

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.

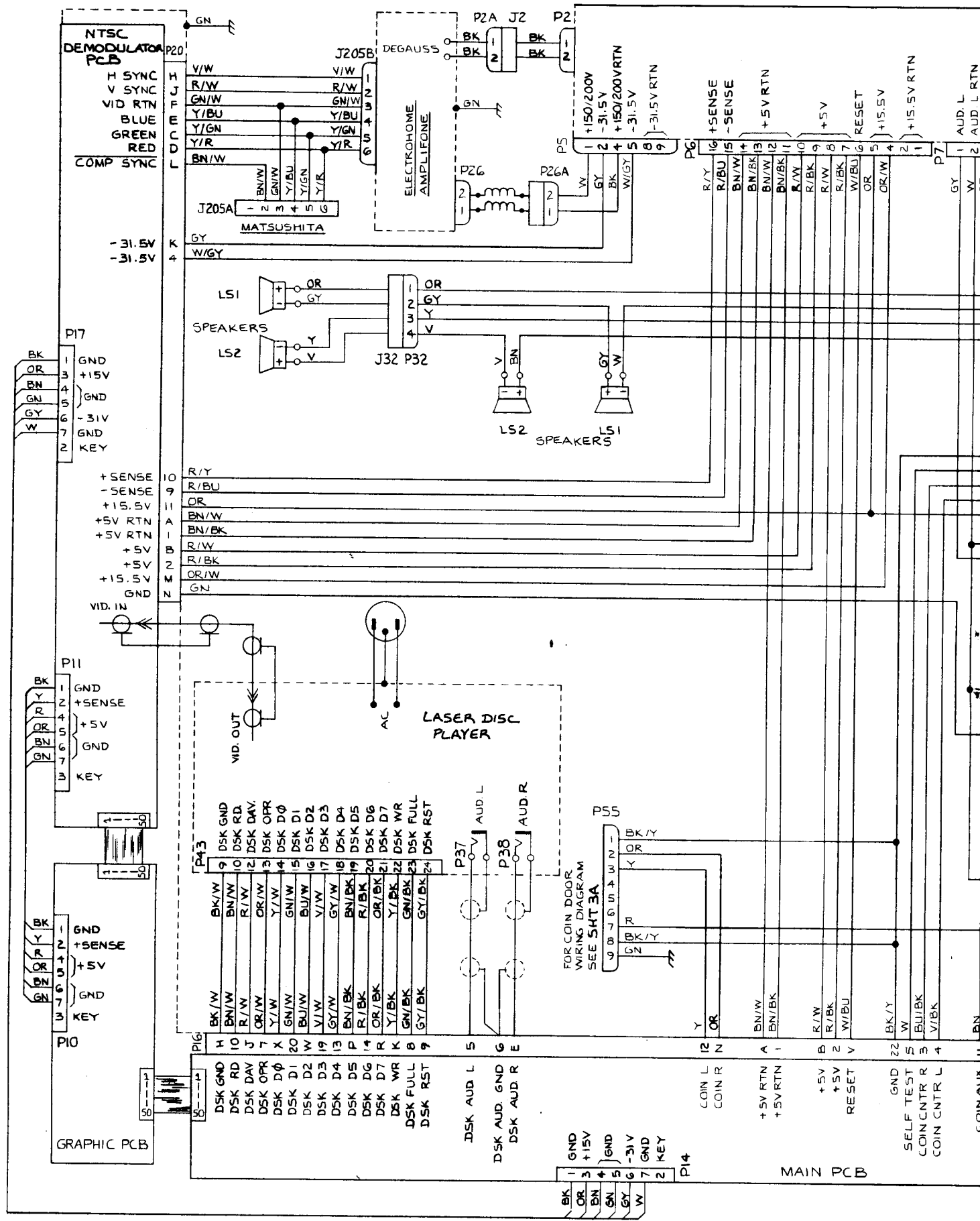
2N

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SP-253 Sheet 1A
2nd printing



NTSC DEMODULATOR PCB

H SYNC
V SYNC
VID RTN
BLUE
GREEN
RED
COMP SYNC

J205B DEGAUSS

ELECTROHOME AMPLIFONE

SPEAKERS

LS1
LS2

LASER DISC PLAYER

P17

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

P11

1 GND
2 +SENSE
3 +5V
4 GN
5 KEY

P10

1 GND
2 +SENSE
3 +5V
4 GN
5 KEY

GRAPHIC PCB

P43

9 DSK GND
10 DSK RD
11 DSK DAY
12 DSK DAV
13 DSK OPR
14 DSK DΦ
15 DSK D1
16 DSK D2
17 DSK D3
18 DSK D4
19 DSK D5
20 DSK D6
21 DSK D7
22 DSK WR
23 DSK FULL
24 DSK RST

P37 AUD L
P38 AUD R

P55

BK/Y
OR
GN
GY
W

FOR COIN DOOR WIRING DIAGRAM SEE SH-3A

DSK AUD L
DSK AUD GND
DSK AUD R

P14

1 GND
2 BK
3 +15V
4 GN
5 BN
6 -31V
7 GND
8 KEY

MAIN PCB

P5

1 +150/200V
2 -31.5V
3 +150/200V RTN
4 -31.5V
5 -31.5V
6 -31.5V RTN

P6

1 +SENSE
2 -SENSE
3 +5V RTN
4 +5V
5 RESET
6 +15.5V
7 +15.5V RTN

P7

1 AUD L
2 AUD L RTN
3 SPEAKER

P8

1 R/Y
2 R/BU
3 BN/W
4 BN/BK
5 BN/BK
6 R/W
7 R/BK
8 R/W
9 R/BU
10 W/BU
11 OR
12 OR/W

P9

1 R/Y
2 R/BU
3 OR
4 BN/W
5 BN/BK
6 R/W
7 R/BK
8 OR/W
9 GN

P10

1 R/Y
2 R/BU
3 OR
4 BN/W
5 BN/BK
6 R/W
7 R/BK
8 OR/W
9 GN

P11

1 GND
2 +SENSE
3 +5V
4 GN
5 KEY

P12

1 COIN L
2 COIN R
3 +5V RTN
4 +5V RTN
5 +5V
6 +5V
7 RESET
8 GND
9 SELF TEST
10 COIN CNTR R
11 COIN CNTR L
12 COIN AUX

P13

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 GY/W
10 BN/BK
11 R/BK
12 OR/BK
13 Y/BK
14 GN/BK
15 GY/BK

P14

1 GND
2 BK
3 +15V
4 GN
5 BN
6 -31V
7 GND
8 KEY

P15

1 R/Y
2 R/BU
3 BN/W
4 BN/BK
5 BN/BK
6 R/W
7 R/BK
8 R/W
9 R/BU
10 W/BU
11 OR
12 OR/W

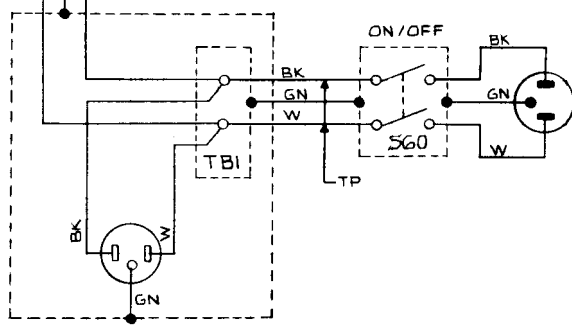
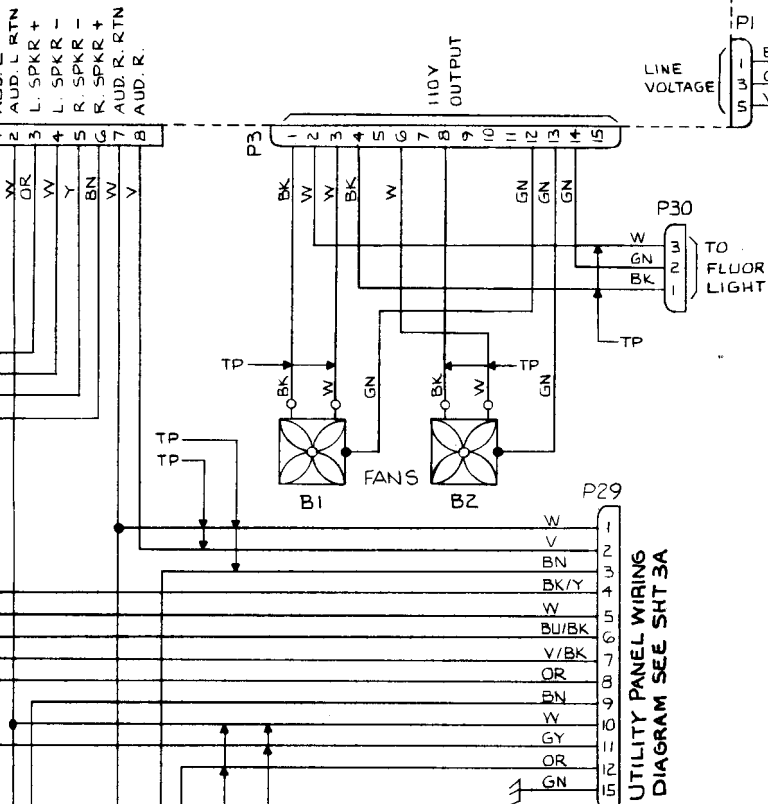
P16

1 GND
2 BK
3 +15V
4 GN
5 BN
6 -31V
7 GND
8 KEY

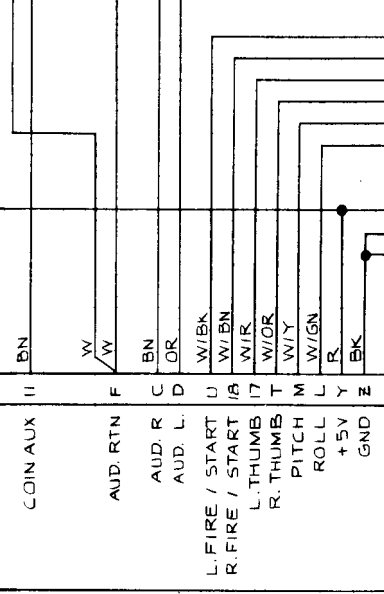
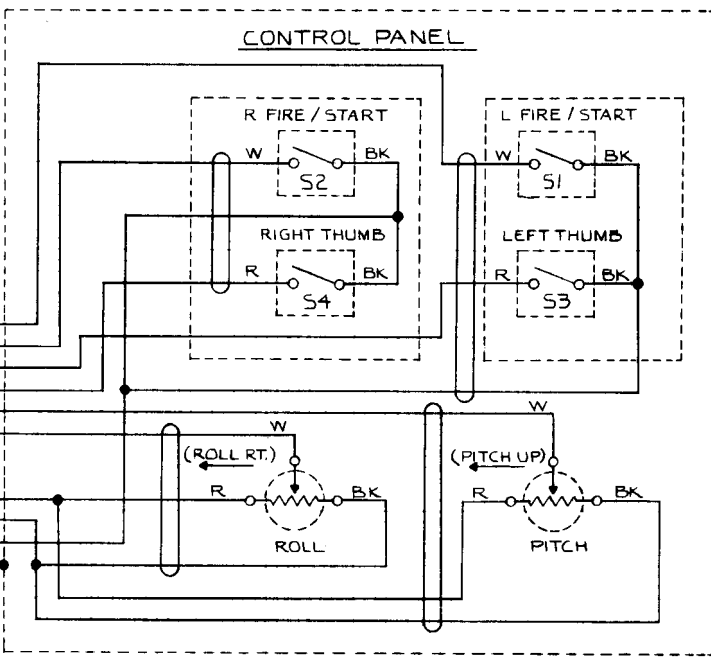
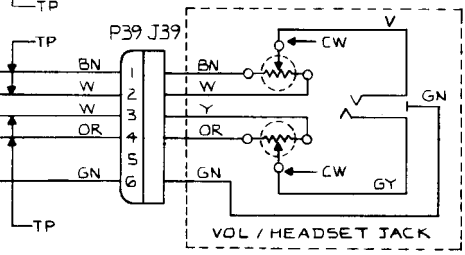
P17

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

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



P29
W
V
BN
BK/Y
W
BU/BK
V/BK
OR
BN
W
GY
OR
GN
UTILITY PANEL WIRING
DIAGRAM SEE SHT 3A



COIN AUX	AUD. RTN	AUD. R	AUD. L	L. FIRE / START	R. FIRE / START	L. THUMB	R. THUMB	PITCH	ROLL	+5V	GND
BN	W	BN	OR	W/BK	W/BN	W/R	W/OR	W/Y	W/GN	R	BK

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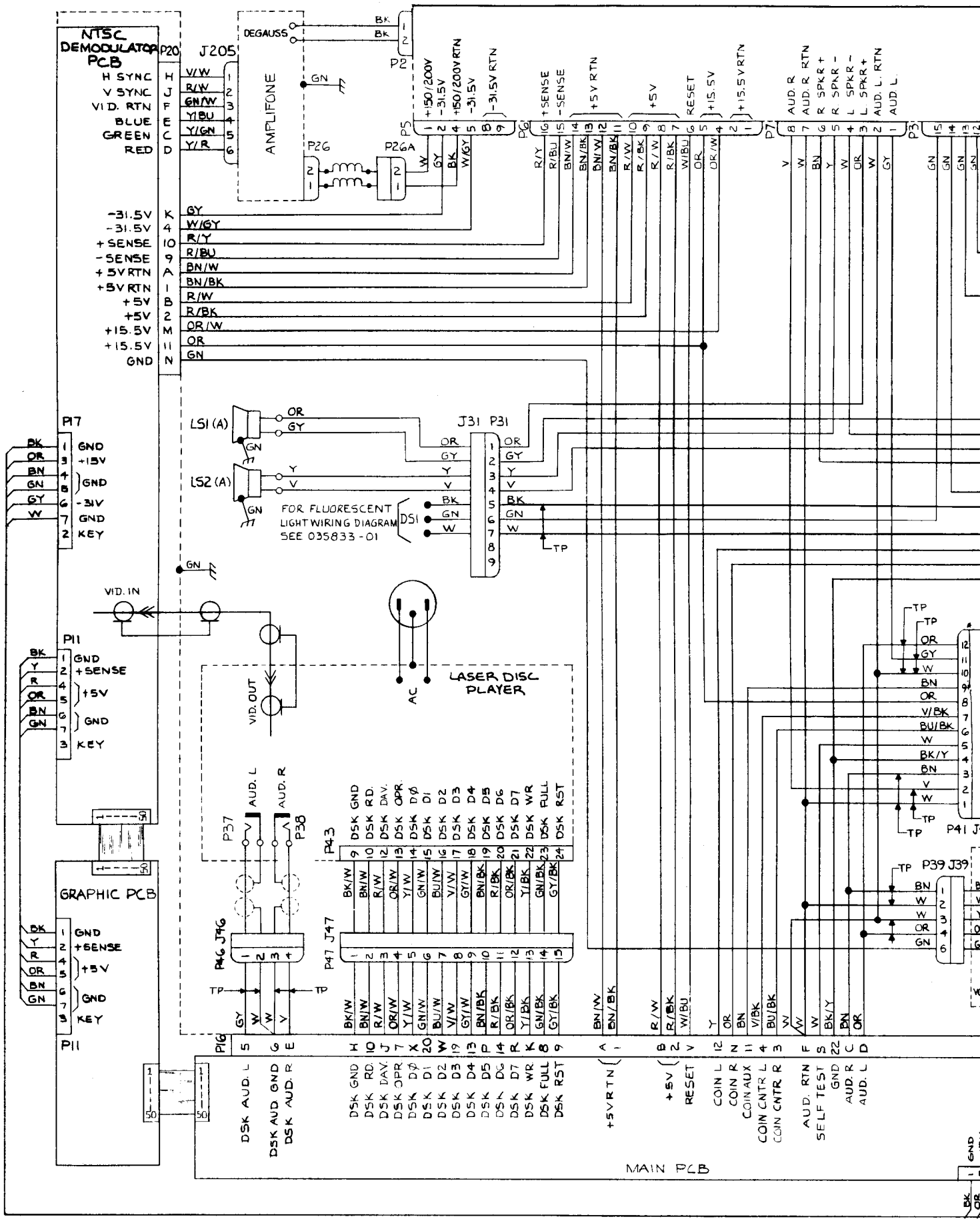
FIREFOX Upright Main Wiring Diagram



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2nd printing



NTSC DEMODULATOR PCB

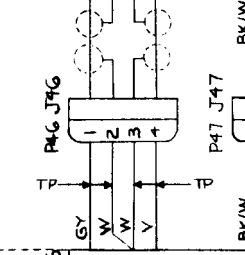
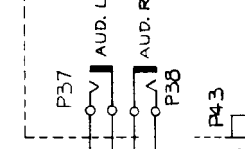
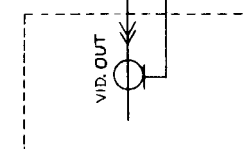
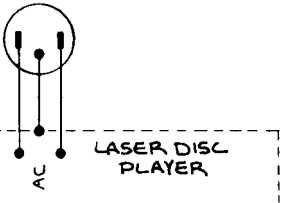
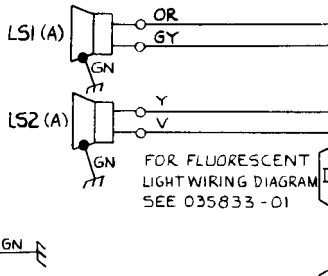
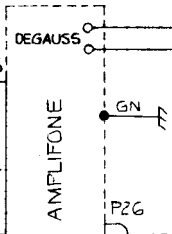
- H V/W
- L R/W
- F GN/W
- E Y/BU
- D Y/GR
- C
- B
- A
- 10
- 9
- 8
- 7
- 6
- 5
- 4
- 3
- 2
- 1
- GN

- 1 GND
- 2 +15V
- 3 GND
- 4 GND
- 5 -3V
- 6 GND
- 7 GND
- 8 KEY

- 1 GND
- 2 +5V
- 3 GND
- 4 GND
- 5 GND
- 6 GND
- 7 GND
- 8 KEY

- 1 GND
- 2 +5V
- 3 GND
- 4 GND
- 5 GND
- 6 GND
- 7 GND
- 8 KEY

- 5 DSK AUD. L
- 6 DSK AUD. GND
- 7 DSK AUD. R

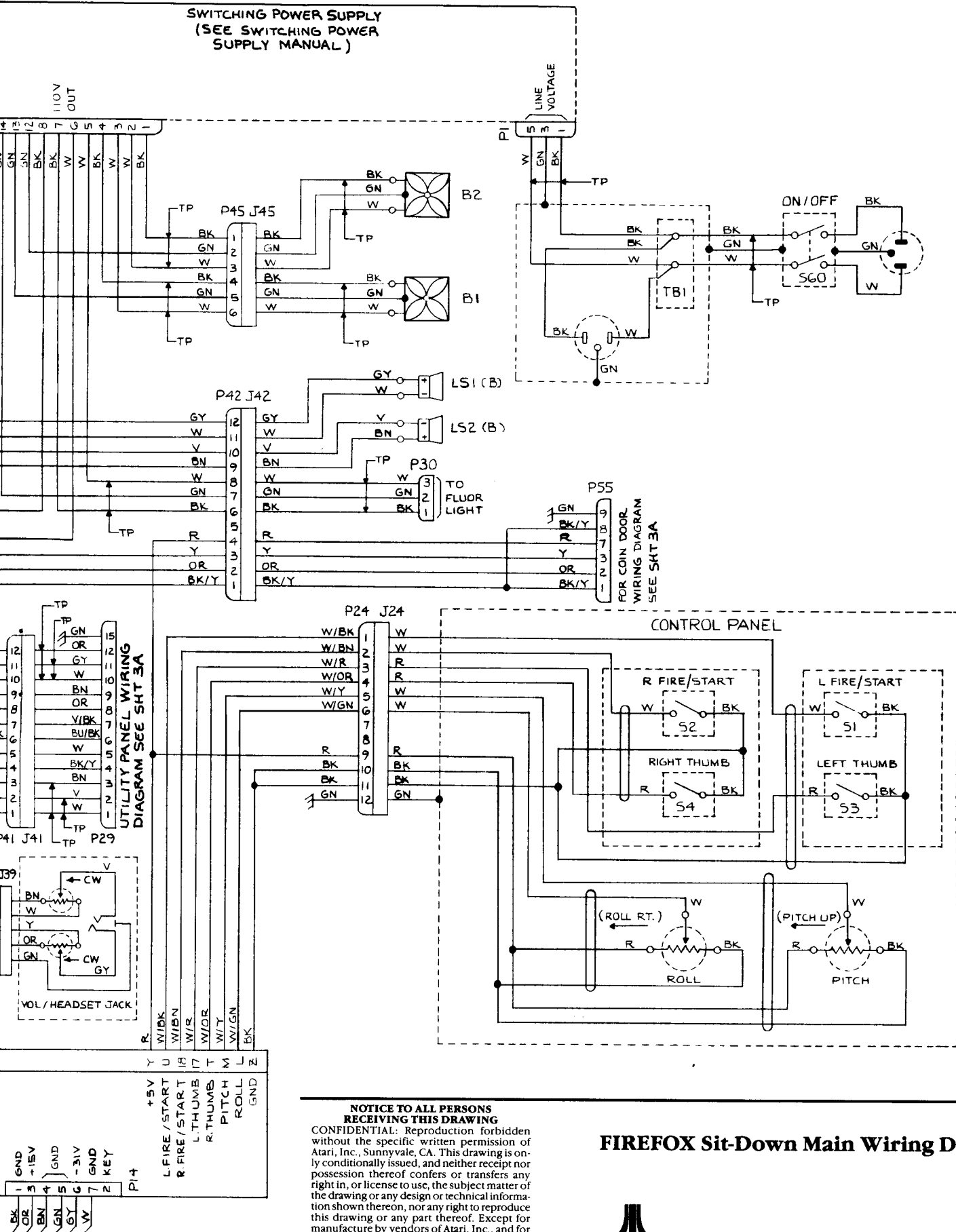


- 9 DSK GND
- 10 DSK RD.
- 11 DSK DAV.
- 12 DSK OPR.
- 13 DSK D₁
- 14 DSK D₂
- 15 DSK D₃
- 16 DSK D₄
- 17 DSK D₅
- 18 DSK D₆
- 19 DSK D₇
- 20 DSK WR
- 21 DSK FULL
- 22 DSK FULL
- 23 DSK FULL
- 24 DSK RST

- 1 BN/W
- 2 BN/BK
- 3 R/W
- 4 R/BK
- 5 W/BU
- 6 Y
- 7 OR
- 8 BN
- 9 V/BK
- 10 BU/BK
- 11 W
- 12 W
- 13 BK/Y
- 14 BN
- 15 OR
- 16 TP
- 17 TP
- 18 TP
- 19 TP
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- 91 TP
- 92 TP
- 93 TP
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- 96 TP
- 97 TP
- 98 TP
- 99 TP
- 100 TP

MAIN PCB

- 1 GND
- 2 +15V
- 3



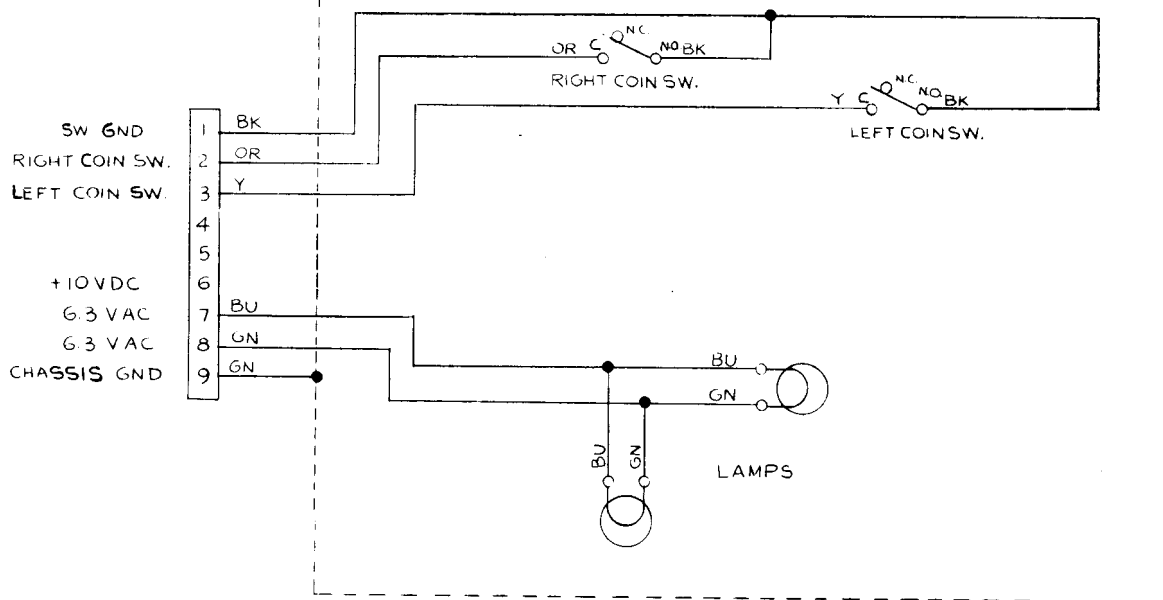
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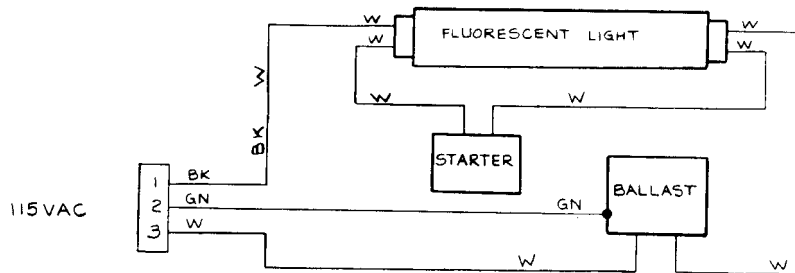
FIREFOX Sit-Down Main Wiring Diagram



Coin Door Wiring Diagram



Fluorescent Light Wiring Diagram



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FIREFOX Game Interfaces



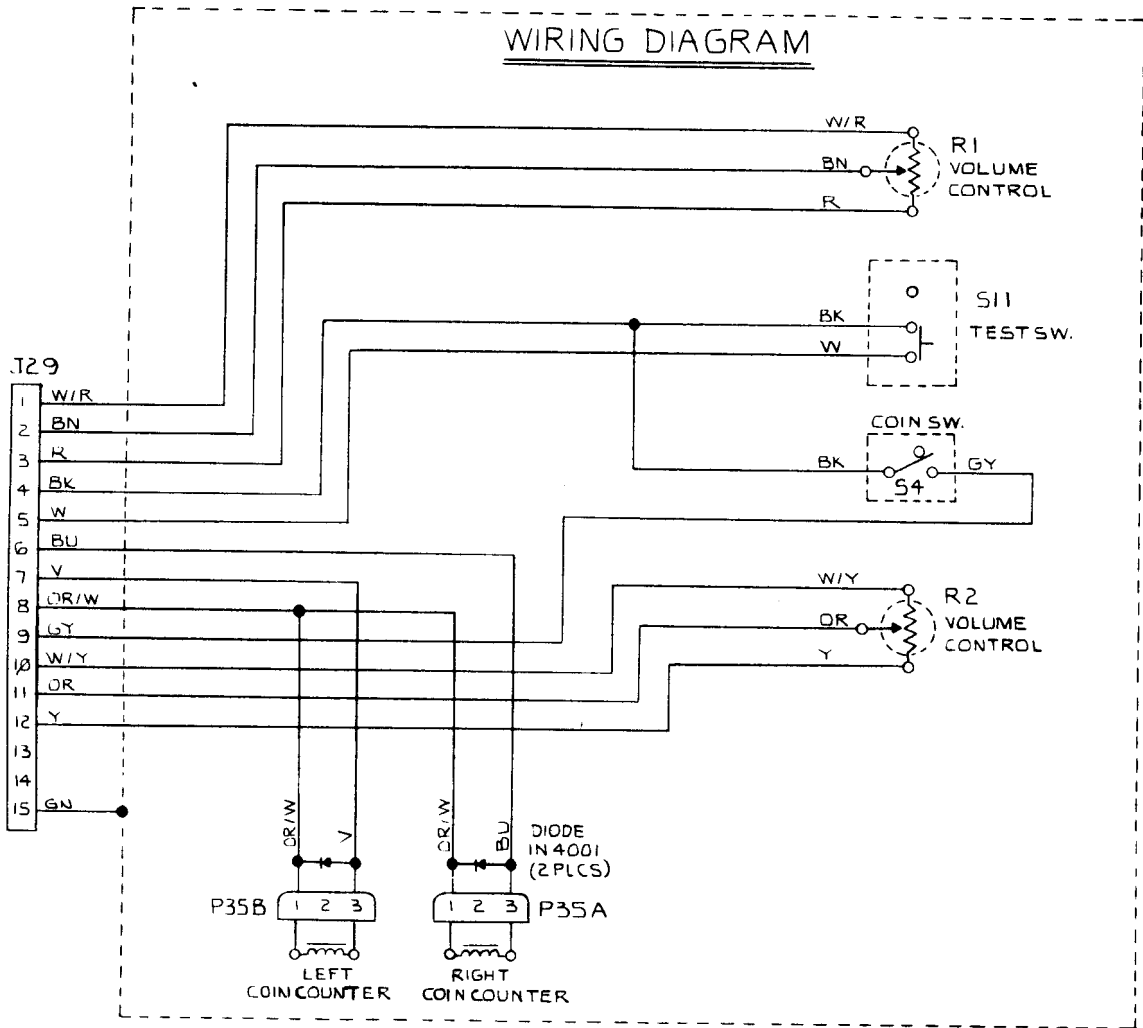
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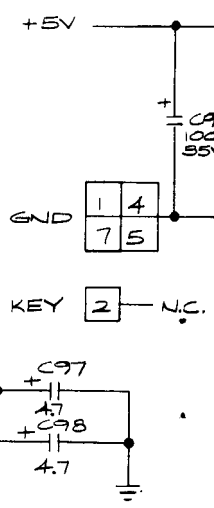
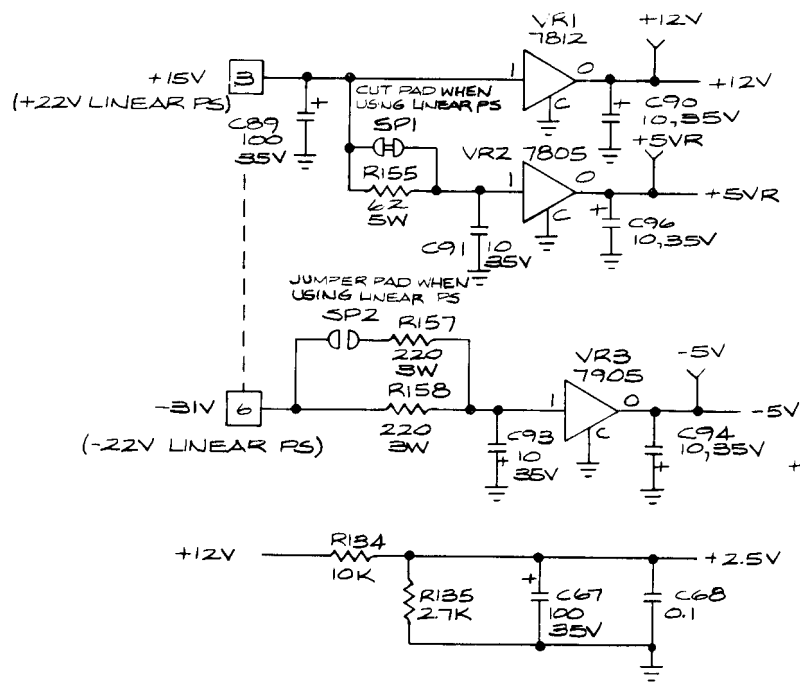
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Utility Panel Wiring Diagram

WIRING DIAGRAM



Power I



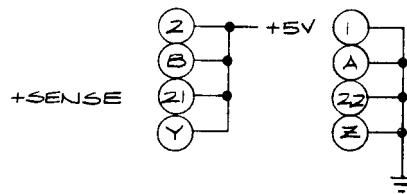
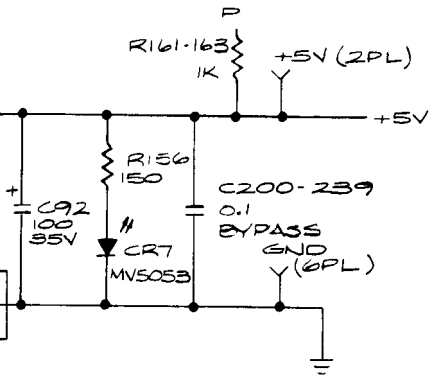
Power Input

NOTES:

□ DENOTES J14 CONNECTOR

○ DENOTES J16 CONNECTOR

◻ DENOTES J15 CONNECTOR



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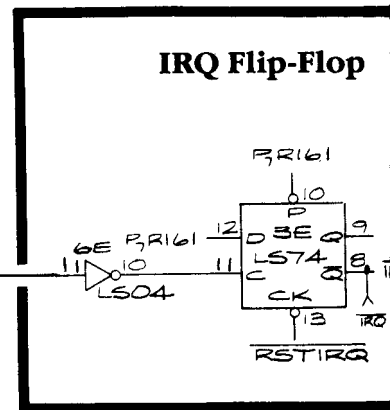
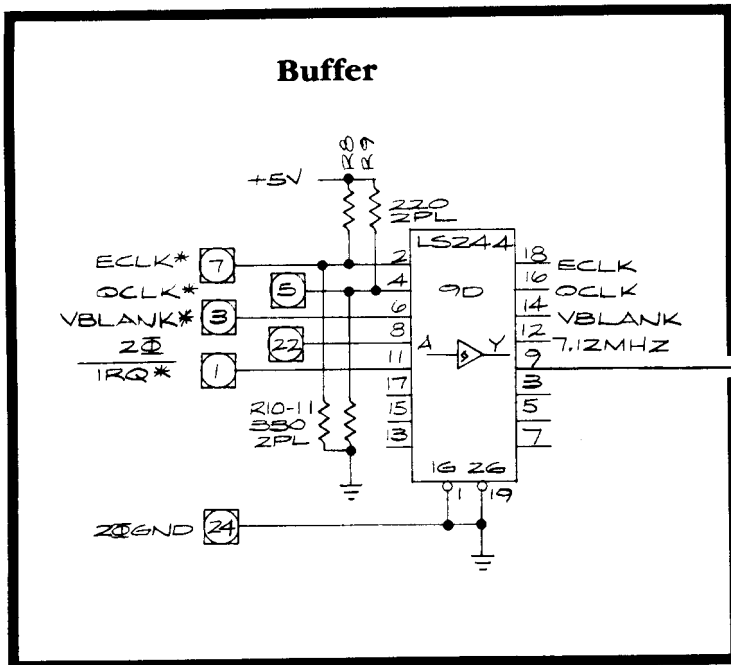
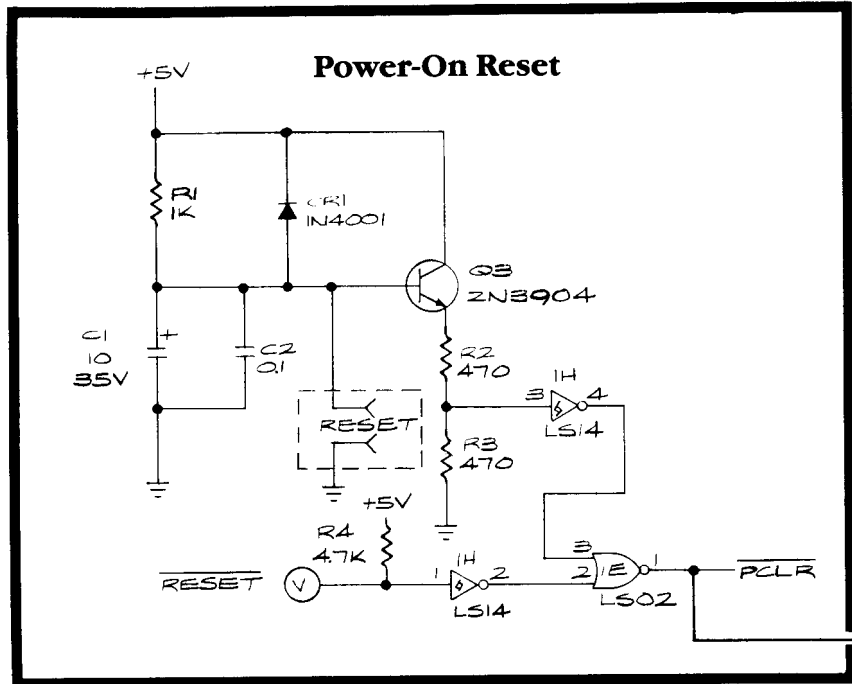
FIREFOX Main PCB



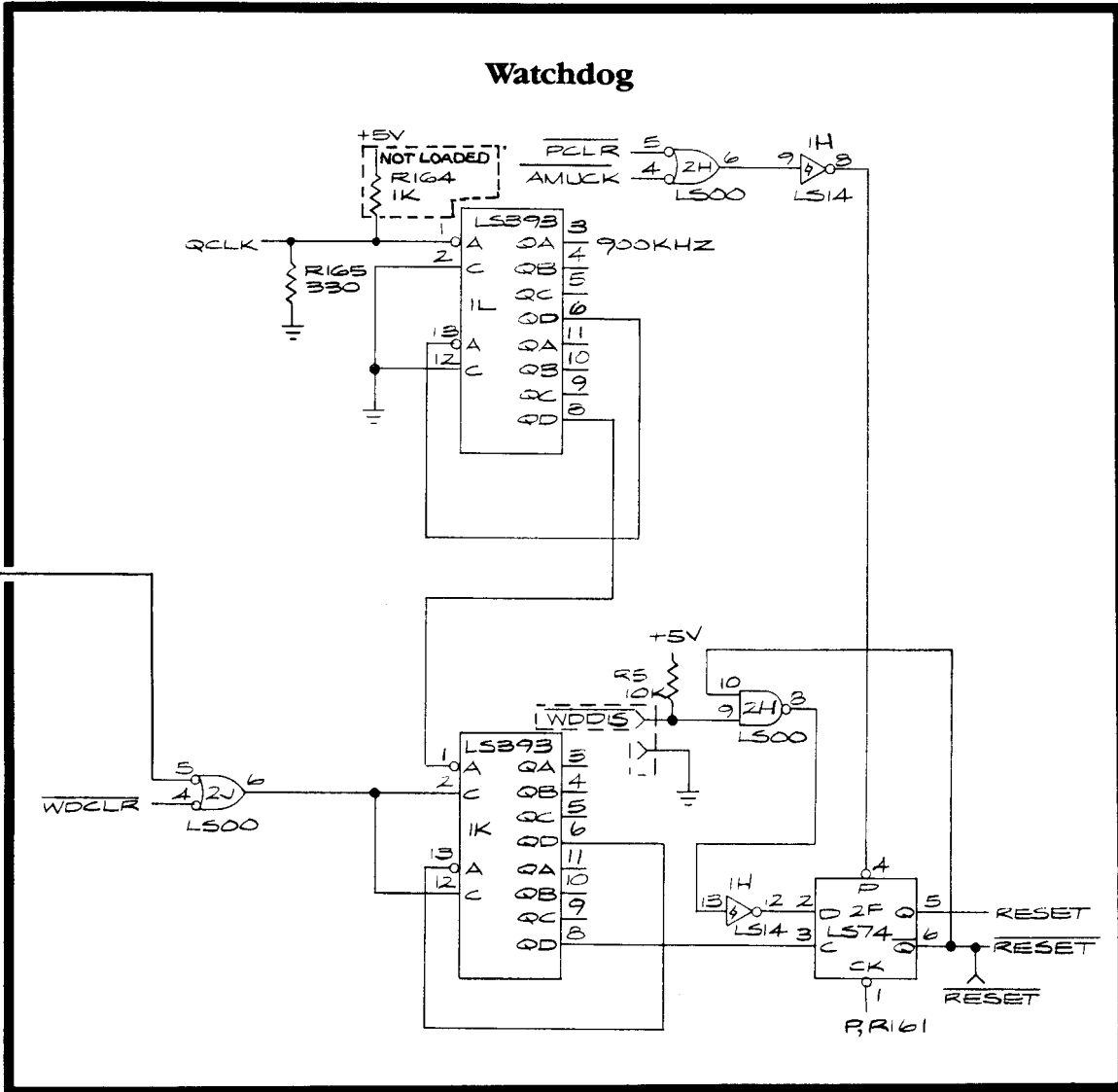
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Watchdog



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FIREFOX Main PCB

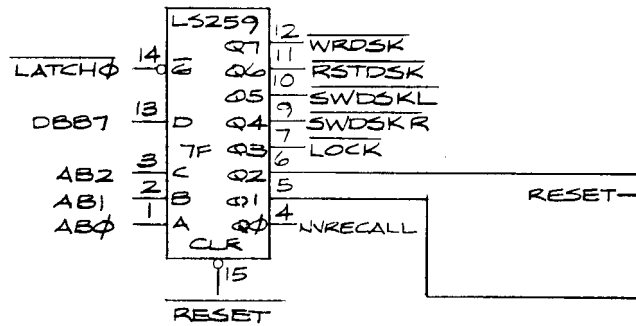
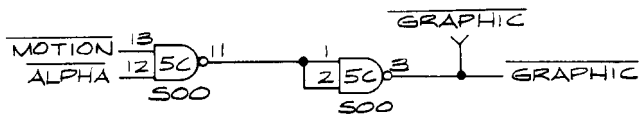
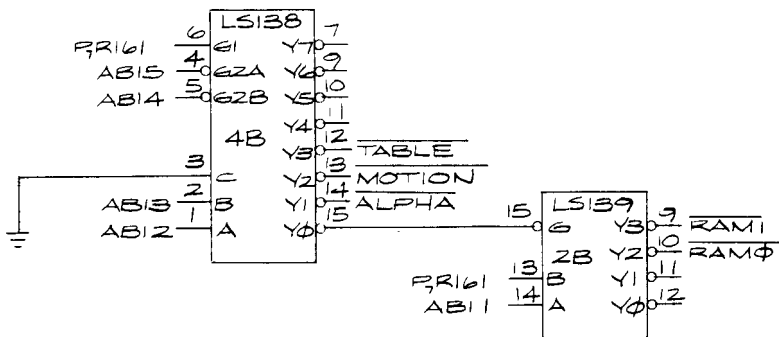
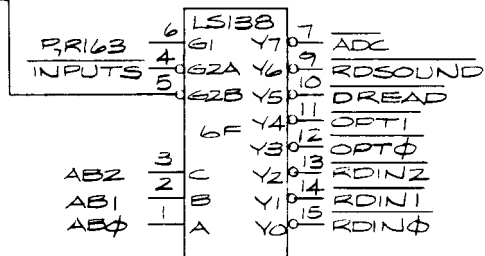
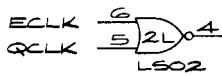
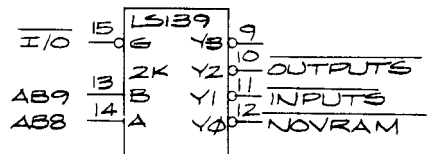
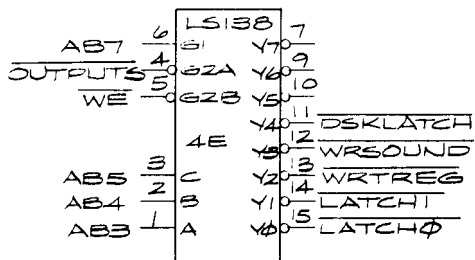
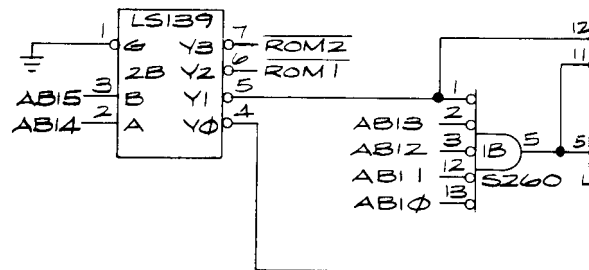
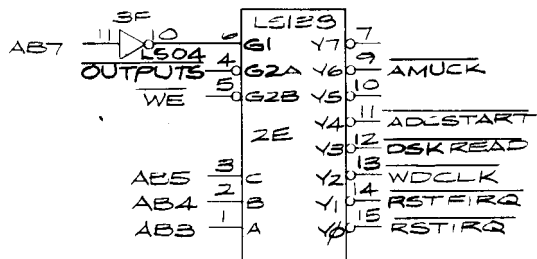


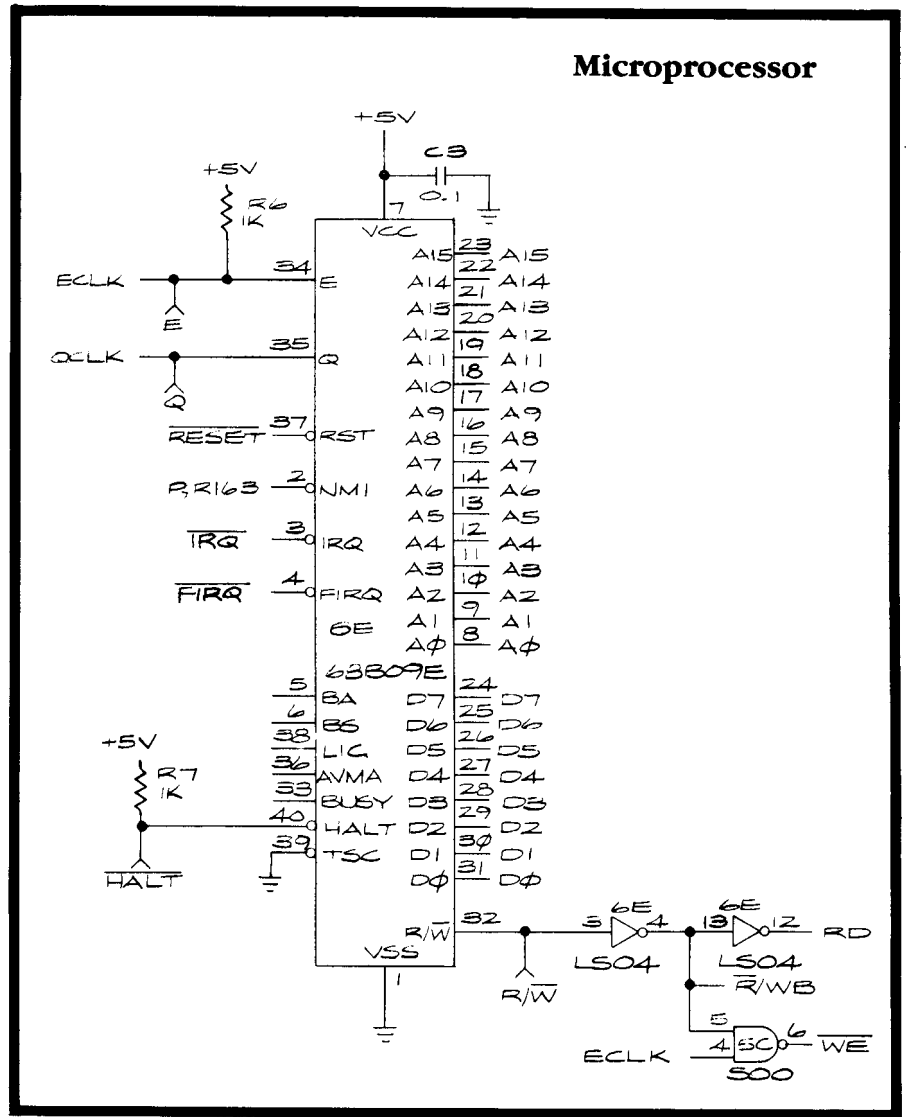
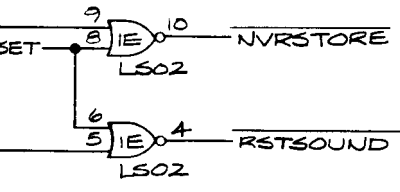
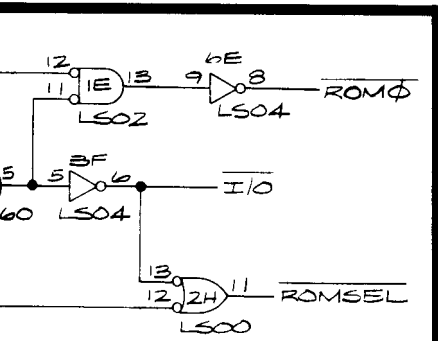
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Address Decoders





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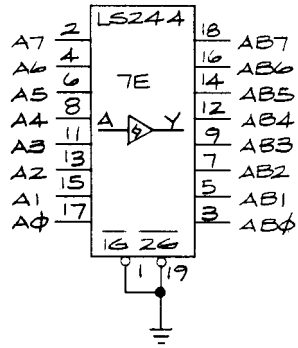
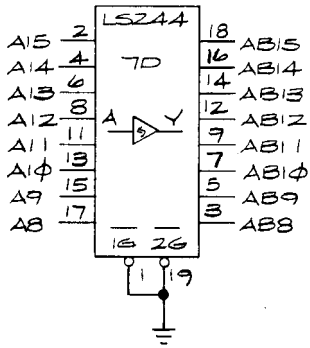
FIREFOX Main PCB



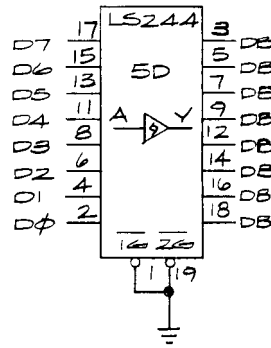
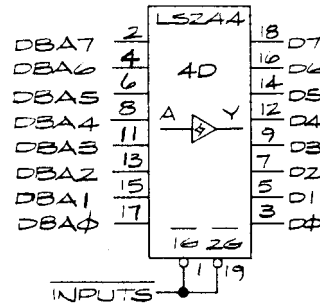
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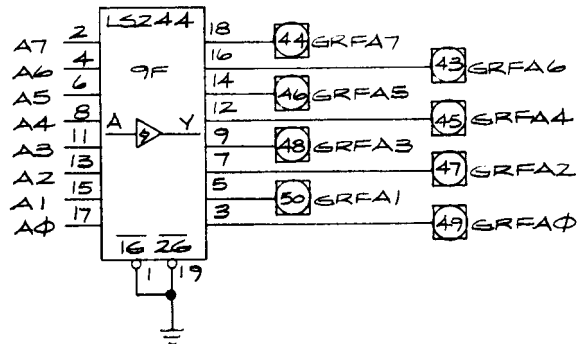
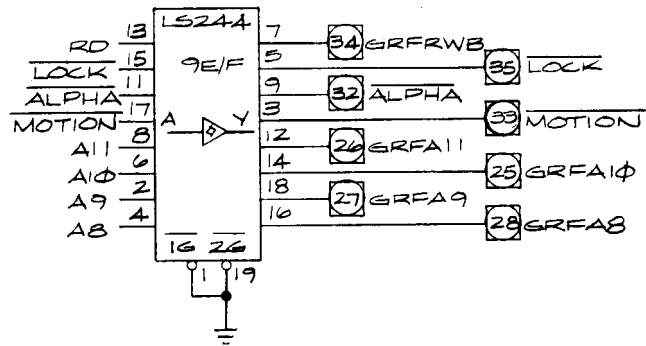
Address Buffers



Data Buffers



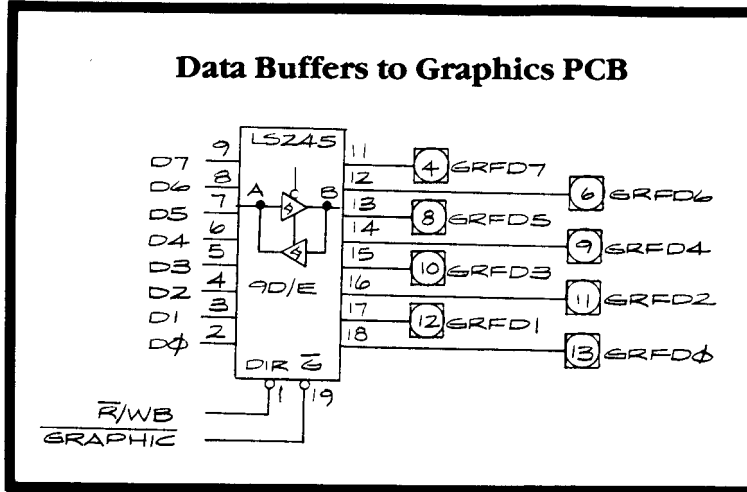
Address Buffers to Graphics PCB



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)

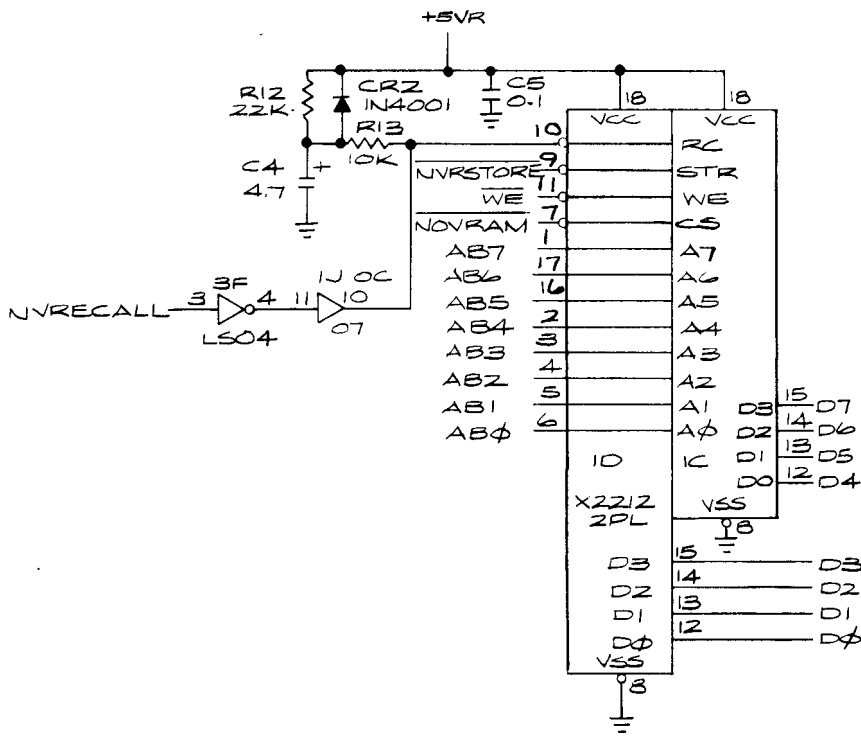
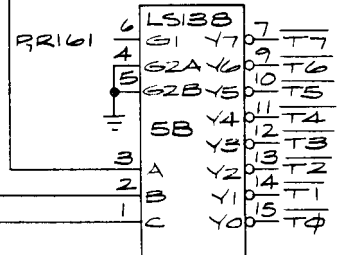
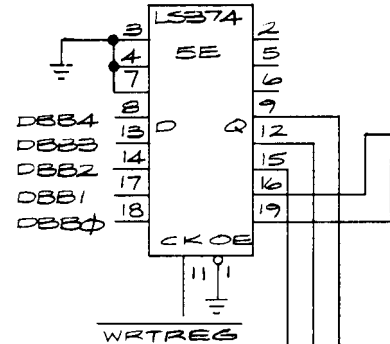


Table ROM Selector



Program RAM

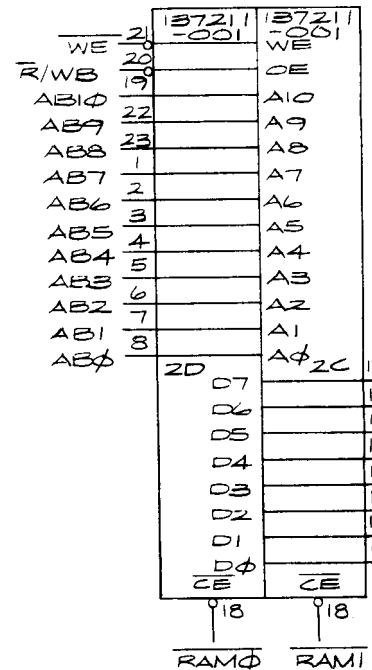
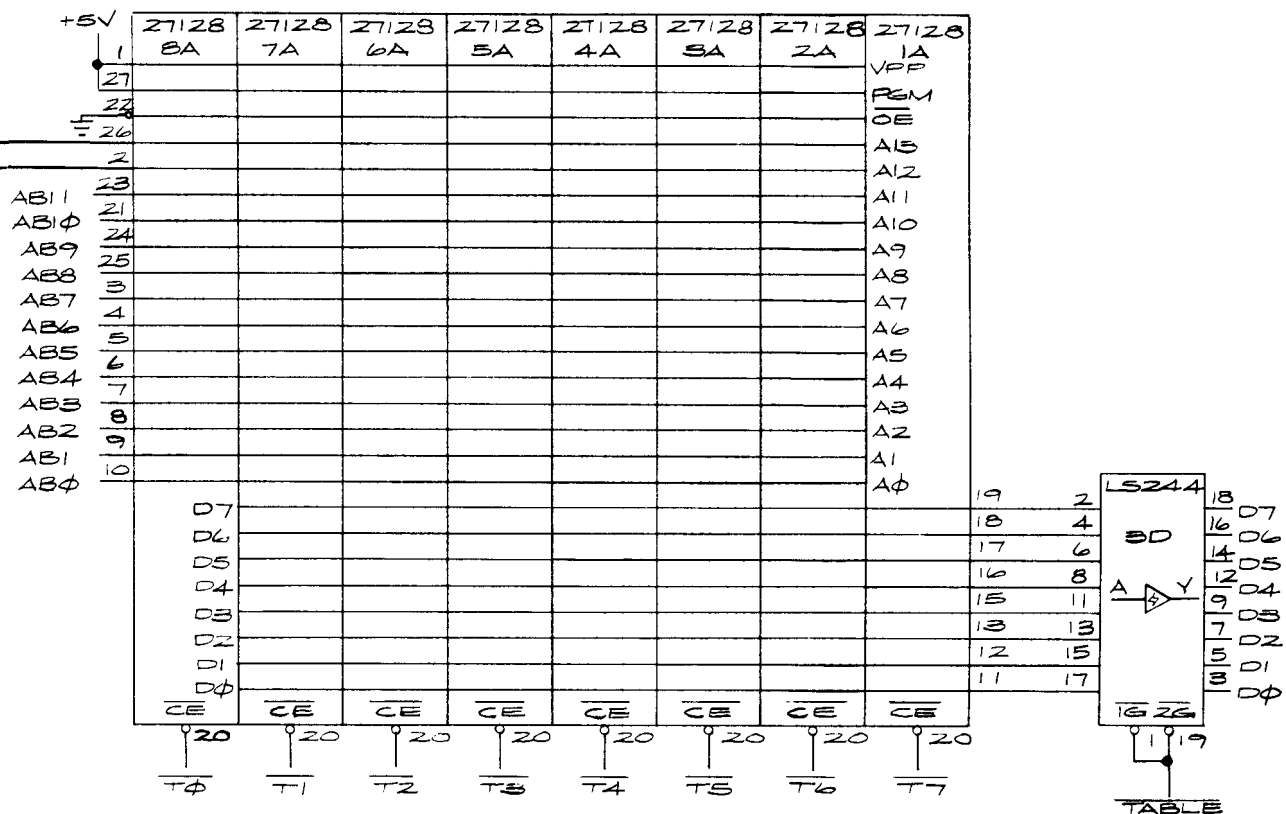
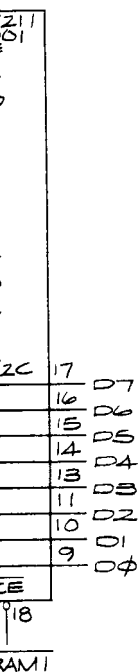


Table ROM



RAM



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FIREFOX Main PCB

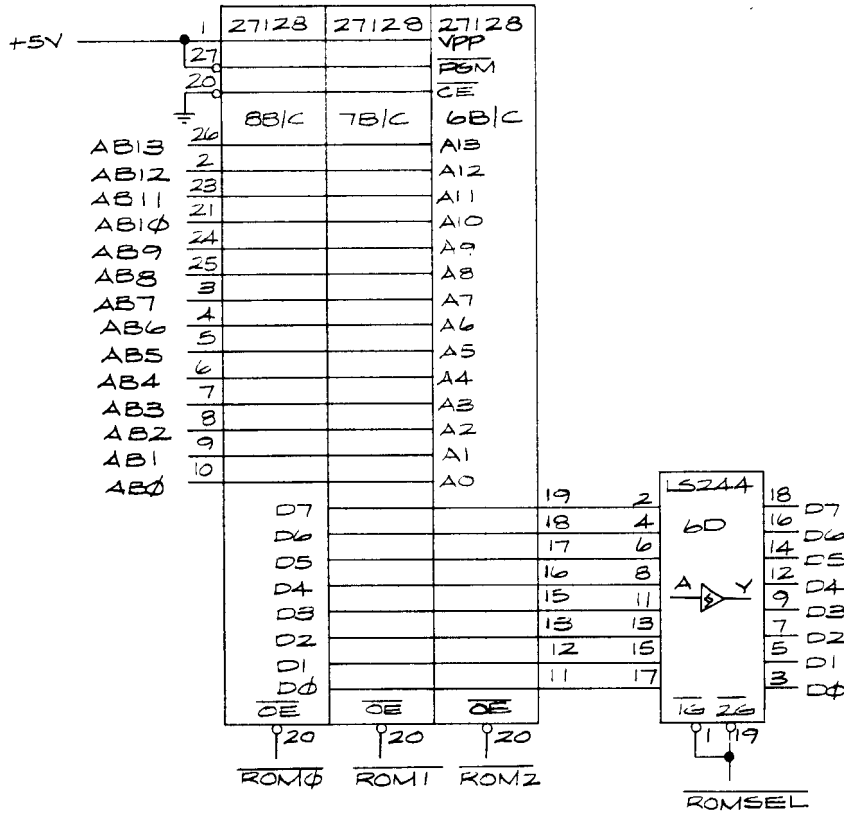


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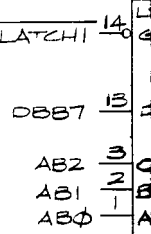
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SP-253 Sheet 6A
2nd printing

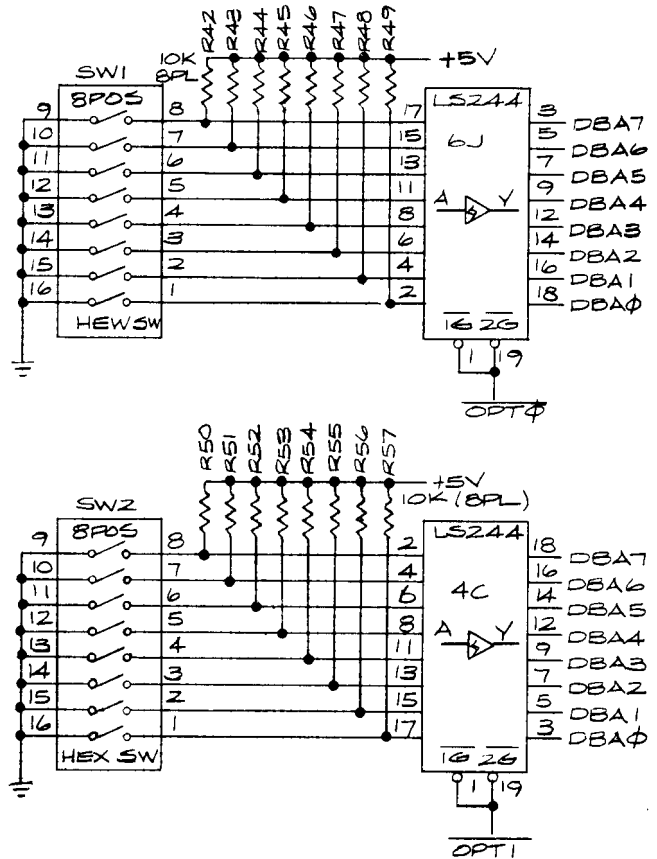
Program ROM



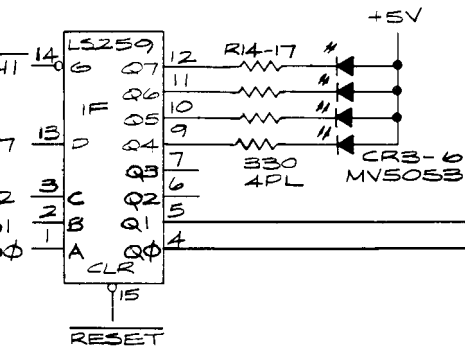
Test a



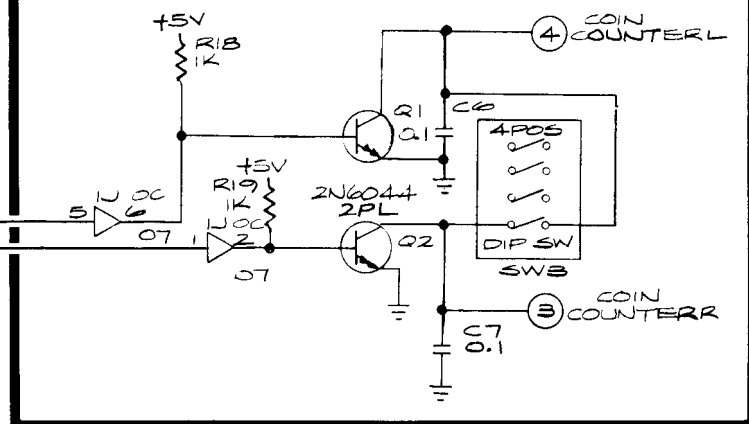
Option Switches



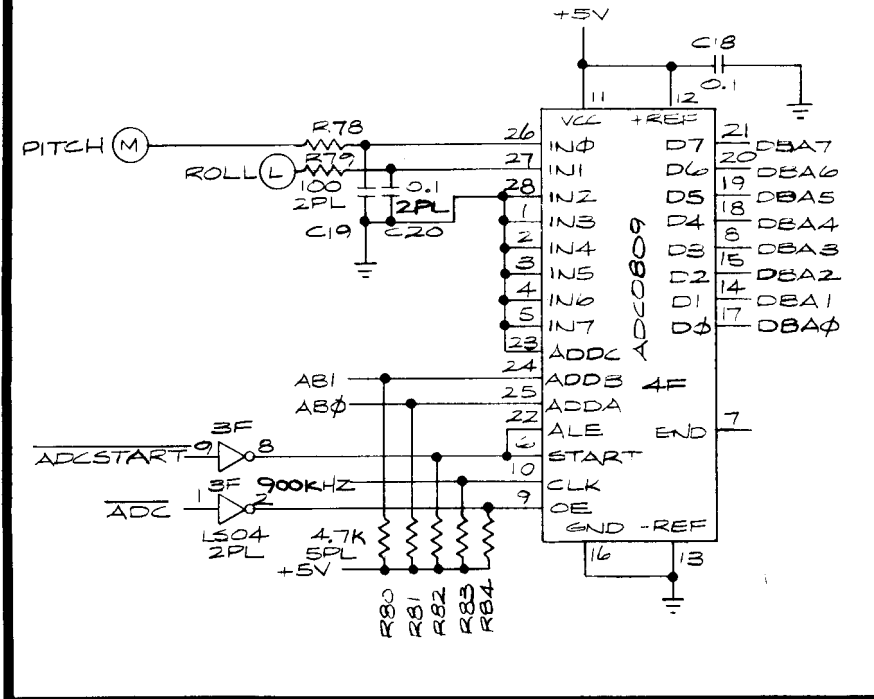
Test and Control Signals



Coin Door Outputs



Analog-to-Digital Converter



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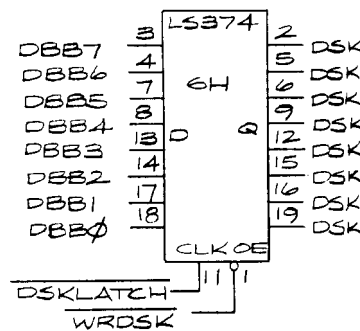
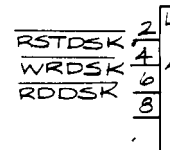
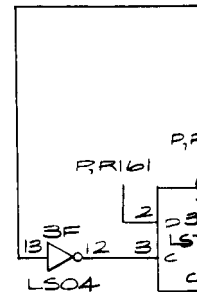
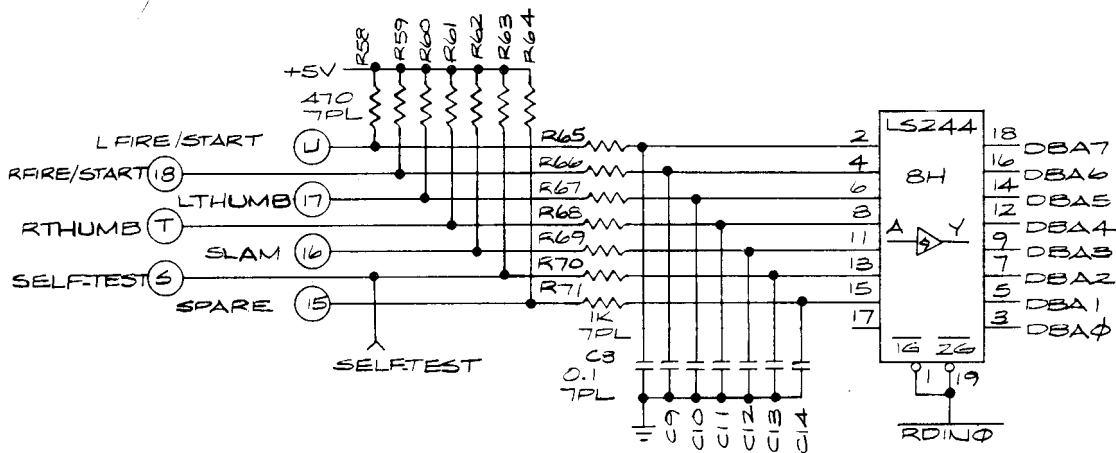
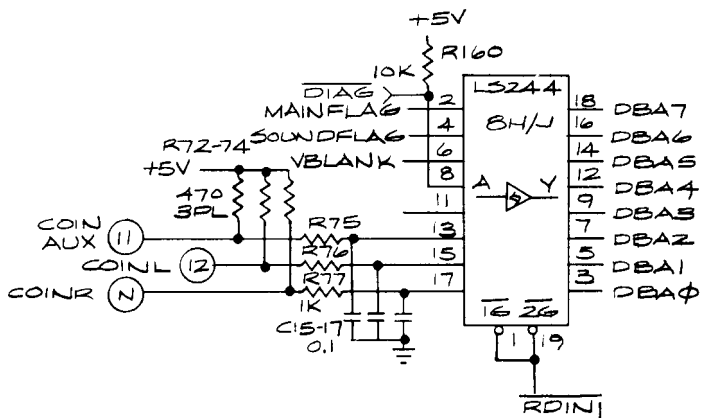


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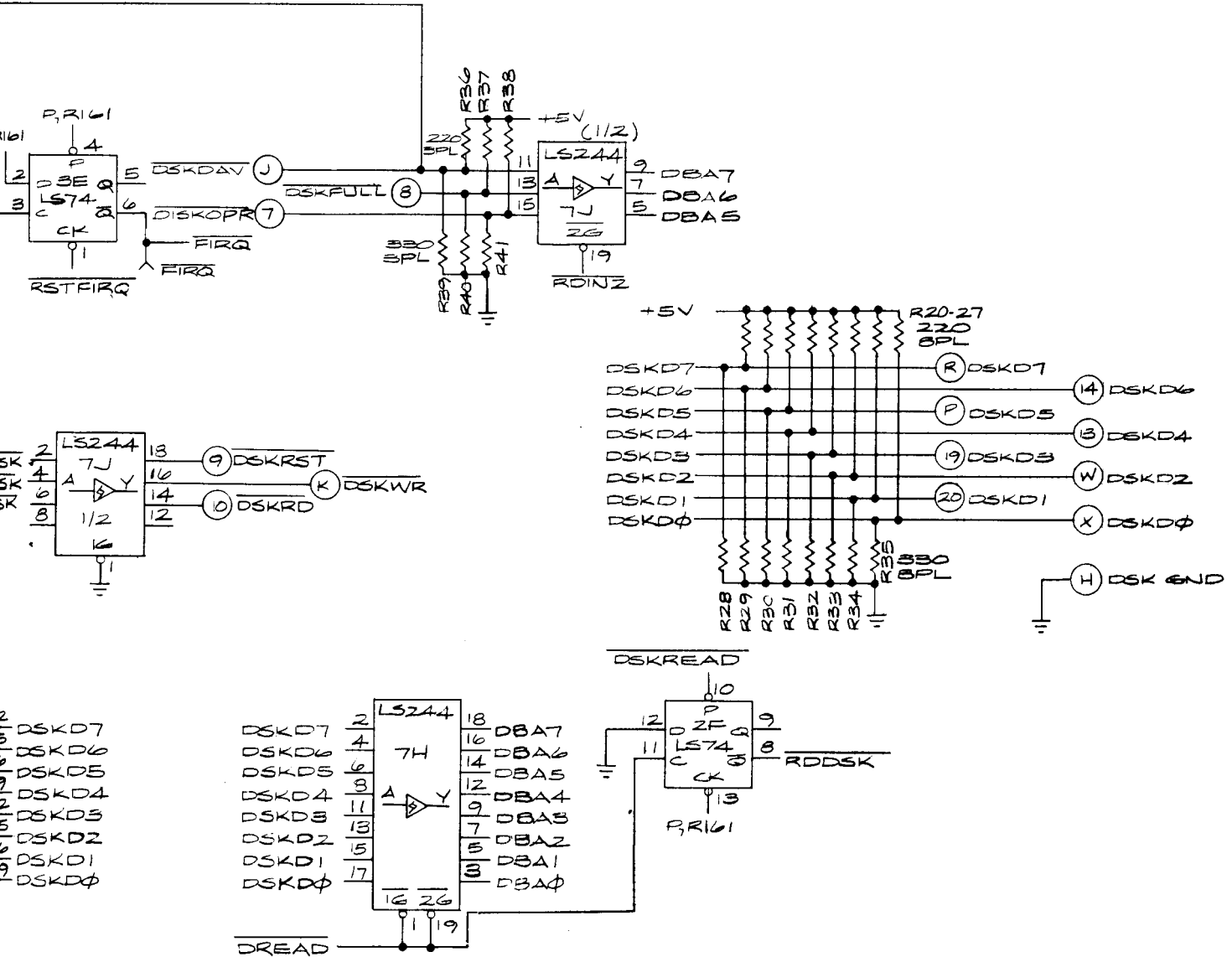
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SP-253 Sheet 6B
2nd printing

Coin Door and Control Panel Inputs



Laser Disc Interface



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FIREFOX Main PCB

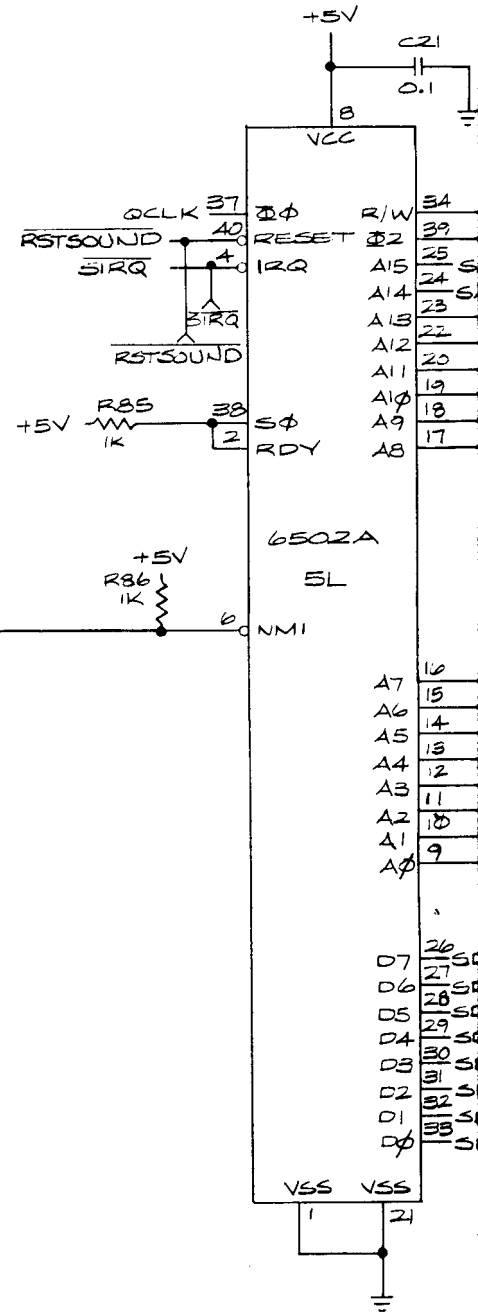
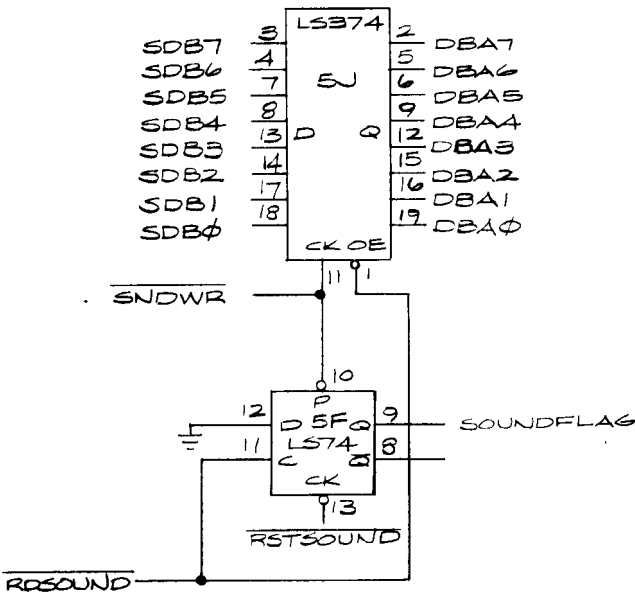
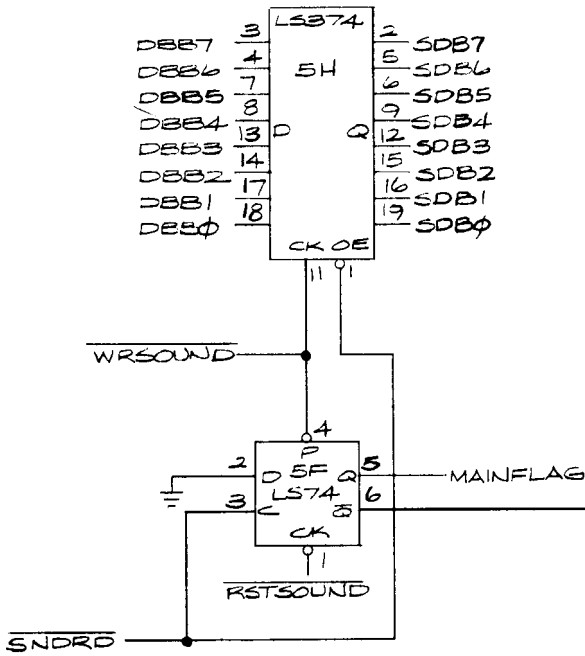


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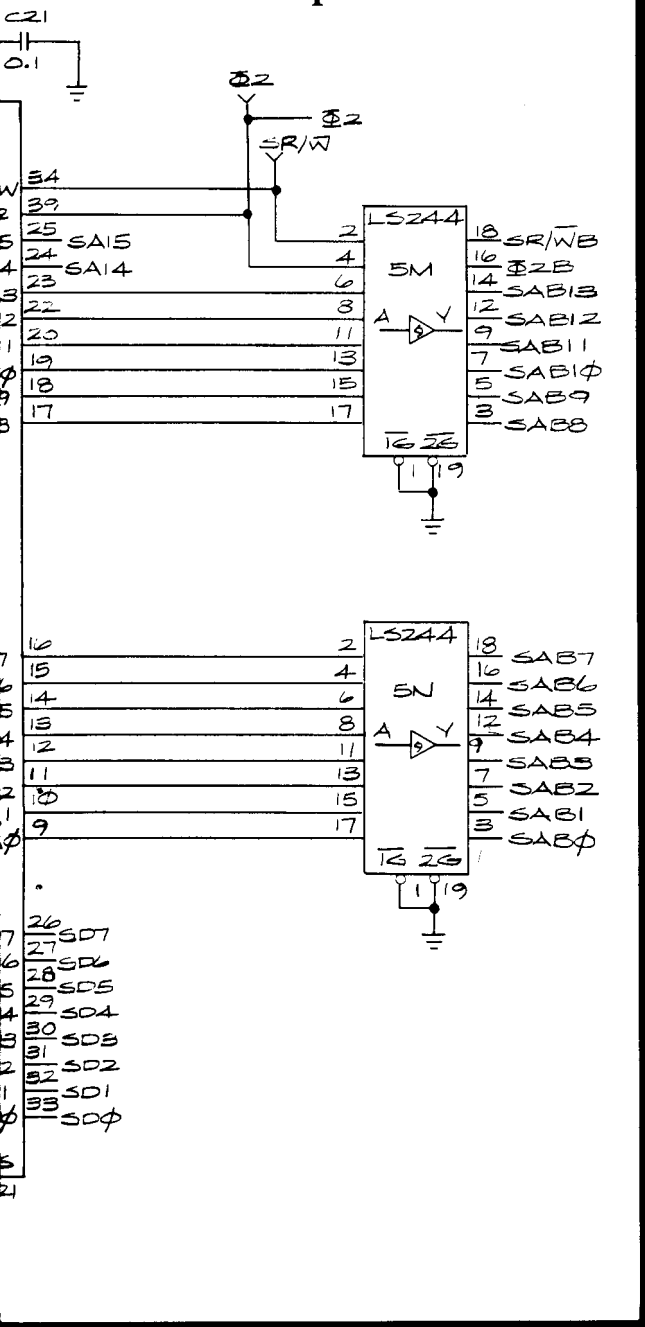
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SP-253 Sheet 7A
2nd printing

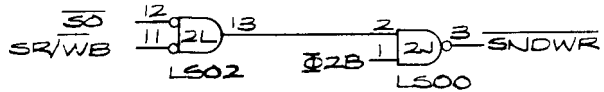
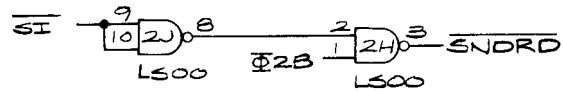
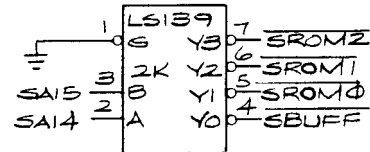
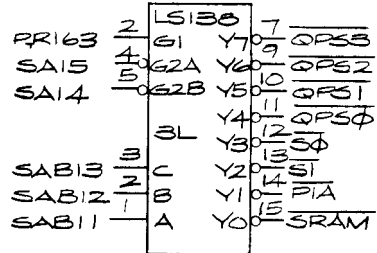
Sound Microprocessor Interface



Sound Microprocessor



Sound Microprocessor Address Decoders



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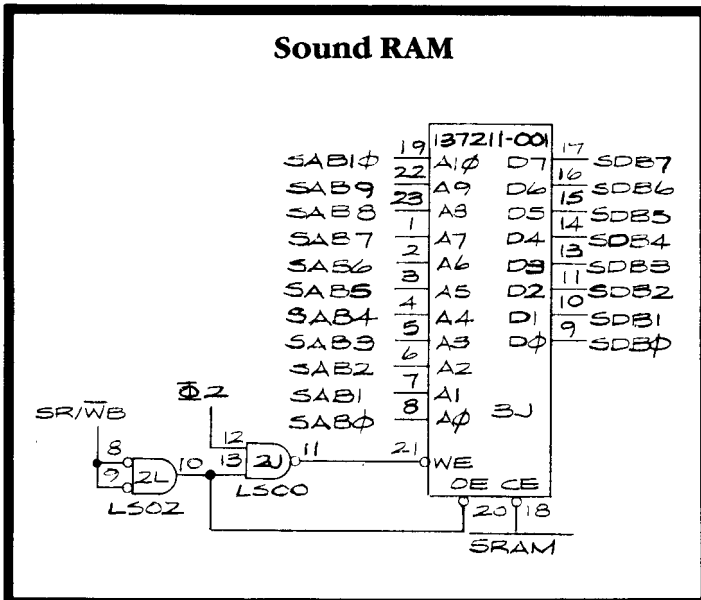
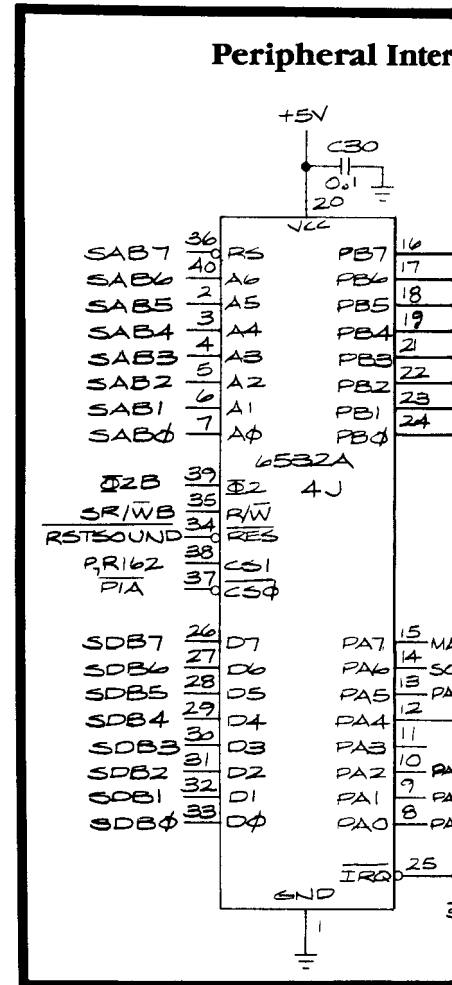
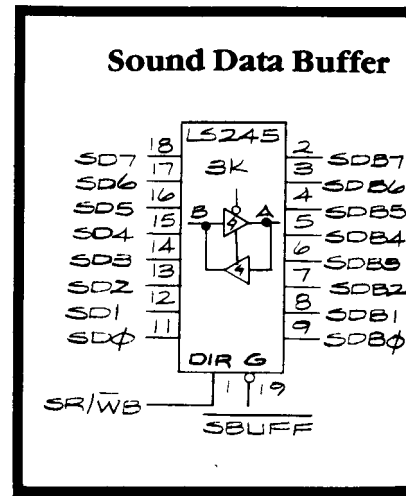
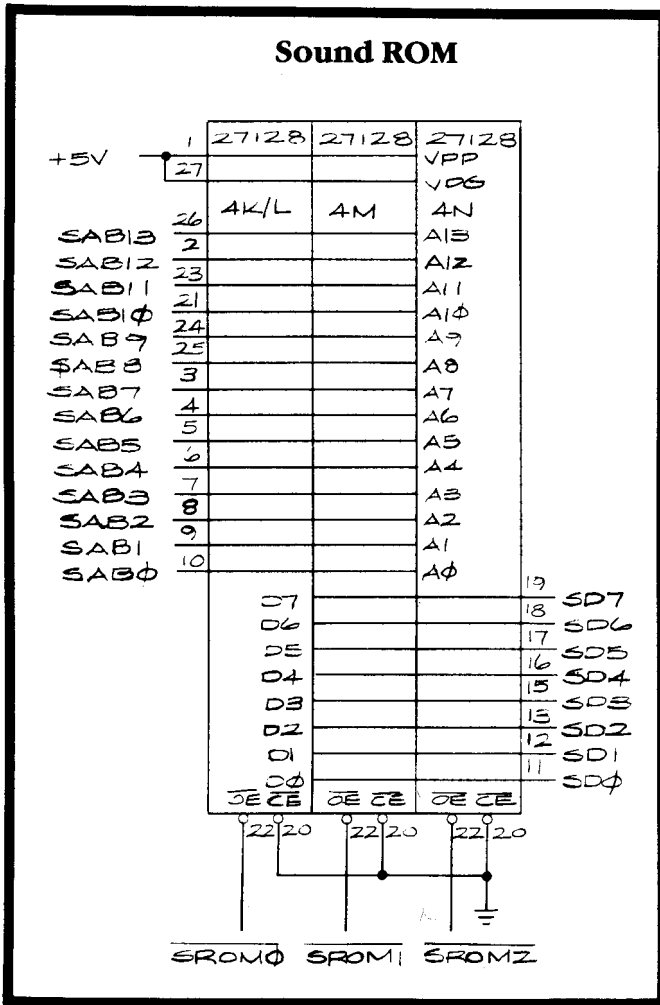
FIREFOX Main PCB



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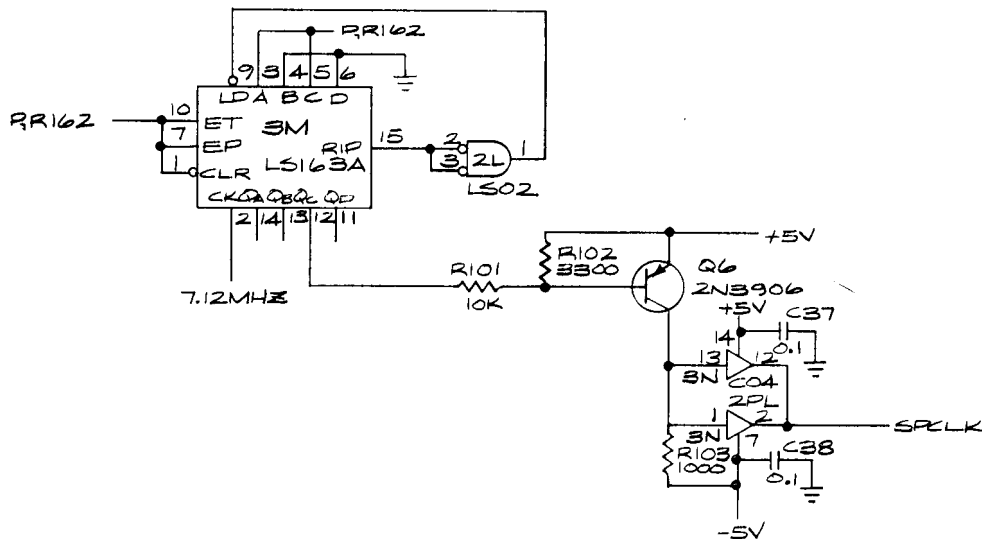
SP-253 Sheet 7B
2nd printing



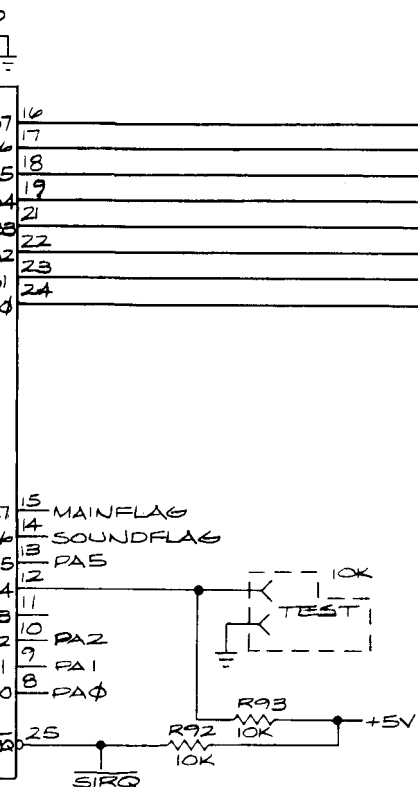
uffer

SDB7
SDB6
SDB5
SDB4
SDB3
SDB2
SDB1
SDBφ

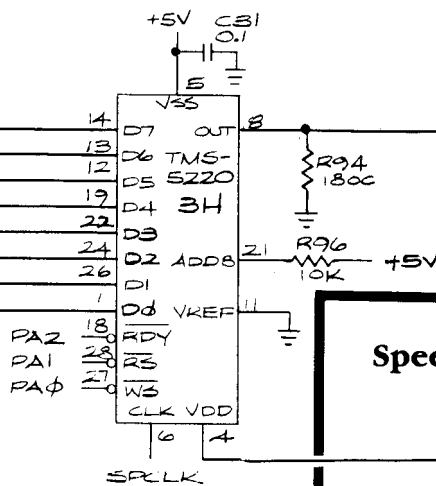
Speech Synthesizer Clock Generator



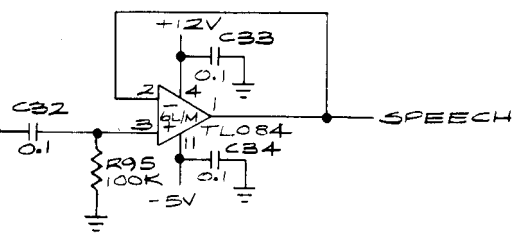
Interface Adapter



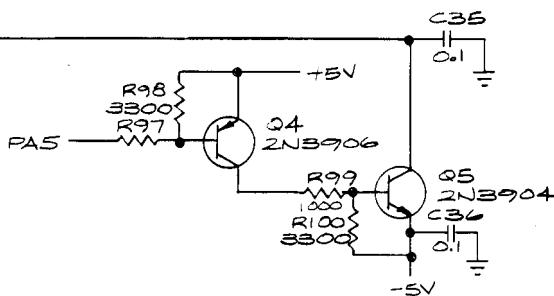
Speech Synthesizer



Buffer



Speech Synthesizer Power Switch



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FIREFOX Main PCB

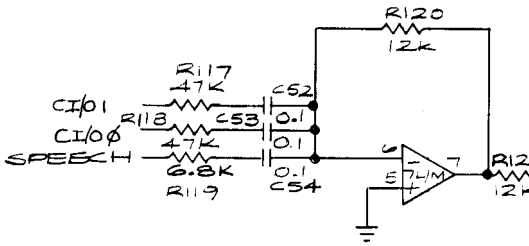
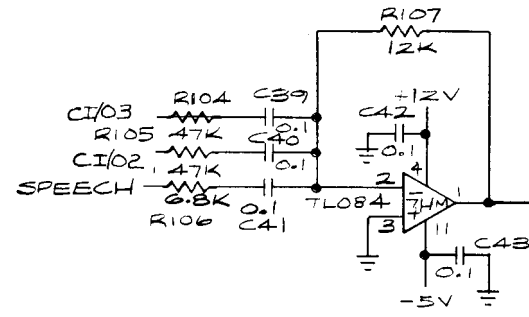


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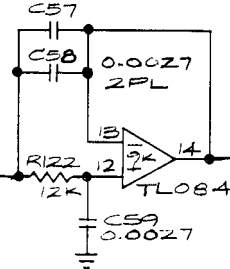
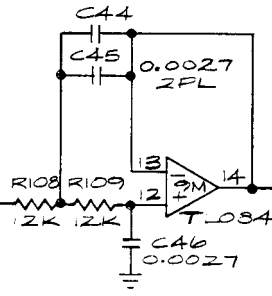
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SP-253 Sheet 8A
2nd printing

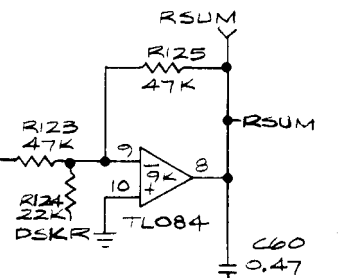
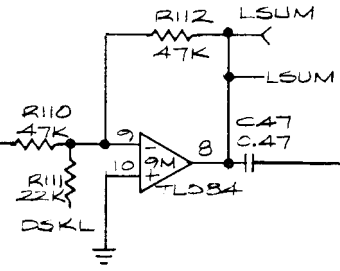
Summing Amplifier



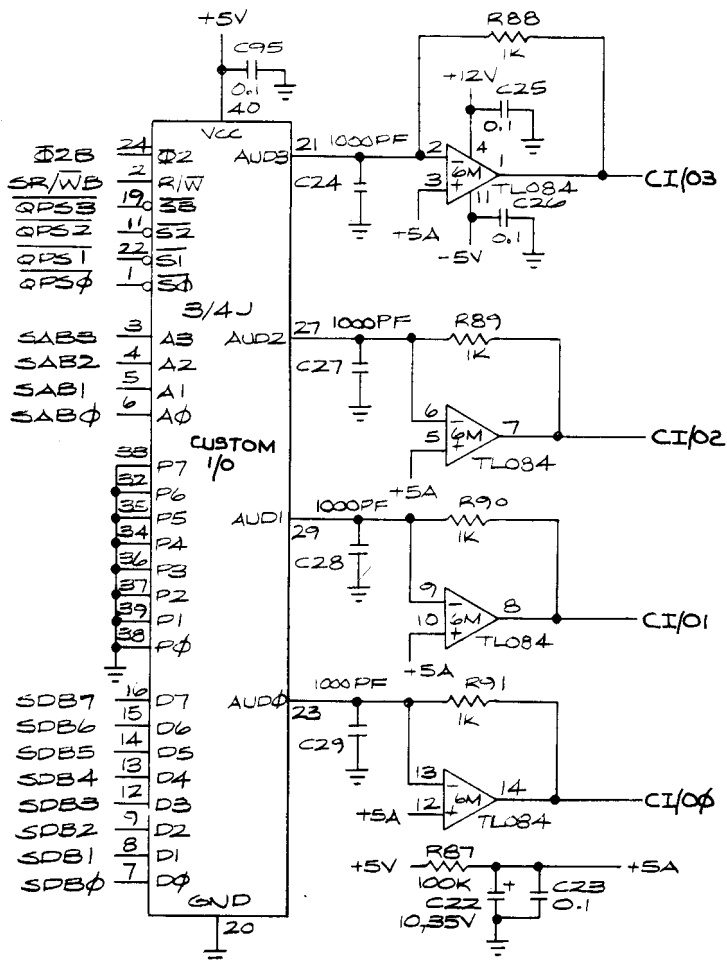
Filters



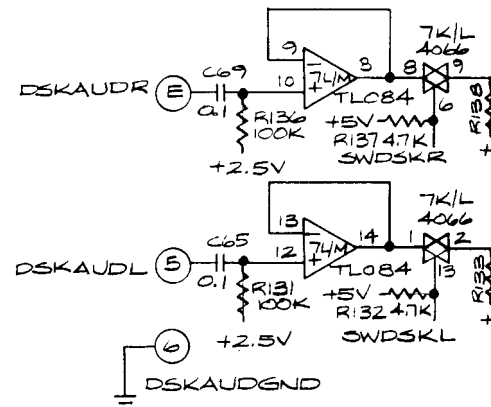
Summing Amplifier



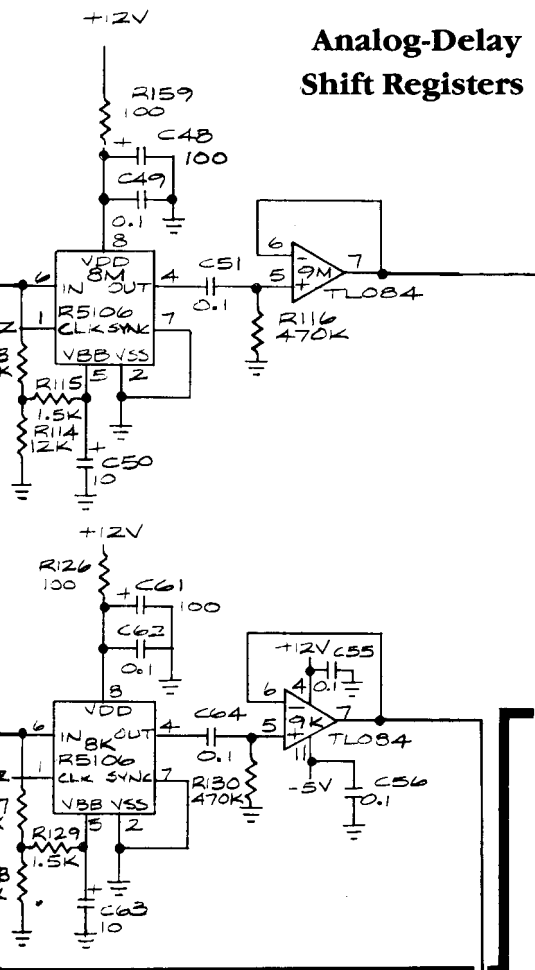
Music and Sound Effects Generators



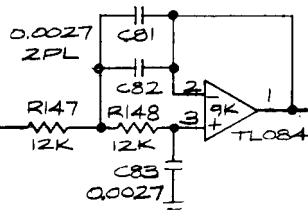
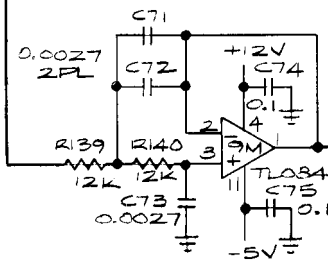
Laser-Disc Audio Buff



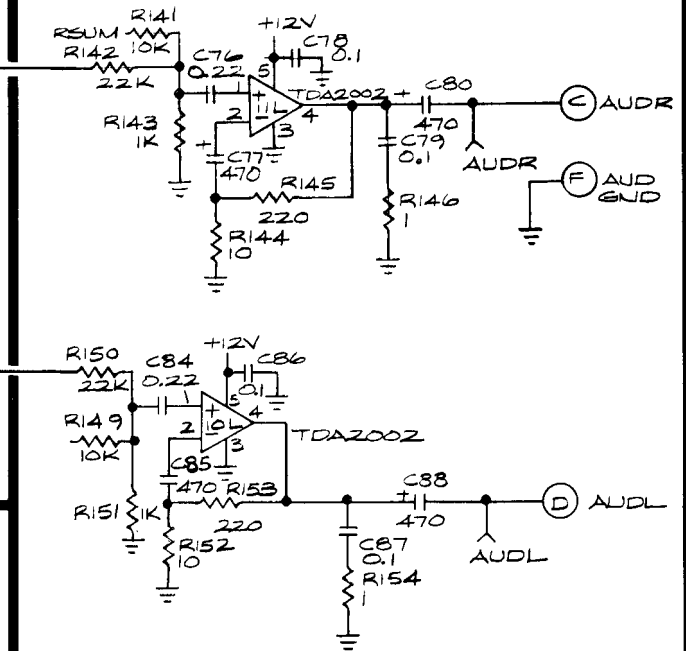
Analog-Delay Shift Registers



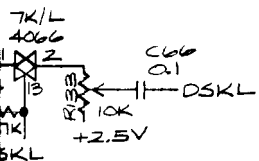
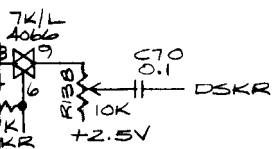
Filter



Audio Output Driver



Buffers



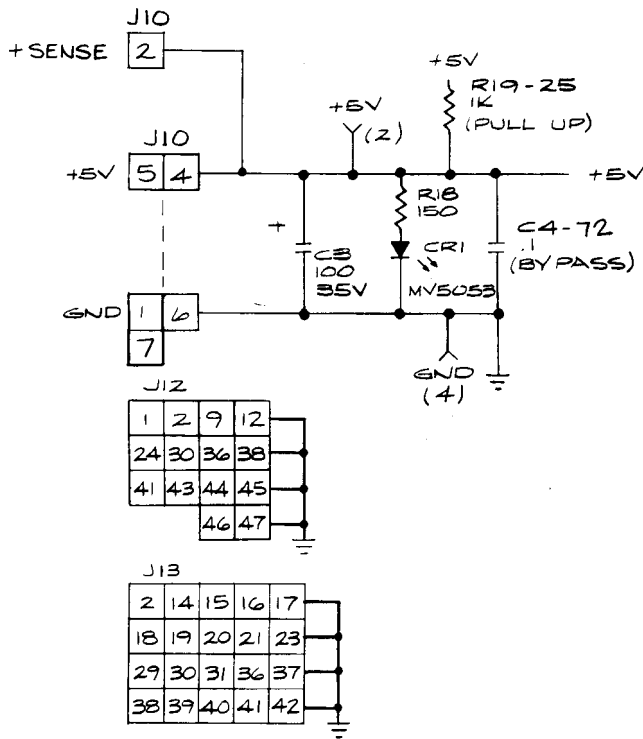
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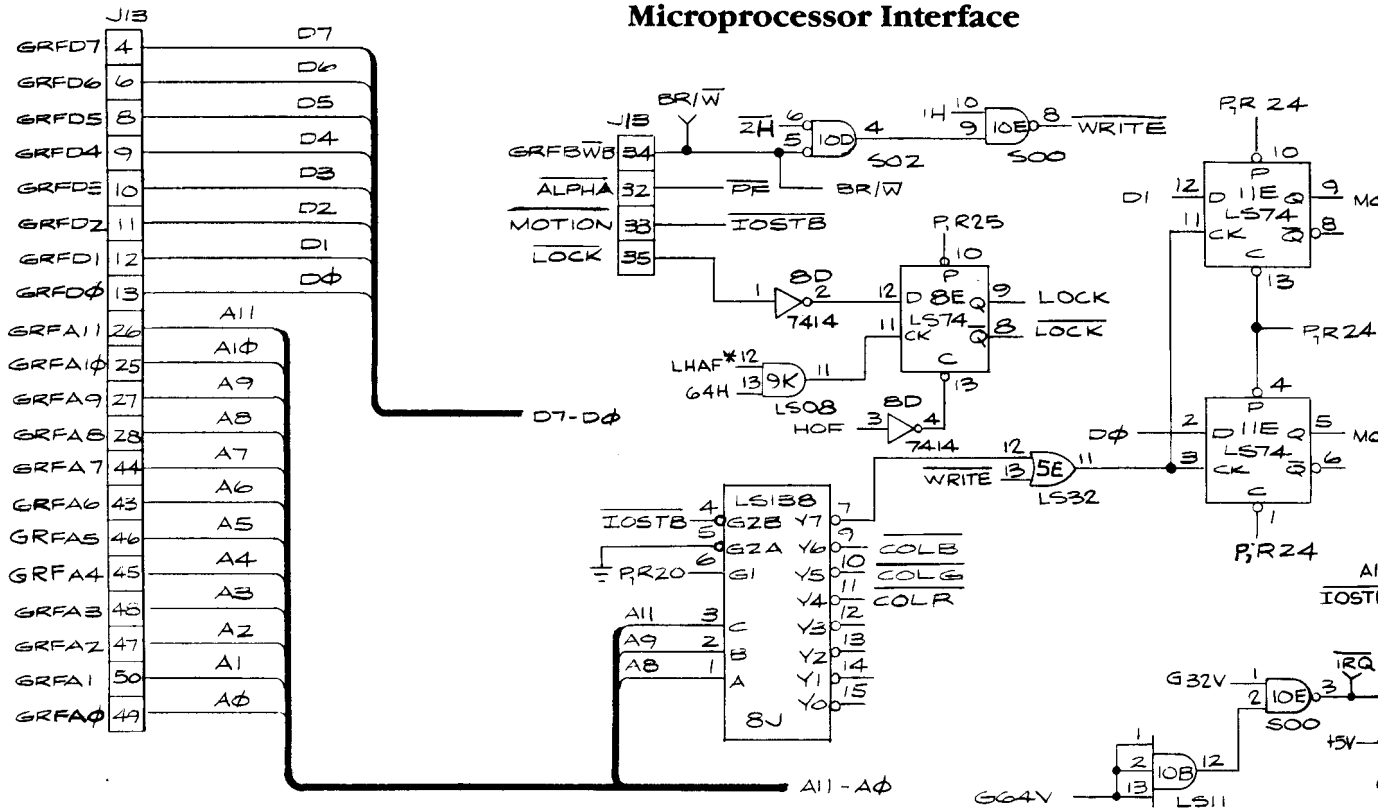
FIREFOX Main PCB



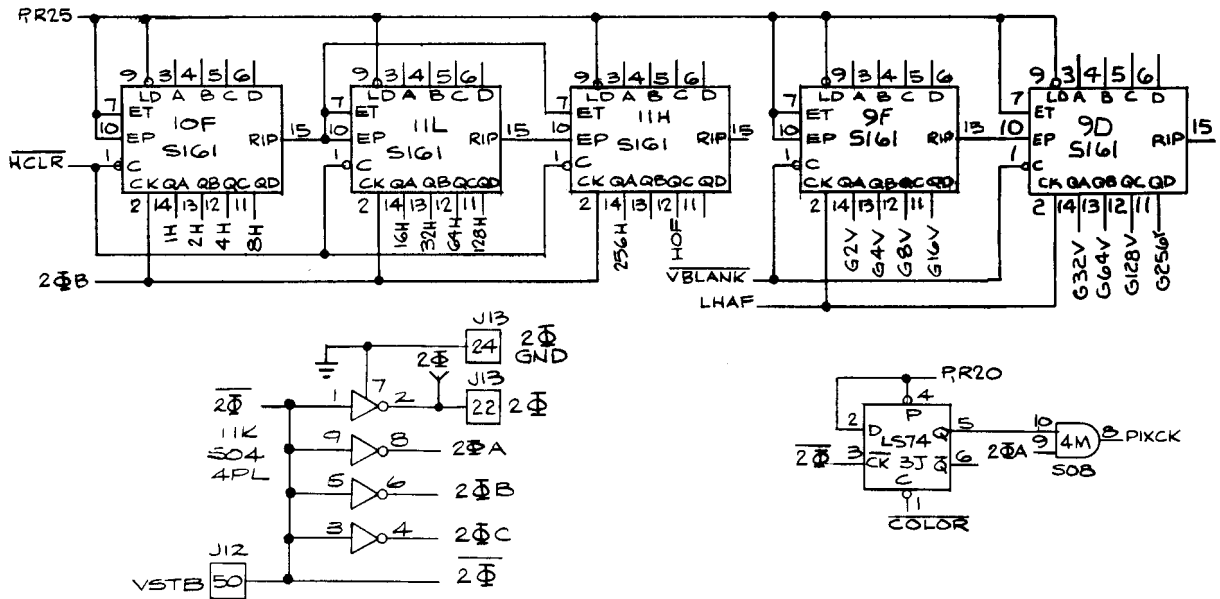
Power Input



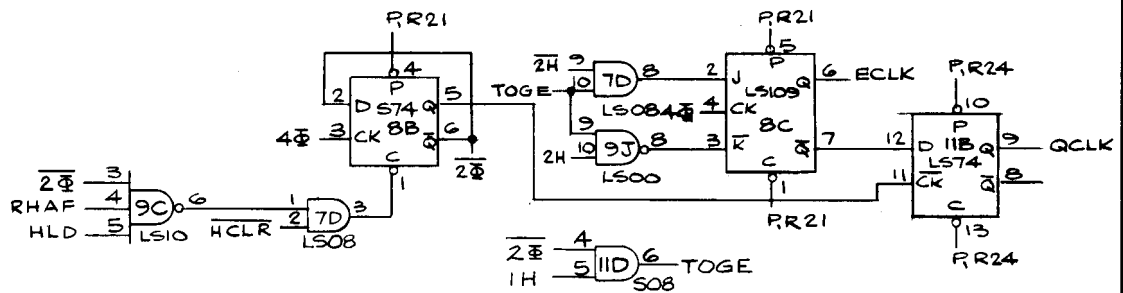
Microprocessor Interface



Graphics Sync Chain



Microprocessor Clock



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FIREFOX Graphics PCB

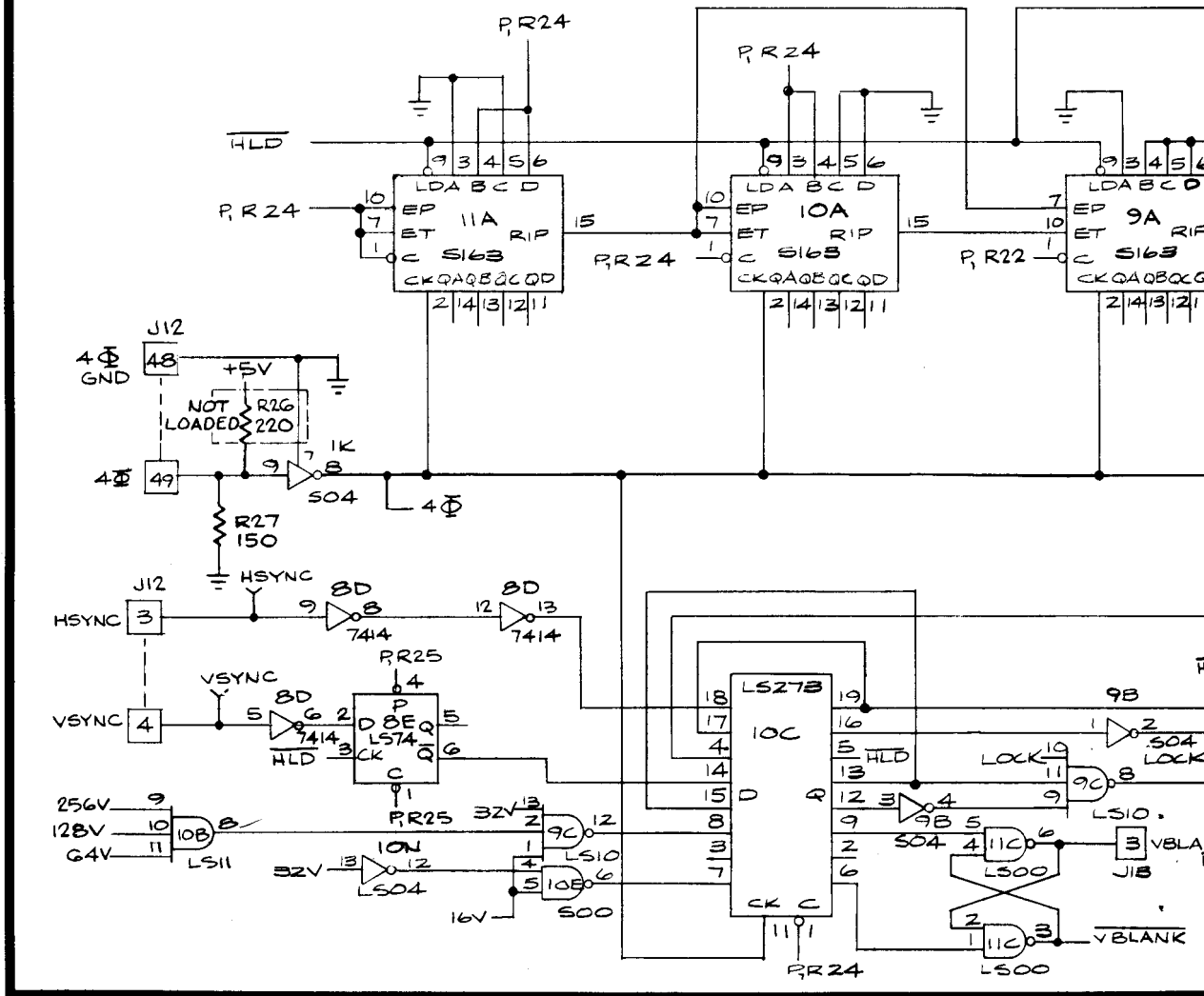


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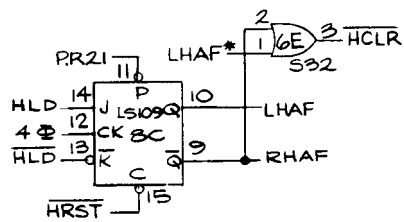
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2nd printing

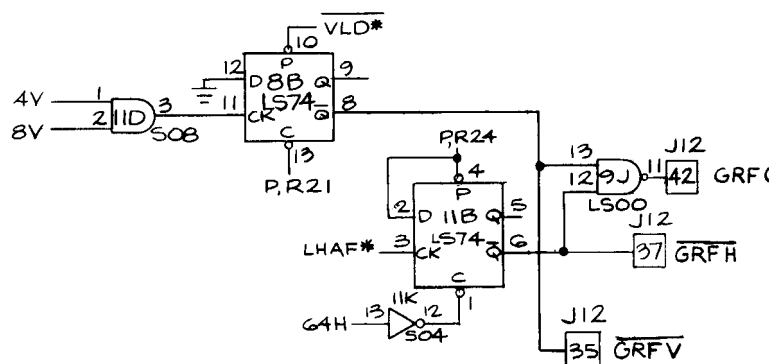
Full Interlace Sync Generator



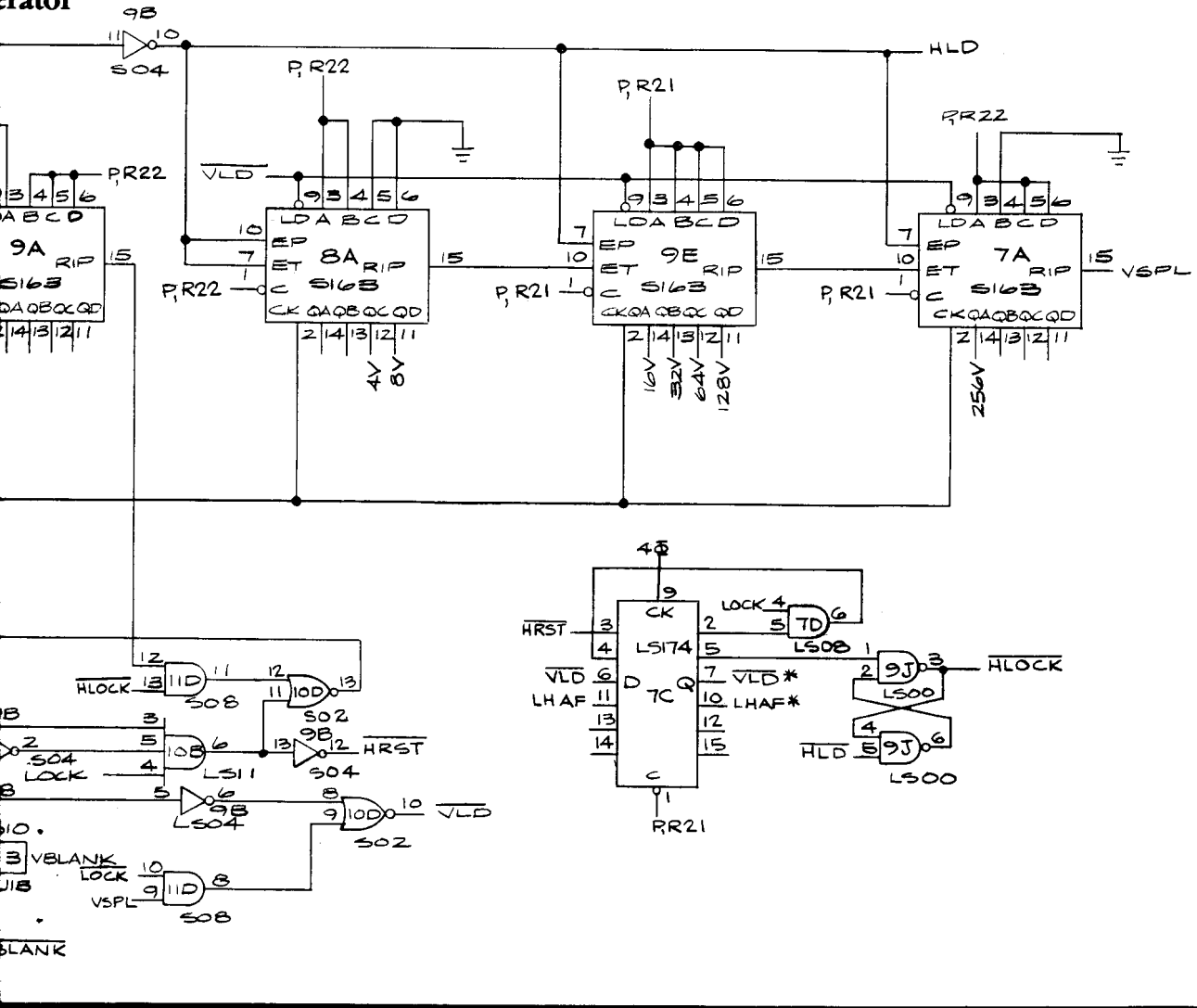
Half-Line Scan



Monitor Sync



erator

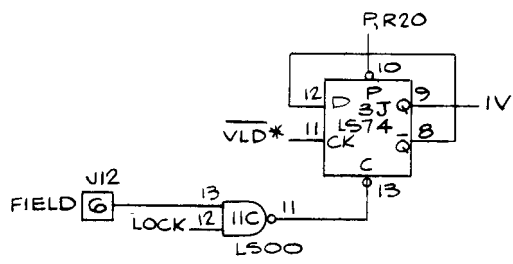


ync

GRFC

RFH

Odd/Even Scan

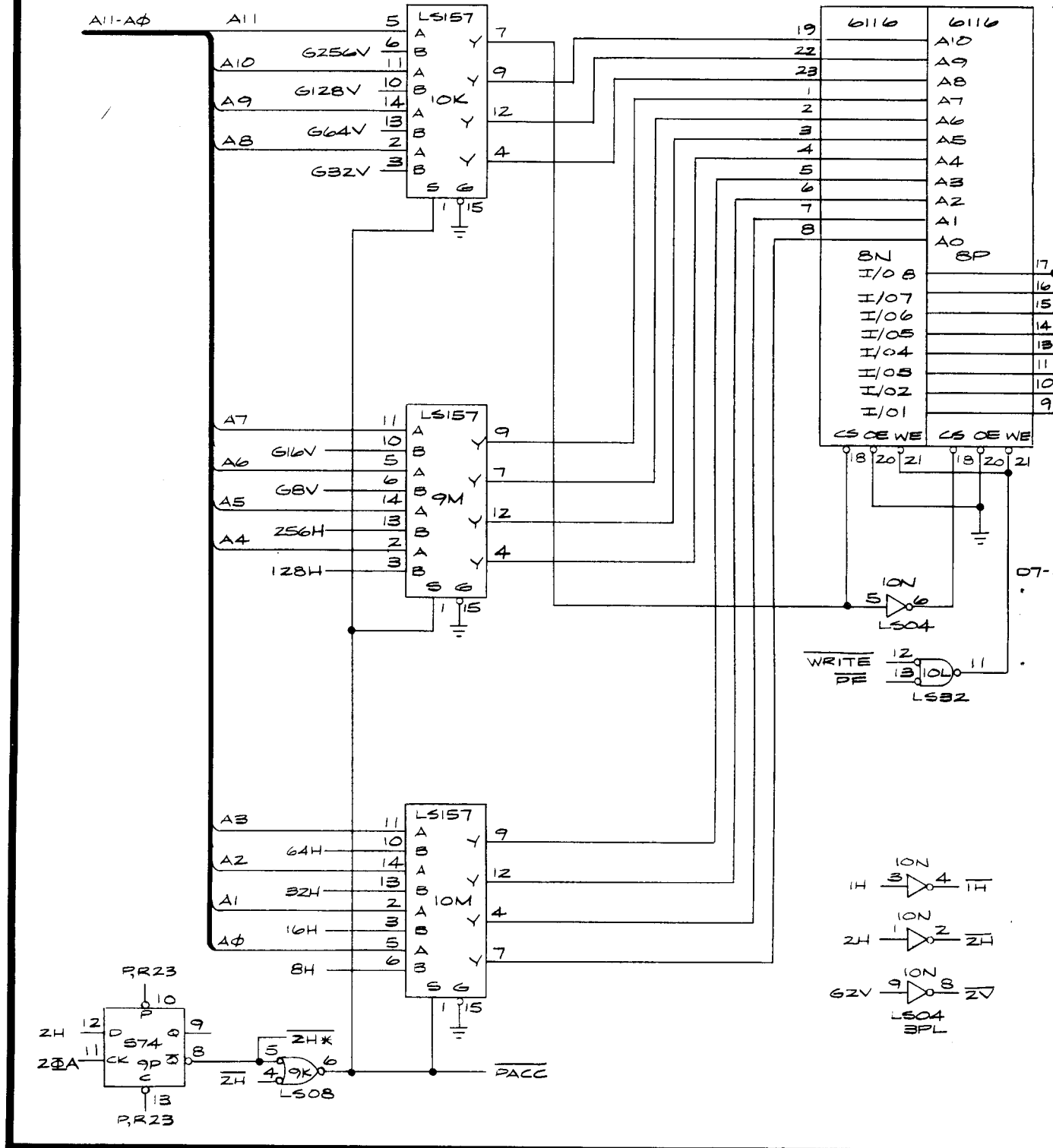


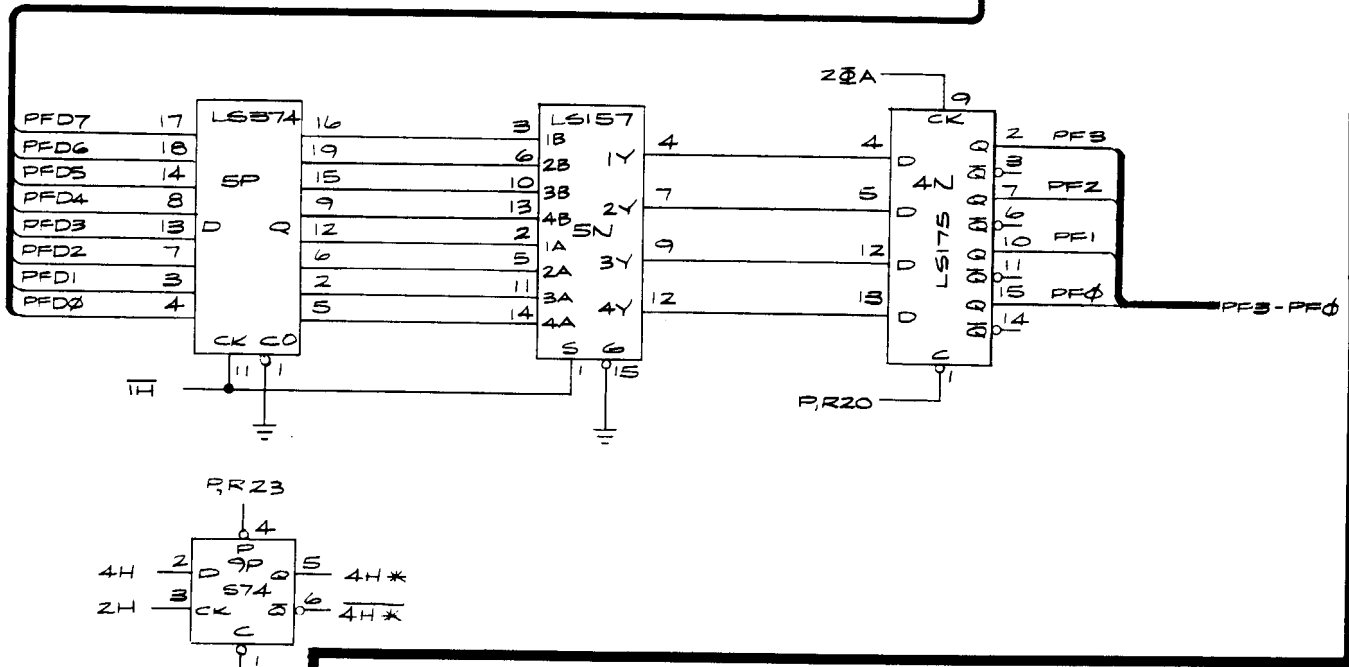
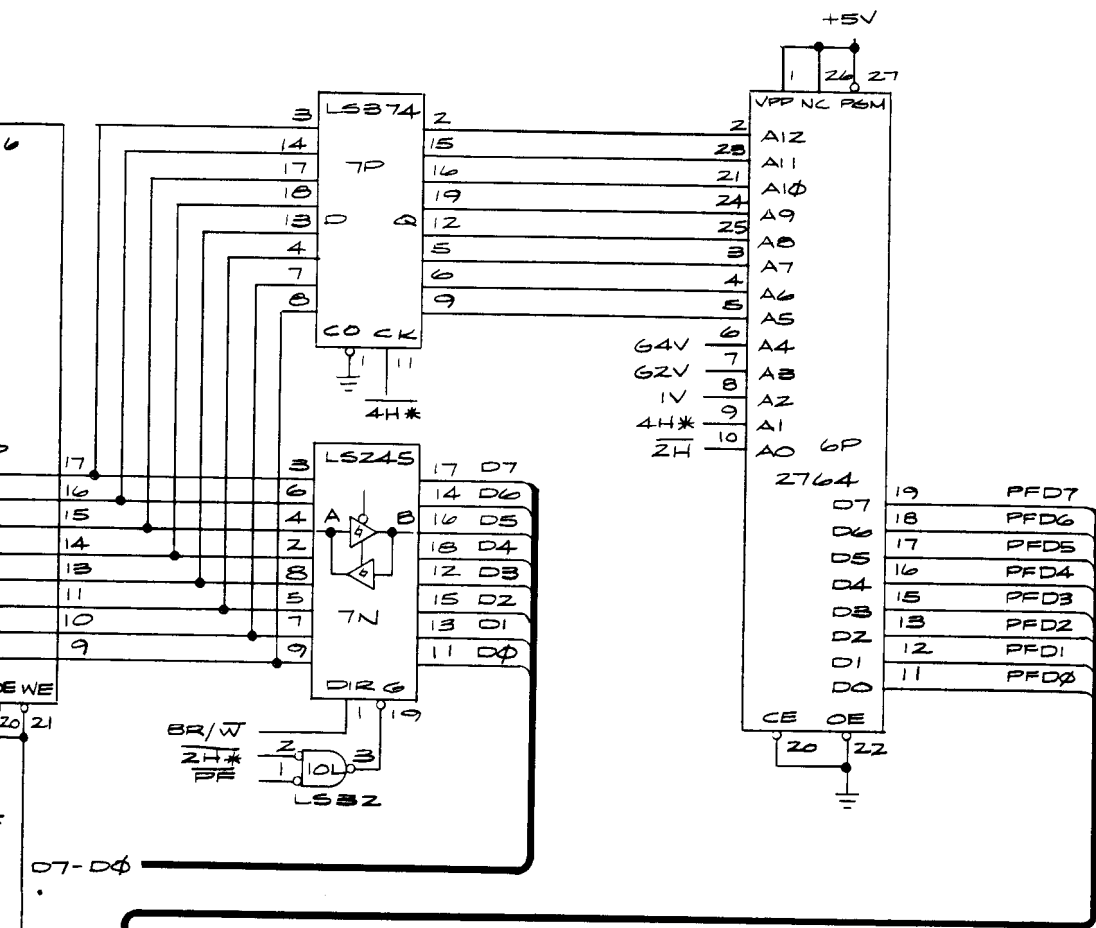
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FIREFOX Graphics PCB



Graphics/Alphanumeric Generator





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FIREFOX Graphics PCB

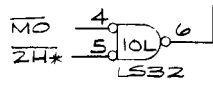
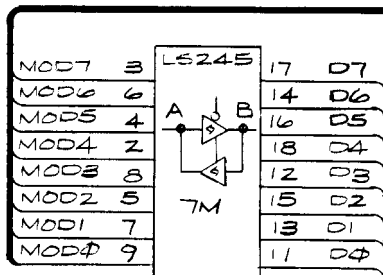
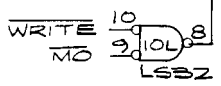
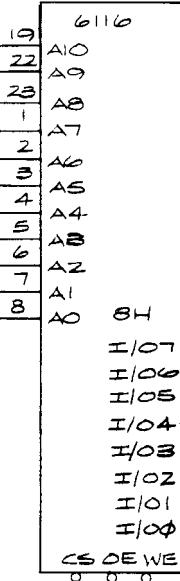
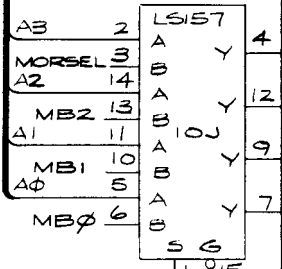
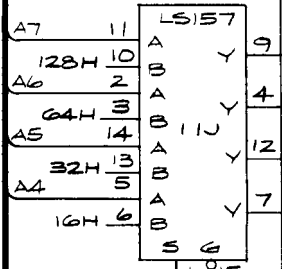
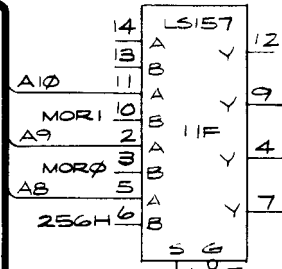


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SP-253 Sheet 10A
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Motion Object RAM

A10-A0



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

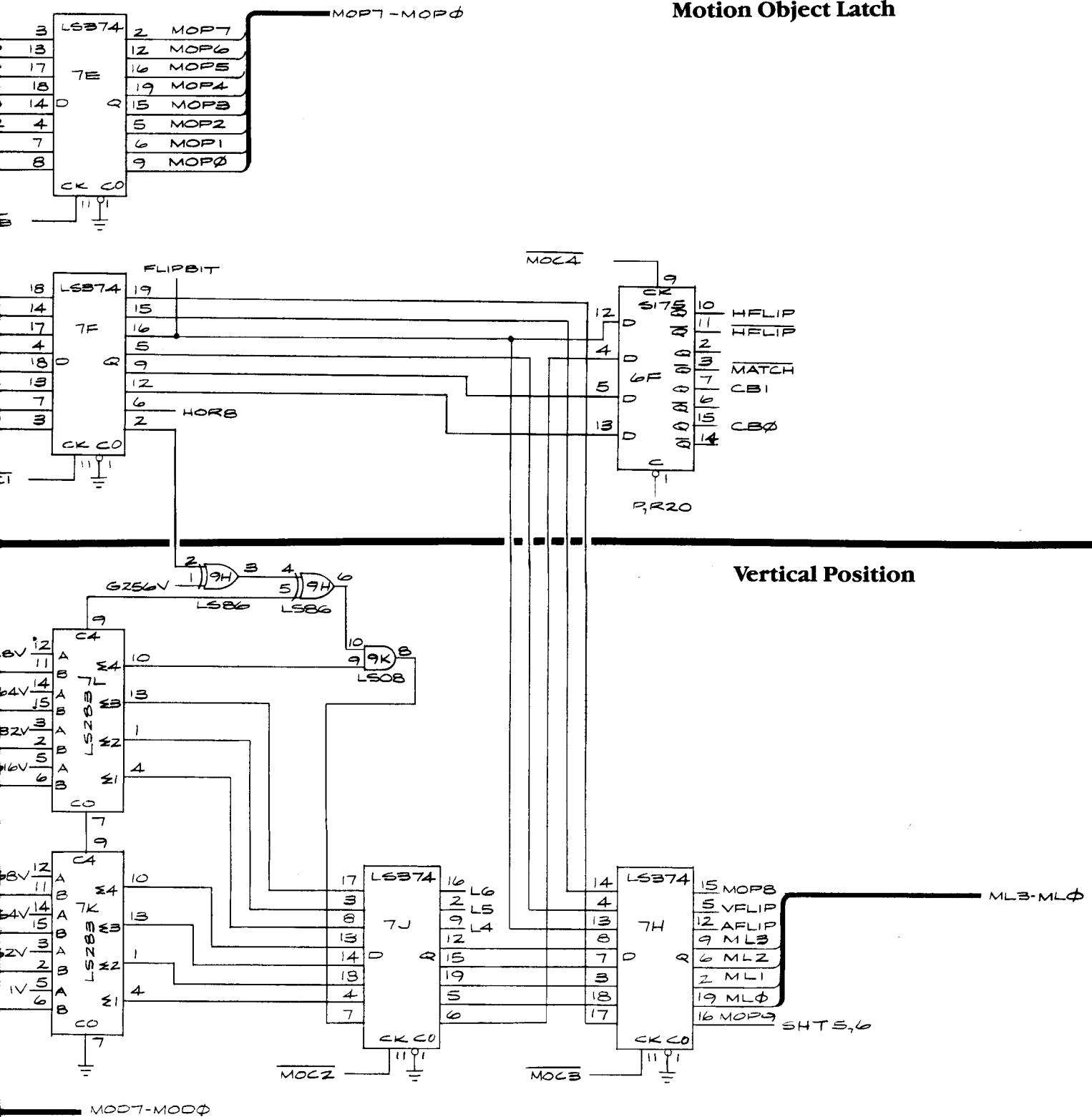
MOD7	18
MOD6	14
MOD5	17
MOD4	4
MOD3	18
MOD2	18
MOD1	7
MOD0	3

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



Vertical Position

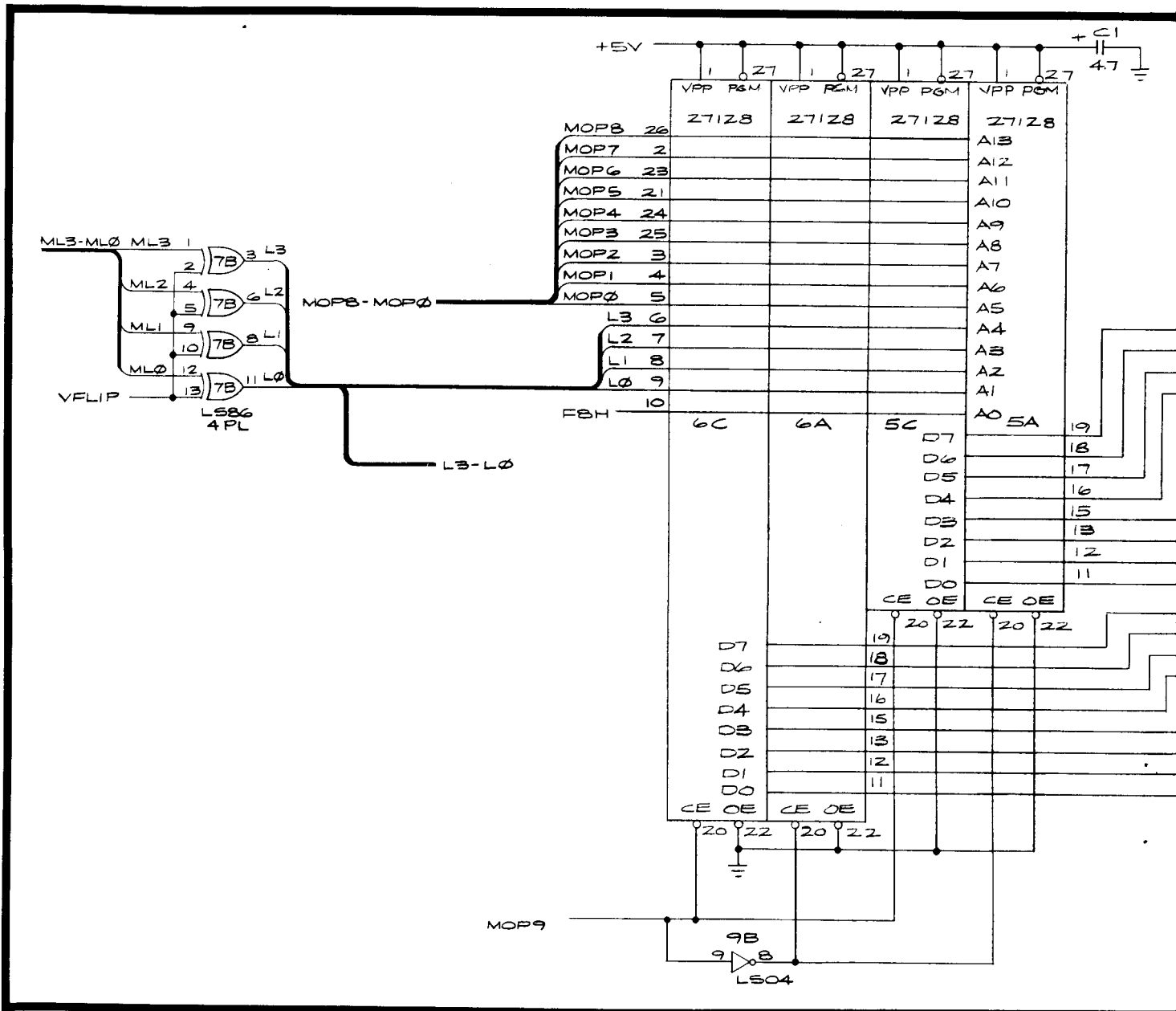
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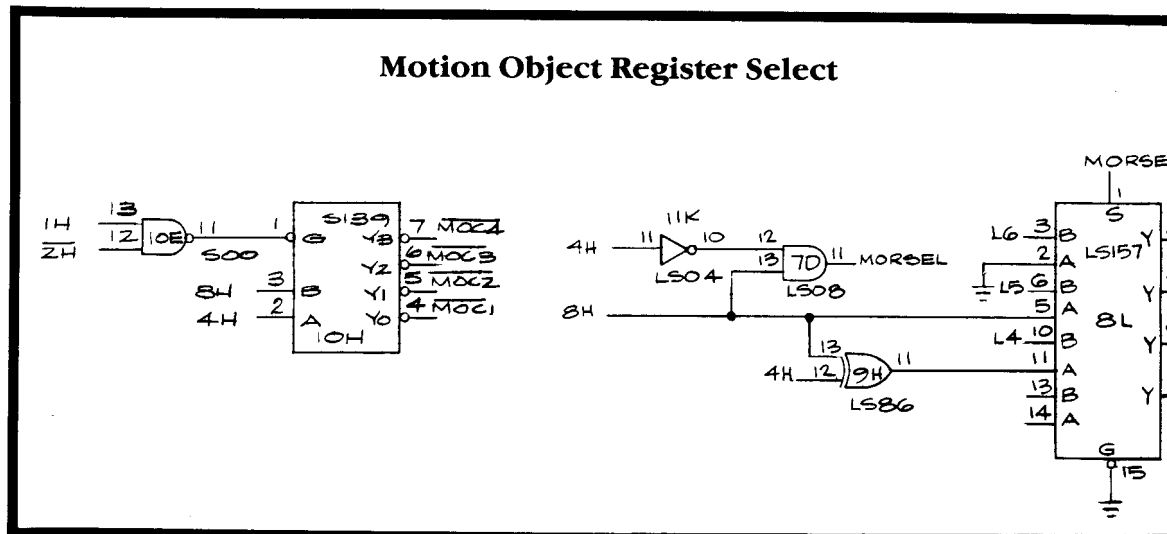
FIREFOX Graphics PCB



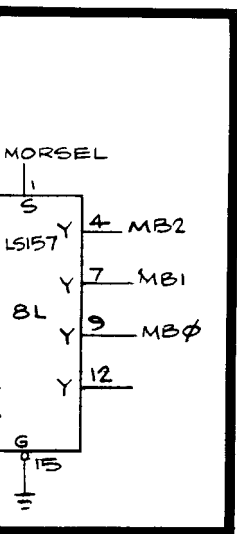
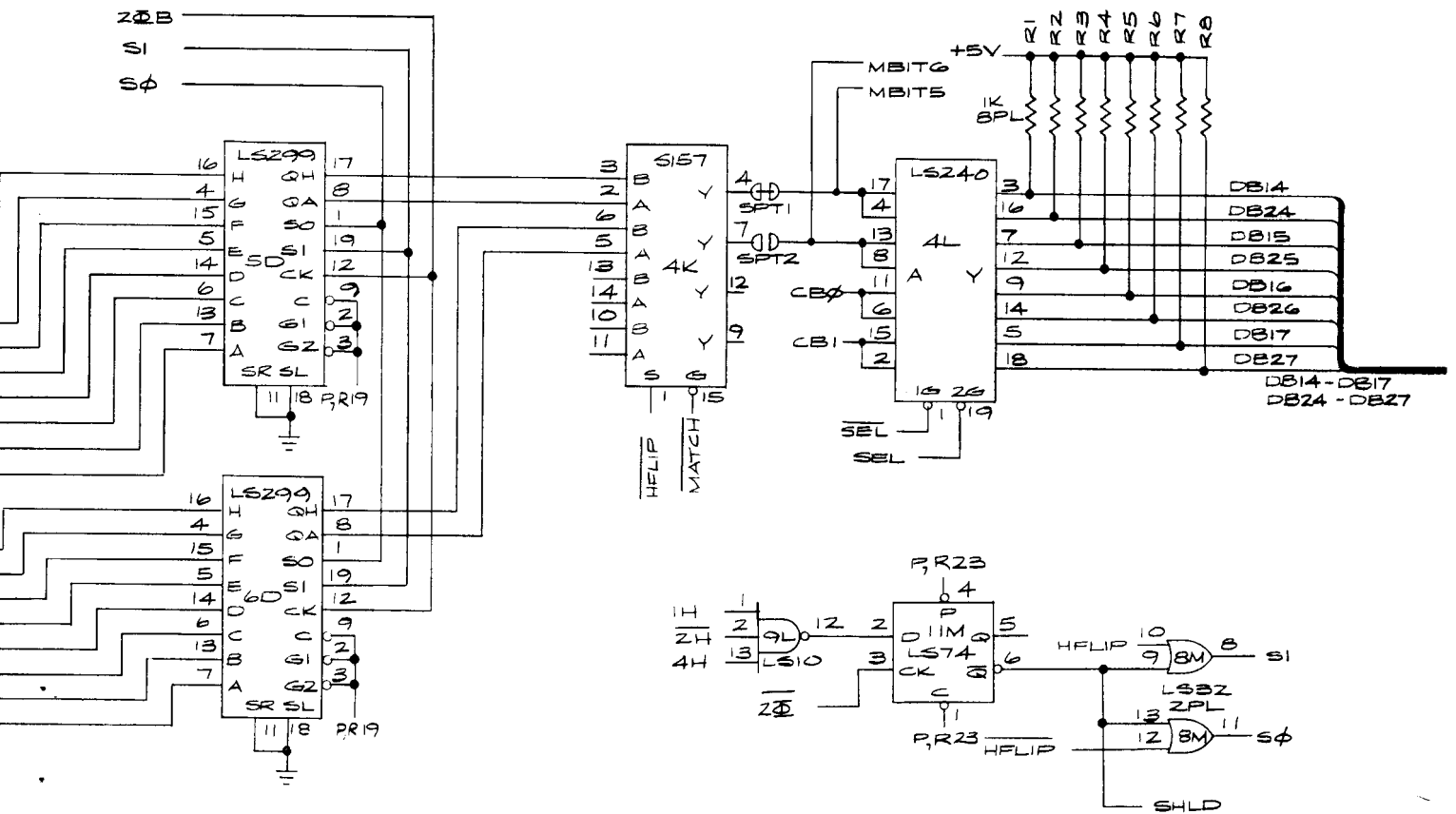
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Motion Object Register Select



Motion Picture ROM



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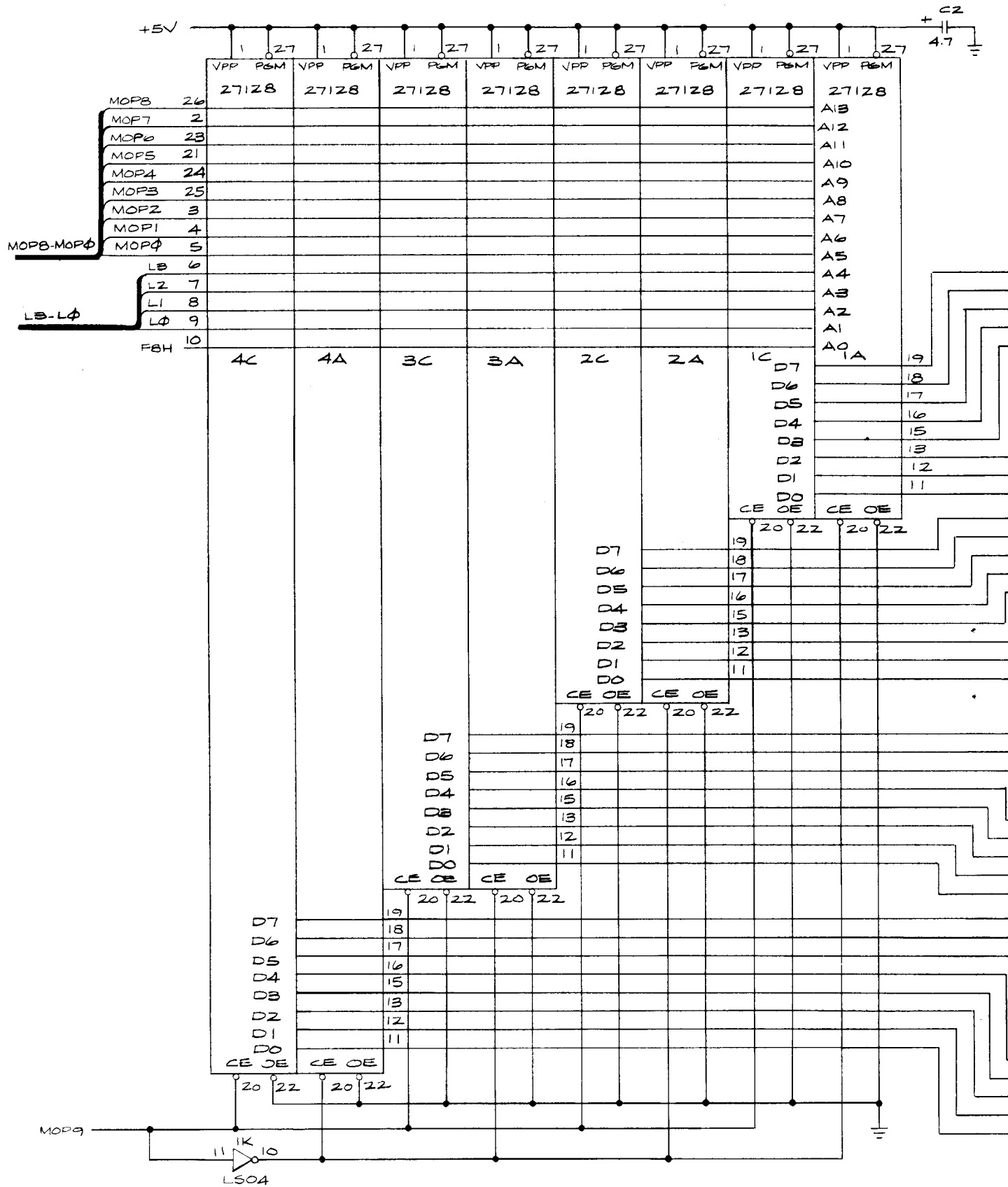
FIREFOX Graphics PCB



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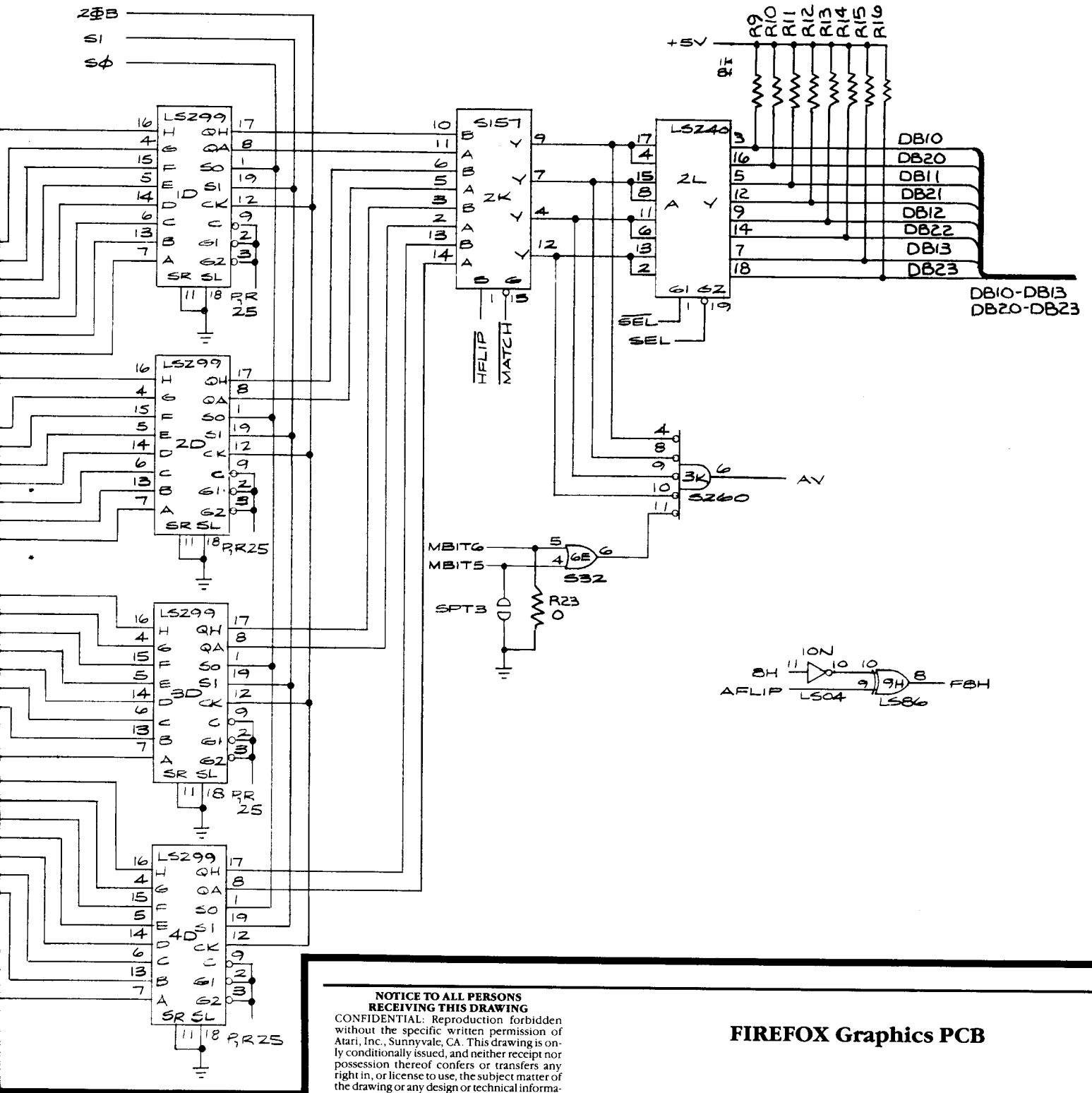
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SP-253 Sheet 11A
2nd printing



Motion Picture ROM-Continued

C2
1.7



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FIREFOX Graphics PCB

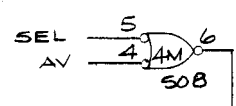
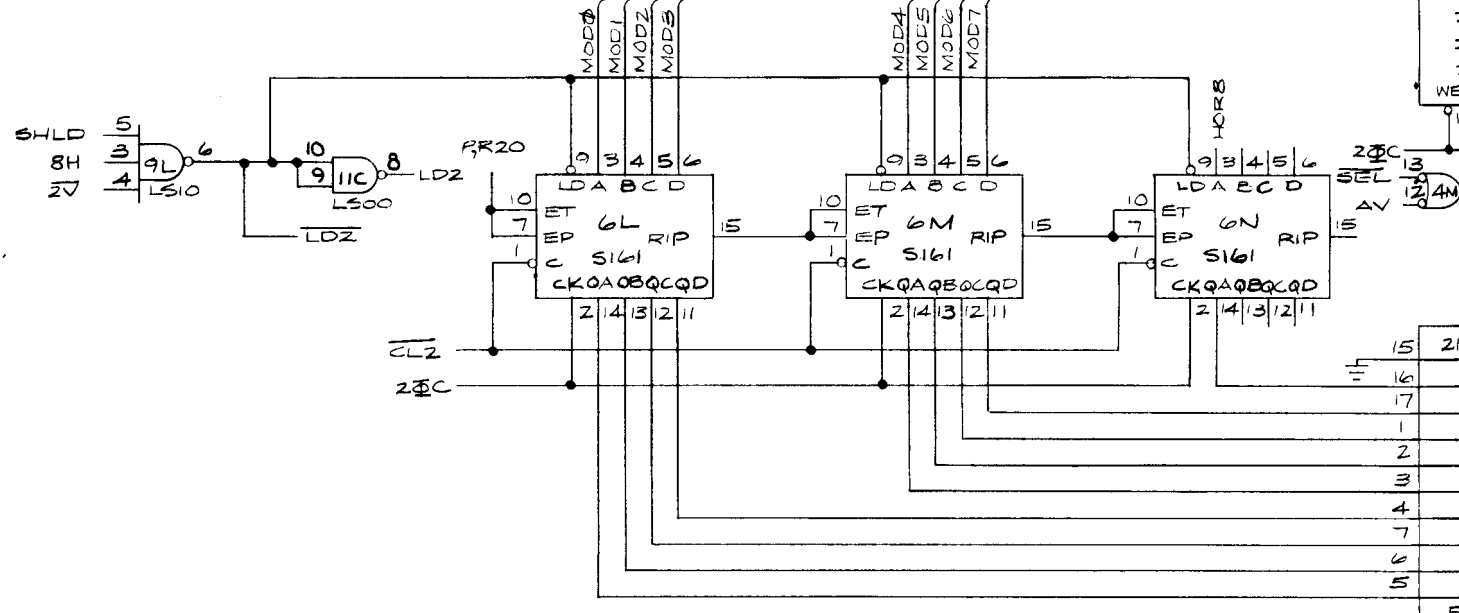
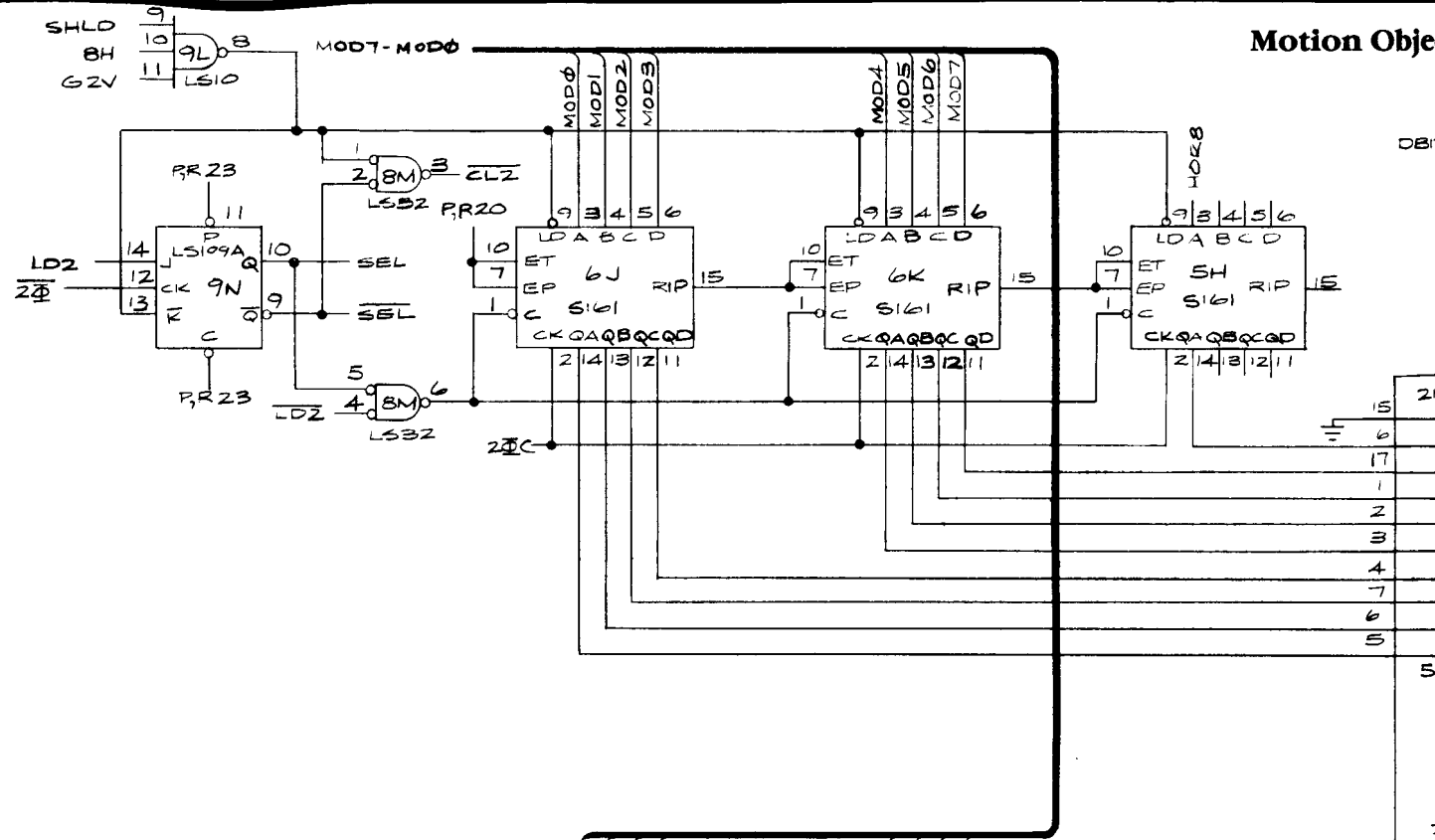


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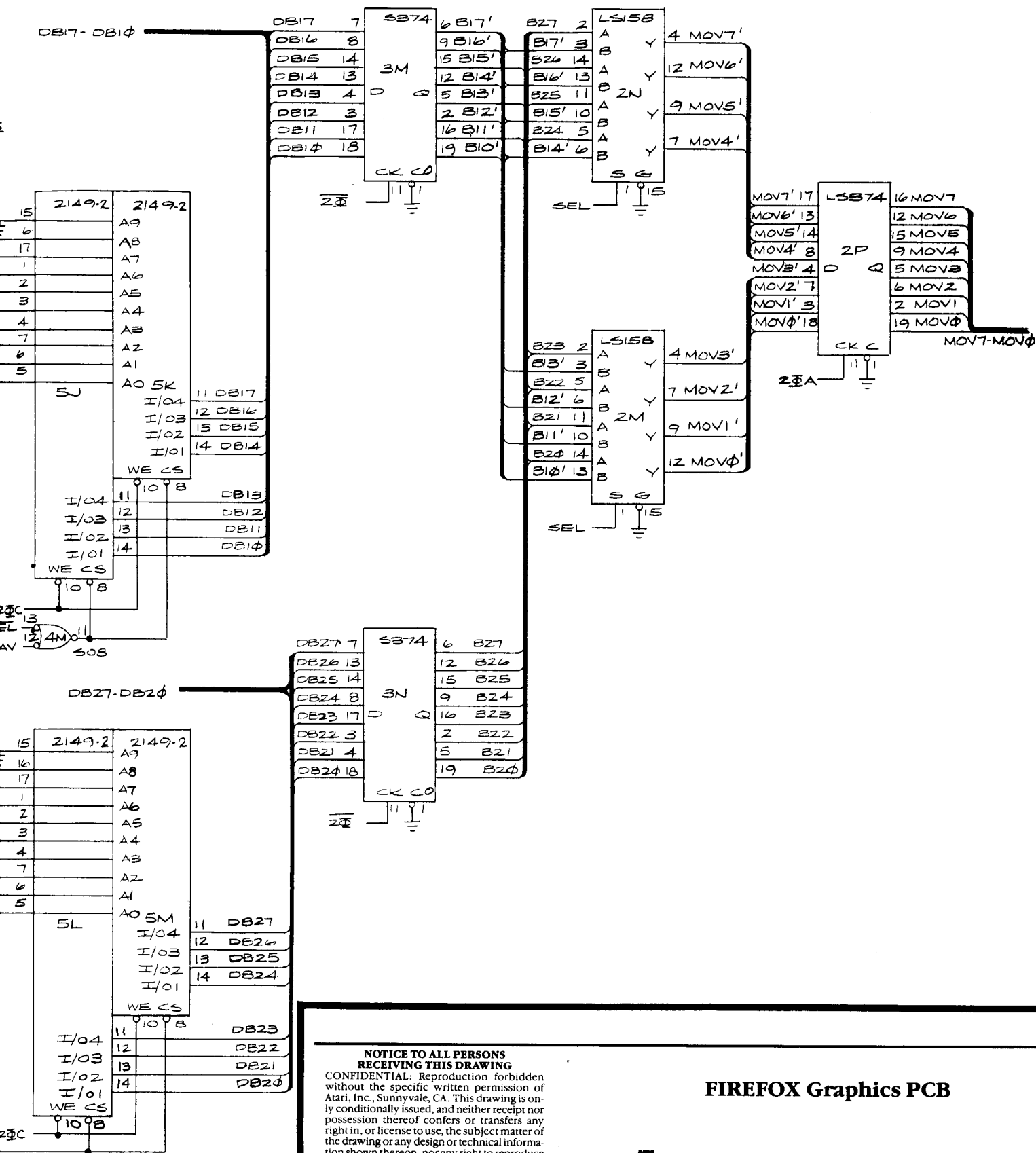
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Motion Object



Object Line Buffers



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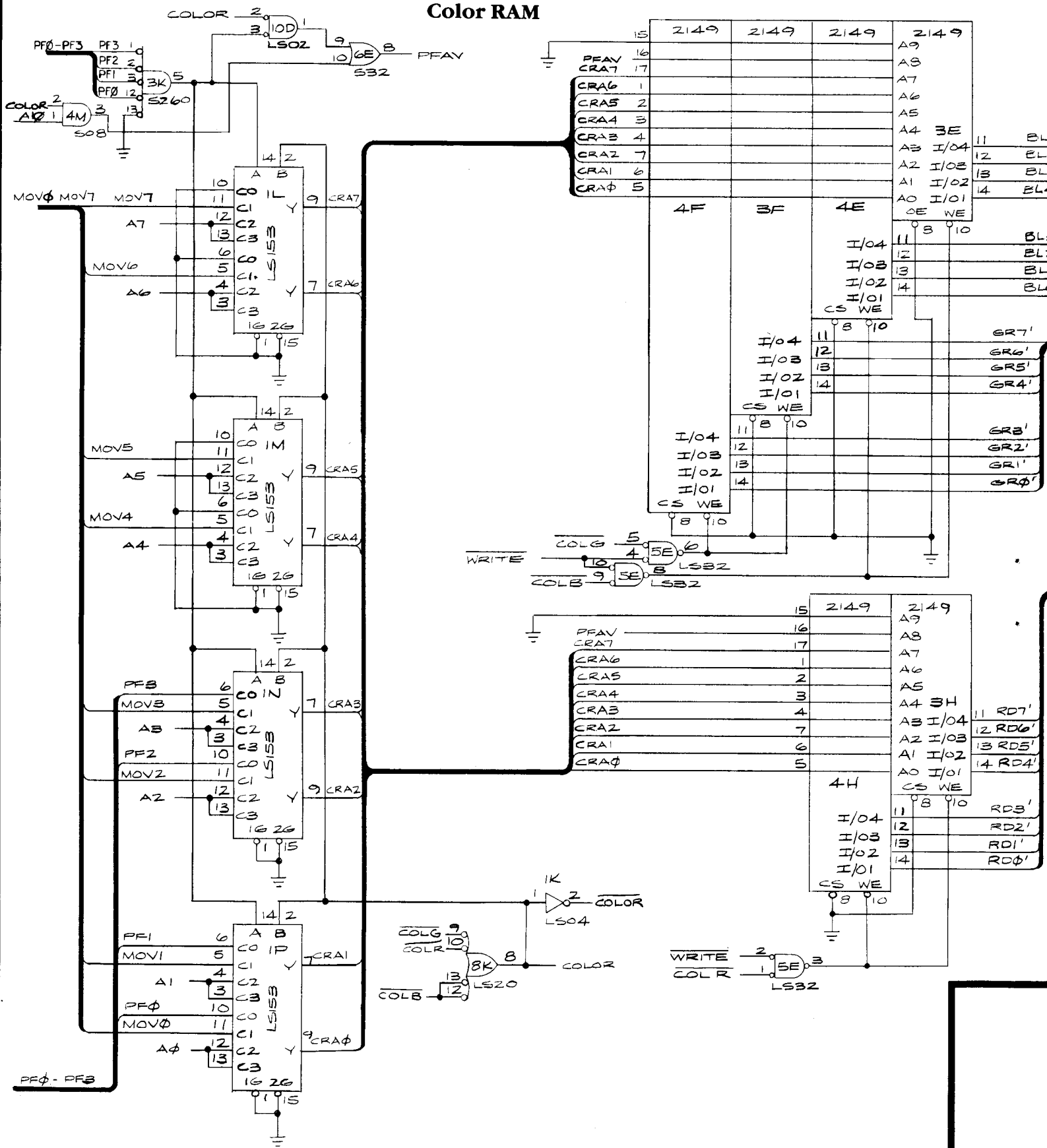
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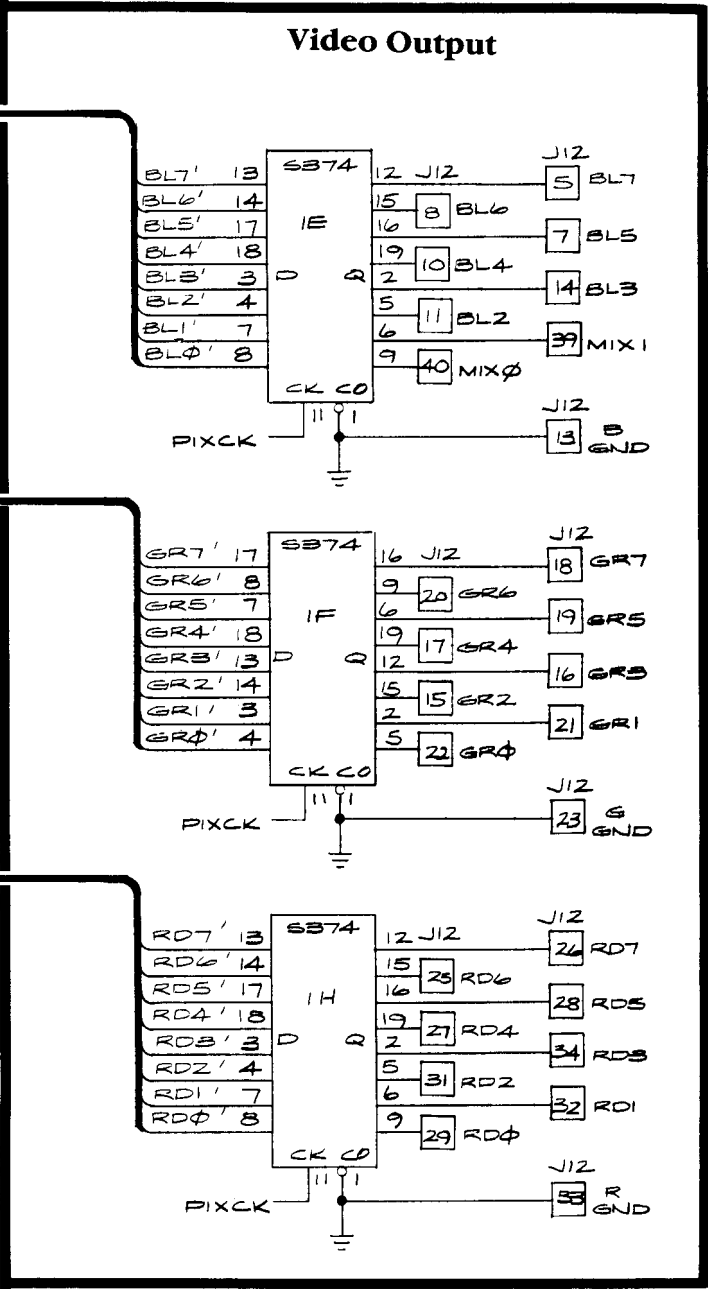
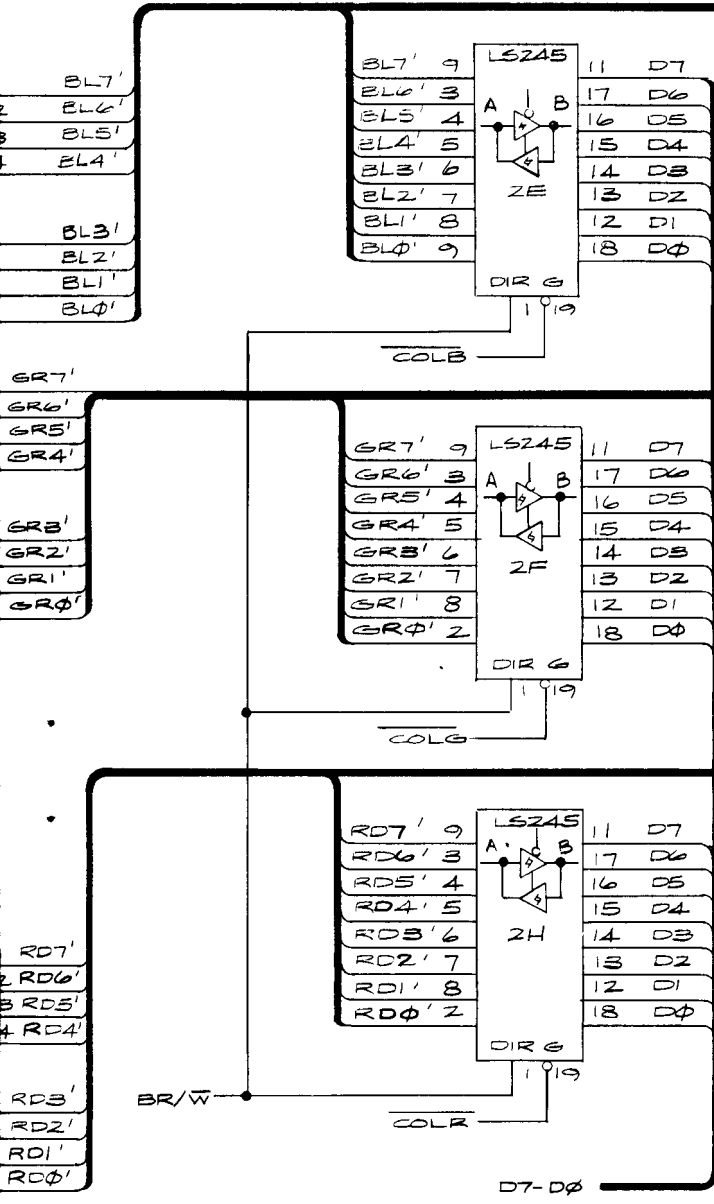
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Color RAM

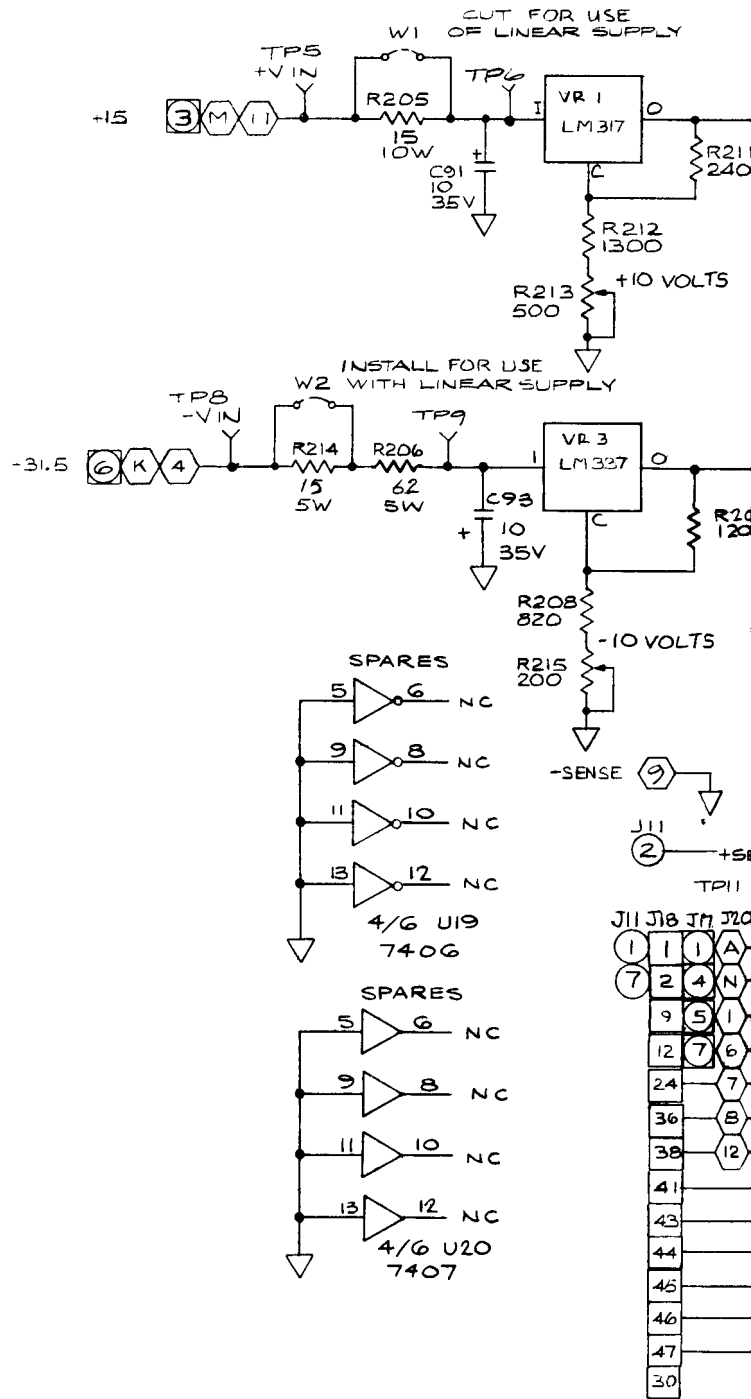




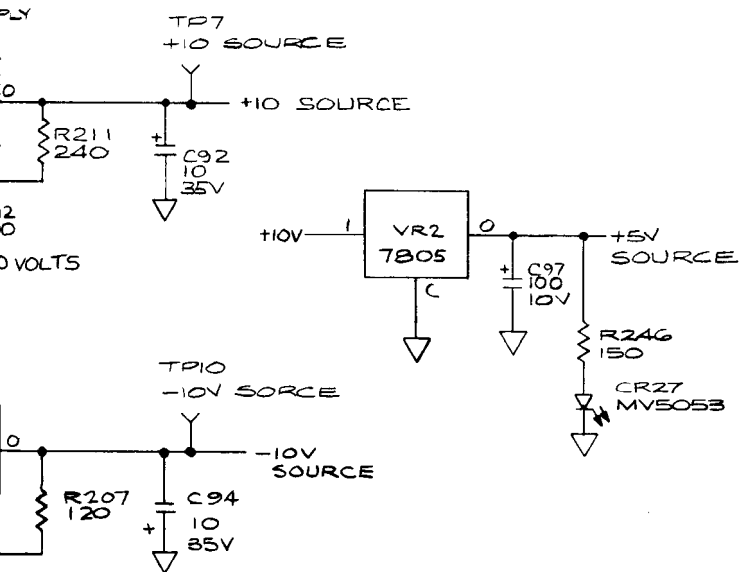
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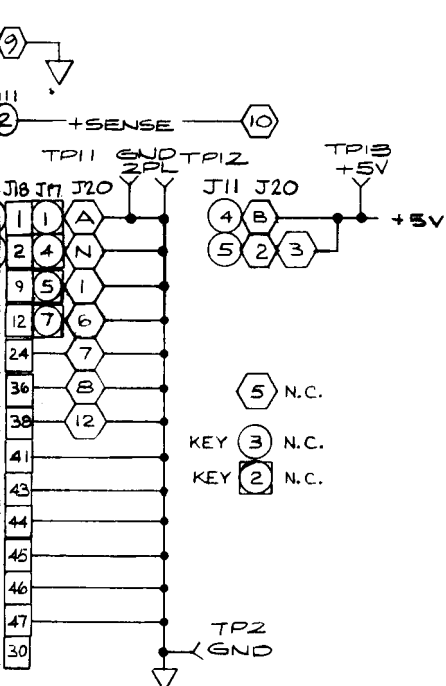




Input Post Regulators



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

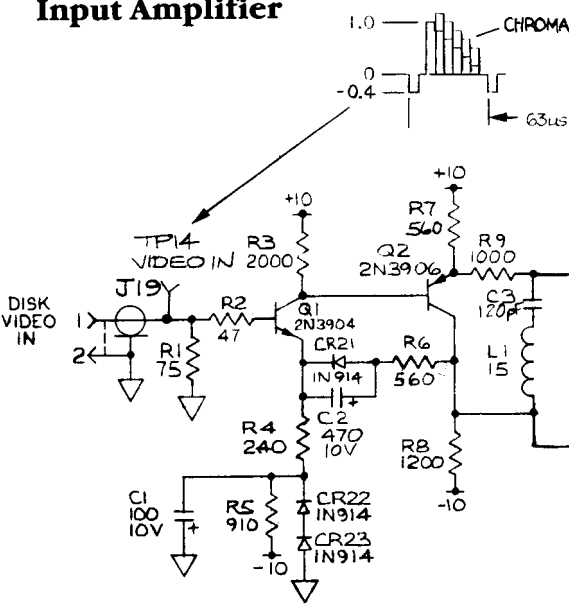


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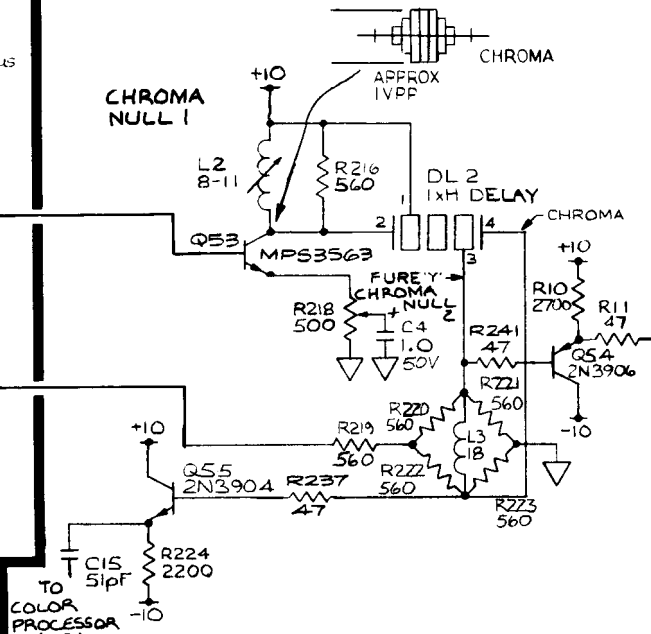
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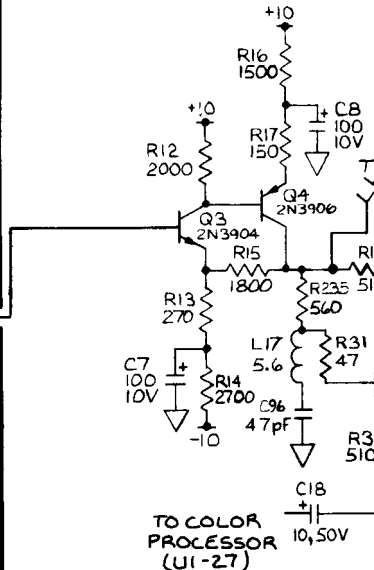
Input Amplifier



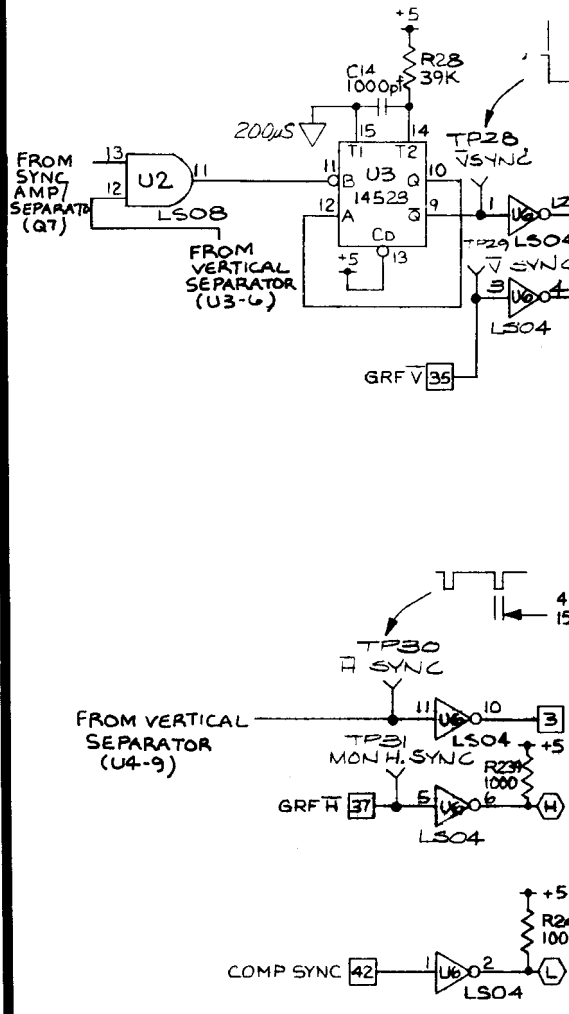
Comb Filter

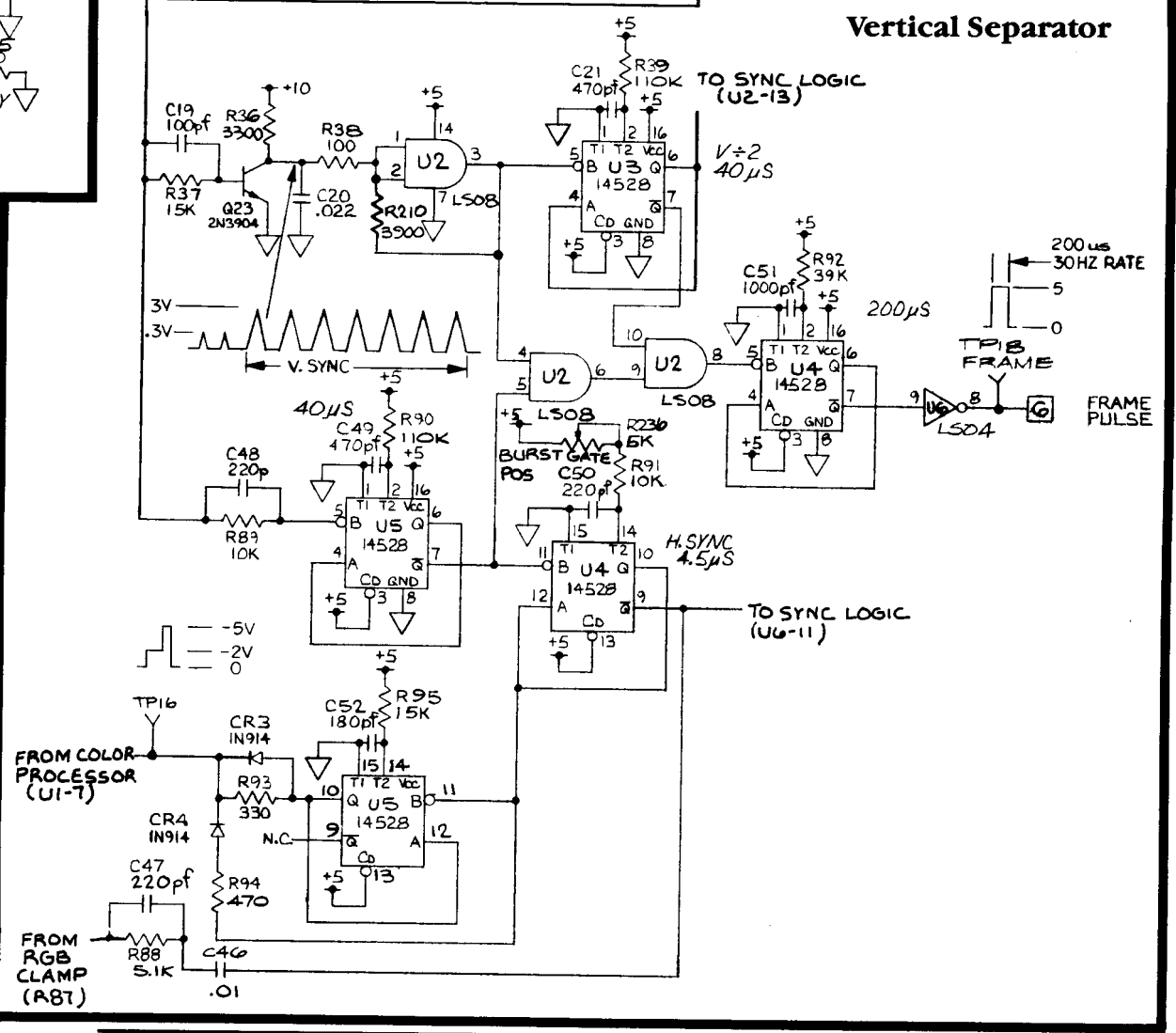
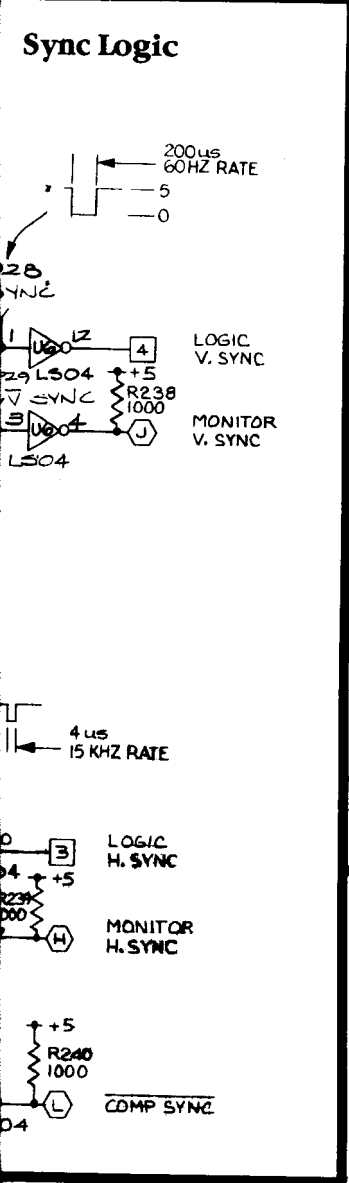
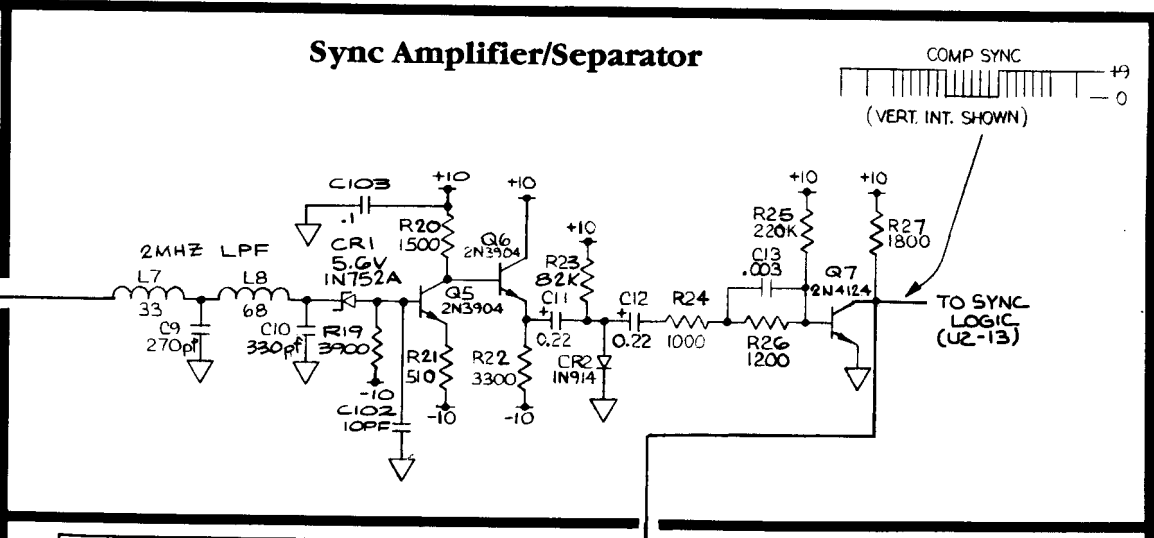
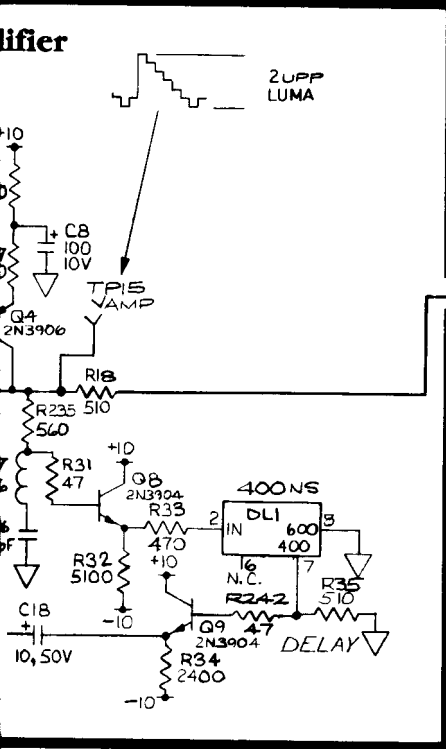


Y Amplifier



Sync I





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FIREFOX NTSC Demodulator PCB

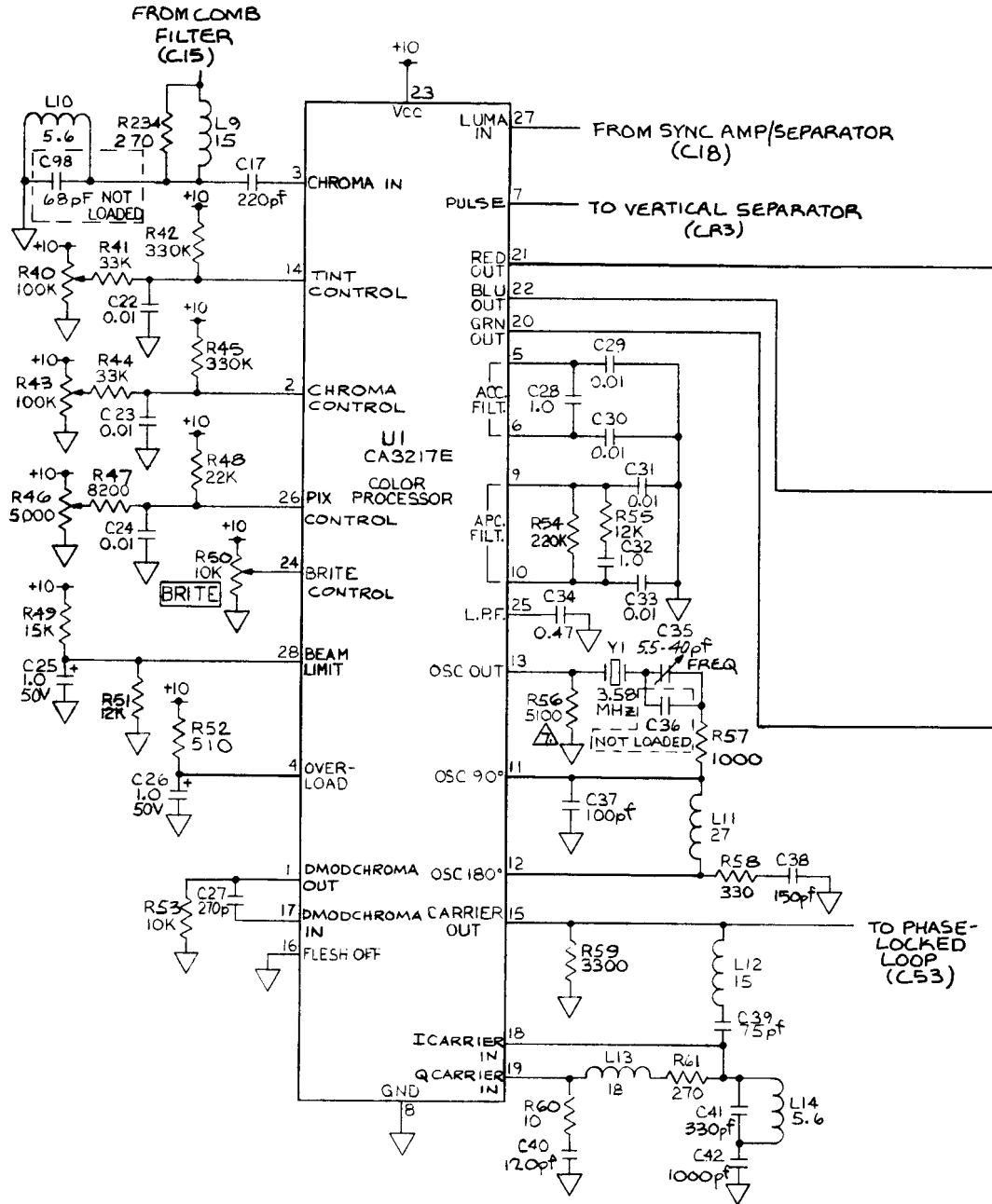


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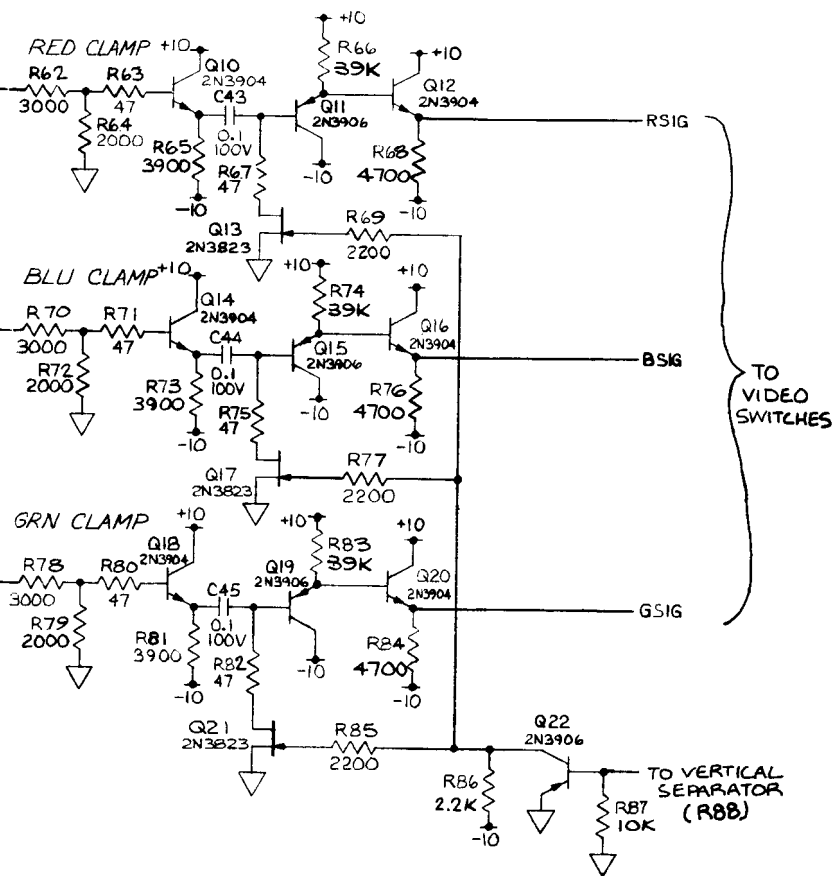
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Color Processor



RGB Clamp



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FIREFOX NTSC Demodulator PCB

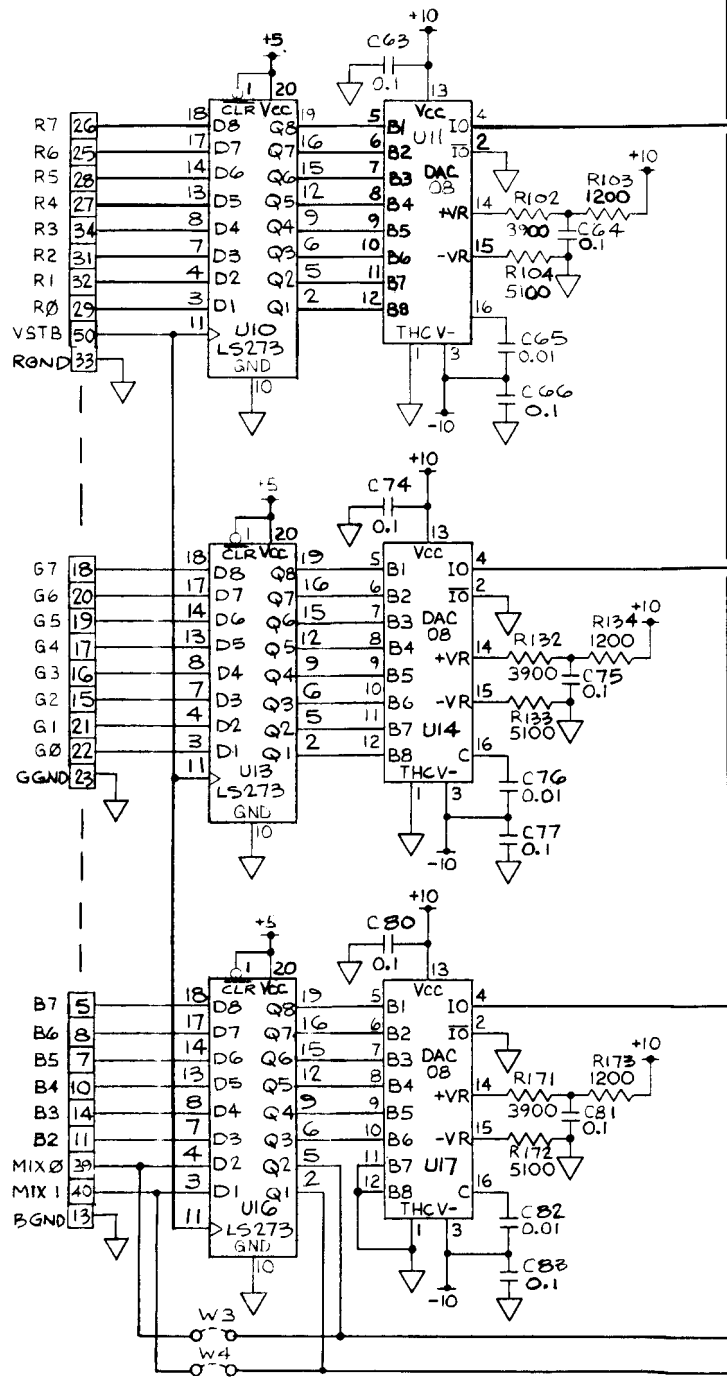


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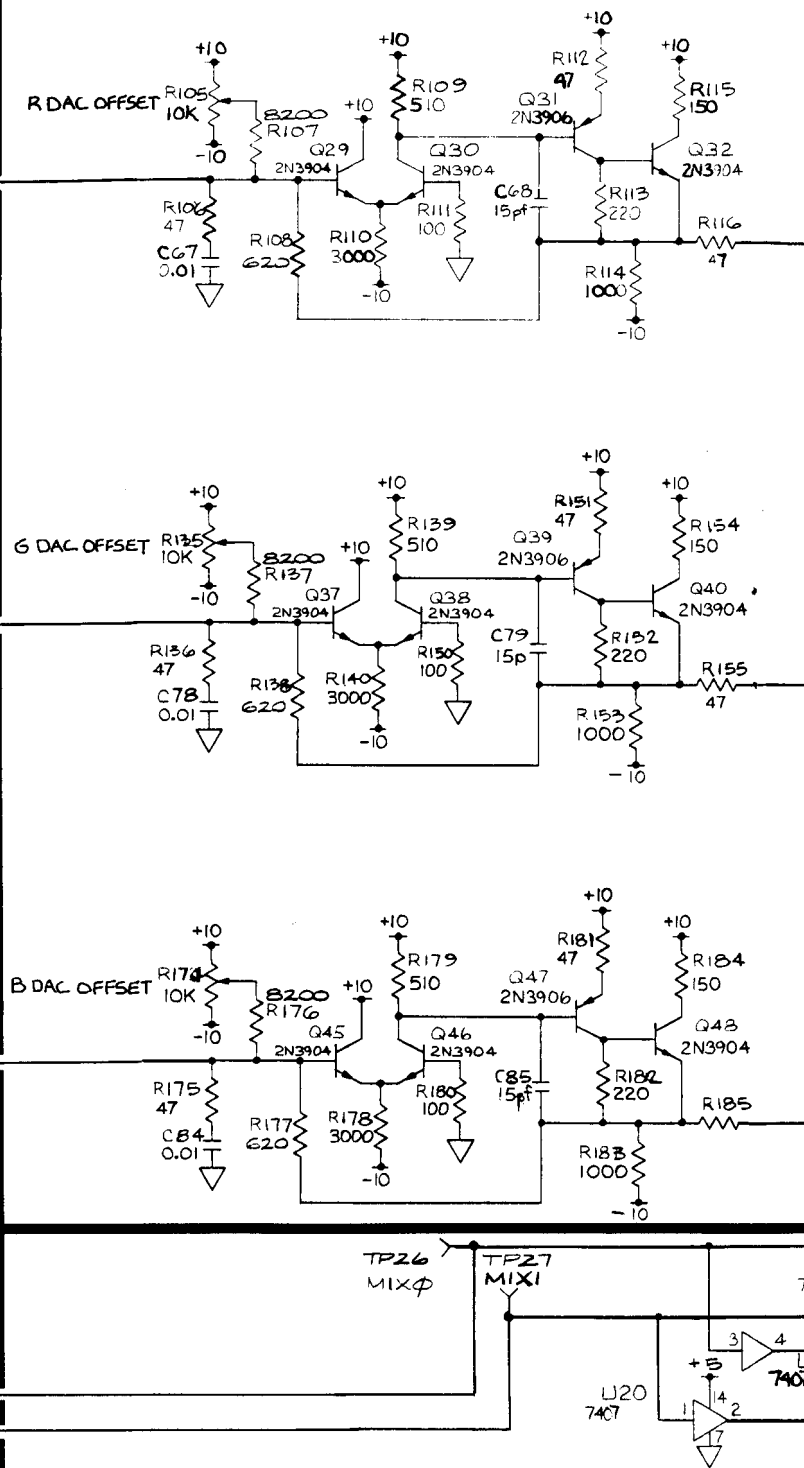
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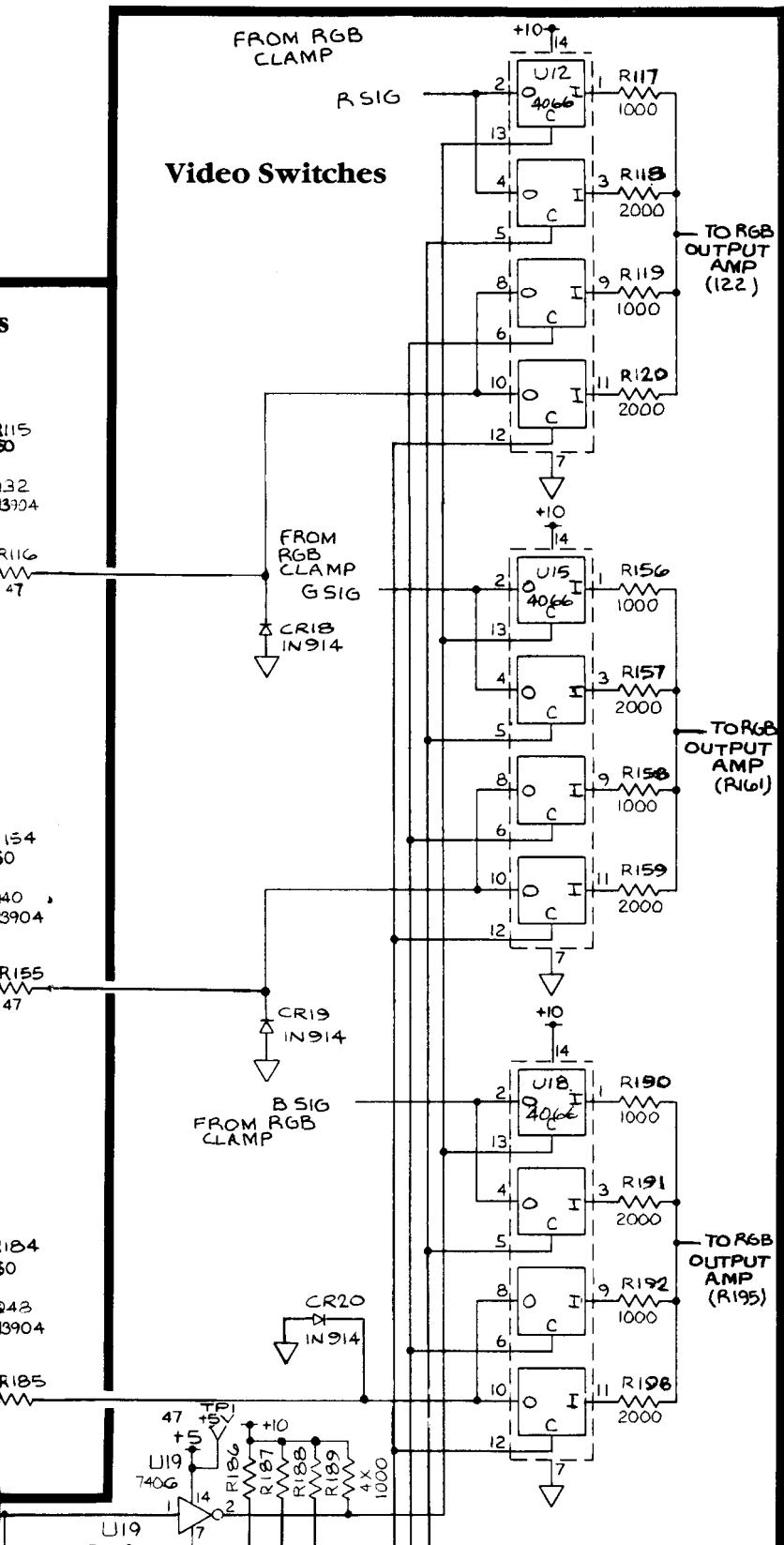
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Graphics RGB Digital-to-Analog Converters



Digital-to-Analog Converter Amplifiers





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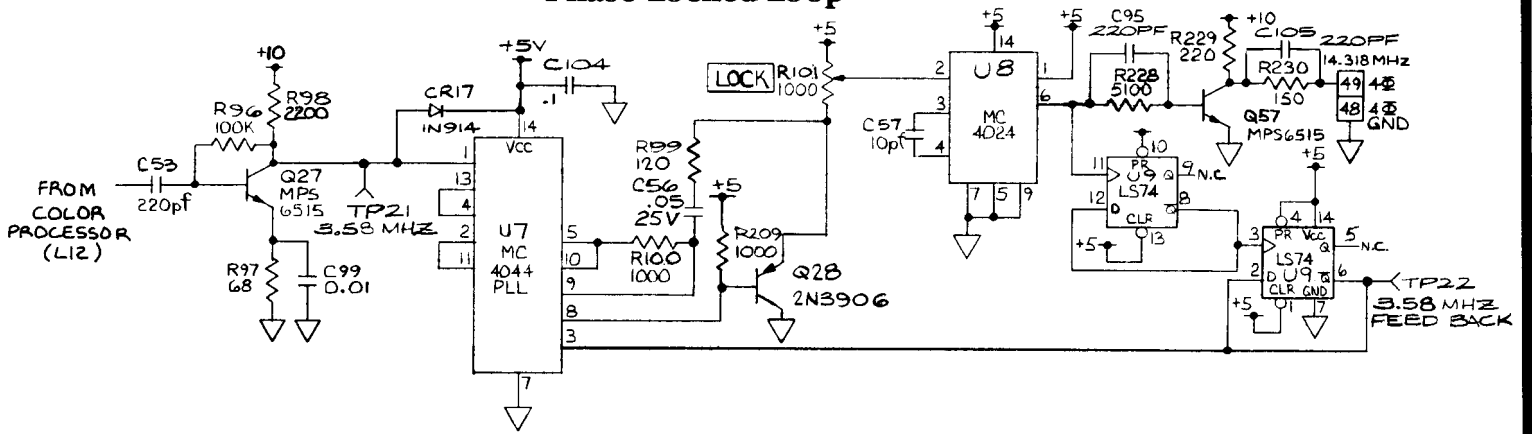
FIREFOX NTSC Demodulator PCB



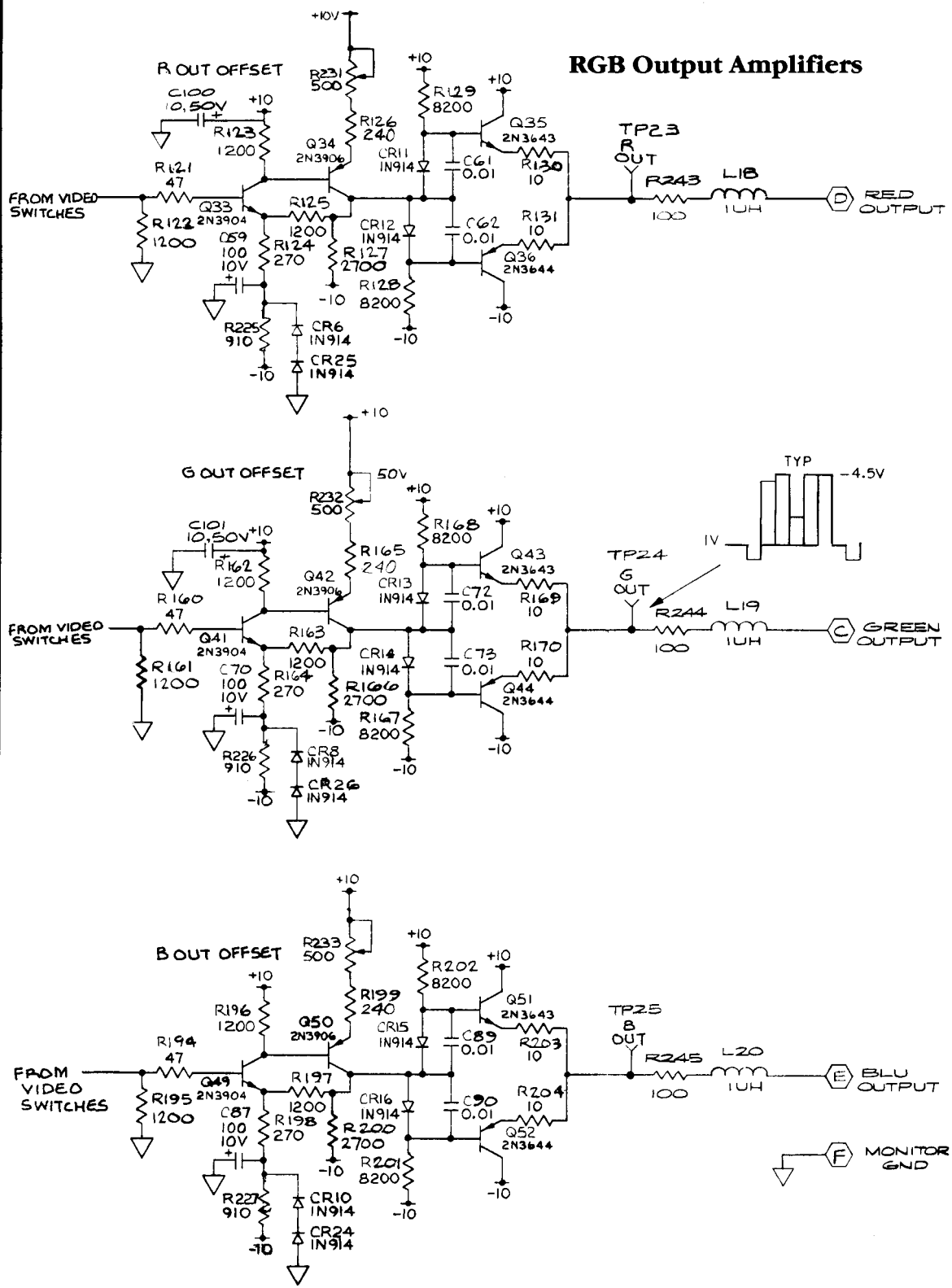
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Phase-Locked Loop



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.

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.

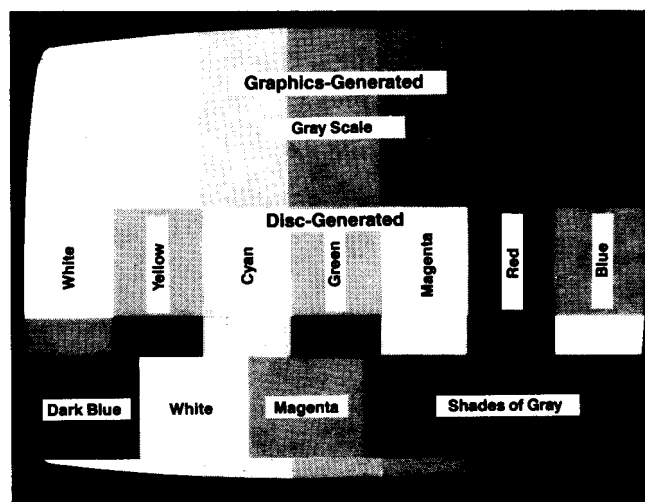


Figure 1
Combined Graphics-Generated Gray Scale and Disc-Generated Color Bar Display

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.

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.

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.

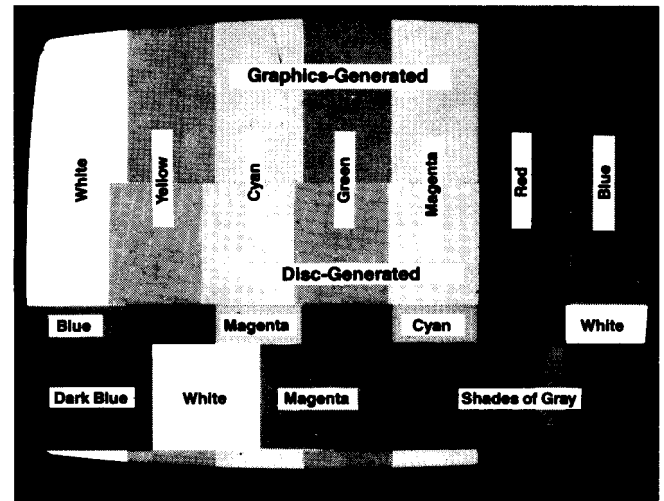


Figure 2
Combined Graphics-Generated Color Bar
and Disc-Generated Color Bar Display

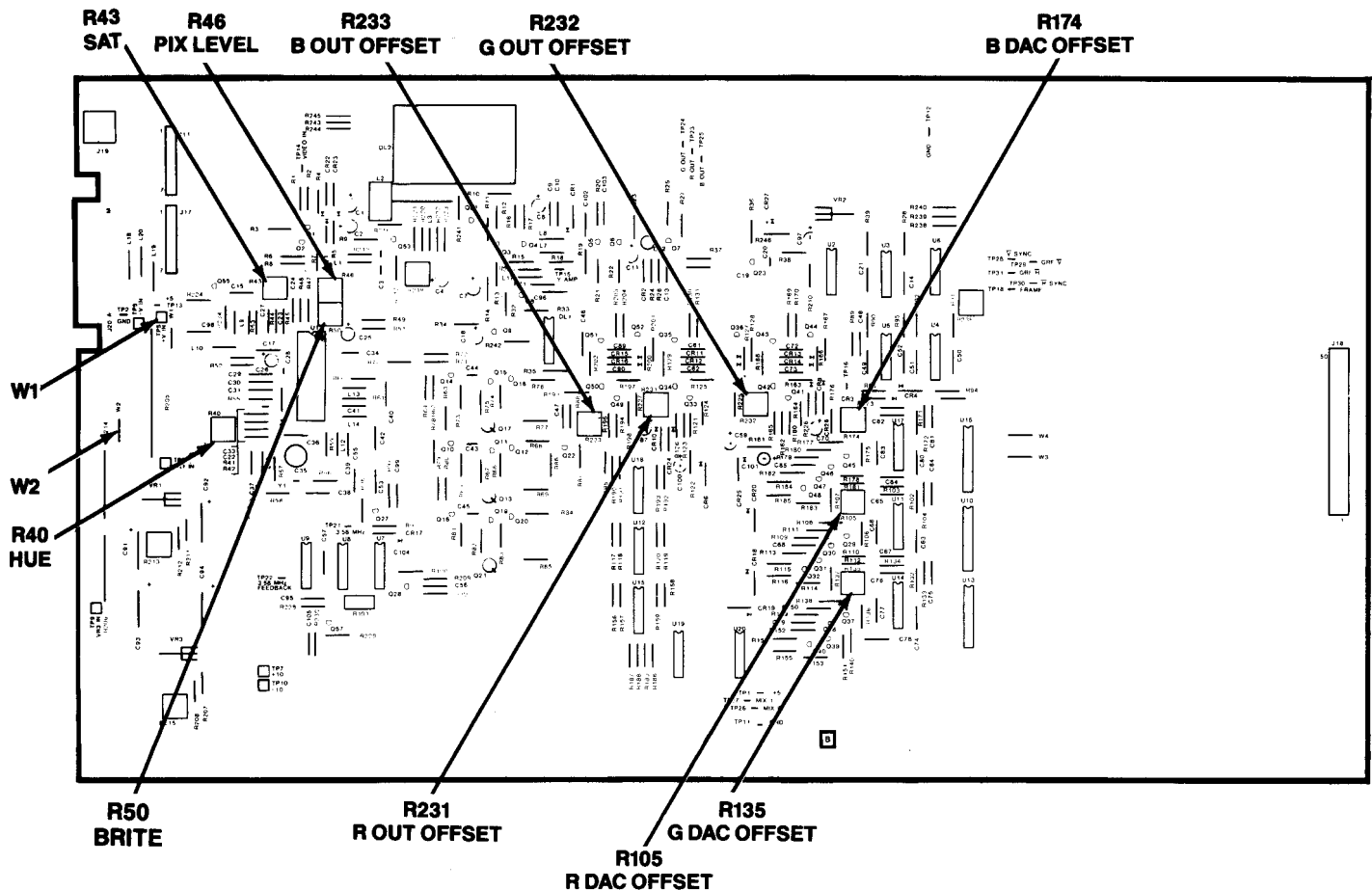


Figure 3 Adjustment Locations—
NTSC Demodulator PCB

The
 pro
 sou
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 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.

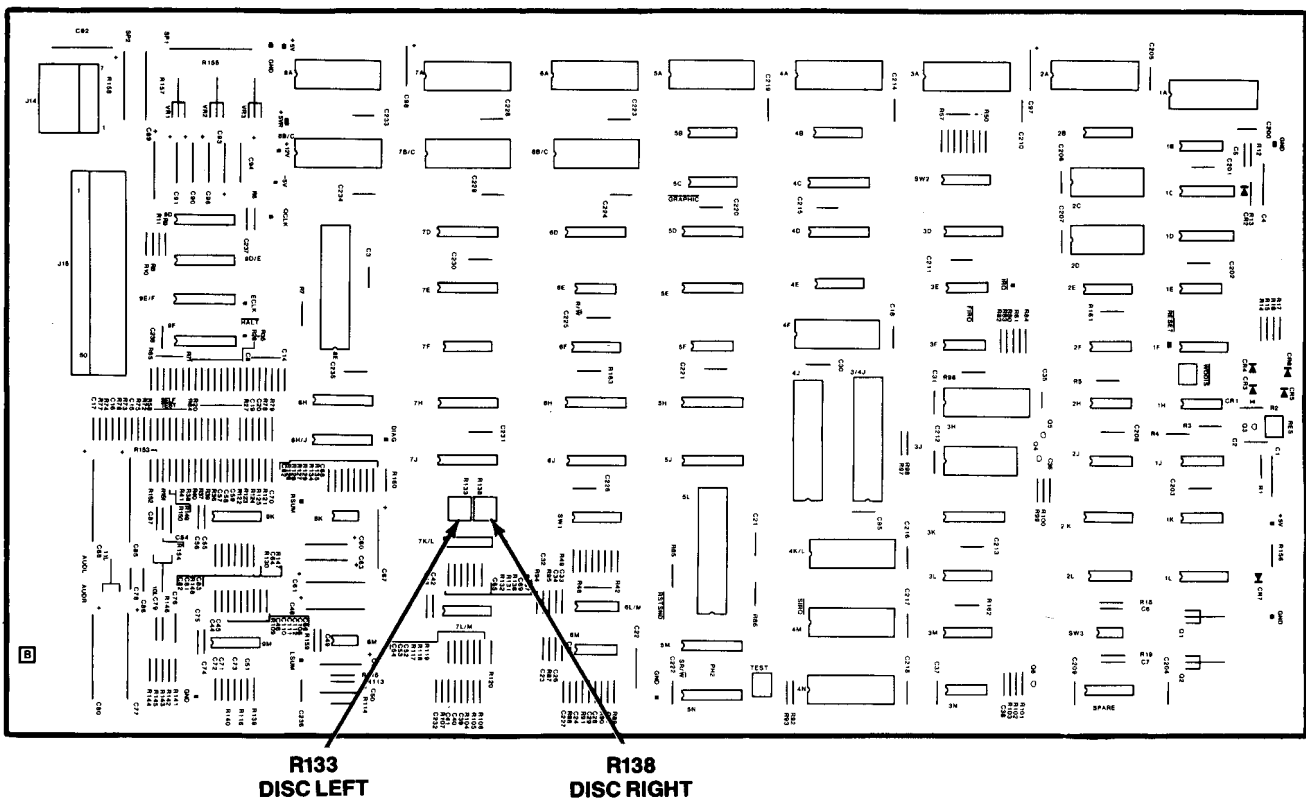


Figure 4 Adjustment Locations-
Main PCB