

Schematic Package Supplement to

FIREFOX*

FIREFOX

FIREFOX

Operators Manual

Includes Adjustment Procedures

NOTE

This staple temporarily holds the schematic package together. Remove the staple before using these schematics.

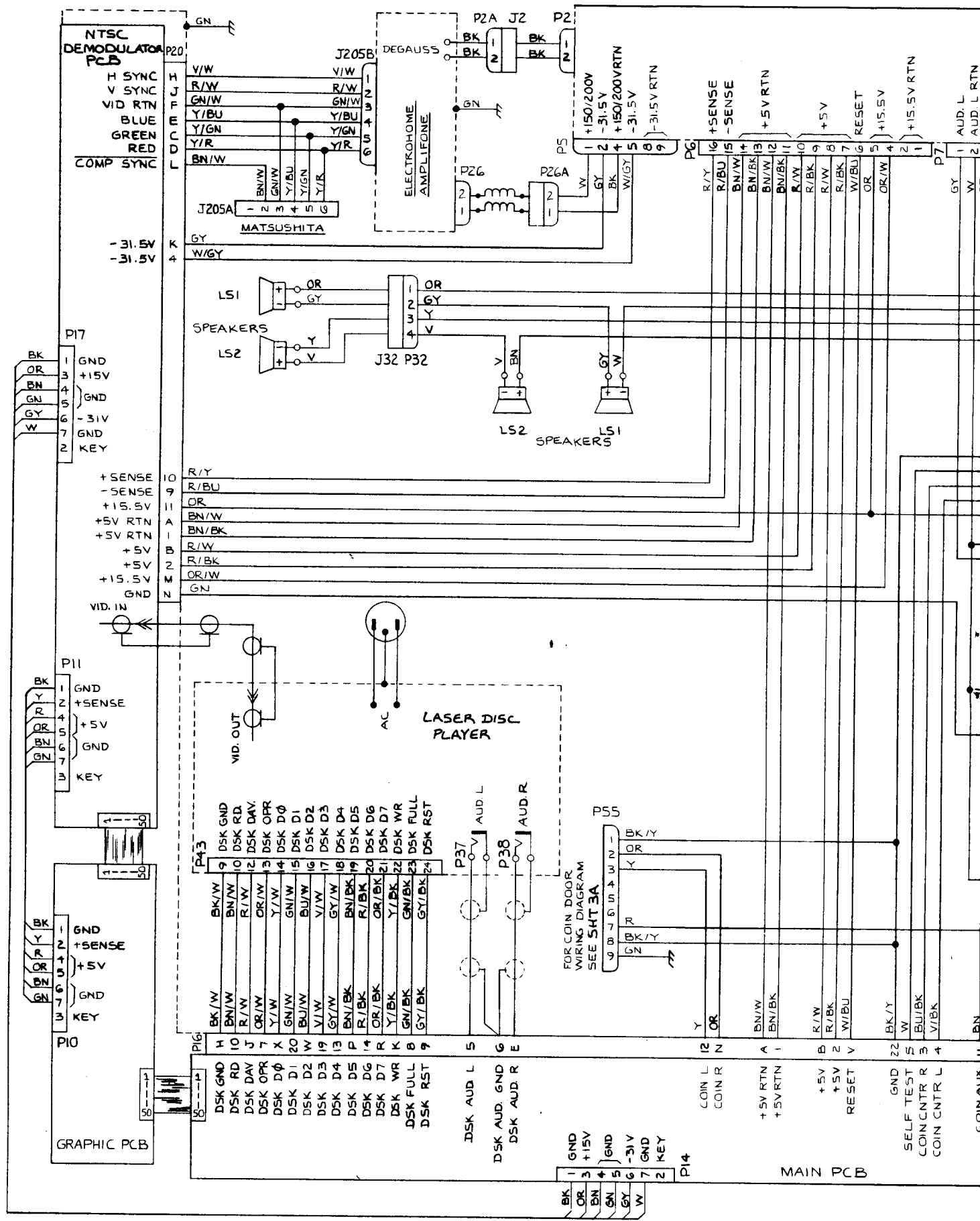
2N

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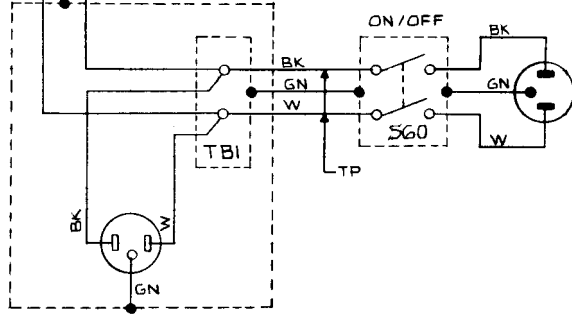
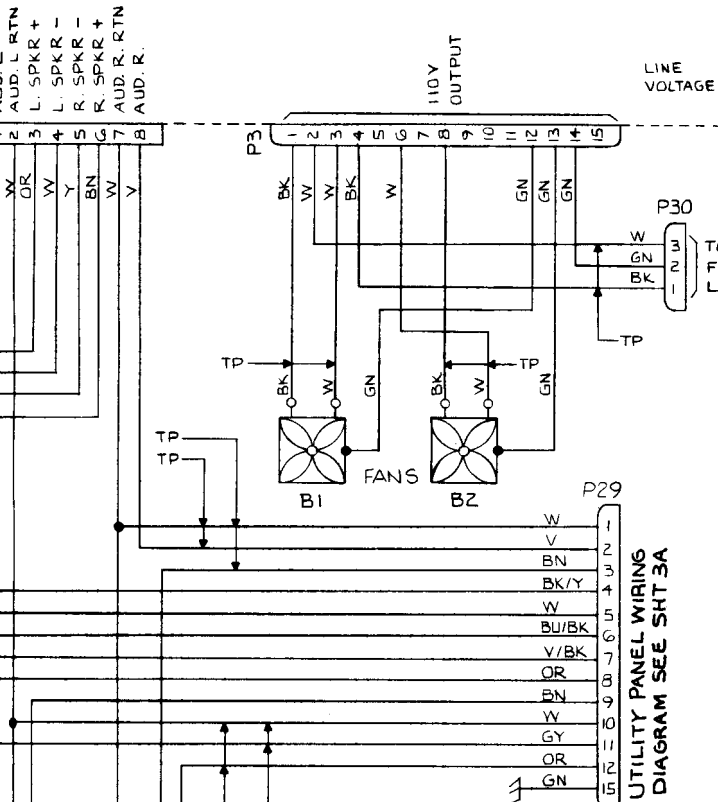


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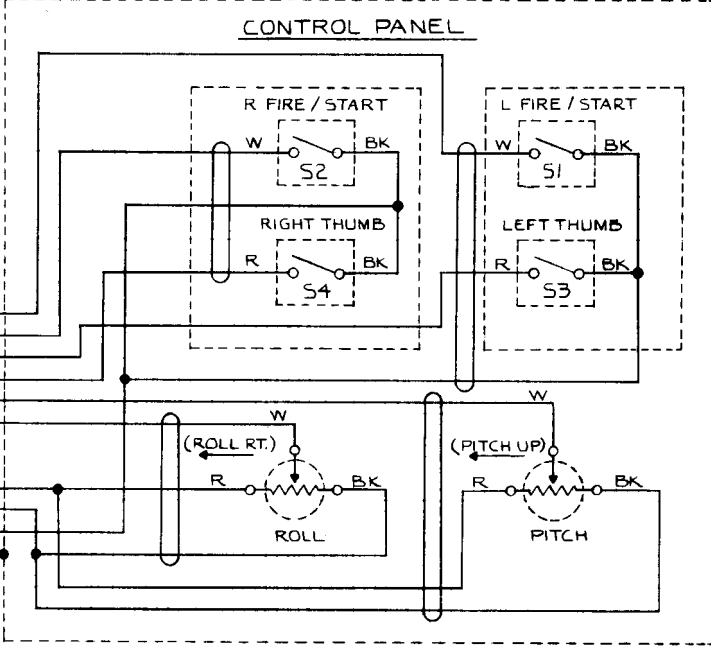
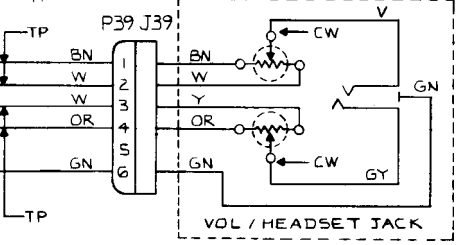
SP-253 Sheet 1A
2nd printing



**SWITCHING POWER SUPPLY
(SEE SWITCHING POWER
SUPPLY MANUAL)**



UTILITY PANEL WIRING
DIAGRAM SEE SHT 3A



II	BN	COIN AUX
F	W	AUD. RTN
C	BN	AUD. R
D	OR	AUD. L
U	W/BK	L. FIRE / START
A	W/BN	R. FIRE / START
I7	W/R	L. THUMB
T	W/OR	R. THUMB
M	W/Y	PITCH
L	W/GN	ROLL
Y	R	+5V
E	BK	GND

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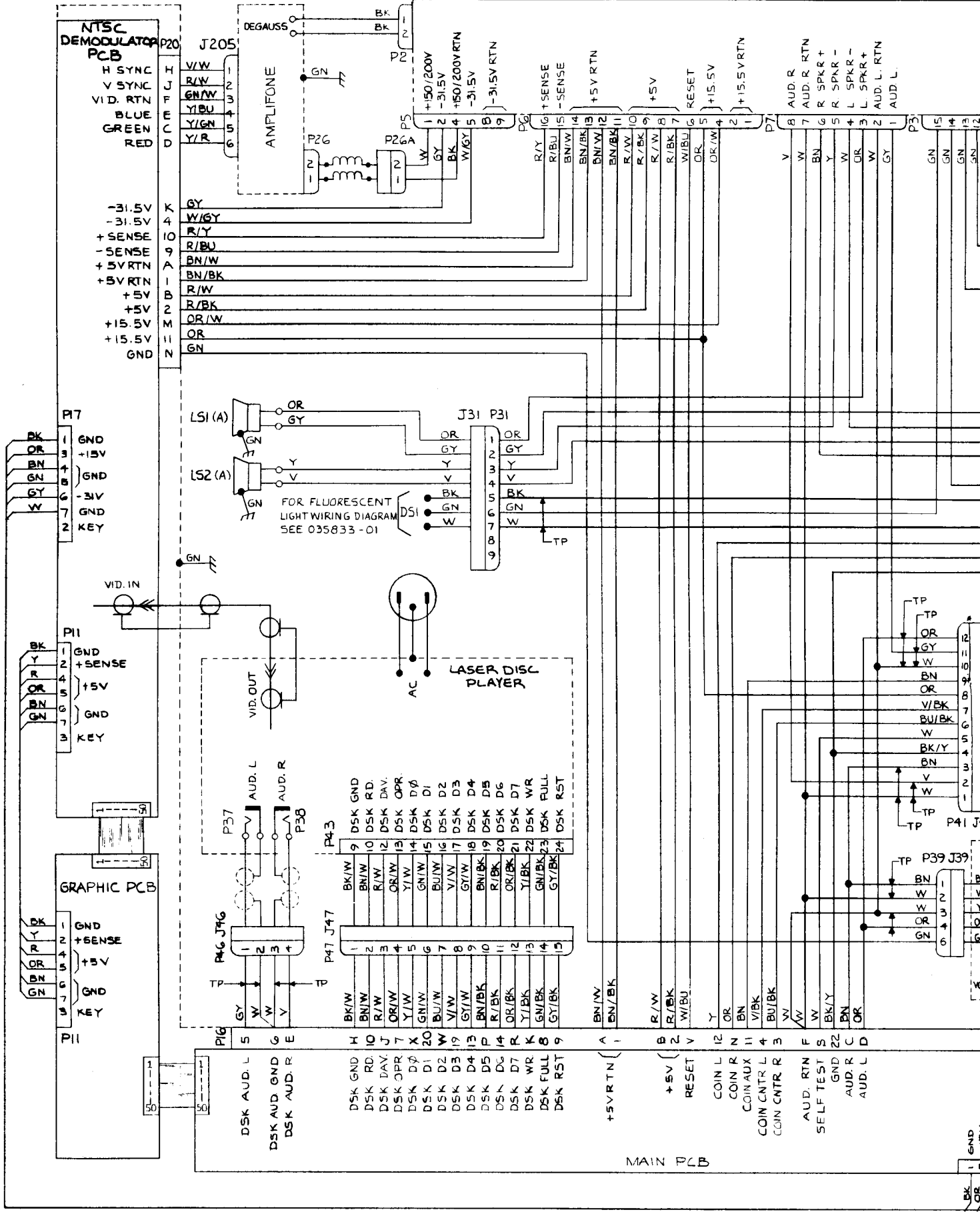
FIREFOX Upright Main Wiring Diagram



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NTSC DEMODULATOR PCB

H SYNC
V SYNC
VID. RTN
BLUE
GREEN
RED

-31.5V
-31.5V
+SENSE
-SENSE
+5V RTN
+5V RTN
+5V
+5V
+15.5V
+15.5V
GND

P17
1 BK
2 OR
3 GN
4 +15V
5 GN
6 -31V
7 GN
8 W
9 KEY

P11
1 BK
2 GN
3 +SENSE
4 +5V
5 GN
6 GN
7 GN
8 KEY

GRAPHIC PCB

1 BK
2 Y
3 OR
4 R
5 GN
6 GN
7 GN
8 KEY

P11
1 BK
2 Y
3 OR
4 R
5 GN
6 GN
7 GN
8 KEY

DEGAUSS
BK
BK
2

GY
W/GY
R/Y
R/BU
BN/W
BN/BK
R/W
R/BK
OR/W
OR
GN

LS1 (A)
OR
GY
GN

LS2 (A)
Y
GN

P37
1
2
3
4
5
6
7
8
9

P38
1
2
3
4
5
6
7
8
9

LASER DISC PLAYER

AC

P43
1 DSK GND
2 DSK RD.
3 DSK DAV.
4 DSK OPR.
5 DSK D₁
6 DSK D₂
7 DSK D₃
8 DSK D₄
9 DSK D₅
10 DSK D₆
11 DSK D₇
12 DSK WR
13 DSK FULL
14 DSK RST

P47 J47
1 BK/W
2 BN/W
3 R/W
4 OR/W
5 Y/W
6 GN/W
7 BU/W
8 V/W
9 GT/W
10 BN/BK
11 R/BK
12 OR/BK
13 Y/BK
14 GN/BK
15 GT/BK

P20
H V/W
L R/W
E GN/W
F Y/BU
D Y/BU
C Y/R
D Y/R

AMPLIFONE
P26
P26A
W
BK
W/GY
BK
W/GY
R/Y
R/BU
BN/W
BN/BK
R/W
R/BK
OR/W
OR
GN

P5
1 +50/200V
2 -31.5V
3 +150/200V RTN
4 -31.5V
5 -31.5V RTN
6
7
8
9

P6
10 +SENSE
11 -SENSE
12 +5V RTN
13 +5V
14 +5V
15 +5V
16 RESET
17 +15.5V
18 +15.5V RTN
19
20

P7
1 AUD. R
2 AUD. R RTN
3 R SPKR +
4 R SPKR -
5 L SPKR +
6 L SPKR -
7 AUD. L RTN
8 AUD. L
9

P31
1 OR
2 GY
3 Y
4 V
5 BK
6 GN
7 W
8
9

P41 J41
1 TP
2 OR
3 GY
4 W
5 BN
6 OR
7 V/BK
8 BU/BK
9 BK/Y
10 BN
11 W
12 TP

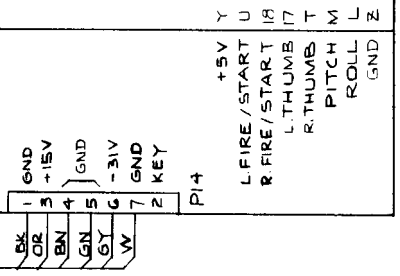
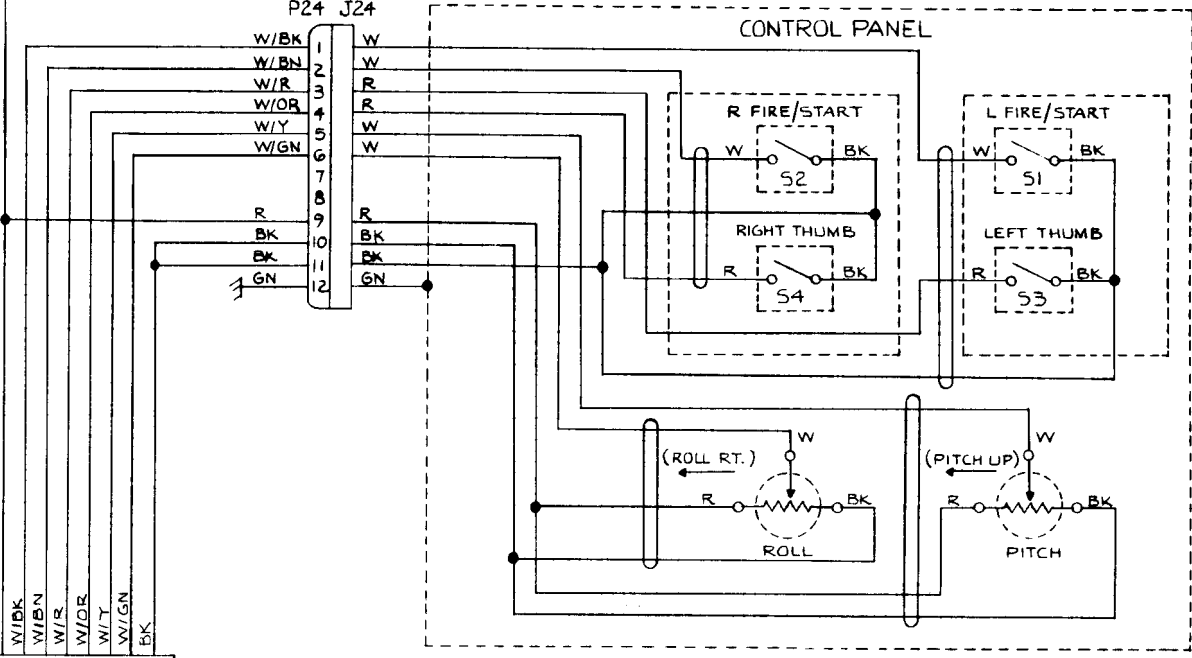
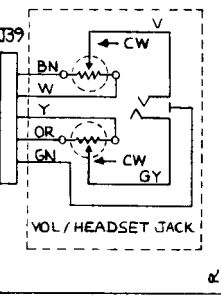
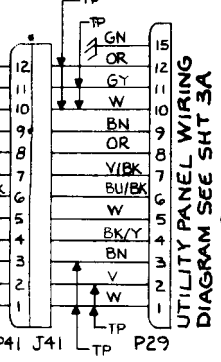
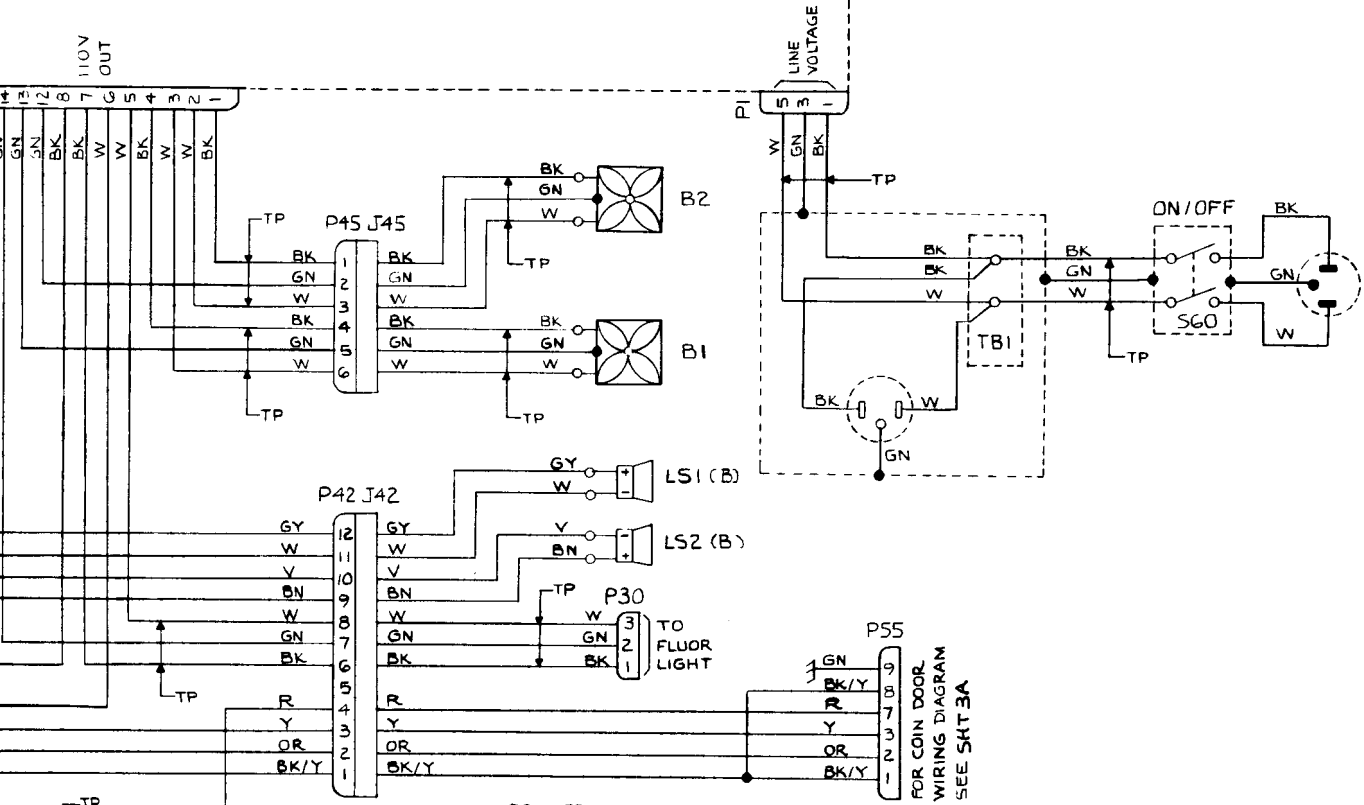
P39 J39
1 BN
2 W
3 Y
4 OR
5 GN

P42 J42
1 TP
2 BN
3 W
4 Y
5 OR
6 GN

MAIN PCB

1 GND
2 +15V
3

**SWITCHING POWER SUPPLY
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FIREFOX Sit-Down Main Wiring Diagram

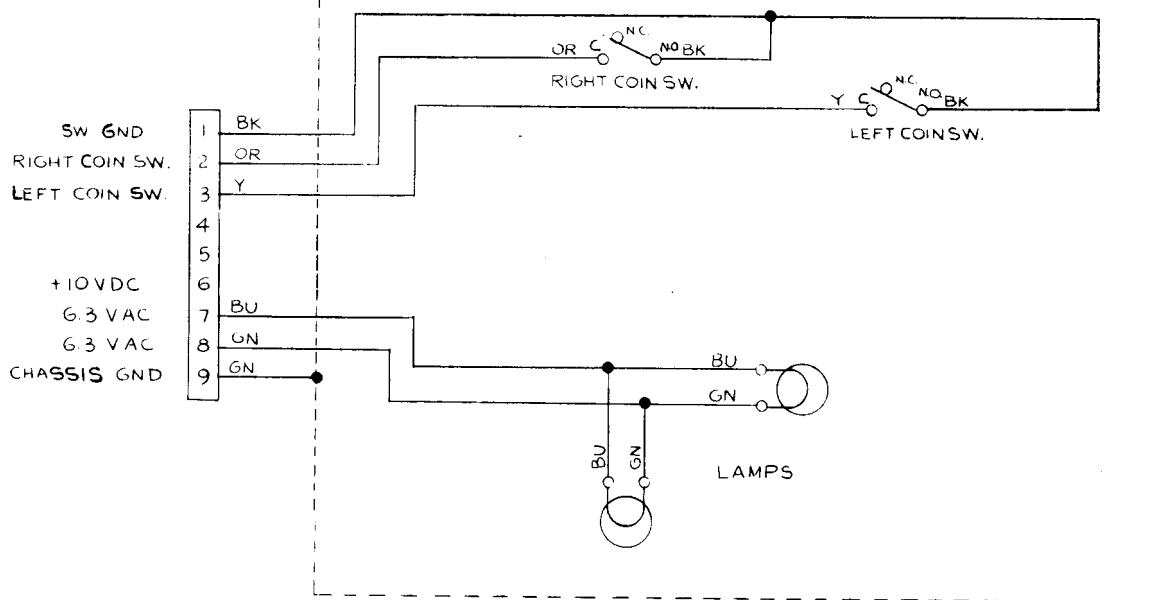


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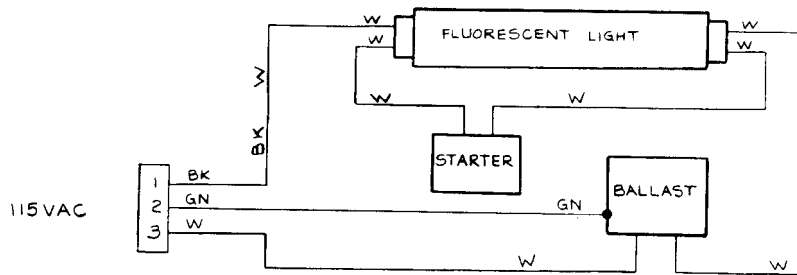
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Coin Door Wiring Diagram



Fluorescent Light Wiring Diagram



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FIREFOX Game Interfaces



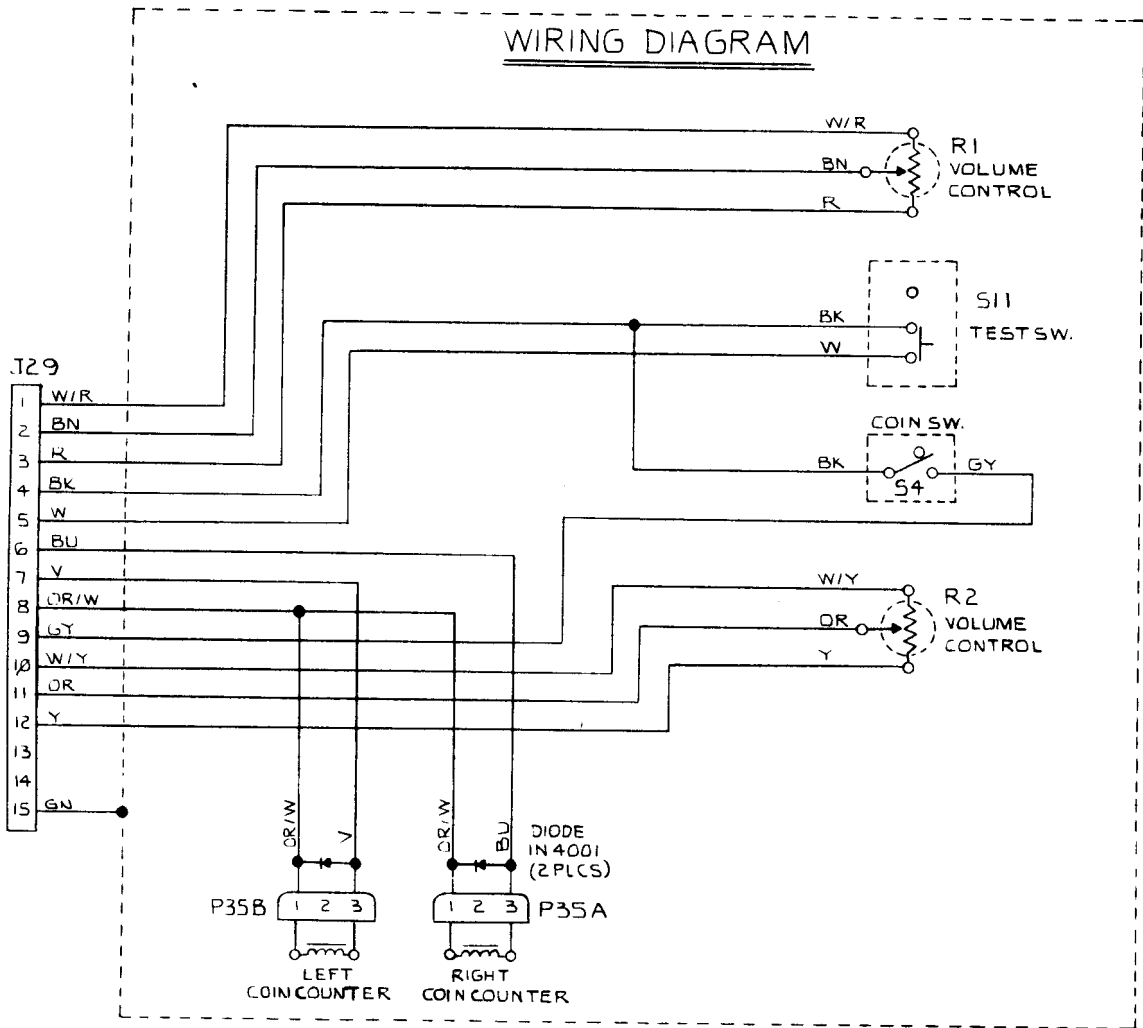
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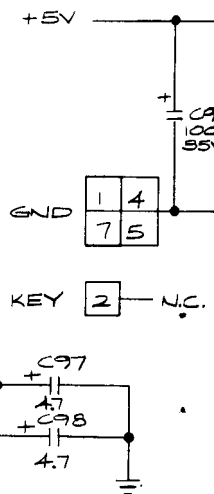
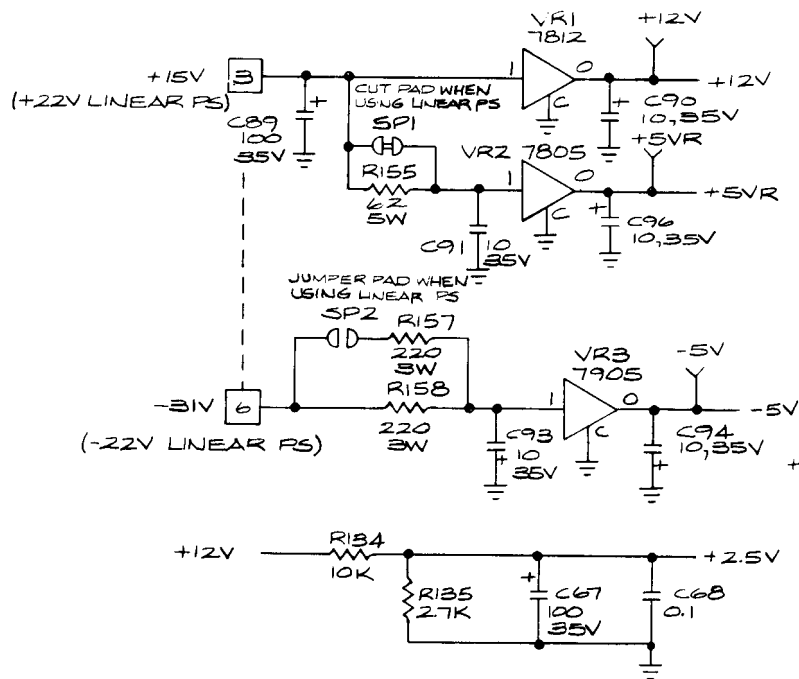
SP-253 Sheet 2B
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Utility Panel Wiring Diagram

WIRING DIAGRAM



Power



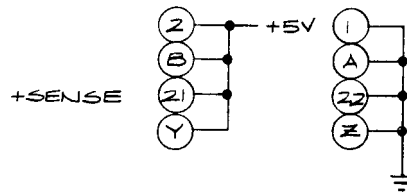
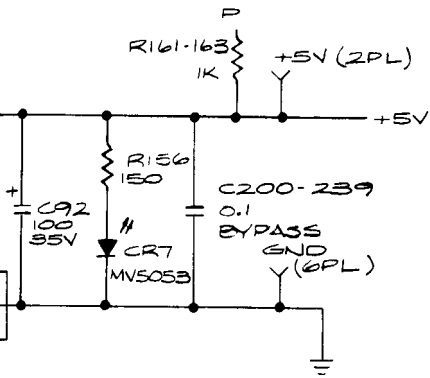
Power Input

NOTES:

□ DENOTES J14 CONNECTOR

○ DENOTES J16 CONNECTOR

◻ DENOTES J15 CONNECTOR



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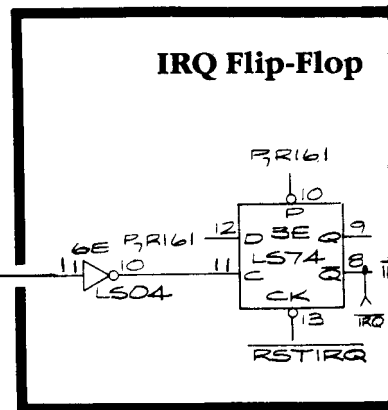
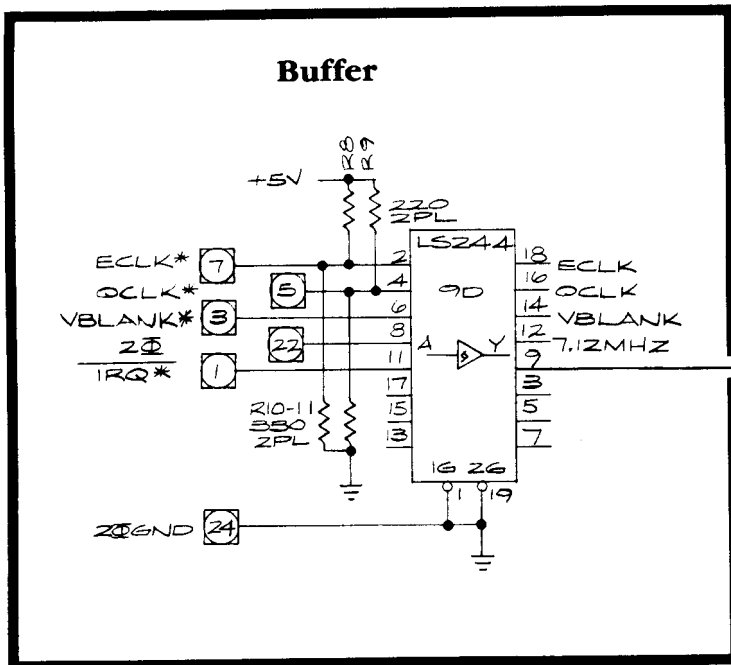
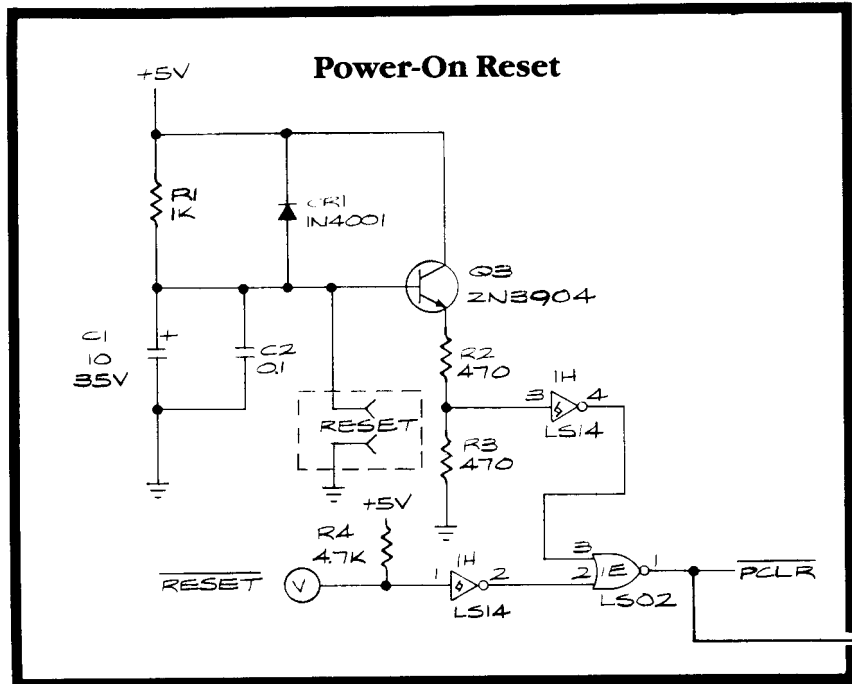
FIREFOX Main PCB



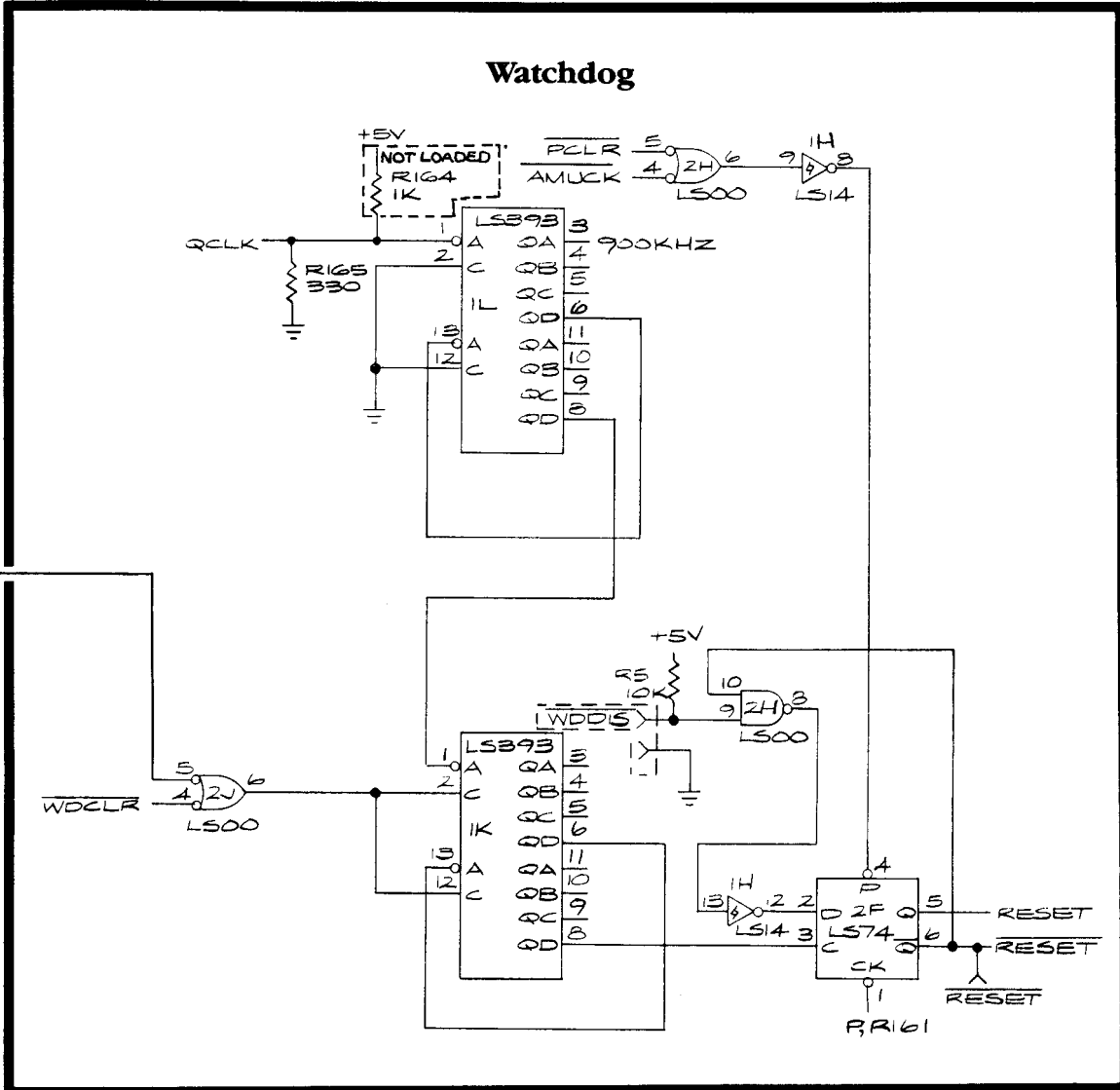
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Watchdog



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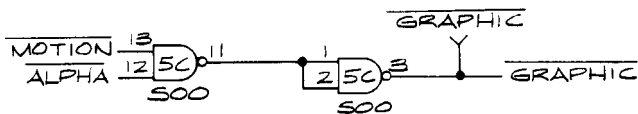
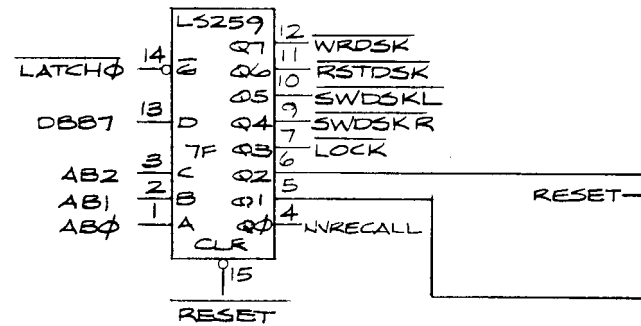
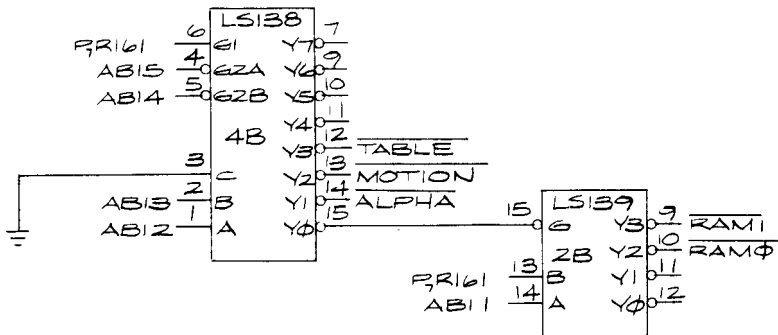
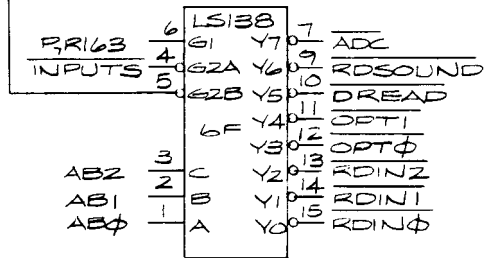
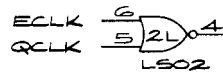
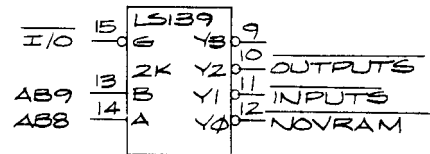
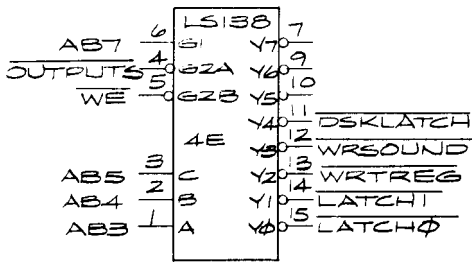
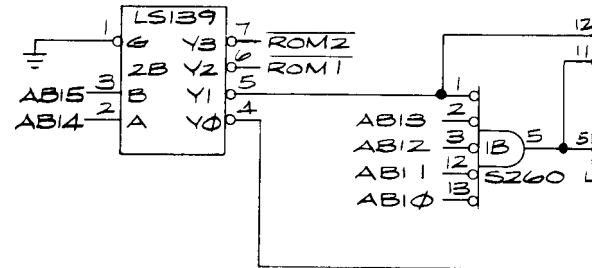
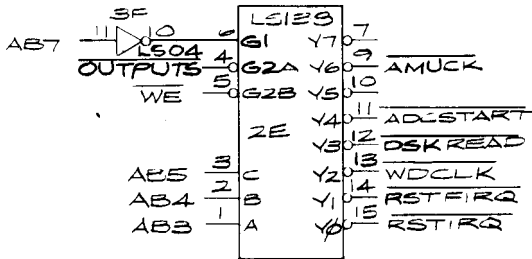
FIREFOX Main PCB

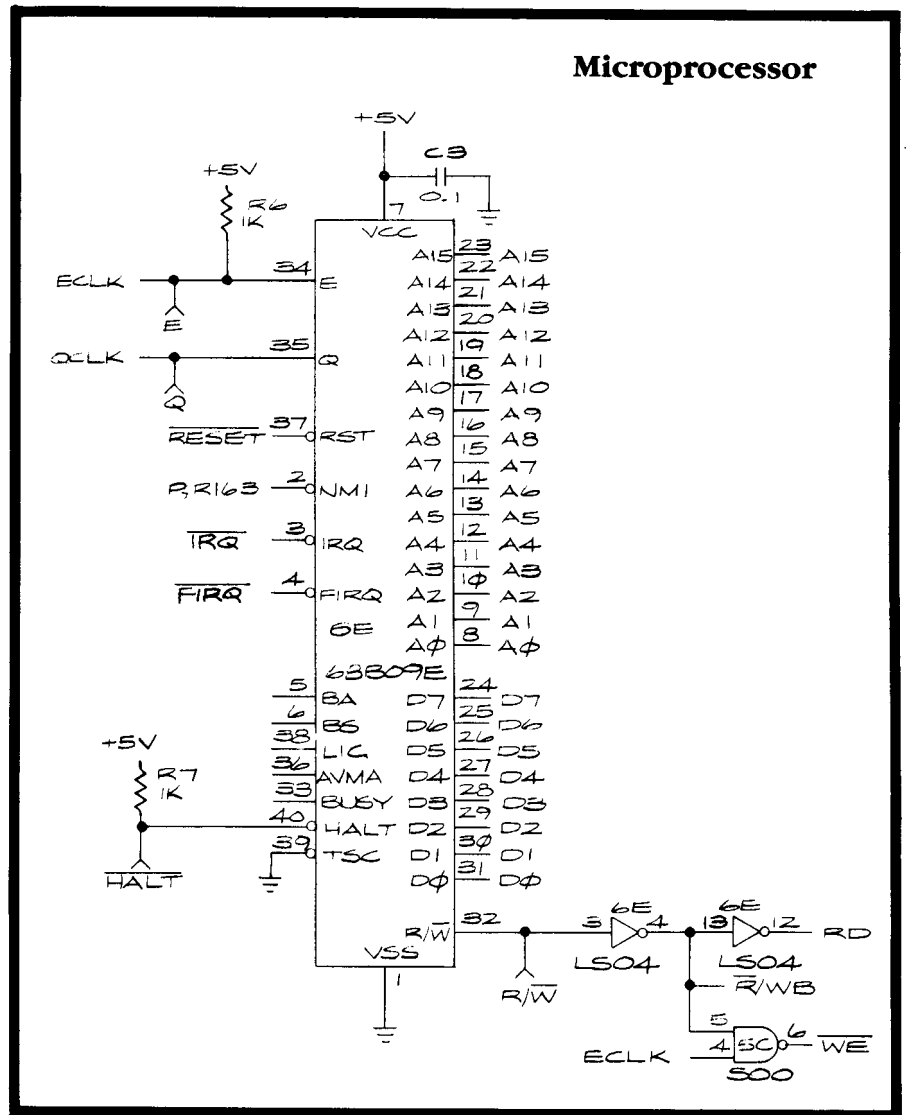
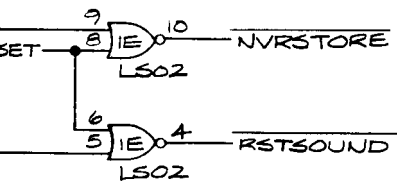
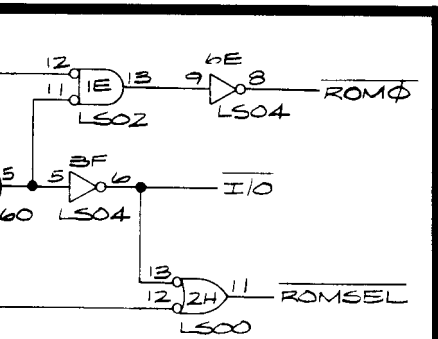


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Address Decoders





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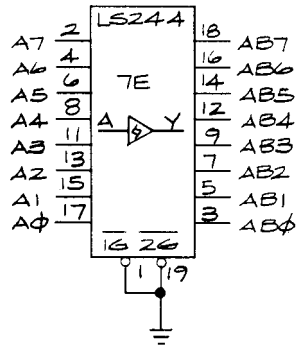
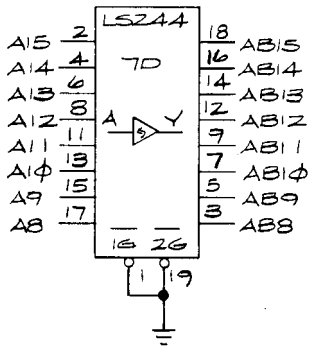


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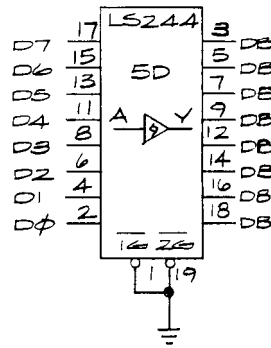
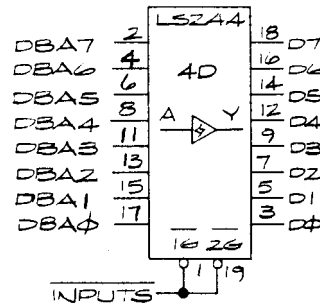
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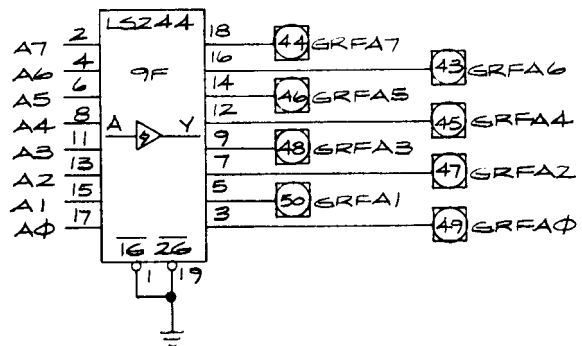
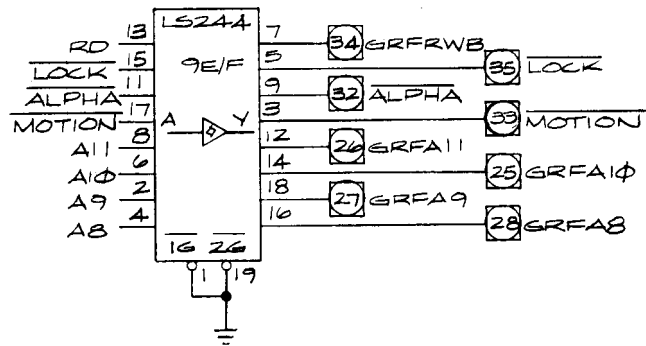
Address Buffers



Data Buffers



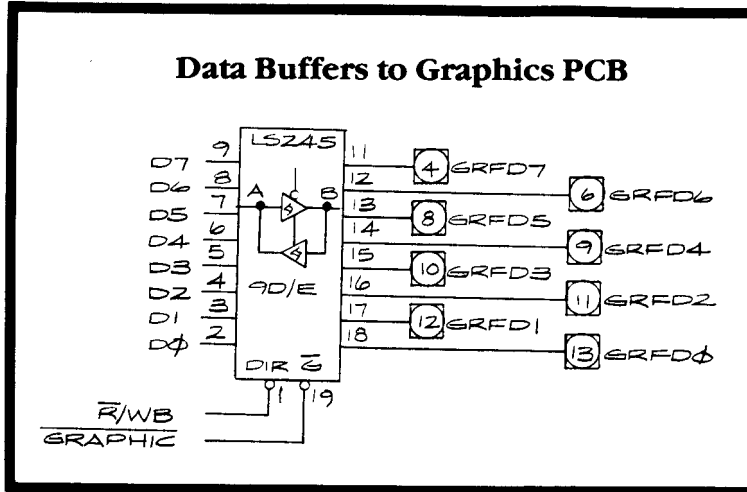
Address Buffers to Graphics PCB



fers

- 18 D7
- 16 D6
- 14 D5
- 12 D4
- 9 D3
- 7 D2
- 5 D1
- 3 D0

- 3 DBB7
- 5 DBB6
- 7 DBB5
- 9 DBB4
- 12 DBB3
- 14 DBB2
- 16 DBB1
- 18 DBB0



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FIREFOX Main PCB



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Non-Volatile RAM (NOVRAM)

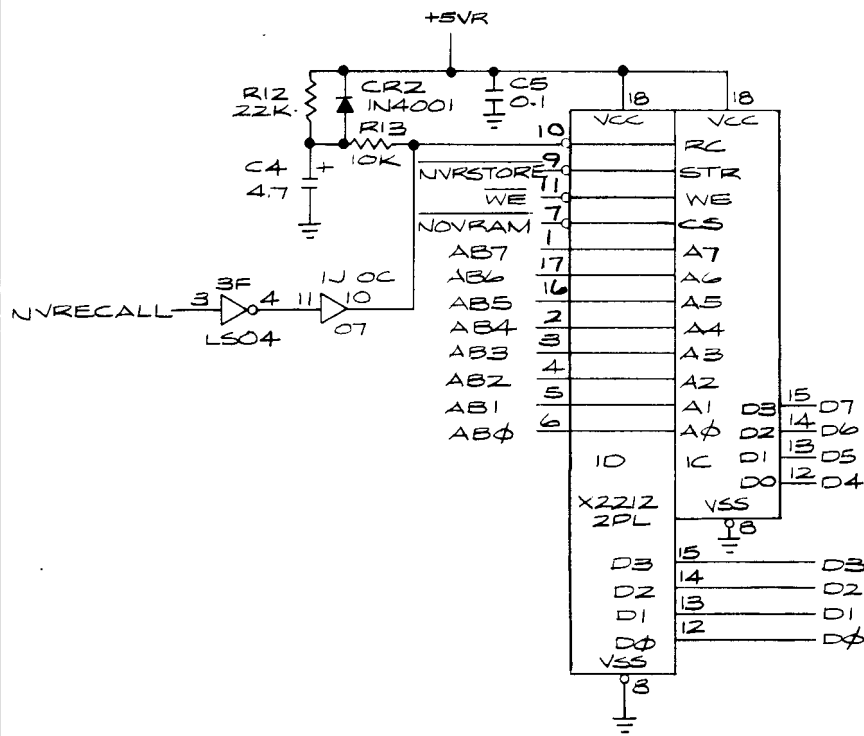
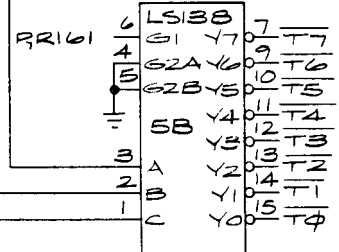
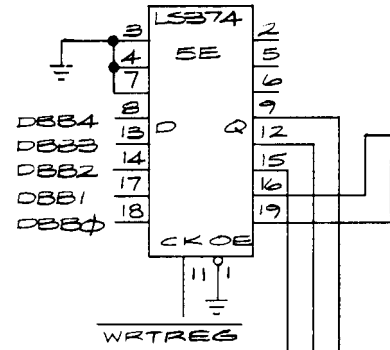


Table ROM Selector



Program RAM

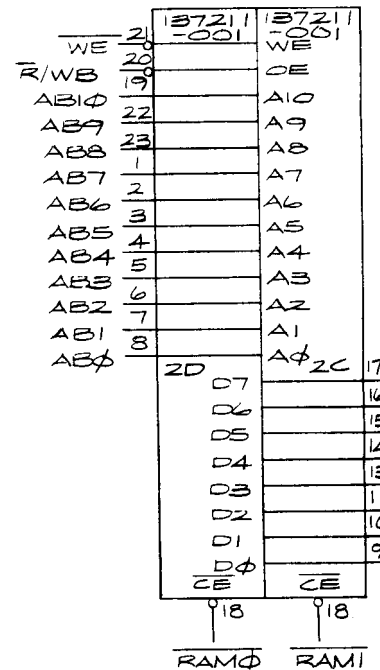
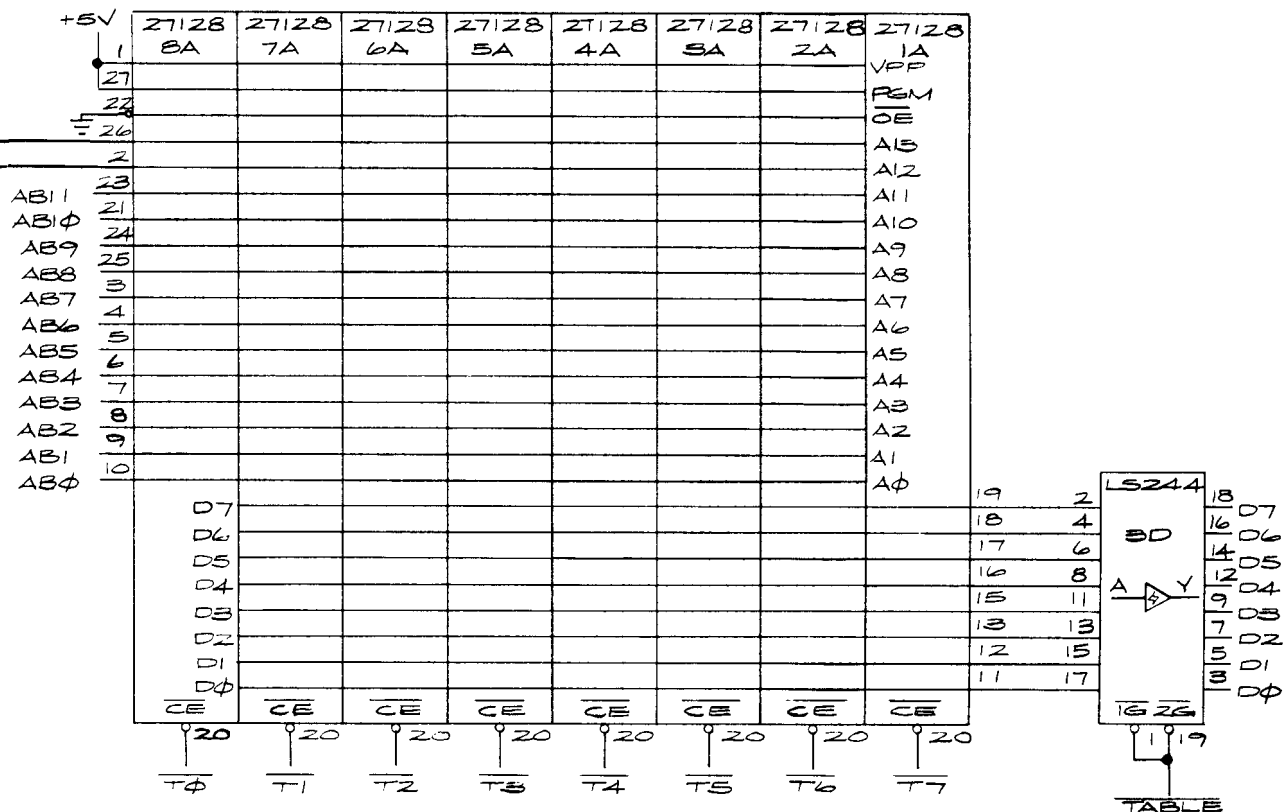
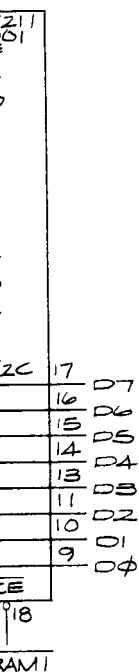


Table ROM



RAM



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FIREFOX Main PCB

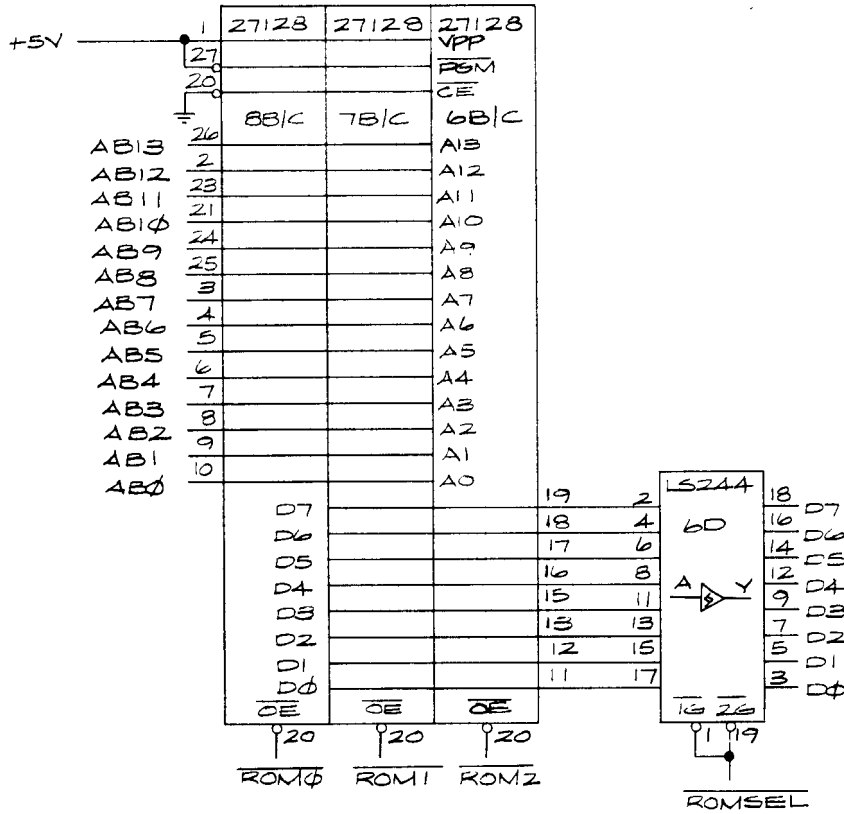


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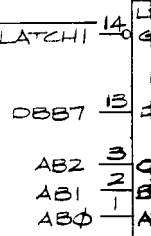
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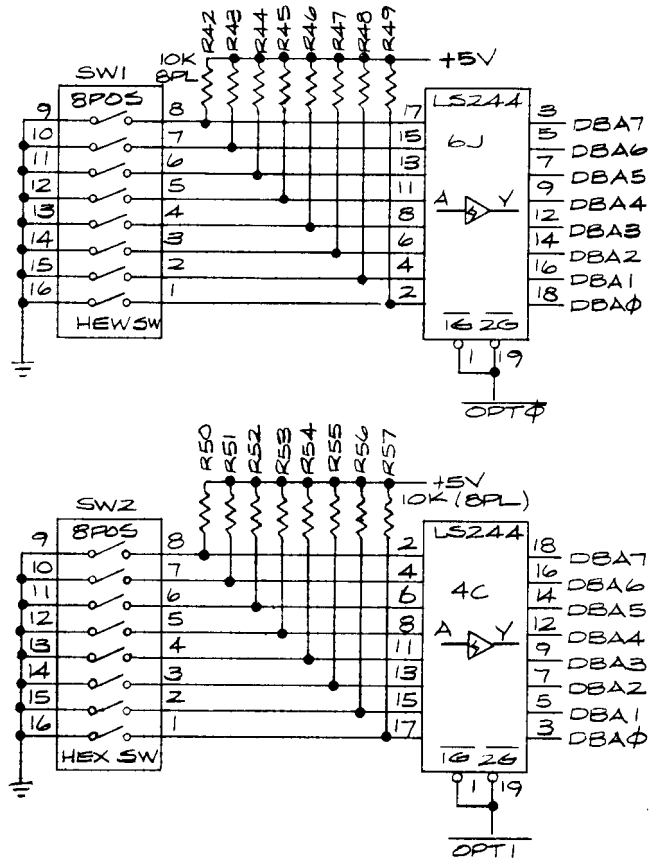
Program ROM



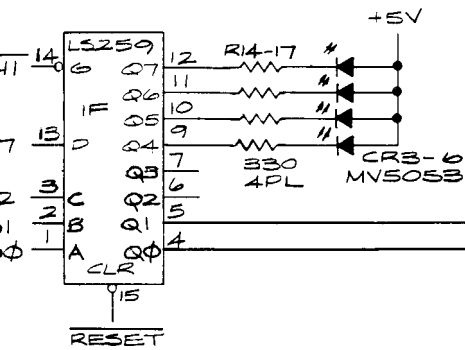
Test a



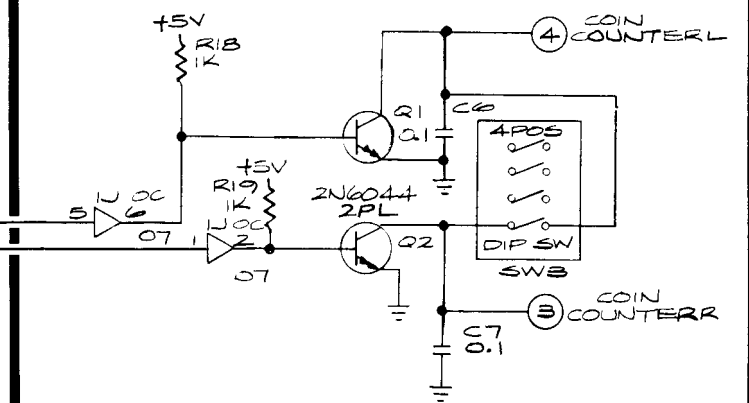
Option Switches



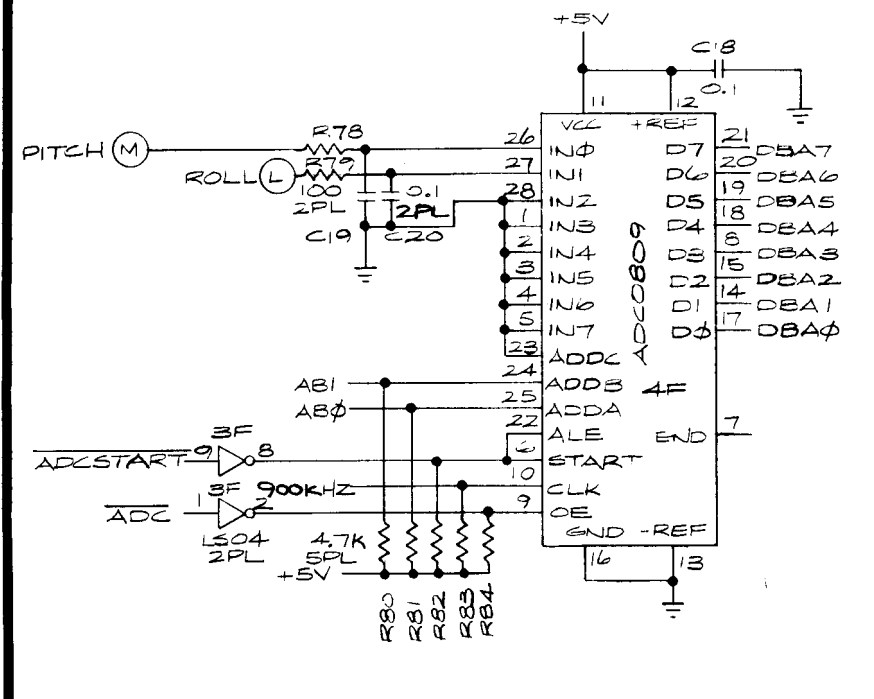
Test and Control Signals



Coin Door Outputs



Analog-to-Digital Converter



BA7
 BA6
 BA5
 BA4
 BA3
 BA2
 BA1
 BAφ

 BA7
 BA6
 BA5
 BA4
 BA3
 BA2
 BA1
 BAφ

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FIREFOX Main PCB

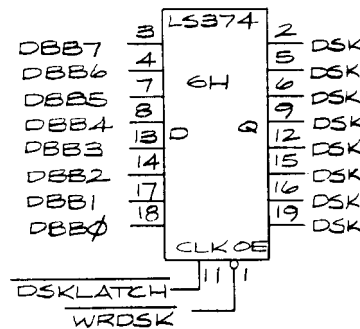
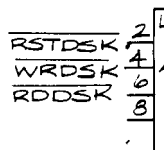
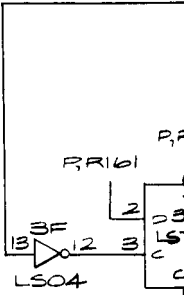
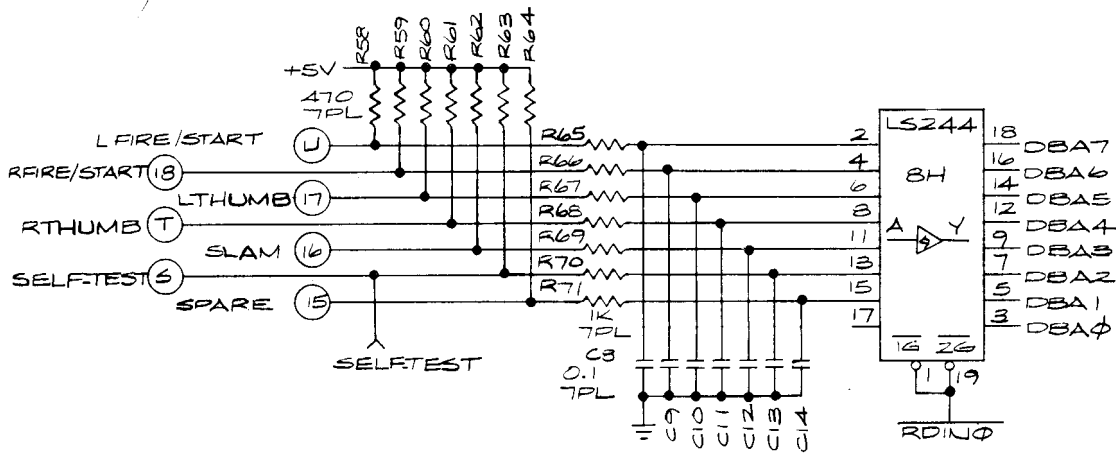
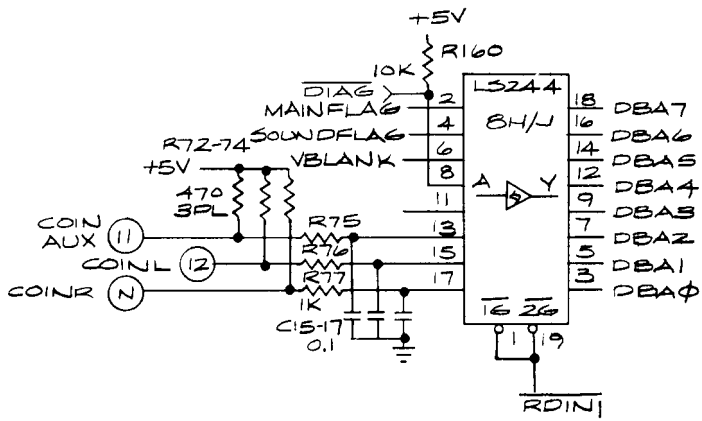


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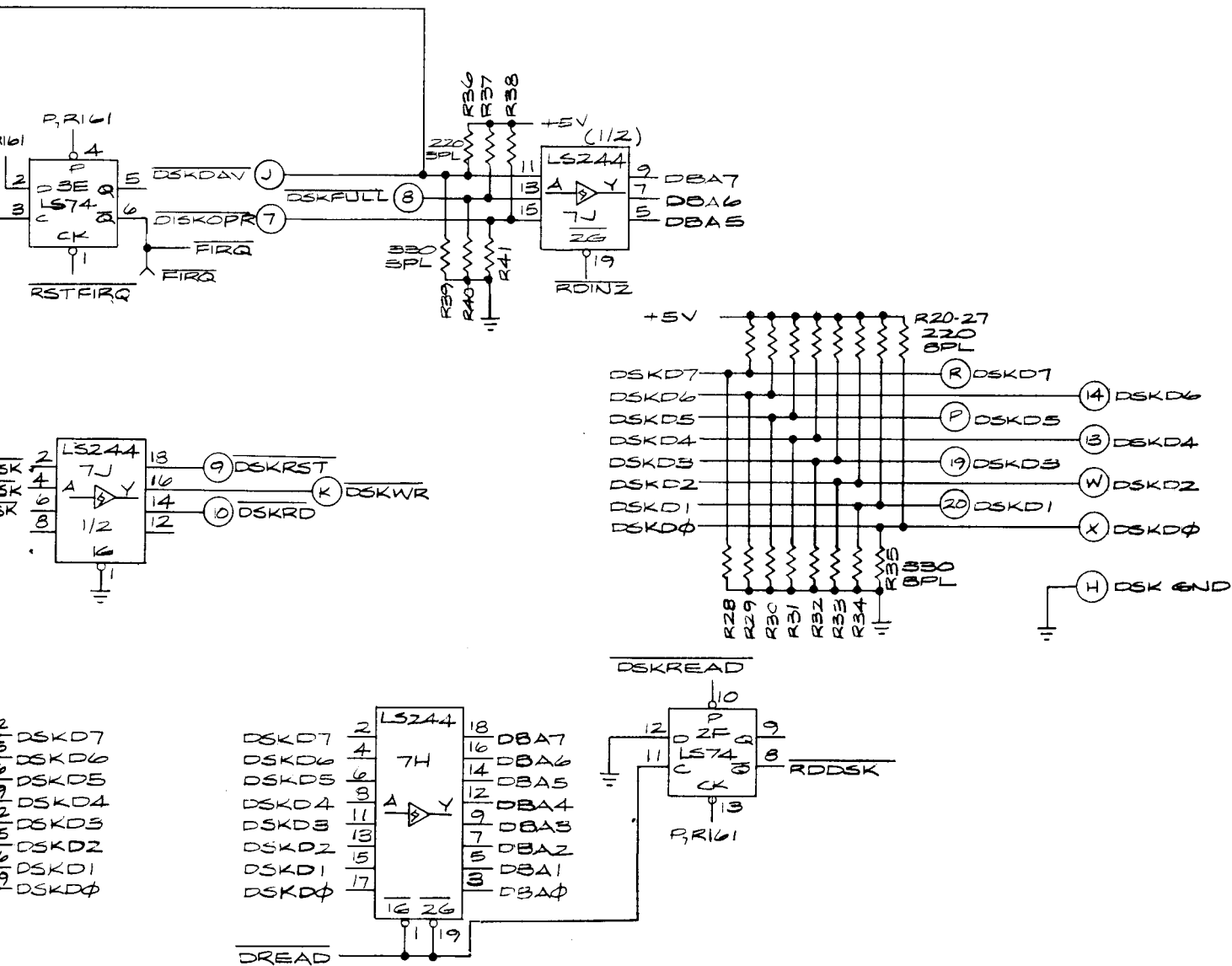
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SP-253 Sheet 6B
2nd printing

Coin Door and Control Panel Inputs



Laser Disc Interface



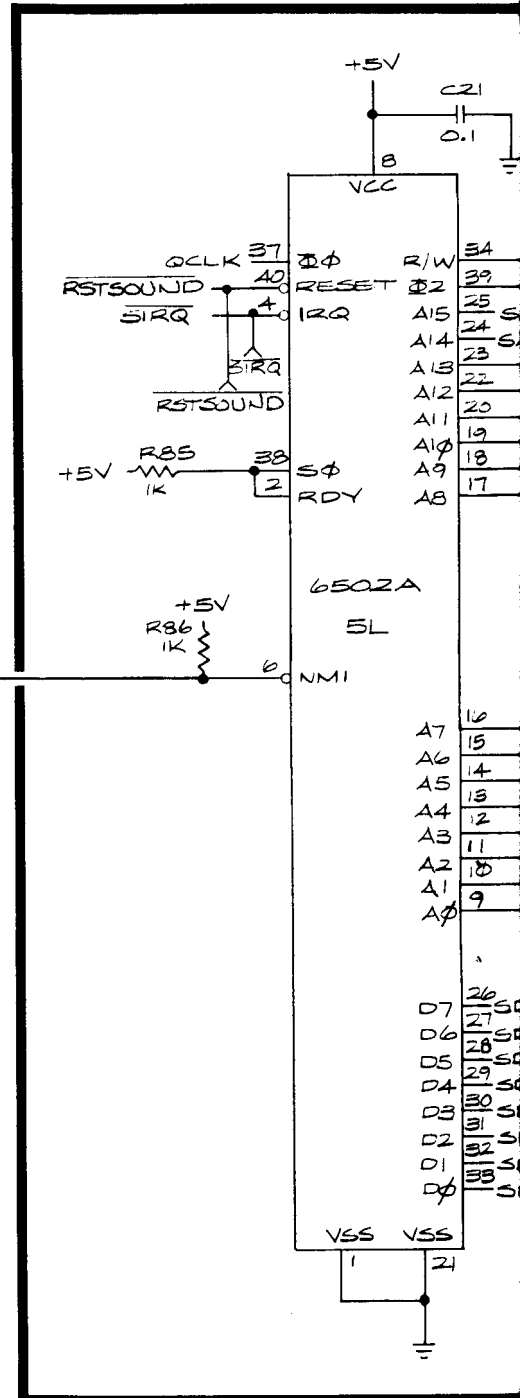
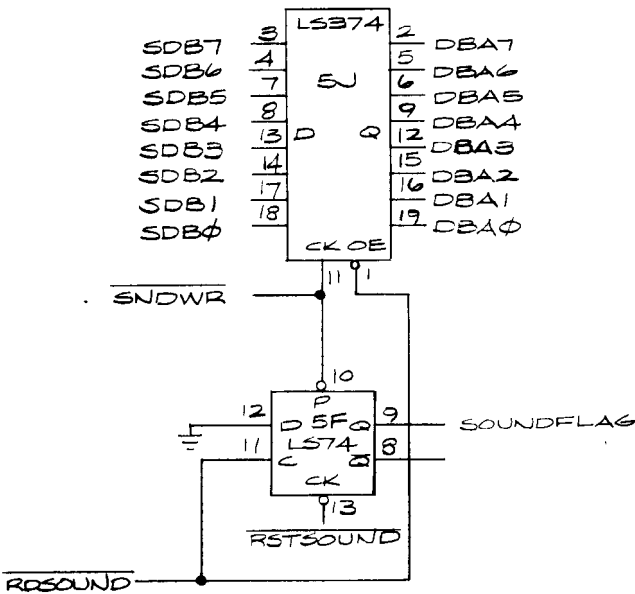
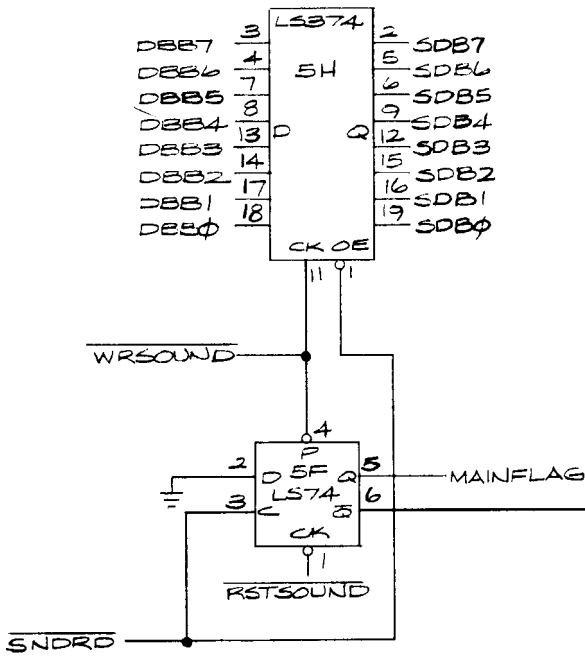
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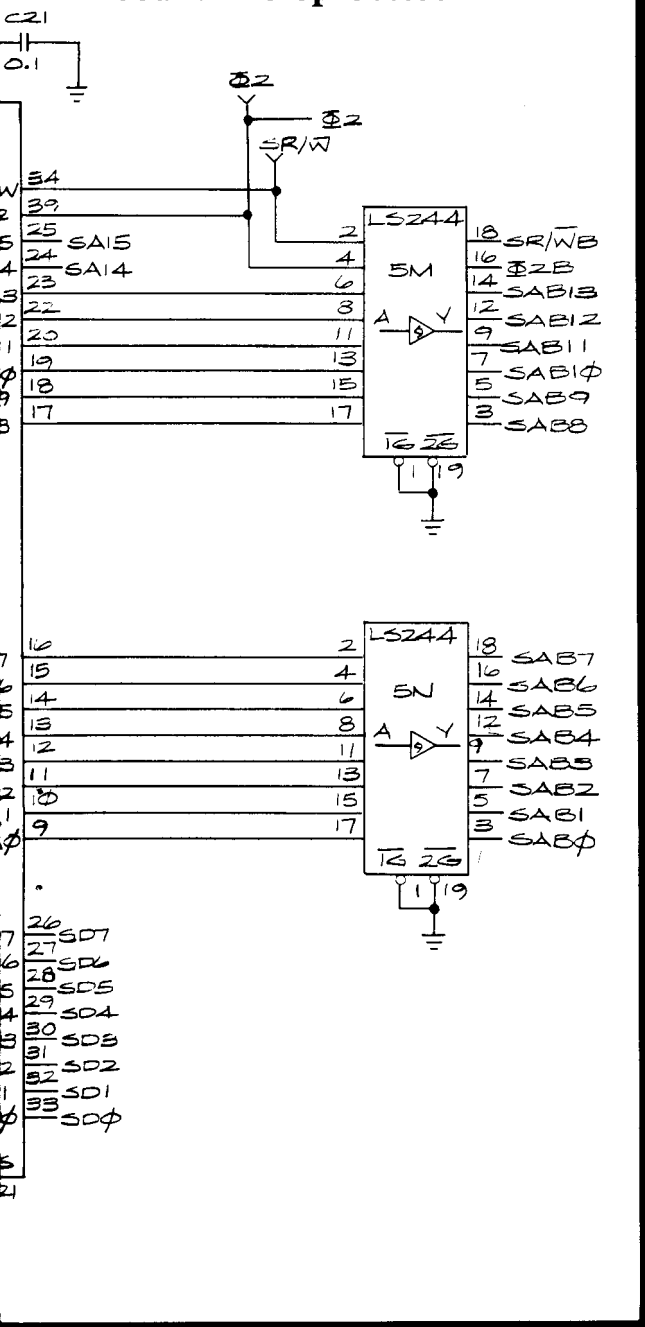
FIREFOX Main PCB



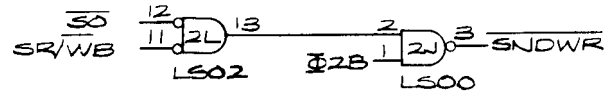
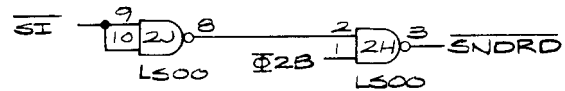
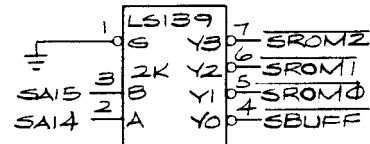
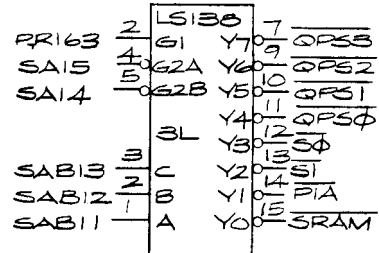
Sound Microprocessor Interface



Sound Microprocessor



Sound Microprocessor Address Decoders



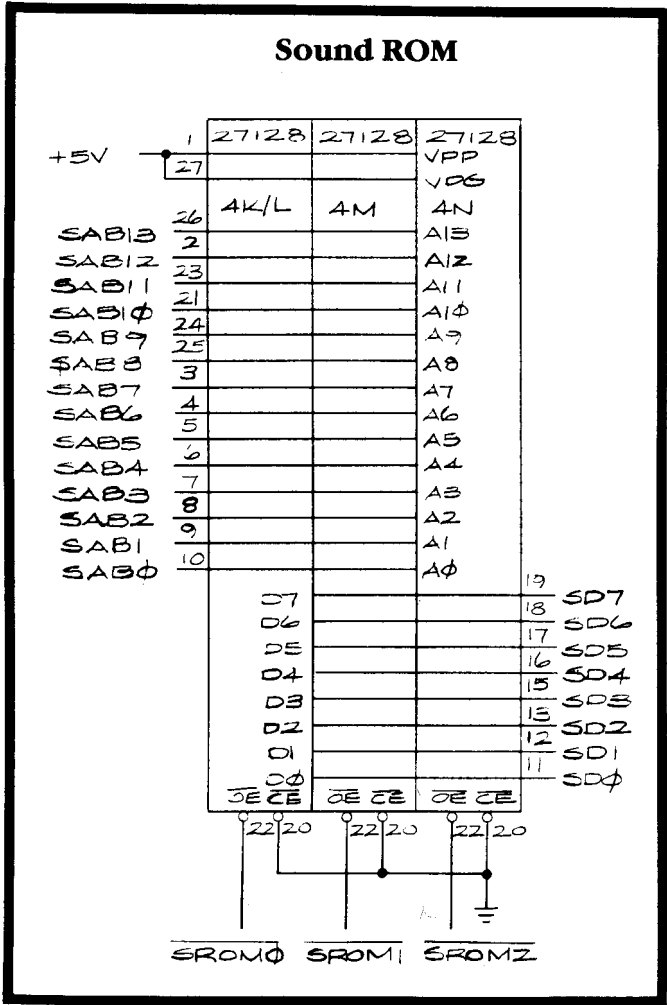
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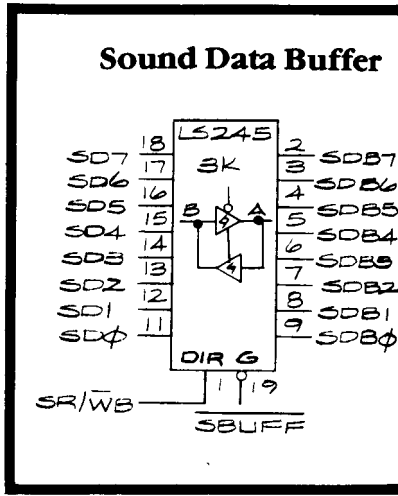
FIREFOX Main PCB



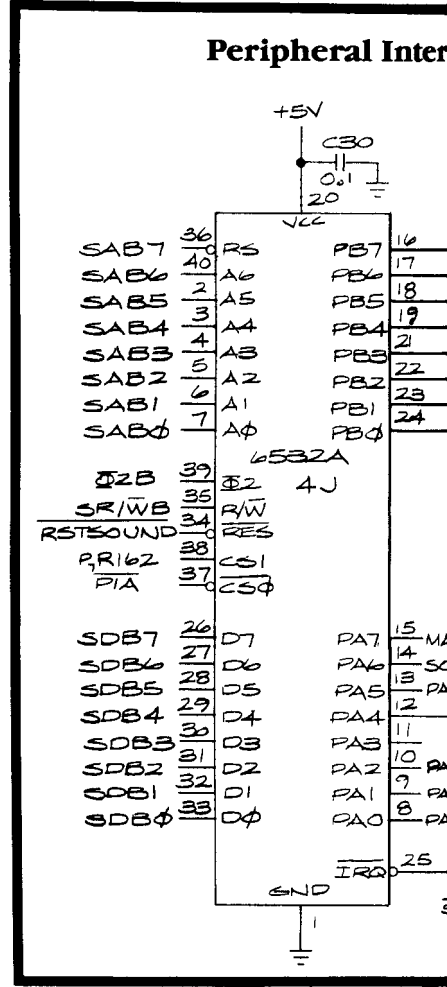
Sound ROM



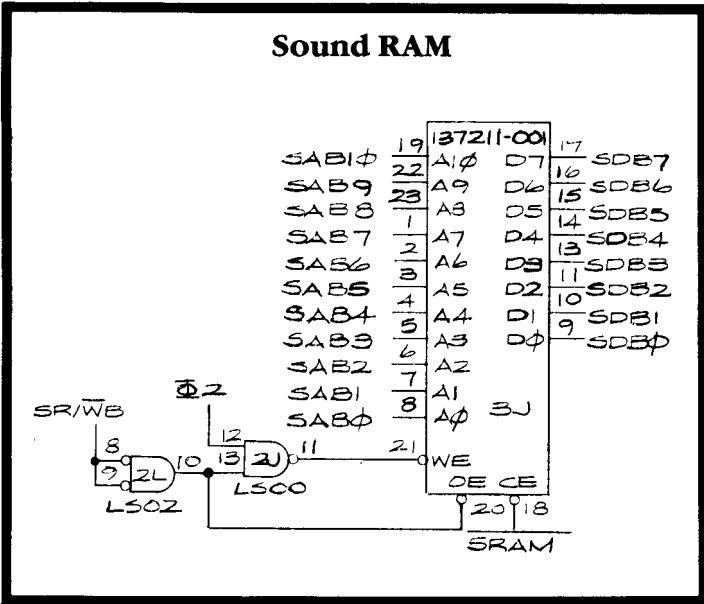
Sound Data Buffer



Peripheral Inter



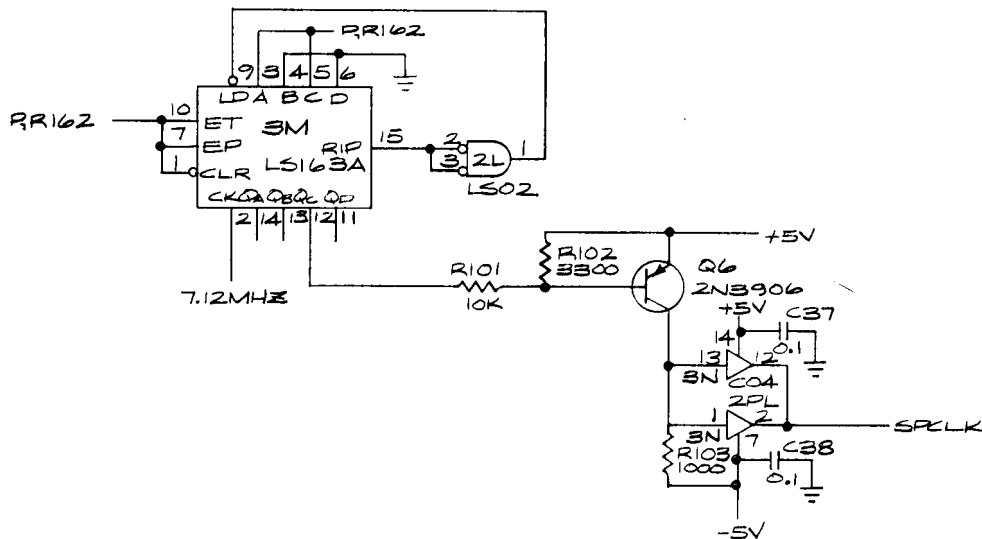
Sound RAM



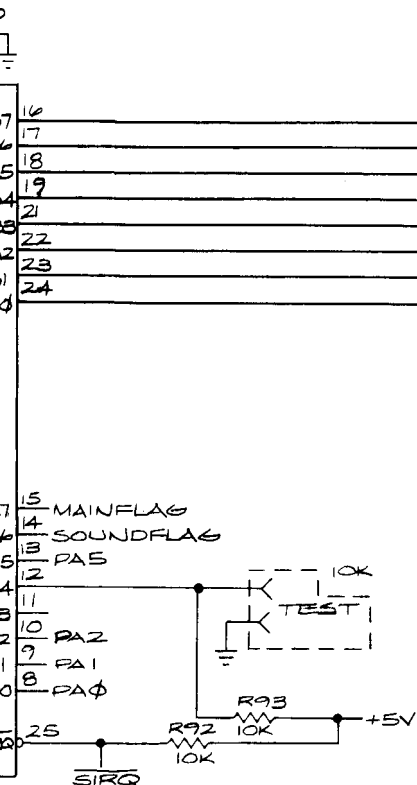
uffer

SDB7
SDB6
SDB5
SDB4
SDB3
SDB2
SDB1
SDBφ

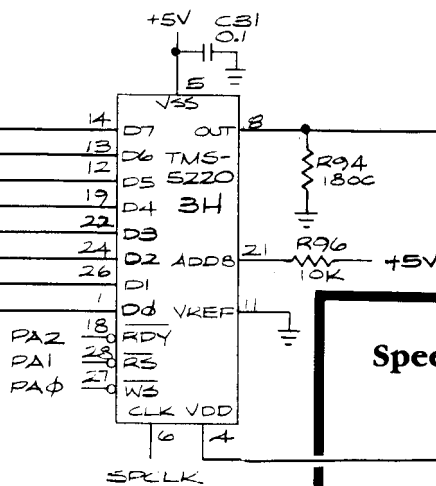
Speech Synthesizer Clock Generator



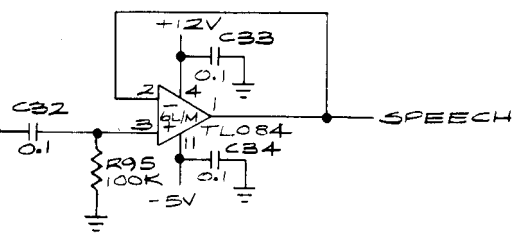
Interface Adapter



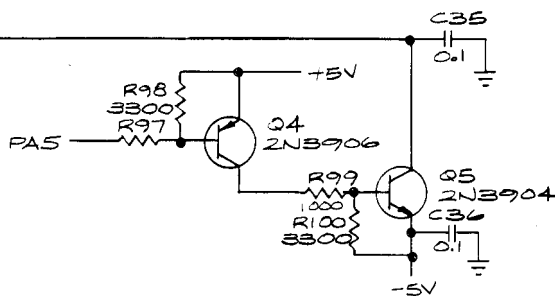
Speech Synthesizer



Buffer



Speech Synthesizer Power Switch



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FIREFOX Main PCB

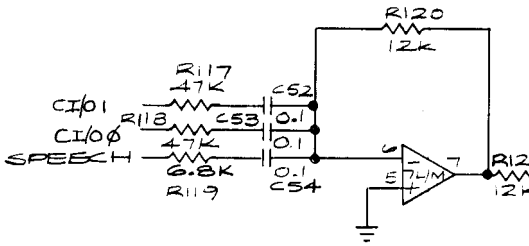
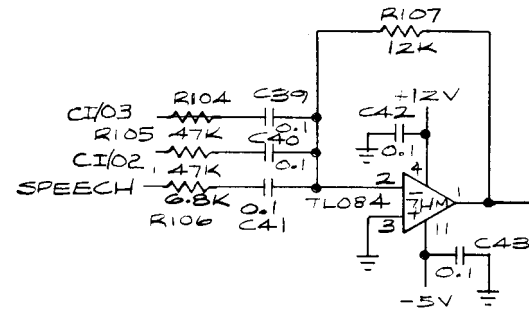


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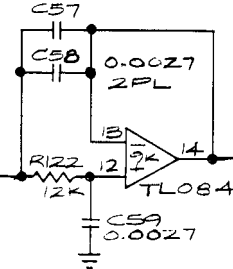
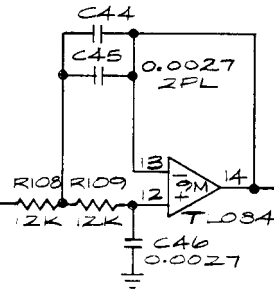
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SP-253 Sheet 8A
2nd printing

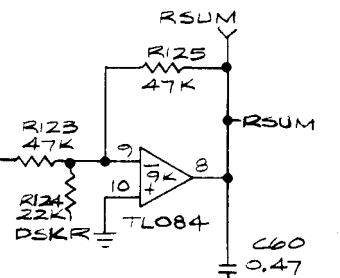
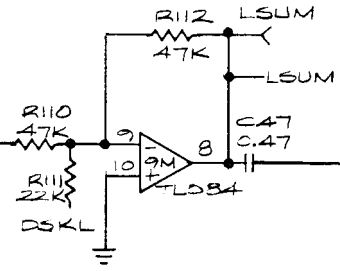
Summing Amplifier



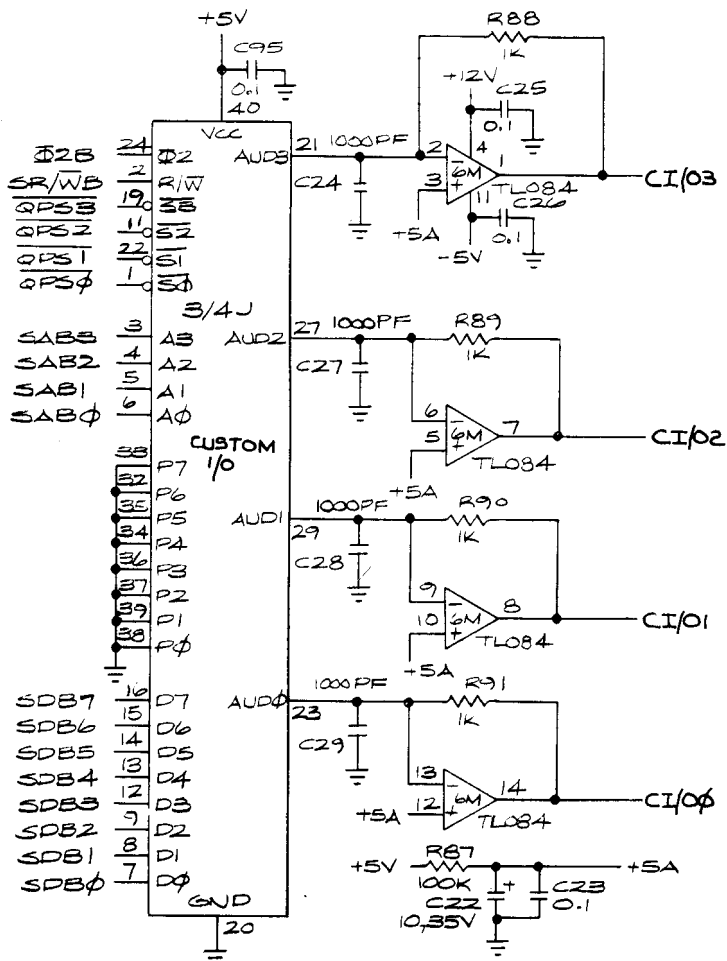
Filters



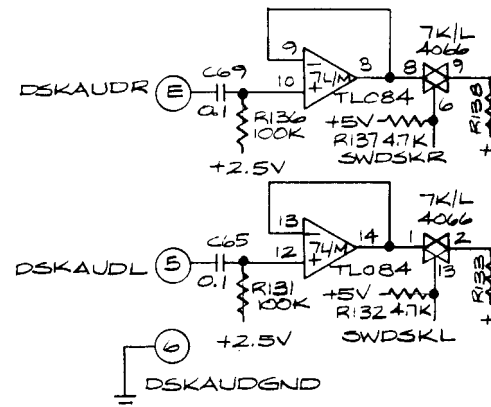
Summing Amplifier



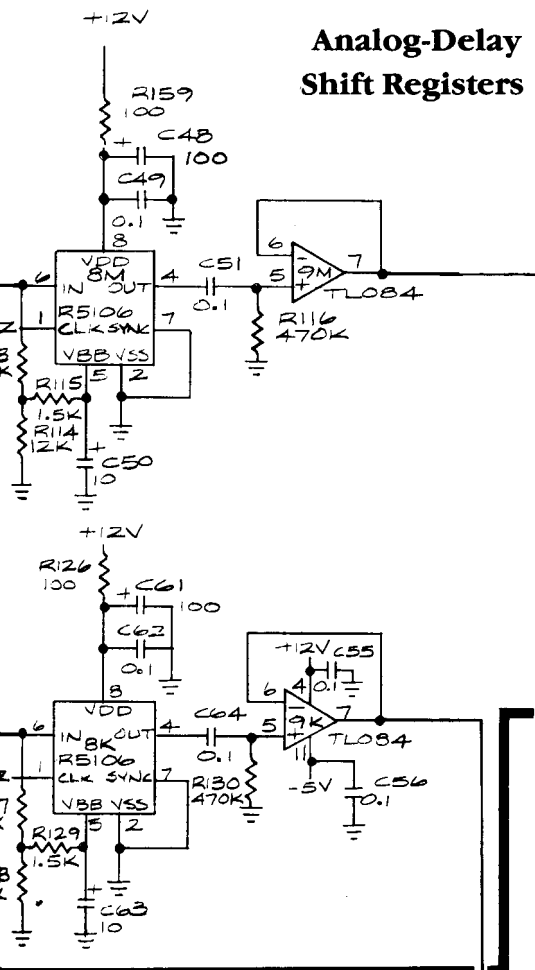
Music and Sound Effects Generators



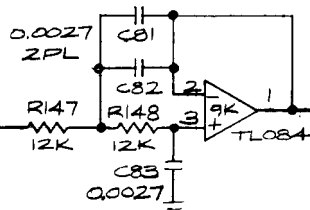
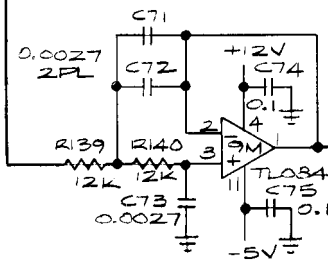
Laser-Disc Audio Buff



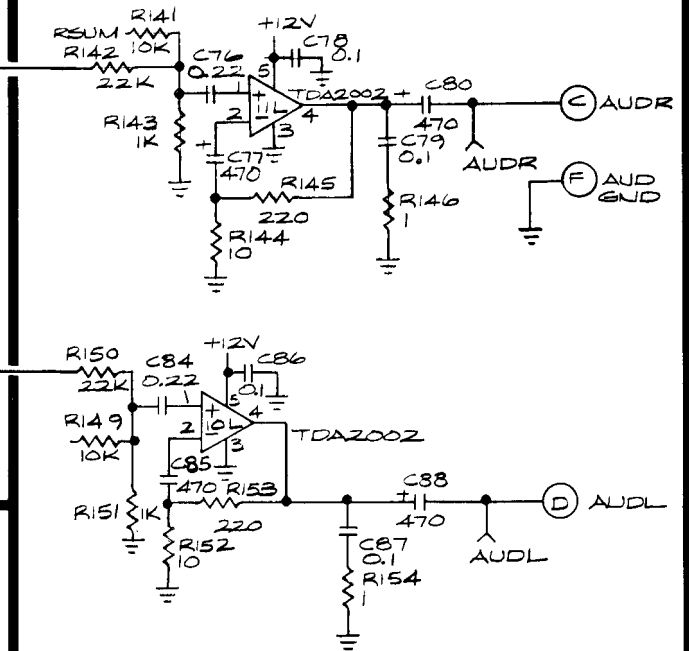
Analog-Delay Shift Registers



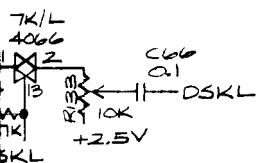
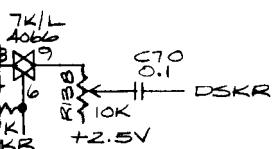
Filter



Audio Output Driver



Buffers



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FIREFOX Main PCB

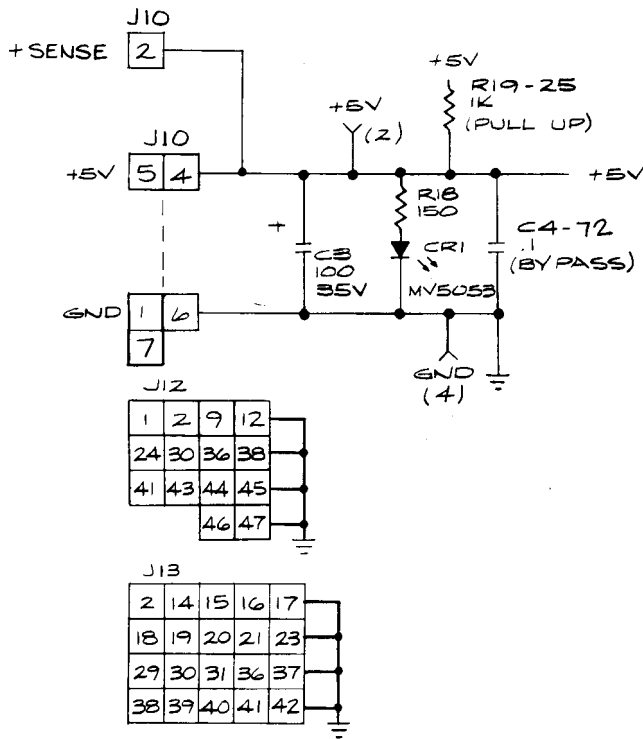


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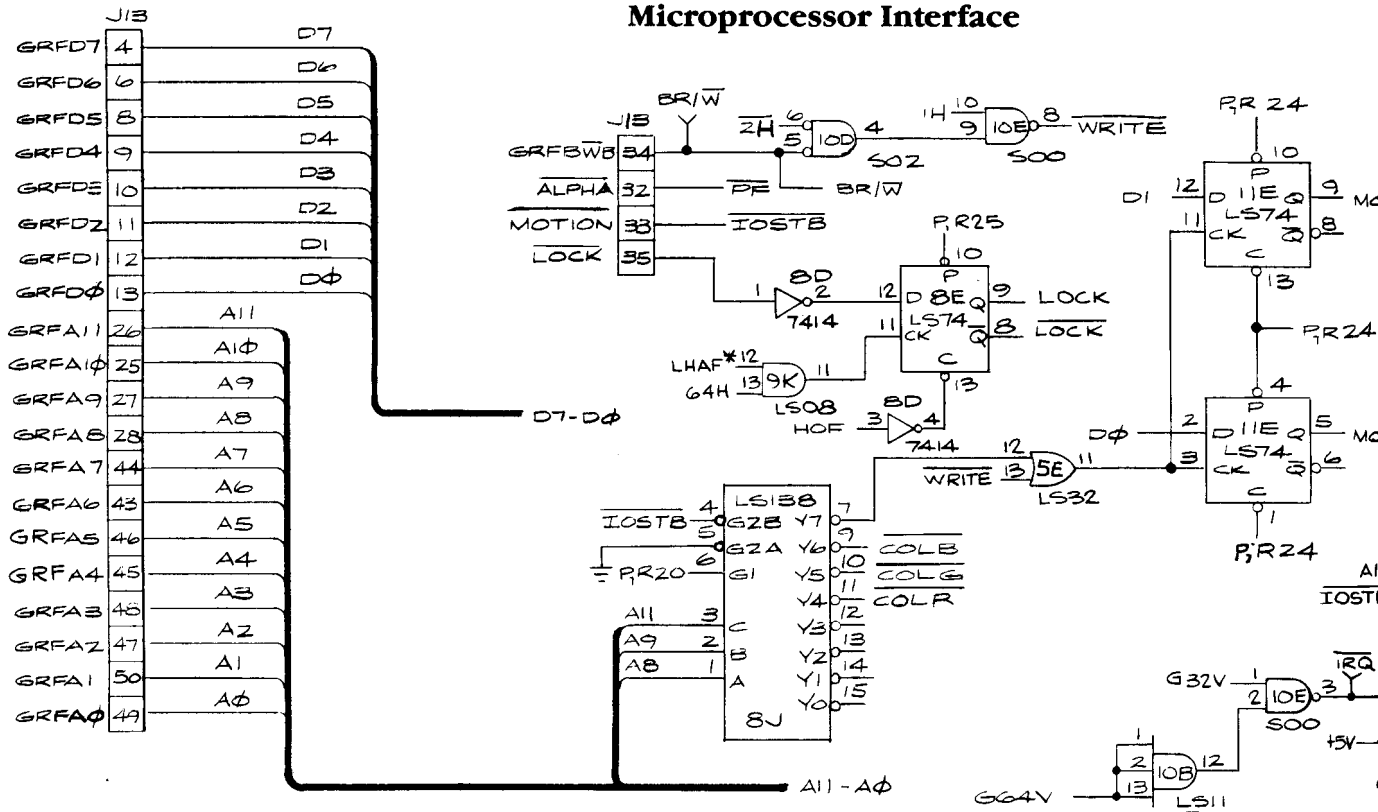
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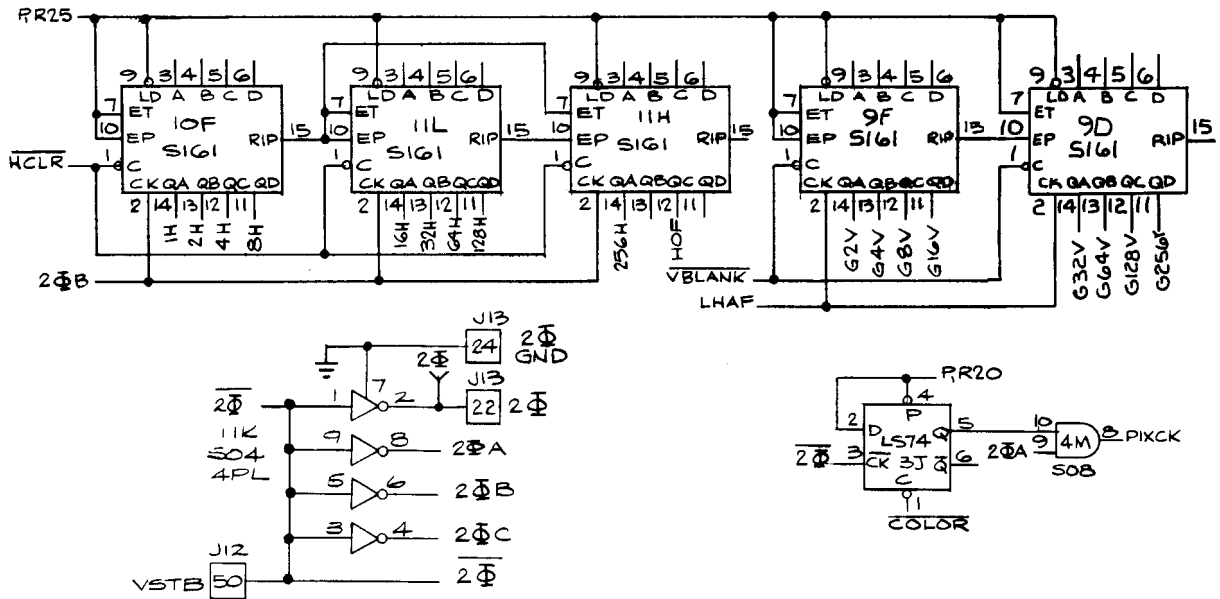
Power Input



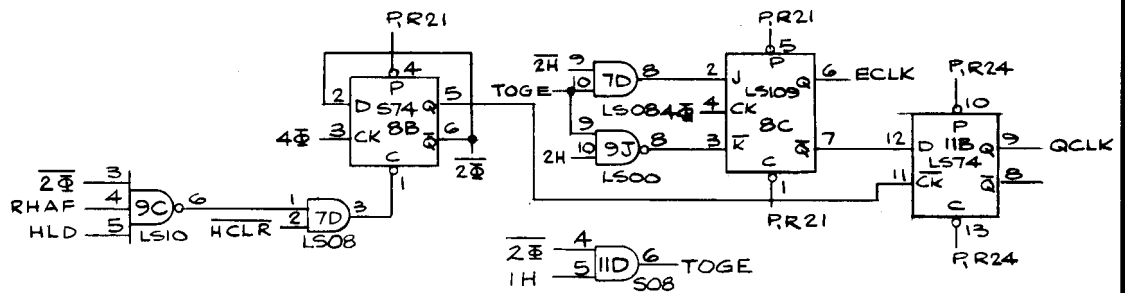
Microprocessor Interface



Graphics Sync Chain



Microprocessor Clock



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FIREFOX Graphics PCB

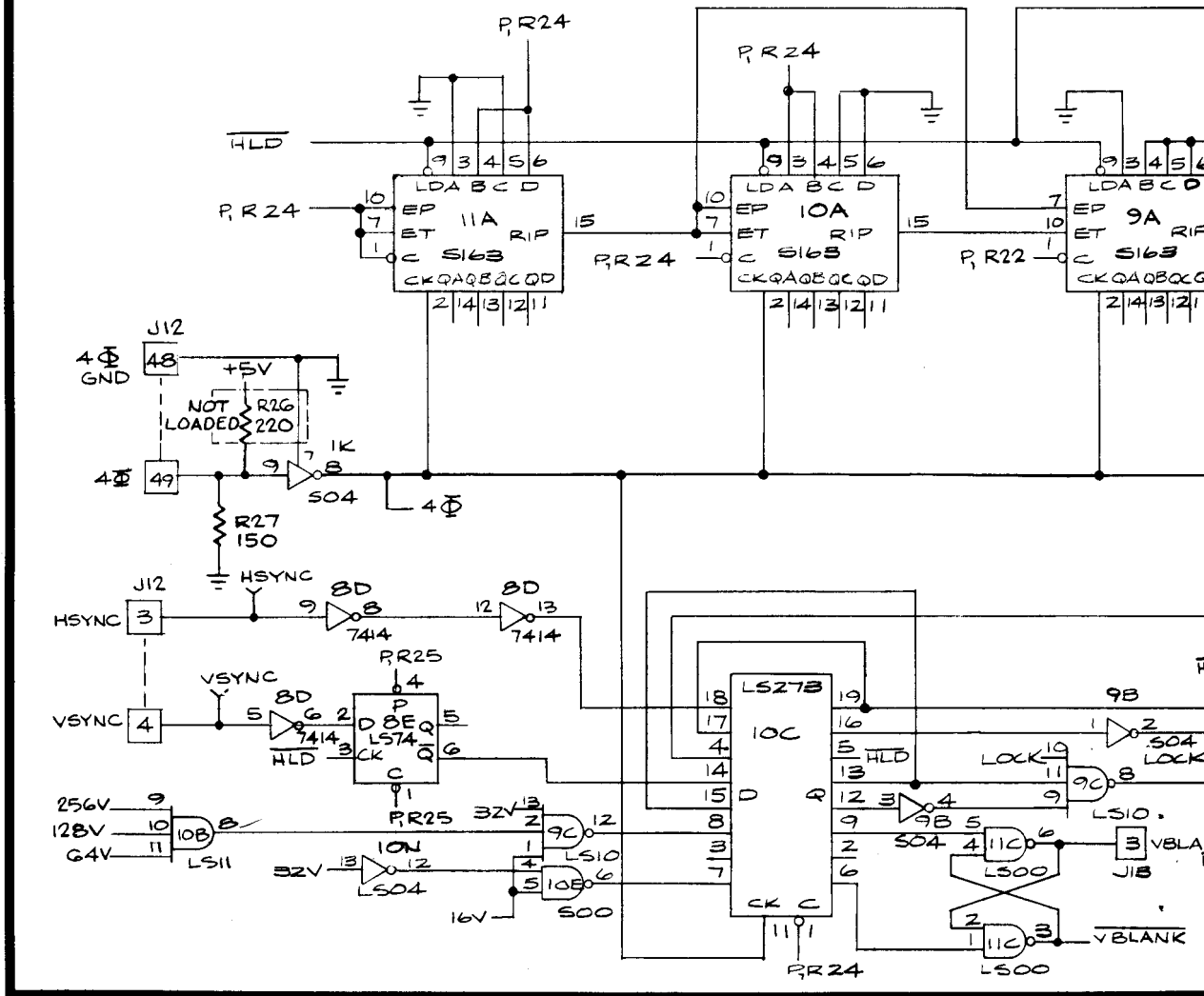


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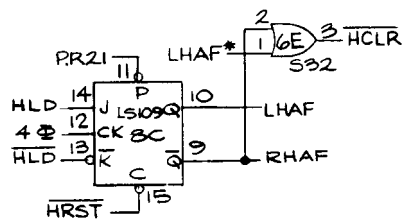
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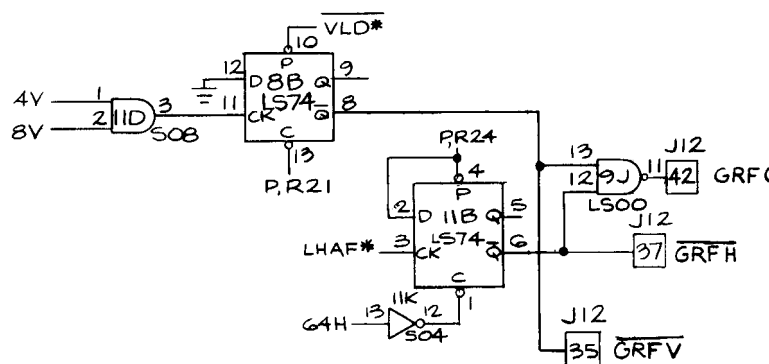
Full Interlace Sync Generator



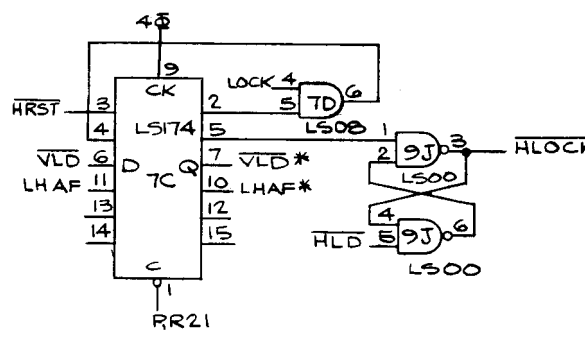
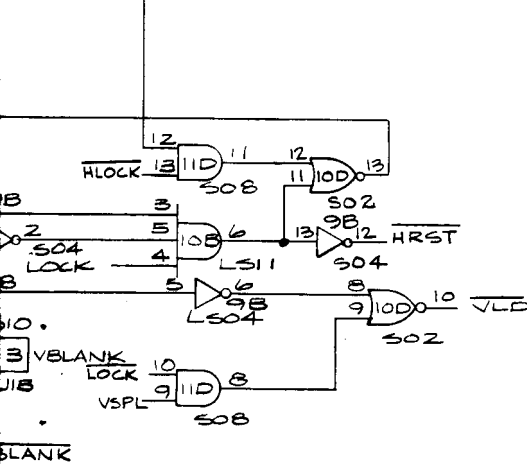
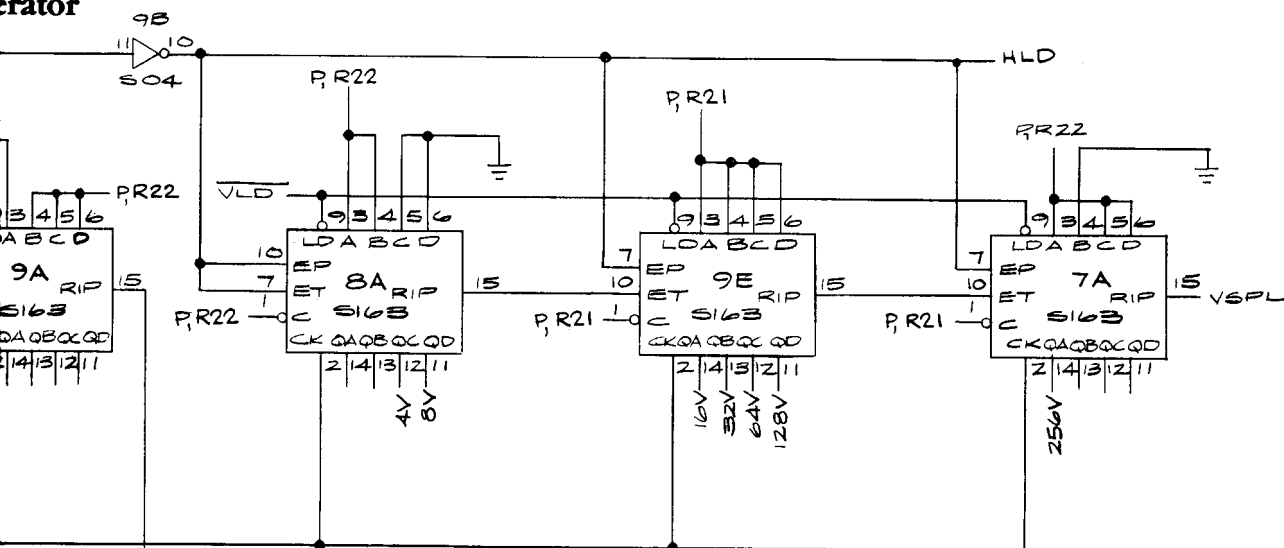
Half-Line Scan



Monitor Sync



erator

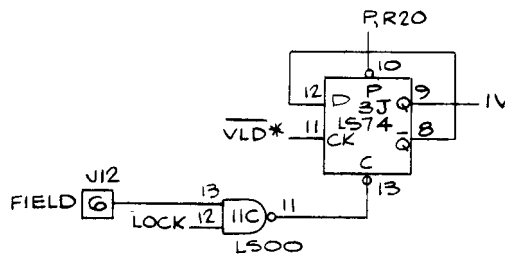


ync

GRFC

RFH

Odd/Even Scan



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FIREFOX Graphics PCB

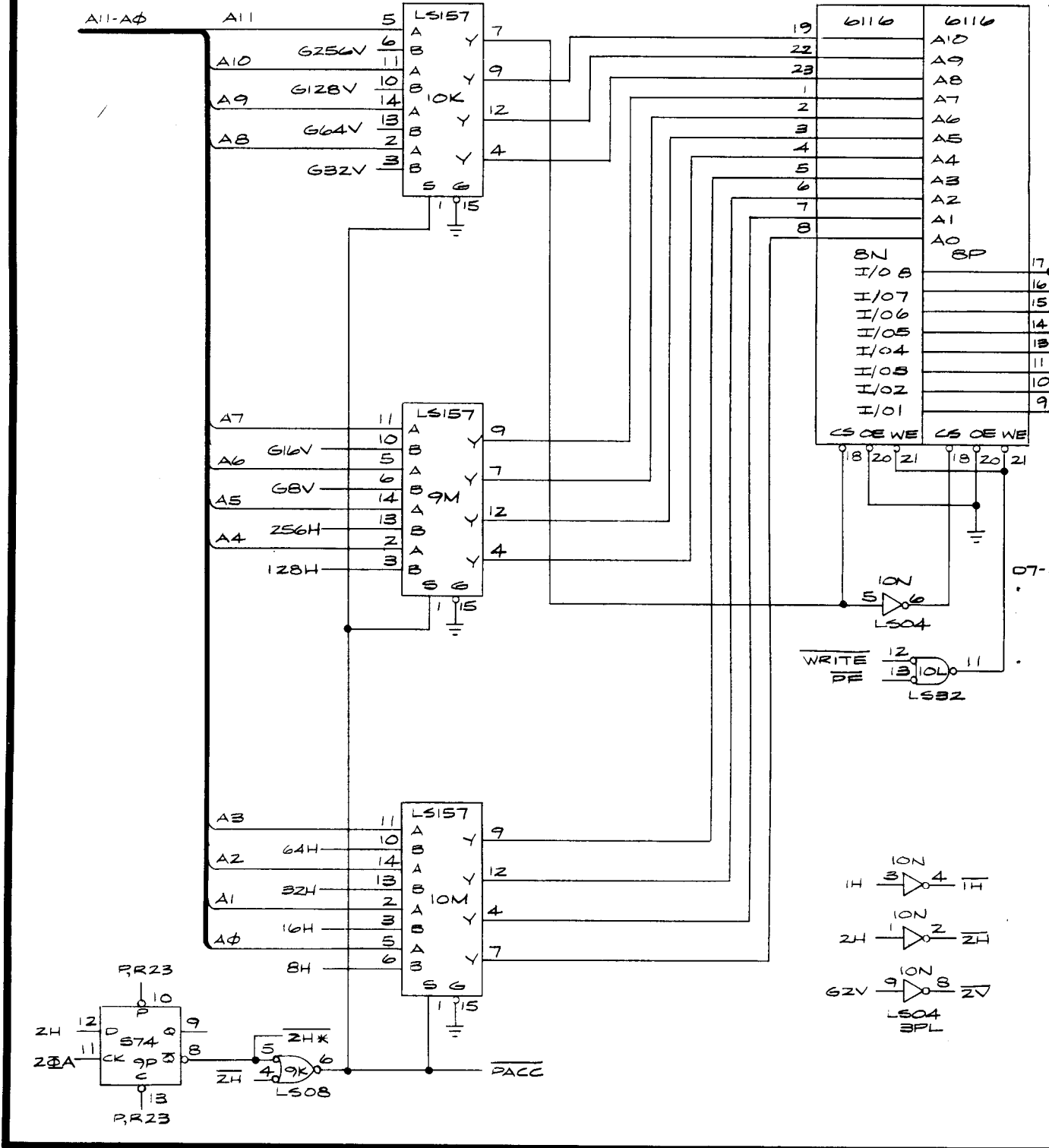


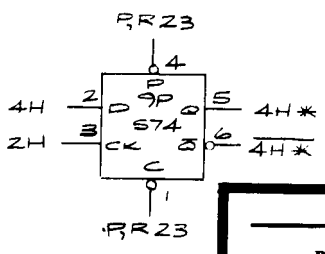
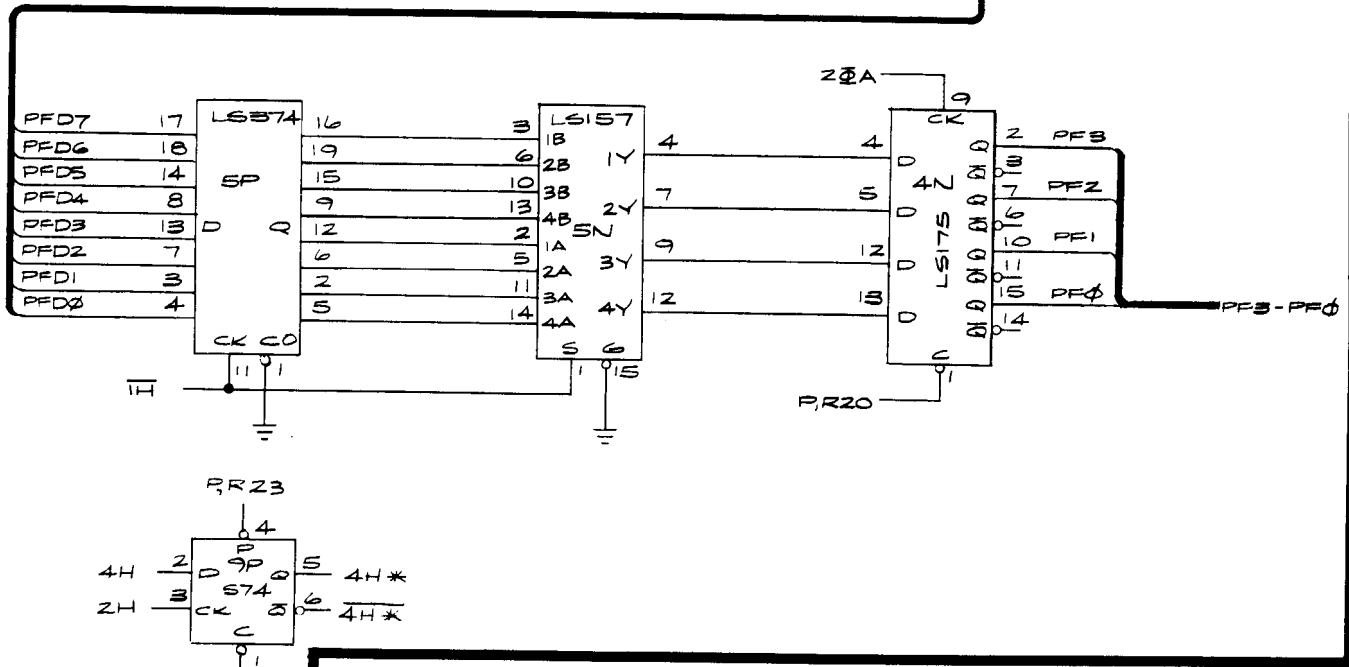
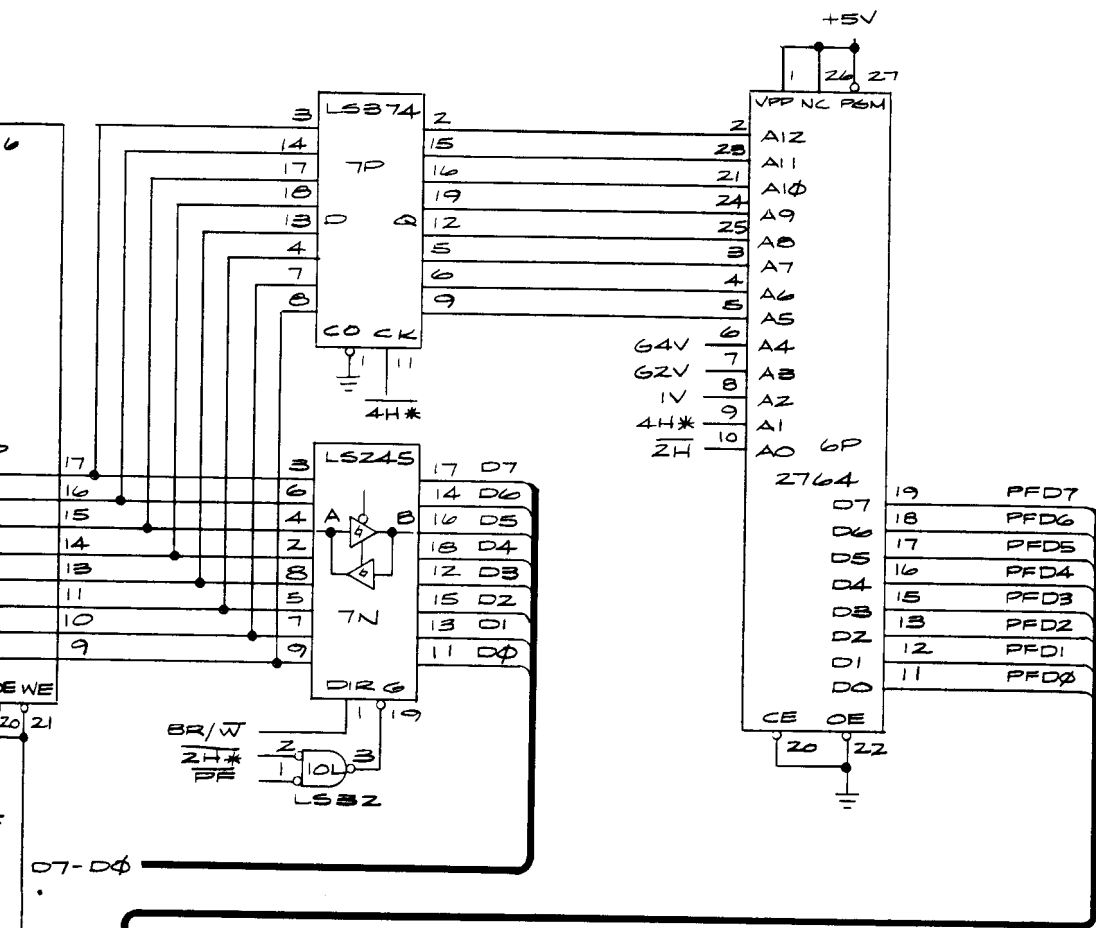
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Graphics/Alphanumeric Generator





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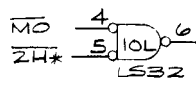
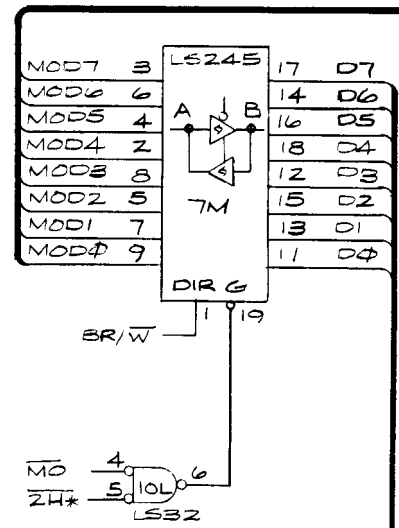
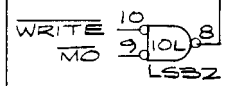
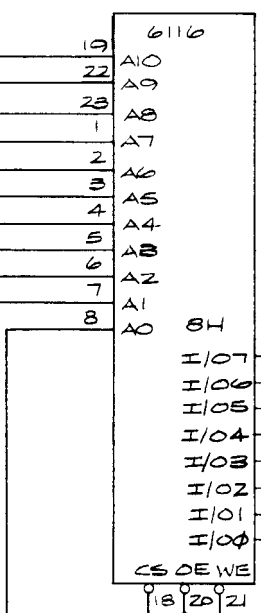
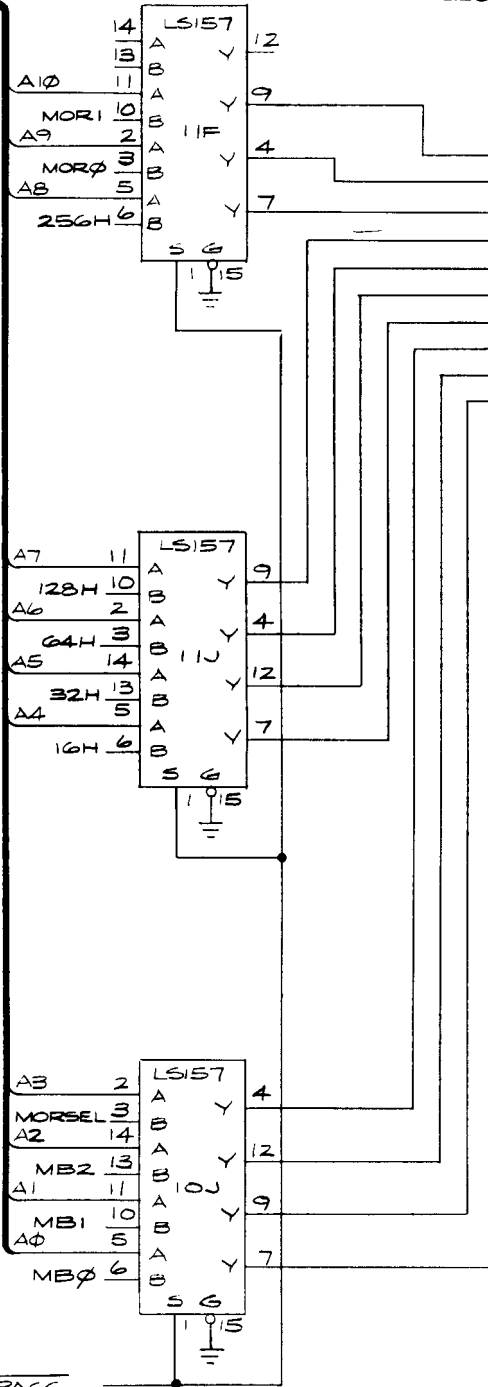


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Motion Object RAM

A10-A0



MOD7	3
MOD6	13
MOD5	17
MOD4	18
MOD3	14
MOD2	4
MOD1	7
MOD0	8

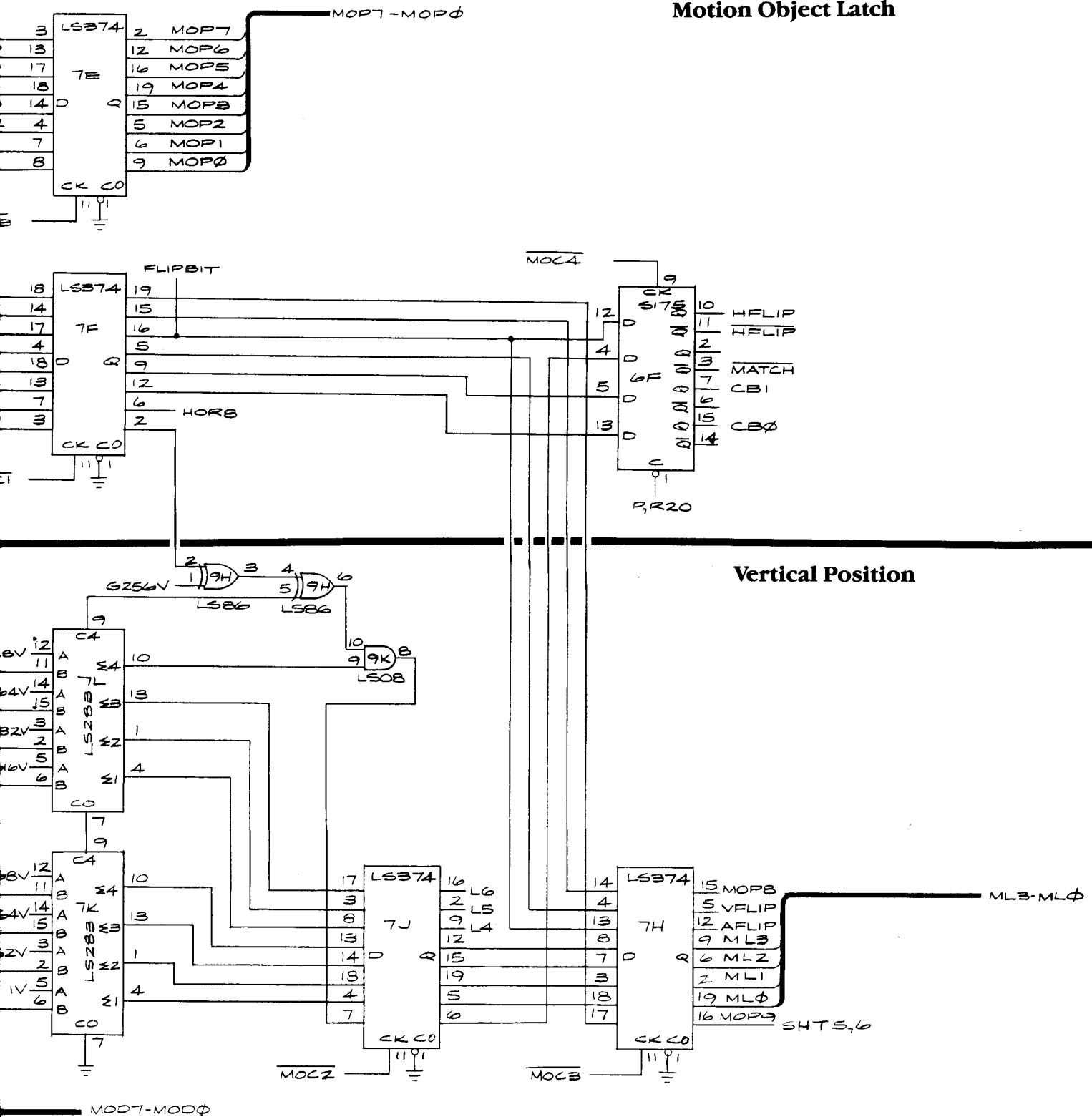
MOD7	18
MOD6	14
MOD5	17
MOD4	4
MOD3	18
MOD2	18
MOD1	7
MOD0	3

G28V	12
MOD7	11
G64V	14
MOD6	15
G32V	3
MOD5	2
G16V	5
MOD4	6

MOD3	8B	12
MOD2	64V	14
MOD1	62V	3
MOD0	1V	5

D7-D0

Motion Object Latch



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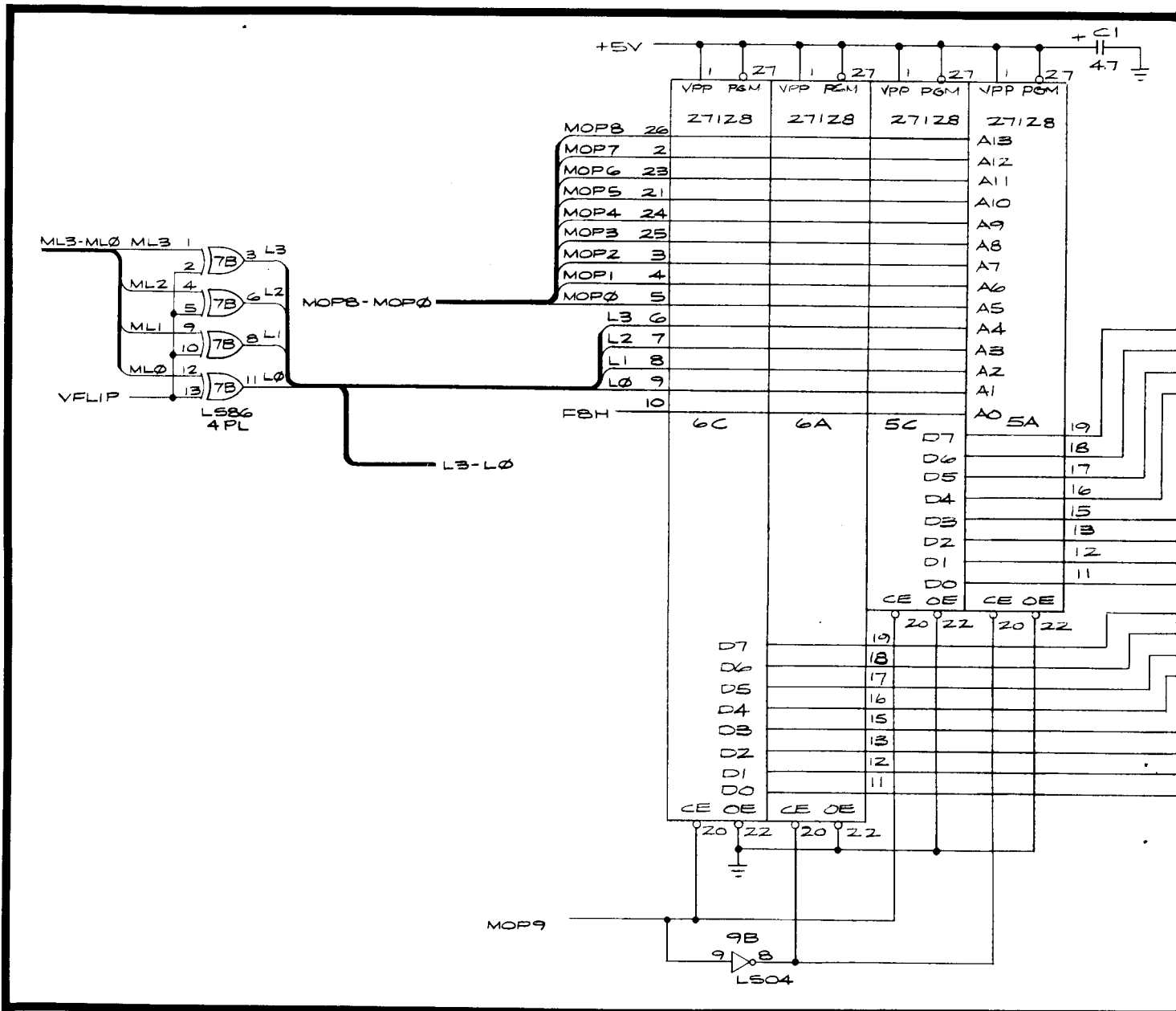
FIREFOX Graphics PCB



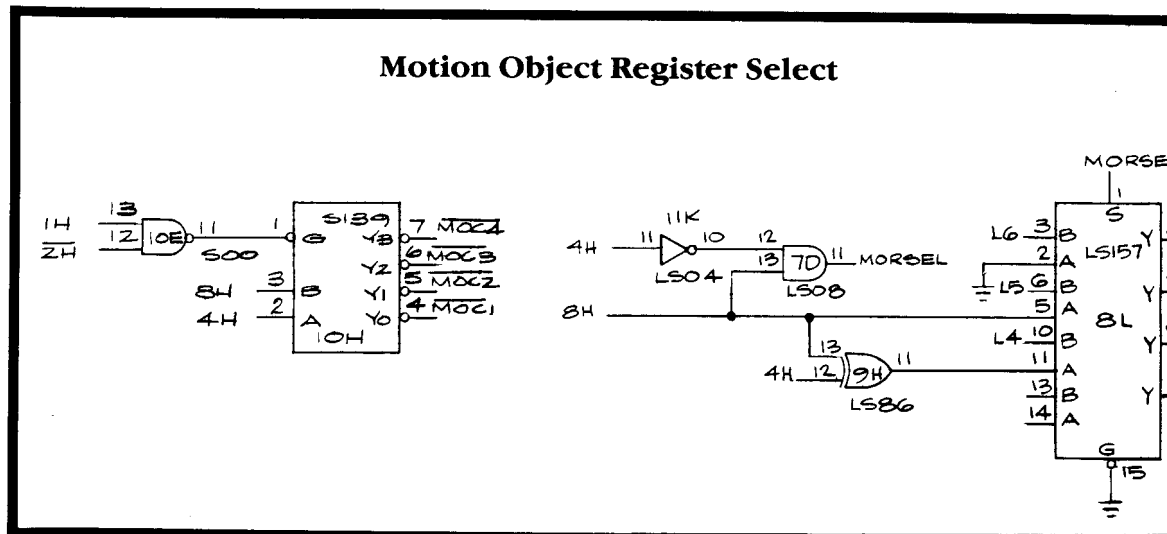
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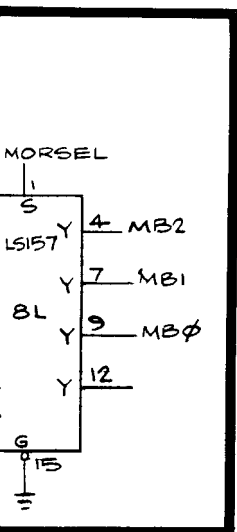
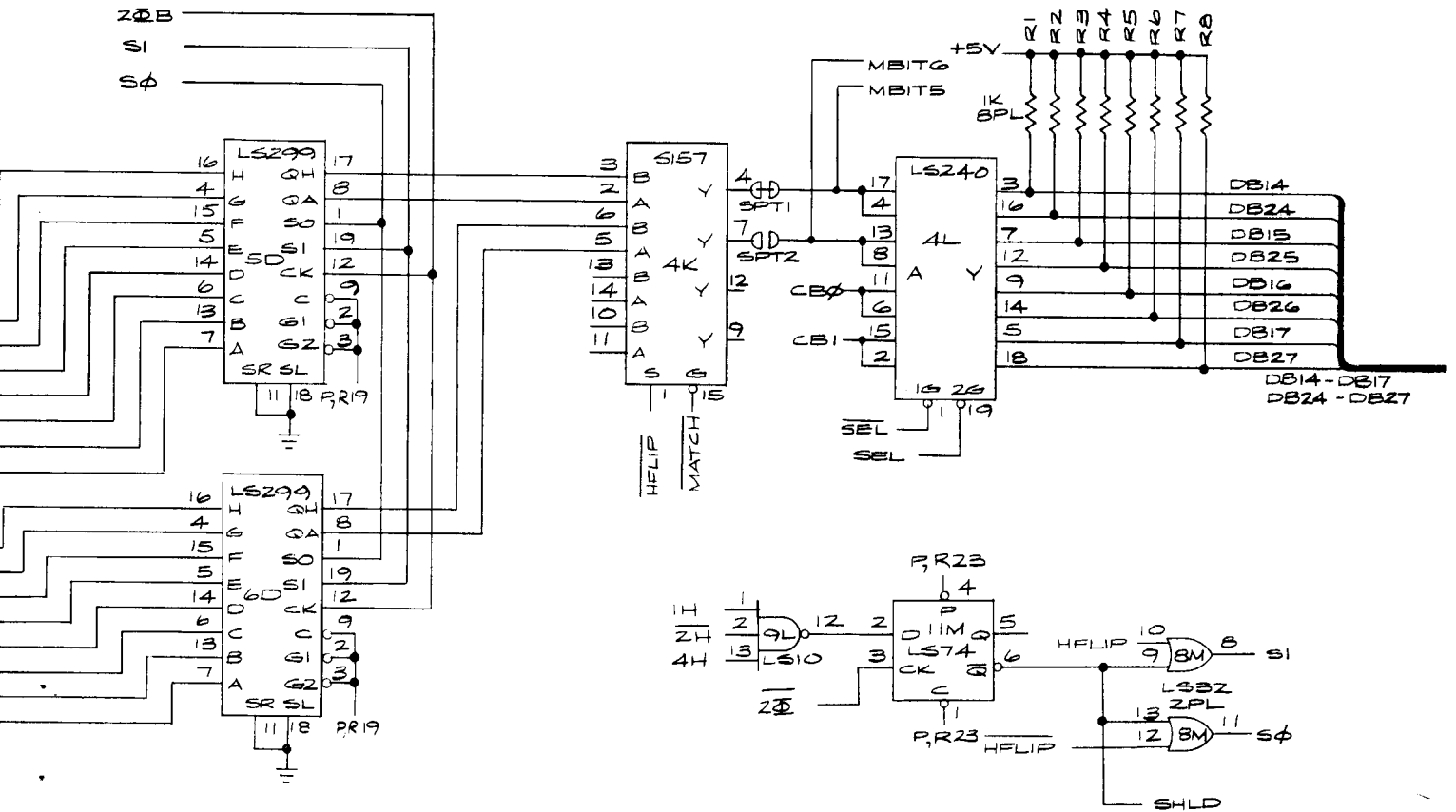
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Motion Object Register Select



Motion Picture ROM



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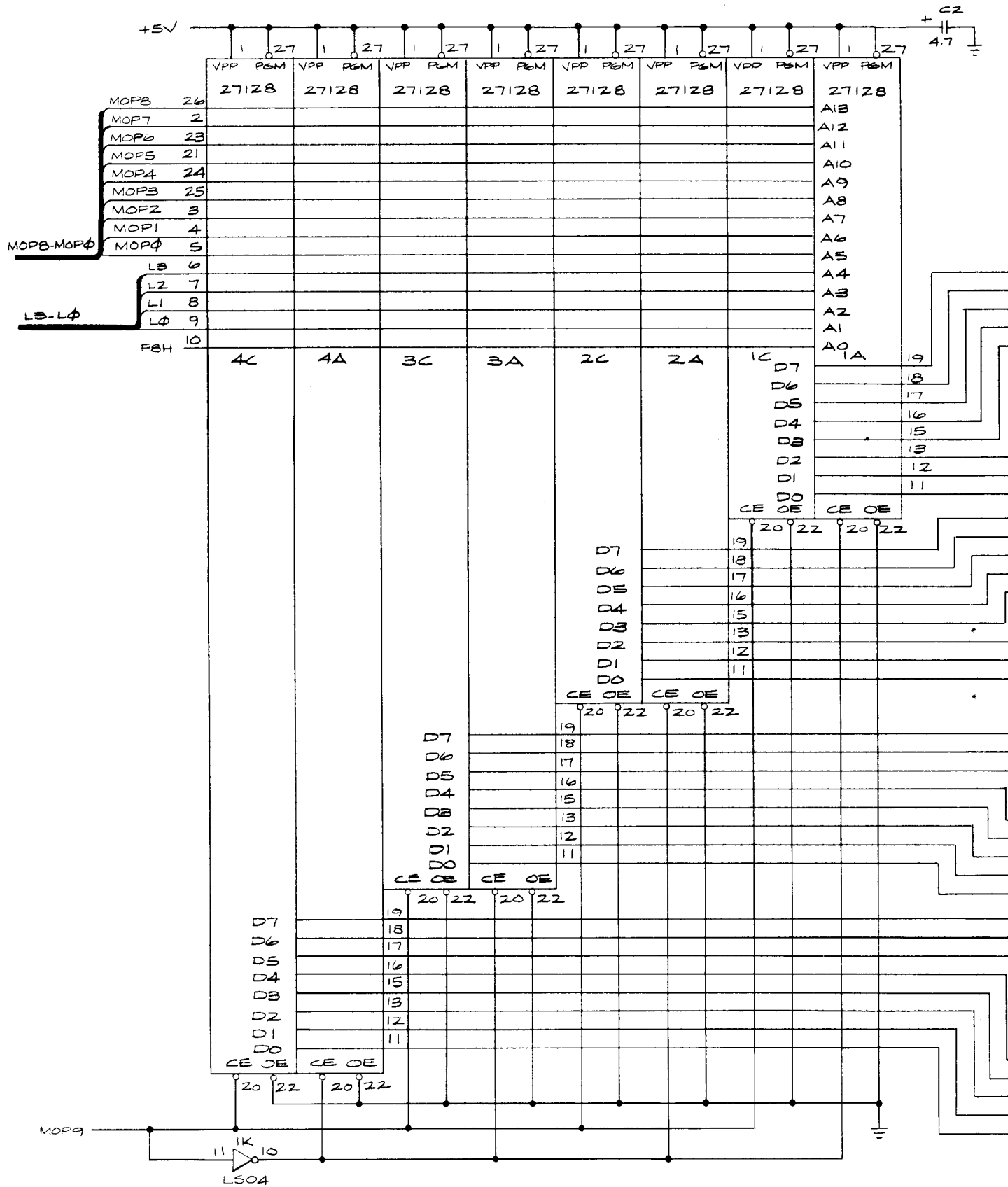
FIREFOX Graphics PCB



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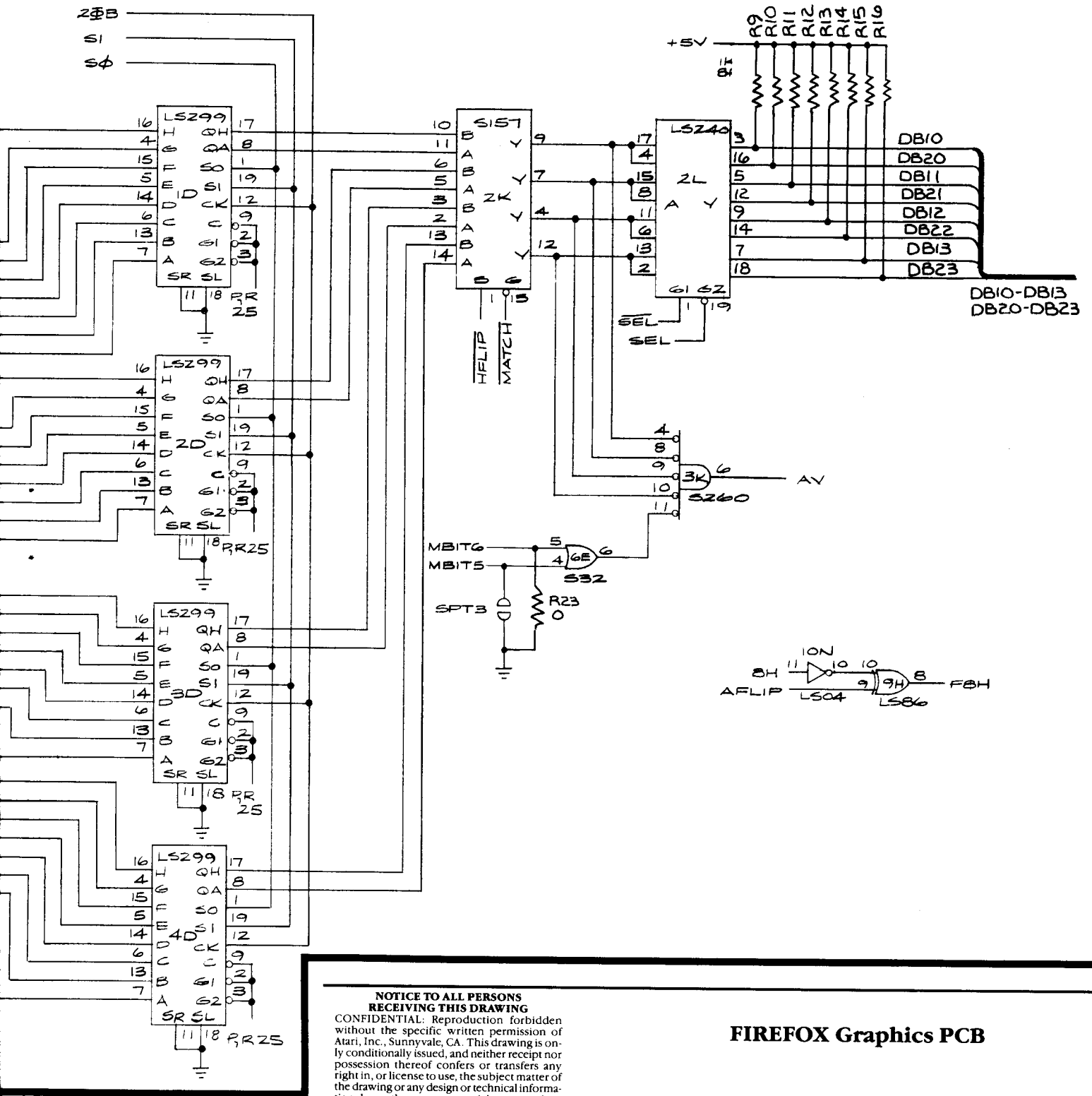
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Motion Picture ROM-Continued

C2
1.7



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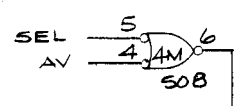
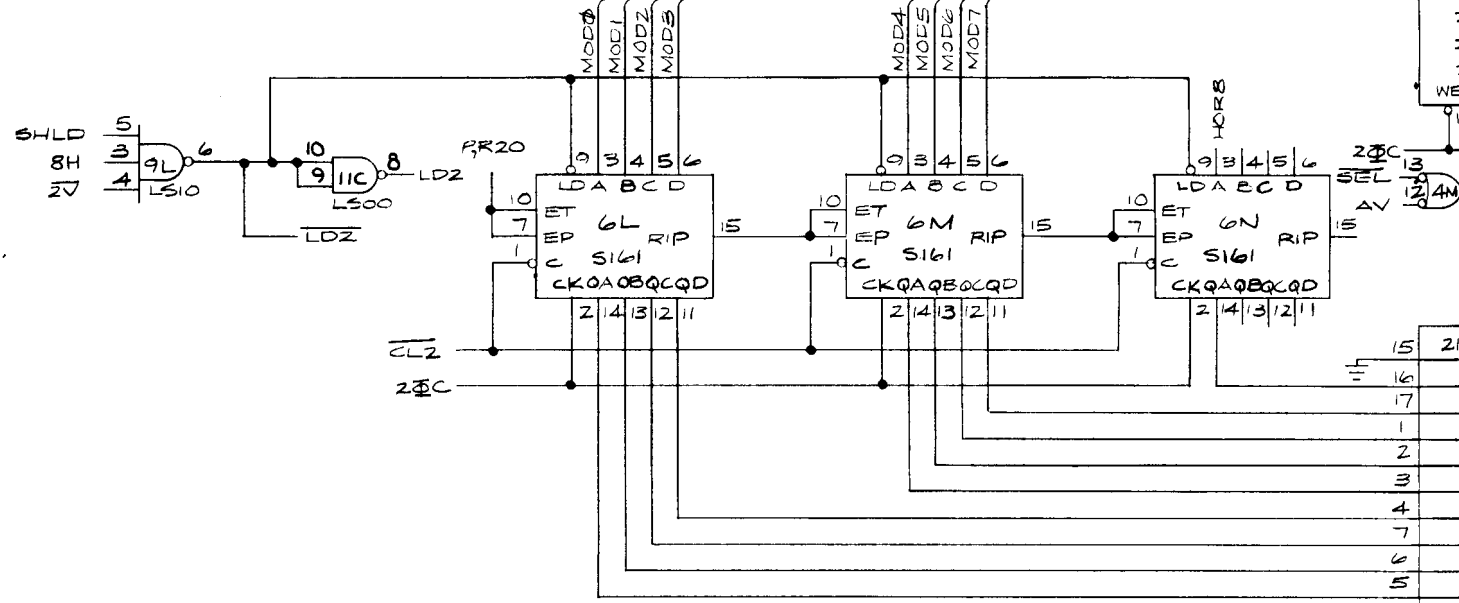
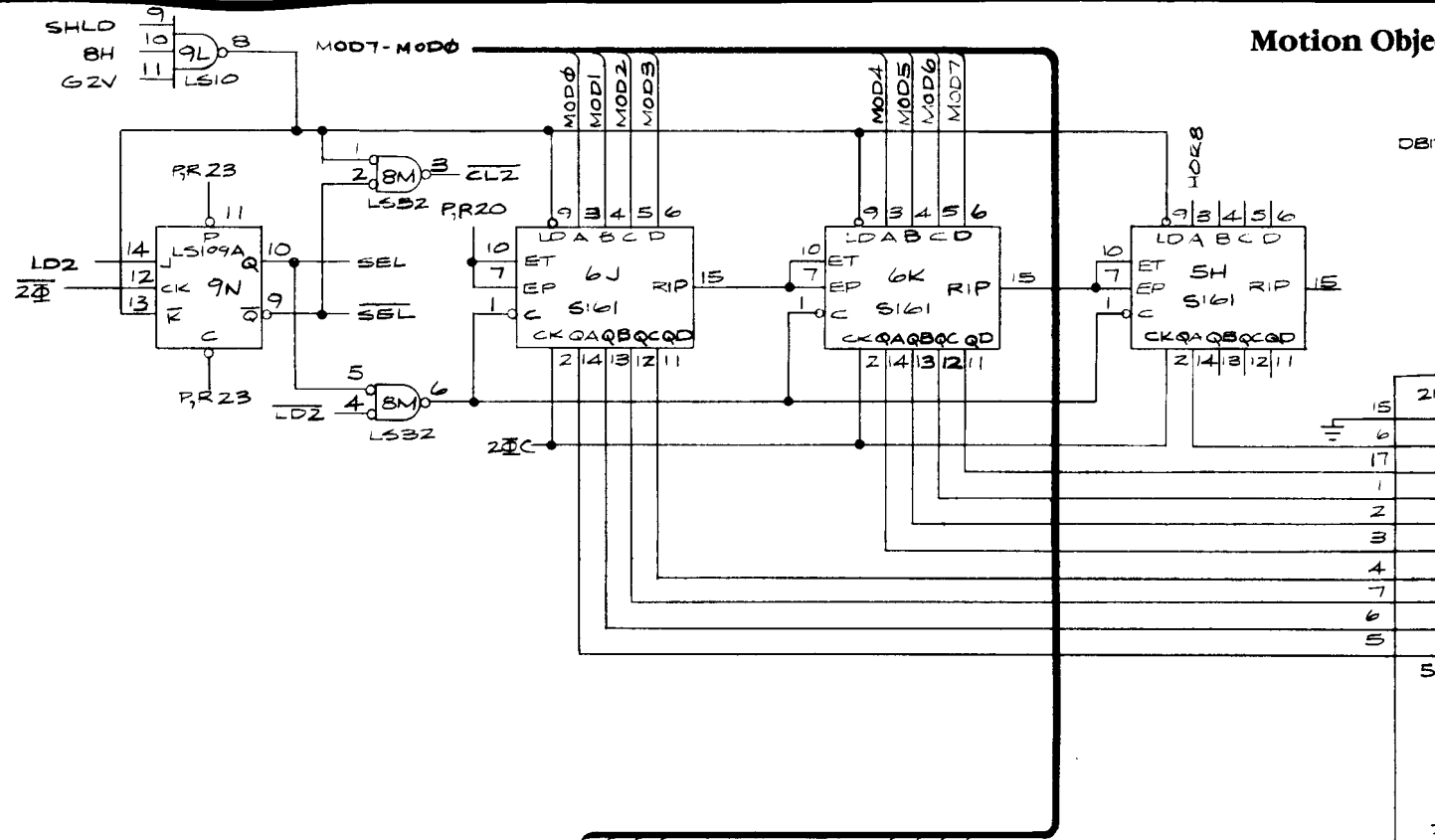
FIREFOX Graphics PCB



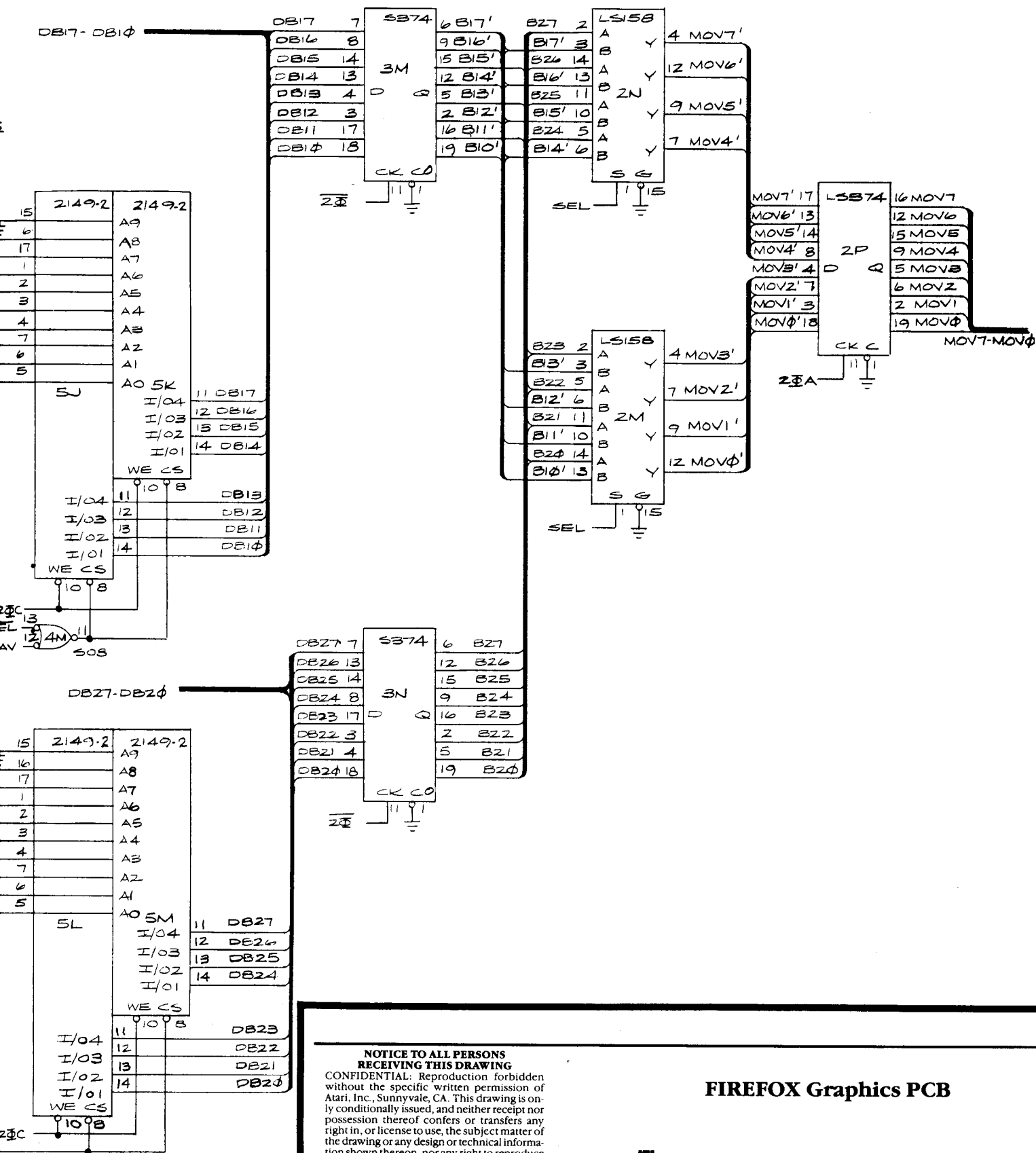
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Object Line Buffers



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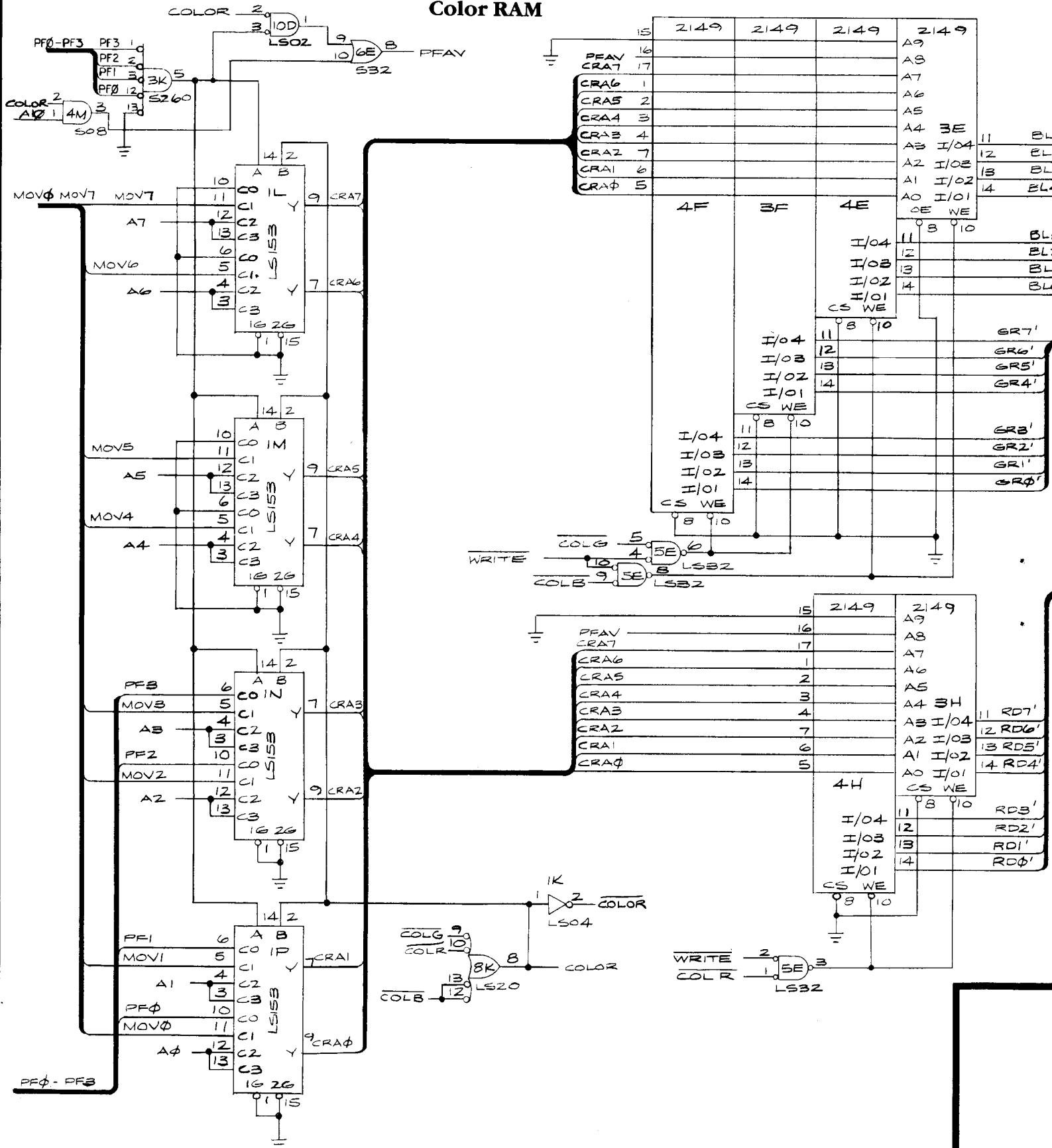
FIREFOX Graphics PCB

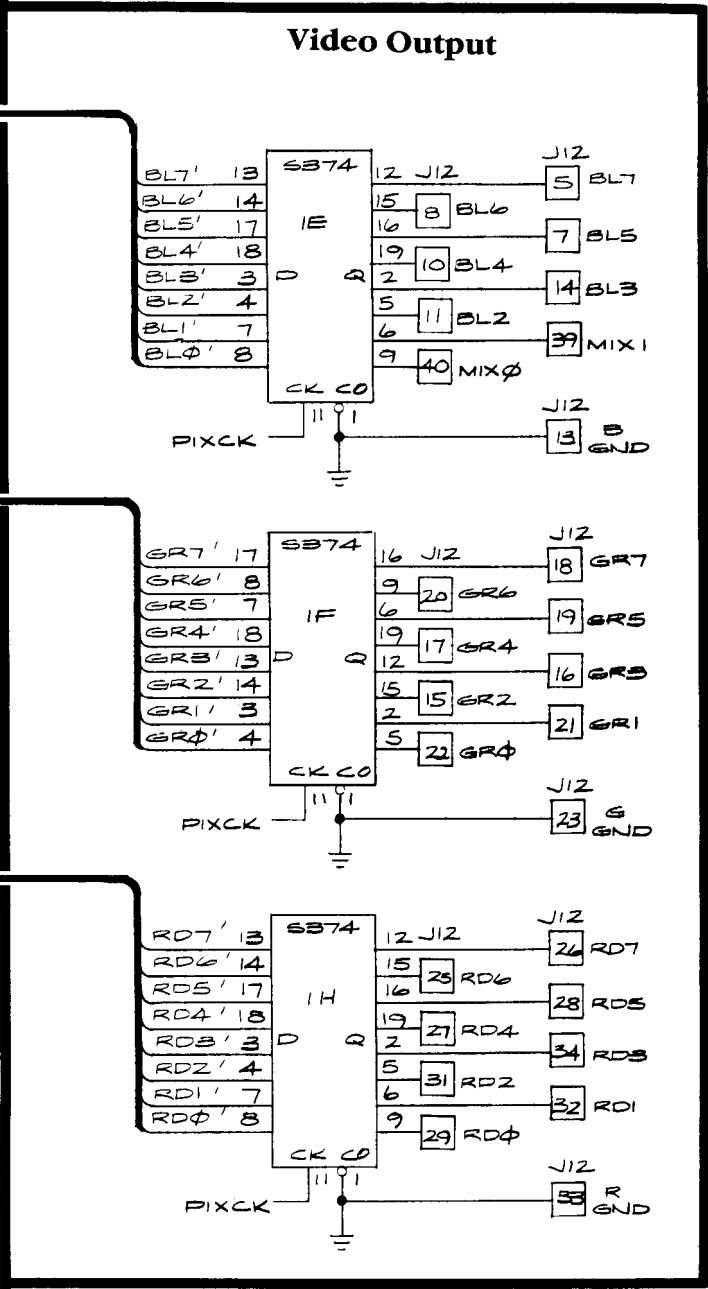
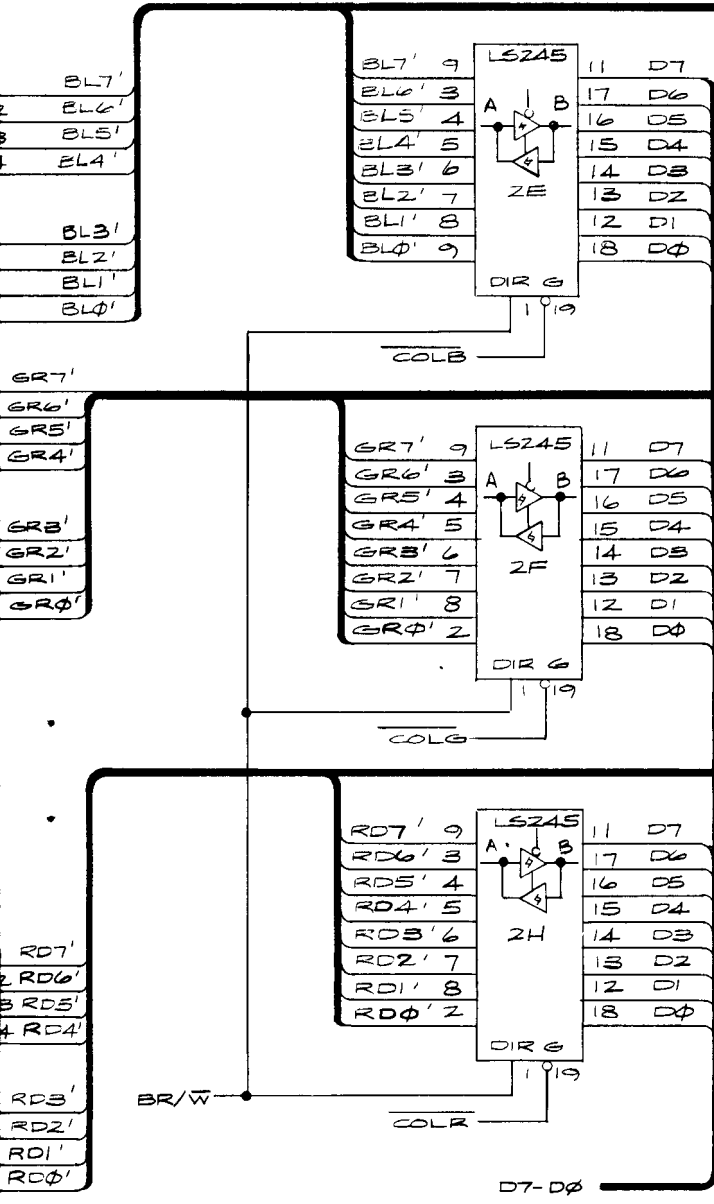


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Color RAM





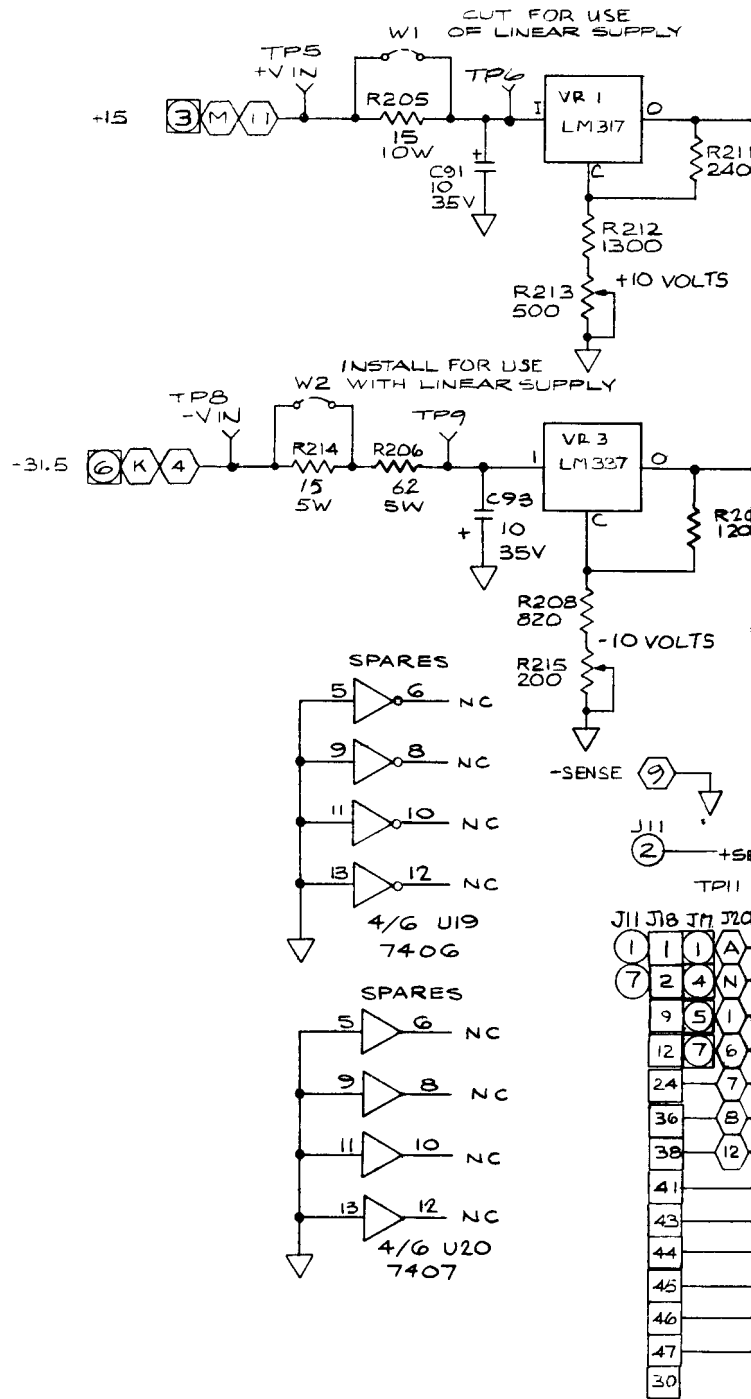
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FIREFOX Graphics PCB

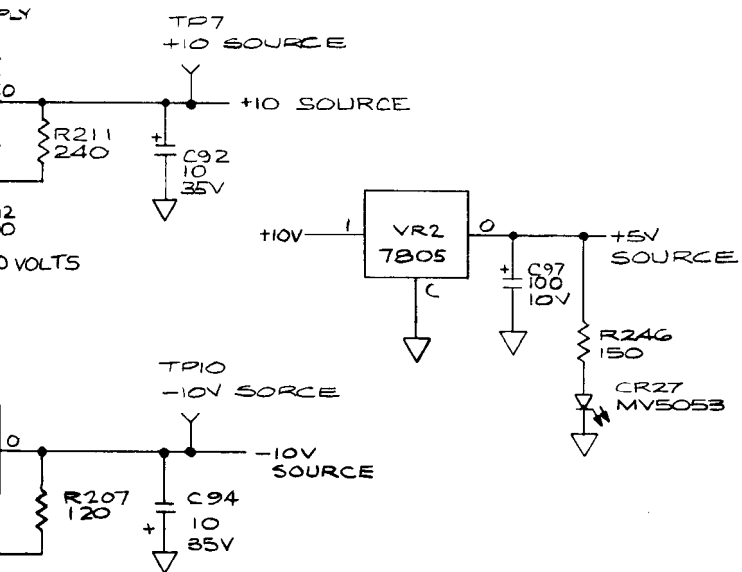


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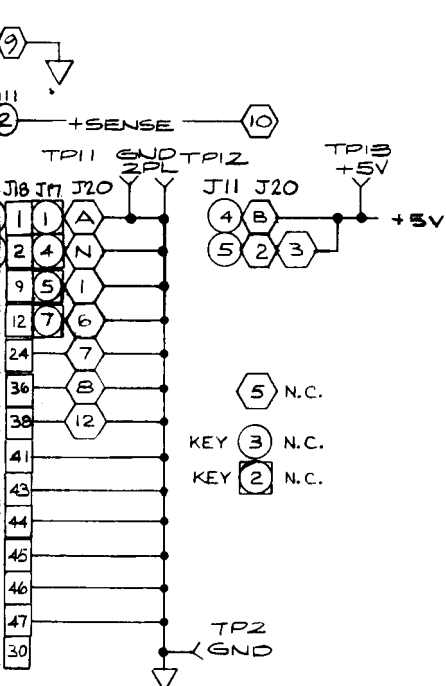
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Input Post Regulators



VOLTS



NOTES:
UNLESS OTHERWISE SPECIFIED

1. DENOTES J20.
2. DENOTES J18.
3. DENOTES J17.
4. RESISTORS ARE IN OHMS, 1/4W, 5%
5. CAPACITORS ARE IN μ F.
6. INDUCTORS ARE IN μ H.
7. R56 VALUE IS DEPENDENT ON CRYSTAL USED.
8. DENOTES J11.

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FIREFOX NTSC Demodulator PCB

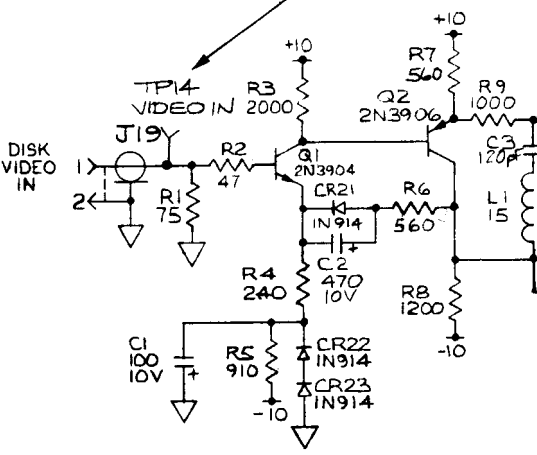
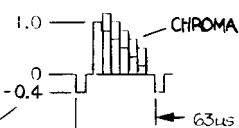


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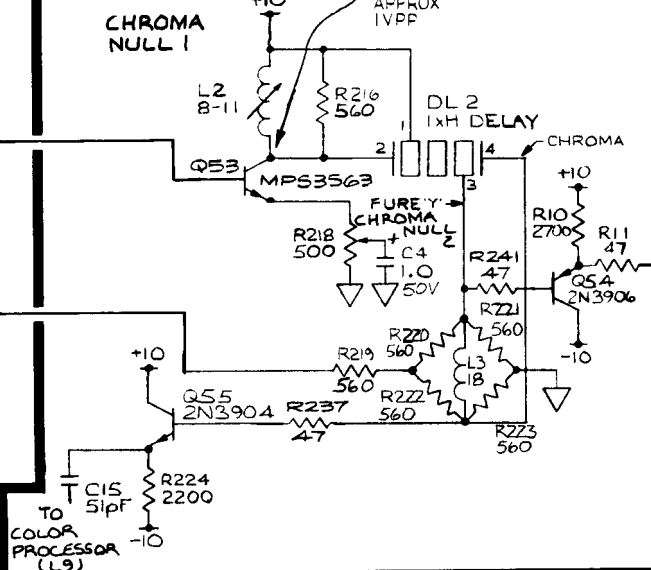
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SP-253 Sheet 13A
2nd printing

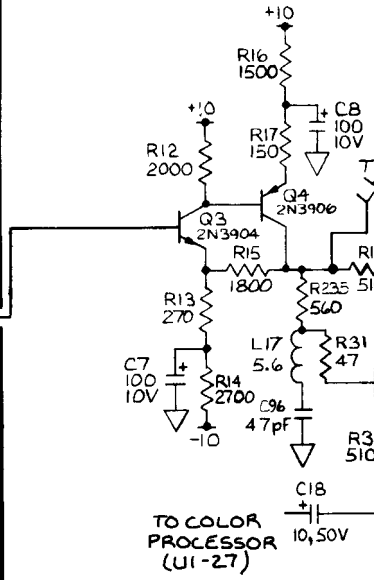
Input Amplifier



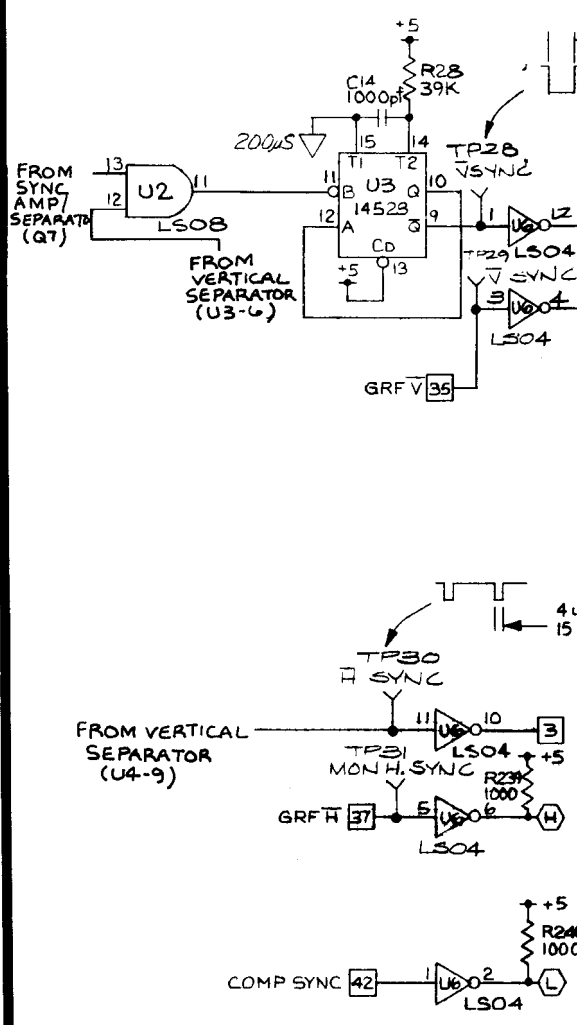
Comb Filter

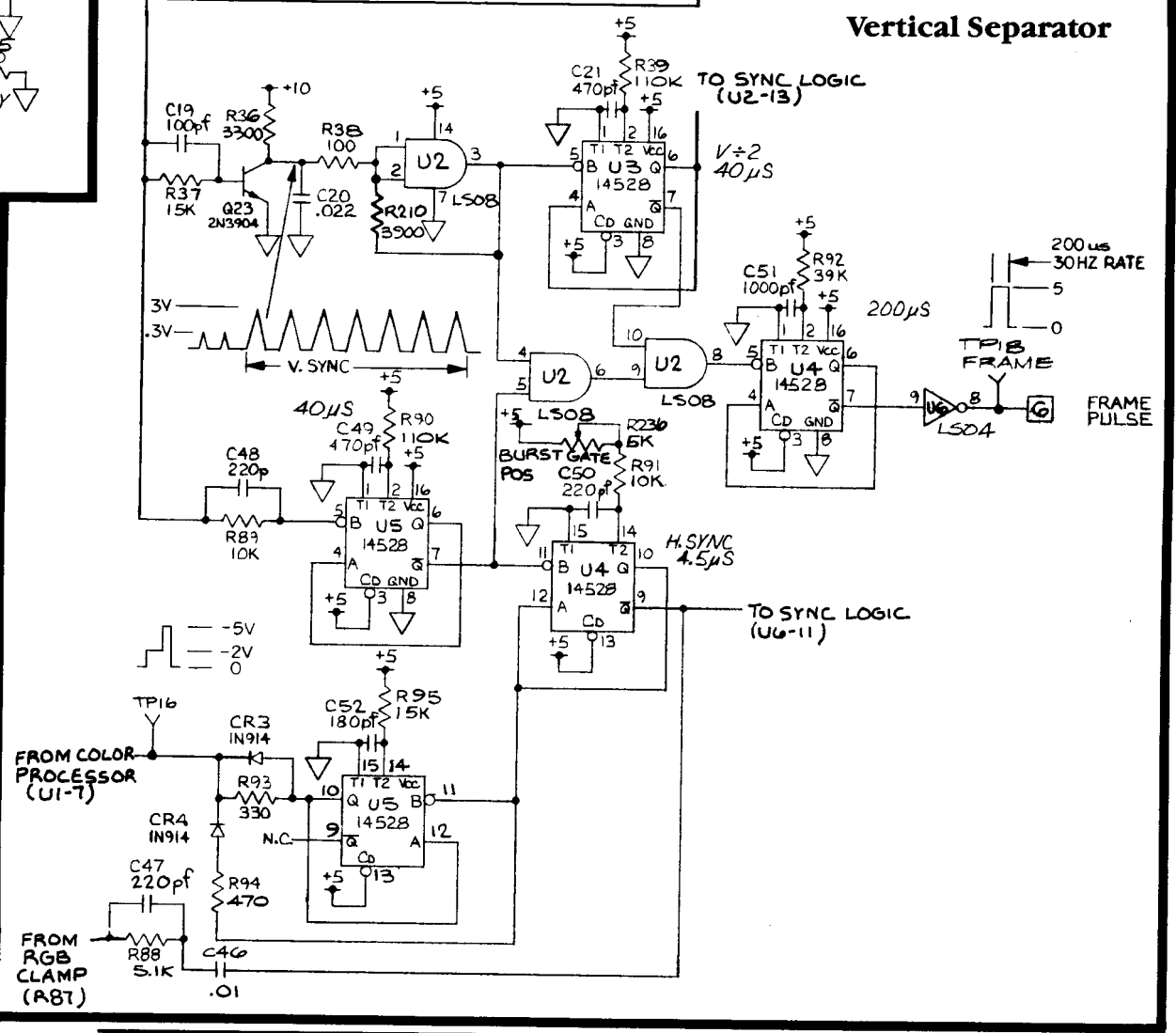
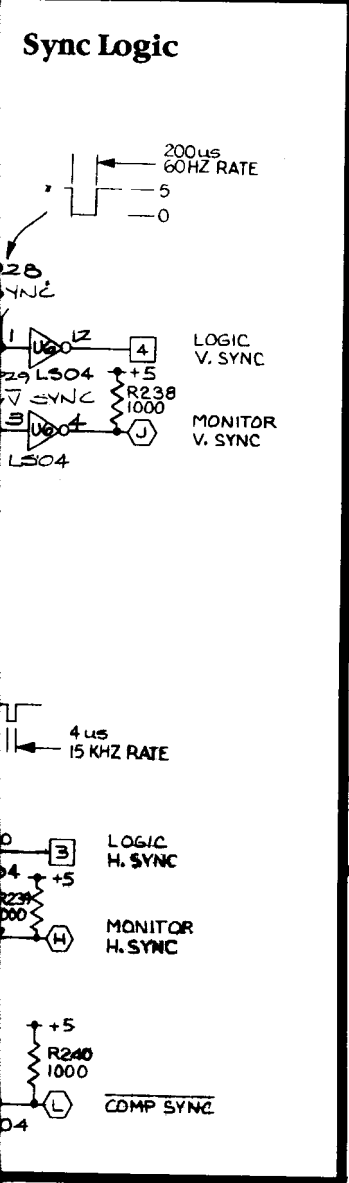
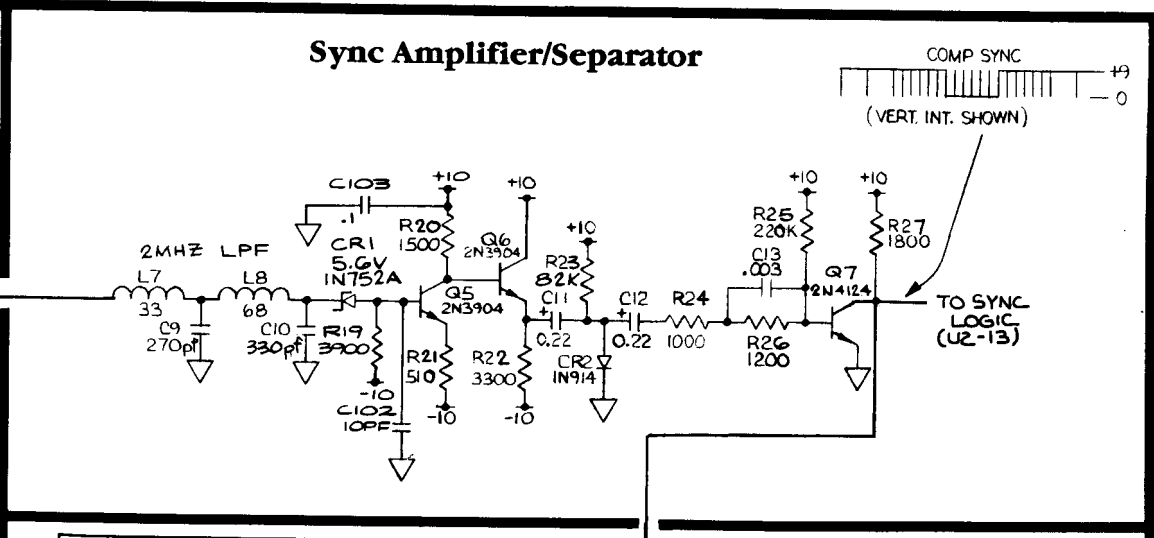
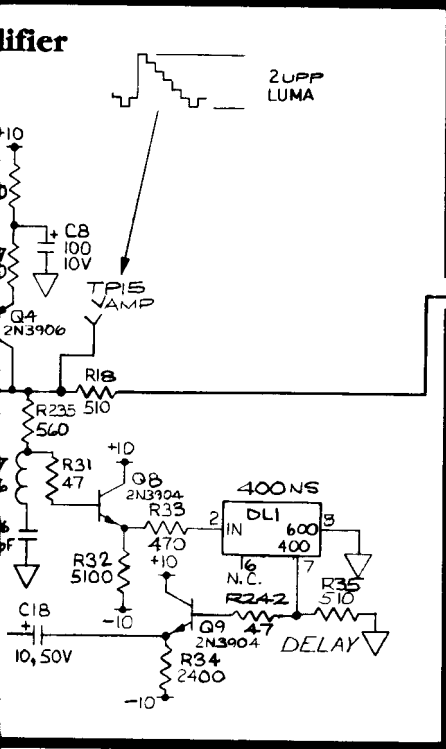


Y Amplifier



Sync I





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FIREFOX NTSC Demodulator PCB

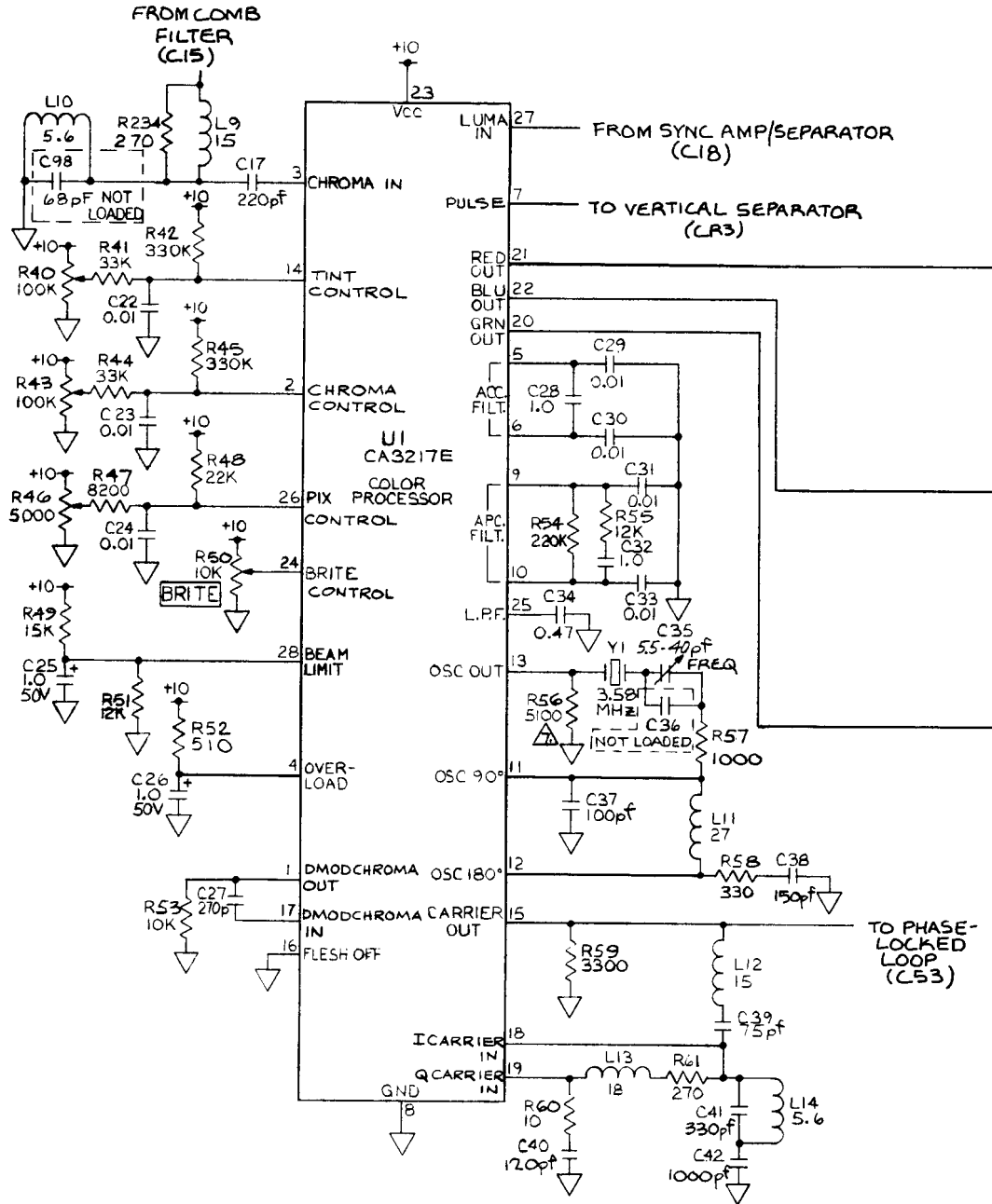


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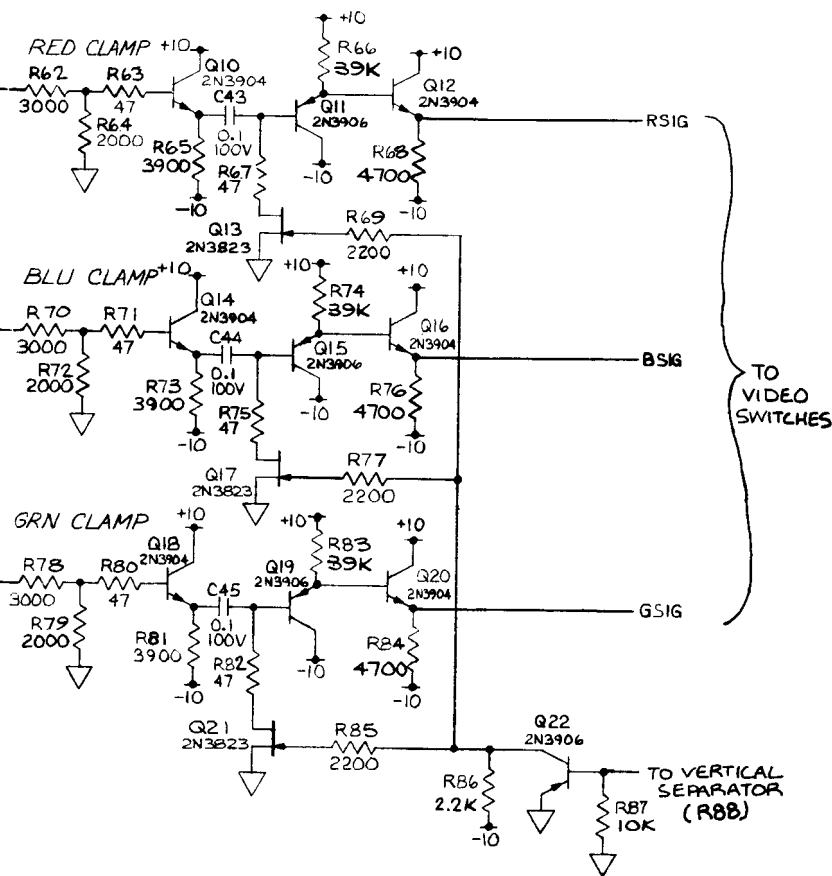
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SP-253 Sheet 13B
2nd printing

Color Processor



RGB Clamp



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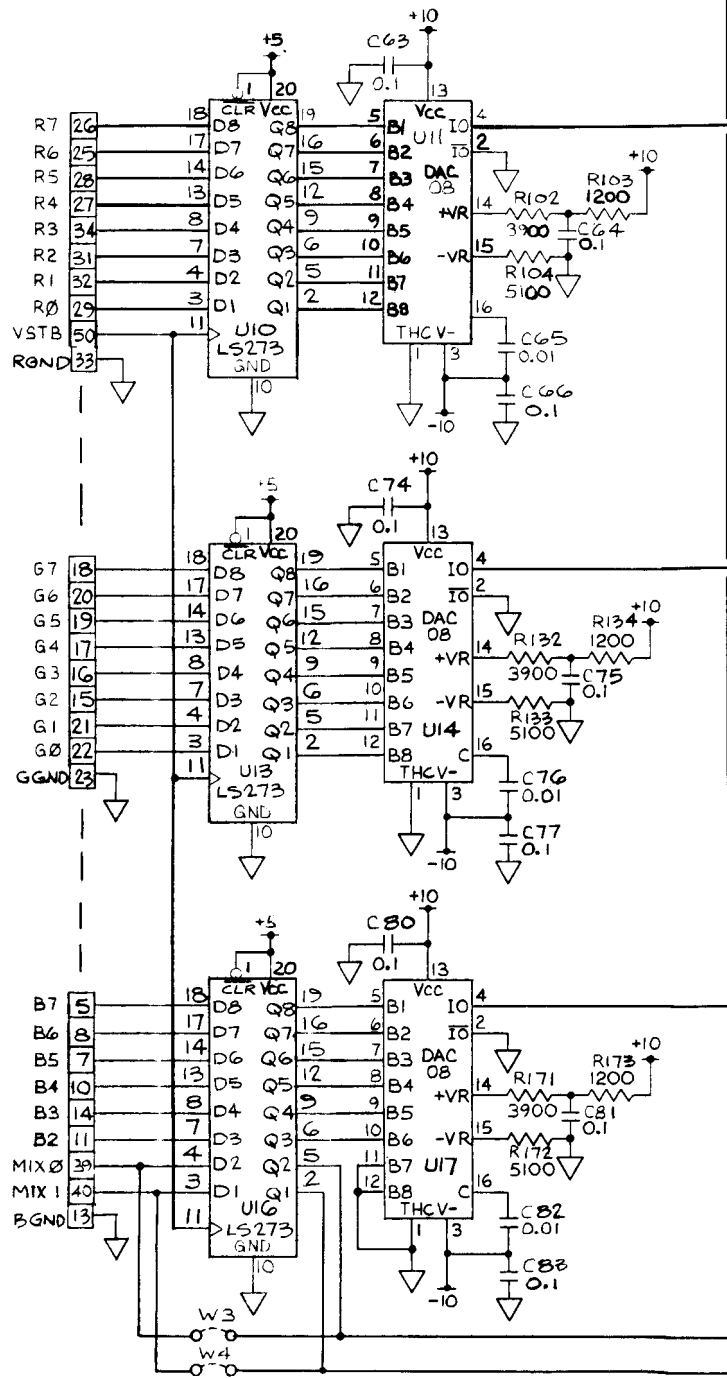
FIREFOX NTSC Demodulator PCB



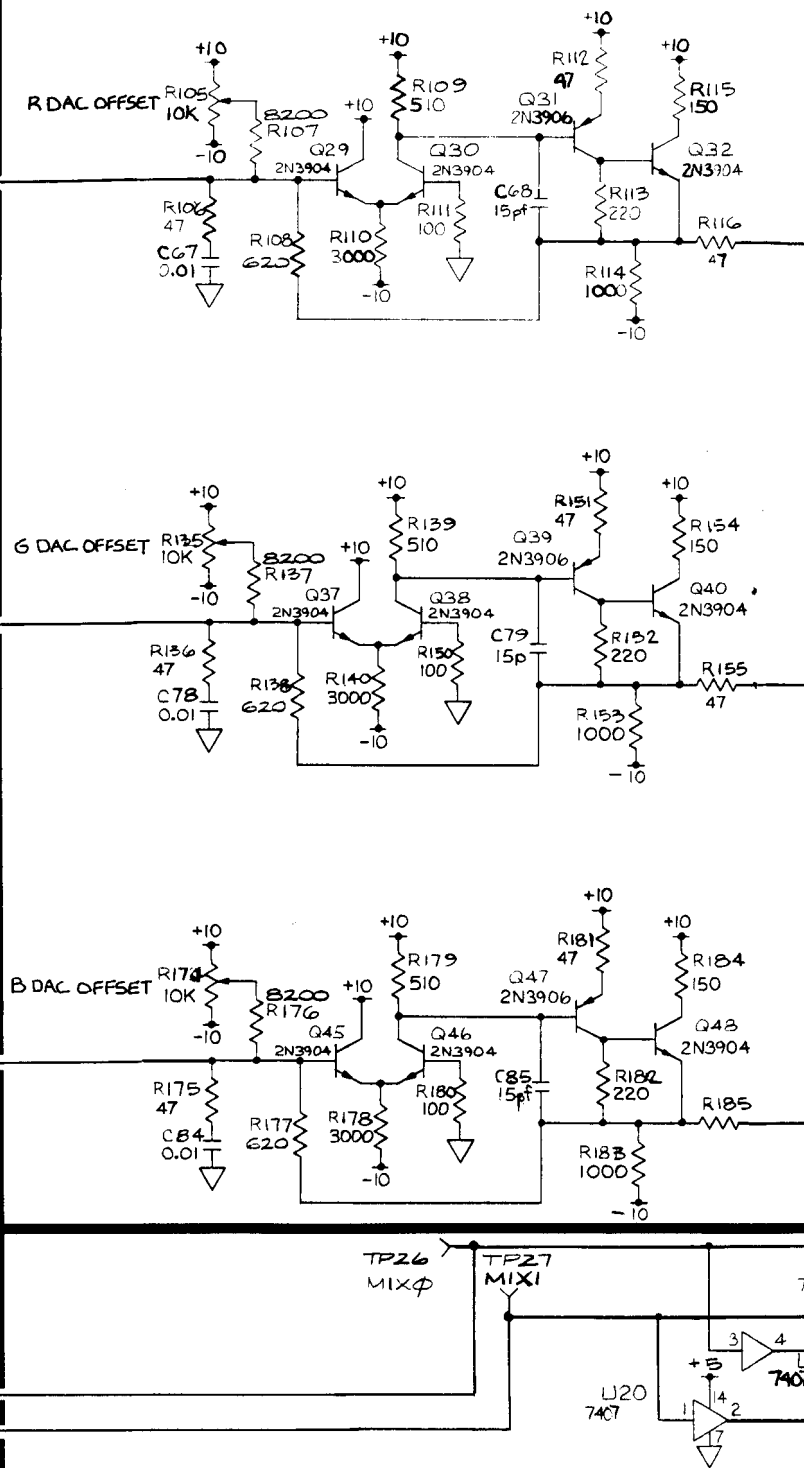
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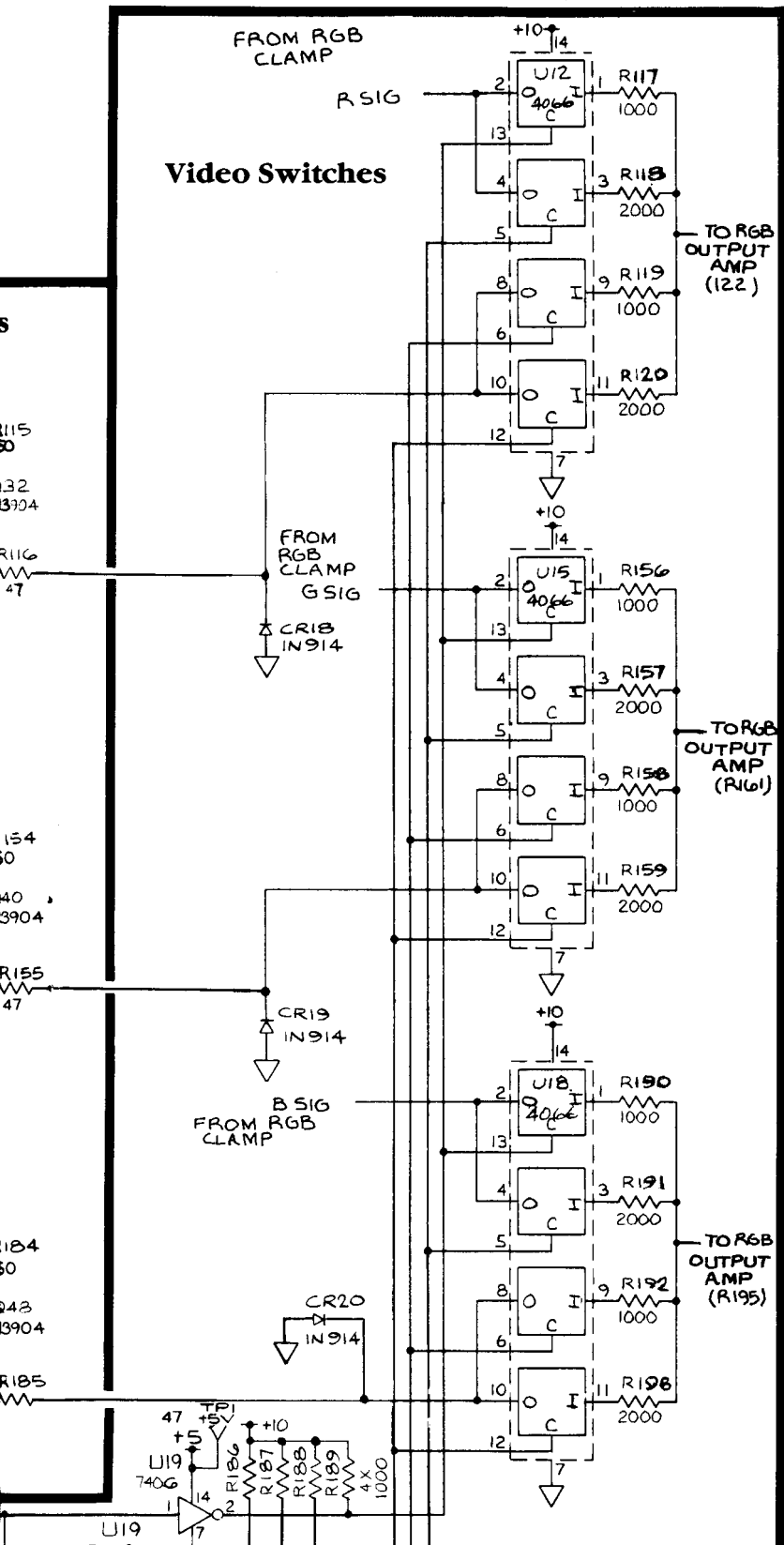
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Graphics RGB Digital-to-Analog Converters



Digital-to-Analog Converter Amplifiers





R115 50
 R132 3904
 R116 47
 R154 50
 R140 3904
 R155 47
 R184 50
 R142 3904
 R185

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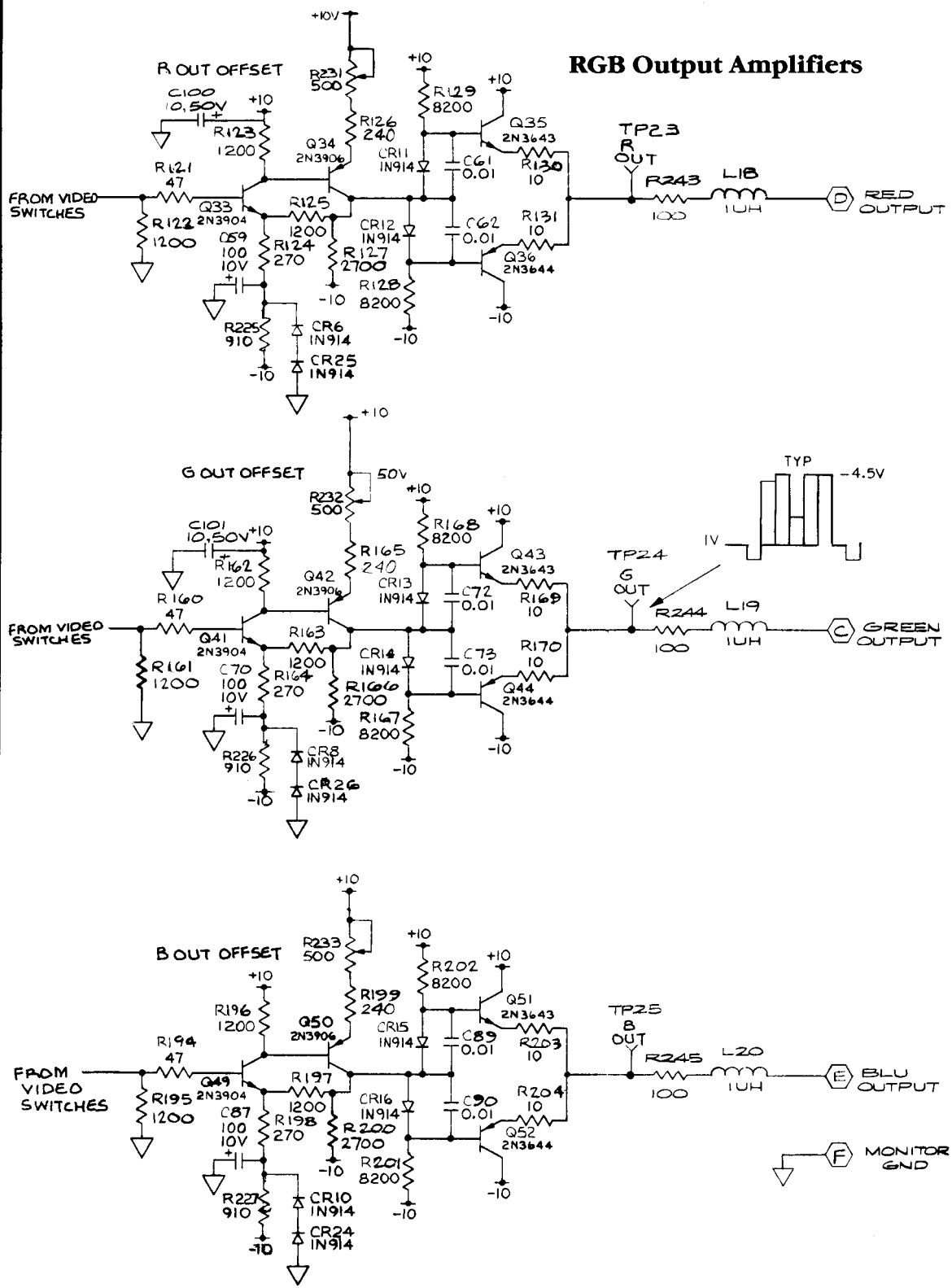
FIREFOX NTSC Demodulator PCB



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RGB Output Amplifiers



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FIREFOX NTSC Demodulator PCB



Demodulator Adjustment Procedure

The National Television System Committee (NTSC) Demodulator printed-circuit board (PCB) circuits are checked and adjusted before shipment from Atari. These circuits should not require adjusting during the normal operating life of the game. However, if the NTSC Demodulator PCB is repaired, a complete adjustment procedure should be performed as described here. Refer to Figure 3 Adjustment Locations—NTSC Demodulator PCB.

Test Equipment Required

- Main Wire Harness and BNC Video-Input Extender Cables (Optional)
- External Display (Optional)
- Non-Metallic Inductor Tuning Tool

Preliminary Procedure

1. Turn the game off.
2. Remove the Main, Graphics, and NTSC Demodulator PCBs from the game cabinet as follows:
 - a. Open the appropriate access panel.
 - b. Disconnect the two wire-harness edge connectors and the BNC video cable connector.
 - c. **US-Built Cabinet:** Pull the six nylon snap-in fasteners on the EMI Shield PCB out to the unlocked position.

Ireland-Built Cabinet: Remove the bracket-mounting screw that attaches the PCBs to the game cabinet. Carefully slide the PCBs from the cleat. Do not twist the PCBs because the connections or components could come loose.

3. Reconnect the main wire harness and BNC video cable to the game PCBs.

NOTE

If an external display is not available, connect main wiring harness and BNC video-input extender cables to the PCBs to allow easy access to the adjustments while observing the color bar displays.

4. If a replaced or repaired NTSC Demodulator PCB is to be installed in the game, check to determine whether the NTSC Demodulator PCB is to be used in a game with a linear or a switching power supply.
 - a. For games with a linear power supply, verify that jumper W1 has been either removed or cut and that jumper W2 is connected.
 - b. For games with a switching power supply, verify that jumper W1 is connected and that jumper W2 has been either removed or cut.

5. Turn the game on.
6. Set the self-test switch (located on the utility panel behind the upper coin door) to the *on* position.

Adjustment Procedure

1. Press the auxiliary coin switch (located behind the coin door) to obtain the combined graphics-generated gray scale and disc-generated color bar display as shown in Figure 1.

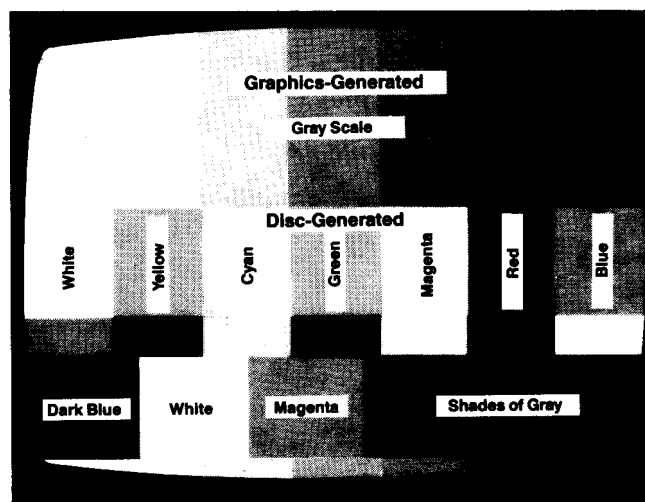


Figure 1

Combined Graphics-Generated Gray Scale and Disc-Generated Color Bar Display

2. Set R43 (SAT) to the fully clockwise position to remove the color from the disc-generated color bars.
3. If necessary, adjust R231 (R OUT OFFSET), R232 (G OUT OFFSET), and R233 (B OUT OFFSET) to remove any apparent color in the disc-generated gray scale.
4. Adjust R105 (R DAC OFFSET), R135 (G DAC OFFSET), and R174 (B DAC OFFSET) to approximately match the gray tones in the disc-generated gray scale to those in the graphics-generated gray scale.
5. Adjust R50 (BRITE) to approximately match the black bar at the extreme right-hand end of the disc-generated gray scale to the same bar in the graphics-generated gray scale.
6. Adjust R46 (PIX LEVEL) to approximately match the white (brightest) bar at the extreme left-hand end of the disc-generated gray scale to the same bar in the graphics-generated gray scale.
7. Repeat steps 5 and 6 until the white and black bars in both gray scales are a close match.

8. Press the auxiliary coin switch to obtain the next composite graphics-generated and disc-generated color bar display as shown in Figure 2.
9. Adjust R43 (SAT) clockwise to obtain some color in the disc-generated color bars.
10. Adjust R40 (HUE) to match the colors (particularly the yellow, cyan, and red) in the disc-generated color bars to those in the graphics-generated color bars.
11. Set R43 (SAT) to the fully counterclockwise position. Then, adjust R43 (SAT) approximately a quarter-turn clockwise.
12. Set the self-test switch to the *off* position and check the display colors in Attract Mode or in Game Play. If necessary, adjust R50 (BRITE) for the desired display brightness.

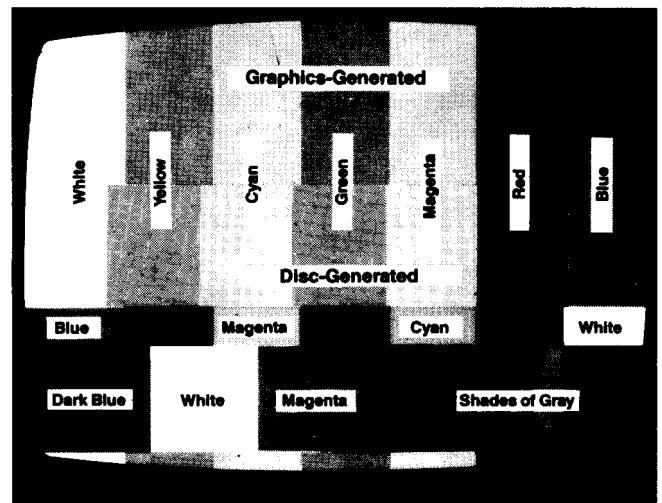


Figure 2
Combined Graphics-Generated Color Bar
and Disc-Generated Color Bar Display

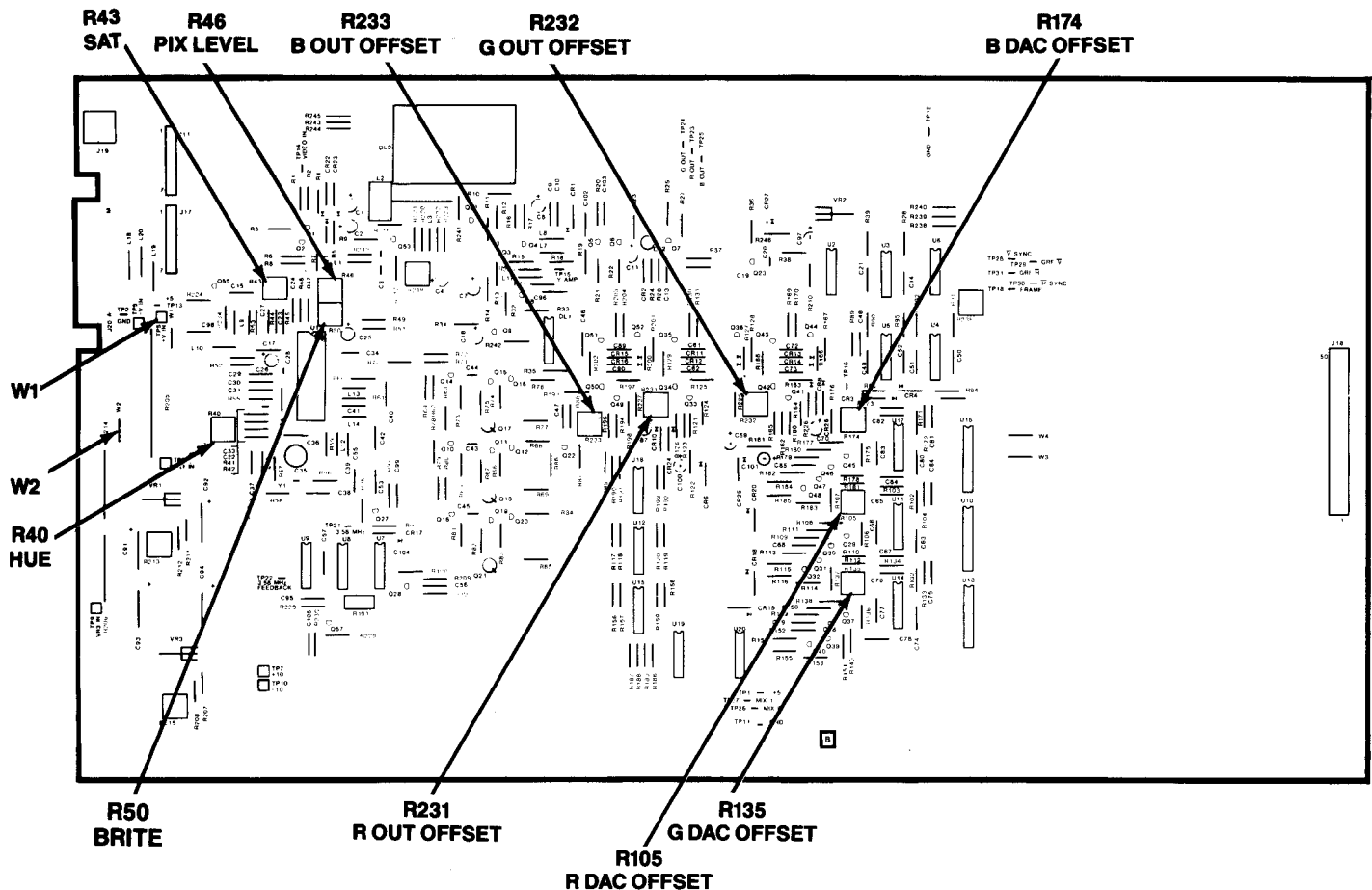


Figure 3 Adjustment Locations—
NTSC Demodulator PCB

The
 pro
 sou
 righ
 tion
 Pr
 1.
 2.

Disc Audio Level Adjustment Procedure

There are two potentiometers on the Main PCB that are provided to balance the levels of the disc-generated and sound-microprocessor generated audio levels to the game right and left speakers. Refer to Figure 4 Adjustment Locations- Main PCB.

Preliminary Procedure

1. Turn the game off.
2. Remove the game PCBs as described in Chapter 3 of the Operators Manual (TM-253-01).

Adjustment Procedure

1. Turn the game on.
2. Turn R133 (DISC LEFT) and R138 (DISC RIGHT) fully clockwise, then counterclockwise approximately 30°.
3. Replace the game PCBs.

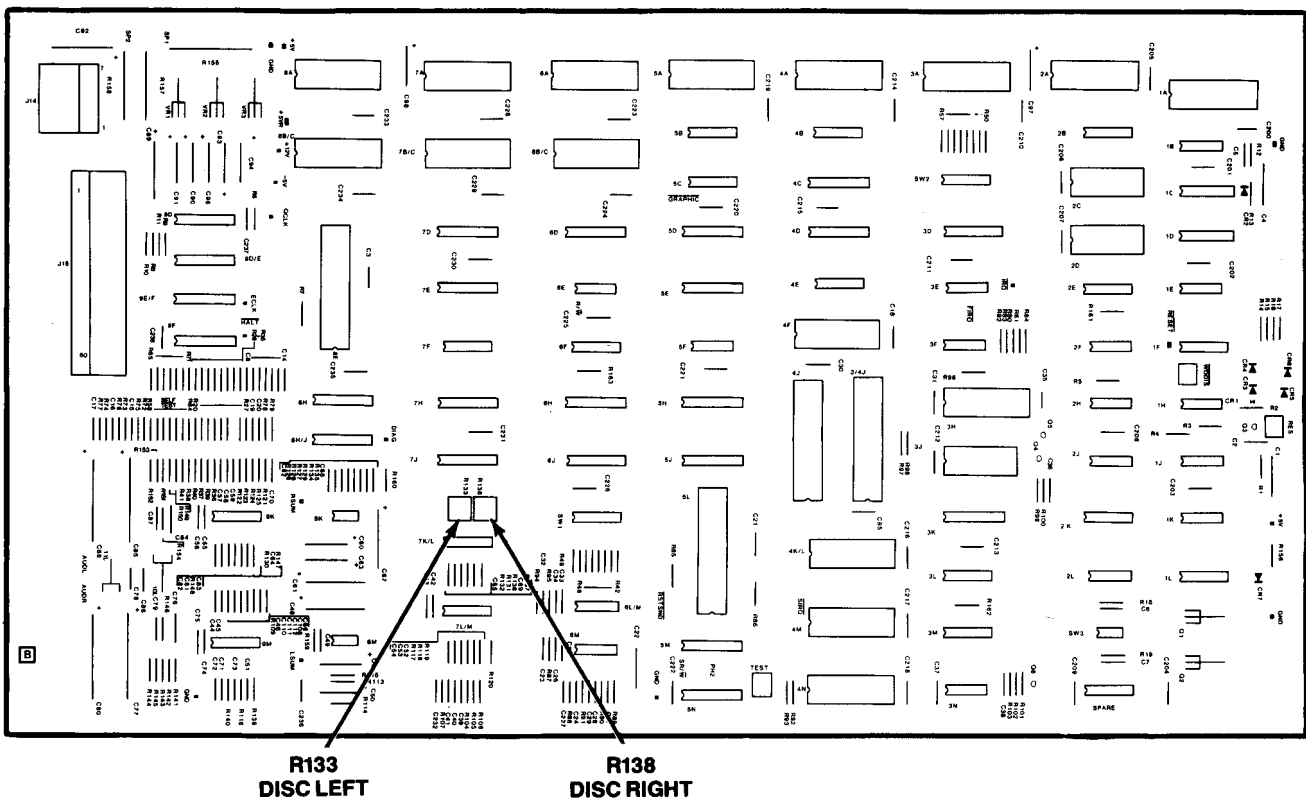


Figure 4 Adjustment Locations-
Main PCB