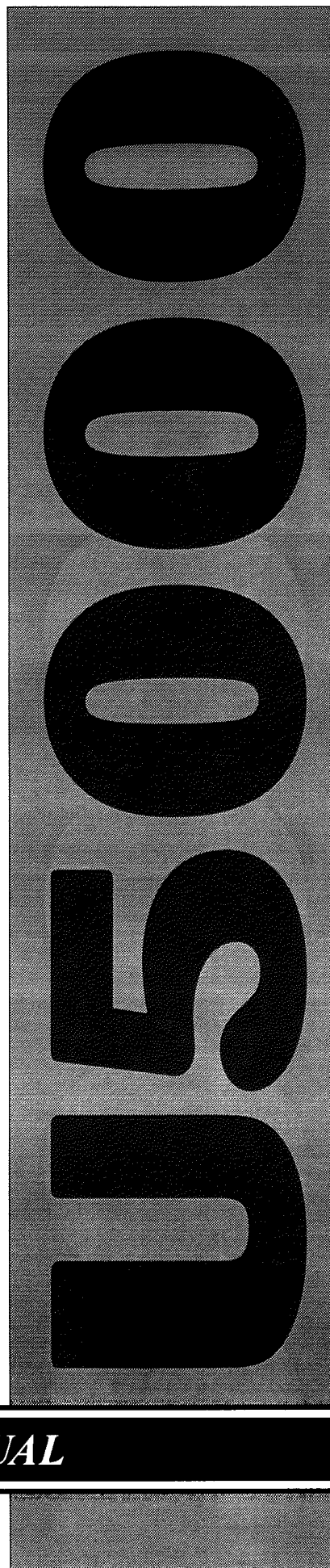
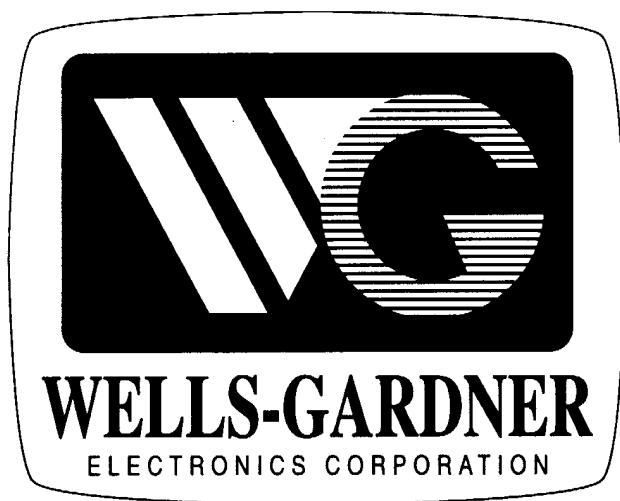




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SERVICE MANUAL

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 COMPOSANTS DONT LE FONCTIONNEMENT EST CRITIQUE 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.

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Monitor Specifications

CRT

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

HORIZONTAL SCAN

- Frequency: Mode 1: 15.1 kHz. to 18.0 kHz.
Mode 2: 24.5 kHz. to 28.5 kHz.
- Linearity: $\pm 5\%$

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: $\pm 5\%$

GEOMETRIC DISTORTION

- $\pm 2\%$ (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)

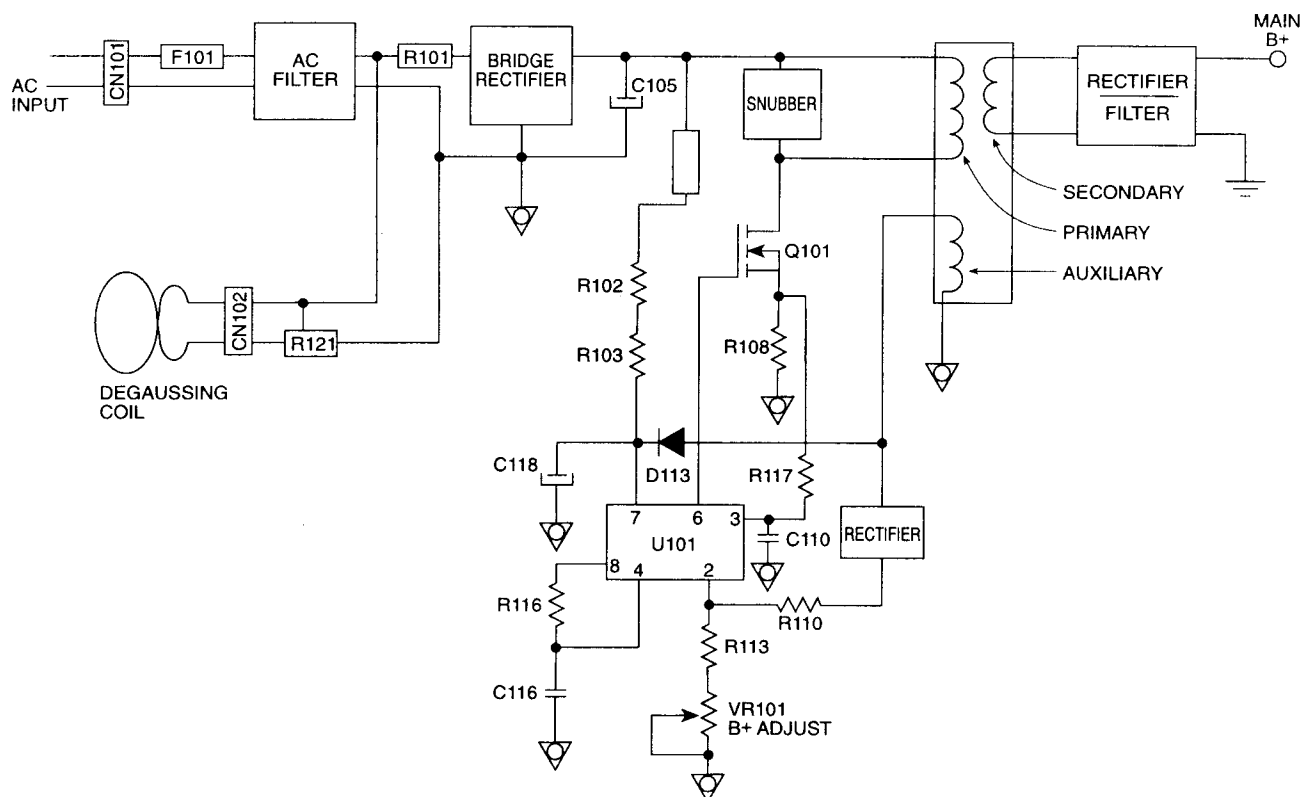
The U5000 base design utilizes a switch mode power supply (switcher). This switcher provides line-to-chassis isolation, eliminating the need for an isolation transformer. In addition, it provides an efficient means of DC-to-DC voltage conversion, delivering a well-regulated output voltage with varying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

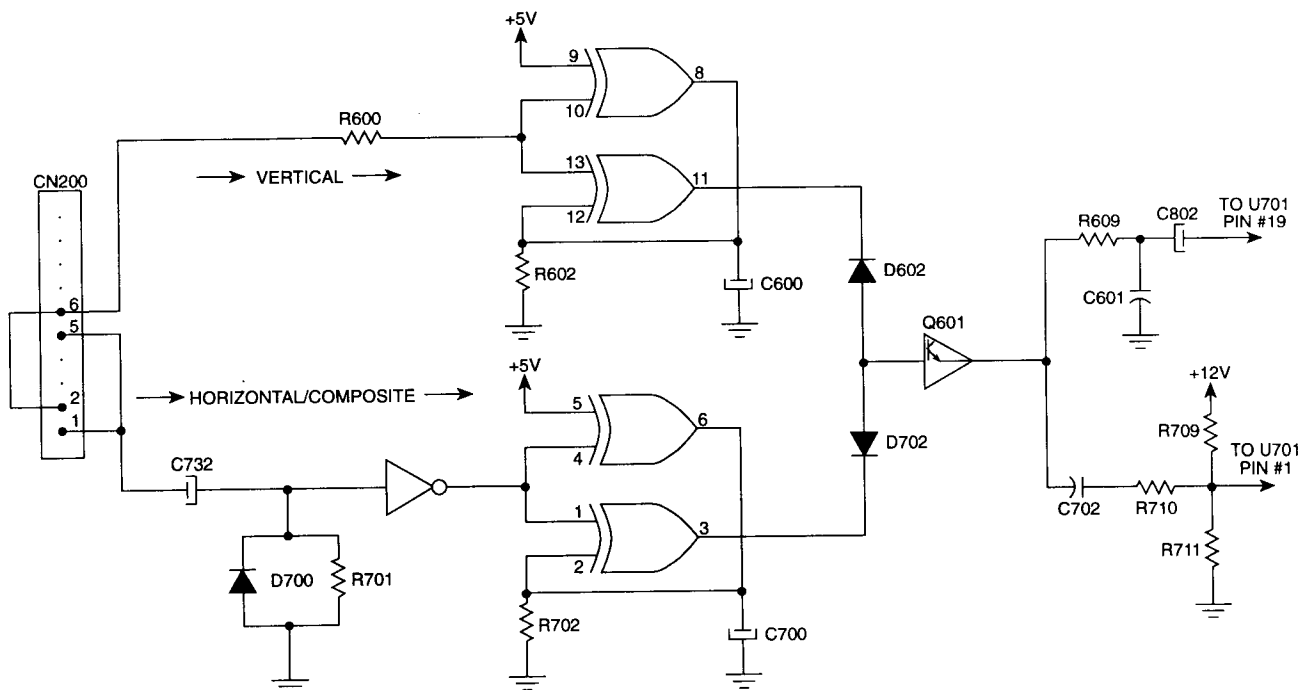
level is created. The DC level will be logic high for positive sync at pin 4, and logic low for negative sync at pin 4. This DC voltage in turn feeds pin 2. Pin 1 is driven by the same inverted sync pulse as pin 4. If pin 2 is logic high, the gate functions as an inverter and pin 3 outputs a twice-inverted 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

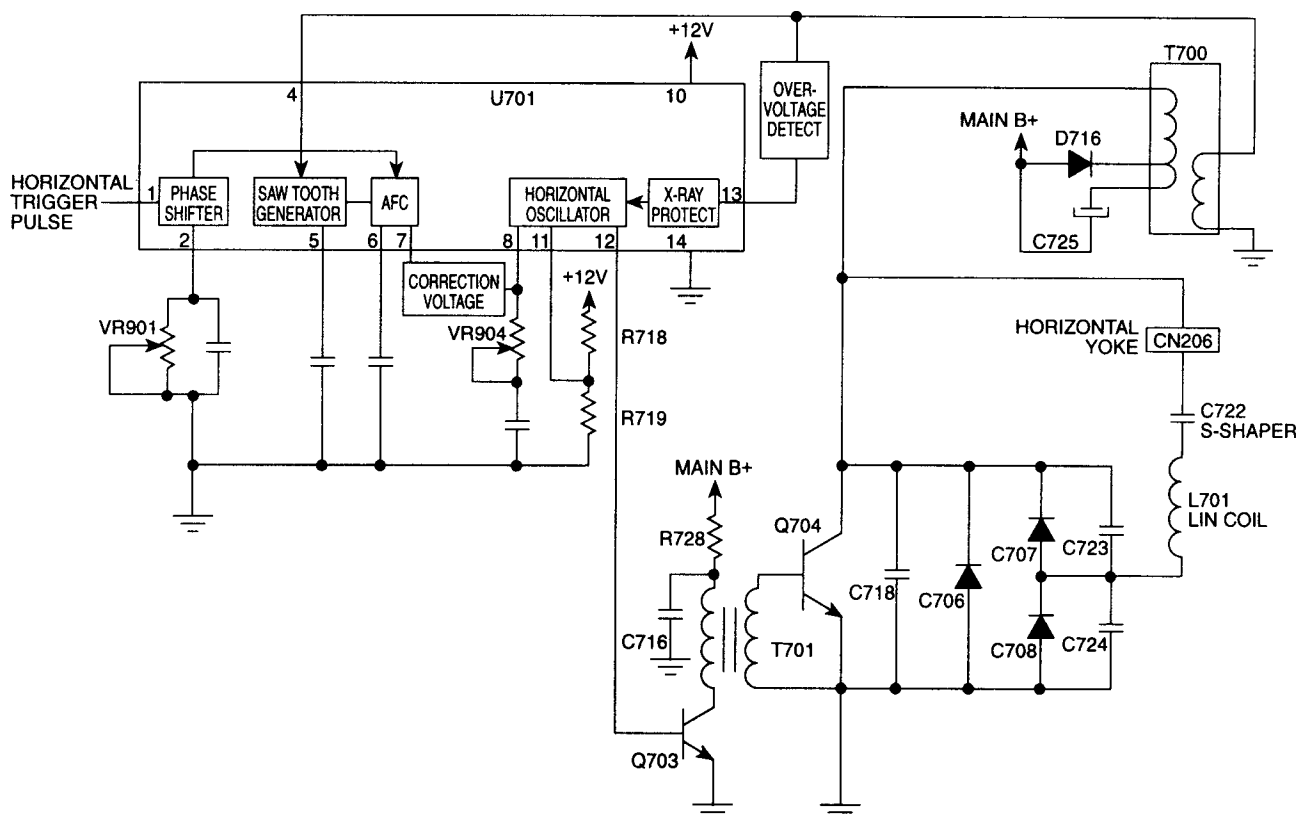
as to bring it closer to the incoming sync frequency. This process continues until the error voltage is zero. The horizontal oscillator is then locked-on to the incoming sync frequency. U701 ultimately generates a square wave output at pin 12, at the proper frequency, to drive the horizontal output circuitry. 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.

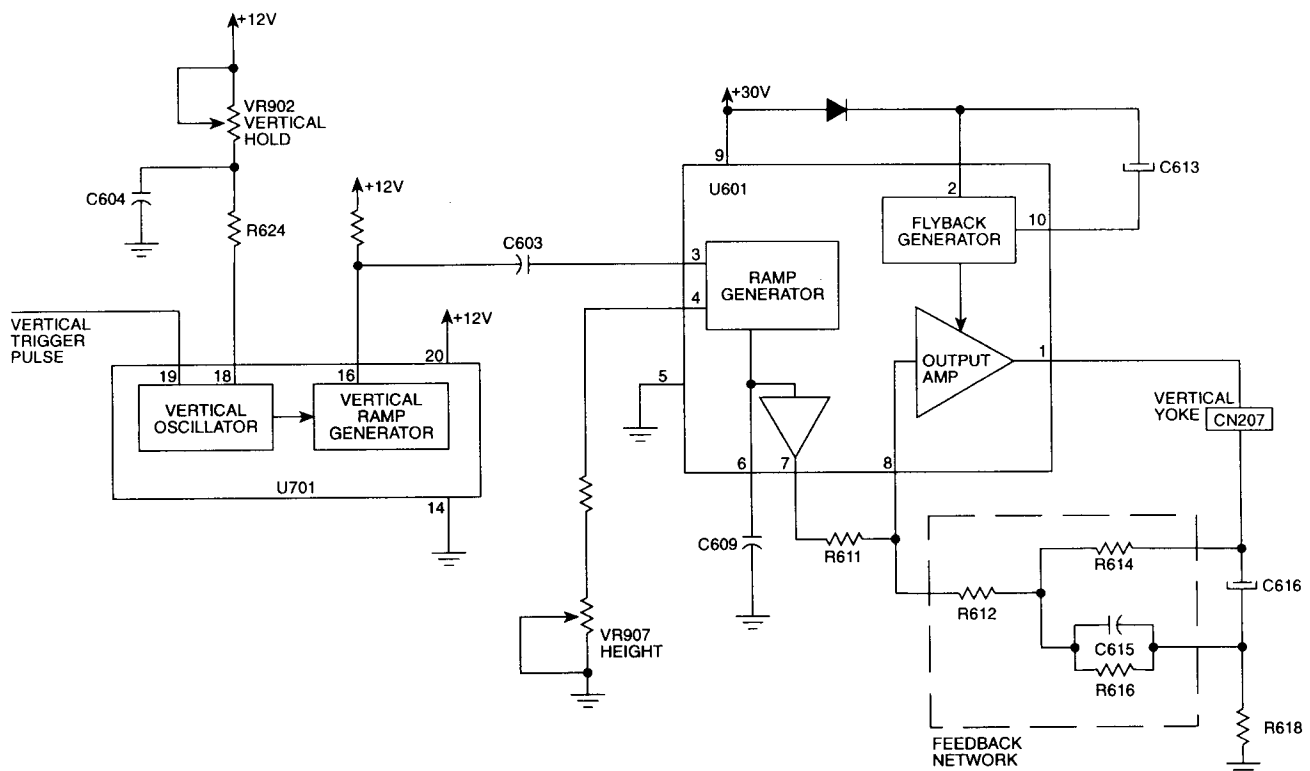
Additional windings inside T700 create the necessary +15V, +30V, and -65V supply voltages used to operate the U5000's circuitry¹. An additional pulse voltage is developed at pin 5 of T700, and is used to supply energy to the CRT filament, provide the feedback pulse used in the horizontal sync-processing, 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.

¹Note 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 modified 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.

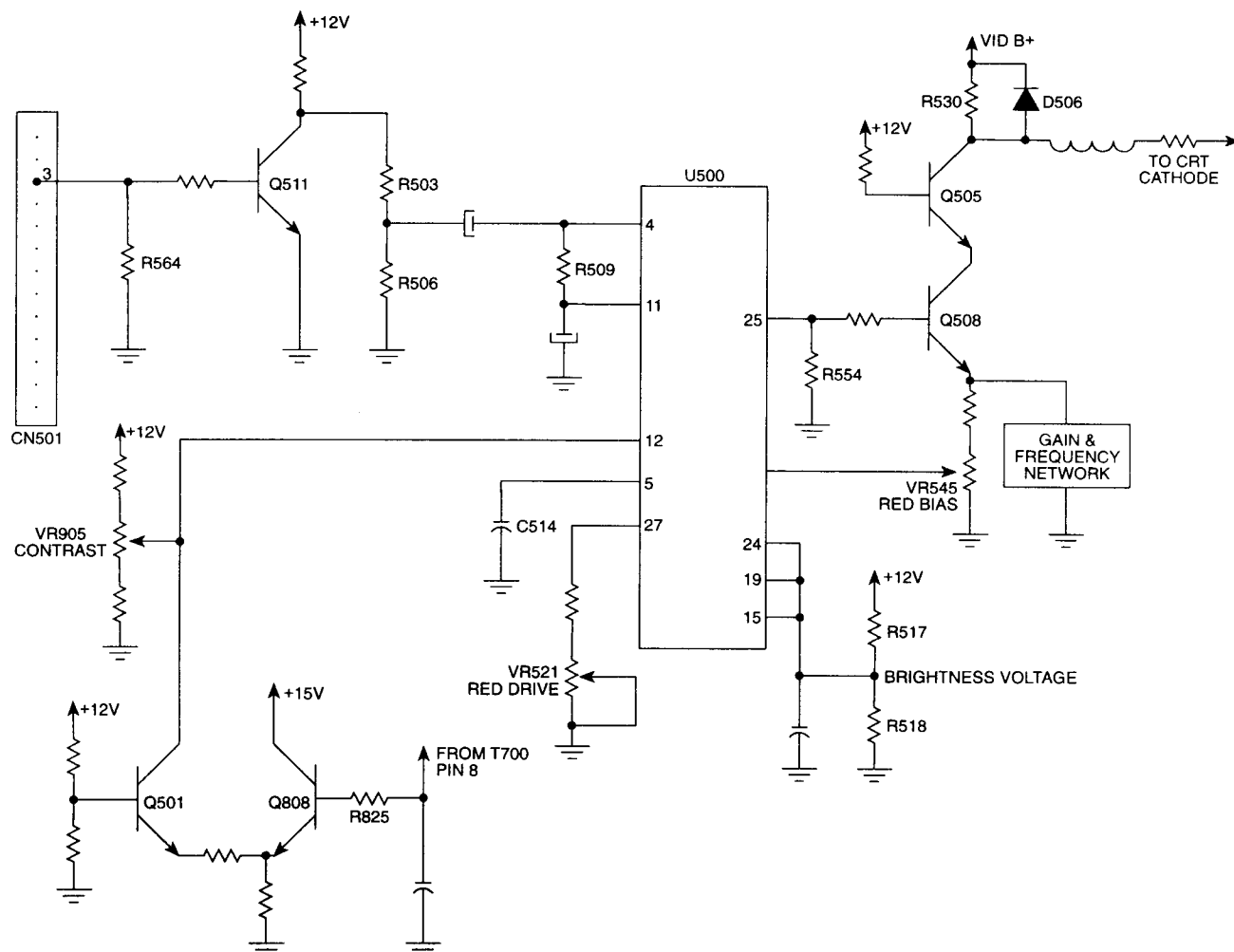
VIDEO PROCESSING

(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.

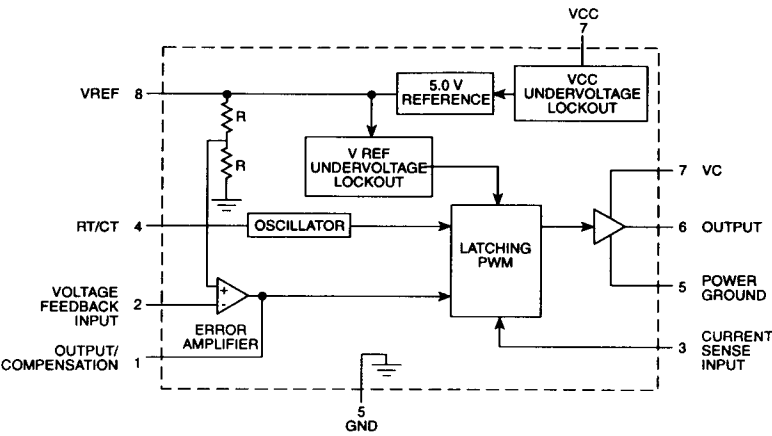
Brightness in the U5000 is controlled by varying the bias voltage on grid 1 (G1) of the CRT. This is achieved through adjustment of the brightness control, VR906, on the control board. CRT blanking is also performed through the use of G1. Horizontal and vertical retrace pulses are added together and 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

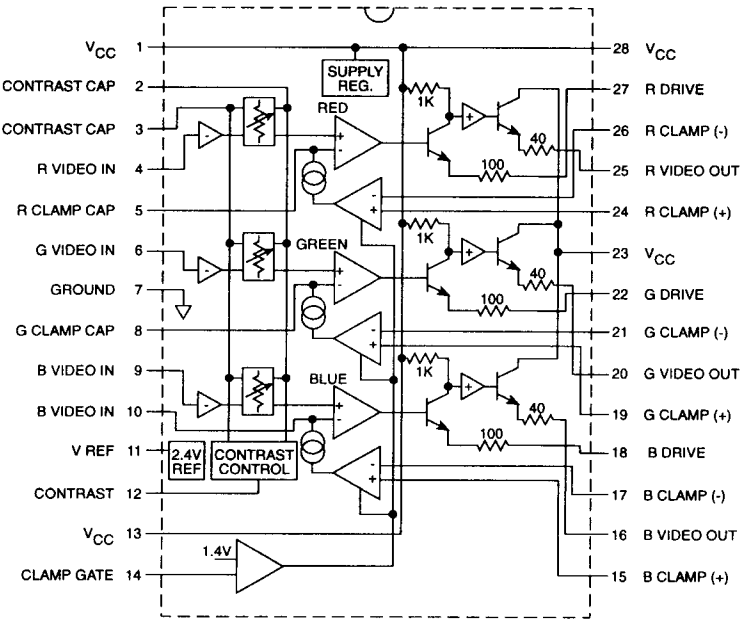
Automatic beam limiting (ABL) is necessary to prevent display aberrations caused by excessive beam current contacting the shadow mask inside the CRT.

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.

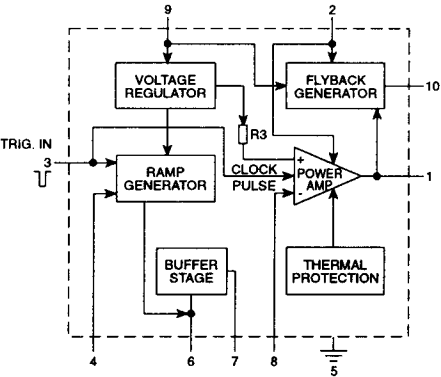
NOTES:



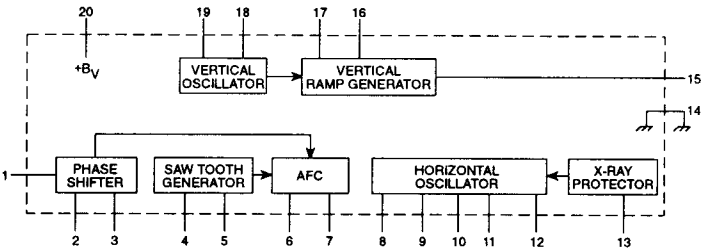
- U101 -



- 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

ZENERS	25kHz		15kHz	
	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

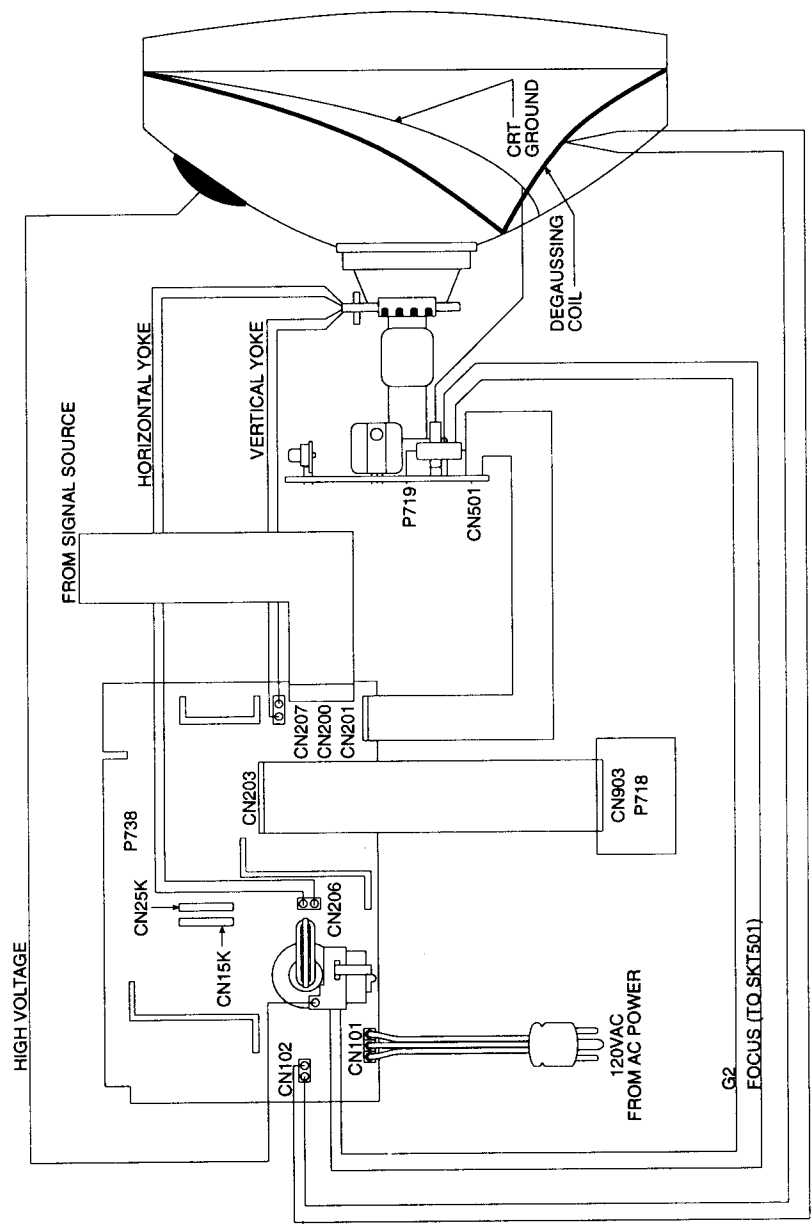
Parts marked with "*" are measured with respect to AC GROUND. All other parts are measured with respect to chassis ground.

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

DIODES	25kHz		15kHz	
	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	EMIT	25kHz BASE	COLL	EMIT	15kHz BASE	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	U101	U500	25kHz U601	U701	U702	U101	U500	15kHz U601	U701	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	-	-	-



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

AC INPUT CONNECTOR: CN101

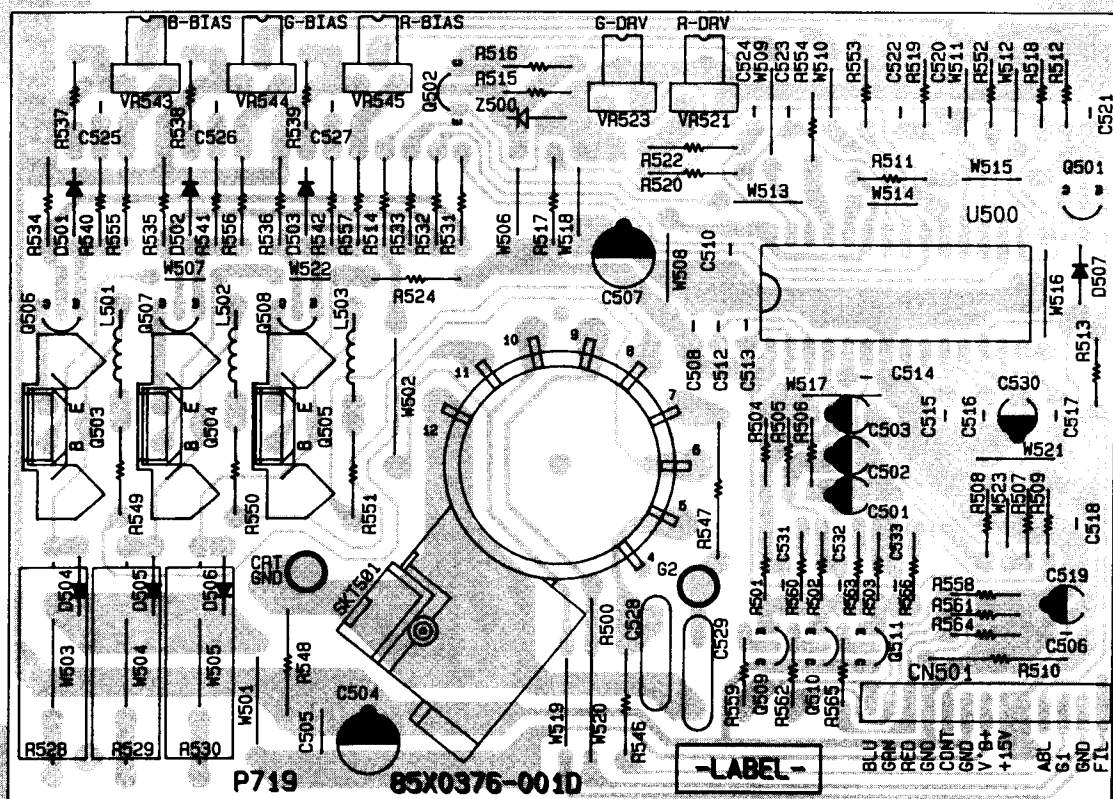
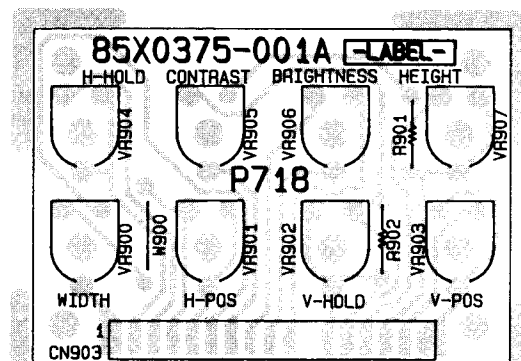
Amp type 350760-4
Mating Amp type 1-480700-0

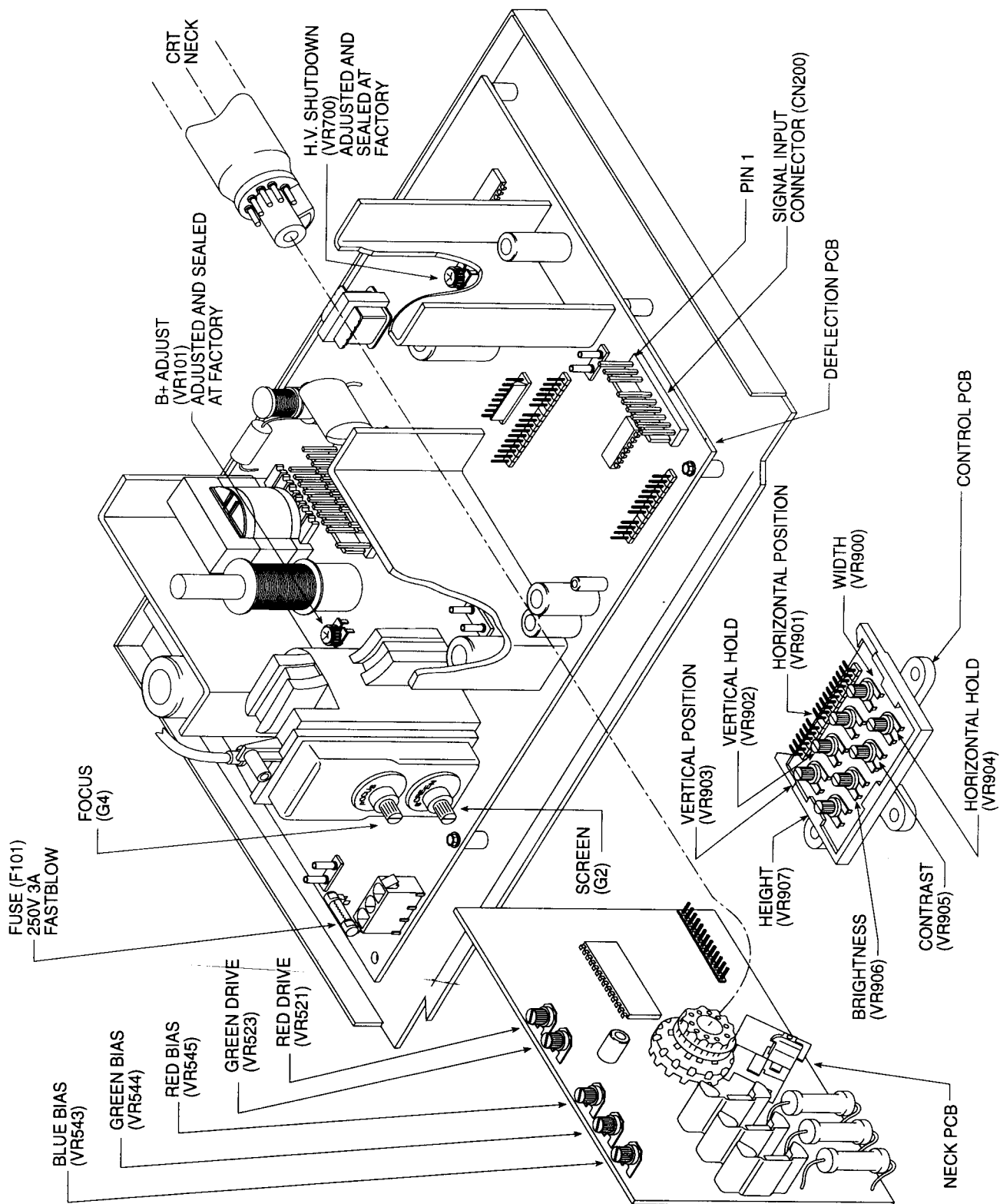
Pin	Description
1	AC hot
2	Earth gnd
3	AC neutral

MODE SELECTION CONNECTORS

CN15K 15kHz Operation
CN25K 25kHz Operation







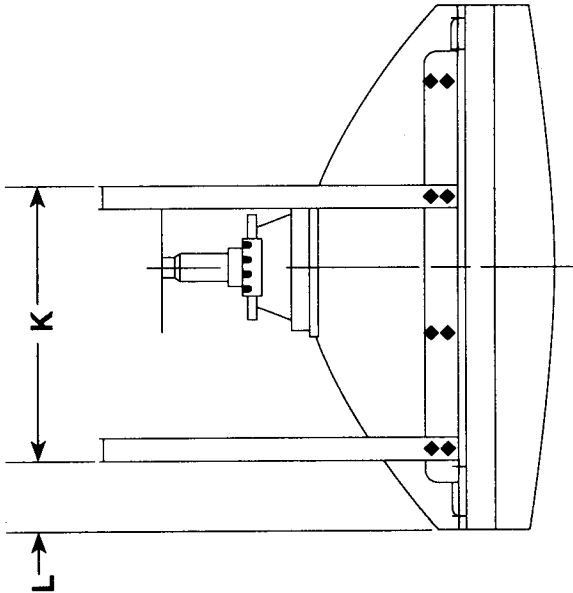
WELLS GARDNER ELECTRONICS CORP.
25V COLOR MONITOR F25M4

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

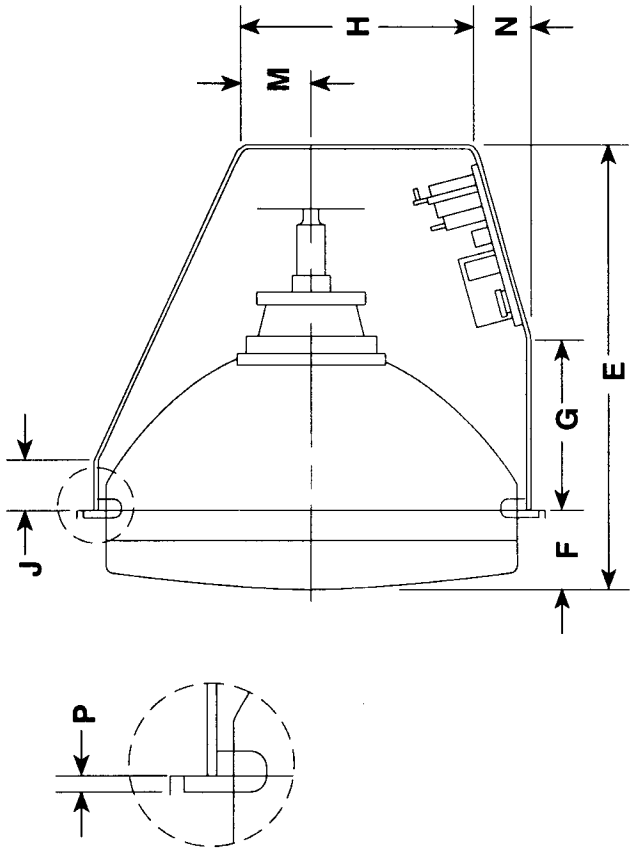
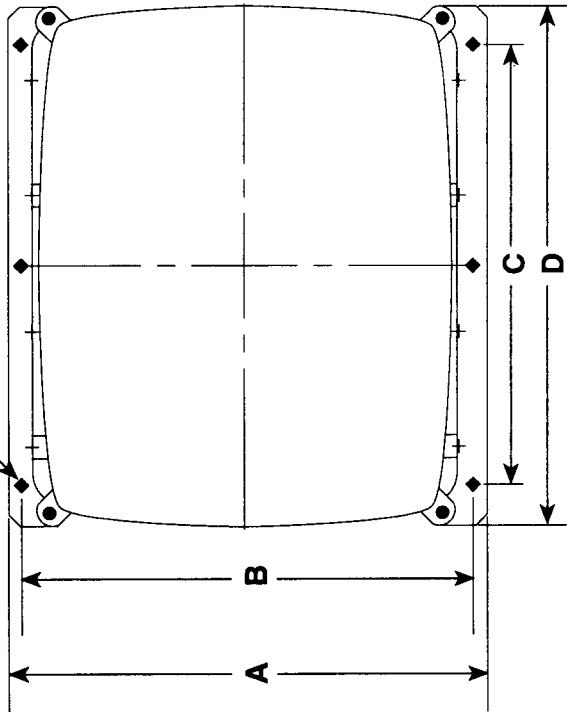
DIM	H	J	K	L	M	N	P
IN.	10.125	1.750	12.000	3.140	3.250	2.562	.343
mm.	257.18	44.45	304.8	79.76	82.55	65.07	8.71

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



.3940
10mm



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

DEFLECTION BOARD ASSEMBLY

025A1426-001

P738

158	038A7357-000	ASSEMBLY: HEAT SINK; U601	168	016X0209-001	FUSE CLIPS PCB 5x20mm (2)
159	038A7432-000	ASSEMBLY: HEAT SINK; Q704	169	020X1877-002	NUT KEPS 4-40; Q704
160	038A7432-000	ASSEMBLY: HEAT SINK; Q101	170	020X1877-002	NUT KEPS 4-40; Q710
161	001X0711-001	INSUL SIL-PAD; Q710	171	020X1877-002	NUT KEPS 4-40; U601
162	001X0772-001	INSUL SIL-PAD; Q101	172	020X1877-002	NUT KEPS 4-40; Q101
163	001X0776-002	INSUL SIL-PAD; Q704	173	020X1877-002	NUT KEPS 4-40; D707
164	001X0772-001	INSUL SIL-PAD; D707	174	085X0397-001	PC BOARD
165	001X0810-001	MOUNTING CLIP FOR Q101	175	303X0602-204	SCR MACH 4-40x1/4 HH; U601
166	001X0810-001	MOUNTING CLIP D707	176	312X0605-208	SCR SWG #4-40x3/8 HWH; Q710
167	002X0591-001	WASHER SHOULDER 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	229	C707	047X0788-515	CAP 0.01uF 20% Z5U 50V MON
179	312X1205-206	SCR SWG #6-32x3/8 HWH; PCB	230	C708	046X0550-502	CAP 5600pF 2% 50V POLY FILM
180	C101	046X0552-002	231	C709	045X0560-544	CAP LYT 1.0uF 50V
181	C102	046X0547-002	232	C710	047X0786-501	CAP 0.01uF 10% 50V P-ESTER
182	C103	046X0547-002	233	C711	047X0789-501	CAP 0.10uF 5% 100V SMF
183	C104	046X0547-001	234	C712	045X0560-006	CAP LYT 1000uF 16V
184	C105	045X0603-003	235	C713	045X0560-501	CAP LYT 4.7uF 25V
185	C106	080X0099-221	236	C714	080X0099-722	CAP 3300pF 10% Y5P 500V CER
186	C107	045X0580-034	237	C715	080X0099-580	CAP 100pF 10% Z5F 500V CER
187	C108	047X0789-510	238	C716	045X0560-549	CAP LYT 1.0uF 20% 200V
188	C109	080X0099-698	239	C718	046X0536-065	CAP 680pF 1600V 2% P-PROP
189	C110	080X0099-685	240	C719	046X0536-021	CAP 0.27 uF 200V 5% P-PROP
190	C111	080X0099-232	241	C720	046X0536-064	CAP 1000pF 630V 10% P-PROP
191	C112	080X0099-111	242	C721	046X0536-083	CAP 1500pF 1600V 2% P-PROP
192	C114	046X0561-002	243	C722	046X0537-006	CAP 0.47uF 200V 5% P-PROP
193	C115	045X0580-031	244	C723	046X0536-044	CAP 6000pF 1600V 2% P-PROP
194	C116	046X0544-004	245	C724	046X0536-012	CAP 0.015uF 400V 5% P-PROP
195	C117	045X0580-027	246	C725	045X0580-533	CAP LYT 100uF 20% 50V 105 C
196	C118	047X0789-510	247	C726	047X0788-505	CAP 270pF 10% NPO 50V MON
197	C301	080X0099-505	248	C727	047X0786-519	CAP 2200pF 5% 50V P-ESTER
198	C302	080X0099-505	249	C728	047X0786-511	CAP 0.1uF 10% 50V P-ESTER
199	C303	080X0099-505	250	C729	045X0580-535	CAP LYT 220uF 20% 50V 105 C
200	C304	045X0560-051	251	C730	045X0560-501	CAP LYT 4.7uF 25V
201	C305	045X0580-032	252	C731	045X0560-518	CAP LYT 10uF 25V
202	C310	045X0560-057	253	C732	045X0560-518	CAP LYT 10uF 25V
203	C600	045X0560-547	254	C733	080X0099-697	CAP 120pF 5% NPO 50V CER
204	C601	047X0786-501	255	C800	080X0099-234	CAP 0.01uF 10% R 250V CER
205	C602	045X0560-518	256	C801	080X0099-234	CAP 0.01uF 10% R 250V CER
206	C603	047X0789-501	257	C802	047X0788-515	CAP 0.01uF 20% Z5U 50V MON
207	C604	047X0789-501	258	C803	080X0099-062	CAP 0.02uF +80-20% Z5U 500V
208	C605	045X0560-504	259	C804	080X0099-095	CAP 1000pF 10% Z5F 2KV CER
209	C606	047X0789-501	260	C805	045X0560-550	CAP LYT 2.2uF 20% 200V
210	C607	045X0560-030	261	C808	045X0560-550	CAP LYT 2.2uF 20% 200V
211	C608	047X0789-501	262	C810	045X0560-555	CAP LYT 10uF 20% 63V
212	C609	047X0786-517	263	CN101	006A0475-003	HEADER 3 PIN
213	C611	047X0786-502	264	CN102	006A0427-001	PLUG HEADER 2 PIN
214	C610	045X0560-522	265	CN15K	006A0403-011	HEADER 11 PIN 0.156 CTR
215	C612	047X0786-508	266	CN25K	006A0403-011	HEADER 11 PIN 0.156 CTR
216	C613	045X0560-504	267	CN200	006A0403-010	HEADER 10 PIN 0.156 CTR
217	C614	047X0789-504	268	CN201	006A0473-013	HEADER 13 PIN 0.100 CTR
218	C615	045X0560-531	269	CN203	006A0473-017	HEADER 17 PIN 0.100 CTR
219	C616	045X0580-038	270	CN206	006A0427-001	PLUG HEADER 2 PIN
220	C617	047X0788-512	271	CN207	006A0427-002	HEADER 2 PIN
221	C620	080X0099-685	272	D101	066X0135-001	DIODE 1N5406
222	C700	045X0560-515	273	D102	066X0135-001	DIODE 1N5406
223	C701	045X0560-518	274	D103	066X0135-001	DIODE 1N5406
224	C702	080X0099-710	275	D104	066X0135-001	DIODE 1N5406
225	C703	047X0788-502	276	D105	066X0095-001	DIODE 1N4007 STATIC SENS
226	C704	047X0788-505	277	D106A	066X0097-001	DIODE 200V 3.5A BYV28-200
227	C705	046X0550-502	278	D106B	066X0097-001	DIODE 200V 3.5A BYV28-200
228	C706	045X0560-544	279	D106C	066X0097-001	DIODE 200V 3.5A BYV28-200

Replacement Parts List (continued)

DEFLECTION BOARD ASSEMBLY

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

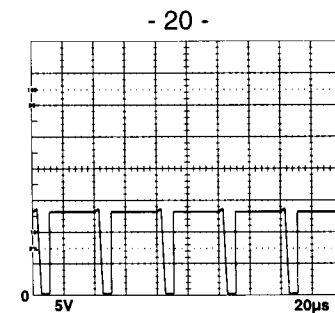
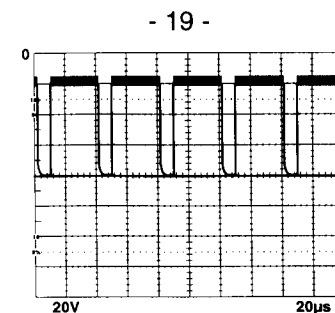
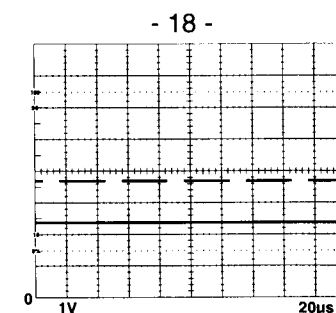
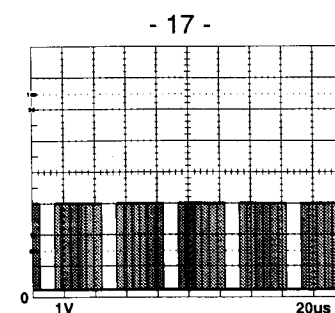
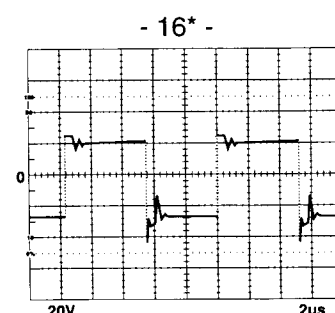
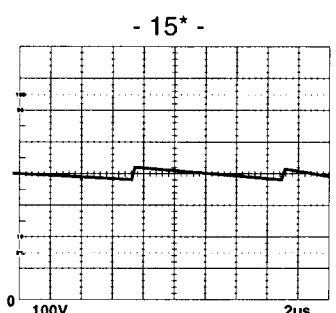
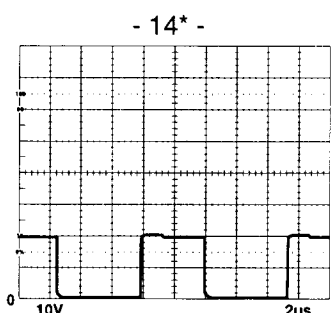
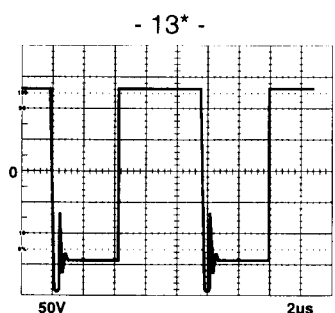
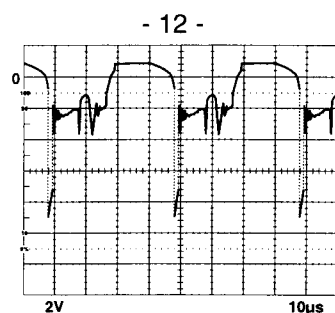
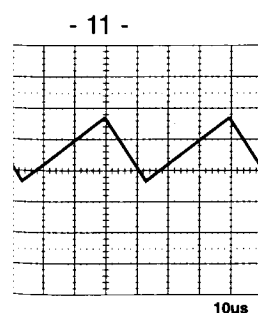
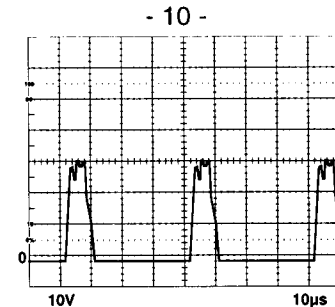
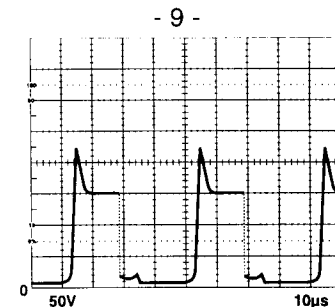
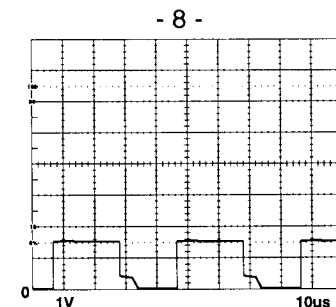
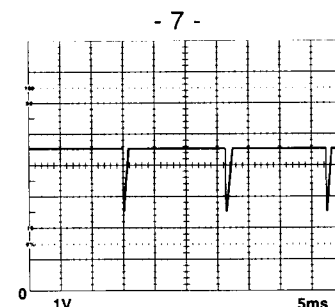
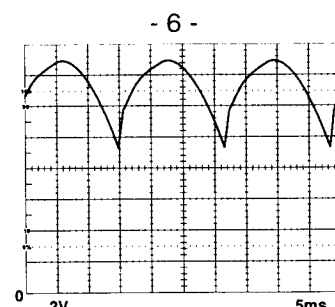
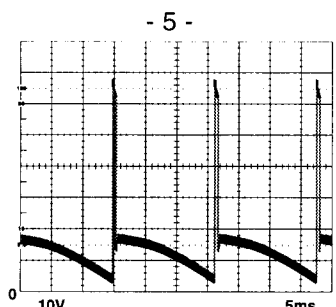
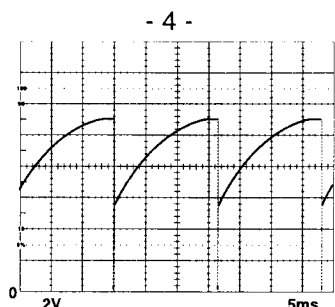
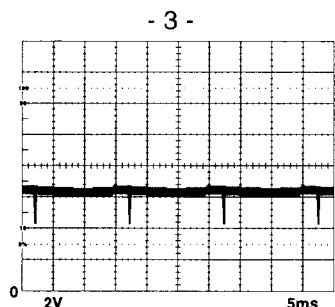
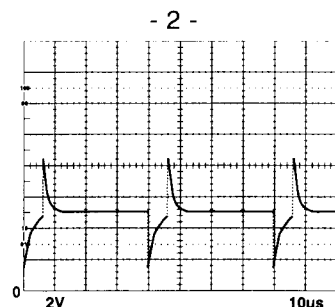
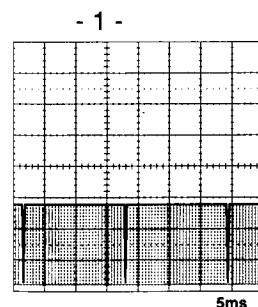
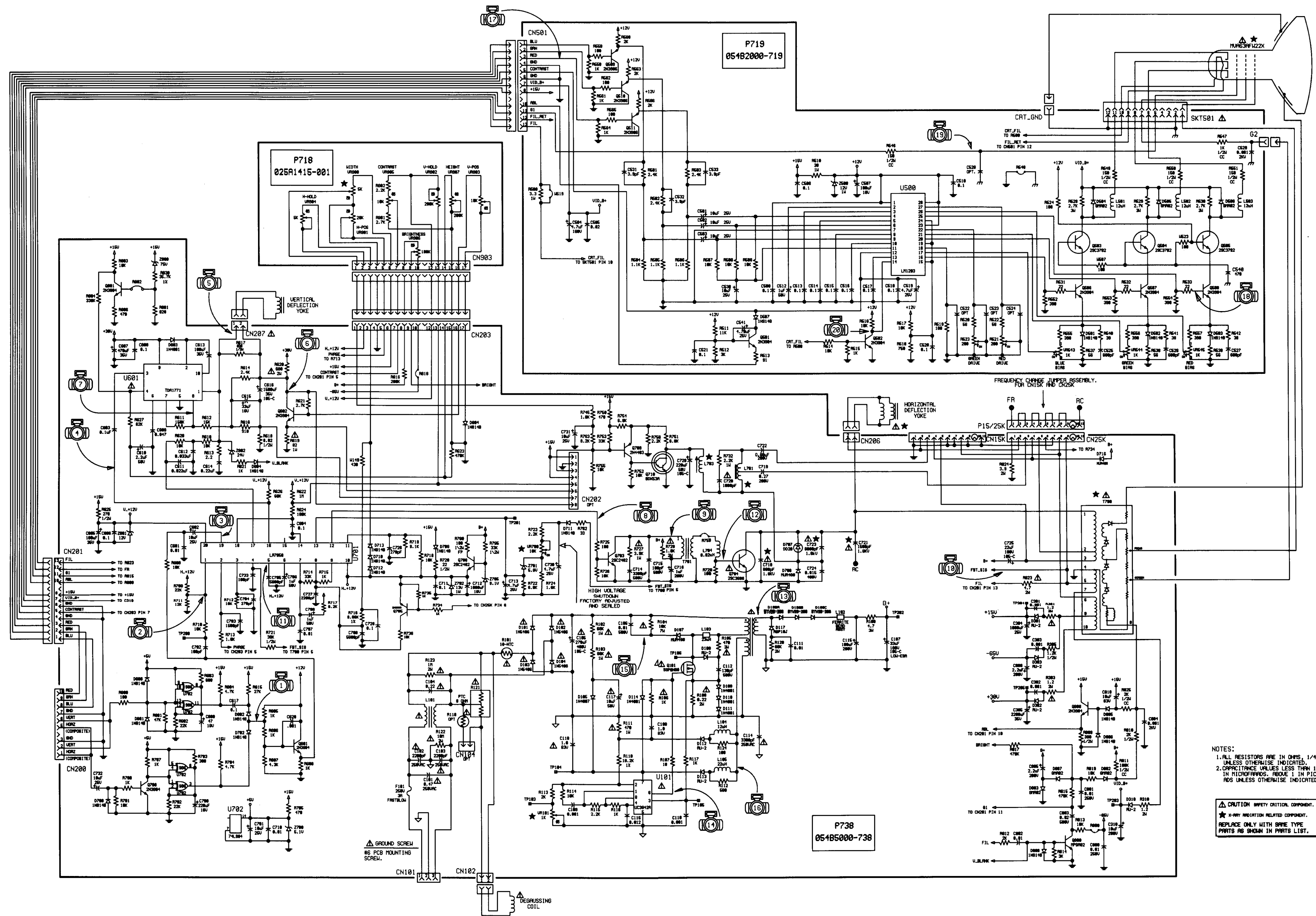
Replacement Parts List (continued)

DEFLECTION BOARD ASSEMBLY

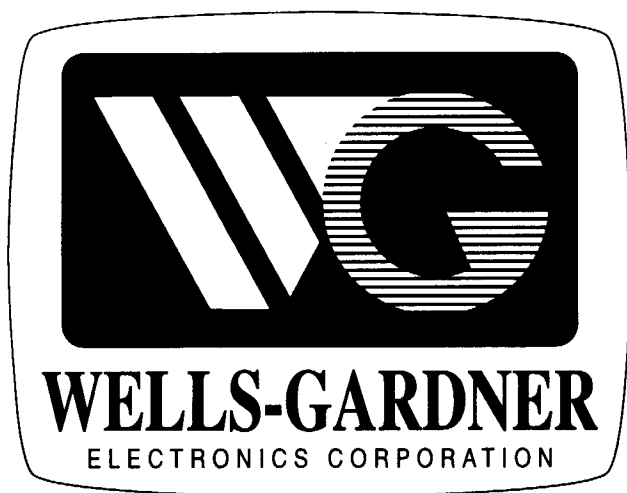
025A1426-001

P738

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



* All waveform references from the switch mode power supply are shown with respect to AC GROUND and not frame ground.
THE UNIT UNDER TEST MUST BE POWERED THROUGH AN ISOLATION TRANSFORMER TO ENSURE THE SAFETY OF THE TESTER.

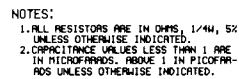


00053

SERVICE MANUAL SUPPLEMENT

MODEL 25K5108





⚠ CAUTION SAFETY CRITICAL COMPONENT
★ X-RAY RADIATION RELATED COMPONENT.
REPLACE ONLY WITH SAME TYPE
PARTS AS SHOWN IN PARTS LIST.

Y73E5108

U5000 Main PCB Assembly Parts List

ZENER DIODES

Z500	ZENER DIODE 12V 5% 1.0W	066X0040-050
Z601	ZENER DIODE 12V 5% 0.5W	066X0040-046
Z701	ZENER DIODE 5.6V 5% 0.5W	066X0040-022
Z700	ZENER DIODE 5.1V 5% 0.5W	066X0040-028
Z702	ZENER DIODE 13V 6.5% 1.0W	066X0040-017
Z705	ZENER DIODE 9.1V 5% 0.5W	066X0040-020
Z802	ZENER DIODE 24V 3% 0.5W	066X0040-031

DIODES

D501 D502 D503 D507	DIODE 1N914B	066X0070-001
D504 D505 D506	DIODE SANYO GMA02	066X0062-001
D802 D803 D807	DIODE SANYO GMA02	066X0062-001
D600 D601 D602 D604 D700	DIODE	066X0070-001
D702 D709 D710 D711 D712	DIODE 1N914B	066X0070-001
D713 D800 D804 D805 D806	DIODE 1N914B	066X0070-001
D109 D110 D111 D114 D603	DIODE 1N4001	066X0071-001
D101 D102 D103 D104	DIODE 1N5406	066X0135-001
D108 D112 D113 D310	DIODE RU-2 1A 600V FAST REC	066X0090-001
D301 D302 D303	DIODE RU-2 1A 600V FAST REC	066X0090-001
D117	DIODE DAMP 1A 600V GI RGP10J	066X0144-001
D105	DIODE 1N4007	066X0095-001
D106A D106B D106C	DIODE 200V 3.5A BYV28-200	066X0097-001
D708 D716	DIODE BOOST 600V 4A MUR460	066X0126-005
D107	DIODE BOOST 900V 4A MUR490E	066X0126-002
D707	DIODE DD20R	066X0143-001

TRANSISTORS

Q501 Q502 Q506 Q507 Q508	TRSTR 2N3904 MOT	086X0113-501
Q503 Q504 Q505	TRSTR NPN SANYO 2SC3782	086X0287-001
Q509 Q510 Q511	TRSTR 2N3906 MOT	086X0114-501
Q601 Q602 Q700 Q808	TRSTR 2N3904 MOT	086X0113-501
Q705	TRSTR 2N3906 MOT	086X0114-501
Q709	TRSTR 2N4403	086X0211-501
Q800	TRSTR MPSA92 MOT	086X0133-501
Q703 Q708	TRSTR 2SC2482 TOSH	086X0185-501
Q704	TRSTR 2SC3686	086X0286-001
Q710	TRSTR BDY53A SGS NPN DAR	086X0335-001
Q101	TRSTR N-MOSFET 6N60	086X0334-001

ICS

U500	IC LM1203N RGB VIDAMP	086X0270-001
U101	IC PWM UC3842AN	086X0257-001
U601	IC VERT DEFL TDA1771	086X0326-001
U701	IC LA7850 HV PROC SANYO	086X0274-001
U702	IC QUAD 2-INPUT X-OR 2N74LS136	086X0333-001

MISCELLANEOUS

F101	FUSE 3AFAST BLOW 5X20MM	016X0208-001
R760	RES 100 OHM 5% 0.5W FP FAILSAFE	003X0509-004
P15/25K	FREQ CHANGE PLUGASSY	038A7508-000



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