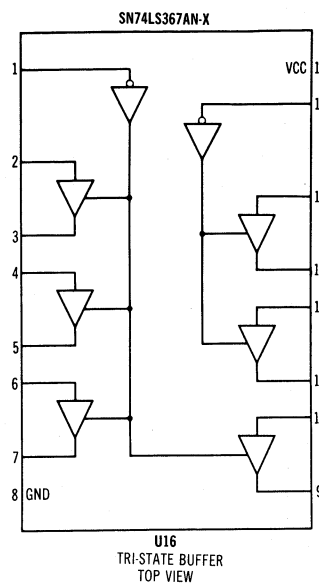
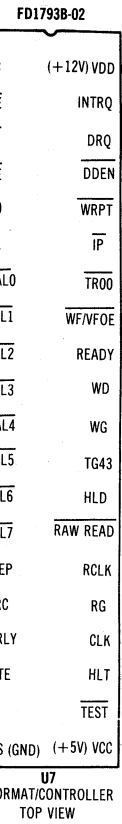
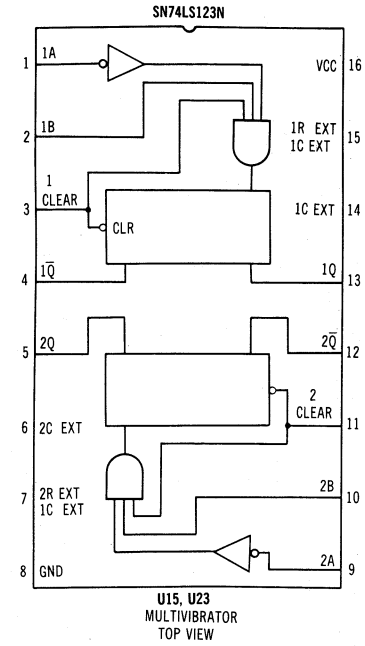
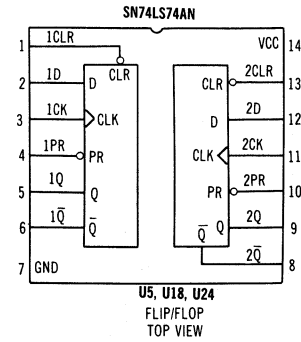
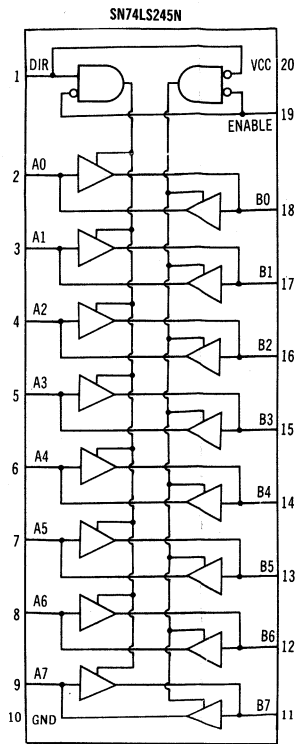
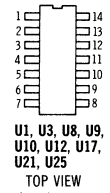
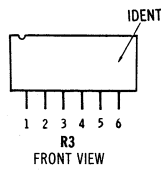
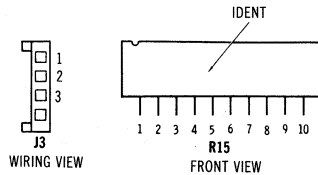
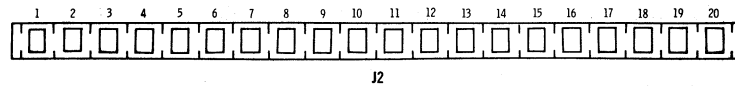
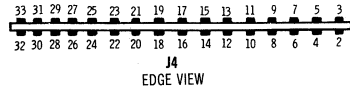
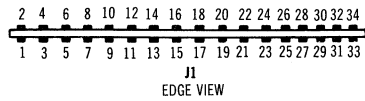
PIN NO.	IC U12	IC U13	IC U14	IC U15	IC U16	IC U17	IC U18	IC U19	IC U20	IC U21	IC U22	IC U23	IC U24	IC U25	IC
1	H	P	L	P	L	H	P	H	L	P	H	*	H	P	
2	H	P	P	H	P	L	H	H	L	L	H	H	P	P	
3	L	P	H	H	P	L	P	*	L	H	H	H	H	P	
4	H	P	P	P	L(1)	L	H	*	L	L	H	L	H	P	
5	H	P	P	H	L(1)	L	P	P	L	L	H	L	P	P	
6	L	P	L	L	P(2)	L	H	H	L	*	P	L	P	L	
7	L	P	L	L	P(2)	*	L	P	L	L	P	*	L	L	
8	H	P	L	L	L	*	H	L	L	*	L	L	L	L	
9	H	L	L	P	H	*	P	*	L	P	H	L	P	*	
10	H	H	H	H	*	L	H	*	P	H	H	H	H	L	
11	H	P	H	H	P	*	P	P	H	L	H	H	P	H	
12	H	P	H	L	P	*	L	L	L	L	H	H	P	L	
13	H	P	P	P	P	L	H	P	L	H	P	H	H	*	
14	H	P	L	H	L	H	H	L	L	P	H	H	H	H	
15		P	H		P			H	L	H	L	*			
16		P	H		L			H	L	H	H	H			

**RADIO SHACK  
MODEL III**

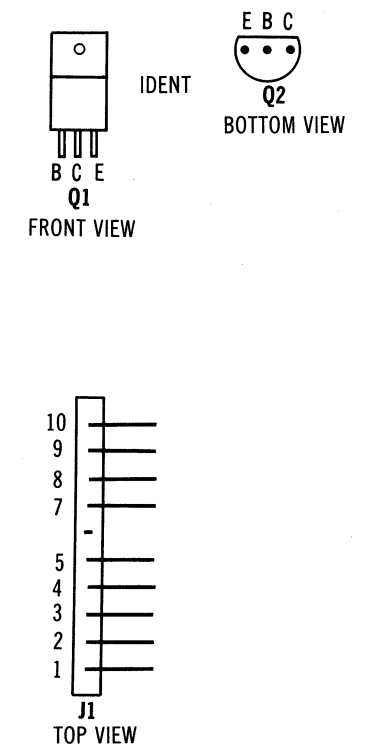
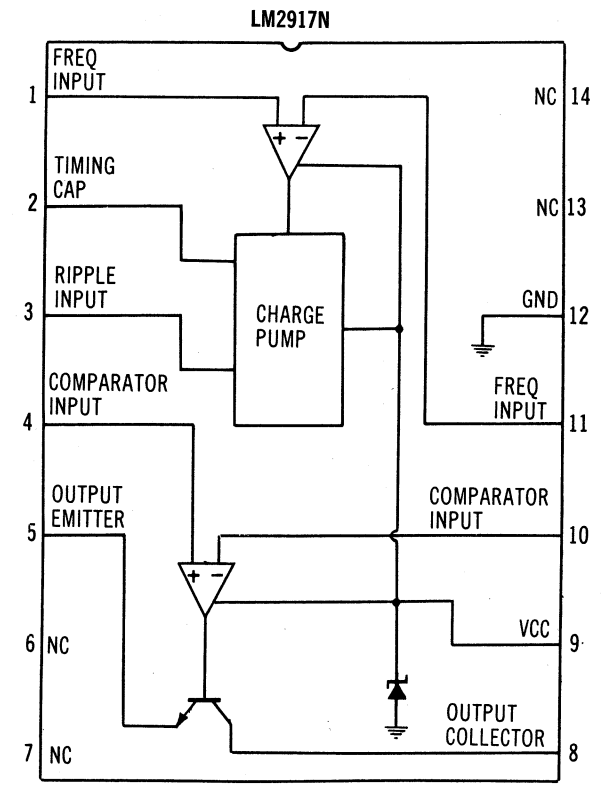
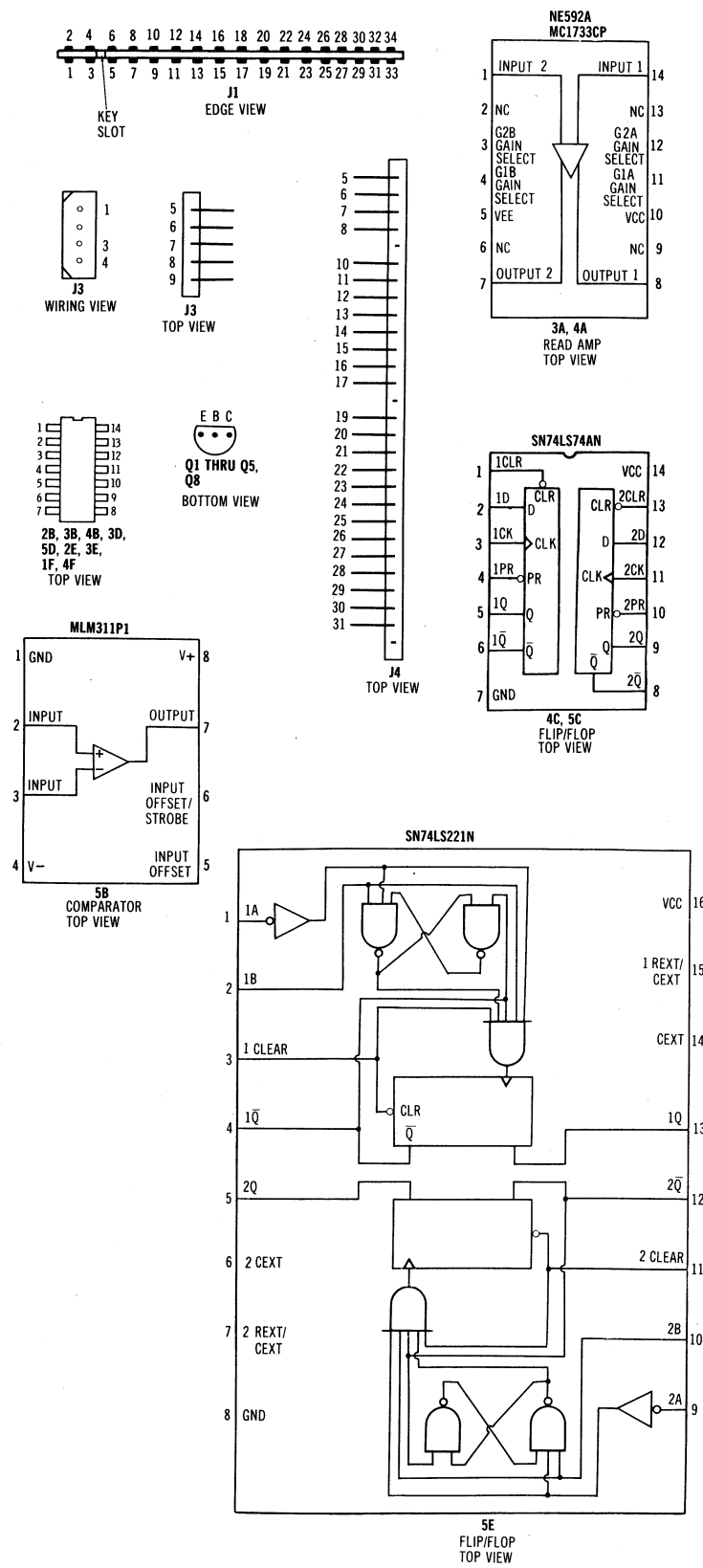
# IC PINOUTS & TERMINAL GUIDES



# IC PINOUTS & TERMINAL GUIDES

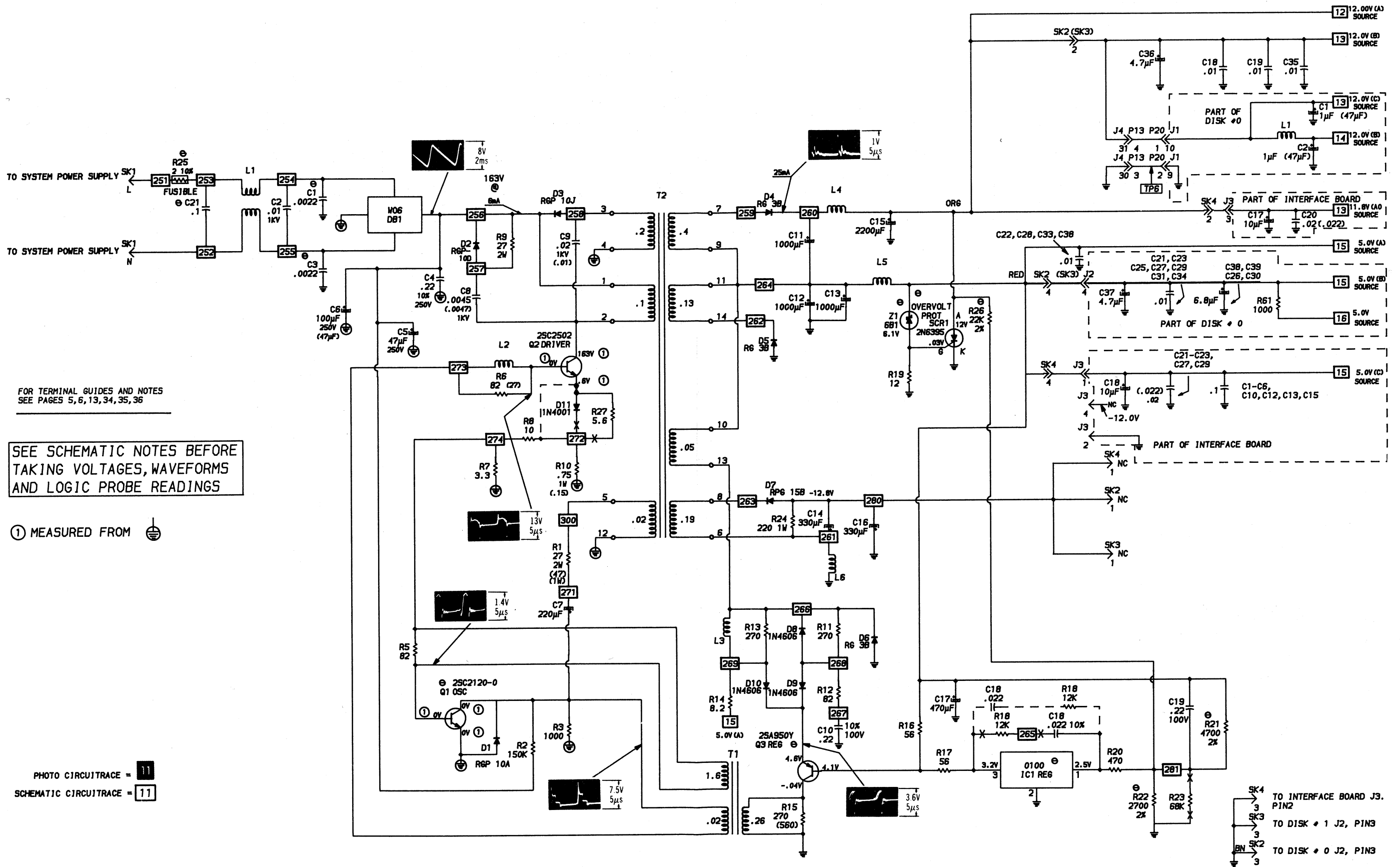


IC PINOUTS & TERMINAL GUIDES



DISK DRIVE BOARD

NON LINEAR SERVO BOARD



FOR TERMINAL GUIDES AND NOTES  
SEE PAGES 5, 6, 13, 34, 35, 36

SEE SCHEMATIC NOTES BEFORE  
TAKING VOLTAGES, WAVEFORMS  
AND LOGIC PROBE READINGS

① MEASURED FROM

PHOTO CIRCUITRACE =

SCHEMATIC CIRCUITRACE =

A PHOTOFACIT STANDARD NOTATION SCHEMATIC  
WITH **CIRCUITRACE**

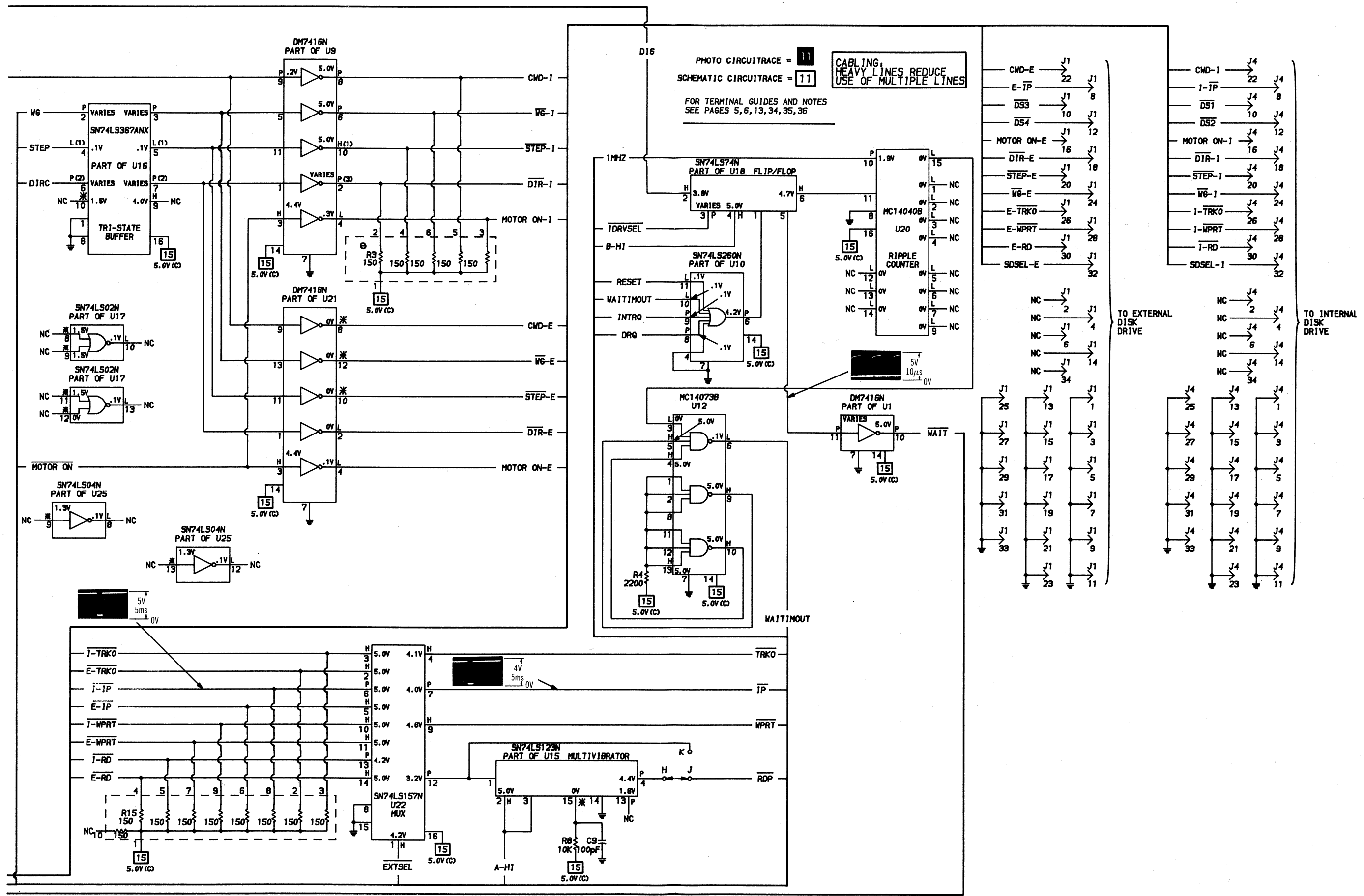
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DISK DRIVE POWER SUPPLY BOARD

DISK DRIVE POWER SUPPLY BOARD

RADIO SHACK  
MODEL III

SK4 TO INTERFACE BOARD J3, PIN2  
SK3 TO DISK # 1 J2, PIN3  
BN SK2 TO DISK # 0 J2, PIN3



A PHOTOFACIT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE

DISK DRIVE INTERFACE BOARD

DISK DRIVE INTERFACE BOARD

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CSCS-5-B  
 RADIO SHACK  
 MODEL III

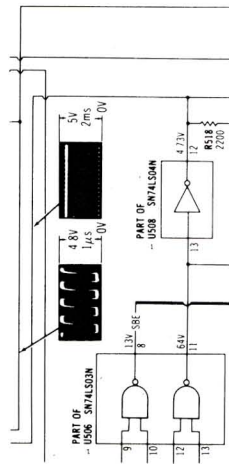


If seal is broken, nonreturnable.

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- Preliminary Service Checks section is an easy to use, step by step guide for the experienced technician or hobbyist, and even beginners.
- SAMS famous industry accepted standardized notation schematics containing CIRCUITRACE®, GRIDTRACE™, waveforms, voltages and stage identification.

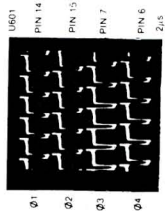


- Step by Step Troubleshooting guides the technician through the necessary procedures to quickly locate the problem.

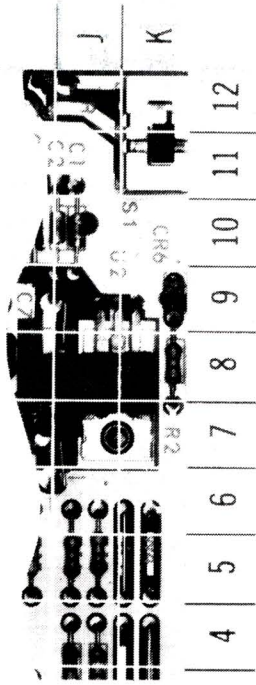
**TROUBLESHOOTING**

**MICROPROCESSOR CHIP (CPU) OPERATION**

Verify the processor is functioning by checking the signals on the address lines (pins 10 thru 24 of IC U600) and the data lines (pins 41 thru 56) using a logic probe or a scope. If a logic probe is used, the probe should be set to the correct mode. If a scope is used, the waveforms on the address lines (except pins 22 and 23 which have no signal in Power Up mode) should be similar to Figure 1. The waveforms on the data lines should be similar to Figure 2.



- Quick Component Location using the SAMS exclusive GRIDTRACE, CIRCUITRACE, and component photographs.



- Logic Chart containing logic probe readings to isolate defective circuitry and components.

**LOGIC**

PIN NO.	IC U100	PIN NO.	IC U100	IC U103	IC U102	IC U104	IC U105	IC U106	IC U107	IC U108	IC U109
1	P	21	P	1	L	L	L	L	L	L	L
2	P	22	P	2	P	P	P	P	P	P	P
3	P	23	P	3	H	H	H	H	H	H	H

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- Complete Components Parts List in an easy to use format with field replacements shown when possible. SAMS unique semiconductor, chip and IC cross-reference gives you many replacements to choose from and is available at your Electronic Distributor.

**SEMICONDUCTORS (Select replacement for best results)**

ITEM No.	TYPE No.	MFGR PART No.	REPLACEMENT DATA					
			GENERAL ELECTRIC PART No.	MOTOROLA PART No.	NTE PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.
0102	15553	1149-2576	ECG519	1N4935	NTE519	SK9091/177	WEF925/519	103-131
0201	1M4004CP	1201-4205	ECG116	1N4004	NTE109	SK308B	WEF134/709	103-2901
0501	15553	1149-2576	ECG519	1N4935	NTE519	SK2091/177	WEF925/519	212-76-02
0903								103-131

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