D5000

WELLS-GARDNER
ELECTRONICS CORPORATION

SERVICE MANUAL

Safety Summary

1. **POWER UP WARNING --**
This product uses a switch mode power supply to provide the monitor chassis with isolation from the AC line. Although servicing the secondary circuitry can be safely done without the use of an AC isolation transformer, **it is recommended that an isolation transformer be used when servicing this product.** This will prevent shock hazard in the event of accidental or erroneous contact with primary power supply circuitry. Before servicing is performed, read all the precautions labelled on the CRT chassis.

2. **X-RAY RADIATION WARNING NOTICE**
WARNING: PARTS WHICH INFLUENCE X-RAY RADIATION IN HORIZONTAL DEFLECTION, HIGH VOLTAGE CIRCUITS, PICTURE TUBE, ETC. ARE INDICATED BY ★ ON THE SCHEMATIC DIAGRAM. FOR REPLACEMENT, USE ONLY THE TYPE SHOWN IN THE PARTS LIST.

3. **HIGH VOLTAGE --**
This monitor contains HIGH VOLTAGES derived from power supplies delivering LETHAL quantities of energy. Do not attempt to service until all precautions necessary for working on HIGH VOLTAGE equipment have been observed.

4. **CRT HANDLING --**
Care must be taken not to bump or scratch the picture tube as this may cause the picture tube to implode resulting in personal injury. Shatter proof goggles must be worn when handling the CRT. **HIGH VOLTAGE CHARGE REMAINS PRESENT ON THE CRT ANODE AFTER THE SET IS POWERED DOWN. THE CRT ANODE MUST BE DISCHARGED TO CHASSIS GROUND BEFORE HANDLING CRT.** Do not handle the CRT by the neck.

5. **PRODUCT SAFETY NOTICE**
WARNING: FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS WITH MANUFACTURER RECOMMENDED PARTS. THESE PARTS ARE IDENTIFIED BY ⚠ ON THE SCHEMATIC DIAGRAM.

AVERTISSEMENT: POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL NE REMPLACER LES COMPSANTS DONT LE FONCTIONNEMENT EST CRITQUE POUR LA SECURITE QUE PAR DES PIECES RECOMMANDEES PAR LE FABRICANT.

For replacement purposes, use the same type or specified type of wire and cable, assuring the positioning of the wires is followed (especially for High Voltage and power supply circuits). Use of alternative wiring or positioning could result in damage to the monitor, shock or fire.

Table of Contents

Monitor Specifications

CRT

- **25", 27" or 33"** diagonal measure.
- **Polished faceplate with P22 phosphor.**
- **Striped trio spacings (standard):** 0.82 mm

HORIZONAL SCAN

- **Frequency:** Mode 1: 15.1 kHz. to 18.0 kHz.
  Mode 2: 24.5 kHz. to 28.5 kHz.
- **Linearity:** ±5%

INPUT SIGNAL

- **Video:** RGB analog
  1V to 4V p-p (adjustable with contrast control)
  1.0 k Ohms input impedance,
- Active Video:
  Mode 1: 46.0-50.0 usec.
  Mode 2: 29.5-30.5 usec.
- **Sync Level:** 0-5 V TTL Level
- Sync Polarity:
  Positive or Negative Going
  Separate or Composite.
- **Optional inputs available:**
  Negative video.
  RGB analog 0-0.7V, 75 Ohms input impedance.

PICTURE SIZE REGULATION

- 2%

VERTICAL SCAN

- **Frequency:** 47 Hz to 63 Hz
- **Linearity:** ±5%

GEOMETRIC DISTORTION

- ±2% (max)

VIDEO CHARACTERISTICS

- **Bandwidth (-3dB):** 15 MHz typical
- **Rise Time:** Less than 23 nanoseconds
- **Overshoot (max):** 5%

MECHANICAL

- The 25" comes standard in a F25M4 frame assembly. Custom frames can be furnished upon request. Contact your sales representative for details.

USER ADJUSTABLE REMOTE CONTROLS

- Brightness, Contrast, Horizontal Hold, Horizontal Size, Horizontal Video Position, Vertical Hold, Vertical Size, Vertical Raster Position.

POWER SUPPLY

- **Type:** Switch Mode Power Supply (No Isolation Transformer Required).
- **Voltage:** 90-264 VAC, 50-60 Hz.
- **Power:** 25" Monitor 100W (max).
  27" Monitor 100W (max).
  33" Monitor 130W (max).
- **NOTE:** Alternate thermistor needed for 220V operation.

ENVIRONMENTAL CONDITIONS

- Operating temperature 0 to 55 degrees celcius.
- Complies with U.L., C.S.A., and D.H.H.S. standards.

Theory of Operation

SWITCH MODE POWER SUPPLY

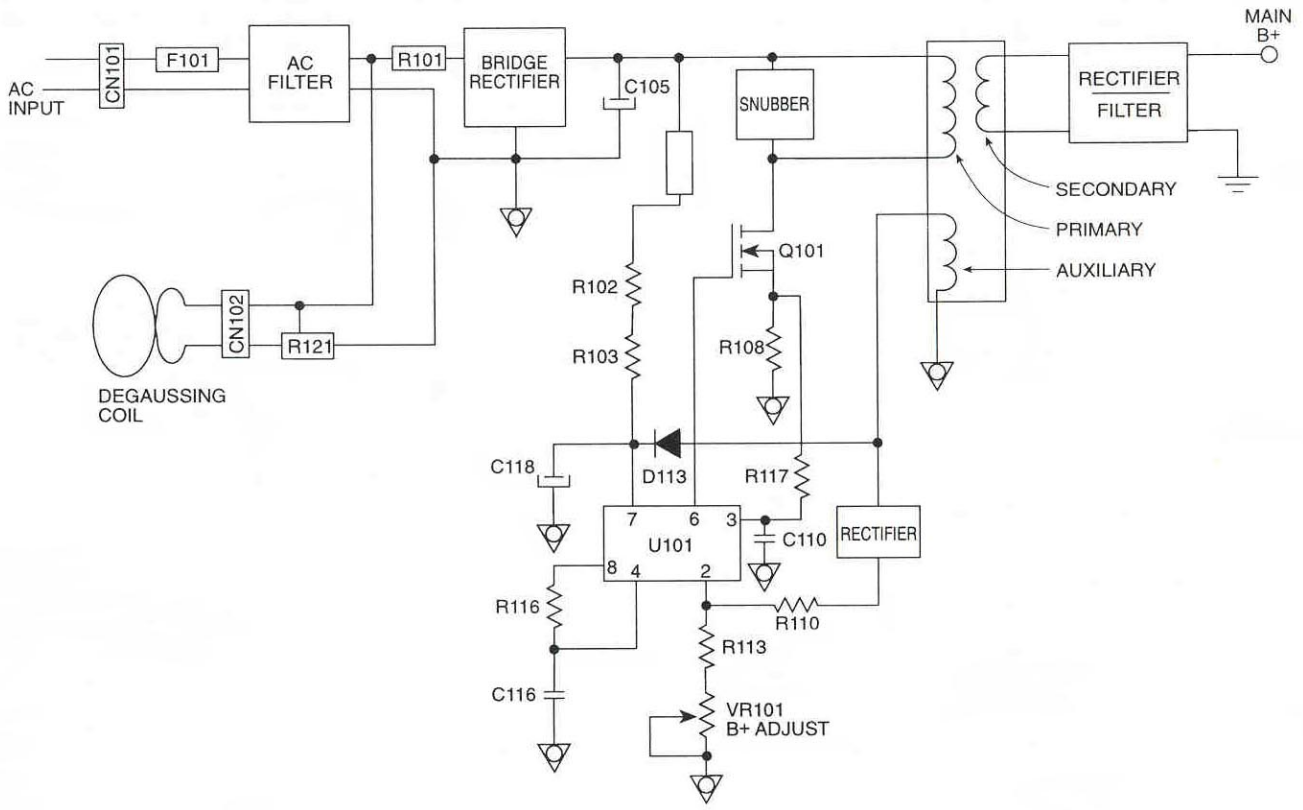
(Refer to FIG. A)

The U5000 base design utilizes a switch mode power supply (switcher). This switcher provides line-to-chassis isolation, eliminating the need for an isolation transformer. In addition, it provides an efficient means of DC-to-DC voltage conversion, delivering a well-regulated output voltage with varying AC line and output load conditions.

AC power enters the set through CN101. The set will function with any AC-line voltage in the range of 90VAC to 260VAC. F101 allows for the interruption of the AC power in the event of a serious malfunction. C101, C102, C103, C104, and L101 provide filtering to prevent high-frequency switcher noise from being conducting back onto the AC line. A degaussing coil is wrapped around the "bell" of the CRT in a figure-8 pattern. AC current is passed through this coil for the purpose of neutralizing residual magnetic fields in and around the face of the CRT. R121, which controls the degaussing current, is a dual element PTC thermistor. The first element has a low resistance and delivers surge current to the degaussing coil (through CN102) during power-up. As the temperature of this element rises, its resistance increases, and the degaussing current diminishes. The second element generates additional heat in the PTC, reducing the degaussing current to a negligible amount. D101, D102, D103, and D104 are connected in a full-wave bridge rectifier configuration; R101 is an NTC thermistor which limits the surge current through the rectifier diodes during power-on. C105 filters the full-wave voltage into DC. The remainder of the power supply circuitry constitutes the DC-to-DC converter.

The voltage on C105 is dropped to several volts through R102 and R103 to develop a start-up voltage at pin 7 of U101; C118 provides additional filtering. Two components, R116 and C116, are chosen to program the frequency at which the switcher will operate. Pin 6 delivers a square-wave output signal which directly drives the power MOSFET, Q101. Q101 generates an inverted square-wave at its drain, using the voltage on C105 as a supply rail. C106, R104, and D107 act to "snub" the square-wave, preventing rise-time overshoot from reaching destructive levels. When the drain of Q101 is driven low, current is drawn through the primary of T101. Power is transfered to the secondary and auxiliary windings through transformer action occurring in T101. The secondary winding is used to generate the voltage for the output of the switcher. The output waveform passes through rectifier diodes D106A, D106B, and D106C, and is filtered by C107, C115, and C119. This voltage is then used as the main B+ supply for the rest of the U5000 circuitry.

Voltage regulation is facilitated through feedback. An auxiliary winding in T101 creates a waveform representative of the output waveform. This auxiliary waveform is first filtered into DC and then divided down through R110 and R113+VR101, and fed into pin 2 of U101. As this voltage changes with load conditions, a correction voltage is developed within U101 and the duty cycle (% on-time/period) of the output square wave (pin 6) is changed. This change in duty cycle changes the



- FIG A -

Theory of Operation (continued)

total power delivered to T101, ultimately correcting the transformer's output voltage. VR101 is used to manually adjust the voltage on pin 2, and is used to vary the switcher output voltage. In addition to providing a feedback voltage, the auxiliary pulse is rectified and filtered by D113 and C118, and used to provide a regulated Vcc to U101 via pin 7.

In the event of excessive current demand from the main B+ rail, the switcher is designed to shut-down its output. If excessive current (over about 3A) is drawn from the main B+ rail, the switcher responds by increasing the power to the primary of T101. The current through the MOSFET is sampled and converted into voltage by R108. This voltage is fed through R117 to pin 3 of U101. C110 bypasses transient noise to ground. When the voltage at pin 3 exceeds 0.6V, U101 shuts-down its output at pin 6, eliminating failure within the switcher. Periodically, the switcher attempts to restart. If the fault persists, it will once again shut itself down. This condition can be heard as a faint "ticking" within the switching supply.

SYNC PROCESSING

(Refer to FIG. B)

Sync processing exists in order to accommodate different types of sync signals which may be used to drive the U5000.

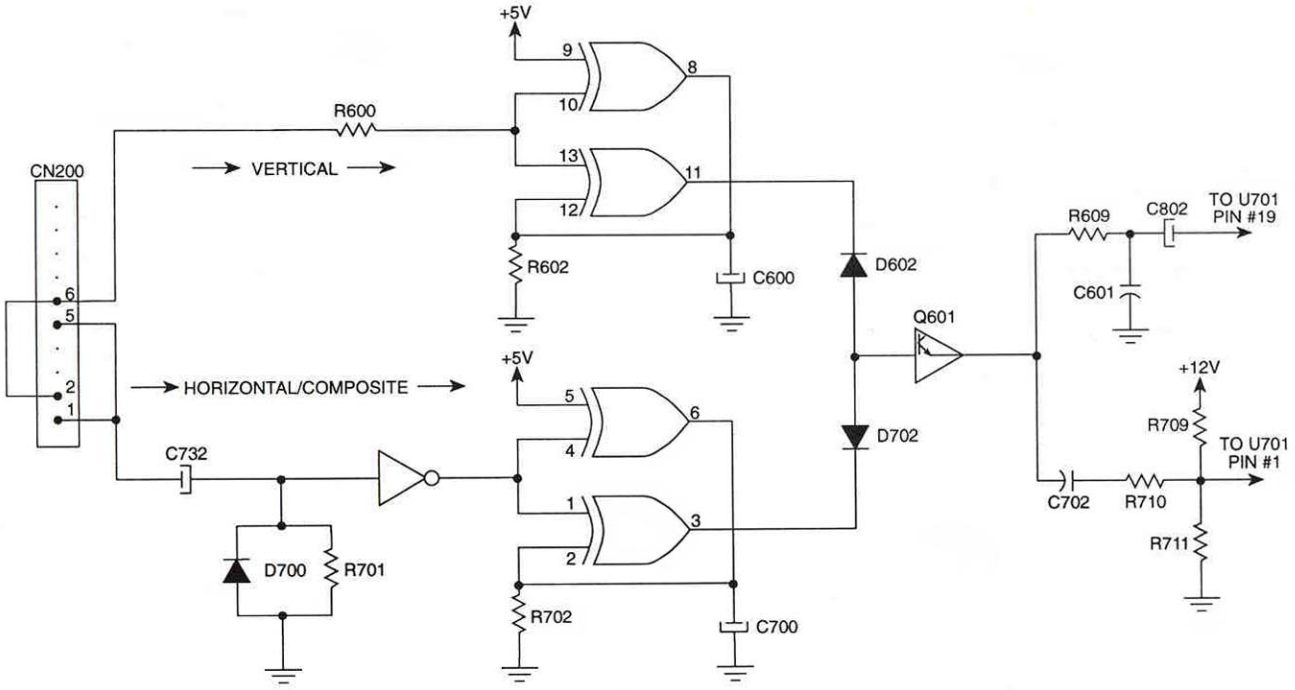
Either composite sync or horizontal sync enter the U5000 through pin 1 or pin 5 of CN200. Both pins function identically. DC is removed from the sync signal via C732. D700 and R701 clamp the bottom of the sync signal to -0.6V. The sync is then fed to the IC via an inverting buffer. Pin 5 of U702 is tied to logic high, while pin 4 is driven by the inverted sync pulse. The XOR gate functions as an inverter. The output at pin 6 is filtered by C700 and a DC level is created. The DC level will be logic high for positive sync at pin 4, and logic low for negative sync at pin 4. This DC voltage in turn feeds pin 2. Pin 1 is driven by the same inverted sync pulse as pin 4. If pin 2 is logic high, the gate functions as an inverter and pin 3 outputs a twice-inverted sync pulse. If pin 2 is logic low, the gate functions as a buffer and pin 3 outputs the once-inverted sync pulse. This circuit will always yield a negative sync signal at pin 3. The incoming sync is "normalized" to a negative signal. Vertical sync enters the U5000 through pin 2 or pin 6 of CN200. Both pins function identically. The sync is fed into U702 via current limiter R600. Two XOR gates are configured in the same manner as those in the horizontal circuit. And, once again, a negative sync signal is always developed at pin 11.

In the case of separate horizontal and vertical sync, the "normalized" sync signals are added through D602 and D702, then divided down and buffered. In the case of composite sync, D602 blocks the vertical sync processing circuit, while D702 allows the composite sync to pass. The composite sync is then divided down and buffered. In either case, the result is negative composite sync at the emitter of Q601. This composite signal is differentiated by C702 and fed into pin 1 (horizontal sync input) of U701, and at the same time, it is integrated by R609 and C601 to remove the horizontal sync signal, and fed into pin 19 (vertical sync input) of U701.

HORIZONTAL OSCILLATOR AND OUTPUT

(Refer to FIG. C)

The horizontal circuitry is responsible for many duties in the U5000. It provides an oscillator, frequency lock, phase shifting, drive signal, over-voltage protection, and horizontal scan.



- FIG B -

Theory of Operation (continued)

Horizontal Sync Processing

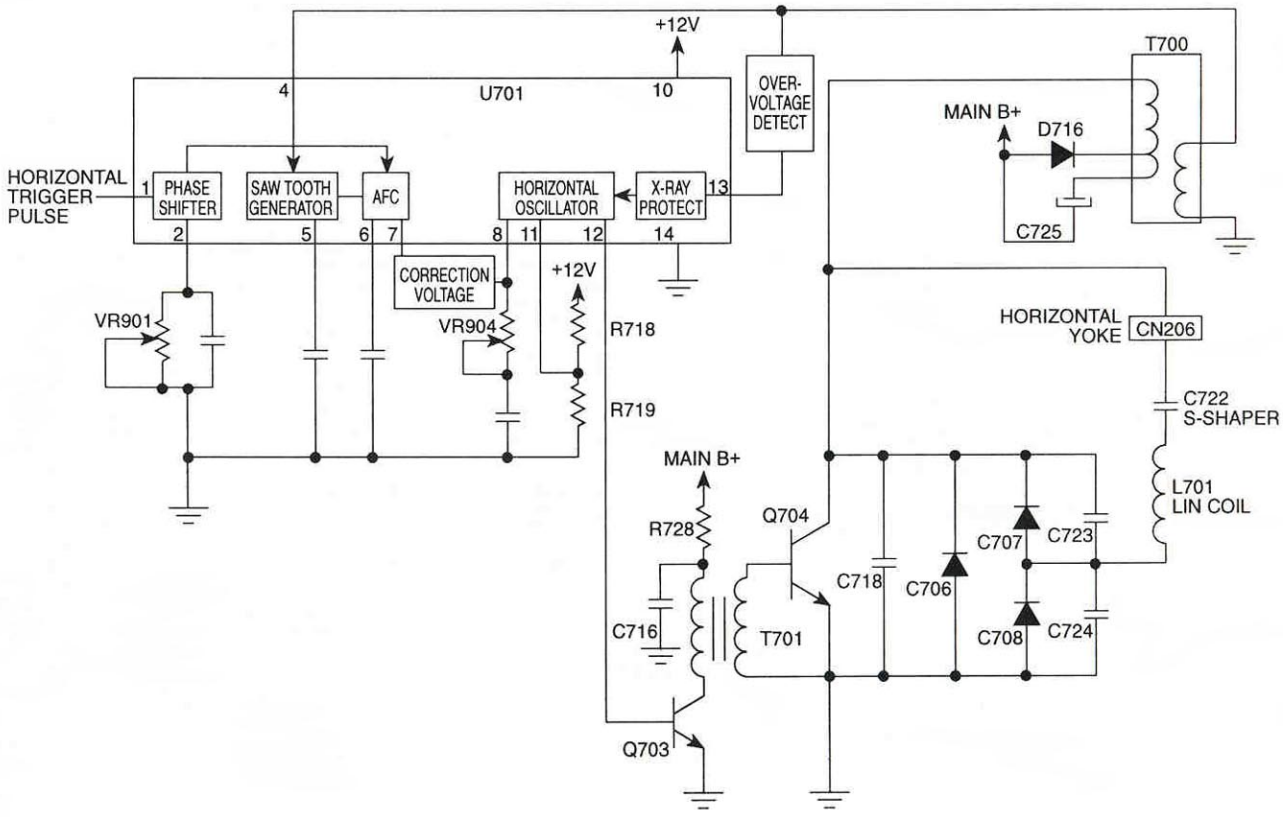
A horizontal sync trigger-pulse enters U701 (horizontal/vertical processor) via pin 1. U701 reconstructs a sync pulse internally, and delays the pulse in proportion to the resistance seen from pin 2 to ground. This resistance is controlled through VR901 on the control board, and allows for the adjustment of the internal phase-delay. Varying the internal delay alters the phase relationship between video and horizontal circuits, resulting in the effect that the video slides side-to-side within the raster. Inside U701 is an internal oscillator circuit. In the absence of an external horizontal sync pulse, the frequency of this oscillator is determined by the RC time constant seen at pin 8 (this particular frequency is termed the "free-run" frequency). VR904+R716 and C708+C727 will determine the free-run oscillator frequency. VR904 is a variable resistor on the control board which allows for the adjustment of this frequency. Provided an external horizontal-sync signal is provided at a frequency close to the free-run frequency, the circuitry will lock-on to the input signal and assume its frequency. If the external sync pulse is absent (even for a brief moment), the oscillator will drift toward the free-run frequency. Therefore, it is best to "zero-beat" the oscillator to the same frequency as the signal generator will provide. The method of locking-on to the incoming sync is as follows. Pin 4 receives a feedback pulse from the flyback transformer. U701 compares the frequency of the feedback pulse to the frequency of the incoming sync and generates an error voltage proportional to their difference. This voltage is used to move the oscillator frequency so as to bring it closer to the incoming sync frequency. This process continues until the error voltage is zero. The horizontal oscillator is then locked-on to the incoming sync frequency. U701 ultimately generates a square wave output at pin 12, at the proper frequency, to drive the horizontal output circuitry. The duty-cycle of this output signal is controlled by the values of R718 and R719.

Q703 is used to invert and buffer the output from U701. When Q703 is on, current is drawn from the main B+ supply through R728 and the primary of T701. Through transformer action, power is transferred to the secondary of T701. This transformer is designed to step-down from the primary to secondary. The high-voltage/low-current in the primary is transformed into a low-voltage/high-current in the secondary. This output current is sufficient to properly drive the base of the horizontal output device, Q704.

Horizontal Output and Deflection

In order to correctly scan the CRT's electron beam, sawtooth current must be developed in the deflection yoke windings. The horizontal sawtooth is generated in the following manner.

With no deflection current through the yoke, the beam free-falls in the center of the CRT face. Yoke coupling capacitor C719 (also known as the S-shaping capacitor) is charged from the main B+. At this point, Q704 is turned on (saturated) and current is drawn in a linear fashion



- FIG C -

Theory of Operation (continued)

from the S-shaper through the horizontal yoke winding, Lhy. This current drawn through the yoke creates a magnetic field which acts to deflect the beam to the right. When the beam has reached the right edge, Q704 is shut off (cut-off), and the C719 discharge current through the yoke is abruptly terminated. This high rate-of-change in the yoke current induces a large voltage-ring at the collector of Q704. The frequency of this ring is controlled in large by the values of Lhy, C718, and C723. (This large pulse is commonly referred to as the "collector-pulse" and 1/2 of the ring period is termed the "retrace time.") During the first 1/2 cycle of the ring, the beam is rapidly deflected from the right edge of the raster to the left edge. This is known as retrace. When this large voltage ring attempts to complete its second 1/2 cycle by traversing negative, damper diode D707 begins conducting, allowing energy stored in the horizontal system to decay to zero. During the damper diode conduction period, the beam is deflected from the left edge of scan back to a zero-current, center position. L701 is a magnetically biased coil placed in series with the yoke, and acts to correct the horizontal linearity of the picture.

(The above circuit description assumes the U5000 is operating in 25kHz mode. The circuit operates in a similar fashion in 15kHz mode, with alternate component values selected by moving the frequency change jumper assembly.)

During the flyback interval, the collector pulse is imposed on the primary winding of T700. This transformer has a large step-up ratio and creates high voltage used to bias the anode of the CRT. The high-voltage is rectified by diodes internal to T700, and filtered through the inherent capacity of the CRT. Inside T700 is a large resistance placed between the high voltage output and ground. Two variable resistors (labeled "focus" and "screen" on T700) are included in the total resistance and are used deliver the proper bias voltage to the focus, and G2 grids of the CRT.

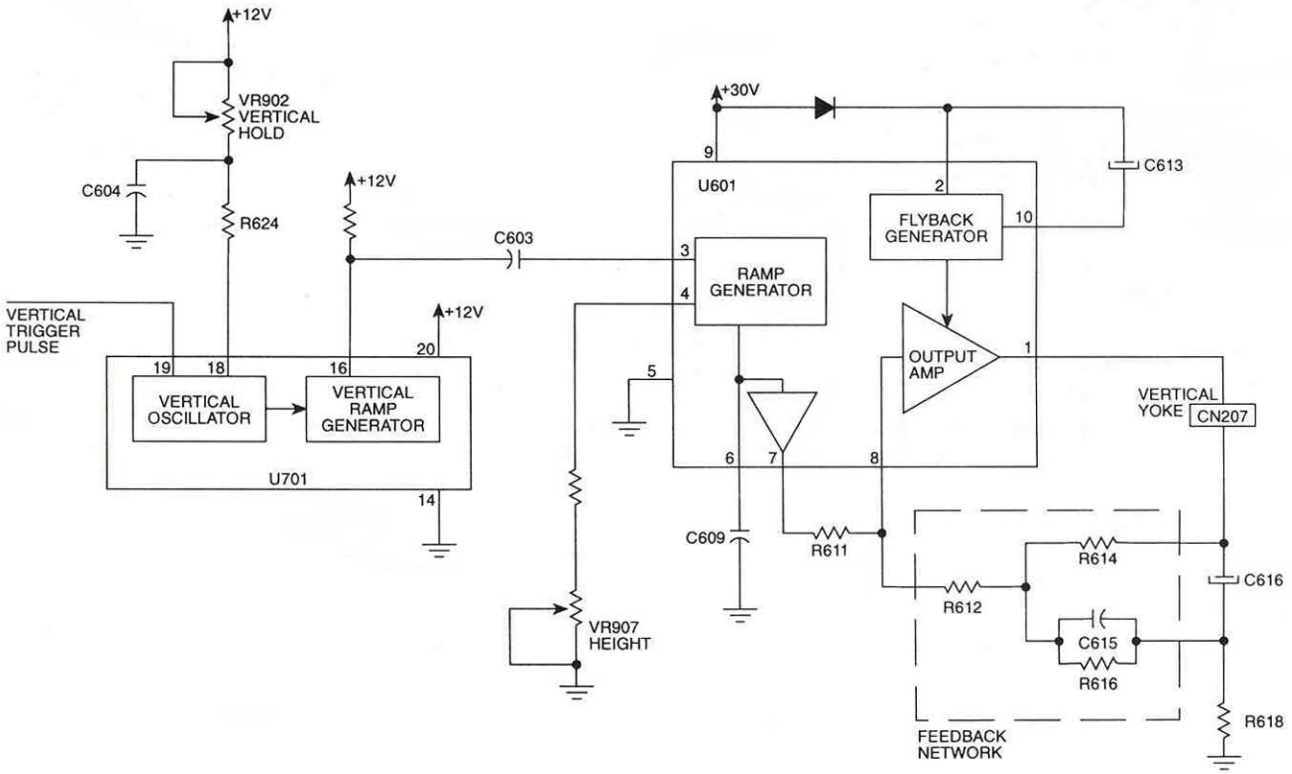
Additional windings inside T700 create the necessary +15V, +30V, and -65V supply voltages used to operate the U5000's circuitry[1]. An additional pulse voltage is developed at pin 5 of T700, and is used to supply energy to the CRT filament, provide the feedback pulse used in the horizontal sync-processing, provide a gate signal for the video, and drive the horizontal blanking circuitry.

VERTICAL OSCILLATOR AND OUTPUT

(Refer to FIG. D)

A vertical sync trigger-pulse enters U701 via pin 19, and is fed internally to the vertical oscillator. The free-run frequency of the oscillator is determined at pin 18 by R624+VR902 and C604. Provided the vertical sync frequency is slightly higher than the free-run frequency, the vertical oscillator will lock-on to the incoming sync. A vertical output ramp is generated at pin 16, and is coupled via C603 into the input of the vertical output IC, U601.

1-Note that in going from 25kHz mode to 15kHz mode, these supply voltages will drop by approximately 15%.



- FIG D -

Theory of Operation (continued)

U601 is a high efficiency vertical output IC. A trigger pulse is supplied to pin 3 to begin each scan cycle. The IC detects the negative leading edge, and from it generates a ramp waveform, using C609 at pin 6 to control the time constant. The amplitude of the ramp can be varied through the use of VR907 on the control PCB. Vertical size increases as the resistance of this control increases. The vertical ramp is routed out of pin 7 and into pin 8 of the IC via resistor R611. This provides the opportunity to add correction to the vertical ramp before it enters the amplification stage. A small portion of the output signal is modified and fed back through a feedback network comprised of R614, R612, R616 and C615 to improve linearity and maintain a constant output. The output waveform is further modifed by C613. C613 receives a flyback pulse from pin 10, and feeds it into pin 2. The pulse is stacked on top of B+ so that the flyback voltage is "pumped up" to a higher voltage necessary for vertical flyback. In addition, by doubling the flyback voltage, vertical retrace is decreased. This allows for faster retrace than the vertical yoke allows for at the lower B+ the IC utilizes. This type of system greatly reduces the dissipation in the IC by using the higher voltage only when it is needed.

The IC has its own internal voltage regulator so that changes in B+ do not affect vertical size. In addition, the IC provides internal thermal protection, shutting itself down in the event of over dissipation.

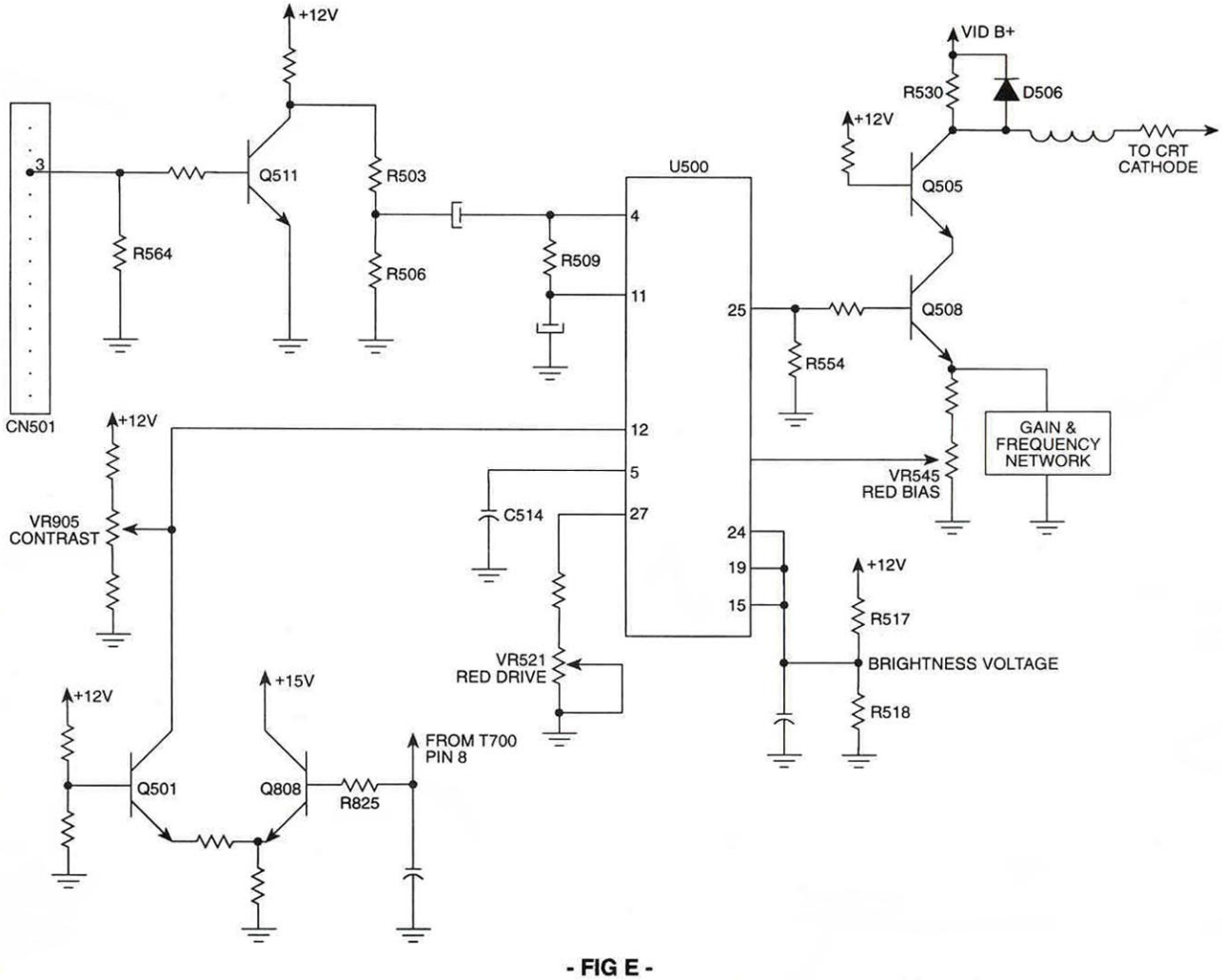
VIDEO PROCESSING

(Refer to FIG. E)

The U5000 video system is made up of three nearly-identical channels, designed to transform incoming RGB (red, green and blue) signals into a state capable of driving the picture tube cathodes. Due to the commonality of these three channels, the red channel is used for illustrative purposes.

Video Processing and Amplification

The red signal enters the U5000 via connector CN201 on the deflection PCB, and is routed to pin 3 of CN501 on the neck PCB through the video cable. The red video signal is terminated by R564 and buffered through Q511. This buffered signal is divided down via R503 and R506, then AC coupled into pin 4 of the video processor IC, U500. Pin 11 provides a DC voltage of 2.4V and is used via R509 to properly bias the input to the IC.



- FIG E -

Theory of Operation (continued)

U500 provides several functions to video system. Among them are signal bias control, signal gain control, and contrast control. Signal bias control is used to vary the amount of DC voltage present in the output stage of each channel. In this way, the CRT cathodes can be individually biased to their respective cutoff points. A voltage, call it the brightness voltage, is set by R517 and R518, and fed into pins 15, 19 and 24. During each horizontal retrace interval, this brightness voltage is compared to a feedback voltage. In the case of the red, the feedback is routed to pin 26 via the red bias control, VR545. When these two voltages are unequal, the output of the comparator shifts accordingly. This output voltage is stored by C514, and the black level portion of the video signal is clamped to it. As the voltage on C514 varies, so does the DC component of the signal. Eventually, the feedback voltage will be driven to equal the brightness voltage, changing the DC operating point of the amplifier and the bias on its respective cathode.

Signal gain can be varied independently for each of the channels (via the drive controls) in order to compensate for differences in the CRT and output stages. The blue drive control is fixed, allowing for any desired color balance to be achieved through the adjustment of red and green drive controls. The gain of the red channel is adjusted by varying VR521.

The red signal exits IC U500 through pin 25. It is terminated by resistor R554, and fed into Q508.

Video intensity is controlled by varying the contrast control, VR905 on the control PCB. This action varies a DC voltage at pin 12 on U500, changing the gain of all 3 of the IC's internal amplifiers simultaneously.

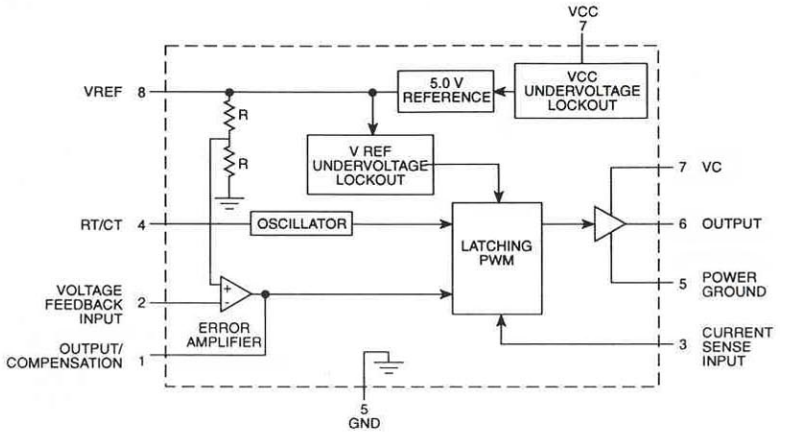
Brightness in the U5000 is controlled by varying the bias voltage on grid 1 (G1) of the CRT. This is achieved through adjustment of the brightness control, VR906, on the control board. CRT blanking is also performed through the use of G1. Horizontal and vertical retrace pulses are added together and fed into the base of Q800. A composite blanking signal of proper amplitude is generated at the collector, then coupled into the G1 circuitry.

Automatic Beam Limiting

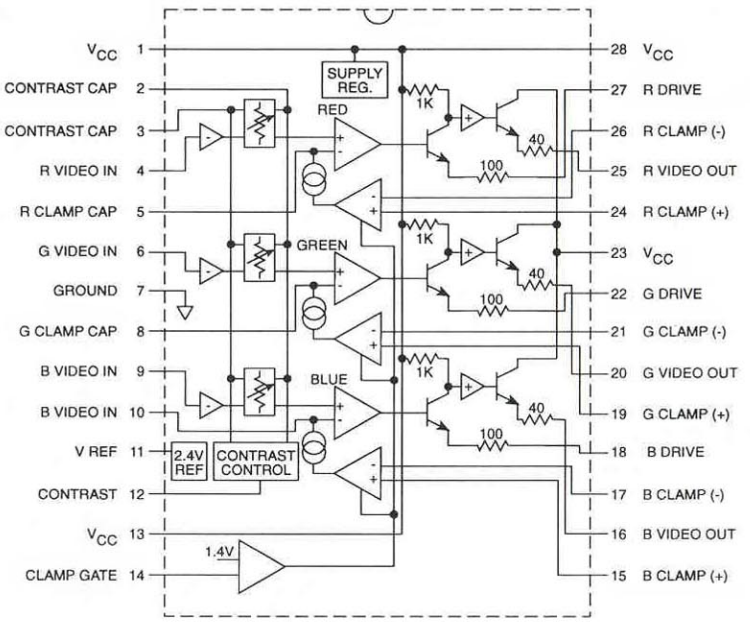
Automatic beam limiting (ABL) is necessary to prevent display aberrations caused by excessive beam current contacting the shadow mask inside the CRT.

Beam current is sensed through R825 and buffered by Q808. Excessive beam current (approximately 1.1ma) will drive the emitter of Q808 downward. This voltage is routed up to the neckboard through the video cable and coupled into the emitter of Q501. When this voltage is sufficiently low, Q501 turns on, pulling the contrast voltage at pin 12 of U500 down. This results in reduced display intensity. In the event of a condition which would override the range of the contrast ABL, excess beam current is routed through R810 generating a negative-going voltage which is coupled into the brightness circuit. This negative-going voltage reduces the bias on grid 1 of the CRT. The net result is a larger range of operation of the ABL.

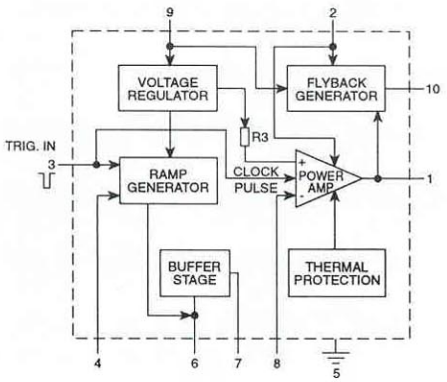
NOTES:



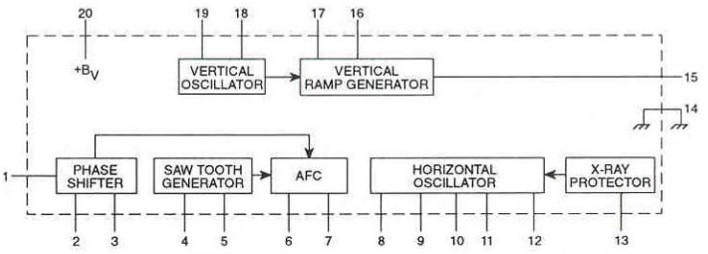
- U101 -



- U500 -



- U601 -



- U701 -

All readings are in volts, and were taken with a crosshatch pattern displayed at nominal screen intensity.

TEST POINTS	25kHz	15kHz
TP103*	0.56	0.50
TP104*	20.00	20.00
TP105*	0.10	0.10
TP106*	152.00	155.00
TP200	4.80	4.60
TP201	0.15	0.14
TP202	117.20	118.50
TP203	156.10	159.00
TP204	17.00	15.20
TP205	32.20	26.00

	25kHz		15kHz	
ZENERS	ANODE	CATH	ANODE	CATH
Z500	0.00	12.20	0.00	11.80
Z601	0.00	11.50	0.00	11.40
Z700	0.00	5.10	0.00	5.20
Z701	0.15	4.80	0.14	4.70
Z702	0.00	13.90	0.00	13.30
Z705	0.00	9.10	0.00	9.10
Z802	0.70	14.20	0.60	13.50

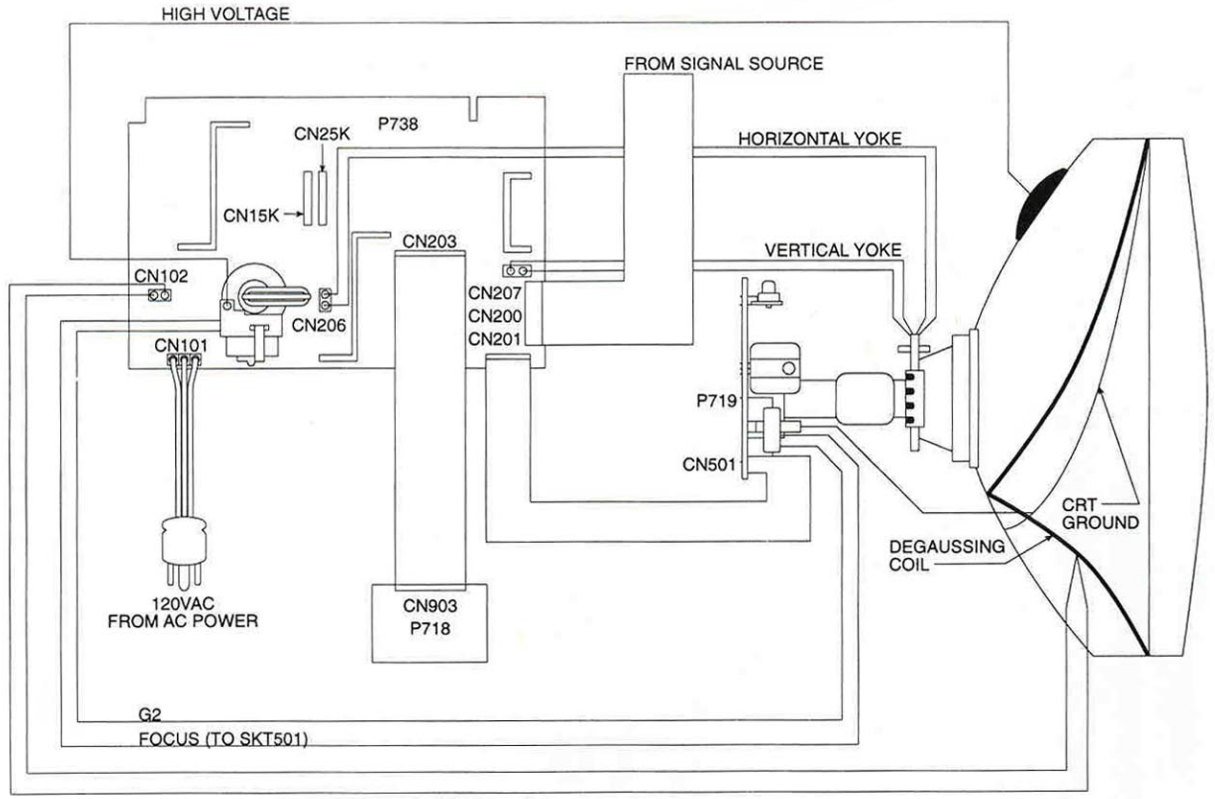
Parts marked with "*" are measured with respect to AC GROUND. All other parts are measured with respect to chassis ground.

FOR YOUR SAFETY, IT IS RECOMMENDED THAT AN ISOLATION TRANSFORMER BE USED WHEN SERVICING THIS PRODUCT.

	25kHz		15kHz	
DIODES	ANODE	CATH	ANODE	CATH
D101*	77.30	157.00	77.70	158.00
D102*	77.30	157.00	78.00	158.00
D103*	0.00	77.30	0.00	78.30
D104*	0.00	77.60	0.00	78.00
D105*	20.50	20.00	20.50	20.00
D106A	-0.30	85.00	-0.30	89.00
D106B	85.00	93.50	89.00	99.00
D106C	93.50	119.60	99.00	120.50
D107*	153.00	306.00	155.00	305.00
D108*	153.00	156.00	155.00	158.00
D109*	0.10	0.20	0.10	0.18
D110*	0.16	-0.12	0.18	0.00
D111*	-0.30	0.00	0.00	0.00
D112*	0.00	20.00	0.00	20.10
D113*	0.00	20.00	0.00	20.00
D114*	8.00	20.00	8.00	20.00
D117	-170.00	-0.30	-166.00	-0.30
D301	-0.80	17.00	-0.50	15.20
D302	-0.40	32.20	0.00	26.00
D303	-54.40	5.70	-59.00	6.40
D310	-0.10	155.60	-0.10	159.00
D501	1.20	0.50	1.20	0.50
D502	1.50	0.70	1.40	0.70
D503	1.50	0.80	1.50	0.80
D504	26.00	156.00	130.70	159.00
D505	117.00	156.00	123.00	159.00
D506	112.00	156.00	102.00	159.00
D507	8.40	8.20	8.30	8.10
D600	3.50	5.10	0.24	5.20
D601	0.00	3.50	0.00	0.24
D602	12.80	18.70	11.50	17.00
D603	32.20	32.50	26.00	26.30
D604	0.50	0.00	0.60	0.00
D700	0.00	-0.20	0.00	-0.20
D702	12.70	15.20	11.50	13.70
D707	7.50	1300.00	16.60	1280.00
D708	0.00	7.50	0.00	16.60
D709	17.00	16.20	15.20	14.40
D710	13.50	12.60	13.00	12.40
D711	-0.18	24.40	-0.10	24.30
D712	13.90	13.50	13.30	12.90
D713	13.00	12.60	12.40	12.00
D716	117.00	165.50	118.50	117.80
D800	-0.40	0.00	-0.40	0.00
D802	-24.70	21.50	-28.00	20.00
D803	-0.40	0.00	-0.60	0.00
D804	-0.60	-0.40	-0.60	-0.40
D805	18.00	17.50	16.30	15.80
D806	0.00	17.50	0.00	15.80
D807	-24.70	-0.40	-28.00	-0.50

TRSTR	25kHz EMIT	25kHz BASE	25kHz COLL	15kHz EMIT	15kHz BASE	15kHz COLL
Q101*	0.10	8.00	153.50	0.10	8.00	154.00
Q501	16.60	8.20	8.20	14.80	6.50	8.10
Q502	0.00	-0.14	10.10	0.00	-0.10	10.20
Q503	11.60	12.20	127.80	11.20	11.70	130.30
Q504	11.70	12.20	119.60	11.20	11.70	122.20
Q505	11.70	12.20	103.60	11.20	11.80	100.00
Q506	1.20	1.90	11.60	1.20	1.90	11.20
Q507	1.40	2.10	11.70	1.30	2.00	11.20
Q508	1.50	2.20	11.70	1.50	2.10	11.20
Q509	0.90	0.20	0.00	0.90	0.25	0.00
Q510	0.90	0.20	0.00	0.90	0.25	0.00
Q511	0.90	0.20	0.00	0.90	0.25	0.00
Q601	9.70	10.30	17.10	8.70	9.30	15.20
Q602	7.20	7.90	13.70	5.00	5.70	13.30
Q700	0.00	-0.30	4.70	0.00	-0.30	4.70
Q703	0.00	0.30	80.50	0.00	0.30	90.00
Q704	0.00	-0.20	1300.00	0.00	-0.20	1280.00
Q705	13.80	13.10	13.90	13.30	13.30	7.00
Q708	13.90	9.10	117.80	13.60	9.10	118.80
Q709	4.40	3.80	1.00	5.70	5.20	1.00
Q710	0.00	1.00	7.50	0.00	1.00	16.00
Q800	0.00	-0.40	-8.10	0.00	-0.40	-8.30
Q808	17.00	17.60	17.20	15.00	15.80	15.30

ICs	25kHz U101	25kHz U500	25kHz U601	25kHz U701	25kHz U702	15kHz U101	15kHz U500	15kHz U601	15kHz U701	15kHz U702
PIN 1	2.10	12.30	14.00	4.90	4.70	2.00	11.80	13.50	4.80	4.70
PIN 2	2.50	5.70	32.70	9.50	0.20	2.50	5.40	26.30	9.50	0.28
PIN 3	0.10	5.70	3.90	10.00	15.30	0.10	5.40	3.90	9.80	13.80
PIN 4	1.80	2.30	6.70	-0.20	4.70	1.90	2.20	6.70	-0.26	4.70
PIN 5	0.00	1.70	0.00	4.10	5.20	0.00	1.50	0.00	4.40	5.20
PIN 6	8.00	2.30	11.10	3.50	0.20	8.00	2.20	11.70	3.70	0.28
PIN 7	20.00	0.00	11.60	7.00	0.00	20.00	0.00	12.30	7.00	0.00
PIN 8	5.00	1.50	4.50	7.20	4.90	5.00	1.30	4.50	7.20	4.70
PIN 9	-	2.30	32.50	6.10	5.20	-	2.20	26.00	6.50	5.20
PIN 10	-	1.50	1.70	14.00	0.20	-	1.30	2.10	13.60	0.24
PIN 11	-	2.30	-	6.70	16.80	-	2.30	-	6.50	14.80
PIN 12	-	8.50	-	0.50	4.90	-	8.30	-	0.50	4.70
PIN 13	-	12.20	-	0.10	0.20	-	11.80	-	0.14	0.24
PIN 14	-	10.10	-	0.00	5.20	-	10.20	-	0.00	5.20
PIN 15	-	0.80	-	2.40	-	-	0.80	-	2.50	-
PIN 16	-	1.90	-	8.80	-	-	1.90	-	8.60	-
PIN 17	-	0.90	-	0.90	-	-	0.90	-	0.90	-
PIN 18	-	1.40	-	5.80	-	-	1.30	-	5.70	-
PIN 19	-	0.80	-	5.80	-	-	0.80	-	5.70	-
PIN 20	-	2.10	-	11.60	-	-	2.00	-	11.50	-
PIN 21	-	0.90	-	-	-	-	0.80	-	-	-
PIN 22	-	1.50	-	-	-	-	1.50	-	-	-
PIN 23	-	12.30	-	-	-	-	11.80	-	-	-
PIN 24	-	0.80	-	-	-	-	0.80	-	-	-
PIN 25	-	2.20	-	-	-	-	2.20	-	-	-
PIN 26	-	0.90	-	-	-	-	0.90	-	-	-
PIN 27	-	1.20	-	-	-	-	1.20	-	-	-
PIN 28	-	12.30	-	-	-	-	11.80	-	-	-



AC INPUT CONNECTOR: CN101

Amp type 350760-4
Mating Amp type 1-480700-0

Pin	Description
1	AC hot
2	Earth gnd
3	AC neutral

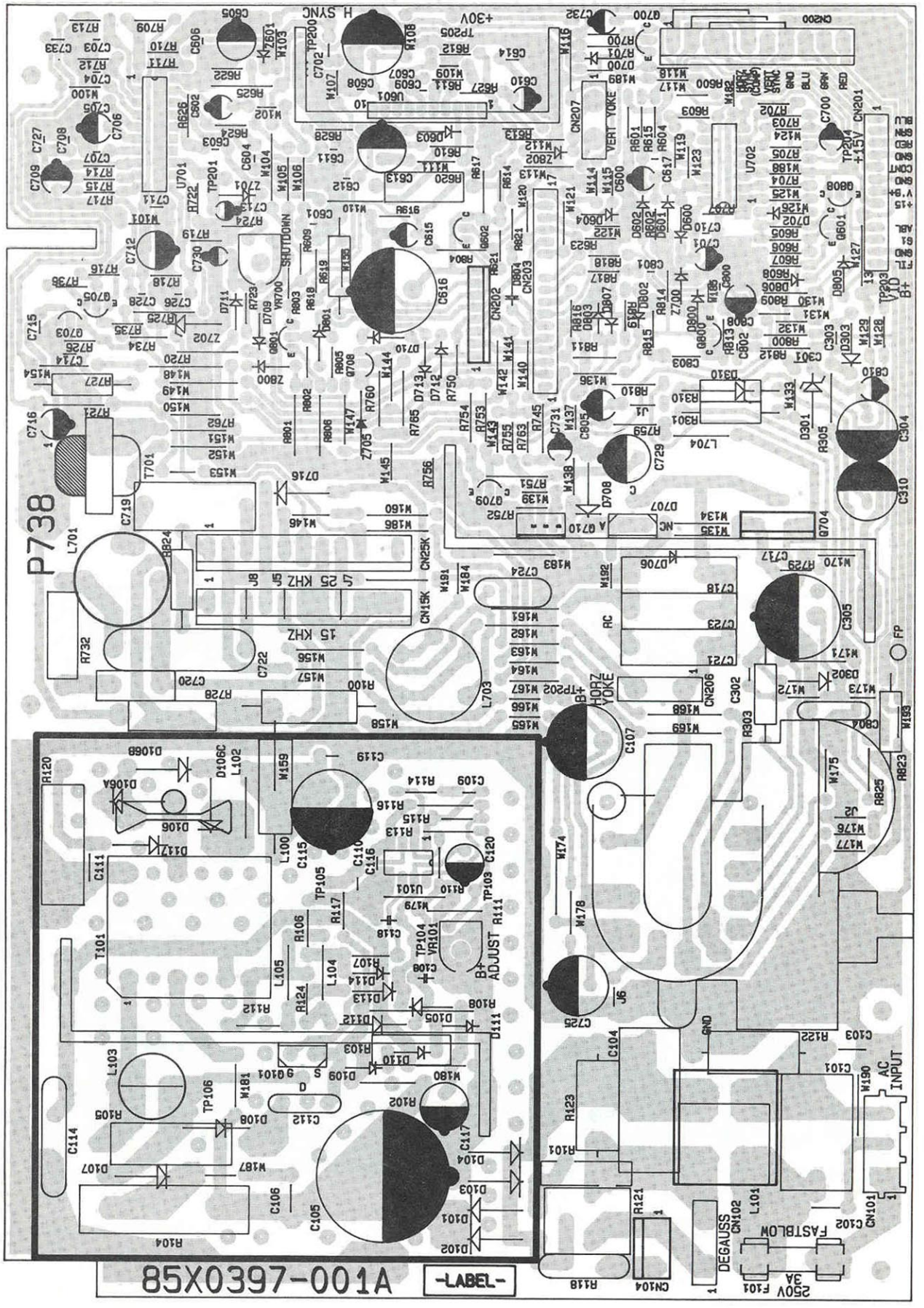
MODE SELECTION CONNECTORS

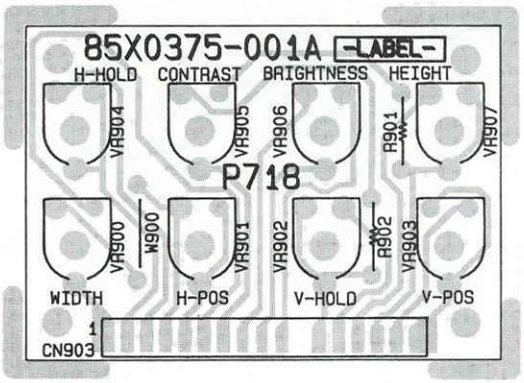
CN15K	15kHz Operation
CN25K	25kHz Operation

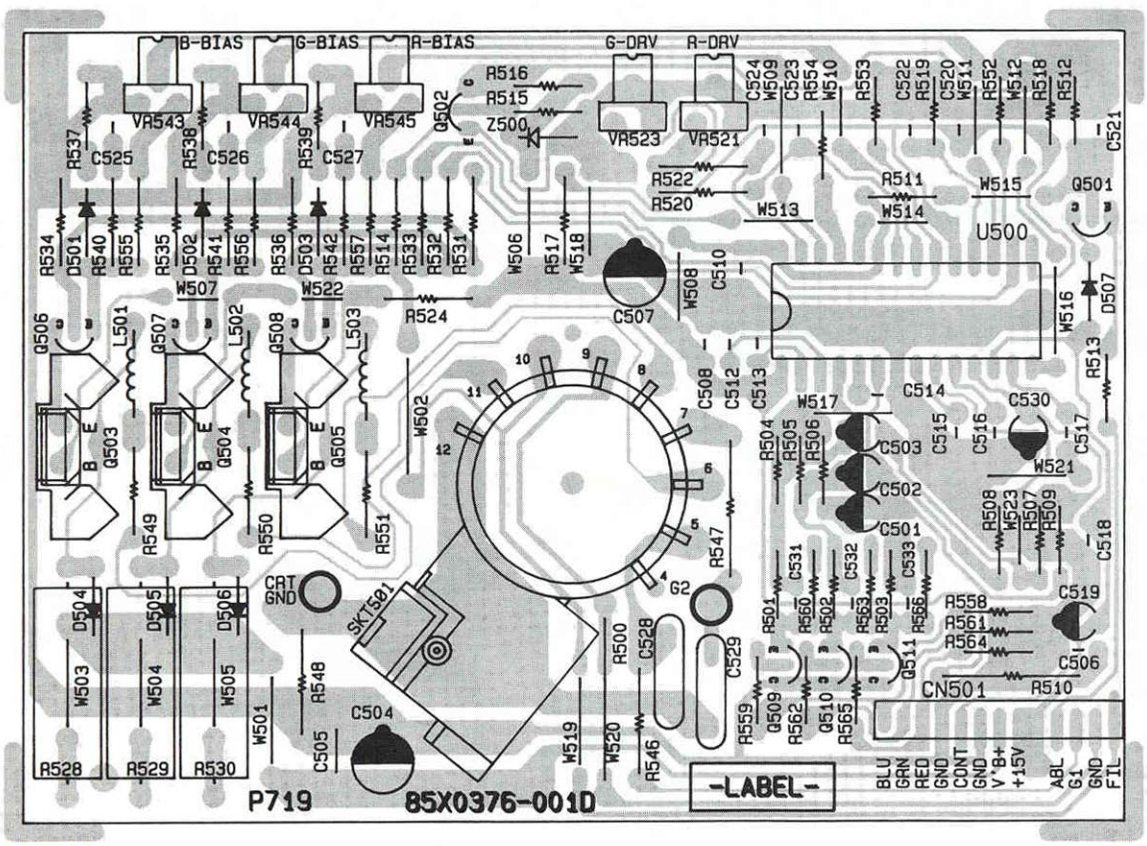
INPUT SIGNAL CONNECTOR: CN200

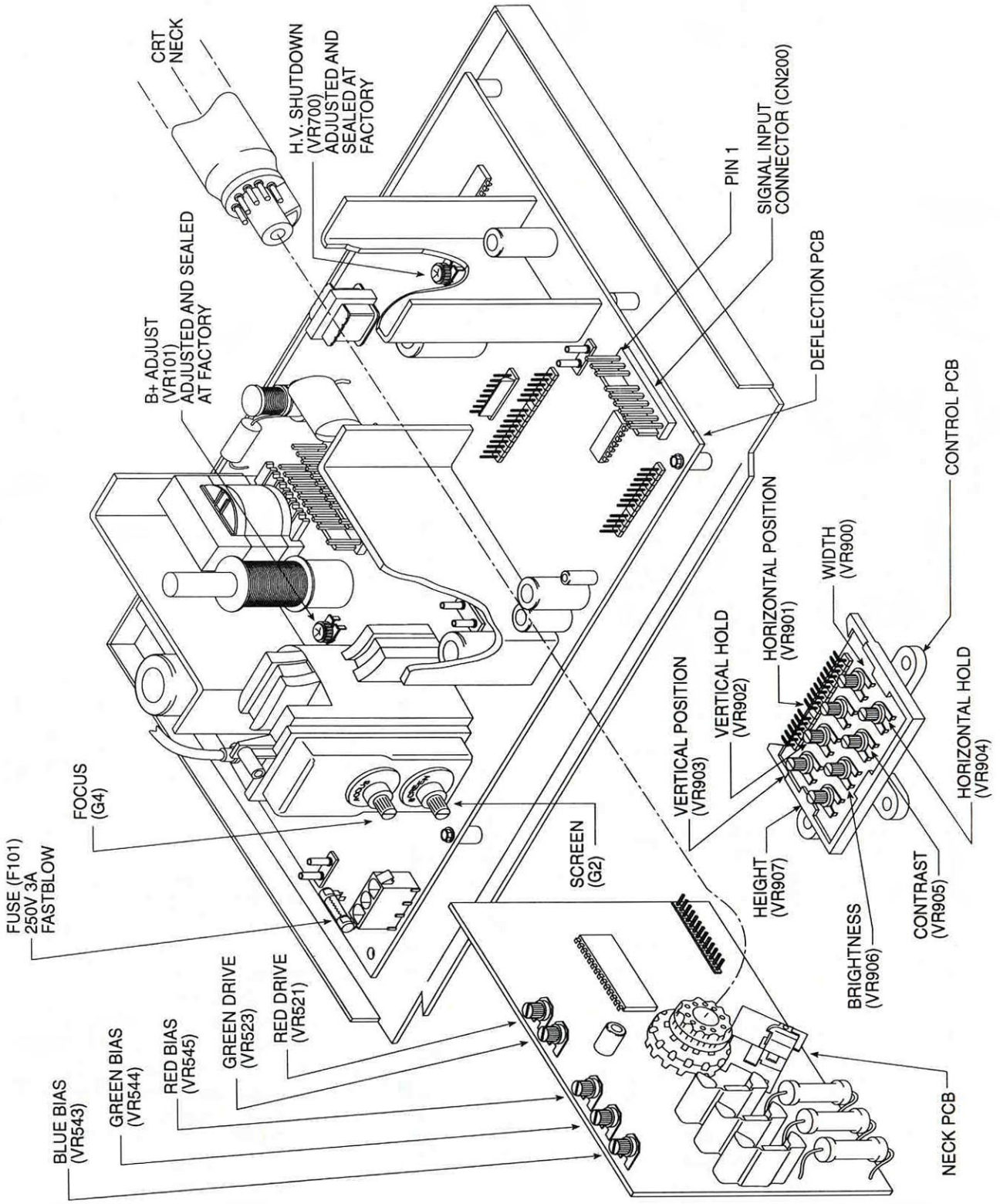
Amp type 1-640445-1
Mating Amp type 1-640428-1

Pin	Description
1	Red
2	Green
3	Blue
4	Gnd
5	Vertical
6	Horizontal
7	
8	Gnd
9	Vertical
10	Horizontal


P738
85X0397-001A
-LABEL-
H SYNC
+30V
25 KHZ
15 KHZ
HORZ YOKE
B+ ADJUST
VERT YOKE
DEGAUSS
FASTBLOW
AC INPUT
SHUTDOWN


85X0375-001A
-LABEL-
H-HOLD
CONTRAST
BRIGHTNESS
HEIGHT
VR904
VR905
VR906
R901
VR907
P718
VR900
W900
VR901
VR902
R902
VR903
WIDTH
H-POS
V-HOLD
V-POS
1
CN903


B-BIAS
G-BIAS
R-BIAS
G-DRV
R-DRV
VR543
VR544
VR545
VR523
VR521
U500
CN501
P719
85X0376-001D
-LABEL-
BLU
GRN
RED
GND
CONT
GND
V'B+
+15V
ABL
G1
GND
FIL


CRT NECK
H.V. SHUTDOWN (VR700) ADJUSTED AND SEALED AT FACTORY
B+ ADJUST (VR101) ADJUSTED AND SEALED AT FACTORY
PIN 1
SIGNAL INPUT CONNECTOR (CN200)
DEFLECTION PCB
CONTROL PCB
FOCUS (G4)
FUSE (F101) 250V 3A FASTBLOW
SCREEN (G2)
VERTICAL POSITION (VR903)
VERTICAL HOLD (VR902)
HORIZONTAL POSITION (VR901)
WIDTH (VR900)
HORIZONTAL HOLD (VR904)
HEIGHT (VR907)
CONTRAST (VR905)
BRIGHTNESS (VR906)
BLUE BIAS (VR543)
GREEN BIAS (VR544)
RED BIAS (VR545)
GREEN DRIVE (VR523)
RED DRIVE (VR521)
NECK PCB

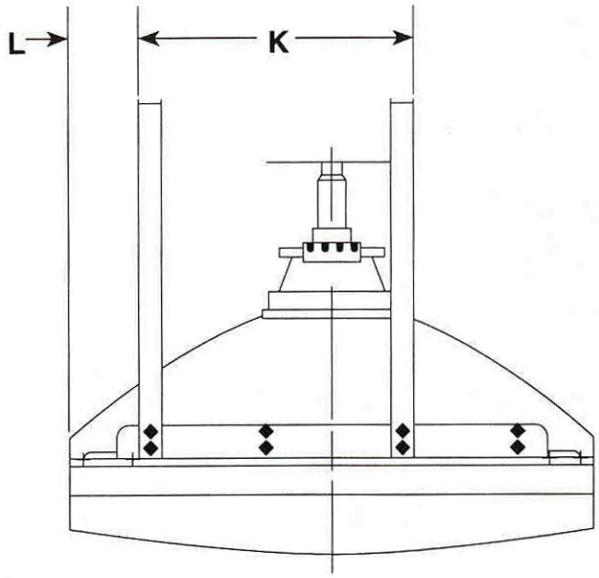
WELLS GARDNER ELECTRONICS CORP.
25V COLOR MONITOR F25M4

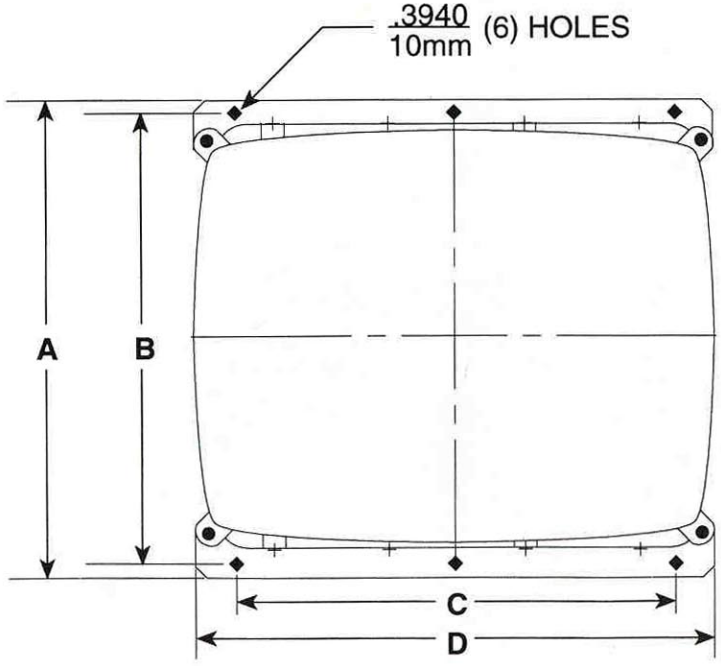
DIM	A	B	C	D	E	F	G
IN.	20.630	19.291	19.291	23.000	19.528	3.515	7.375
mm.	524	490	490	584.2	496	89.28	187.33

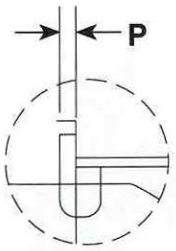
DIM	H	J	K	L	M	N	P
IN.	10.125	1.750	12.000	3.140	3.250	2.562	.343
mm.	257.18	44.45	304.8	79.76	82.55	65.07	8.71

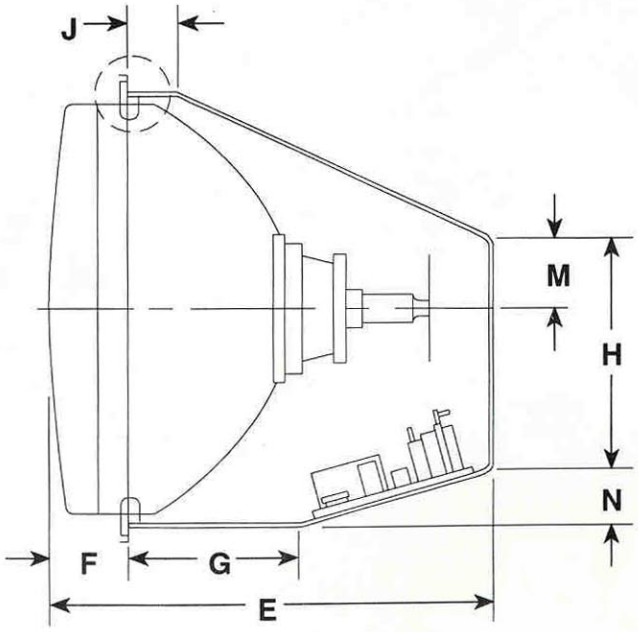
DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.
FOR SPECIFICS CONTACT W.G.E.C. ENGINEERING.

2701 N. KILDARE AVE.
CHICAGO, ILLINOIS 60639
PHONE (312) 252-8220
FAX (312) 252-8072









Replacement Parts List

FINAL ASSEMBLY PARTS

Y63E5191-000

1		038A7448-000	ASSEMBLY: CRT BRKT MTG 2)	11		030X0762-001	CABLE TIE (7)
2		038A7469-000	ASSEMBLY: CHASSIS PAN	12		030X0765-001	LUG
3		038A7520-000	ASSEMBLY: CRT GND WIRE	13		030X0827-001	WIRE CLAMP
4		001X0802-002	DEGAUSSING COIL STRAP (4)	14		088X0351-506	CRT 25" C MVA63AFW22X PHILIPS
5		001X0811-001	BARRIER NECK PCB	15		089X0113-001	RTV SILICON RUBBER
6		002X0602-005	SPACER 5/16 (5)	16		089X0133-001	ADHESIVE 2 PART EPOXY
7		004X2577-001	PCB SUPPORT	17		312X1205-206	SCR SWG #6-32x3/8 HWH (2)
8		009A2963-002	COIL DEGAUSS 25" CRT ALUM	18		312X1505-906	SCR SWG 8-32x3/8 HWH GRN
9		020X1794-126	SCR 1/4-20x5/8 HH WSH/LK (4)	19		312X1805-206	SCR SWG 10-24x3/8 HWH (12)
10		025X3299-001	BRKT U-CHANNEL (2)	20		Y63E5191-000L	RS LITERATURE - Y63E5191

CONTROL BOARD ASSEMBLY

025A1415-001

P718

21		004X2572-001	PCB HOLDER	29	VR901	040X0703-006	TRIM POT 20K OHM 0.5W 20%
22		013X1331-001	CABLE ASSY CONTROL PCB	30	VR902	040X0703-008	TRIM POT 200K OHM 0.5W 20%
23		085X0375-001	PC BOARD	31	VR903	040X0703-005	TRIM POT 10K OHM 0.5W 20%
24	CN903	006A0474-017	HEADER 17 PIN 0.100 CTR R.A.	32	VR904	040X0703-004	TRIM POT 5K OHM 0.5W 20%
25	R900	320X2200-000	WIRE #22 BARE SOLID	33	VR905	040X0703-005	TRIM POT 10K OHM 0.5W 20%
26	R901	340X2272-934	RES 2.7K OHM 5% 1/4 CF	34	VR906	040X0703-007	TRIM POT 100K OHM 0.5W 20%
27	R902	340X2222-934	RES 2.2K OHM 5% 1/4 CF	35	VR907	040X0703-008	TRIM POT 200K OHM 0.5W 20%
28	VR900	040X0703-004	TRIM POT 5K OHM 0.5W 20%				

NECK BOARD ASSEMBLY

025A1414-001

P719

36		013X1330-001	CABLE ASSY VIDEO PCB	61	C526	047X0788-033	CAP 680pF 10% NPO 50V MON
37		025X3341-001	HEAT SINK (QTY 3)	62	C527	047X0788-033	CAP 680pF 10% NPO 50V MON
38		085X0376-001	PC BOARD	63	C529	080X0099-095	CAP 1000pF 10% Z5F 2KV CER
39	W507	340X2101-934	RES 100 OHM 5% 1/4W	64	C530	045X0560-518	CAP LYT 10uF 25V
40	W522	340X2101-934	RES 100 OHM 5% 1/4W	65	C531	080X0099-703	CAP 3.9pF NPO 50V CER
41	C501	045X0560-518	CAP LYT 10uF 25V	66	C532	080X0099-703	CAP 3.9pF NPO 50V CER
42	C502	045X0560-518	CAP LYT 10uF 25V	67	C533	080X0099-703	CAP 3.9pF NPO 50V CER
43	C503	045X0560-518	CAP LYT 10uF 25V	68	C540	090X0099-506	CAP 470pF 10% 25F
44	C504	045X0566-007	CAP LYT 4.7uF 20% 200V 105 C	69	C541	045X0560-001	CAP LYT 4.7uF 25V
45	C505	080X0099-062	CAP 0.02uF +80-20% Z5U 500V	70	CN501	006A0473-013	HEADER 13 PIN 0.100 CTR
46	C506	047X0788-512	CAP 0.1uF 20% Z5U 50V MON	71	CRT-GND	030X0756-001	PIN BEAD CHAIN
47	C507	045X0560-554	CAP LYT 100uF 20% 16V	72	D501	066X0070-001	DIODE 1N914B
48	C508	047X0788-512	CAP 0.1uF 20% Z5U 50V MON	73	D502	066X0070-001	DIODE 1N914B
49	C510	047X0788-512	CAP 0.1uF 20% Z5U 50V MON	74	D503	066X0070-001	DIODE 1N914B
50	C512	045X0560-519	CAP LYT 1.0uF 20% 50V	75	D504	066X0062-001	DIODE SANYO GMA02
51	C513	047X0788-512	CAP 0.1uF 20% Z5U 50V MON	76	D505	066X0062-001	DIODE SANYO GMA02
52	C514	047X0788-512	CAP 0.1uF 20% Z5U 50V MON	77	D506	066X0062-001	DIODE SANYO GMA02
53	C515	047X0788-512	CAP 0.1uF 20% Z5U 50V MON	78	D507	066X0070-001	DIODE 1N914B
54	C516	047X0788-512	CAP 0.1uF 20% Z5U 50V MON	79	G2	030X0797-001	PLUG V PIN
55	C517	047X0788-512	CAP 0.1uF 20% Z5U 50V MON	80	L501	009A2811-004	COIL 12uH
56	C518	047X0788-512	CAP 0.1uF 20% Z5U 50V MON	81	L502	009A2811-004	COIL 12uH
57	C519	045X0560-501	CAP LYT 4.7uF 25V	82	L503	009A2811-004	COIL 12uH
58	C520	047X0788-512	CAP 0.1uF 20% Z5U 50V MON	83	Q501	086X0113-501	TRSTR 2N3904 MOT
59	C521	047X0788-512	CAP 0.1uF 20% Z5U 50V MON	84	Q502	086X0113-501	TRSTR 2N3904 MOT
60	C525	047X0788-033	CAP 680pF 10% NPO 50V MON	85	Q503	086X0287-001	TRSTR NPN SANYO 2SC3782

Replacement Parts List (continued)

NECK BOARD ASSEMBLY

025A1414-001

P719

86	Q504	086X0287-001	TRSTR NPN SANYO 2SC3782
87	Q505	086X0287-001	TRSTR NPN SANYO 2SC3782
88	Q506	086X0113-501	TRSTR 2N3904 MOT
89	Q507	086X0113-501	TRSTR 2N3904 MOT
90	Q508	086X0113-501	TRSTR 2N3904 MOT
91	Q509	086X0114-501	TRSTR 2N3906 MOT
92	Q510	086X0114-501	TRSTR 2N3906 MOT
93	Q511	086X0114-501	TRSTR 2N3906 MOT
94	R500	340X4033-633	RES 3.3 OHM 5% 1W MO/MF
95	R501	340X2242-934	RES 2.4K OHM 5% 1/4W CF
96	R502	340X2242-934	RES 2.4K OHM 5% 1/4W CF
97	R503	340X2242-934	RES 2.4K OHM 5% 1/4W CF
98	R504	340X2112-934	RES 1.1K OHM 5% 1/4W CF
99	R505	340X2112-934	RES 1.1K OHM 5% 1/4W CF
100	R506	340X2112-934	RES 1.1K OHM 5% 1/4W CF
101	R507	340X2103-934	RES 10K OHM 5% 1/4W CF
102	R508	340X2103-934	RES 10K OHM 5% 1/4W CF
103	R509	340X2103-934	RES 10K OHM 5% 1/4W CF
104	R510	340X4300-934	RES 30 OHM 5% 1W CF
105	R511	340X2113-934	RES 11.0K OHM 5% 1/4W CF
106	R512	340X2302-934	RES 3.0K OHM 5% 1/4W CF
107	R513	340X2910-934	RES 91 OHM 5% 1/4W CF
108	R514	340X2103-934	RES 10K OHM 5% 1/4W CF
109	R515	340X2102-934	RES 1.0K OHM 5% 1/4W CF
110	R516	340X2103-934	RES 10K OHM 5% 1/4W CF
111	R517	340X2103-934	RES 10K OHM 5% 1/4W CF
112	R518	340X2751-934	RES 750 OHM 5% 1/4W CF
113	R519	340X2181-934	RES 180 OHM 5% 1/4W CF
114	R520	340X2560-934	RES 56 OHM 5% 1/4W CF
115	R522	340X2560-934	RES 56 OHM 5% 1/4W CF
116	R524	340X2101-934	RES 100 OHM 5% 1/4W CF
117	R528	420X8272-326	RES 2.7K OHM 5% 5W MO
118	R529	420X8272-326	RES 2.7K OHM 5% 5W MO
119	R530	420X8272-326	RES 2.7K OHM 5% 5W MO
120	R531	340X2220-934	RES 22 OHM 5% 1/4W CF
121	R532	340X2220-934	RES 22 OHM 5% 1/4W CF
122	R533	340X2220-934	RES 22 OHM 5% 1/4W CF
123	R537	340X2560-934	RES 56 OHM 5% 1/4W CF
124	R538	340X2560-934	RES 56 OHM 5% 1/4W CF
125	R539	340X2560-934	RES 56 OHM 5% 1/4W CF
126	R540	340X2390-934	RES 39 OHM 5% 1/4W CF
127	R541	340X2390-934	RES 39 OHM 5% 1/4W CF
128	R542	340X2390-934	RES 39 OHM 5% 1/4W CF
129	R543	040X0653-008	TRIM POT 1K OHM 20% 0.5W
130	R544	040X0653-008	TRIM POT 1K OHM 20% 0.5W
131	R545	040X0653-008	TRIM POT 1K OHM 20% 0.5W
132	R546	340X3151-234	RES 150 OHM 5% 1/2W CC
133	R547	340X3102-234	RES 1.0K OHM 5% 1/2W CC
134	R548	320X2000-000	WIRE #20 BARE SOLID
135	R549	340X3151-234	RES 150 OHM 5% 1/2W CC
136	R550	340X3151-234	RES 150 OHM 5% 1/2W CC
137	R551	340X3151-234	RES 150 OHM 5% 1/2W CC
138	R552	340X2391-934	RES 390 OHM 5% 1/4W CF
139	R553	340X2391-934	RES 390 OHM 5% 1/4W CF
140	R554	340X2391-934	RES 390 OHM 5% 1/4W CF
141	R555	340X2391-934	RES 390 OHM 5% 1/4W CF
142	R556	340X2391-934	RES 390 OHM 5% 1/4W CF
143	R557	340X2391-934	RES 390 OHM 5% 1/4W CF
144	R558	340X2102-934	RES 1.0K OHM 5% 1/4W CF
145	R559	340X2101-934	RES 100 OHM 5% 1/4W CF
146	R560	340X2202-934	RES 2.0K OHM 5% 1/4W CF
147	R561	340X2102-934	RES 1.0K OHM 5% 1/4W CF
148	R562	340X2101-934	RES 100K OHM 5% 1/4W CF
149	R563	340X2202-934	RES 2.0K OHM 5% 1/4W CF
150	R564	340X2102-934	RES 1.0K OHM 5% 1/4W CF
151	R565	340X2101-934	RES 100K OHM 5% 1/4W CF
152	R566	340X2202-934	RES 2.0K OHM 5% 1/4W CF
153	SKT501	003A0636-002	CRT SOCKET 29MM
154	U500	086X0270-001	IC LM1203N RGB VID AMP NSC
155	VR521	040X0653-001	TRIM POT 200 OHM 20% 0.5W
156	VR523	040X0653-001	TRIM POT 200 OHM 20% 0.5W
157	Z500	066X0040-050	ZENER DIODE 12V 5% 1W

DEFLECTION BOARD ASSEMBLY

025A1426-001

P738

158	038A7357-000	ASSEMBLY: HEAT SINK; U601
159	038A7432-000	ASSEMBLY: HEAT SINK; Q704
160	038A7432-000	ASSEMBLY: HEAT SINK; Q101
161	001X0711-001	INSUL SIL-PAD; Q710
162	001X0772-001	INSUL SIL-PAD; Q101
163	001X0776-002	INSUL SIL-PAD; Q704
164	001X0772-001	INSUL SIL-PAD; D707
165	001X0810-001	MOUNTING CLIP FOR Q101
166	001X0810-001	MOUNTING CLIP D707
167	002X0591-001	WASHER SHOULDER Q710
168	016X0209-001	FUSE CLIPS PCB 5x20mm (2)
169	020X1877-002	NUT KEPS 4-40; Q704
170	020X1877-002	NUT KEPS 4-40; Q710
171	020X1877-002	NUT KEPS 4-40; U601
172	020X1877-002	NUT KEPS 4-40; Q101
173	020X1877-002	NUT KEPS 4-40;D707
174	085X0397-001	PC BOARD
175	303X0602-204	SCR MACH 4-40x1/4 HH; U601
176	312X0605-208	SCR SWG #4-40x3/8 HWH; Q710
177	312X0605-208	SCR SWG #4-40x1/2 HWH; Q101

Replacement Parts List (continued)

DEFLECTION BOARD ASSEMBLY

025A1426-001

P738

178		312X0605-208	SCR SWG #4-40x1/2 HWH; Q704
179		312X1205-206	SCR SWG #6-32x3/8 HWH; PCB
180	C101	046X0552-002	CAP 0.47uF 250V UL/CSA/VDE
181	C102	046X0547-002	CAP 2200pF 400V UL/CSA/VDE
182	C103	046X0547-002	CAP 2200pF 400V UL/CSA/VDE
183	C104	046X0547-001	CAP 0.22uF 250V UL/CSA/VDE
184	C105	045X0603-003	CAP LYT 270uF 20% 400V 105 C
185	C106	080X0099-221	CAP 0.01uF 10% Y5P 500V CER
186	C107	045X0580-034	CAP LYT 33uF 20% 160V 105 C
187	C108	047X0789-510	CAP 1.0uF 63V SMF
188	C109	080X0099-698	CAP 1000pF 10% Z5P 1KV CER
189	C110	080X0099-685	CAP 0.001uF 10% Y5P 50V CER
190	C111	080X0099-232	CAP 0.01uF +80-20% Z5U 1KV
191	C112	080X0099-111	CAP 130pF 10% 500V CER
192	C114	046X0561-002	CAP 3300pF 20% 250V UL/CSA
193	C115	045X0580-031	CAP LYT 100uF 20% 200V 105 C
194	C116	046X0544-004	CAP 0.012uF 5% 100V P-PROP
195	C117	045X0580-027	CAP LYT 10uF 50V 105 C
196	C118	047X0789-510	CAP 1.0uF 63V SMF
197	C301	080X0099-505	CAP 0.001 20% Z5F 500V CER
198	C302	080X0099-505	CAP 0.001 20% Z5F 500V CER
199	C303	080X0099-505	CAP 0.001 20% Z5F 500V CER
200	C304	045X0560-051	CAP LYT 1000uF 20% 25V
201	C305	045X0580-032	CAP LYT 2200uF 35V 105 C
202	C310	045X0560-057	CAP LYT 10uF 20% 200V
203	C600	045X0560-547	CAP LYT 47uF 16V
204	C601	047X0786-501	CAP 0.01uF 10% 50V P-ESTER
205	C602	045X0560-518	CAP LYT 10uF 25V
206	C603	047X0789-501	CAP 0.10uF 5% 100V SMF
207	C604	047X0789-501	CAP 0.10uF 5% 100V SMF
208	C605	045X0560-504	CAP LYT 100uF 35V
209	C606	047X0789-501	CAP 0.10uF 5% 100V SMF
210	C607	045X0560-030	CAP LYT 470uF 35V
211	C608	047X0789-501	CAP 0.10uF 5% 100V SMF
212	C609	047X0786-517	CAP 0.047uF 10% 100V P-ESTER
213	C611	047X0786-502	CAP 0.022uF 10% 50V P-ESTER
214	C610	045X0560-522	CAP LYT 2.2uF 50V
215	C612	047X0786-508	CAP 0.033uF 10% 50V P-ESTER
216	C613	045X0560-504	CAP LYT 100uF 35V
217	C614	047X0789-504	CAP 0.22uF 5% 50V SMF
218	C615	045X0560-531	CAP LYT 33uF 16V
219	C616	045X0580-038	CAP LYT 1000uF 20% 50V 105 C
220	C617	047X0788-512	CAP 0.1uF 20% Z5U 50V MON
221	C620	080X0099-685	CAP 1000pF 10% Y5P 50V CER
222	C700	045X0560-515	CAP LYT 220uF 16V
223	C701	045X0560-518	CAP LYT 10uF 25V
224	C702	080X0099-710	CAP 100pF 10% Z5F 50V CER
225	C703	047X0788-502	CAP 1500pF 5% NPO 50V MON
226	C704	047X0788-505	CAP 270pF 10% NPO 50V MON
227	C705	046X0550-502	CAP 5600pF 2% 50V POLY FILM
228	C706	045X0560-544	CAP LYT 1.0uF 50V
229	C707	047X0788-515	CAP 0.01uF 20% Z5U 50V MON
230	C708	046X0550-502	CAP 5600pF 2% 50V POLY FILM
231	C709	045X0560-544	CAP LYT 1.0uF 50V
232	C710	047X0786-501	CAP 0.01uF 10% 50V P-ESTER
233	C711	047X0789-501	CAP 0.10uF 5% 100V SMF
234	C712	045X0560-006	CAP LYT 1000uF 16V
235	C713	045X0560-501	CAP LYT 4.7uF 25V
236	C714	080X0099-722	CAP 3300pF 10% Y5P 500V CER
237	C715	080X0099-580	CAP 100pF 10% Z5F 500V CER
238	C716	045X0560-549	CAP LYT 1.0uF 20% 200V
239	C718	046X0536-065	CAP 680pF 1600V 2% P-PROP
240	C719	046X0536-021	CAP 0.27 uF 200V 5% P-PROP
241	C720	046X0536-064	CAP 1000pF 630V 10% P-PROP
242	C721	046X0536-083	CAP 1500pF 1600V 2% P-PROP
243	C722	046X0537-006	CAP 0.47uF 200V 5% P-PROP
244	C723	046X0536-044	CAP 6000pF 1600V 2% P-PROP
245	C724	046X0536-012	CAP 0.015uF 400V 5% P-PROP
246	C725	045X0580-533	CAP LYT 100uF 20% 50V 105 C
247	C726	047X0788-505	CAP 270pF 10% NPO 50V MON
248	C727	047X0786-519	CAP 2200pF 5% 50V P-ESTER
249	C728	047X0786-511	CAP 0.1uF 10% 50V P-ESTER
250	C729	045X0580-535	CAP LYT 220uF 20% 50V 105 C
251	C730	045X0560-501	CAP LYT 4.7uF 25V
252	C731	045X0560-518	CAP LYT 10uF 25V
253	C732	045X0560-518	CAP LYT 10uF 25V
254	C733	080X0099-697	CAP 120pF 5% NPO 50V CER
255	C800	080X0099-234	CAP 0.01uF 10% R 250V CER
256	C801	080X0099-234	CAP 0.01uF 10% R 250V CER
257	C802	047X0788-515	CAP 0.01uF 20% Z5U 50V MON
258	C803	080X0099-062	CAP 0.02uF +80-20% Z5U 500V
259	C804	080X0099-095	CAP 1000pF 10% Z5F 2KV CER
260	C805	045X0560-550	CAP LYT 2.2uF 20% 200V
261	C808	045X0560-550	CAP LYT 2.2uF 20% 200V
262	C810	045X0560-555	CAP LYT 10uF 20% 63V
263	CN101	006A0475-003	HEADER 3 PIN
264	CN102	006A0427-001	PLUG HEADER 2 PIN
265	CN15K	006A0403-011	HEADER 11 PIN 0.156 CTR
266	CN25K	006A0403-011	HEADER 11 PIN 0.156 CTR
267	CN200	006A0403-010	HEADER 10 PIN 0.156 CTR
268	CN201	006A0473-013	HEADER 13 PIN 0.100 CTR
269	CN203	006A0473-017	HEADER 17 PIN 0.100 CTR
270	CN206	006A0427-001	PLUG HEADER 2 PIN
271	CN207	006A0427-002	HEADER 2 PIN
272	D101	066X0135-001	DIODE 1N5406
273	D102	066X0135-001	DIODE 1N5406
274	D103	066X0135-001	DIODE 1N5406
275	D104	066X0135-001	DIODE 1N5406
276	D105	066X0095-001	DIODE 1N4007 STATIC SENS
277	D106A	066X0097-001	DIODE 200V 3.5A BYV28-200
278	D106B	066X0097-001	DIODE 200V 3.5A BYV28-200
279	D106C	066X0097-001	DIODE 200V 3.5A BYV28-200

Replacement Parts List (continued)

DEFLECTION BOARD ASSEMBLY

025A1426-001

P738

280	D107	066X0126-002	DIODE MUR490
281	D108	066X0090-001	DIODE RU2 1A 600V FAST REC
282	D109	066X0071-001	DIODE 1N4001
283	D110	066X0071-001	DIODE 1N4001
284	D111	066X0071-001	DIODE 1N4001
285	D112	066X0090-001	DIODE RU2 1A 600V FAST REC
286	D113	066X0090-001	DIODE RU2 1A 600V FAST REC
287	D114	066X0071-001	DIODE 1N4001
288	D117	066X0144-001	DIODE 1A 600V GI RGP10J
289	D301	066X0090-001	DIODE RU2 1A 600V FAST REC
290	D302	066X0090-001	DIODE RU2 1A 600V FAST REC
291	D303	066X0090-001	DIODE RU2 1A 600V FAST REC
292	D310	066X0090-001	DIODE RU2 1A 600V FAST REC
293	D600	066X0070-001	DIODE 1N914B
294	D601	066X0070-001	DIODE 1N914B
295	D602	066X0070-001	DIODE 1N914B
296	D603	066X0071-001	DIODE 1N4001
297	D604	066X0070-001	DIODE 1N914B
298	D700	066X0070-001	DIODE 1N914B
299	D702	066X0070-001	DIODE 1N914B
300	D707	066X0143-001	DIODE DD202
301	D708	066X0126-005	DIODE 900V 4A MUR490E
302	D709	066X0070-001	DIODE 1N914B
303	D710	066X0070-001	DIODE 1N914B
304	D711	066X0070-001	DIODE 1N914B
305	D712	066X0070-001	DIODE 1N914B
306	D713	066X0070-001	DIODE 1N914B
307	D716	066X0126-005	DIODE 200V 3.5A BYV28-200
308	D800	066X0070-001	DIODE 1N914B
309	D802	066X0062-001	DIODE SANYO GMA02
310	D803	066X0062-001	DIODE SANYO GMA02
311	D804	066X0070-001	DIODE 1N914B
312	D805	066X0070-001	DIODE 1N914B
313	D806	066X0070-001	DIODE 1N914B
314	D807	066X0062-001	DIODE SANYO GMA02
315	F101	016X0208-001	FUSE 3A FAST BLOW 250V
316	L101	052X0147-001	CHOKE COM MODE INPUT
317	L102	038A7494-000	ASSEMBLY: FERRITE BEAD
318	L103	009A2983-001	CHOKE TOROID 23uH 3A
319	L104	009A2811-004	COIL 12uH
320	L105	009A2811-009	COIL 22uH
321	L701	009A2976-002	COIL LINEARITY CTR TAPPED
322	L703	009A2970-002	COIL PINCUSION
323	L704	009A2811-012	COIL PEAKING 0.82uH
324	P15/25K	038A7508-000	FREQ CHANGE PLUG ASSY
325	Q101	086X0334-001	FET N CHANNEL SSP6N60
326	Q601	086X0113-501	TRSTR 2N3904 MOT
327	Q602	086X0113-501	TRSTR 2N3904 MOT
328	Q700	086X0113-501	TRSTR 2N3904 MOT
329	Q703	086X0185-501	TRSTR 2SC2482 TOSH
330	Q704	086X0286-001	TRSTR 2SC3686 SANYO
331	Q705	086X0114-501	TRSTR 2N3906 MOT
332	Q708	086X0185-501	TRSTR 2SC2482 TOSH
333	Q709	086X0211-501	TRSTR 2N4403 STATIC SENS
334	Q710	086X0335-001	TRSTR BDX53A SGS NPN DAR
335	Q800	086X0133-501	TRSTR MPSA92 MOT
336	Q801	086X0113-501	TRSTR 2N3904 NPN
337	Q808	086X0113-501	TRSTR 2N3904 MOT
338	R100	340X8047-631	RES 4.7 OHM 5% 5W MO/MF
339	R101	043X0493-001	THERM NTC 10 OHM
340	R102	420X4683-313	RES 68K OHM 5% 1 W
341	R103	420X4683-313	RES 68K OHM 5% 1 W
342	R104	043X0484-006	RES 10K OHM 5% 7W
343	R105	340X6471-631	RES 470 OHM 5% 3W MO/MF
344	R106	340X2102-934	RES 1.0K OHM 5% 1/4W CF
345	R107	340X2100-934	RES 10 OHM 5% 1/4W CF
346	R108	420X5209-323	RES 0.22 OHM 5% 2W
347	R110	421X1822-221	RES 18.2K OHM 1% 1/4W MF
348	R111	340X4471-631	RES 470 OHM 5% 1W MO/MF
349	R112	340X2561-934	RES 560 OHM 5% 1/4W CF
350	R113	421X2001-221	RES 2.00K OHM 1% 1/4W MF
351	R114	340X2103-934	RES 10K OHM 5% 1/4W CF
352	R115	340X2222-934	RES 2.2K OHM 5% 1/4W CF
353	R116	340X2102-934	RES 1.0K OHM 5% 1/4W CF
354	R117	340X2102-934	RES 1.0K OHM 5% 1/4W CF
355	R120	340X5683-531	RES 68K OHM 5% 2W CF
356	R121	043X0510-001	THERM PTC 8 OHM 120V
357	R122	340X5106-531	RES 10M OHM 10% 2W CF
358	R123	340X5105-531	RES 1M OHM 10% 2W CF
359	R124	340X2101-934	RES 100 OHM 5% 1/4W CF
360	R301	043X0486-002	RES 1.2 OHM 5% 2W MF
361	R303	043X0486-002	RES 1.2 OHM 5% 2W MF
362	R305	340X3122-934	RES 1.2K OHM 5% 1/2W CF
363	R310	943X0486-002	RES 1.2 OHM 5% 2W MF
364	R600	340X2101-934	RES 100 OHM 5% 1/4W CF
365	R601	340X2473-934	RES 47K OHM 5% 1/4W CF
366	R602	340X2223-934	RES 22K OHM 5% 1/4W CF
367	R603	340X2681-934	RES 680 OHM 5% 1/4W CF
368	R604	340X2472-934	RES 4.7K OHM 5% 1/4W CF
369	R605	340X2102-934	RES 1.0K OHM 5% 1/4W CF
370	R606	340X2102-934	RES 1.0K OHM 5% 1/4W CF
371	R607	340X2432-934	RES 4.3K OHM 5% 1/4W CF
372	R608	340X2102-934	RES 1K OHM 5% 1/4W CF
373	R609	340X2103-934	RES 10K OHM 5% 1/4W CF
374	R610	340X2103-934	RES 10K OHM 5% 1/4W CF
375	R611	340X2154-934	RES 150K OHM 5% 1/4W CF
376	R612	340X2153-934	RES 15K OHM 5% 1/4W CF
377	R613	340X2022-934	RES 2.2 OHM 5% 1/4W CF
378	R614	340X2242-934	RES 2.4K OHM 5% 1/4W CF
379	R615	340X2273-934	RES 27K OHM 5% 1/4W CF
380	R616	340X2911-934	RES 910 OHM 5% 1/4W CF
381	R617	340X3821-934	RES 820 OHM 5% 1/2W CF

Replacement Parts List (continued)

DEFLECTION BOARD ASSEMBLY

025A1426-001

P738

382	R618	340X3829-934	RES .82 OHM 5% 1/2W CF
383	R619	340X4820-633	RES 82 OHM 5% 1W MO/MF
384	R620	340X4681-531	RES 680 OHM 5% 1W CF
385	R621	340X2272-934	RES 2.7K OHM 5% 1/4W CF
386	R622	340X2105-934	RES 1M OHM 5% 1/4W CF
387	R623	340X2474-934	RES 470K OHM 5% 1/4W CF
388	R624	340X2184-934	RES 180K OHM 5% 1/4W CF
389	R625	340X3271-934	RES 270 OHM 5% 1/2W CF
390	R626	340X2683-934	RES 68K OHM 5% 1/4W CF
391	R627	340X2623-934	RES 62K OHM 5% 1/4W CF
392	R628	340X2103-934	RES 10K OHM 5% 1/4W CF
393	R700	340X2102-934	RES 1K OHM 5% 1/4W CF
394	R701	340X2103-934	RES 10K OHM 5% 1/4W CF
395	R702	340X2223-934	RES 22K OHM 5% 1/4W CF
396	R703	340X2301-934	RES 300 OHM 5% 1/4W CF
397	R704	340X2472-934	RES 4.7K OHM 5% 1/4W CF
398	R705	340X2471-934	RES 470 OHM 5% 1/4W CF
399	R707	340X2102-934	RES 1K OHM 5% 1/4W CF
400	R709	340X2223-934	RES 22K OHM 5% 1/4W CF
401	R710	340X2103-934	RES 10K OHM 5% 1/4W CF
402	R711	340X2123-934	RES 12K OHM 5% 1/4W CF
403	R712	340X2103-934	RES 10K OHM 5% 1/4W CF
404	R713	340X2102-934	RES 1K OHM 5% 1/4W CF
405	R714	340X2333-934	RES 33K OHM 5% 1/4W CF
406	R715	340X2102-934	RES 1.0K OHM 5% 1/4W CF
407	R716	421X8661-221	RES 8.66K OHM 1% 1/4W
408	R717	340X2822-934	RES 8.2K OHM 5% 1/4W CF
409	R718	340X2103-934	RES 10K OHM 5% 1/4W CF
410	R719	340X2912-934	RES 9.1K OHM 5% 1/4W CF
411	R720	340X3220-934	RES 22 OHM 5% 1/2W CF
412	R721	340X3393-234	RES 39K OHM 5% 1/2W CC
413	R722	340X2682-934	RES 6.8K OHM 5% 1/4W CF
414	R723	340X2222-934	RES 2.2K OHM 5% 1/4W CF
415	R724	340X2162-934	RES 1.6K OHM 5% 1/4W CF
416	R725	340X2101-934	RES 100 OHM 5% 1/4W CF
417	R726	340X2103-934	RES 10K OHM 5% 1/4W CF
418	R727	340X4392-631	RES 3.9K OHM 5% 1W MO/MF
419	R728	340X5102-731	RES 1.0K OHM 5% 2W MO/MF
420	R729	340X2101-934	RES 100 OHM 5% 1/4W CF
421	R732	340X4222-631	RES 2.2K OHM 5% 1W MO/MF
422	R734	340X2101-934	RES 1.0K OHM 5% 1/4 W CF
423	R735	340X2102-934	RES 1.0K OHM 5% 1/4 W CF
424	R736	340X2153-934	RES 15K OHM 5% 1/4 W CF
425	R745	340X2182-934	RES 1.8K OHM 5% 1/4W CF
426	R750	340X2471-934	RES 470 OHM 5% 1/4W CF
427	R751	340X2682-934	RES 6.8K OHM 5% 1/4W CF
428	R752	340X2103-934	RES 10K OHM 5% 1/4W CF
429	R753	340X2333-934	RES 33K OHM 5% 1/4W CF
430	R754	340X2682-934	RES 6.8K OHM 5% 1/4W CF
431	R755	340X2103-934	RES 10K OHM 5% 1/4W CF
432	R756	340X2222-934	RES 2.2K OHM 5% 1/4W CF
433	R759	320X2000-000	WIRE #20 BARE SOLID
434	R760	043X0509-004	RES 100 OHM 5% 1/2W FP
435	R762	340X2330-934	RES 33 OHM 5% 1/4W CF
436	R763	340X2822-934	RES 8.2K OHM 5% 1/4W CF
437	R765	340X3333-934	RES 33K OHM 5% 1/2W CF
438	R800	320X2000-000	WIRE #20 BARE SOLID
439	R801	340X2821-934	RES 820 OHM 5% 1/4W CF
440	R802	340X2000-000	WIRE #20 BARE SOLID
441	R803	340X2103-934	RES 10K OHM 5% 1/4W CF
442	R804	340X2334-934	RES 330K OHM 5% 1/4W CF
443	R806	340X2471-934	RES 470 OHM 5% 1/4W CF
444	R809	340X3391-934	RES 390 OHM 5% 1/2W CF
445	R810	340X3202-934	RES 2K OHM 5% 1/2W CF
446	R811	340X3104-934	RES 100K OHM 5% 1/2W CF
447	R812	340X2202-934	RES 2.0K OHM 5% 1/4W CF
448	R813	340X2103-934	RES 10K OHM 5% 1/4W CF
449	R814	340X2302-934	RES 3.0K OHM 5% 1/4W CF
450	R815	340X2474-934	RES 470K OHM 5% 1/4W CF
451	R816	340X2204-934	RES 200K OHM 5% 1/4W CF
452	R817	340X2474-934	RES 470K OHM 5% 1/4W CF
453	R818	320X2000-000	WIRE #20 BARE SOLID
454	R819	340X2103-934	RES 10K OHM 5% 1/4W CF
455	R821	340X2102-934	RES 1.0K OHM 5% 1/4W CF
456	R823	340X5047-631	RES 4.7 OHM 5% 2W MF
457	R824	340X5043-631	RES 4.3 OHM 5% 2W
458	R825	340X3202-844	RES 2.0K OHM 5% 1/2W CC
459	R830	421X3572-221	RES 35.7K OHM 1% 1/4W
460	T101	053X0631-001	TFMR SMPS 140-340V 120KHZ
461	T700	053X0624-001	TFMR FLYBACK
462	T701	052X0131-001	TFMR HORIZ DRIVER
463	TP103	030X0798-001	PIN 1mm OSHIMA
464	TP104	030X0798-001	PIN 1mm OSHIMA
465	TP105	030X0798-001	PIN 1mm OSHIMA
466	TP106	030X0798-001	PIN 1mm OSHIMA
467	TP200	030X0798-001	PIN 1mm OSHIMA
468	TP201	030X0798-001	PIN 1mm OSHIMA
469	TP202	030X0798-001	PIN 1mm OSHIMA
470	TP203	030X0798-001	PIN 1mm OSHIMA
471	TP204	030X0798-001	PIN 1mm OSHIMA
472	TP205	030X0798-001	PIN 1mm OSHIMA
473	U101	086X0257-001	IC PWM UC3842AN
474	U601	086X0326-001	IC VERT DEFL TDA1771
475	U701	086X0274-001	IC LA7850 H/V PROC SANYO
476	U702	086X0333-001	IC QUAD XOR SN74LS136N
477	VR101	040X0639-014	TRIM POT 1K OHM 0.3W 20%
478	VR700	040X0639-008	TRIM POT 10K OHM 0.3W 20%
479	Z601	066X0040-046	MOT IM5242B DIODE
480	Z700	066X0040-028	ZENER DIODE 5.1V 5% 0.5W
481	Z701	066X0040-022	ZENER DIODE 5.6V 5% 0.5W
482	Z702	066X0040-017	ZENER DIODE 13V 1W
483	Z705	066X0040-020	ZENER DIODE 9.1V 5% 0.5W
484	z800	421X3572-221	RES 35.7K OHM 1% 1/4W
485	Z802	066X0040-031	ZENER DIODE 24V 3% 0.5W