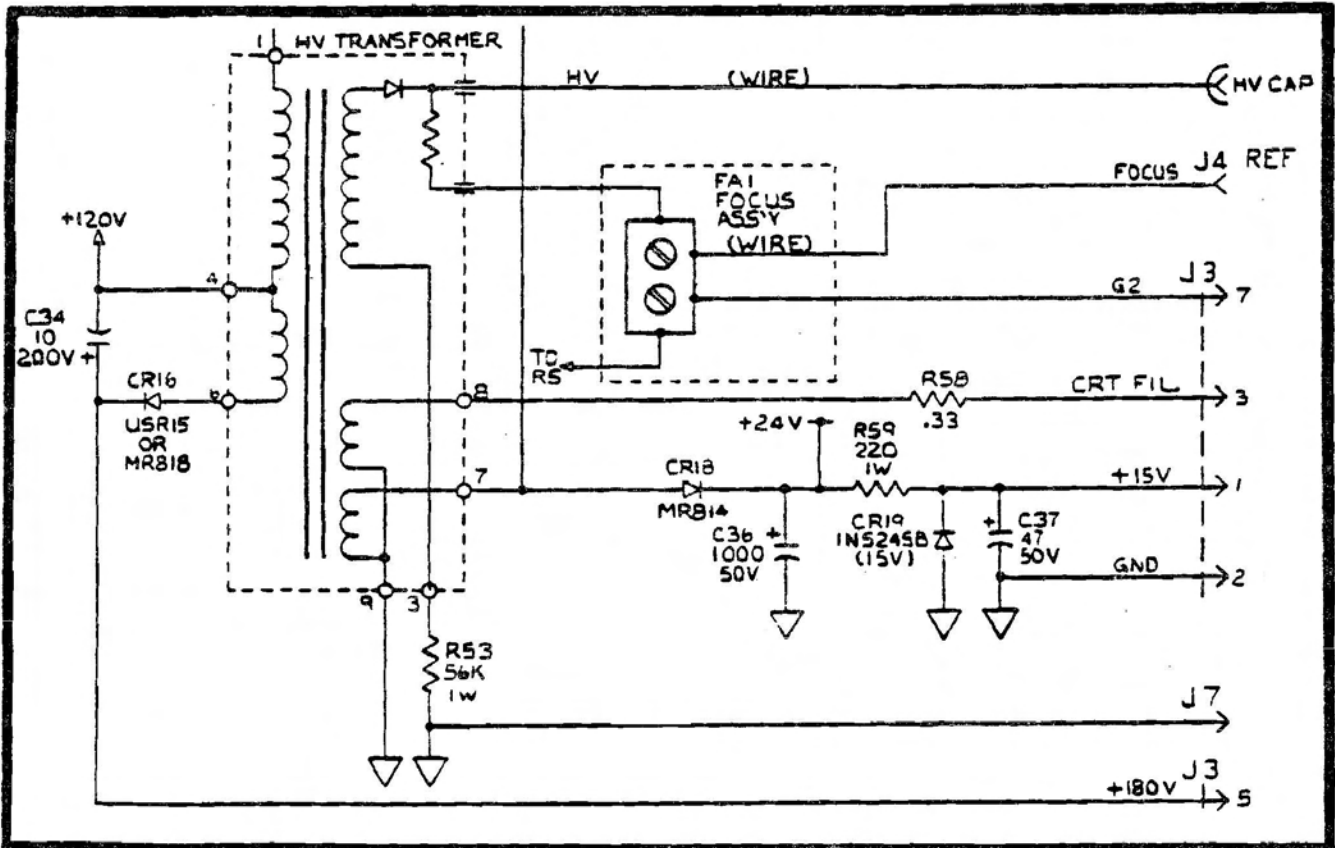


Supplement to the Atari 19-Inch Color Raster Display Service Manual



(TM-199, 2nd printing)

This supplement contains changes and additions to the 19-Inch Color Raster Display Service Manual (TM-199, 2nd printing) that affect the Deflection PCB Assembly (Atari part number A201022-01, revisions A and C).



- { } Add the following phase-locked-loop (PLL) circuit details of operation to the TM-199 Vertical and Horizontal Amplifiers discussion in Chapter 3:

The phase-locked-loop (PLL) circuit prevents incorrect horizontal sync signals from reaching the horizontal amplifier. Phase-locked-loop integrated circuit U1 contains a phase comparator and a voltage-controlled oscillator (VCO). When the horizontal sync signal is applied to U1, the phase comparator compares the phase and frequency of the sync signal with the VCO frequency and generates an error voltage proportional to the phase and frequency difference of the sync signal and VCO. The error voltage is filtered by the filter network comprised of R6, R9, C2, and C5. The resultant voltage is applied to the control input of the VCO which then causes the VCO to lock to the sync frequency. The output of the VCO is a square-wave horizontal sync signal which is applied to the horizontal circuit at pin 6 of connector P1.

Transistor Q1 and its associated circuitry limits the cathode-ray tube beam-current to 2 milliamperes.

- { } Delete paragraph 3 in Chapter 3 describing the one-shot multivibrators U1A and U1B (disabled by the removal of diode CR1).
- { } Replace the TM-199 Figure 1 Display Block Diagram with the revised block diagram at the back of this change order.

NOTE

Notice that integrated circuits U1A and U1B are disabled by the removal of diode CR1.

{ } Add the following adjustment procedure to Chapter 5:

NOTE

Normally, the CENTER FREQUENCY control (R4) on the PLL Adapter PCB should not require adjustment. The following adjustment procedure should only be performed if the phase-locked-loop integrated circuit U1 located on the PLL Adapter PCB is replaced.

Center Frequency

Adjust the phase-locked-loop VCO center frequency as follows:

1. Set CENTER FREQUENCY control (R4) to the center of its adjustment range. Refer to Figure 8A for the location of CENTER FREQUENCY control (R4).
2. Apply power to the game and obtain a display.

CAUTION

Be careful not to adjust CENTER FREQUENCY control (R4) outside the lock range of the voltage-controlled oscillator (see Chapter 3 for the operation of the phase-locked-loop circuitry). Damage to the display circuitry could result if the horizontal sync signal is not present while the display is operating.

3. Slowly adjust CENTER FREQUENCY control (R4) for a stable display.

{ } Delete the following items from the TM-199 Deflection PCB Parts List:

- Diode CR1
- Resistor R9
- Resistor R56
- Resistor R60
- Connector J1

{ } Change the following items in the TM-199 Deflection PCB Assembly parts list:

- Fuse F1 from 1 A, 250 V, 3AG Slow-Blow Fuse, part number 46-2011002 to 1.5 A, 250 V, 3AG Slow-Blow Fuse, part number 46-2011502.
- Rectifier diodes CR6-CR9 from type 1N4001, 1 A, 400 V, part number 131011-001 to type 1N5397, 1.5 A, 600 V, part number 131030-001.

{ } Add the following items to the TM-199 Deflection PCB Assembly parts list:

- Resistor R68: 47 Ω , $\pm 5\%$, 1/4 W, part number 110000-470.
- Resistor R69: Thermal, 40 Ω , 2 A, part number 110018-400.
- PLL Adapter Printed-Circuit Board: part number A201133-01

{ } Add the Figure 8A PLL Adapter PCB Assembly illustration and parts list at the back of this change order to the back of the TM-199 parts lists.

{ } Replace the TM-199 Figure 10 Deflection PCB Schematic Diagram with the revised schematic diagram at the back of this change order.

{ } Add the Figure 12 PLL Adapter PCB Schematic Diagram at the back of this change order to the back of the TM-199 schematics.

{ } Change the TM-199 Table of Contents to reflect these changes.

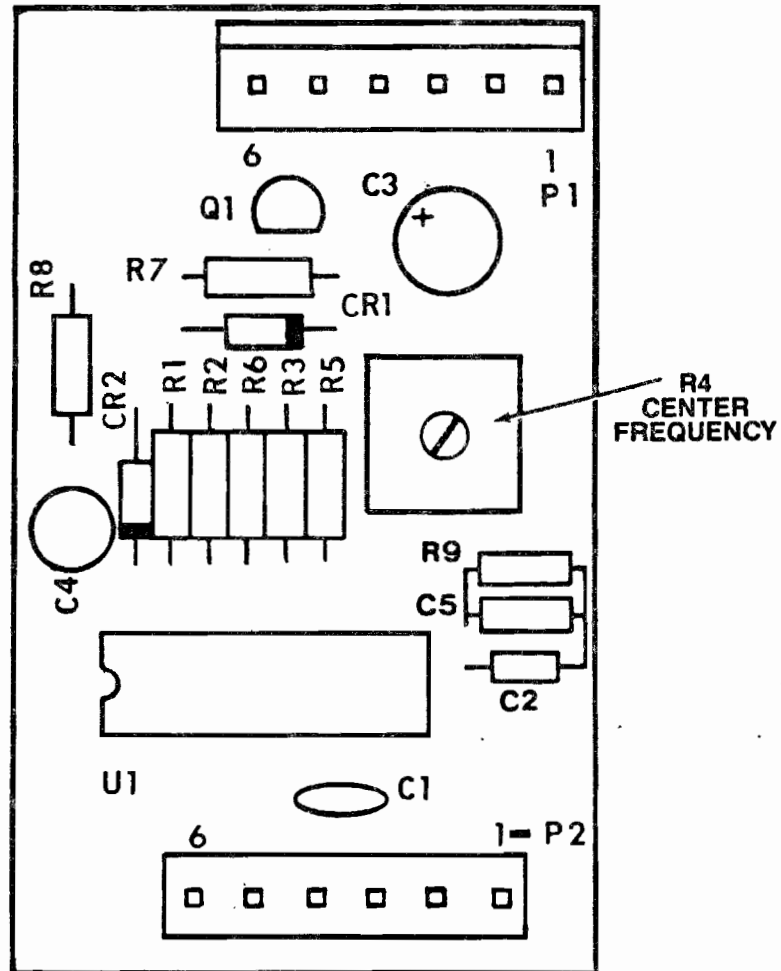


Figure 8A PLL Adapter PCB Assembly

PLL Adapter Printed-Circuit Board
Parts List
A201133-01 2

Capacitors

C1	0.0022 μ F, 100 V, Plastic Film Radial-Lead Capacitor	121022-222
C2	0.1 μ F, +80%, -20%, 50 V Ceramic Capacitor	122002-104
C3	47 μ F, \pm 20%, 16-V Minimum, Aluminum Electrolytic Radial-Lead Capacitor	123004-470
C4	2.2 μ F, \pm 20%, 50-V Minimum, Aluminum Electrolytic Radial-Lead Capacitor	123005-225
C5	4700 pF, \pm 10%, 50 V, Axial-Lead Ceramic Capacitor	122015-472

Resistors

R1	2.2 k Ω , \pm 5%, 1/4 W Resistor	110000-222
R2	10 k Ω , \pm 5%, 1/4 W Resistor	110000-103
R3	33 k Ω , \pm 5%, 1/4 W Resistor	110000-333
R4	25 k Ω , 1/2 W, Horizontal Trimming Potentiometer	119002-253
R5	220 k Ω , \pm 5%, 1/4 W Resistor	110000-224
R6	10 k Ω , \pm 5%, 1/4 W Resistor	110000-103
R7	12 k Ω , \pm 5%, 1/4 W Resistor	110000-123
R8	5.6 k Ω , \pm 5%, 1/4 W Resistor	110000-562
R9	12 k Ω , \pm 5%, 1/4 W Resistor	110000-123

Miscellaneous

CR1	Type-1N914, 100 V, 10 mA Switching Diode	31-1N914
CR2	Type-1N751A, 5.1 V, 500 mW Zener Diode	31-1N7514
J1	6-Circuit, 0.056 Centers, Polarized Header Connector	179014-006
J2	6-Pin, 6-Circuit, 0.056 Centers, Polarized Right-Angle Header Connector	179014-006
Q1	Type-2N3906, 40 V, 1 W PNP Transistor	33-2N3906
U1*	Type-4046, CMOS Phase-Locked Loop Integrated Circuit	137349-001

*Static-sensitive device

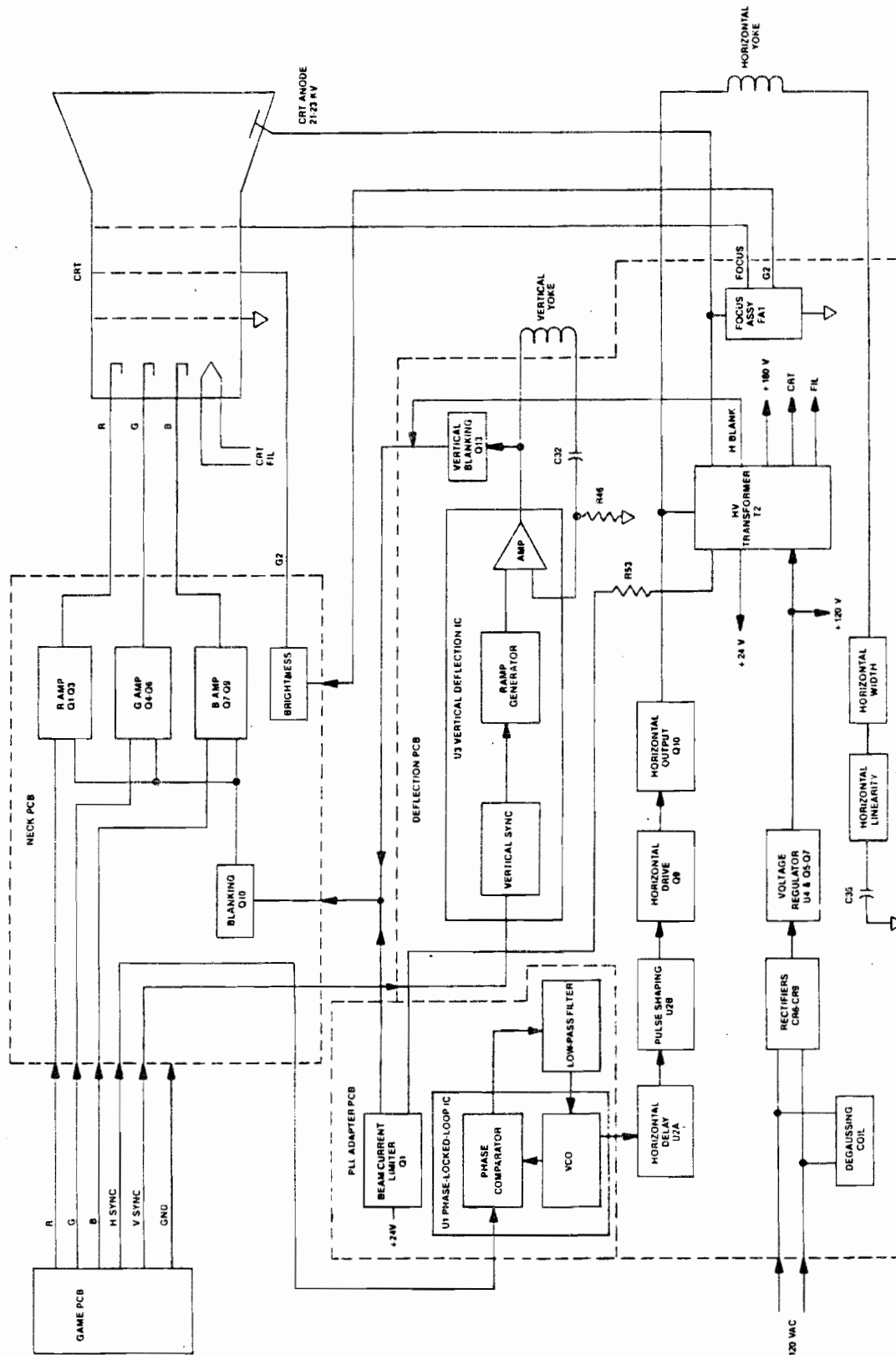
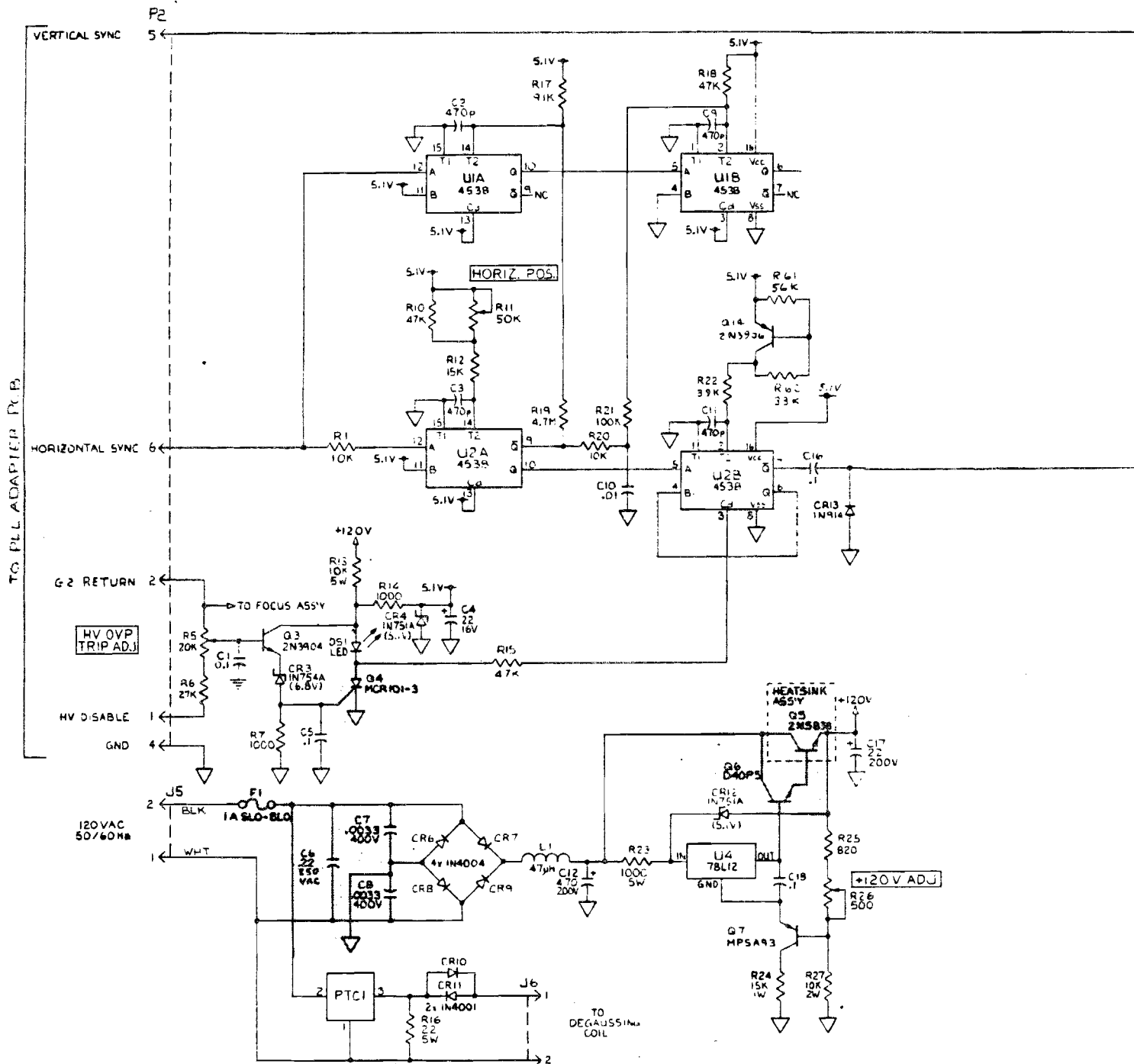
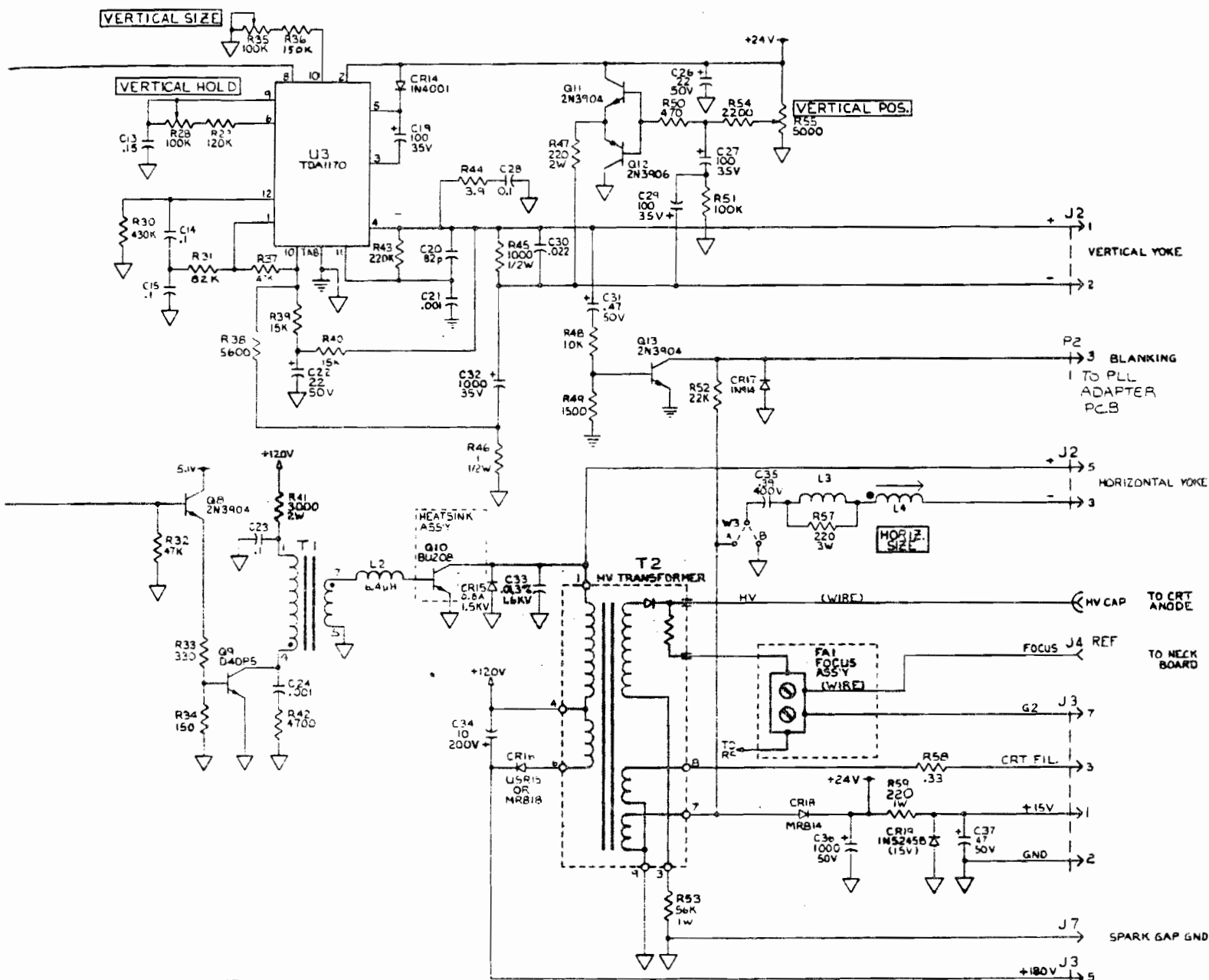


Figure 1 Display Block Diagram



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Figure 10 Deflection PCB Schematic Diagram



NOTES:
UNLESS OTHERWISE SPECIFIED,
1. ALL RESISTORS ARE 5% 1/4 WATT, AND IN OHMS.
2. CAPS ARE IN MICRO-FARADS.
3. ⊕ INDICATES COM. CON. ⊕ INDICATES EARTH GND.

PRODUCT SAFETY NOTICE

The shaded areas of this schematic indicate components whose values are of special significance to product safety. Should any component in the shaded areas need to be replaced, use only the value given in the parts lists. Do not deviate from the resistance, wattage, and voltage values shown.

Figure 10 Deflection PCB Schematic Diagram, continued

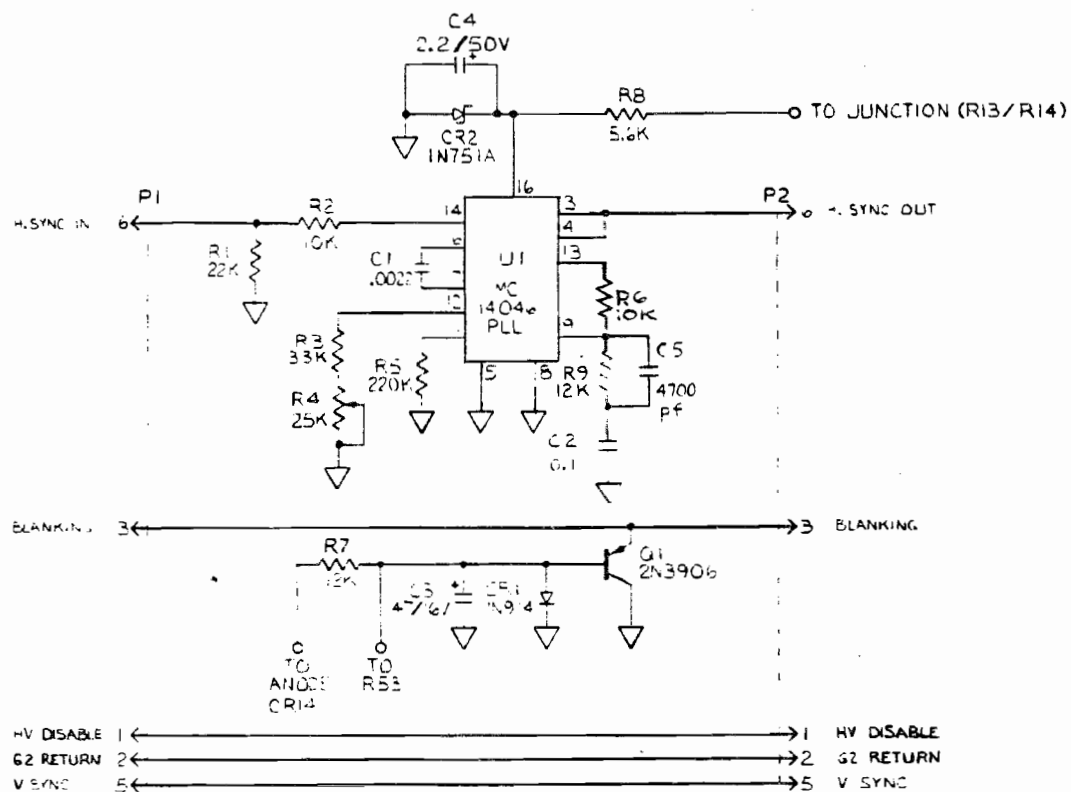




Figure 12 PLL Adapter PCB Schematic Diagram

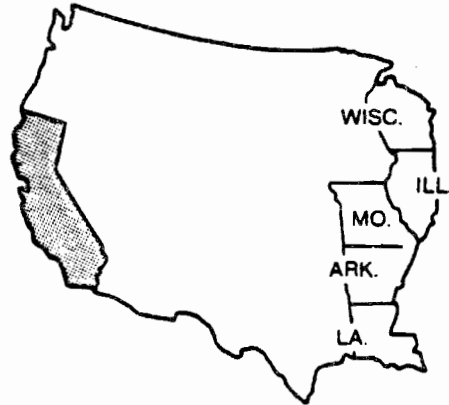
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