

OMNI VISION INC

Service Manual

for

Standard Monochrome CRT Monitors

(6" Models)



Meeting Your Application Requirements

Specialists in CRT Displays

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General Information

Omni Vision's display monitors incorporate circuitry that provides the finest presentation of data through the use of the latest state-of-the-art components. High quality, reliability, and dependability are assured through the all-solid state design that is adaptable to most environments. The mechanical configurations provide for customer flexibility and versatility. The double-sided printed circuit board with plate through holes improves the mechanical and electrical integrity of all inserted components.

Electrical

The power requirement for any of the units in the family is +12 volts DC with a maximum current of 1.25 amps; however, the typical current drain will be about 900 milliamps. Power can be supplied through the 10-pin edge connector or through an optional power input connector.

Signals are applied as composite video, separate TTL or VGA depending on application. They are applied through the 10-pin edge connector or through an optional connector. The amplitude of the applied signals is specified in the specification section of this document.

Mechanical

The unit can be purchased in an open frame chassis version.

Safety Notes -- IMPORTANT INFORMATION --

In operation, the CRT has a high voltage charge stored on the anode connection of the tube. This charge may be retained for a period of time and must be discharged when handling the CRT. This warning applies even when power has been removed from the unit for some period of time.

CRT manufacturers recommend that any user of the CRT take extra precautions and use safety glasses when handling the CRT. It is also recommended that gloves be used during the handling of the tubes.

SPECIFICATIONS

CRT

Deflection angle	70 Degrees
Phosphor types	Green (P31) is standard, but white (P4) is an option
Viewing Area	5.0 x 3.5 inches

ELECTRICAL

Power requirements.....	+12 Vdc @ 0.2 Vdc at 900 milliamps, 18 Watts Maximum, 2A fusing is recommended
Synchronization	
Horizontal	15 kHz +/- 1kHz (standard) either TTL or composite
.....	31 kHz for VGA applications
Vertical	47-63 Hz
Blanking, Horizontal.....	10 usec at 15.75 kHz
Vertical.....	800 usec
Video performance	Bandwidth to 26 MHz
Resolution.....	650 lines center screen
Linearity, Horizontal.....	Less than 10% variation between adjacent characters
Linearity, Vertical	Less than 10% variation between adjacent rows
Geometry	Within 1.5% overall deviation from a perfect rectangle
High Voltage	Greater than 7 KV at 50 @ amps

MECHANICAL

Dimensions with chassis

Width	6.0	inches
Height.....	4.5	inches
Depth	7.25	inches

Weight 3 lbs.

Connectors, power and signal Card Edge or optional connectors

Chassis version Only version available

Other Data

Environment

Operating Temperature	+10 to +55 degree C
Storage Temperature	- 20 to +85 degree C

Humidity 95% relative humidity

Altitude up to 10,000 ft

Warranty One-year parts and labor

Regulatory Agency Compliance UL/cUL 1950, 2601
..... TUV No. 950-93

Set Up Procedure

1. Size Check

- a. Horizontal
If it is necessary to adjust horizontal width, reset width coil (L2) to proper width.
- b. Vertical
If it is necessary to adjust vertical height, reset height control (R38) to proper height. Some interaction between the vertical linearity (R48) control and the size control may require additional adjustment of both controls to achieve proper size and linearity.

2. Brightness Check

WITH Remote Brightness Control

- a. If necessary, increase remote brightness control to maximum.
- b. Raster lines should be visible at this time. If not, increase setting on master brightness control (R52) for visible raster lines.
- c. Reset remote brightness control to normal viewing.

WITHOUT Remote Brightness Control

- a. Adjust master control (R52) until raster lines are visible.
- b. Reset control just below threshold so that raster lines are no longer visible.

3. Synchronization Check

- a. Vertical
 - 1. Vary vertical hold control (R34) to both ends of the control's range. Non-synchronous roll of screen should occur.
 - 2. Adjust control to lock in screen. Ideal position is mid range of drop out point and extreme end of control.
- b. Horizontal
 - 1. Increase brightness level so that raster lines are visible.
 - 2. Disable horizontal synchronization pulse.
 - 3. Screen should be rolling. Adjust horizontal hold control (R18) until a single vertical bar is visible on the screen and stop adjustment.
 - 4. Re-enable horizontal sync pulse, video should now be stable.
 - 5. Adjust video centering control (R19) so that video is centered on screen.
 - 6. Reset brightness controls to normal viewing level.

4. Focus Check

Adjust focus control (R28) for best overall focus on screen. A compromise may be required between center focus and corner focus.

5. Contrast Check

With brightness control adjusted to normal level, adjust contrast control (R63) to desired video gain.

6. Unit should now be completely and correctly adjusted.

Typical Signal Pulse Widths

For a display that operates at 15.72 kHz horizontal and 60 Hz vertical:

	Horizontal	Vertical
Total Period	63.6 usec	16.7 msec
Total Active Video Period	53.6 usec	1.4 msec
Sync Pulse Width	4.0 usec	180.0 usec
Period before Sync (Front Porch)	2.0 usec	180.0 usec
Period after Sync (Back Porch)	4.0 usec	1.04 msec

Compatible Video Signals - RS170 /NTSC

Dot or Pixel Rate	to 22 Mhz
Horizontal Frequency	15.75 kHz (63.5 usec)
Vertical Frequency	60.00 Hz (16.667 millisec)

Horizontal Details	Pixels	usec	Vertical Details	Lines	millisec
Total	800	63.5	Total Lines	525	16.7
Active	640	52.6	Active Lines	480	15.4
Blanking	160	10.9	Blanking Lines	45	1.3
Sync Delay	16	1.5	Sync Delay	3	0.190
Sync Width	96	4.7	Sync Width	3	0.190
Sync Polarity	negative		Sync Polarity	negative	

Note:

Above example is for interlaced composite signal. The above examples of timing information are provided for models operating at fixed horizontal frequencies of 15.75 kHz. Model can be either TTL or composite video operating at 15.7 kHz.

VGA Signal

For a display that operates at 31.4 kHz horizontal and 60 Hz vertical
640 x 480 VGA resolution mode:

	Horizontal	Vertical
Total Period	31.778 usec	16.683 msec
Total Active Video Period	25.442 usec	15.253 msec
Sync Pulse Width	3.182 usec	0.064 msec
Period before Sync (Front Porch)	0.636 usec	0.317 msec
Period after Sync (Back Porch)	1.907 usec	1.049 msec
Sync Polarity	Negative	Negative

Input Signal and Power Information

TTL version

- pin 1 - ground
- pin 2 - remote brightness control - upper end
- pin 3 - remote brightness control - lower end
- pin 4 - remote brightness control - center arm
- pin 5 - no connection
- pin 6 - horizontal sync input - TTL level
- pin 7 - power input, +12 VDC
- pin 8 - video input - TTL level
- pin 9 - vertical sync input - TTL level
- pin 10 - ground

Input signals should be TTL level signals with amplitudes of 2.4 to 5.0 volts for high level.

Composite Video version

- pin 1 - ground
- pin 2 - remote brightness - upper end
- pin 3 - remote brightness - lower end
- pin 4 - remote brightness - wiper arm
- pin 5 - no connection
- pin 6 - no connection
- pin 7 - power input, +12 VDC
- pin 8 - composite video input
- pin 9 - no connection
- pin 10 - ground

The input composite signal should have an amplitude of 0.7 to 1.8 volts of composite video information to be processed within the unit. The typical input signal is 1.0 volts peak to peak with the white level being positive. The video content is typically 0.7 volts peak to peak. The black level is just above threshold with negative oriented sync pulses of 0.2 volts.

VGA Graphics Output (for 10-pin card edge connector)

- Pin 2 – Green video
- Pin 5 – Ground
- Pin 7 – Green return
- Pin 10 – Sync return
- Pin 13 – Horizontal sync
- Pin 14 – Vertical sync

Card Edge Connectors

Description: 10 pin, 0.156 inch centers
Sources: Amphenol part # 143-010-01

Brightness Control

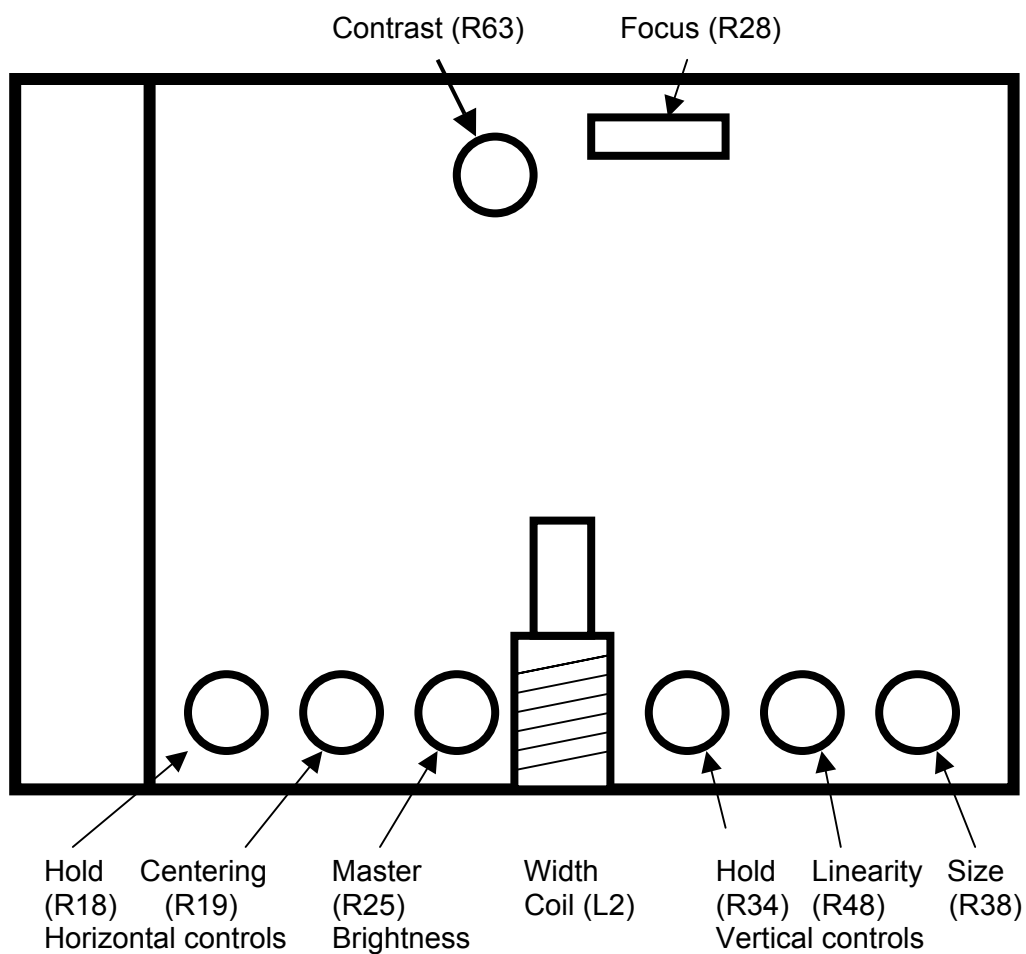
Recommended value is 250K Ω , however, unit will interface with 100K Ω controls.

Control Designations - Composite Video or TTL version product

Horizontal Oscillator.....	R18
Horizontal Video Centering.....	R19
Contrast	R63
Width Coil	L2
Brightness.....	R52
Vertical Linearity	R48
Vertical Hold	R34
Vertical Size.....	R38
Focus	R28

Control and Component Locations -

Top View of Module



Selected SPARE and REPLACEMENT PARTS List

P/N	Description	Designator
23-004	Resistor Power 1K 3W 5%	R90
24-356	Pot / Carbon 500 ohm - Contrast	R63
24-352	Pot / Carbon 200K - Vertical Lin	R48**
24-351	Pot / Carbon 100K ohm - Vert Hold & Lin	R34,R48
24-354	Pot / Carbon 500K ohm - Vert Size	R38
24-353	Pot / Cermet 250K - Brightness	R25
24-358	Pot / Cermet 2K - Horizontal Hold	R18
24-350	Pot / Cermet 30K - Horizontal Hold	R18**
24-359	Pot / Cermet 5K - Horizontal Centering	R19
24-359	Pot / Cermet 200K - Horizontal Centering	R19**
24-011	Pot 2 Meg - Focus	R28
27-011	Yoke	**
28-002	Coil Peaking 4.7uh	L3
28-042	Coil Linearity	L1
28-009	Coil Width	L2
	(15 kHz models LP0615xx)	
32-012	Cap Lytic 10uf 25v bipolar	C19
33-002	Cap Polypropylene .027 uf/400v	C17
38-028	Flyback	T1
	(19 kHz model LP0619xx)	
32-022	Cap Lytic 6.8uf 25v bipolar	C19
33-008	Cap Polypropylene .018 uf/400v	C17
38-033	Flyback	T1
	(31 kHz model LP0631xx)	
32-031	Cap Lytic 3.9uf 25v bipolar	C19
33-017	Cap Polypropylene .012 uf/400v	C17
38-028	Flyback	T1
41-002	Diode Power GI 1-1200	D5
41-003	Diode Power MR 818	D14
41-005	Diode Power 1N4936	D2, D3, D4
42-001	Diode Zener 1N733A	D8, D9
42-004	Diode Zener 1N5234B	D10, D16
45-000	Transistor Signal (NPN) 2N3904	Q3, Q5, Q10, Q11
45-001	Transistor Signal (PNP) 2N3906	Q6, Q7, Q9
45-011	Transistor Signal (NPN) 2N5551	Q8
46-000	Transistor Power BU806	Q2
46-001	Transistor Power MPS U07	Q4
46-019	Transistor Power MPS U05	Q1
50-007	Integrated Circuit MC 1391	U1
50-016	Integrated Circuit TDA 1175P	U2
50-000	Integrated Circuit TDA 1170S	U2**
50-001	Integrated Circuit TDA 1180	U1**
54-012	Fuse 2A Slo blow	F1
55-009	CRT Socket Assembly	

CRT - call factory

Complete PCB Assemblies - call factory

** On Models of LP0615Exx and LP0619Exx

Schematics and Component Placement Information -

See Appendix A for earlier version models with IC's TDA 1170 used for Vertical processor and TDA 1180 used for horizontal processor.

Models:

- 15 kHz TTL
- 19 kHz TTL
- 15 kHz Composite video
- 31 kHz VGA

See Appendix B for current version models with IC's TDA 1175 used for Vertical processor and MC1391 used for horizontal processor.

Models:

- 15 kHz TTL
- 19 kHz TTL

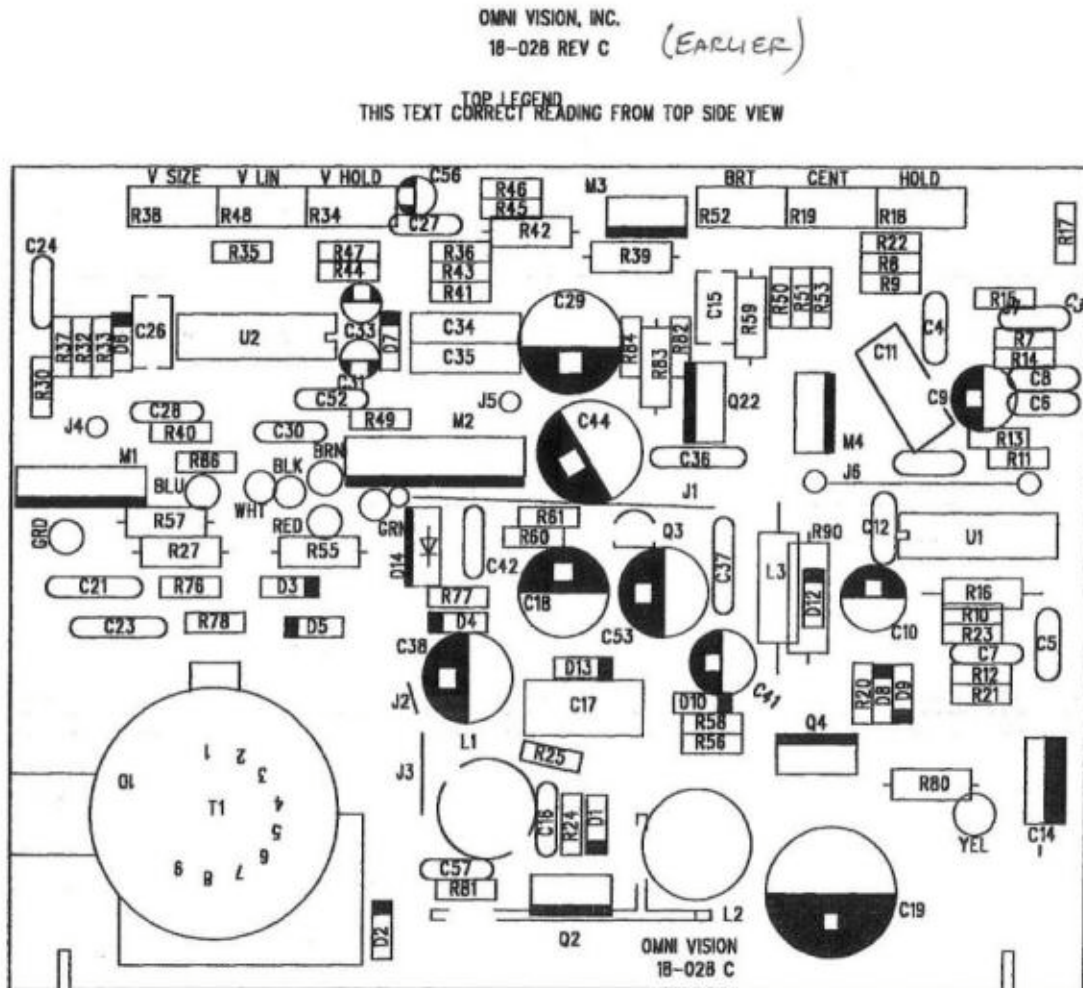
These current models are typically marked as Rev 1.

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Appendix A - LP06xxExx earlier models

Models with TDA1180 horizontal processor chip and TDA1170 vertical processor chip

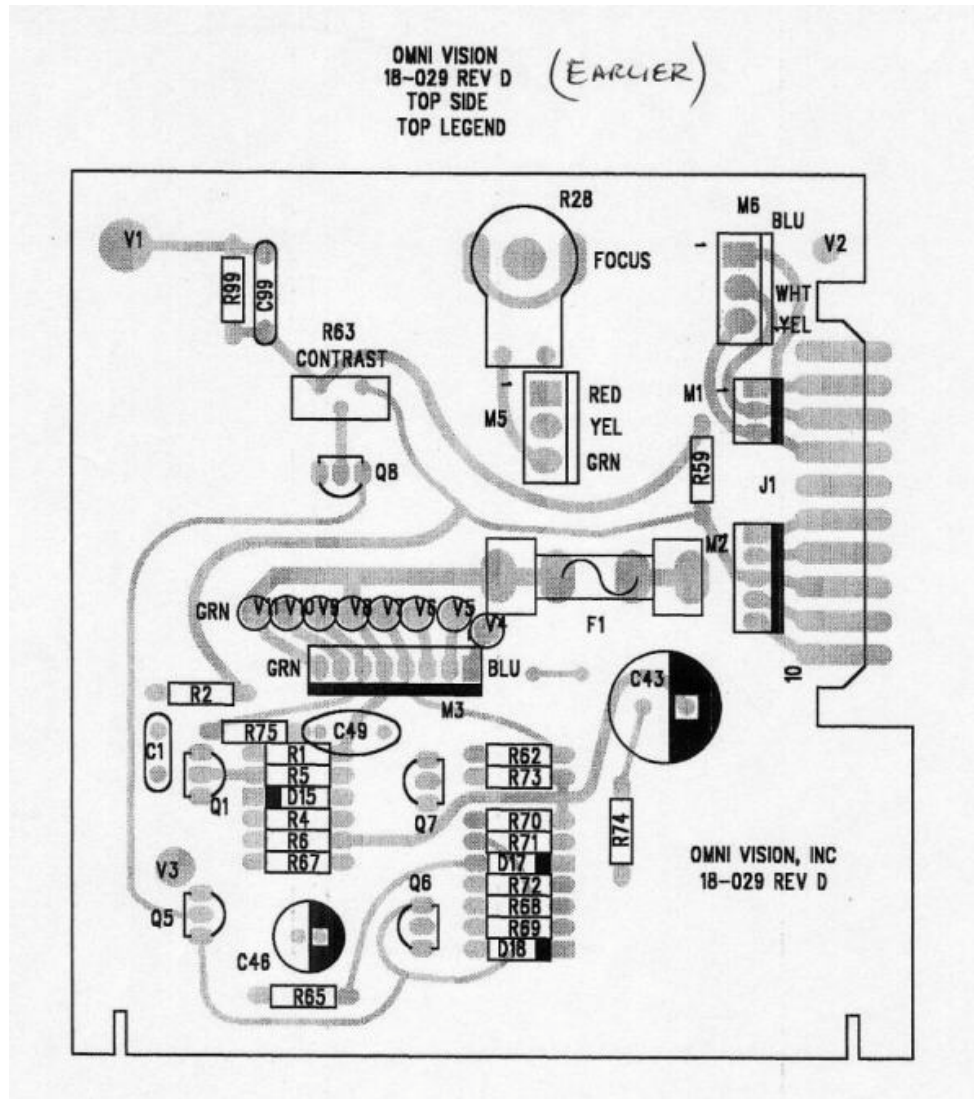
Main board

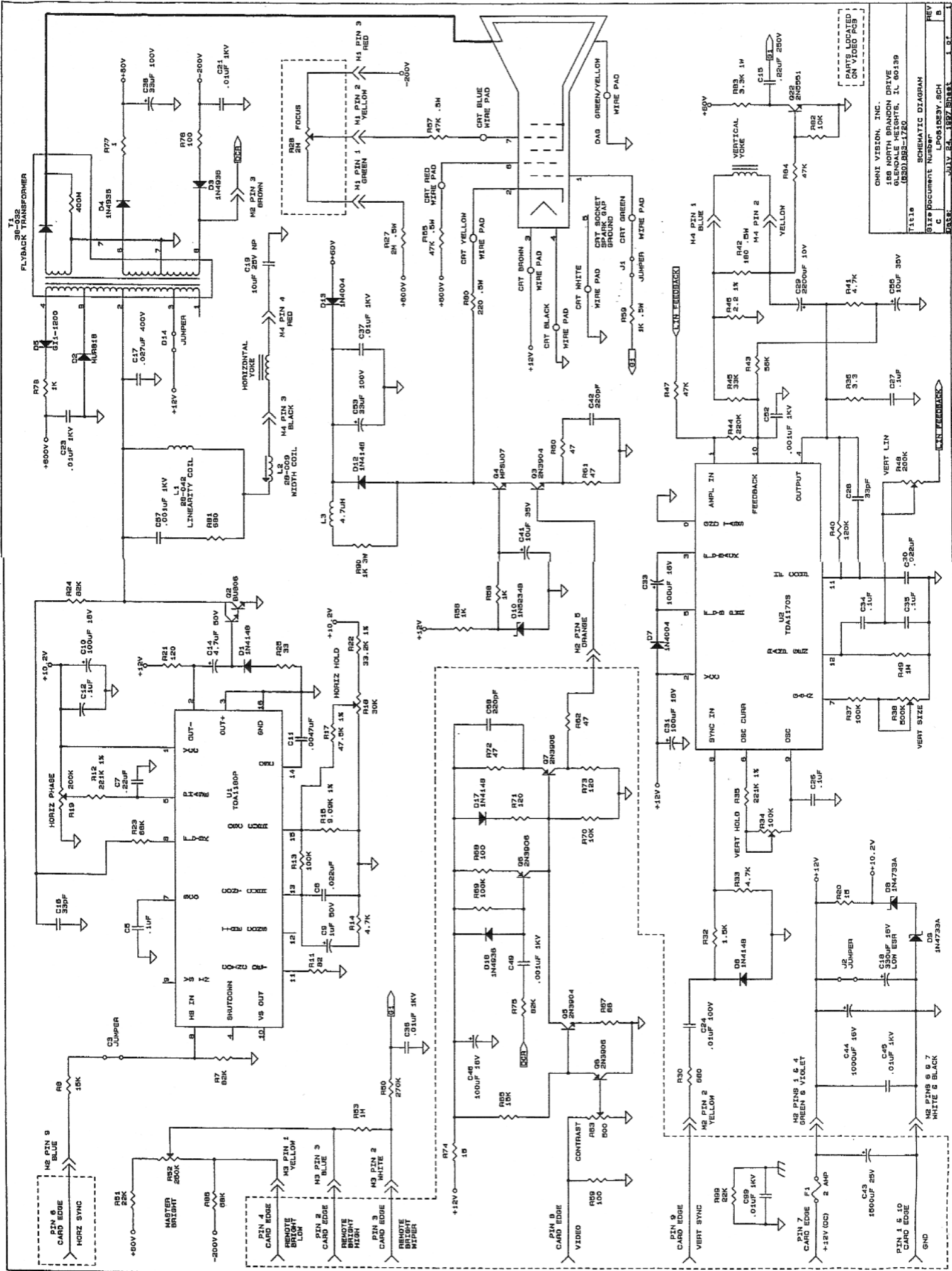


Appendix A - LP06xxExx earlier models

Models with TDA1180 horizontal processor chip and TDA1170 vertical processor chip

Input board

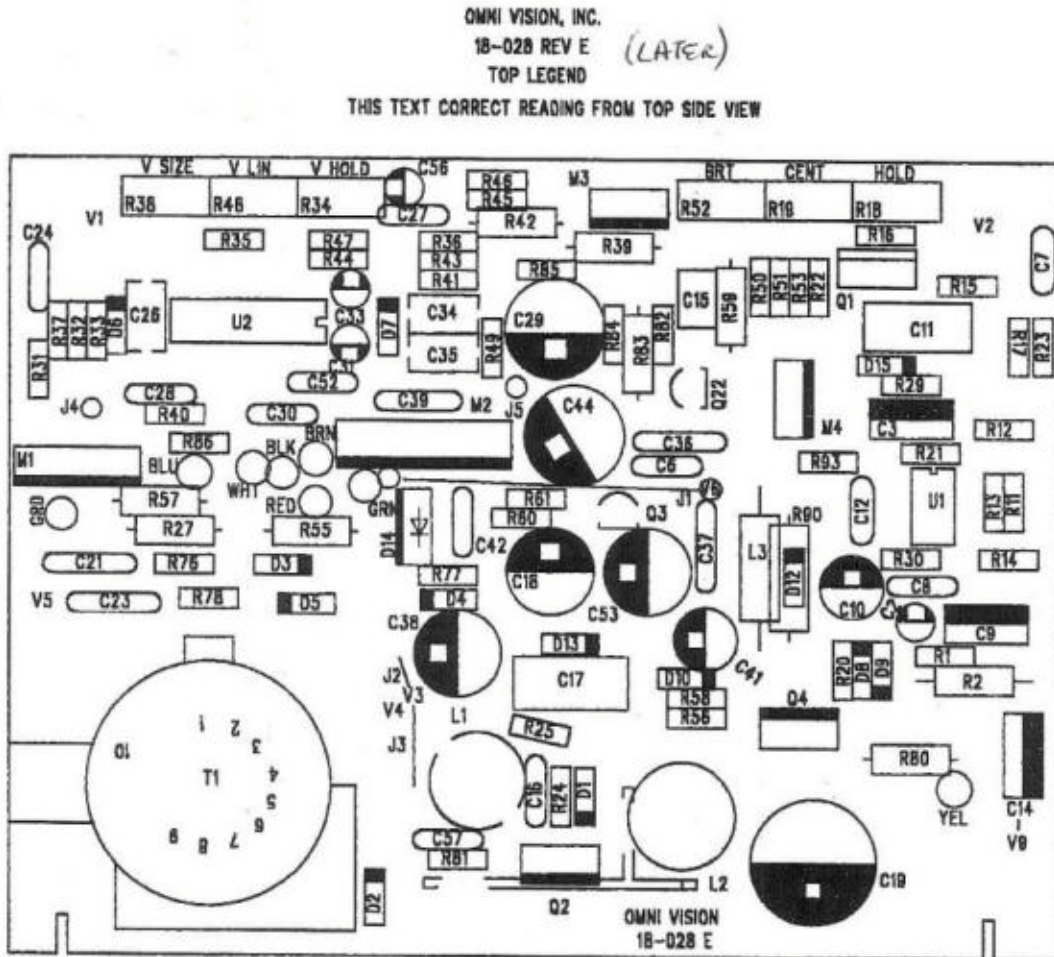




Appendix B - LP06xxExx current models

Models with MC1391 horizontal processor chip and TDA1175 vertical processor chip

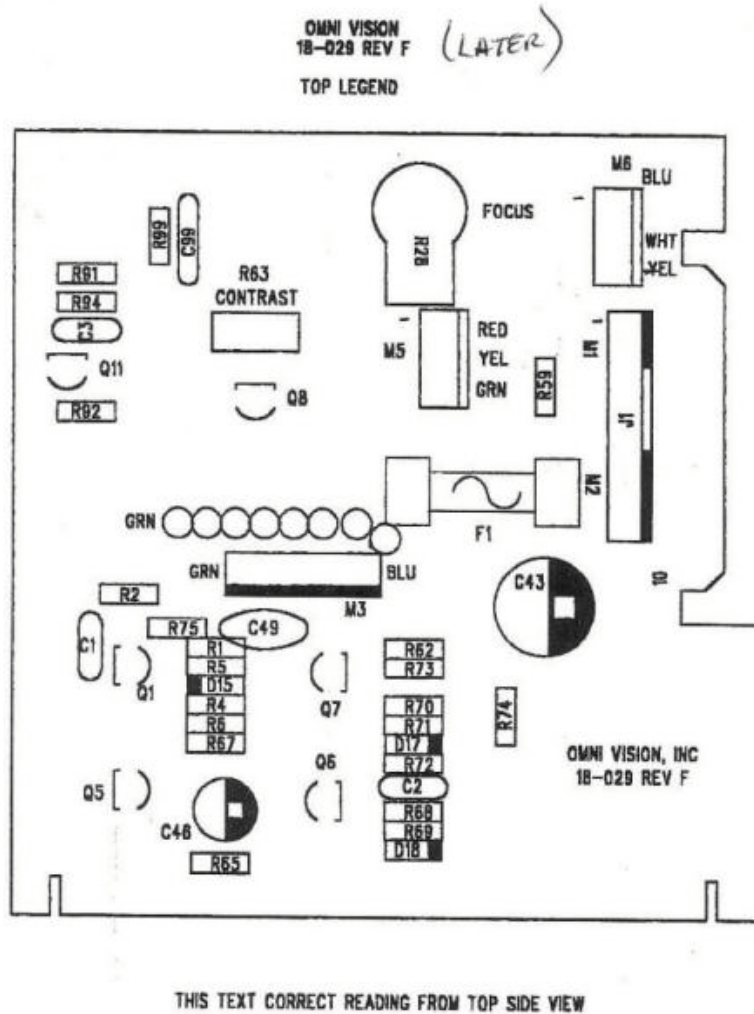
Main board



Appendix B - LP06xxExx current models

Models with MC1391 horizontal processor chip and TDA1175 vertical processor chip

Input board



Appendix B Current version with MC1391 and TDA 1175

