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577 D1 or D2

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TEKTRONIX®

577 D1 or D2 CURVE TRACER

SERVICE

INSTRUCTION MANUAL

Tektronix, Inc.
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TO John Martin 94-540 DATE June 25, 1991

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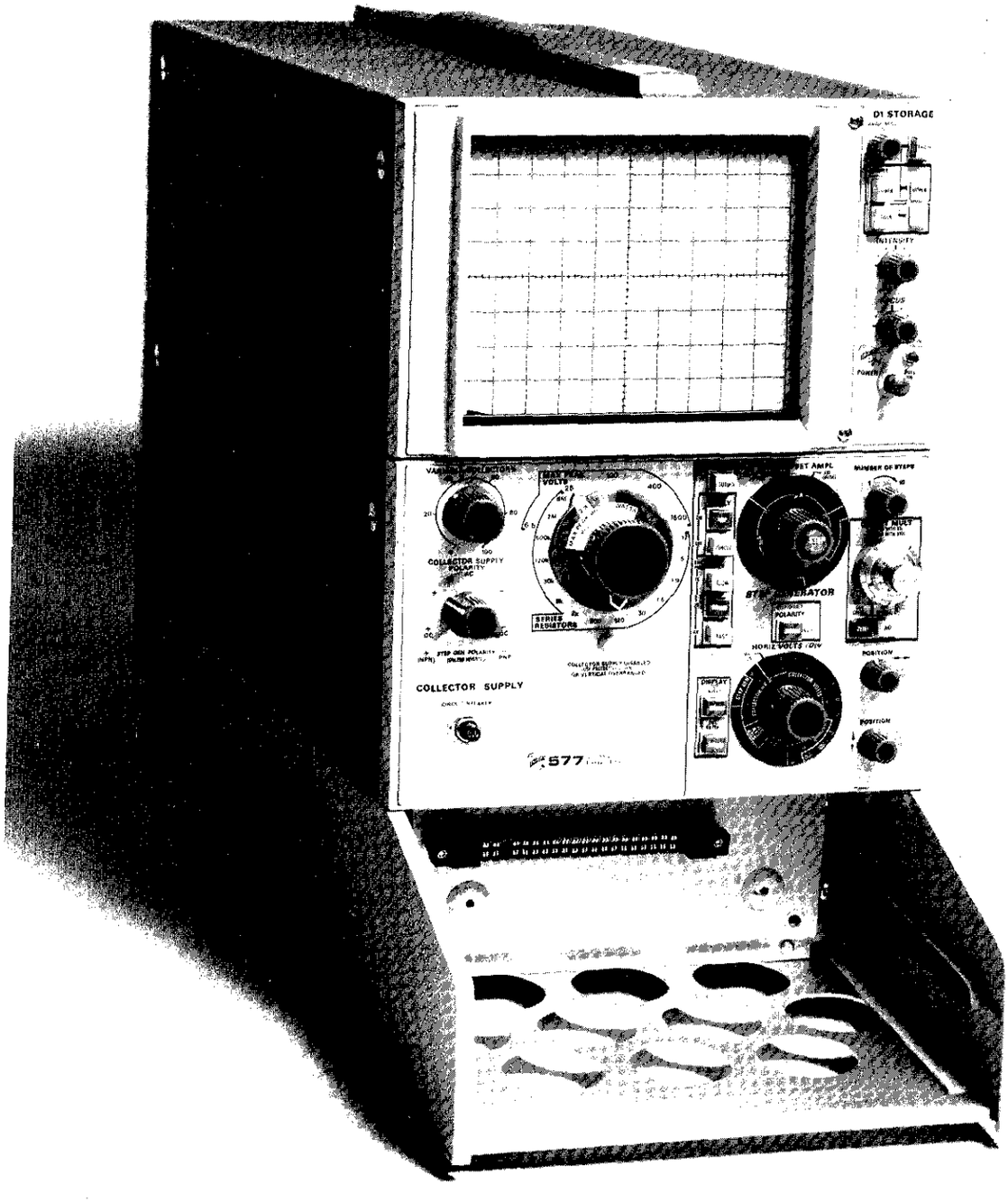
D1 STORAGE
COLLECTOR SUPPLY
577

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SPECIFICATION

Introduction

The 577-D1 or D2 Curve Tracer and Display Unit is the mainframe of a curve tracer system. The plug-in test fixtures are covered in separate service manuals.

The system is a dynamic curve tracer that permits the display of characteristics of a variety of devices.

The 577 is designed to bolt to the display module that is available in either a storage (D1) or non-storage (D2) version.

3.5 kV accelerating potential ensures a bright display on the 8 x 10 division (1/2-inch or 1.27 cm/Div) internal graticule.

The 577 features include pulsed steps, calibrated step offset, step polarity tracking with collector supply polarity, independent horizontal and vertical magnifiers, and automatic display positioning when used with the 177 Test Fixture. When used with the 177 Test Fixture, the display dims automatically when the collector supply voltage is reduced to zero.

The collector supply, 0 to 1600 volts in five ranges, is continuously variable within each range.

A step generator supplies either current or voltage steps. Current steps are 5 nA/Step to 200 mA/Step and voltage steps are 5 mV/Step to 2 V/Step. Single or repetitive steps of up to 10 steps per family (approximately 1 to 95 steps per family in STEP X.1) can be applied to the device under test.

When using the 177 Standard Test Fixture, vertical current limiting protects the device under test. When the device under test current causes the display to exceed 2.5 times full-screen vertical deflection for a short time, the collector supply is disabled if the MAX PEAK POWER WATTS setting is above .6 for serial numbers B010200 and up (577-D1) and B010120 and up (577-D2), or the SERIES RESISTORS switch is below 8 k for serial numbers below B010200 (577-D1) and B010120 (577-D2).

The horizontal display amplifier measures voltage ranging from 5 mV/DIV to 200 V/DIV and base voltage from 5 mV/DIV to 2 V/DIV. The STEP GEN position of the HORIZ VOLTS/DIV switch permits the step generator output to be displayed. Illuminated knob-skirt readout is provided on the horizontal and base-step switches.

A safety interlock provides operator protection from hazardous potentials. Interlock can be defeated from the test fixture.

This instrument is intended to be operated from a single-phase earth-reference power source having one current-carrying conductor (the Neutral Conductor) near earth potential. Operation from power sources where both current-carrying conductors are live with respect to earth (such as phase-to-phase on a three-wire system) is not recommended, since only the Line Conductor has over-current (fuse) protection within the instrument.

This instrument has a three-wire power cord with a three-terminal polarized plug for connection to the power source and safety earth. The safety-earth terminal of the plug is directly connected to the instrument frame. For electric-shock protection, insert this plug only in a mating outlet with a safety-earth contact. The color-coding of the cord conductors is in accordance with recognized standards.

The electrical and environmental characteristics shown are valid for instruments operated in an ambient temperature range from +10°C (+50°F) to +40°C (+104°F) after a five-minute warmup, if calibrated at +20°C (+58°F) to +30°C (+86°F).

CHARACTERISTICS

ELECTRICAL

Collector Supply

Voltage Ranges	6.5 V	25 V	100 V	400 V	1600 V
Max Peak Current	10 A	2.5 A	0.6 A	0.15 A	0.04 A
Peak Current, Pulsed	20 A	5 A	1.25 A	0.31 A	0.08 A
Min Series Resistance	.12 Ω	1.9 Ω	30 Ω	500 Ω	8 kΩ
Max Series Resistance	8 kΩ	120 kΩ	2 MΩ	8 MΩ	8 MΩ

Series Resistances Available: 0.12 Ω, 0.5 Ω, 1.9 Ω, 7.5 Ω, 30 Ω, 120 Ω, 500 Ω, 2 kΩ, 8 kΩ, 30 kΩ, 120 kΩ, 500 kΩ, 2 MΩ, and 8 MΩ, all within ±15%, ±0.1 Ω.

Step Generator

Accuracy (current or voltage steps, including offset)

Incremental: The amplitude of any step is within 2% of any other step.

Absolute: Within 3% of STEP/OFFSET AMPL switch setting or 3% of total output, whichever is greater. Within 4% of total output when using 10 steps, in STEP X.1

OFFSET MULT Range: Continuously variable from 0 to 10 times or from 0 to 100 times STEP/OFFSET AMPL switch setting, depending on the STEP X.1 setting, either aiding or opposing the step generator polarity.

Current Mode

STEP/OFFSET AMPL

Switch Range: 200 mA/Step to 50 nA/Step in a 1-2-5 sequence with STEP X.1 knob pushed in (X1 position). 20 mA/Step to 5 nA/Step in a 1-2-5 sequence with STEP X.1 knob in the out position (X.1 position).

Maximum Current (steps and aiding offset): 20 times STEP/OFFSET AMPL switch setting, except at least 10 times switch setting when switch is set to 200 mA/Step and 15 times switch setting when switch is set to 100 mA/Step.

Maximum Voltage: At least 7 volts, up to 1 A total output, and at least 5 volts, up to 2 A total output.

Maximum Opposing Offset Current: 10 times STEP/OFFSET AMPL switch setting up to 10 mA. Not more than 20 mA.

Maximum Opposing Voltage: Between 1 volt and 5 volts.

Voltage Mode

STEP/OFFSET AMPL

Switch Range: 50 mV/Step to 2 V/Step in a 1-2-5 sequence with STEP X.1 button pushed in (X1 position). 5 mV/Step to 200 mV/Step with STEP X.1 knob in the out position (X.1 position).

Maximum Voltage (Steps and aiding offset): 20 times STEP/OFFSET AMPL switch setting.

Maximum Current: at least 100 mA.

Short Circuit Current Limiting: Not more than 200 mA.

Maximum Opposing Offset Voltage: 10 times the STEP/OFFSET AMPL switch setting.

Maximum opposing Current: Limited between 10 mA and 20 mA at zero volts, going down to zero current at 20 V, opposing.

Pulsed Steps: Pulsed steps, approximately 300 μs, produced when the PULSED 300 μs, button is pushed to the in position.

Number of Steps: Ranges from 1 to 10 as selected by the NUMBER OF STEPS control (STEP X.1 button in). Approximately 1 to 95 steps when STEP X.1 button is released (button out).

Display Amplifiers

Display Accuracies (percent of highest on-screen value)

Vertical: See Test Fixture Service Manual for system specification.

Horizontal Collector Volts: 3%, unmagnified, and 4% magnified.

Horizontal Base Volts: 3%, unmagnified, and 4%, magnified.

Horizontal Step Generator: 4%, unmagnified, and 5%, magnified.

Deflection Factors

Vertical: See Test Fixture Service Manual

Horizontal Collector Volts: 50 mV/DIV to 200 V/DIV in a 1-2-5 sequence, unmagnified. 5 mV/DIV to 20 V/DIV in a 1-2-5 sequence, magnified.

Horizontal Base Volts: 50 mV/DIV to 2 V/DIV in a 1-2-5 sequence, unmagnified. 5 mV/DIV to .2 V/DIV in a 1-2-5 sequence, magnified.

Display Positioning Accuracy, using POLARITY switch (with 177 only):

Spot positioning with change in POLARITY switch setting (using AC position as a reference).

	Vertical	Horizontal
AC	Centered	Centered
+(NPN)	−4 div	−5 div
−(PNP)	+4 div	+5 div

Indicator and CRT (Display Module)

Cathode Ray Tube

Type: Electrostatic Deflection.

Phosphor:

D2 (non-storage): P31 (standard).

D1 (storage): Equivalent to P1.

Accelerating Voltage: 3.5 kV.

Storage Characteristics (D1)

Storage Time: 1 hour.

Power Input

Line Voltage (RMS)

Nominal: 100 V, 110 V, 120 V, or 200 V, 220 V, 240 V, within 10%.

Line Freqeuncy

Range: 50 to 60 Hz.

Maximum Power at 110 VAC, 60 Hz: 155 W (1.7 A).

ENVIRONMENTAL

Temperature

Specified Operating: +10°C (+50°F) to +40°C (+104°F).

Useful Operating: 0°C (+32°F) to +50°C (122°F).

Non Operating: −40°C (−40°F) to +65°C (149°F).

Altitude

Operating: to 10,000 feet.

Transportation

12-inch package drop: Qualified under the National Safe Transit Committee procedure 1A.

PHYSICAL

Net Weight

Main frame: Approximately 40 pounds (18.1 kg).

Dimensions

Length (without test fixture):	≈22 1/4 inches
Width:	≈8 1/3 inches
Height:	≈14 5/8 inches

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OPERATING INFORMATION

Introduction

The D1 (storage) and D2 (non-storage) display modules operate with the Tektronix 577 Mainframe and a test fixture to form a curve tracer system.

This section of the manual gives a brief functional description of the front-panel controls and connectors and a familiarization procedure.

Preliminary

The Operating Instructions section of the appropriate Operators Manual should be referred to for initial preparation. The Operators Manual contains operating information as well as general and specific applications information.

Function of Controls

This is a brief description of the functions of the front-panel controls.

577

COLLECTOR SUPPLY

SUPPLY

+DC	Applies positive DC to the collector terminals of the test fixture.
+	Applies positive sweeping voltage at twice line rate to the collector terminals of the test fixture. See PULSED 300 μs.
AC	Applies AC at power line frequency to the test fixture collector terminals (use slow step rate).
−	Applies negative sweeping voltage at twice line rate to the test fixture collector terminals. See PULSED 300 μs.
−DC	Applies negative DC to the test fixture collector terminals.

NOTE

The normal step generator polarity is positive-going in +DC, +, and AC, and negative-going in − and −DC. Step generator polarity can be inverted by either the STEP/OFFSET POLARITY switch or the test fixture Terminal Selector.

[1] **Automatic trace position with polarity change is maintained in all switch positions.**

VARIABLE COLLECTOR %	Provides uncalibrated, continuously variable control of collector supply amplitude from 0% to 100% of the voltage selected with the MAX PEAK VOLTS switch.
MAX PEAK VOLTS	Selects one of five collector supply voltages.
SERIES RESISTORS and PEAK POWER WATTS switches	Fourteen resistor values coupled to the MAX PEAK VOLTS switch to maintain one of six labeled peak power limits. The SERIES RESISTORS and PEAK POWER WATTS switch pulls out to unlock from the MAX PEAK VOLTS switch to change the power setting. Lower power settings are available on all except the highest voltage range.
COLLECTOR SUPPLY DISABLED (Indicator Lamp)	The yellow lamp is lighted when the test fixture protective lid is not closed over the test terminals (unless modified by a wiring option in the test fixture) whenever the MAX PEAK VOLTS switch is in the 100 V, 400 V, or 1600 V position. The yellow lamp pulses (on and off) if the vertical current limiting circuit disables the collector sweep.
COLLECTOR SUPPLY CIRCUIT BREAKER	Protects the collector supply from excessive power dissipation. Push to reset breaker after circuit interruption.
PULSED 300 μs (Pushbutton)	With the PULSED 300 μs pushbutton in the in position (Pulsed Mode), the step generator produces 300 μs wide pulses at 1 or 2 times line frequency, depending on the Step Rate selected.
STEP FAMILY REP	With this pushbutton in the in position, up to ten steps per family are generated, depending on the position of the NUMBER OF STEPS control. When the pushbutton, STEP X.1, concentric with the STEP/OFFSET AMPL switch, is in the out position, the NUMBER OF STEPS control provides from about 1 to 95 steps.

SINGLE — Each time the SINGLE button is pressed, a single family is generated. Upon release, the step generator is turned off.

SLOW (1X LINE Frequency) — When the SLOW button is in the in position, the generator stepping rate is at power-line frequency.

NORM (2X LINE Frequency) — When the NORM button is in the in position, the generator stepping rate is twice the power-line frequency.

FAST (4X LINE Frequency) — When the FAST button is in the in position, the generator stepping rate is four times the power-line frequency.

NOTE

Step transitions occur at the start of the collector supply sweep in SLOW and NORM modes. Transitions occur at both the start and the peak of the collector supply sweep in the FAST mode.

FAST and SLOW — When FAST and SLOW buttons are in the in position simultaneously, the generator stepping rate is twice the power-line frequency, but the step transitions occur at the peaks of the collector supply sweeps.

NUMBER OF STEPS — Continuously variable control selects the number of steps per display.

STEP/OFFSET AMPL — Selects from 21 current steps, from 50 nA/Step to 200 mA/Step, or six voltage steps from .05 V/Step to 2 V/Step in a 1-2-5 sequence.

STEP X.1 — Push-push knob concentric with STEP/OFFSET AMPL knob. When this knob is released (out position) the step amplitude is reduced to .1X the previous amplitude and is indicated by the illuminated area of the STEP/OFFSET AMPL knob skirt. The number of steps available changes to approximately 1 to 95 steps.

STEP/OFFSET POLARITY — When the NORM pushbutton is in the in position, the step voltage is the same polarity as the collector sweep unless inverted by the test fixture.

OFFSET MULT — Multiturn control providing DC offset from 0 to 10 times the STEP/OFFSET AMPL switch setting with the STEP X.1 button in, 0 to 100 times with the STEP X.1 button out.

OFFSET (ZERO button) — In the out position, the offset voltage is determined by the OFFSET MULT control.

OPPOSE (AID button) — In the in position, the offset voltage aids in the step generator signal. When the OPPOSE button is in the out position, the offset voltage opposes the step generator signal.

HORIZ VOLTS/DIV (knob) — Selects from 12 calibrated collector deflection factors from .05 V/DIV to 200 V/DIV or from 6 calibrated base deflection factors from 50 mV/DIV to 2 V/DIV, unmagnified. With the X10 HORIZ MAG in the out position, the deflection factors are 5 mV/DIV to 20 V/DIV or 5 mV/DIV to .2 V/DIV. All steps follow a 1-2-5 sequence.

Horizontal POSITION (knob) — Provides uncalibrated horizontal positioning over at least ±10 graticule divisions.

X10 HORIZ MAG PULL — Pulling the Horiz POSITION knob to the out position provides ten times magnification of the horizontal display.

DISPLAY INVERT — When the NORM pushbutton is in the in position, a normal display is presented. When the NORM button is out, the display is inverted, both horizontally and vertically.

DISPLAY FILTER — Full vertical bandwidth is obtained with the NORM pushbutton in the in position. When the NORM button is in the out position, vertical bandwidth is limited to reduce noise on the trace.

Vertical POSITION (knob) — Provides uncalibrated vertical positioning over at least ±8 divisions.

X10 VERT MAG PULL — Pulling the Vertical POSITION knob to the out position provides ten times magnification of the vertical display.

D1 and D2

INTENSITY	Controls display brightness
FOCUS	Provides adjustment to provide a well-defined display.
BEAM FINDER	Brings beam on screen; limits the display to the area inside the graticule.
POWER	Turns instrument power on and off.
TRACE ROTATION (rear panel)	Permits alignment of the trace with respect to the graticule lines.
UPPER and LOWER STORE	Button pushed in selects storage operation. Button out selects normal operation without storage. Each button has a push-push action and is independent of the other.
UPPER and LOWER STORE	Complementary cancelling switches select the screen to be erased. Both buttons pushed in selects both screens.
ERASE	Momentary contact pushbutton initiates erasure of the stored image selected by the Erase Selector.
BRIGHTNESS	Provides continuously variable flood-gun current duty cycle from about 10% to 100% (when the collector sweep is turned down or disabled), permitting extended retention of displayed information. Also controls the degree of spot dimming when collector sweep is turned down or disabled.

Familiarization

The following steps demonstrate the use of the controls of the D1 or D2. Follow the procedure for familiarization.

Setup Information

1. Be sure that the Curve Trace system is complete. The D1 or D2 must be properly connected to the 577 mainframe (with the test fixture in place).

2. Set the POWER switch to Off and connect the Curve Tracer system to a power source that meets the voltage and frequency requirements in the Operating Instructions of the 577 system Operators Manual.

3. Set the D1 or D2 front-panel controls as follows:

NOTE

When first receiving the instrument and when it has been turned off for two weeks or more turn the BRIGHTNESS control fully clockwise, and place the push-push STORE switches (UPPER and LOWER) in the in position. Turn the INTENSITY control fully counterclockwise. Turn the power on and note that after a short delay the screen becomes fully illuminated. Leave the instrument in this mode for five minutes before erasing or going to the non-store mode.

D1-D2

INTENSITY	counterclockwise
FOCUS	centered

D1 Only

BRIGHTNESS	counterclockwise
STORE	
UPPER and LOWER	out position
ERASE	
UPPER and LOWER	either position

4. Pull the POWER switch to the ON position.

5. Allow one minute for instrument warm-up.

6. Set the 577 Curve Tracer system controls as follows:

MAX PEAK VOLTS	25
MAX PEAK POWER WATTS	.15
VARIABLE COLLECTOR %	0
COLLECTOR SUPPLY POLARITY	AC
All Dark Gray Buttons	pushed in
HORIZ VOLTS/DIV	1 V, COLLECTOR
VERTICAL CURRENT/DIV	1 mA
LEFT-RIGHT Switch	off (centered)
Terminal Selector	EMITTER GROUNDED BASE TERM, STEP GEN

7. Slowly turn the INTENSITY control clockwise, while pressing the BEAM FINDER button, until a spot appears in the CRT viewing area. To avoid burning the CRT phosphor, adjust the INTENSITY control until the spot is easily visible, but not exceptionally bright. Position the spot to graticule center and release the BEAM FINDER button.

8. Adjust the FOCUS control for a sharp, well-defined spot.

9. Turn the VARIABLE COLLECTOR % control to produce a ten-division horizontal trace on the CRT graticule.

10. Adjust the INTENSITY control for the desired viewing level (brightness). Adjust the FOCUS control for a sharp, well-defined display over the trace length.

11. Vertically position the trace to center horizontal graticule line. If the trace is not parallel to the center horizontal line, see Trace Alignment Adjustment in this section.

Beam Finder

1. Move the display off screen with the Vertical POSITION control.

2. Push the BEAM FINDER button and observe that the display returns to within the graticule area. Reposition the display to graticule center and release the BEAM FINDER button.

Storage Operation (D1)

Turn the INTENSITY control counterclockwise and press both UPPER and LOWER STORE buttons. A background light level will be present on the storage screens.

Simultaneously press both the UPPER and LOWER screen-selector buttons. Push the ERASE button to erase both screens; this prepares the targets for storage.

Turn the INTENSITY control slowly clockwise to produce a trace of normal viewing intensity, then turn the control (INTENSITY) fully counterclockwise. A stored display should remain on the screen.

Separate STORE switches are provided for the upper and lower storage screens, permitting independent screen use. When both screens are operated in the non-store mode (both UPPER and LOWER STORE buttons out) the instrument provides a normal display. When either or both screens are operated in the storage mode (applicable STORE button in) a display can be retained for further analysis.

A stored display is erased by first selecting the screen to be erased, then pushing the ERASE button. The erasure of one screen has no effect on the other. The UPPER and LOWER ERASE buttons are interlocked to provide cancellation of either switch when the other is pressed. However, either screen, or both, can be selected for erasure.

To demonstrate independent storage screen operation, push the ERASE, UPPER, screen selector button to release the ERASE, LOWER button. Press the ERASE button and note that only the upper screen erases. Push the ERASE, LOWER button (ERASE, UPPER button releases) and press the ERASE button. Set either screen to non-store (STORE button out) and note that the other screen is fully operable in the storage mode, permitting simultaneous store and non-store operation.

The brightness (intensity) of the CRT display is controlled from the INTENSITY control. This control is adjusted for an easily visible but not excessively bright display. Readjustment may be necessary for different displays.

Particular care should be exercised when only a spot is displayed, as a high-intensity spot can burn the CRT phosphor. Permanent damage may result if a stationary spot remains too long.

CIRCUIT DESCRIPTION

General

This circuit description is divided into two parts: a block diagram description and a circuit description.

The block diagram description describes the functions of the major circuit blocks, using the overall block diagram included in the diagrams section at the rear of the manual.

The circuit description provides a more detailed description of each of the major circuits. Some individual block diagrams are included with the text in this description. Complete schematic diagrams, including component numbers and component values, are provided on the pullouts at the rear of the manual.

BLOCK DIAGRAM DESCRIPTION (577)

The 577-D1 or D2, when used with the appropriate test fixture, is a dynamic curve tracer system that measures and displays the characteristics of a wide variety of devices. The collector supply and step generator circuits produce operating voltages that are applied to the device under test. The display amplifiers measure the results of the voltages applied to the device under test. These measurements result in the display (on the CRT) of the characteristics of the device.

The collector supply circuit produces full-wave rectified, filtered or unfiltered, sine waves (either negative going or positive going) or unrectified sine waves, depending on the positions of the COLLECTOR SUPPLY POLARITY switch or the PULSED 300 μs button. The signal amplitude can be varied from 0 to 1600 volts, determined by the settings of the MAX PEAK VOLTS switch and the VARIABLE COLLECTOR % control. The collector supply output is connected to the collector, or equivalent, terminal of the device under test.

The step generator produces ascending steps of current or voltage at a Normal rate of one step for each half-sine wave of the collector supply. The current or voltage step amplitude is controlled by the STEP/OFFSET AMPL switch. The number of steps produced is controlled by the NUMBER OF STEPS control. The step generator output is applied to either the base or emitter terminals (or equivalent) of the device under test.

The display amplifiers are connected to the device under test. These amplifier circuits sense the effects of the collector supply and step generator output on the device under test, amplify the resulting signals, and apply these signals to the CRT deflection plates. The deflection factors of these amplifiers are controlled by the VERTICAL CURRENT/DIV and HORIZ VOLTS/DIV switches.

CIRCUIT DESCRIPTION (577)

The following analysis provides a description of the major circuits in the curve tracer, with special emphasis on those areas of unique or especially complex circuitry.

Power Supply

The low-voltage power supply provides five regulated and five unregulated dc voltages and three ac voltages, derived from T701.

The regulated dc voltages are: −30 V, −12 V, +5 V, +12 V, and +30 V. The unregulated dc voltages are: −40 V, +40 V, +200 V and two voltages, +10 V and +40 V (step amplifier supplies with the step amplifier common being the reference).

The three ac voltages are used for: D1 Display Unit flood-gun heaters, 6.3-volt CRT heater (elevated to −3400 volts), + and −15 volts for the collector sweep board, and a 90-volt, ac, p-p, signal (from the same secondary as the +40 and −40-volt supplies) used as a line phase reference in the step generator.

−30-Volt Supply. The −30-volt supply consists of CR751 (a diode bridge also shared with the +30-volt supply); a filter, C771; a reference diode, VR772; an error amplifier, Q772-Q786; and a series regulator, Q788.

VR772 sets the voltage on Q772 emitter. Any variation in the −30-volt supply output level (set by R775) is compared to the reference voltage on the emitter through the divider (R777, R775, and R776). Any variation in Q772 base voltage is amplified by Q772 and Q786. This amplified error signal controls the conduction of Q788.

The −30-volt supply is short-circuit protected. If the current through series regulator Q788 causes a drop in excess of approximately 0.7 volts across R786, CR785 conducts, turning on Q786, which turns off the series regulator, limiting the current to a safe level.

+30-Volt Supply. The +30-volt supply consists of the diode bridge (shared with the −30-volt supply); a filter, C751; an error amplifier, Q754; a series regulator, Q766; and short-circuit protection, Q760.

The −30 volts at the bottom of divider R763-R765-R764 is the reference for the +30-volt supply. Any change in the +30-volt output level causes a change at the variable tap on R765 (about zero volts, DC). The voltage at R765 tap is compared to Q754 emitter voltage (approximately −0.7 volts, set by CR755). Any variation is amplified by Q754 and controls the conduction of the series regulator, Q766.

The +30-volt supply is short-circuit protected. When current through the series regulator, Q766, reaches a value that causes the drop across R766 to reach approximately 0.7 volt, Q760 turns on, limiting the base drive to Q766, limiting the current to a safe level.

−12-Volt Supply. The −12-volt supply consists of a diode bridge, CR731; filters 731 and C733; and a monolithic regulator, U732. The regulator is designed to provide short-circuit and thermal protection.

+12-Volt Supply. The +12-volt supply consists of a diode bridge, CR721 (shared with the +5-volt supply); a filter, C721 (also shared with the +5-volt supply); and a monolithic regulator, U722. U722 is identical to U732 and is designed to provide short-circuit and thermal protection.

+5-Volt Supply. The +5-volt supply consists of CR721 and C721; and a monolithic regulator, U724, which is designed to provide short-circuit and thermal protection.

Step Generator

The step generator consists of three major sections: the clock, the staircase generator, and the pulse generator. See Fig. 3-1.

The clock circuit produces a negative-going clock pulse that determines the rate and phase (with respect to the collector supply) of the step generator output.

The staircase generator produces a staircase of steps. It also determines the number of steps, and whether a single family or repetitive family of steps is produced.

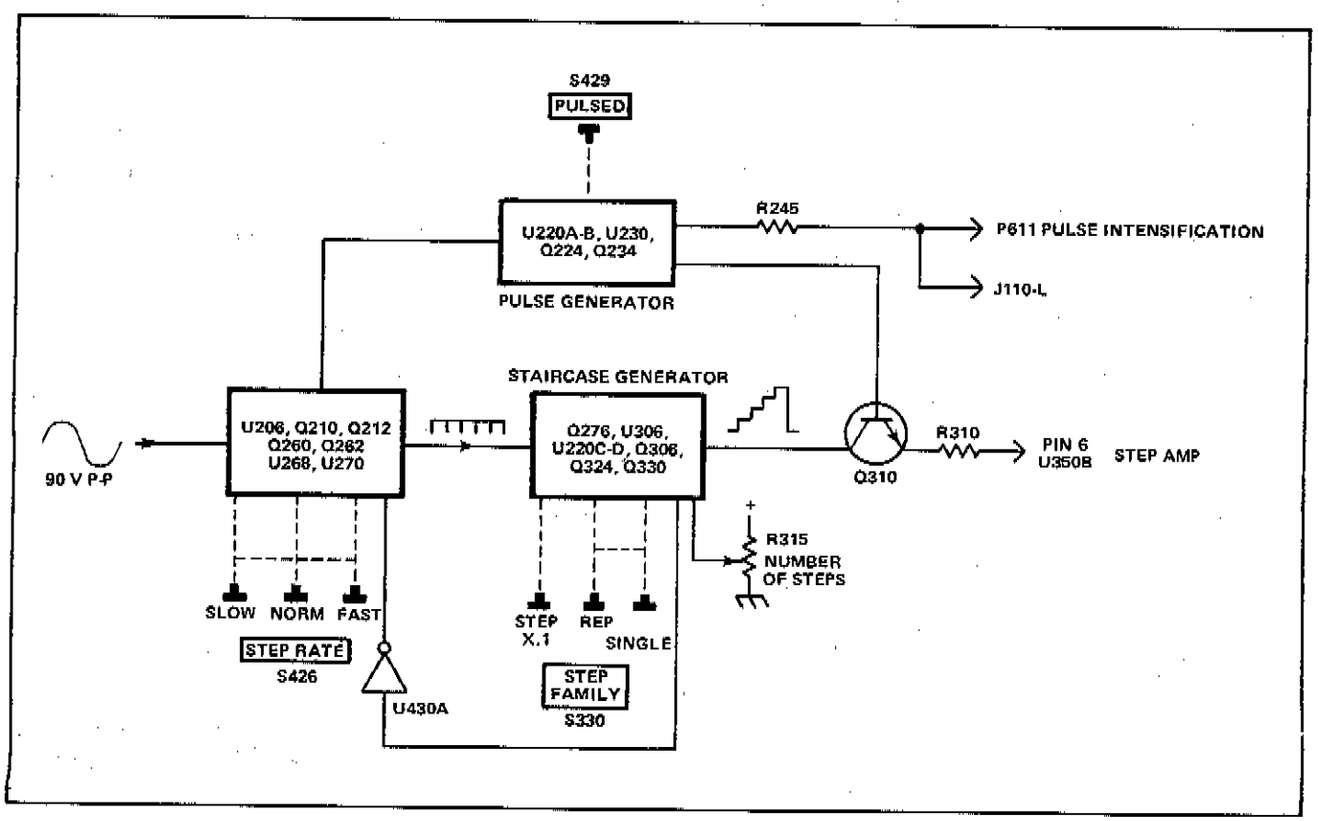


Fig. 3-1. Block diagram of the Step Generator.

The pulse generator controls the output of the step generator and may permit only 300 μs pulses instead of the staircase. The three major sections of the pulse generator are shown in Fig. 3-1, illustrating the major components.

The Clock Circuit. The clock circuit consists of phase-shift amplifier, U206; two zero-crossing comparators (Q210-Q212 and Q260-Q262); a four-wide, two-input gate, U268; and a monostable multi, U270.

The input to the clock circuit (line frequency) is from pin 8 of P392. This ac signal is fed to the base of Q260, one of the zero-crossing comparators, and also to the input of the phase-shift amplifier. The phase-shift amplifier shifts the phase of the ac signal by 90° and feeds the phase-shifted signal to the bases of the other zero-crossing comparators.

The zero-crossing comparators have four outputs, which coincide with the four zero points of the sine-wave signal and the phase-shifted signal. The phase-shifted signal is also fed to the pulse generator circuit.

The four outputs are connected to the four-wide, two-input gates of U268. The four signals at the input gates of U268 correspond in time to the two zeros and two peaks of one complete sine wave of the ac collector-supply reference signal at the input of the clock circuit. The signals at gates A and B (U268) respond to the peaks and gates C and D respond to the zeros.

The ability of U268 to pass these signals is controlled by the STEP RATE switch. If either input of any gate is connected to a low level (zero), the gate will not pass a signal.

If the SLOW button is pressed, gates A, B, and C, each has one input tied to ground. A, B and C are disabled and only gate D can pass the signal. This signal corresponds to one zero crossing of the input sine wave.

When the NORM button is pushed in, gates A and B are disabled, and gates C and D pass the signal. These signals correspond to both zeros of the input sine wave.

If the FAST button is pressed, all gates pass the signal, corresponding to both zeros and both peaks of the input sine wave.

If the FAST and SLOW buttons are pressed simultaneously, gates C and D are disabled, permitting gates A and B to pass signals corresponding to both sine-wave peaks.

The signals passed by U268 are applied to the input, pins 3 and 4 of U270.

U270 is a monostable multi having a time constant set by R273-C273. The output of U270 is a constant-width positive pulse which is applied to the staircase generator. U270 may be disabled by applying a low level to pin 5 of U270. This level is provided by U430A, which is controlled by the step family switches.

The Staircase Generator.

STEP FAMILY REPETITIVE. The staircase generator circuit consists of a common-emitter amplifier, Q276; an integrator, U305A; a level detector, U305B; U220C and U220D connected as a bistable multi; a reset transistor, Q306; and two common-emitter amplifiers, Q324 and Q330. The positive-going, constant-width input pulse from U270 is applied to the input of the staircase generator Q276. The result is a negative-going pulse (at the collector of Q276). The pulse amplitude (when STEP X.1 is pushed in) is adjusted by the Step Amplitude control, R278. When STEP X.1 is released, the pulse amplitude is adjusted by R281. This negative-going pulse is applied to either C279 or C280, depending on the setting of the STEP X.1 switch.

The negative-going step coupled by C279 or C280 causes the — input of U305A, pin 6, to try to go negative, causing the output of U305A, pin 7, to go positive to offset the negative step on pin 6. This action produces a charge on C306, causing a positive step at U305A output. The amplitude of the positive-going step depends on the ratio of C279 (or C280) to C306.

If the STEP X.1 button is pushed in, the amplitude of each step is one-half volt. Each following pulse from Q276 causes an additional step at U305A output. These steps continue until pin 2 of U305 goes more positive than pin 3 of U305B. The level at pin 3 is set by the NUMBER OF STEPS control (front panel) and is adjusted from approximately zero to approximately 5 volts.

When the — input of U305B goes more positive than the + input, the output switches to a — level. This — level is applied as a low level to U220C, pin 13, causing U220C output, pin 11, to switch to its high level, causing a high level at pin 4 of U220D. The high level on pin 4 of U220D does not cause U220D to switch, since pin 5 is still at a low level. The leading edge of the next positive pulse from U270, pin 6, is coupled through C274 to pin 5 of U220D, causing pin 6 of U220D to go low, causing a low pin 12 of U220C, keeping the flip-flop latched in this condition.

The low level at U220D output is connected to Q324 base, turning Q324 off and causing the collector level to go

high. The high level at Q324 collector does two things: holds pin 5 of U220D at a high level and turns Q306 on. This causes Q306 to discharge C306, which in turn causes pin 7 of U305A to return to ground level.

Ground level on U305A, pin 7, causes U305B, pin 2 to go to a level lower than that on pin 3 of U305B, causing the output of U305B, pin 1, to go positive. This positive step causes a high level on U220C, pin 13, but a switch cannot occur since pin 12 of U220C is at a low level, the falling edge of the positive-going pulse from pin 6, U270, is coupled through C274 to pin 5 of U220D. U220D switches, causing pin 6 to go high, causing a high level at pin 12, U220C, causing pin 11 to go low, latching the flip-flop in this condition. At this point another staircase will be generated.

STEP FAMILY SINGLE. When the SINGLE button is pressed, the REP button is released and one family is permitted to run.

When the REP button is released, pin 2 of U430A is connected to Q324 collector. Since U430A is wired as in inverter, whenever the collector of Q324 is high, pin 3 of U430A is low, disabling U270. The base of Q330 is tied to Q324 collector, so that whenever the collector of Q324 is high, Q330 is turned on, causing Q324 base to be at ground level. Q324 is held in the off condition.

Pressing the SINGLE button causes Q330 base to be grounded momentarily by C332. This permits Q330 collector to go to a high level, since pin 6 of U220D is high. Q324 collector goes to the low level, enabling U270, causing pulses to run, and turning off Q330.

One step family runs as described previously, until pin 6 of U220D goes to the low state, and turns Q324 off, permitting Q324 collector to go high, disabling U270, turning Q330 on, latching until the single button is pressed again.

The output of the staircase generator is applied to Q310 collector.

300 μs Pulse Generator. The 300 μs pulse generator consists of gates U220A and U220B; a monostable multi, U230; common-emitter pulse-intensification amplifier, Q224; and a common-emitter amplifier, Q234.

The gates in the input of the pulse generator (U220A and U220B) operate similarly to the gates in the clock circuit in the input of U268. The inputs to U220A and U220B come from the zero-crossing comparators, Q210 and Q212. These input signals correspond in timing to the peaks of the sine-wave signal (collector supply reference) applied to the input of the step generator clock circuit. The ability of U220A and U220B to pass these signals is controlled by the PULSED 300 μs and the STEP RATE buttons.

When either the STEP RATE NORM or FAST button is pressed, while the PULSED 300 μs button is pushed in, pin 12 of U220A and pin 1 of U220B are permitted to go to high levels, and both gates (U220A and U220B) pass the signals.

When the STEP RATE SLOW button is pressed while the PULSED 300 μs button is pushed in, pin 1 of U220B is low and U220B cannot pass the signal (only U220A passes signal).

The output of U220A and U220B are coupled through C223 and C226 and applied to the input of the monostable multi, U230.

The time constant of the monostable multi is set by C231-R231. A 300 μs pulse appears at both monostable-multi outputs (Q and $\overline{Q}$) for each signal input. The Q output, pin 6, has a positive-going 300 μs pulse, and the $\overline{Q}$ output, pin 1, has a negative-going 300 μs pulse.

The $\overline{Q}$ output, pin 1, is normally about 5 volts (high state) positive unless an input signal is applied, in which case pin 1 goes to ground level for 300 μs.

When $\overline{Q}$ is at its high level, Q234 is held on, causing its collector to be at ground level, which holds Q310 off.

When $\overline{Q}$ goes to ground, Q234 turns off, causing Q310 to turn on for 300 μs, permitting a pulse step at the emitter of Q310.

When the PULSED 300 μs button is not pushed in, CR234 cathode is grounded, holding Q234 off.

The Q output of U230 is normally at ground and goes positive for 300 μs each time an input signal is applied to the input. This positive-going step at Q is delayed 100 μs by network R241-C242. After the 100 μs delay, Q224 turns off for 200 μs (300 μs minus the 100 μs delay). As Q (pin 6) returns to the low level, CR241 turns on and Q224 is immediately turned off. This process creates a negative-going signal at Q224 collector, 200 μs wide, delayed by

100 μs. The negative-going pulse on Q224 collector is used to intensify the last 200 μs of the 300 μs pulse.

The PULSED 300 μs switch has two sections. The section previously explained controls the signals through U220A and U220B. When the PULSED 300 μs button is pushed in, pins 3 and 4 of U268 are grounded, preventing U268, A and B from passing signals in the PULSED 300 μs mode. Only SLOW and NORM rates can be achieved when in pulsed mode.

The remainder of the PULSED 300 μs switch permits continuity (when pushed in) from terminal 2, P433, to the STEP RATE switch to ground. When the PULSED 300 μs button is pushed in, and either the SLOW or NORM STEP RATE button is pushed in, the collector supply goes automatically to DC mode.

When the FAST STEP RATE button is pushed in, the pulses occur at normal rate (2X line frequency) and the collector supply is not switched automatically to DC mode.

Step Amplifier

The step amplifier converts the step generator output to current or voltage steps for application to the device under test. The STEP/OFFSET AMPL switch determines the amplitude of these steps.

The step amplifier consists of an offset amplifier, U350A; a current summing amplifier, U305B; an X1 inverting or non-inverting amplifier; and an output amplifier.

For voltage steps, the output amplifier consists of U380A, and Q384 or Q386 (depending on polarity). See Fig. 3-2A.

For current steps the output amplifier consists of U380A; Q384 or Q386; Q450A and B; and U380B (an X1 feedback amplifier). See Fig. 3-2B.

The offset amplifier, U350A, produces currents ranging from 0 to 500 μA, of either polarity, depending on the setting of the OFFSET mult dial and the ZERO-AID buttons. The current is applied to the – input of U350B, pin 6. The step generator signal, consisting of steps of 50 μA each, is applied to pin 6.

Each 50 μA step to U350B input produces a negative-going step of 0.4 volts at the output of U350B, pin 7. A total of 10 steps, therefore, produces 4 volts at U350B output. If the OFFSET AID button is pressed and the OFFSET MULT dial is set to 10.00, for an additional 4.0 volts at U350B output, the result is a total of 8.0 volts at the tenth step level.

U350B output, at pin 7, is applied to U360. U360 operates as either an inverter or a follower (– or + one times amplifier), depending on the setting of relay K436. Pin 6 of U360 will be at the same voltage as U350B output, whether the same or opposite polarity.

The position of K436 is controlled by the COLLECTOR SUPPLY POLARITY switch; the STEP/OFFSET POLARITY INVERT switch; or the test fixture Terminal Selector switch, in conjunction with the step generator polarity logic, U430B, C, D, and Q326.

The step generator polarity is controlled by three inputs: pin 9, U430C; pin 12, U430D; and pin 13, U430D.

Each of these three inputs controls the step generator polarity. A change in logic level of any one of these inputs causes pin 6, U430B, level to change, resulting in Q436 turning either on or off. The condition of Q436 (on or off) controls relay K436, the step amplifier polarity relay. When pin 6, U430B, is high, Q436 is on and K436 is activated. This is the negative polarity position of the relay. When pin 6, U430B, is low, Q436 is off and K436 is not activated. This is the positive position of relay K436.

The output of U430B also controls Q440. When Q436 is on, Q440 is off, and vice versa. The collectors of Q436 and Q440 control two sets of diodes, CR441-CR438 and CR439-CR440, which are reverse-voltage limiters in the current mode.

The output step amplifier converts the output steps of U360 to current or voltage steps at amplitudes determined by the STEP/OFFSET AMPL switch. This amplifier is a differential amplifer with separate feedback to each input.

The negative amplifier input, pin 3, controls the amplitude of the output steps. The positive amplifier input, pin 2, provides either feedback from the current-setting resistors in the current mode or a constant voltage level in the voltage output mode.

Current Mode. To obtain current steps, the gain of the negative side of the differential amplifier is set to provide an output of 200 mV/Step. This output is connected to the variable series current-setting resistors (R404-R427).

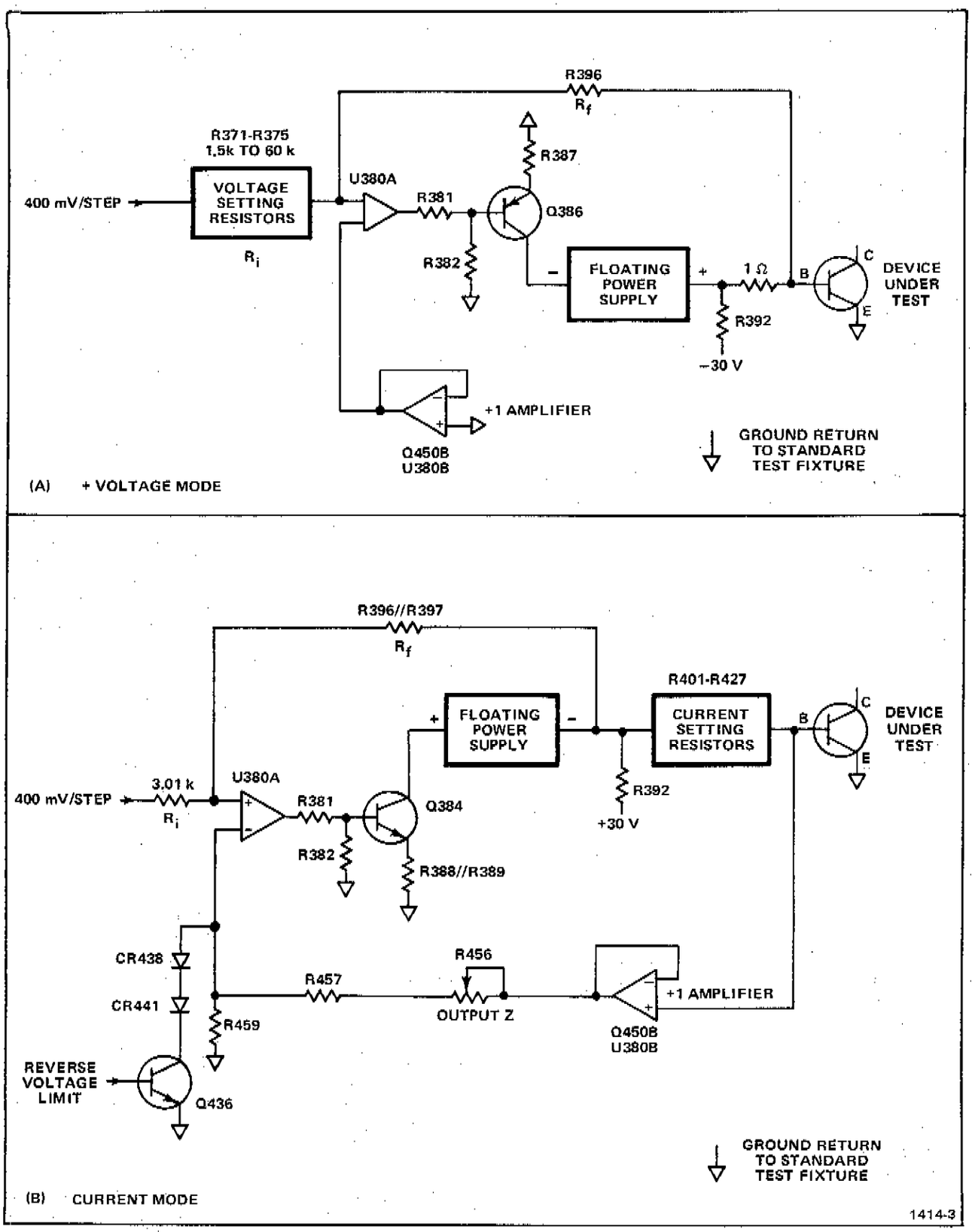


Fig. 3-2. Step Amplifier block diagram (A) Voltage mode and (B) Current mode.

With a constant-voltage per step across the current setting resistors, the current/step can be varied by changing the resistance.

To obtain voltage steps, the voltage setting resistors (which compose the input resistance of the negative input) are changed, thus varying the gain of the negative side of the feedback amplifier, U380A.

Voltage Mode. The output step amplifier in the voltage mode is an inverting feedback amplifier. The input resistance consists of R371 through R375 (the selectable voltage setting resistors); the feedback resistance is R396. With 400 mV steps in, the output steps range from 50 mV to 2 V.

The + input of the inverting feedback amplifier, U380A, is connected to the output of the +1 amplifier (voltage follower), Q450A and B, and U380B.

In the voltage mode, the input to the +1 amplifier is connected to the ground return to the standard test fixture (output voltage steps are referred to ground).

The output of U380A drives the base of either Q384 or Q386, depending on the setting of relay K436, which determines the step polarity. In the — mode, Q386 is driven by U380A output through the divider R381 and R382. Q386 collector is connected to the — side of the floating power supply.

The + side of the floating power supply is connected to the base of the device under test through a 1 Ω resistance.

The feedback path to the inverting-feedback amplifier is from the output side of the current setting resistors, through R396, the feedback resistor for the — side of the amplifier.

Voltage divider, R381-R382, in conjunction with R387 (emitter of Q386-Q384), sets the forward current limit in the voltage mode. The divider limits the voltage that may be applied to the base of Q384 or Q386.

Since the base voltage is limited, the voltage across R387 is limited, thus limiting the current through the device-under-test.

When the amplifier is in the + step polarity mode, it is possible to achieve minus voltage output by using the OFFSET MULT AID button. The power supply used for this opposite polarity output is either the + or — 30 volts to R393, via relay K436.

The current provided by the + or — 30-volt supply is limited by R393, which is the reverse current for voltage and current modes and is normally set at about 15 mA with zero volts out.

Current Mode. In current mode, the operation of the amplifier is similar to voltage mode. The output voltage is fed back to the + side of the differential amplifier (U380A), providing a reference. Input to pin 3 of U380A is always through the voltage setting resistors, R371 through R375. In the current mode, the input resistance is set at 3.01 kΩ for all positions of the STEP/OFFSET AMPL switch. When the feedback resistance is R396 and R397 in parallel, the gain of the amplifier is the feedback resistance (R396 and R397 in parallel) divided by the input resistance (3.01 kΩ) for a gain of 0.5.

400 mV steps into the input resistor produces 200 mV steps across the current setting resistors. The output of the current-setting resistors is fed back through the +1 amplifier (Q450-U380B), via divider R456-R457-R459 to the input, pin 2, of U380A. This arrangement produces a constant 200 mV across the current-setting resistors, regardless of the voltage on the terminals of the device under test, up to the voltage limit in current mode. Current out can be changed by changing the value of the current-setting resistor, R404 through R427, permitting current steps ranging from 50 nA/DIV to 200 mA/DIV with STEP X.1 pushed in.

The output impedance adjustment, R456, permits the divider ratio to be adjusted to exactly match the U380A input divider ratio. This helps to ensure a 200 mV/Step across the current-setting resistors (up to the voltage limit in current mode), regardless of the voltage on the terminals of the device under test. Since the current-setting resistors can be selected, current out can be varied by changing the value of current-setting resistor.

CR438-CR439-CR440, and CR441, reverse-voltage limiting diodes, are connected to Q436 and Q440 collectors. Either CR438 and CR441 or CR439 and CR440 determine the reverse voltage limit, depending on whether Q436 or Q440 is turned on.

If the step-amplifier polarity is +, Q436 is off and its collector high and Q440 is on (saturated), with its collector at a low level. In this condition, the junction of R457 and R459 can go no more negative than two diode junctions, plus a saturated transistor, for a voltage limit of about —1.3 volts.

In the opposite polarity, Q436 is turned on (saturated) and R457-R459 junction can go no more positive than about +1.3 volts. With the voltage at this point limited to about +1.3 volts, either polarity, the voltage at the output of the current-setting resistors is also limited. The 1.3 volts at the input to the differential comparator corresponds to about 2 volts at the output of the current-setting resistors.

The collector sweep dimming circuit is located on the main circuit board and is a part of the step amplifier schematic. Collector sweep dimming consists of Q594 and its associated components. The input to the circuit arrives via pin 1 of P596, from T102, the collector sweep transformer. When the VARIABLE COLLECTOR % control is set at 100, the signal is 200 volts, p-p. The signal is rectified by CR591 and filtered by R591-R592-C591, and applied to Q594 base.

Since Q594 is turned on by a very small signal, the VARIABLE COLLECTOR % control need be turned only a few degrees from zero to cause Q594 to saturate. When Q594 saturates, its collector approaches ground, which is applied to pin 2 of P611 to disable the collector sweep dimming. When no signal is applied to CR591 (when the VARIABLE COLLECTOR % is turned to 0) Q594 is turned off, its collector is positive, permitting the collector sweep dimming in the display module to operate, dimming the display.

Collector sweep dimming can be disabled internally by grounding pin 2 of P524 or externally by grounding pin 11 of J110 (at the test fixture interface jack).

Horizontal Amplifier

The horizontal amplifier consists of a voltage divider, R502A, B, C, and D; a FET amplifier, Q514A and B; a feedback amplifier, U520; and an adjustable gain-inverting feedback amplifier, U530. The output of this amplifier is connected to the output amplifier in the display unit.

The input to the divider, R502, comes from pin 1, P508 (pin 4-P110, 577-test fixture interface). The value of R502 is selected by S502, HORIZ VOLTS/DIV. The signal is applied to one end of the divider, R502. A selectable tap on this divider is used to select the voltage applied to the FET amplifier (Q514A and B) input. The selectable tap is moved by the HORIZ VOLTS/DIV switch and provides decade switching. In the most sensitive ranges, 50 mV, .1 and .2 volts (in both collector volts and base volts ranges), R502 is out of the circuit and the signal goes through R501, directly into the FET amplifier input.

The step-generator signal from pin 6 of U360 can bypass both R501 and R502 and be fed to the FET amplifier input. This step-generator signal arrives via the divider, R511-R512 and is applied to the FET amplifier input in the STEP GEN position of the HORIZ VOLTS/DIV switch.

Any of the signal sources must pass through the POLARITY NORM-INVERT switch, which sets the horizontal amplifier polarity.

FET amplifier, Q514A and B, is a differential-input source follower. The output of this follower is fed to the inverting-feedback amplifier, U520, having a gain of +1. U520 output is fed to another inverting-feedback amplifier, having selectable input and feedback resistors.

The input resistance consists of R526, R524, and R523, which make up the .5, 1 and 2 switching. In all the .5 positions of the HORIZ VOLTS/DIV switch, contact 24 is closed, paralleling R523 and R526. In the 1 positions of the HORIZ VOLTS/DIV switch, contact 25 is closed and R524 and R525 are in parallel. In the 2 positions of the HORIZ VOLTS/DIV switch, contacts 24 and 25 are open, leaving only R526 as the input resistance.

The feedback resistors of U530 are R536 and R537. When this amplifier is in X1 (X10 HORIZ MAG pushed in), R536 is in parallel with R537. When X10 HORIZ MAG is pulled out, R537 is the feedback resistor.

Pins 4 and 5 of P524 (pins 8-9 and J-K, P110) provide a current source for automatic display positioning with polarity change when using the 177 Standard Test Fixture.

Vertical Amplifier

The vertical amplifier is a differential-chopper amplifier. See Fig. 3-3. The amplifier is isolated and can float up to 2000 volts of common-mode voltage.

The amplifier consists of floating +15 and −15-volt power supplies and an oscillator and driver transistors to drive the chopper transformer.

The floating power supplies consist of a winding on power transformer, T701; a diode bridge, CR582; a filter, C581; and two 15-volt Zeners, VR581 and VR582.

The chopper consists of U542A, B, C, D, and E. The driver transistors Q544 and Q546 drive the primary of chopper transformer T550. T550 secondary terminals 7, 8, 9, and 10 connect to FET switches Q552, Q554, Q556, and Q558. The FET switches drive signal-isolation transformer, T560.

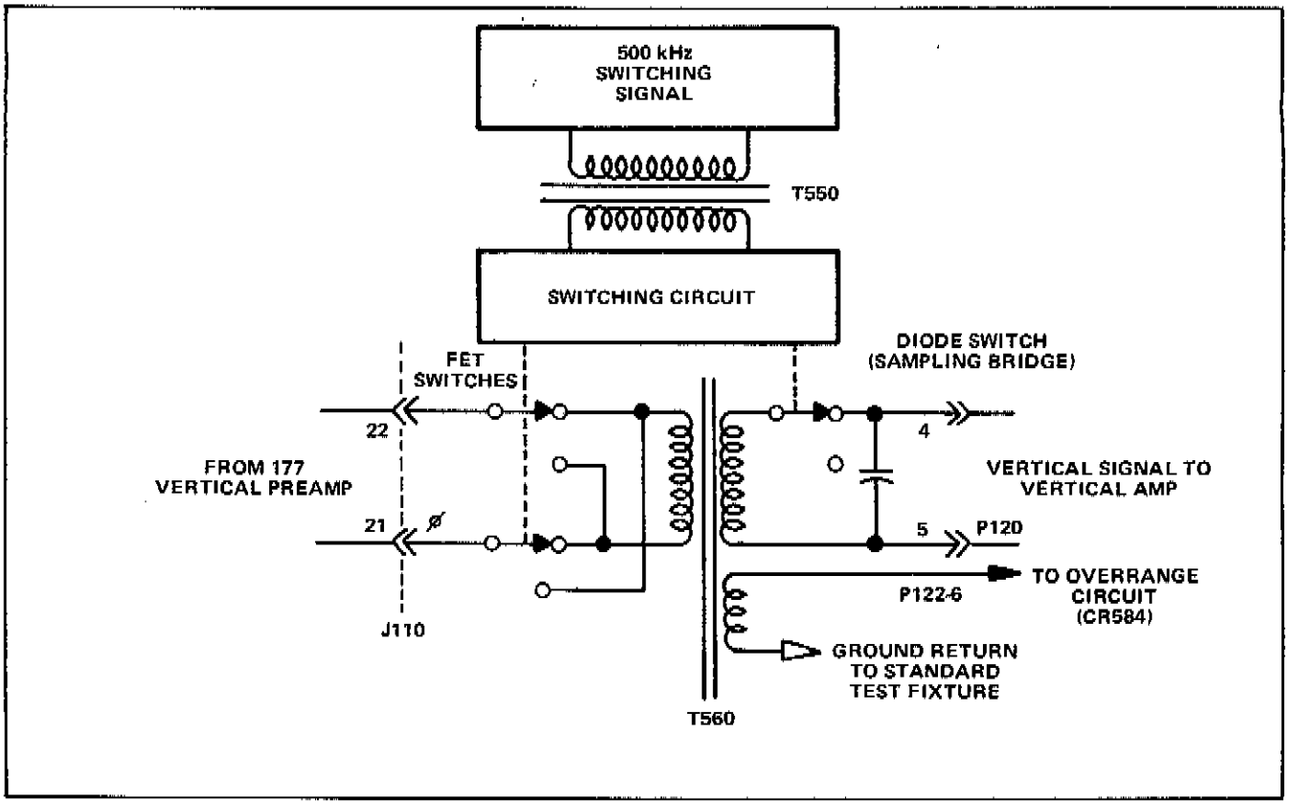


Fig. 3-3. Block diagram of the vertical amplifier.

T550 secondary feeds a sampling bridge, CR561, CR562, CR563, and CR564; and an inverting-feedback amplifier, U570.

The differential vertical signal comes to the two FET pairs, Q552, Q554, Q556, and Q558, via pins 1 and 4 of P129. The common signal on pin 1 is connected to the sources of Q556 and Q558, and the vertical signal (pin 4) is connected to the sources of Q552 and Q554. The gates of these FETs are controlled by the chopper transformer, T550.

T550 is driven by a 500 kHz square wave that is generated by the astable multi, U542, which drives Q544 and Q546. T550 secondaries drive the gates of the FET pairs. Only one FET pair is turned on at one time (Q552-Q556 on or Q554-Q558 on).

In the zero-signal (on T550 secondary) condition, the four FETS are conducting. When pin 7 of T550 is negative with respect to pin 8, CR552 and CR553 are forward biased, and Q552 turns off. At the same time, pin 9 is negative with respect to pin 10, CR556 and CR557 are forward biased, and Q556 turns off. Therefore, Q554 and Q558 are conducting. The vertical signal from pins 1 and 4 of P129 are now passed through the conducting FETs, Q554 and Q558 to T560 primary. When the polarity at pins 7 and 8 and pins 9 and 10 reverse, Q554 and Q558 turn off and the vertical signal from the test fixture is connected to T560 primary in the opposite direction. This switching occurs at a 500 kHz rate, as previously described.

Thus, the vertical signal is coupled through the signal isolation transformer, T560, and appears at terminals 1 and 2. Pins 1 and 2 are connected to the diode bridge, CR561, CR562, CR563 and CR564. The bridge is driven by a winding on chopper transformer, T550. The diodes are turned on half the time, driven by the 500 kHz square wave. This action connects T560 output (terminals 1 and 2) across C565.

Filter L564-C564 helps to remove the 500 kHz component from the signal. Thus, the vertical signal is reconstructed across C565. The signal then goes through the NORM-INVERT switch, which can invert the signal applied to the inverting-feedback amplifier, U570. The input resistance of U570 is R567 and R568. The feedback resistance is the parallel total of R576 and R577 when X10 VERT MAG is pushed in. When the X10 VERT MAG is

pulled out, R577 is the feedback resistance, changing the gain by a factor of 10. A vertical filter, C568 and C569 (with protective diodes, CR568 and CR569), filters the ac signal at U570 input. When this filter (DISPLAY FILTER) is switched (S568) in, only very low frequency measurements can be made. Pin 2, U570, is the − input of the inverting amplifier and has two signal sources other than the signal through R567 and R568. These sources are: the Vertical POSITION control, R575, and the automatic positioning signal from the COLLECTOR SUPPLY POLARITY switch.

The additional winding on T560 (terminals 4 and 6) provides collector supply disable if the vertical signal is too large. The signal at terminal 4 (T560) is related to the vertical signal amplitude. This signal (terminal 4) is rectified by CR584 and connected to Q586 base via R584. Q586 is normally on (no-signal condition). If the signal amplitude is large enough, Q586 starts to turn off. As Q586 starts to turn off, the negative-going collector signal, coupled through C587 back to Q586 base, creates a negative-going ramp at Q586 collector as long as the signal amplitude is high enough to attempt to turn Q586 off (because of the Miller effect. If the ramp duration reaches approximately 150 ms (the level at R587-R588 junction reverse biases Q588), Q588 collector signal (positive-going) is coupled back to Q586-R586, and turns Q586 off.

When Q588 collector goes positive, relay K125 (collector supply schematic) deactivates and disables the collector supply. With the collector supply disabled, the signal on terminal 4 of T560 is removed and the circuit reverts to its quiescent state after C586 discharges through R586 and R585 (Q586 and Q588 on), and the collector supply, through relay K125 is enabled.

When the MAX PEAK POWER-WATTS switch is set at .6 watts or below, Q588 base is grounded through R149, disabling the collector sweep disable circuit by holding Q558 in conduction. This shut-down circuit protects the current measuring resistors in the test fixture from excessive power dissipation when the collector sweep is on the high-power ranges.

Collector Supply

The collector supply circuit produces: an unrectified sine wave; a full-wave rectified sine wave; or a capacitor-filtered full-wave rectified sine wave, with peak amplitudes that can be varied from zero to 1600 volts, peak, in five ranges.

The voltage for the collector supply is provided by a variable autotransformer, T101. T101 output is connected to sweep transformer (T102) primary and varies from zero to approximately 110 volts.

The MAX PEAK VOLTS switch permits a choice of five collector sweep voltage ranges, choosing secondary transformer (T102) taps. These secondary voltages are rectified by one of two diode bridges: CR107 for the 6.5 V, 25 V and 100 V ranges and CR103-4-5-6 for the 400 V and 1600 V ranges.

The polarity of the outputs is changed by reversing the power supply output connections. When the COLLECTOR SUPPLY POLARITY is in either the +DC or −DC modes, the MAX PEAK VOLTS switch selects one of three resistor-capacitor combinations (connected between the collector sweep output and the current-return input). The capacitance holds the collector-sweep DC voltage at a constant level, set by the VARIABLE COLLECTOR % control, to produce a spot on the CRT, rather than a sweeep. The shunt resistance discharges the capacitance when the collector voltage is turned down.

Maximum peak current is set by R131 through R147, in series with the collector sweep. These series resistors are selected by the SERIES RESISTORS control (front panel).

If excessive power is drawn from the collector sweep supply, circuit breaker S101 opens, disabling the supply.

Input power to T101 (variable auto-transformer) is also controlled by relay K125. Relay K125 is controlled by several sources, via pin 4, P122, to the COLLECTOR SUPPLY POLARITY switch (S120, which interrupts collector sweep supply between POLARITY switch positions), and to Q588 collector. Q588, as explained previously, is controlled from several points.

BLOCK DIAGRAM DESCRIPTION (D1 and D2)

The vertical and horizontal deflection amplifiers provide final amplification for the signals from the 577 unit. They produce push-pull outputs suitable to drive the CRT vertical and horizontal deflection plates. Beam-finding circuitry is incorporated to limit the display within the screen area when the front-panel BEAM FINDER button is pressed.

The CRT Circuit produces the high voltage (about −3.4 kilovolts) and contains the controls necessary for operation of the cathode-ray tube. The CRT Circuit also contains the Z-Axis amplifier, which provides the drive signal to control the intensity level of the display.

The Storage Circuit provides the voltage levels necessary to operate the storage elements associated with the CRT. The circuit includes the erase-pulse generator for erasing

stored information and a multivibrator that permits the flood-gun duty cycle to be varied.

CIRCUIT DESCRIPTION (D1 and D2)

Deflection Amplifiers

Vertical Deflection Amplifier. The Vertical Deflection Amplifier provides the final amplification of signals applied from the 577. It produces a push-pull output sufficient to drive the CRT vertical deflection plates. The amplifier consists of Q1104, Q1106, Q1114, and Q1116, connected in a differential cascode configuration.

The input signal arrives via P612 via the interface circuit from the 577. The output signal is developed across the collector load resistors, R1104 and R1114, and is about 50 times the magnitude of the input signal. R1116, Vert Gain, provides Q1106-Q1116 emitter degeneration to set the gain of the stage to provide a calibrated vertical display.

Horizontal Deflection Amplifier. The Horizontal Deflection Amplifier consists of Q1124, Q1126, Q1134, and Q1136, and is basically the same as the Vertical Deflection Amplifier just described. It provides final amplification of signals from the 577, which arrive via P611. Gain of the stage is set by R1136, Horiz Gain, to provide a calibrated horizontal display.

Beam Finder. If a high-amplitude signal or a misadjusted control has deflected the trace or display off screen, it can be located by pressing the front-panel BEAM FINDER pushbutton. This opens S1125, permitting current to pass through R1125 into the emitter circuits of both deflection amplifiers. R1125 limits the current available to the transistors, and hence, to the collector-load resistors. Thus, the dynamic range of the deflection plates is limited to an on-screen level, and the display is compressed within the viewing area.

CRT Circuit

General. The CRT Circuit produces the high-voltage and provides the control circuits necessary for operation of the cathode-ray tube (CRT). This circuit also includes the Z-Axis Amplifier stage to set the intensity of the CRT display.

Z-Axis Amplifier. The Z-Axis Amplifier is a current-driven, shunt-feedback, operational amplifier with a voltage output, consisting of Q1222, Q1226, and Q1234. The feedback path is from the collectors of Q1226 and Q1234 through R1227-C1227 to the base of Q1222. Q1234 is a constant-current source to provide drive for the capacitance of the floating CRT grid supply without excessive power dissipation in Q1226. The output voltage provides the drive signal to control the CRT intensity level through the Control-Grid supply.

The output level of the Z-Axis Amplifier is established by the voltage drop across R1227 with reference to virtual ground at the base of Q1222 (the operational amplifier summing point). The current through R1227 is determined by the input current from any combination of several sources, such as from the front-panel INTENSITY control, test fixture interface (blanking, intensification, etc.), and from Q1214. Q1214 is a common-emitter amplifier which acts as a switch. Q1214 is normally on and is turned off whenever the Brightness multivibrator turns off the flood guns. This, in turn, blanks the CRT to prevent an incorrect deflection factor being shown.

High Voltage Regulator

High Voltage Primary. A repetitive, non-sinusoidal signal is produced by a phase- modulated switching circuit in the primary of T1240 and induced into the secondaries. Current drive for the primary winding is furnished by Q1252 in its conducting state. Q1252 is turned on by positive-going feedback applied through C1259 and L1259 from the feedback winding, then turned off by switching action from Q1262. A sample of the output DC voltage is modulated by the AC from another feedback winding at the gate of Q1278; this establishes the conduction time of Q1252 and thus maintains the proper output level. Q1252 delivers energy to T1240 only once each cycle.

Assuming Q1262 and Q1264 are initially off, R1262 provides base drive for Q1252, causing it to deliver current to T1240 primary. As Q1252 conducts, the increasing current through the primary winding induces a voltage into the secondaries. The gate of Q1278 is driven negative by the voltage from the feedback winding, switching Q1264 and Q1262 on. With conduction of Q1262, base drive for Q1252 is removed.

With Q1252 off, the transformer field collapses, reversing the polarity of the voltage induced into the secondaries. When the gate of Q1278 is driven sufficiently positive to switch Q1264 and Q1262 off, Q1252 is switched on again. Q1252 again delivers energy to the primary winding and the action is repeated.

High Voltage Regulation. Regulation is accomplished as follows: Feedback from the −3400-volt cathode supply is summed with +30 volts through the voltage divider consisting of resistors R1272B-E, R1275, and R1276 to establish the DC level at the gate of Q1278. The ac component, which is the switching signal, is derived from the trans-

former as described previously. If the output level of the cathode supply drops below the nominal −3400 volts (becomes more positive), the level at the gate of Q1278 rises. A new point is selected on the varying ac component to cause switching of Q1262-Q1264 later and hence increase conduction time of Q1252. This allows more energy to be delivered to the primary winding of T1240, resulting in an increase of voltage in the secondaries. Conversely, if the output level increases, Q1252 is allowed to conduct for a shorter length of time. The DC level at the gate of Q1278 is adjusted by R1275, H.V. Adj., to set the output at exactly −3400 volts.

High Voltage Outputs

Transformer T1240 has two high-voltage output windings which provide the potentials required for the CRT cathode and control grid supplies. The −3400-volt accelerating potential for the cathode is supplied by half-wave rectifier CR1247. The cathode heater is elevated to the cathode potential through R1273.

Half-wave rectifier CR1241 provides about −3450 volts to establish bias voltage on the CRT control grid. This voltage (and hence the CRT beam current) is dynamically controlled by the Z-Axis Amplifier, which contains the INTENSITY control, blanking inputs, and intensification inputs. R1245, Int Range, provides a fine adjustment of the quiescent grid voltage to bias the CRT just below cutoff when the Z-Axis Amplifier output is at its minimum quiescent level (INTENSITY control counterclockwise and no intensifying or blanking inputs).

Neon bulbs DS1271, DS1272, and DS1273 provide protection to the CRT if the voltage difference between the control grid and the cathode exceeds about 180 volts.

CRT Control Circuits

In addition to the INTENSITY control discussed previously, front-panel FOCUS and internal astigmatism controls have been incorporated for arriving at an optimum CRT display. FOCUS control R1295 provides the correct voltage for the second anode in the CRT. Proper voltage for the third anode is obtained by adjusting Astig control R1286. In order to obtain optimum spot size and shape, both the FOCUS and Astig controls are adjusted to provide the proper electrostatic lens configuration in the CRT.

The Geom adjustment R1285 varies the positive level on the horizontal deflection plate shields to control the overall geometry of the display. The TRACE ROTATION control, R1291, permits adjustment of the DC current through beam-rotation coil L1291 to align the display with the graticule lines.

Storage Circuit (D1 only)

General. The CRT used in the D1 is a direct-view bistable storage cathode-ray tube with a split-screen viewing area that permits each half to be operated individually for stored displays. Only those elements associated with the storage capability of the CRT are shown in the CRT enclosure on the right side of the Storage Circuit schematic diagram. The writing gun, its deflection systems and associated elements have been discussed previously under CRT circuit.

Storage Operation. Four low-energy electron guns (flood guns) provide full coverage of the large screen area. Each consists of a heated cathode and an anode. The cathode heaters, which receive an unfiltered pulsating DC from full-wave rectifier CR1329, are elevated to −30 volts (cathode potential) through R1329. Quiescently, Q1308 is saturated, providing current to the flood-gun cathodes. The anode potential is established by VR1396 and supplied via emitter follower Q1396.

The collimation electrode is a metallic band around the inner wall of the CRT envelope. It produces an electrostatic field to distribute the flood-gun electrons uniformly over the storage target. R1390, CE1, provides adjustment of the flood electron trajectories to cover the extreme rim of the targets and optimize uniformity of the target coverage. Emitter follower Q1392 maintains a stable voltage on the collimation electrode, providing a low-impedance current path to absorb current variations.

The storage screen consists of a thin tin oxide layer called the target backplate, which is coated with an insulator material containing finely-ground phosphor particles called the target. A positive voltage is applied via Q1372, S1372, and S1375 to the backplate to establish the operating level of the tube, which is the difference in potential between the backplate and the flood-gun cathodes. The CRT screen area is divided into two halves, which are electrically insulated from each other to permit independent operation.

The target operates in a bistable mode because of the secondary-emission properties of the insulator material. The first stable state is the rest potential, at which the target has gathered low-energy flood-gun electrons, causing it to charge down to the flood-gun cathode potential. The second stable state is the stored state, at which the target (or portions of it) is shifted to the backplate potential by increasing the secondary emission. Although the flood guns do not have sufficient energy to shift the target to the stored state, they do supply sufficient energy to hold the target in the stored state after it has been shifted by the high-energy writing-gun beam (CRT beam). This is because the landing energy of the flood electrons has increased with the increased potential difference between the flood-gun

cathode and the target. These higher energy electrons produce a visual display as long as the flood gun beam covers the target.

When the stored display is no longer needed, the information is erased by first shifting the entire target to the stored state, then removing the charge. A positive-going short-duration pulse is first applied to the backplate, increasing the flood-gun electron landing energy and writing the entire target area. Next, the backplate voltage is pulled well below the rest potential of the target, which follows due to its inherent capacitive coupling. Then, as the backplate is gradually returned to its quiescent potential, the target charges to the rest potential and is ready to write again.

Backplate Supply. A regulated +370 volt DC power supply is incorporated in the Storage Circuit to provide the storage level for the CRT and to ensure a potential sufficient for the erasure process. A winding of the high-voltage transformer T1240 supplies 400 volts RMS, which is rectified by CR1386. Q1386 and Q1388 are connected as a feedback pair to provide the regulated +370-volt DC output. VR1388 establishes the reference voltage, and R1387, +370 V Adj., sets the current through Q1386 to set the output level. VR1387 is a protection device for the transistors, and is normally operated in a region of its characteristic curve below its Zener knee.

Backplate Control. Separate STORE switches, S1375A and S1375B, are provided for the target backplates to permit each storage screen to be operated individually. In the store mode, the store-level potential for the backplate is supplied by either Q1372 or by the erase-generator output operational amplifier, depending upon the setting of the ERASE SELECT switches, S1372A and B.

Target backplate control is precisely maintained by a feedback amplifier system consisting of Q1356, Q1358, Q1362, and Q1364. The operational amplifier summing point is the base of Q1356 and the feedback resistor is R1355. Variable resistor R1350, Store Level, provides an adjustment of the current to the null point and hence, sets the backplate voltage through R1355 to an optimum storage level. R1370, Store Bal, permits matching the backplate voltages for uniform screen luminance, whether they are selected for erasure or not. When either or both screens are operated in the store mode, the divider network in the high-voltage regulator circuit is modified to shift the high voltage slightly, correcting for the deflection sensitivity changes that occur. The backplate voltage is applied through either R1381 or R1382 to the base of Q1384, removing the ground potential from the Q1384 collector. R1385, Sense Correct, permits an adjustable sensitivity correction voltage to be applied to the high-voltage regulator.

Erase Generator. The previously discussed operational amplifier is driven by a monostable multivibrator when it is desired to erase a stored display. The multivibrator consists of Q1334, which is normally on, and Q1336, which is normally off. When ERASE button S1330 is pressed, R1330 is grounded, producing a negative-going step through C1331 to cut Q1334 off. Q1336 turns on, and the negative-going step produced at its collector causes a corresponding positive-going step at the output of the operational amplifier. This positive-going step is applied to the target backplate, increasing the storage level and "writing" the entire target.

After an RC-controlled time of 10 milliseconds, the multivibrator reverts to its quiescent state, producing a positive-going step at the collector of Q1336 as the transistor turns off. This positive-going step is coupled through C1342, and the backplate is pulled negative through the action of the operational amplifier. The target is pulled well below its rest potential. As C1342 charges, the voltage at the cathode of CR1343 decays from about +20 volts toward the −30-volt supply at an RC-controlled rate until it is clamped at ground by conduction of CR1343. This action allows the target backplate to be raised slowly to its operating level, while the target remains at the flood-gun cathode potential. The total time from initiation of erasure to the ready-to-write condition is about 250 milliseconds.

Flood-Gun Cathode Control. As previously mentioned, Q1308 provides the current for the flood-gun cathodes, It operates at saturation, establishing a cathode potential of nearly −30 volts. Q1308 is controlled by a transistor switch activated by the sweep gate, and also by a multivibrator. While the sweep is running, Q1304 overrides the multivibrator output and holds Q1308 in its conduction state. Emitter follower Q1302 receives the sweep blanking input from R1203 in the Z-Axis Amplifier circuit; however, the level of interest is the zero volts applied to the base of Q1302 while the sweep is running. This level permits the base of Q1304 to move slightly negative, biasing the transistor into saturation and grounding the collector of Q1320. Through R1307-R1308 divider action, Q1308 is held on.

When the collector sweep is turned down, the +5 volt collector sweep dimming level is applied to Q1302, raising its emitter positive. This level switches Q1304 off, releasing its hold on Q1308. In this condition, Q1308 is controlled by collector-coupled multivibrator Q1310-Q1320. When Q1320 conducts, Q1308 conducts. Symmetry of the multivibrator is controlled by R1313 and R1325. R1325, BRIGHTNESS, is adjustable to allow Q1320 to conduct anywhere from 10% to 100% of the time. Thus the duty cycle of the flood-gun cathodes can be varied from 10% to 100%, which has the effect of varying the stored brightness.

MAINTENANCE

Introduction

This section of the manual contains information for use in preventive and corrective maintenance with some aids to troubleshooting.

WARNING

Lethal voltages are present in many areas within the instrument. Be particularly careful near the power transformer, since lethal voltages can exist on the transformer terminals even with the MAX PEAK VOLTS switch on low range, unless the VARIABLE COLLECTOR % control is set to 0. The Collector Sweep circuit board and the HORIZ VOLTS/DIV switch can also be at lethal voltage levels if the VARIABLE COLLECTOR % control is not at 0.

PREVENTIVE MAINTENANCE

General

Preventive maintenance consists of cleaning, visual inspection, lubrication, etc. Preventive maintenance performed on a regular basis improves instrument reliability. The severity of the environment in which the instrument is used determines the frequency of maintenance.

Cleaning

The 577 Curve Tracer system should be cleaned as often as operating conditions require. Accumulation of dirt in the instrument can cause overheating and component breakdown. Dirt on components acts an an insulating blanket, preventing efficient heat dissipation. Dirt, in a humid atmosphere, can also furnish a conducting path.

Exterior. Loose dust accumulated on the outside of the instrument can be removed with a soft cloth or a small paint brush. The paint brush is particularly useful for dislodging loose dust on and around the front-panel controls. Dirt that remains can be removed with a soft cloth dampened in a mild detergent and water solution. Abrasive cleaners should be avoided.

Interior. Dust in the interior of the instrument should be removed occasionally to prevent electrical conduction in high-humidity environments. Blow out accumulated dust using dry, low-velocity air. Remove any remaing dirt with a mild detergent and water solution. A cotton-tipped applicator is useful for cleaning circuit boards.

CAUTION

Avoid the use of chemical cleaning agents that might damage the plastics used in the instrument. Do not use chemicals that contain benzene, toluene, xylene, acetone, or similar solvents.

Lubrication

The reliability of potentiometers, rotary switches, and other moving parts can be maintained if they are kept properly lubricated. Use a cleaning-type lubricant (such as Tektronix Part No. 006-0442-00) on rotary switch contacts. Lubricate switch detents with heavier grease (such as Tektronix Part No. 006-0219-00).

NOTE

Do not lubricate cam switch contacts. Shaft bushings and potentiometers that are not sealed should be lubricated with a lubricant (such as Tektronix Part No. 006-0172-00) that will not affect the electrical characteristics. Do not over-lubricate. A lubrication kit (Tektronix Part No. 003-0342-01) is available.

Visual Inspection

The 577 and associated modules should be inspected occasionally for such defects as broken connections, loose pin connections, improperly seated transistors, damaged circuit boards, and heat damaged parts.

The corrective procedure for most visible defects is obvious. However, particular care must be taken if heat damaged components are found. Overheating usually indicates other trouble in the instrument. It is, therefore, important that the cause of overheating be corrected to prevent recurrence of the damage.

Transistors and Integrated Circuits

Periodic checks of individual transistors and integrated circuits are not recommended. The best check is their operation in the equipment as reflected by performance. Sub-standard performance is normally detected during a performance check or calibration procedure.

Recalibration

To ensure accurate measurements, check the instrument calibration after each 1000 hours (approximately) of operation, or if the instrument is used infrequently, every year. Replacement of components may necessitate recalibration of the affected circuits. Complete calibration instructions are given in the Performance Check/Adjustment section of the appropriate test fixture manual. The Performance Check/Adjustment procedure can also be helpful in locating troubles.

TROUBLESHOOTING

Introduction

The following information is provided to facilitate troubleshooting the 577-D1 or D2 Curve Tracer system. Information contained in other sections of this manual should be used with the following information to aid in locating circuit defects (see the Operating and Circuit Description sections).

Troubleshooting Equipment

The following equipment is useful for troubleshooting the 577-D1 or D2 Curve Tracer system:

1. Semiconductor Test. Some means of testing the transistors, diodes, and FETs used in the instrument is helpful. A curve tracer such as the Tektronix 575, 576, or 577 gives the most complete information.

2. DC Voltmeter and Ohmmeter. A voltmeter for checking circuit voltages and an ohmmeter for checking resistors and diodes are required. For most applications a 20,000 ohms/volt VOM can be used if allowances are made for circuit loading when measuring voltage at high impedance points.

3. Test Oscilloscope. A test oscilloscope is necessary to view circuit waveforms. An oscilloscope with a DC to 10 MHz frequency response and 1 mV/Div to 10 V/Div vertical deflection factor is suggested. A 10X probe should be used to minimize circuit loading.

Troubleshooting Aids

Diagrams. Circuit diagrams are given on foldout pages in the Diagrams section. The component number and electrical value of each component are shown. See the first page of the Diagrams section for definition of the symbols used to identify components.

Important voltages and waveforms are shown in blue on the diagrams. Portions of the circuits mounted on circuit boards are enclosed by blue lines or boxes.

Diode Color Code. The cathode end of each glass enclosed diode is indicated by a stripe, a series of stripes, or a dot. For diodes using a series of stripes, the color code identifies either the Tektronix part number or the JEDEC number. This code follows the standard color code except that a pink first band indicates a Tektronix part number, i.e., pink—orange—red—yellow is Tektronix Part Number 152-0324-00.

The cathode and anode of metal-case diodes can be identified by the diode symbol marked on the diode body.

Circuit Boards. A photograph of each circuit board, with circuit components identified, is included on the apron of the schematic diagram most directly relating to the circuit board. Some board photos may be placed on the back of the preceding circuit diagram. Each circuit board photo is sectioned by a grid system to facilitate rapid location of components by component number.

Switch Wafer Identification. Rotary switch wafers shown on the diagrams are coded to indicate the position of each wafer in the switch assembly. The number portion of the code is the wafer number, counting from the mounting end of the switch. The F and R indicate whether the front or rear of the wafer performs the switching function. For example, a wafer designated 2R indicates the rear of the second wafer.

Circuit Description. The Circuit Description, Section 3, describes each circuit. The section contains a brief description of the theory of circuit operation illustrated by a block diagram of each section of circuitry. Following the Block Diagram description is a detailed description of each circuit that contains unique or complex circuitry.

Transistor and Integrated Circuit Lead Configuration. The lead configuration of the transistors and ICs in the 577 Curve Tracer system is shown with the circuit board photos on the schematic foldout aprons.

Power Supply Voltage and Ripple. Table 4-1 lists the voltage tolerances of the power supplies in the 577. If the supply voltage is within the listed tolerance, the supply can be assumed to be operating properly. If outside the tolerances, the supply may be misadjusted or operating incorrectly. See Fig. 4-1 for power transformer line-voltage taps.

TABLE 4-1[1]

Supply	Voltage Accuracy	Ripple
+200 V	Unregulated	4 V p-p, or less, full load
+30 V[2]	Adjust to within 0.25% or less	10 mV, p-p, or less, full load
+12 V[3]	Within 5%	10 mV
+5 V[3]	Within 5%	10 mV
−12 V	Within 5%	10 mV
−30 V[2]	Adjust to within 0.25% or less	10 mV, p-p, or less, full load

CIRCUIT BOARD REMOVAL AND REPLACEMENT

Removal of Main Circuit Board

1. Note the position of the STEP/OFFSET AMPL and HORIZ VOLTS/DIV switches. Loosen the set screws and remove the knobs.

2. Remove the hex nuts from the through-panel bushings and remove the bushings from the front panel.

3. Place all pushbuttons in the out position.

4. Referring to Fig. 4-2, remove the right-side rail as follows:

a. Remove the four machine screws from the bottom of the rail.

b. Remove the screw from the lower-left corner of the rear panel.

c. Remove the two screws on the right, inside the plug-in test fixture compartment.

d. Remove the side rail.

5. Remove the multi-pin lead connector. The plastic body is color-coded to the P number (with the exception of leads originating in the display unit). The color code follows the familiar resistor color code. The last digit of the P number indicates the connector body color.

6. Remove the machine screws securing the flat-pack transistors, Q384 and Q386, to the panel at the rear of the circuit board.

7. Note the insulating, heat-conducting washer between the transistor and the panel.

8. Remove the four machine screws securing the circuit board to the chassis.

9. Pull the rear of the circuit board out toward the side of the instrument and then slide the circuit board to the rear to remove.

Replacing the Main Circuit Board

1. Stand the instrument upright on the rear end.

2. Place the two hex panel-bushing nuts over the cam-switch shafts.

3. Slide the cam-switch shafts through the front-panel holes (pushbuttons must be aligned with the plastic guide bushings before the circuit board can be moved to its permanent position).

4. Align the pushbuttons with the front-panel holes by reaching through with a device that will not damage the plastic buttons (for example, a cotton-tipped applicator or a slender rubber-tipped rod) while carefully sliding the circuit board toward the front panel.

5. Start the rear circuit board securing screw but do not tighten.

6. Push the through-panel bushings through the front panel around the switch shafts. Place the hex nuts on the bushings and tighten.

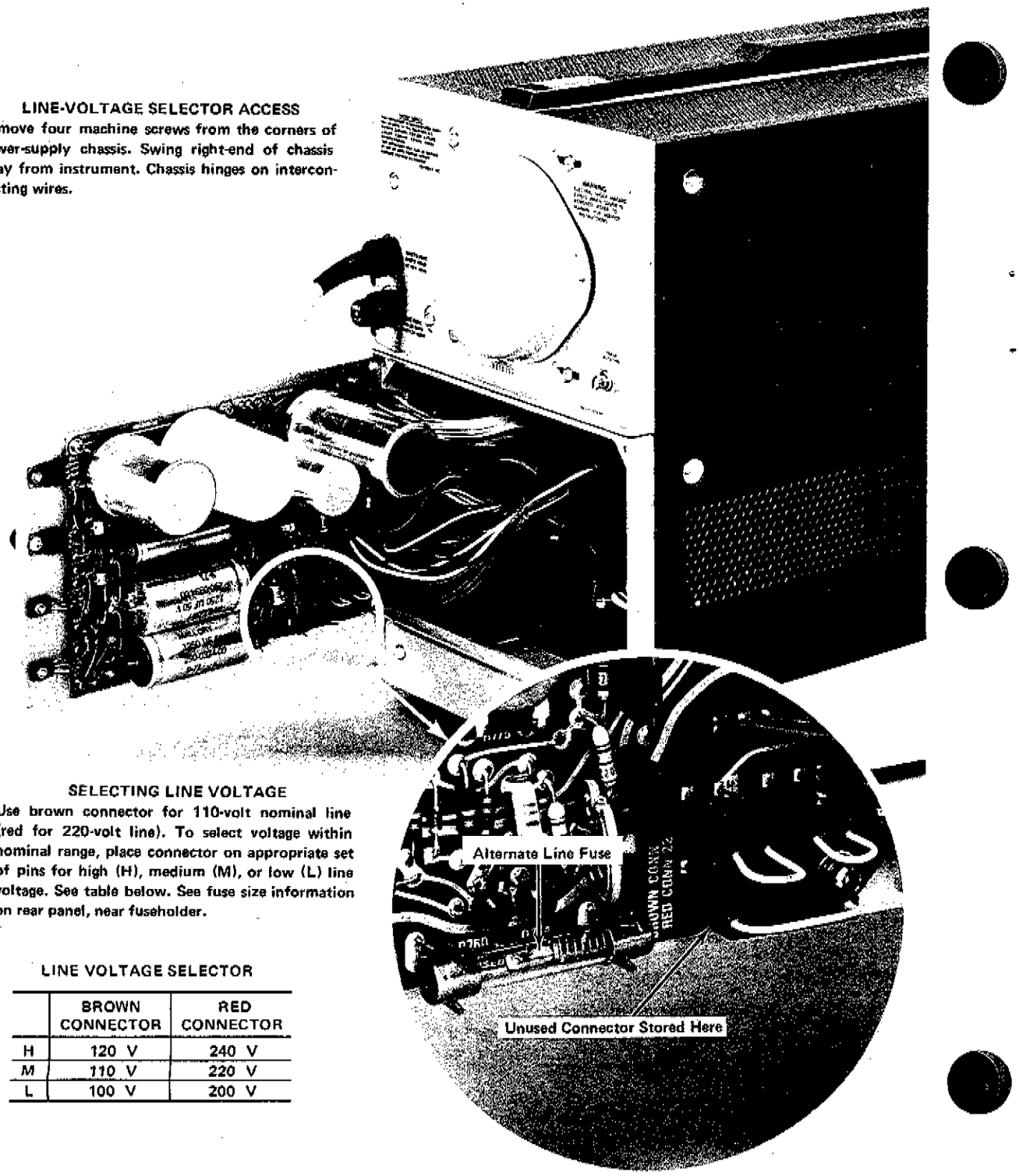
[1] With test fixture removed.

[2] Must be within 1/2% of 30 volts. +30 and −30-volt supplies must be within 1/2% of each other.

[3] +5 V and +12 V supplies can be loaded individually to 675 mA, but the total load on the two supplies should not exceed 800 mA.

LINE-VOLTAGE SELECTOR ACCESS

Remove four machine screws from the corners of power-supply chassis. Swing right-end of chassis away from instrument. Chassis hinges on interconnecting wires.



SELECTING LINE VOLTAGE

Use brown connector for 110-volt nominal line (red for 220-volt line). To select voltage within nominal range, place connector on appropriate set of pins for high (H), medium (M), or low (L) line voltage. See table below. See fuse size information on rear panel, near fuseholder.

LINE VOLTAGE SELECTOR

	BROWN CONNECTOR	RED CONNECTOR
H	120 V	240 V
M	110 V	220 V
L	100 V	200 V

Fig. 4-1. Power transformer line-voltage taps.

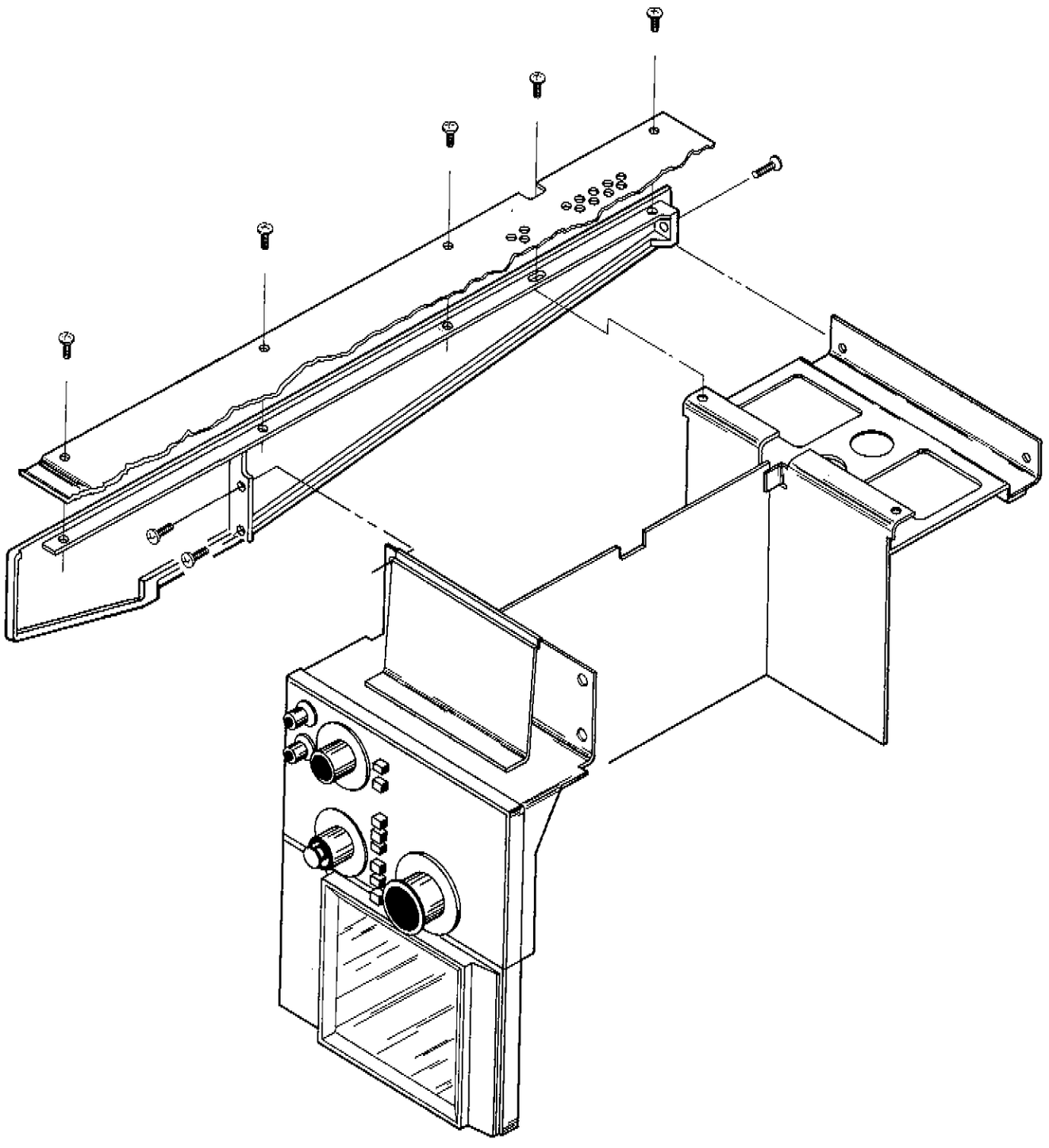


Fig. 4-2. Removal of right-side rail.

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7. Coat both sides of the insulating washers with silicone grease and assemble the washers and transistors to the panel with the machine screws, but do not tighten.

8. Place the four circuit-board screws and tighten.

9. Tighten the screws securing the transistors to the panel.

10. Replace the circuit-board connectors.

11. Replace the knobs in the original positions.

Replacing the Side Rail

1. Put the rail in place and place the four screws through the bottom panel into the side rail, but do not tighten.

2. Place the screw through the rear panel into the side rail and tighten.

3. Place the two screws in the plug-in test-fixture compartment, but do not tighten.

4. Slide the test fixture into the test fixture compartment. Adjust the side rail to permit the test fixture to slide freely, without excess side clearance.

5. Tighten the four bottom-panel screws. Note that the front screw is shorter than the remaining three. If a long screw is placed in the front hole, the test fixture cannot be removed after the bottom screws are tightened.

6. Remove the test fixture and tighten the two screws in the test fixture compartment.

7. Replace the STEP/OFFSET AMPL and HORIZ VOLTS/DIV knobs in their correct positions.

8. Connect the instrument to the power line and turn the instrument power on.

9. Check the positions of the STEP/OFFSET AMPL and HORIZ VOLTS/DIV with the STEP X.1 and Horizontal POSITION controls pushed to the in position and both knobs turned to the 200 position. Check for alignment at 200 with the knob skirt lamp. If the 200 is positioned to illuminate all three digits, the alignment should be correct for all other positions.

Removal of Collector Sweep Board

WARNING

Do not attempt to remove any leads or screws with the instrument power turned on. Allow a minute after turning power off to allow capacitors to discharge.

1. Remove the left side rail from the instrument as detailed for the right-side rail removal.

2. Unsolder the five wires from the circuit board. Note the position of the two red and one yellow leads.

3. Remove the multiple-lead connectors.

4. Remove the six board screws and remove the circuit board.

Access to Power Supply Circuit Board

Remove the four corner screws (rear panel) from the power supply chassis and swing the right side of the chassis away from the instrument (the chassis will hinge on the interconnecting leads).

NOTE

The power supply should be operated in the open position only with the 177 Test Fixture. Use of a test fixture other than the 177 can possibly use more power than the power supply can dissipate with the chassis away from the mainframe.

Removal of the Power Supply Circuit Board

1. Remove the machine screws that fasten U722, U732, Q766, and Q788 to the chassis. Note the insulating, heat-conducting washers between the chassis and U732, Q788, and Q766.

2. Remove the multipin connectors and unsolder the leads that are soldered to the circuit board. Note the wire colors and positions.

3. Remove the six machine screws that secure the board to the chassis.

MISCELLANEOUS

Max Peak Volts-Series Resistors Knob Alignment

1. If removal and replacement of this switch is necessary, turn the MAX PEAK VOLTS switch to 6.5 and the SERIES RESISTORS knob to .12 and remove the knobs.

2. Set the replacement switches fully counterclockwise (both sections against the stops).

3. Mount the MAX PEAK VOLTS knob to the shaft and tighten the set screw enough to permit the shaft to turn with the knob.

4. Switch to the 100 position and align the white arrow with the second digit in the 100. Tighten the set screw.

5. Place the SERIES RESISTORS knob on the shaft and tighten the set screw enough to permit the shaft to turn with the knob.

6. Switch to the 120 position and align the black arrow with the second digit (2) in the 120 (pull knob to switch to the 120 position). Tighten the set screw.

Removal of Display Unit from Mainframe

1. Remove all multi-pin connectors (display unit to 577 mainframe leads).

2. Remove the shield from the display unit high-voltage compartment (3 screws).

3. Remove the two screws that secure the rear of the display unit to the 577 mainframe. The screws are accessible from the top of the display unit.

4. Remove the two hex-head machine screws that secure the front of the display unit to the 577 mainframe (accessible from the underside of the display unit).

5. Remove the display unit.

Removal of 577-Test Fixture Interface Connector

1. Remove the instrument bottom panel, (four machine screws on each edge). Note that the two front screws are shorter than the remaining six screws.

2. Remove the two screws (one at each end) from the ends of the connector. Note the position of the washers between the connector and the chassis.

3. Pull the connector forward far enough to gain access to the soldered terminals on the rear of the connector.

4. Note the wire colors and positions and unsolder all leads.

Replacement of 577-Test Fixture Interface Connector

1. Solder all leads to the connector and push the connector toward the opening.

2. Push the mounting screws through the panel holes and mount the washers, (a piece of masking tape over one or both of the screw heads to hold them in place may make the task a bit easier).

3. Place the connector over the mounting screws and replace the plastic guides.

4. Hold the guide blocks snugly in place while tightening the screws.

5. After assembly is completed, check to determine that the connector assembly floats on its mountings (the connector must float for proper mating with the test fixture).

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CHECK AND ADJUSTMENT PROCEDURE

Introduction

This section of the manual contains separate check and adjustment procedures. The Check procedure is provided to check the instrument operation against the instrument specifications. The adjustment procedure returns the circuitry to within the design capabilities. Adjustment is generally required after a repair has been made, or after a long time interval in which normal aging of components may affect instrument accuracy.

For initial inspection, using the check procedure, leave the instrument side covers in place.

Services Available

Tektronix, Inc. provides complete instrument repair and calibration service at local field service centers and field offices. Contact your local Tektronix Field Office or representative for further information.

Test Equipment Required

The following test equipment, or equivalent, is required for complete check and adjustment of the 577-D1 or 577-D2 Curve Tracer. All test equipment is assumed to be correctly calibrated and operating within the listed specifications.

1. DC Voltmeter. Accuracy, 3%, full scale; voltage range, −3400 volts to +370 volts. Example: the Simpson Model 262 VOM.

2. Digital DC Voltmeter (4-1/2 digits) or a DC voltage bridge. Input impedance, 500 MΩ (see footnote 3, Table 5-9); Accuracy, 0.01%; voltage range, −30 volts to +1000 volts.

3. Tektronix 177 Standard Test Fixture.

4. Capacitor. Capacitance, 0.01 μF; working voltage, 1000; tolerance, ±20%.

5. Capacitor. Capacitance, 0.1 μF; working voltage, 100; tolerance, ±20%.

6. Resistor. Resistance, 15 kΩ; watts, 1/4; tolerance, 10%.

7. Resistors as follows: see footnote 1.

8. Extender cable, (to permit making adjustments to the test fixture without removing the 577 bottom panel) Tektronix Part Number 067-0721-00.

Quantity	Value	Watts	Tolerance
1	1 Ω	10	1/4%
1	10 Ω	5	1/4%
1	100 Ω	1/2	1/4%
2	200 Ω	10	1%
1	1 kΩ	1/4	1/4%
1	10 kΩ	1/4	1/4%
1	100 kΩ	1/8	1/4%
1	1 MΩ	1/8	1/4%
1	10 MΩ	1/8	1/4%

SHORT-FORM PERFORMANCE CHECK PROCEDURE

Preliminary

1. Check CRT Operation Page 5-4

INTENSITY

CHECK—A spot should appear within the graticule area (with the BEAM FINDER button held in) as INTENSITY control is turned clockwise.

FOCUS

Set FOCUS control for the smallest spot while reducing the spot intensity.

CAUTION

A focused, high-intenity spot can burn the CRT phosphor.

TRACE ROTATION

CHECK—Horizontal trace must be parallel to the center horizontal graticule line (adjustment on rear panel).

GEOMETRY

CHECK—Bowing should not exceed 0.1 division over the eight vertical or ten horizontal divisions.

[1]These resistors are available as a kit from Tektronix, Inc. Order Part Number 067-0691-00.

2. Check Beam Finder Page 5-4

CHECK—The spot cannot be positioned out of the graticule area with the BEAM FINDER button held in.

3. Check Trace Dimming Page 5-5

CHECK—The spot should dim noticeably or disappear when the VARIABLE COLLECTOR % control is turned to 0.

4. Check Storage Operation Page 5-5

CHECK—The screen should have a uniform bright glow, with top and sides pulled in (top pulled down about 1/2 major division).

CHECK—The eleven displayed vertical traces should be uniform in appearance from top to bottom with all lines similar in appearance.

CHECK—Stored display should dim when the BRIGHTNESS control is turned counterclockwise.

5. Check Horizontal Amplifier Balance Page 5-6

CHECK—Spot movement should not exceed 0.5 major division while switching between 5 V/DIV and 2 V/DIV, COLLECTOR.

6. Check Horizontal Gain Page 5-6

CHECK—500 mV should produce 10 divisions, within 2.5% (±0.25 major division), of horizontal deflection.

7. Check Horizontal Magnifier Page 5-6

CHECK—50 mV should produce a horizontal deflection of 10 divisions, within ±3% (±0.3 major divisions).

8. Check Horizontal Display Accuracy Page 5-6

CHECK—Horizontal deflection should be 10 divisions, ±3% (±0.3 divisions) as in Tables 5-2 and 5-3.

9. Check Vertical Amplifier Gain Page 5-8

CHECK—375 mV should produce a vertical deflection of 7.5 divisions, ±0.15 division.

10. Check Collector Supply Peak Voltages Page 5-8

CHECK—The voltages should produce the deflections shown in Table 5-4.

11. Check Max Peak Current and Circuit Breaker Operation Page 5-9

CHECK—Vertical display should indicate >20 A.

CHECK—The COLLECTOR SUPPLY CIRCUIT BREAKER should open within two minutes.

CHECK—The COLLECTOR SUPPLY CIRCUIT BREAKER can be reset within one minute.

CHECK—The COLLECTOR SUPPLY CIRCUIT BREAKER should not open with 10 A of collector current.

CHECK—The peak current for each setting of the MAX PEAK VOLTS switch should be as shown in Table 5-5.

12. Check Collector Supply Interlock Page 5-9

CHECK—The yellow COLLECTOR SUPPLY DISABLED lamp lights when the protective box cover is open.

CHECK—The yellow lamp extinguishes and the red lamp on the 177 Test Fixture lights when the protective box cover is closed.

CHECK—The red lamp extinguishes, yellow lamp lights, and collector sweep is disabled when the protective box is opened.

13. Check Automatic Positioning with Collector Supply Polarity Change Page 5-10

CHECK—The spot should shift from the center reference to the lower-left corner, within ±0.1 division when COLLECTOR SUPPLY POLARITY is switched to +.

CHECK—The spot should shift to the upper-right corner of the graticule when the COLLECTOR SUPPLY POLARITY is switched to −.

STEP GENERATOR-VOLTAGE MODE

14. Check Step/Offset Amplitude Accuracy at 2 V Page 5-10

CHECK—The 11th spot should be within 3% (2.4 divisions) of the +40-volt reference.

CHECK—The 11th spot should be within 3% (2.4 divisions) of the −40-volt reference.

15. Check Linearity at Maximum Voltage and Current Page 5-11

CHECK—Position the spots successively (11th, 10th, 9th, etc.) to the center reference. Each spot should be within 2% (±0.1 major division) of the position of the reference spot (10th).

CHECK—Each step must be within ±2% of any other step.

CHECK—Recheck as above for +DC COLLECTOR SUPPLY POLARITY.

16. Check Linearity in Oppose Page 5-12

CHECK—The distance between any two successive spots should be within 2% of the distance between any other adjacent spots.

17. Check Maximum Current Limit Page 5-12

CHECK—Maximum current should be less than 200 mA (4 divisions of deflection at 50 mA/DIV).

CHECK—Maximum current should be less than 200 mA with STEP/OFFSET POLARITY NORM button out.

18. Check Step/Offset Amplitude Absolute Accuracy, Step X1 Page 5-13

CHECK—See the procedure and Table 5-6.

19. Check Step/Offset Amplitude Absolute Accuracy, X.1 Page 5-14

CHECK—See the procedure and Table 5-7.

STEP GENERATOR-CURRENT MODE

20. Check Maximum Current and Voltage Page 5-15

CHECK—At 5 volts, the trace should be displaced not more than 2.2 divisions downward from the vertical reference and not above the vertical reference. See Fig. 5-3A and 5-3B.

CHECK—At 5 volts, the trace should be displaced vertically not more than 2.2 divisions upward from the vertical reference. See Fig. 5-4A and 5-4B.

21. Check Current at 100 mA (Step/Offset Amplitude) and Maximum Voltage Page 5-16

CHECK—At 7 volts, the trace should be displaced vertically not more than 1.2 divisions downward from the vertical reference. See Fig. 5-5A and 5-5B.

CHECK—At 7 volts, the trace should be displaced vertically not more than 1.2 divisions upward from the vertical reference. See Fig. 5-6A and 5-6B.

22. Check Step/Offset Amplitude Absolute Accuracy, STEP X1 Page 5-18

CHECK—See the procedure and Tables 5-8 and 5-9.

23. Check Maximum Current and Voltage Limits with Opposing Offset Page 5-20

CHECK—Vertical deflection from the center reference should be > 10 mA, but < 20 mA (> 2 divisions, but < 4 divisions).

CHECK—The horizontal deflection from the center reference should be > 1 volt, but < 5 volts (> 1 division, but < 5 divisions).

24. Check Pulsed 300 μs and Step Rates Page 5-21

CHECK—See the procedure and Fig. 5-7, 5-8, 5-9, 5-10, and 5-11 A or B.

PERFORMANCE CHECK

Preliminary

Set the controls as follows:

MAX PEAK VOLTS	6.5
SERIES RESISTORS	.12
COLLECTOR SUPPLY POLARITY	AC
VARIABLE COLLECTOR %	10
HORIZ VOLTS/DIV	200 V, COLLECTOR
NUMBER OF STEPS	10 (clockwise)
All Dark Gray Buttons and Knobs	in
STEP/OFFSET AMPL	.1 V
PULSED, 300 μs	out
VERTICAL CURRENT/DIV	2 A
Terminal Selector	EMITTER GROUNDED BASE TERM, STEP GEN
INTENSITY	ccw
FOCUS	centered
LEFT-RIGHT	Off (center)

D1 Only

STORE	
UPPER and LOWER	out
Erase Selectors	
UPPER and LOWER	in
POWER Switch (D1 or D2)	on

1. Check CRT Operation

INTENSITY

a. While holding the BEAM FINDER button depressed, turn the INTENSITY control slowly clockwise.

b. CHECK—A spot should appear within the graticule area.

c. Release the BEAM FINDER button and turn the INTENSITY control counterclockwise.

FOCUS

a. Set the FOCUS control fully clockwise and turn the INTENSITY control fully clockwise.

b. CHECK—The spot should be round (if the spot is not round, the Astigmatism control, R1286, Astig, should be adjusted).

c. Turn the FOCUS control counterclockwise until the spot is the smallest possible while turning the INTENSITY control counterclockwise to reduce the spot intensity. A focused, high-intensity spot can burn the CRT phosphor.

d. Place a diode adapter (013-0111-00) in the right-hand set of 177 jacks and place a 1 kΩ resistor in the diode adapter.

e. Switch the VERTICAL CURRENT/DIV control to 1 mA and HORIZ VOLTS/DIV to 1 V, COLLECTOR.

f. Set the LEFT-RIGHT switch to RIGHT and turn the VARIABLE COLLECTOR % control clockwise until the diagonal line reaches to approximately the top and bottom graticule lines.

g. CHECK—The diagonal trace should be in focus throughout its length. Minor readjustment of the FOCUS control may be necessary. Switch the LEFT-RIGHT switch to Off.

TRACE ROTATION

a. Set the HORIZ VOLTS/DIV control to .5 V, COLLECTOR and adjust the VARIABLE COLLECTOR % for 10 divisions of display horizontally.

b. CHECK—If the trace is not parallel to the center graticule line, adjust the TRACE ROTATION control (rear screw-driver adjustment) to align the trace with the center graticule line.

GEOMETRY

a. Using the Vertical POSITION control, position the trace to the bottom graticule line.

b. CHECK—Bowing should not exceed 0.1 division over the ten-division trace.

c. Vertically position the trace to the top graticule line.

d. CHECK—Bowing should not exceed 0.1 division over the ten-division trace. Position the trace to the graticule center.

e. Set VARIABLE COLLECTOR % to 0. Remove the diode adapter and connect a patch cord between emitter (E) and collector (C) terminals on the right-hand set of jacks on the 177. Set the VERTICAL CURRENT/DIV to 1 mA. Switch the LEFT-RIGHT switch to RIGHT. The trace should be vertical. Set the VARIABLE COLLECTOR % for at least 8 divisions of vertical trace.

f. Horizontally position the trace to the left graticule line (zero line).

g. CHECK—Bowing should not exceed 0.1 division over the eight graticule divisions.

h. Horizontally position the trace to the right (tenth) graticule line.

i. CHECK—Bowing should not exceed 0.1 division over the eight graticule divisions. Return the trace to graticule center.

2. Check Beam Finder

a. Turn the VARIABLE COLLECTOR % to 0. Switch the LEFT-RIGHT switch to Off. Set HORIZ VOLTS/DIV to 200 V, COLLECTOR. Set INTENSITY for a visible spot.

b. While holding the BEAM FINDER button pressed in, rotate both vertical and horizontal POSITION controls throughout their range.

c. CHECK—The spot cannot be positioned out of the graticule area. Release the BEAM FINDER button and center the spot vertically and horizontally.

3. Check Trace Dimming

a. Set the controls as follows:

MAX PEAK VOLTS	6.5
VARIABLE COLLECTOR %	20
COLLECTOR SUPPLY POLARITY	AC
HORIZ VOLTS/DIV	200 V, COLLECTOR
INTENSITY	visible trace
BRIGHTNESS	counterclockwise (D1 only)

b. Turn the VARIABLE COLLECTOR % control to 0 and watch the spot intensity.

c. CHECK—The spot should dim noticeably or disappear when the VARIABLE COLLECTOR % control is turned to 0.

d. Turn the BRIGHTNESS control fully clockwise. (D1 only)

e. CHECK—The spot should intensify.

4. Check Storage Operation (D1 only)

a. Set the controls as follows:

VARIABLE COLLECTOR %	≈80
Vertical POSITION	centered
Horizontal POSITION	centered
HORIZ VOLTS/DIV	1 V, COLLECTOR
VERTICAL CURRENT/DIV	2 A
STORE UPPER and LOWER	in
Erase Selector UPPER and LOWER	in
BRIGHTNESS	clockwise

b. Set the INTENSITY control for normal viewing intensity of the display.

c. CHECK—The screen should have a uniform bright glow, with top and sides pulled in (top pulled down about 1/2 major division).

d. Press the ERASE button. The bright glow should be replaced by a dim background glow with the horizontal line displayed.

e. Increase the INTENSITY as necessary for a bit brighter than normal display.

f. Slowly turn the Vertical POSITION control to write the entire screen. If the screen does not write uniformly, increase the INTENSITY and rewrite.

g. CHECK—The written screen should have uniform brilliance.

h. Press the ERASE button. Release the UPPER and LOWER STORE buttons.

i. Switch the HORIZ VOLTS/DIV to STEP GEN, NUMBER OF STEPS to 10, STEP FAMILY to REP, and STEP RATE to FAST. Position the first spot (furthest left) to the lower-left graticule corner.

j. Press the UPPER and LOWER STORE buttons to the in position.

k. Push the ERASE button.

l. Decrease the INTENSITY control to display the smallest spots consistent with good storage. Rotate the Vertical POSITION control very slowly clockwise to write 11 vertical traces.

m. CHECK—The display should be 11 vertical traces, approximately uniform in appearance from top to bottom and with all vertical traces similar in appearance.

n. Turn the INTENSITY control fully counterclockwise.

o. Turn the VARIABLE COLLECTOR % to 0.

p. CHECK—Slowly turn the BRIGHTNESS control counterclockwise and note that the stored display and background glow dim. Turn the BRIGHTNESS control slowly clockwise and note that the display brightens.

q. Press to release the UPPER and LOWER STORE buttons to the out position.

5. Check Horizontal Amplifier Balance

a. Set the controls as follows:

MAX PEAK VOLTS	6.5
SERIES RESISTORS	8 k
VARIABLE COL-LECTOR %	0
X10 HORIZ MAG	out
HORIZ VOLTS/DIV	5 V, COLLECTOR
Horizontal POSITION	centered
STEP FAMILY SINGLE	press
Vertical POSITION	centered
VERTICAL CUR-RENT/DIV	2 A
LEFT-RIGHT	RIGHT

b. Connect a patch cord from the right-side collector (C) terminal to the emitter (E) terminal.

c. Switch the HORIZ VOLTS/DIV switch from 5 V, COLLECTOR, to 2 V, COLLECTOR.

d. CHECK—Spot movement should not exceed 0.5 major division while switching between 5 V/DIV and 2 V/DIV, COLLECTOR.

e. Remove the patch cord. Push the X10 HORIZ MAG in.

6. Check Horizontal Gain

a. Set the controls as follows:

COLLECTOR SUPPLY POLARITY	AC
HORIZ VOLTS/DIV	50 mV, BASE
STEP/OFFSET AMPL	.1 V
VERTICAL CUR-RENT/DIV	2 A
LEFT-RIGHT	RIGHT

All Dark Gray Buttons and Knobs in except:

STEP FAMILY	SINGLE
OFFSET ZERO	out
AID (light gray button)	in

b. Connect a DVM between the emitter sense (E SENSE) and base (B) terminals, right side.

c. Set the OFFSET MULT to 0.00.

d. Check and note the DVM reading.

e. Position the spot to the left-center graticule (centered vertically on the zero line).

f. Adjust the OFFSET MULT for a DVM reading 500 mV greater than that noted in part d.

g. CHECK—The spot should be at the right-center graticule line, within ±2.5% (0.25 major division).

7. Check Horizontal Magnifier

a. Set the controls as follows:

STEP/OFFSET AMPL	.05 V
OFFSET AID	in
X10 HORIZ MAG	out
HORIZ VOLTS/DIV	5 mV, BASE

b. Set the OFFSET MULT control to 0.00. Record the DVM reading. Position the spot to left center.

c. Adjust the OFFSET MULT for a DVM reading of 0.050 volts greater than that noted in part b.

d. CHECK—The spot should be on the right-center graticule line, ±0.3 division.

8. Check Horizontal Display Accuracy

a. Set the controls as follows:

OFFSET MULT	0.00
MAX PEAK VOLTS	6.5
SERIES RESISTORS	2 k
STEP/OFFSET AMPL	.1 V
COLLECTOR SUPPLY PLARITY	+DC
VERTICAL CUR-RENT/DIV	2 A
LEFT-RIGHT	RIGHT

All Dark Gray Buttons and Knobs in except:

STEP FAMILY	SINGLE
OFFSET ZERO AID (light gray button)	in
HORIZ VOLTS/DIV	50 mV, BASE

b. Note the DVM reading.

c. Position the spot to left-center graticule.

d. Set the OFFSET MULT to produce a DVM reading of 0.500 volt greater than that noted in part b.

e. CHECK—The spot position should be within the limits shown in columns 4 and 5 in Table 5-2.

f. For each listing in Table 5-2, proceed as follows:

Push the ZERO button to the in position and note the DVM reading; position the spot to the left-corner graticule line; release the ZERO button, readjust the OFFSET MULT, if necessary, to the voltmeter reading plus the reading previously noted, and CHECK the spot position.

TABLE 5-2

HORIZ VOLTS/DIV	STEP/ OFFSET AMPL	Voltmeter Reading	Spot Position	Limit in Div
50 mV, BASE	.1 V	0.5 V	10th div	±0.3
.1 V, BASE	.2 V	1.0 V	10th div	±0.3
.2 V, BASE	.5 V	2.0 V	10th div	±0.3
.5 V, BASE	1 V	5.0 V	10th div	±0.3
1 V, BASE	2 V	10.0 V	10th div	±0.3
2 V, BASE	2 V	18.0 V	9th div	±0.27

g. Set the LEFT-RIGHT switch to Off. Disconnect the DVM lead from B and reconnect the lead to C SENSE (DVM from C SENSE to E SENSE).

h. Connect a 0.01 μF, 1000 V capacitor between C and E.

i. Set the controls as follows:

HORIZ VOLTS/DIV	5 V, COLLECTOR
VARIABLE COLLECTOR %	0
MAX PEAK VOLTS	100
SERIES RESISTORS	2 M
COLLECTOR SUPPLY POLARITY	+DC
VERTICAL CURRENT/DIV	2 A
LEFT-RIGHT	RIGHT

j. Position the spot to left-center graticule, using the vertical and horizontal POSITION controls.

WARNING

Enabling the 100, 400 or 1600 V supplies without the protective box exposes the operator to potentially lethal voltages at the 177 terminals.

k. Push the red Interlock Defeat button and set the VARIABLE COLLECTOR % control for a 50-volt DVM reading.

l. CHECK—The spot should be at the 10th graticule division, ±0.3 division.

m. Continue the test through 200 V/DIV, COLLECTOR, as shown in Table 5-3. Readjust VARIABLE COLLECTOR % as necessary.

TABLE 5-3

HORIZ VOLTS/DIV COLLECTOR	MAX PEAK VOLTS	DC Voltmeter READING	SPOT Position	LIMIT in Div
5 V	100	50.0 V	10th div	±0.3
10 V	400	100.0 V	10th div	±0.3
20 V	400	200.0 V	10th div	±0.3
50 V	1600	500.0 V	10th div	±0.3
100 V	1600	1000.0 V	10th div	±0.3
200 V	1600	1000.0 V	5th div	±0.15

n. Turn the VARIABLE COLLECTOR % to 0, switch LEFT-RIGHT to Off.

o. Discharge the capacitor (short-circuit the leads) and remove the capacitor and the DVM.

9. Check Vertical Amplifier Gain

a. Set the controls as follows:

MAX PEAK VOLTS	100
SERIES RESISTORS	30
COLLECTOR SUPPLY POLARITY	AC
VARIABLE COLLECTOR %	0
STEP/OFFSET AMPL	.05 VOLTS
OFFSET MULT	0.00

All Dark Gray Buttons and Knobs in except:

STEP FAMILY	SINGLE
OFFSET ZERO	in
AID (light gray button)	in
DISPLAY FILTER	out
HORIZ VOLTS/DIV	200 V, COLLECTOR
Horiz POSITION	center
VERTICAL CURRENT/DIV	50 nA
LEFT-RIGHT	Off

b. Connect the DVM between E and B and a shorting patch cord between B and C, right side.

c. Switch LEFT-RIGHT to RIGHT.

d. Position the spot to the top-center graticule line, and note the DVM reading.

e. Push to release the OFFSET ZERO button.

f. Turn the OFFSET MULT to produce a DVM reading of 0.375 volt greater than the DVM reading noted in part d.

g. CHECK—The spot should deflect 7.5 divisions, ±0.15 division. This checks the 177-577 gain accuracy.

h. Switch LEFT-RIGHT to Off. Remove the DVM and patch cords.

10. Check Collector Supply Peak Voltages

a. Set the controls as follows:

VARIABLE COLLECTOR %	0
MAX PEAK VOLTS	6.5
SERIES RESISTORS	.12
COLLECTOR SUPPLY POLARITY	+DC
HORIZ VOLTS/DIV	1 V
VERTICAL CURRENT/DIV	2 A
All Dark Gray Buttons and Knobs	in
LEFT-RIGHT	Off

b. Position the spot to the lower-left corner of the graticule.

c. Set VARIABLE COLLECTOR % to 100 and install the protective box.

d. CHECK—For the approximate deflection (voltage) listed in Table 5-4.

e. Set MAX PEAK VOLTS and HORIZ VOLTS/DIV to the next settings in Table 5-4 and repeat parts d and e.

TABLE 5-4

MAX PEAK VOLTS	HORIZ VOLTS/DIV	Approximate Deflection in Divisions
6.5	1 V	6.5
25	5 V	5
100	20 V	5
400	50 V	8
1600	200 V	8

f. Set COLLECTOR SUPPLY POLARITY to —DC, push DISPLAY INVERT, and set VARIABLE COLLECTOR % to 0.

g. Repeat parts b through e.

h. Remove the protective box.

11. Check Max Peak Current and Circuit Breaker Operation

a. Set the controls as follows:

VARIABLE COLLECTOR %	0
MAX PEAK VOLTS	6.5
SERIES RESISTORS	.12
COLLECTOR SUPPLY POLARITY	+
HORIZ VOLTS/DIV	1 V, COLLECTOR
VERTICAL CURRENT/DIV	2 A
All Dark Gray Buttons and Knobs	in
LEFT-RIGHT	RIGHT

b. Connect a short, heavy-gauge patch cord from C to E, right side. Position the spot to the lower-left corner of the graticule.

c. Adjust VARIABLE COLLECTOR % for 2 vertical divisions of display.

d. Position the top of the display to the bottom graticule line (most of the display is now off screen).

e. Adjust the VARIABLE COLLECTOR % fully clockwise.

f. CHECK—The top of the trace is off the top of the graticule (> 20 A).

g. CHECK—The COLLECTOR SUPPLY CIRCUIT BREAKER must open within 2 minutes.

h. Set the SERIES RESISTORS to .5.

i. CHECK—The CIRCUIT BREAKER can be reset within 1 minute after opening.

j. Adjust the VARIABLE COLLECTOR % to 0. Position the display to the lower-left corner and readjust VARIABLE COLLECTOR % to 5 vertical divisions (10 A).

k. CHECK—The CIRCUIT BREAKER should not open.

l. Set VARIABLE COLLECTOR % to 0 and install the protective box.

m. Set the VERTICAL CURRENT/DIV for the MAX PEAK VOLTS settings listed in Table 5-5, starting with 25 MAX PEAK VOLTS.

n. Set the SERIES RESISTORS knob (pull to unlock knob) for a MAX PEAK POWER-WATTS of 100.

o. Turn the VARIABLE COLLECTOR % fully clockwise, note the peak current, and turn the VARIABLE COLLECTOR % fully couterclockwise.

p. CHECK—The peak current noted in part o should be equal to or greater than the current limit shown for the MAX PEAK VOLTS setting in Table 5-5.

q. Set MAX PEAK VOLTS to the next setting in the table and repeat parts o through q.

TABLE 5-5

MAX PEAK VOLTS	VERTICAL CURRENT/DIV	Limit	
		Current	Deflection
25	2 A	≥5 A	≥2.5 div
100	.5 A	≥1.25 A	≥2.5 div
400	.1 A	≥.31 A	≥3.1 div
1600	20 mA	≥80 mA	≥4.0 div

r. Remove the protective box.

12. Check Collector Supply Interlock

a. Set the controls as follows:

MAX PEAK VOLTS	1600
SERIES RESISTORS	8 M
VARIABLE COLLECTOR %	0
HORIZ VOLTS/DIV	10
COLLECTOR SUPPLY POLARITY	AC
LEFT-RIGHT	Off

b. Install the protective box on the 177 Test Fixture. Open the protective box lid.

c. CHECK--The yellow COLLECTOR SUPPLY DISABLED lamp is lighted.

d. Close the lid on the protective box.

e. CHECK—The yellow lamp should extinguish and the red lamp on the 177 Test Fixture should turn on.

f. Turn the VARIABLE COLLECTOR % clockwise to produce a 10-division horizontal trace.

g. Lift the protective box lid.

h. CHECK—The red lamp extinguishes, the yellow lamp lights, and the collector sweep is disabled (no trace, only a spot).

i. Close the lid on the protective box.

j. Switch the MAX PEAK VOLTS to 400 and SERIES RESISTORS to 500 k and repeat parts c through h.

k. Switch the MAX PEAK VOLTS to 100 and SERIES RESISTORS to 30 k and repeat parts d through h.

l. Remove the protective box from the 177 Test Fixture.

13. Check Automatic Positioning with Collector Polarity Change

a. Set the controls as follows:

MAX PEAK VOLTS	6.5
SERIES RESISTORS	.12
COLLECTOR SUPPLY POLARITY	AC
VARIABLE COLLECTOR %	0
VERTICAL CURRENT/DIV	2 A
HORIZ VOLTS/DIV	100 V, COLLECTOR

b. Position the spot vertically and horizontally to the graticule center.

c. Set the COLLECTOR SUPPLY POLARITY to +.

d. CHECK—The spot should shift to the lower-left corner of the graticule, within ±0.1 division.

e. Switch the COLLECTOR SUPPLY POLARITY to —.

f. CHECK—The spot should shift to the upper-right corner of the graticule, within ±0.1 division.

STEP GENERATOR-VOLTAGE MODE

14. Check Absolute Accuracy at 2 V/Step

a. Set the controls as follows:

MAX PEAK VOLTS	100
SERIES RESISTORS	2 M
VARIABLE COLLECTOR %	0
COLLECTOR SUPPLY POLARITY	+DC
STEP/OFFSET AMPL	2 V
NUMBER OF STEPS	10
OFFSET MULT	10.00

All Dark Gray Buttons and Knobs in except:

OFFSET ZERO	out
AID (light gray button)	in
X10 HORIZ MAG	out
HORIZ VOLTS/DIV (MAG On)	.5 V, COLLECTOR

b. Connect the DVM between E and C, left side, and connect a 0.1 μF, 100 V capacitor across E and C, left side.

c. Patch B to C, right side, and connect a 400 Ω, 1%, 10-watt resistor between E and B, right side. The two 200 Ω resistors supplied with the kit can be used for this test.

d. Switch LEFT-RIGHT switch to LEFT. Press the Interlock Defeat button and adjust the VARIABLE COLLECTOR % to produce a DVM reading of +40.00 volts.

e. Horizontally position the spot to graticule center or to a point near center and note the spot position. Release the Interlock Defeat button.

f. Switch LEFT-RIGHT to RIGHT.

g. CHECK—The 11th spot should be within 3% of the 40-volt reference noted in part e. 3% is 1.2 volts, or 2.4 divisions at 0.5 volts per division.

h. Switch COLLECTOR SUPPLY POLARITY to —DC.

i. Switch LEFT-RIGHT to LEFT, press BEAM FINDER, and vertically center the spot on the graticule. Push the Interlock Defeat and adjust VARIABLE COLLECTOR % for —40 volts on the DVM. Horizontally position the spot to a reference point near graticule center. Release the Interlock Defeat.

j. Switch LEFT-RIGHT to RIGHT.

k. CHECK—The 11th spot should be within 3% (±2.4 divisions) of the 40-volt reference noted in part i.

l. Remove the DVM and capacitor, 400 Ω resistor and shorting strap from B to C.

15. Check Linearity at Maximum Voltage and Current

a. Reset the controls as follows:

HORIZ VOLTS/DIV (MAG On)	.2 V, COLLECTOR
COLLECTOR SUPPLY POLARITY	+DC

b. Place a 200 Ω, 1%, 10 watt resistor between C and B, right side, and another 200 Ω, 1%, 10 watt resistor between C and E, right side.

c. Switch LEFT-RIGHT to RIGHT, press the BEAM FINDER button to locate the spot, and position the 11th spot to graticule center or a reference point near center and note the position of the 10th and 11th spots (see Fig. 5-1).

d. Position the 10th spot to the center reference and note the position of the 9th spot.

e. CHECK—With the 10th spot at the center reference, the 9th spot should be within ±2% (±0.1 major division) of the position of the 10th spot in part c.

f. CHECK—Position each spot (8th, 7th, 6th, etc.) to the center reference and note that each lower spot must be within ±2% (±0.1 major division) of the 10th spot in part c.

g. The measurement in each part must be within ±2% of the measurement in any other part.

h. Reset COLLECTOR SUPPLY POLARITY to —DC.

i. Press the BEAM FINDER and position the 11th (furthest left) spot (see Fig. 5-2) to graticule center and note the position of the 10th and 11th spots (reposition vertically as necessary).

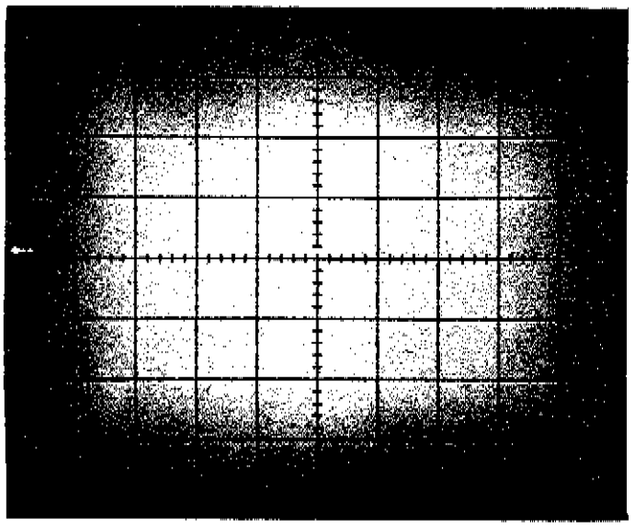


Fig. 5-1. Illustration of step 15c.

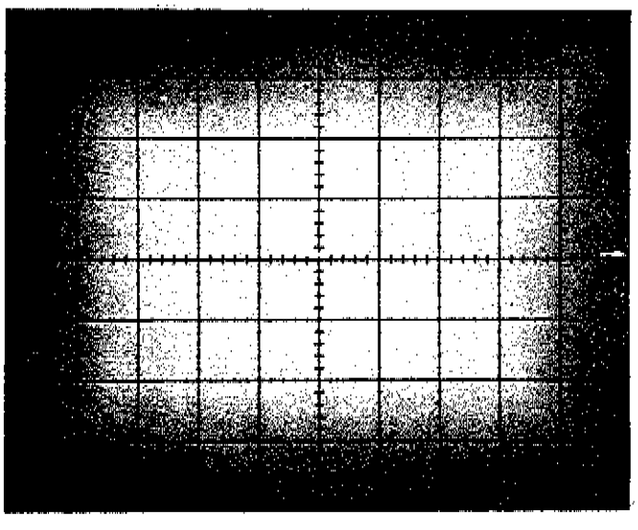


Fig. 5-2. Illustration of step 15i.

j. Position the 10th spot to graticule center and note the position of the 9th spot.

k. CHECK—With the 10th spot at the center reference, the 9th spot should be within ±2% of the position of the 10th spot in part i.

l. CHECK—Position each spot (8th, 7th, 6th, etc.) to the center reference and note that each lower spot is within ±2% of the 10th spot in part i.

m. Remove the resistors.

16. Check Linearity in Oppose

a. Reset the controls as follows:

STEP/OFFSET AMPL	1 V
HORIZ VOLTS/DIV	.2 V, BASE
OFFSET	
AID	out

b. Position the 1st spot (right end of the display) to a reference point near graticule center.

c. Note the positions of the 1st and 2nd spot (distance between spots).

d. Reposition the 2nd spot to the reference in part b.

e. CHECK—The distance between the 2nd and 3rd spots should be within ±2% (±0.1 major division) of that in part c.

f. Position each successive spot (3rd, 4th, etc.) to the reference.

g. CHECK—The distance between any two spots should be within ±2% of the distance between any other two adjacent spots.

17. Check Maximum Current Limit

a. Set the controls as follows:

MAX PEAK VOLTS	6.5
SERIES RESISTORS	.12
COLLECTOR SUPPLY	
POLARITY	AC
VARIABLE COLLECTOR %	0
STEP/OFFSET AMPL	2 V
OFFSET MULT	10.00

All Dark Gray Buttons and Knobs in except:

OFFSET	
ZERO	out
AID (light gray button)	in
HORIZ VOLTS/DIV	200 V, COLLECTOR
VERTICAL CURRENT/DIV	50 mA
LEFT-RIGHT	Off

b. Patch C to B, right side.

c. Vertically and horizontally position the spot to graticule center. Switch LEFT-RIGHT to RIGHT.

d. CHECK—The maximum current should be less than 200 mA (4 divisions of vertical deflection at 50 mA/DIV).

e. Press to release the STEP/OFFSET POLARITY NORM button to the out position.

f. CHECK—The maximum current should be less than 200 mA (4 divisions of vertical deflection from the graticule center line).

g. Reset the controls as follows:

STEP FAMILY	
SINGLE	press
OFFSET	
AID	out
VERTICAL CURRENT/DIV	5 mA
LEFT-RIGHT	Off

h. Horizontally and vertically position the spot to graticule center.

i. Switch LEFT-RIGHT to RIGHT.

j. CHECK—Maximum current should be 10 mA (2 divisions) or greater, of vertical deflection, but less than 20 mA (4 divisions).

k. Push the STEP/OFFSET POLARITY NORM in.

l. CHECK—Maximum current should be 10 mA (2 divisions) or greater, of vertical deflection, but less than 20 mA (4 divisions).

m. Set LEFT-RIGHT switch to Off. Remove B to C patch cord.

18. Check Step/Offset Amplitude Absolute Accuracy, Step X1

a. Reset the controls as follows:

All Dark Gray Buttons and Knobs in except:

X10 HORIZ MAG	out
STEP FAMILY	SINGLE
HORIZ VOLTS/DIV (MAG On)	.2 V, BASE
STEP/OFFSET AMPL	1 V
OFFSET AID (light gray button)	in
LEFT-RIGHT	RIGHT
NUMBER OF STEPS	fully clockwise
OFFSET ZERO	out

b. Connect the DVM between B and E, right side.

c. Set the OFFSET MULT to the DVM reading shown in Table 5-6. If this voltage cannot be set, the Step Generator is misadjusted at the low end (recalibrate the Step Generator).

d. Position the spot to approximately 0.5 of limit in divisions from Table 5-6 left of center and note the position of the spot.

e. Set the OFFSET MULT dial to 10.00.

f. CHECK—The spot should be within limit in divisions given in Table 5-6 (to the right) of the position noted in part d.

g. Push the ZERO and STEP FAMILY buttons in.

h. CHECK—The spot should be within limit in divisions given in Table 5-6 to the right of the reference position noted in part d.

i. Push to release the OFFSET POLARITY NORM button.

j. Push STEP FAMILY SINGLE button, release ZERO button to the out position, and release the AID button to the out position.

k. CHECK—The spot should be within limit in divisions given in Table 5-6 to the right of the reference in part d.

l. Push the AID button in and set the OFFSET MULT to produce the DVM reading shown in Table 5-6.

m. Position the spot to approximately 0.5 of limit in divisions from Table 5-6 to the right of center and note the position.

n. Reset the OFFSET MULT dial to 10.00.

o. CHECK—The spot should be within limit in divisions given in Table 5-6 to the left of the position noted in part m.

p. Press the STEP FAMILY REP and ZERO buttons in.

q. CHECK—The spot should be within limit in divisions given in Table 5-6 to the left of the position noted in part m.

r. Push the OFFSET POLARITY NORM button in. Push the STEP FAMILY SINGLE button, release the ZERO button to the out position and release the AID button to the out position.

s. CHECK—The spot should be within limit in divisions given in Table 5-6 to the left of the reference in part m.

t. Push the AID button in.

u. Using Table 5-6, repeat parts c through t for each of the STEP/OFFSET AMPL settings. Use the HORIZ VOLTS/DIV, OFFSET MULT, and DVM settings shown in the table and use the positions and limits shown.

TABLE 5-6

STEP/ OFFSET AMP	HORIZ VOLTS/ DIV	DVM Reading	Limit in[2] Divisions
+1 V	.2 V	+9.7 V	+3
−1 V		−9.7 V	−3
+.5 V	.1 V	+4.85 V	+3
−.5 V		−4.85 V	−3
+.2 V	50 mV	+1.94 V	+2.4
−.2 V		−1.94 V	−2.4
+.1 V	10 mV	+0.97 V	+6
−.1 V		−0.97 V	−6
+.05 V	5 mV	+0.485 V	+6
−.05 V		−0.485 V	−6

[2] + = to the right of the reference

− = to the left of the reference

19. Check Step/Offset Amplitude Absolute Accuracy, Step X.1

a. Set the controls as follows:

COLLECTOR SUPPLY POLARITY	AC
NUMBER OF STEPS	counterclockwise

All Dark Gray Buttons and Knobs in except:

STEP X.1	out
OFFSET AID (light gray button)	in
STEP/OFFSET AMPL	.2 V
HORIZ VOLTS/DIV	.2 V, BASE
VERTICAL CURRENT/DIV	2 A
LEFT-RIGHT	RIGHT

b. Connect the DVM between B and E, right side.

c. Horizontally position the first (furthest left of the two displayed spots) to the left graticule line.

d. Turn the NUMBER OF STEPS control clockwise until 10 steps (11 spots) are displayed horizontally. Horizontally position the 11th spot to graticule center. Pull the X10 HORIZ MAG knob.

e. Reset the 11th spot to graticule center.

f. Push STEP FAMILY SINGLE button and push OFFSET ZERO button to release to the out position.

g. Set the OFFSET MULT for a DVM reading of 2.000 volts, ±5 mV.

h. Reposition the spot, relative to graticule center or a reference point near graticule center by the amount of difference, if any, of the DVM reading from 2.000 volts (example: if the difference from 2.000 volts is +5 mV, then, at 20 mV/DIV, 5 mV is equal to 0.25 major divisions. Set the spot 0.25 division to the right of graticule center or a reference point near center. If in the negative direction, set the spot to the left of the reference point).

i. Press the STEP FAMILY REP button and the OFFSET ZERO buttons in.

j. CHECK—The spot should be not more than ±4 divisions from the reference.

k. Push the STEP/OFFSET POLARITY NORM and the DISPLAY INVERT NORM buttons to release to the out position. Note: For each successive step in Table 5-7 alternate the position of these buttons.

l. Press the STEP FAMILY SINGLE button and push to release the OFFSET ZERO button to the out position.

m. Readjust the OFFSET MULT for 2.000 volts, ±5 mV on the DVM.

n. Set the spot to a reference point as detailed in part h.

o. Push the STEP FAMILY REP and OFFSET ZERO buttons in.

p. CHECK—The spot should be within ±4 divisions of the reference.

q. Using Table 5-7, reset the controls to the next set of conditions.

r. Repeat parts e through p, using the control settings, DVM readings, and limits for each of the items in the table.

TABLE 5-7

STEP/ OFFSET AMPL	HORIZ VOLTS/DIV (magnified)	DVM Reading (Volts)	Max Deviation (4%) from the reference (in divisions)
.2 V	20 mV	2.000, ±5 mV	±4
.1 V	10 mV	1.000, ±2.5 mV	±4
.05 V	5 mV	0.500, ±5 mV	±4
.02 V	5 mV	0.200, ±0.5 mV	±1.6
.01 V	5 mV	0.100, ±0.25 mV	±0.8
5 mV	5 mV	0.050, ±0.13 mV	±0.4

STEP GENERATION-CURRENT MODE

20. Check Maximum Current and Voltage

a. Set the controls as follows:

MAX PEAK VOLTS	6.5
SERIES RESISTORS	.12
VARIABLE COLLECTOR %	0
COLLECTOR SUPPLY POLARITY	AC

All Dark Gray Buttons and Knobs in except:

STEP FAMILY	SINGLE
STEP RATE	SLOW
STEP/OFFSET AMPL	200 mA
NUMBER OF STEPS	10
Horizontal POSITION	centered
Vertical POSITION	centered
HORIZ VOLTS/DIV	1 V, COLLECTOR
VERTICAL CURRENT/DIV	.5 A
LEFT-RIGHT	Off

b. Connect a 1 Ω, 1/4%, 10-watt resistor between C and B terminals, left side, and connect the DVM to the same (C and B) terminals.

c. Connect a shorting patch cord between C and B terminals, right side. Horizontally position the spot to graticule center.

d. Switch LEFT-RIGHT switch to LEFT.

e. Push to release the ZERO button.

f. Set the OFFSET MULT dial to produce a DVM reading of 1.94 volts.

g. Pull the X10 VERT MAG and vertically position the trace near graticule center. Do NOT reposition horizontally. Note the position of the trace (reference).

h. Set the OFFSET MULT dial to 10.00 and LEFT-RIGHT switch to RIGHT.

i. Set MAX PEAK VOLTS to 25 and SERIES RESISTORS to 1.9.

j. Set the VARIABLE COLLECTOR % to produce a horizontal deflection that passes through 5 volts (5th division right of center). See Fig. 5-3A.

k. CHECK—At 5 volts, the trace should be displaced not more than 2.2 divisions downward from the vertical reference set in part g, and not above the vertical reference.

l. Push the ZERO and STEP FAMILY REP buttons in.

m. CHECK—At 5 volts, the trace should be displaced not more than 2.2 divisions downward from the vertical reference. Set in part g, and not above the vertical reference. See Fig. 5-3B.

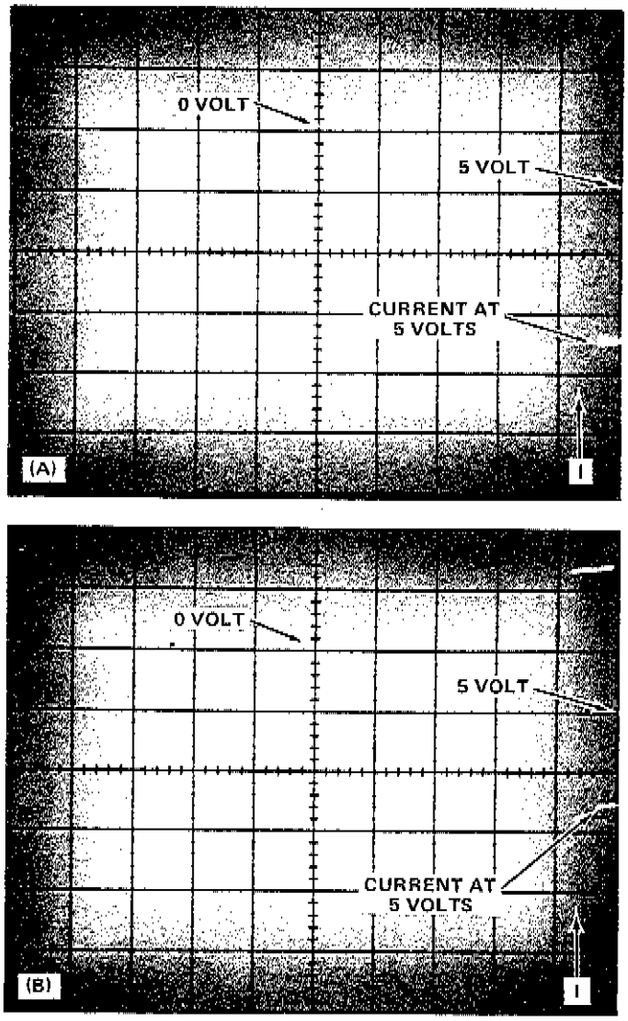


Fig. 5-3. Typical displays of Step Generator current at maximum voltage. (A) Illustrating step k and (B) illustrating step m.

n. Reset the controls as follows:

MAX PEAK VOLTS	6.5
SERIES RESISTORS	.12
VARIABLE COL-LECTOR %	0
STEP/OFF POLARITY NORM	out
STEP FAMILY SINGLE	press
OFFSET ZERO	out
LEFT-RIGHT	LEFT

o. Adjust the OFFSET MULT for 1.94 volts on the DVM.

p. Position the spot vertically near graticule center and note the vertical position of the spot (reference). Do NOT reset horizontally.

q. Set MAX PEAK VOLTS to 25 and SERIES RESISTORS to 1.9.

r. Switch LEFT-RIGHT switch to RIGHT.

s. Reset OFFSET MULT dial to 10.00.

t. Adjust VARIABLE COLLECTOR % to produce a horizontal deflection that passes through 5 volts (5th division to the left center. See Fig. 5-4A).

u. CHECK—At 5 volts on the graticule, the trace should be displaced vertically not more than 2.2 divisions upward from the vertical reference set in part p, and not below the vertical reference.

v. Push the OFFSET ZERO and STEP FAMILY REP buttons.

w. CHECK—At the left graticule line the trace should be displaced not more than 2.2 divisions upward from the vertical reference set in part p, and not below the vertical reference. See Fig. 5-4B.

21. Check Current at 100 mA (Step/Offset Amplitude) and Maximum Voltage

a. Set the controls as follows:

MAX PEAK VOLTS	6.5
SERIES RESISTORS	.12
Horizontal POSITION	centered

All Dark Gray Buttons and Knobs in except:

STEP FAMILY	SINGLE
STEP RATE	SLOW
OFFSET ZERO	out
AID (light gray button)	in
HORIZ VOLTS/DIV	2 V, COLLECTOR
STEP/OFFSET AMPL	100 mA

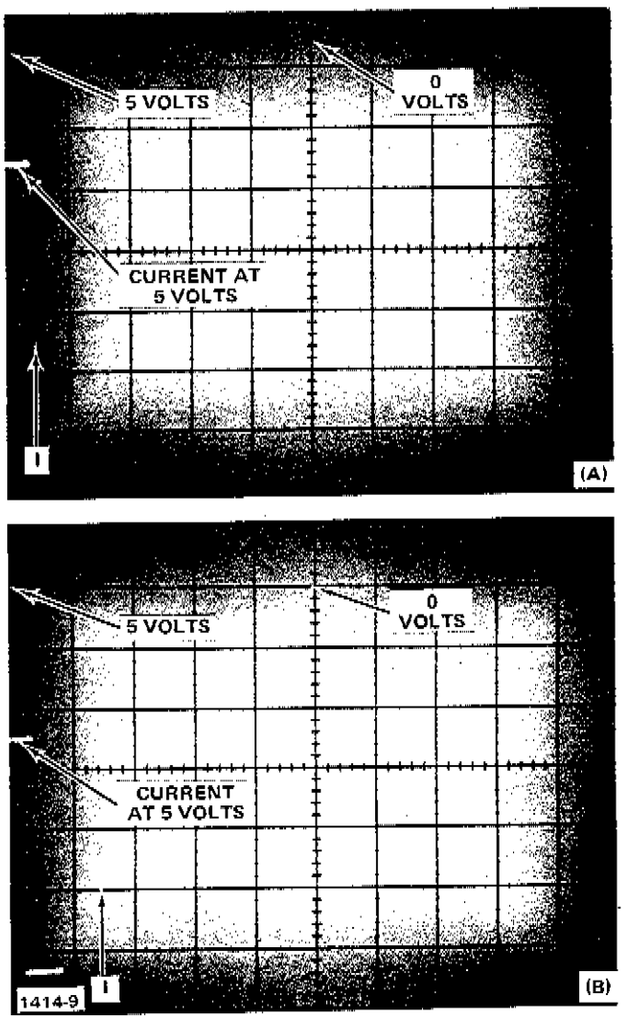


Fig. 5-4. Typical displays of Step Generator current at maximum voltage. (A) Illustrating step t and (B) illustrating step w.

b. Horizontally position the spot to graticule center. Switch LEFT-RIGHT switch to LEFT. Adjust the OFFSET MULT for a DVM reading of 0.97 volts.

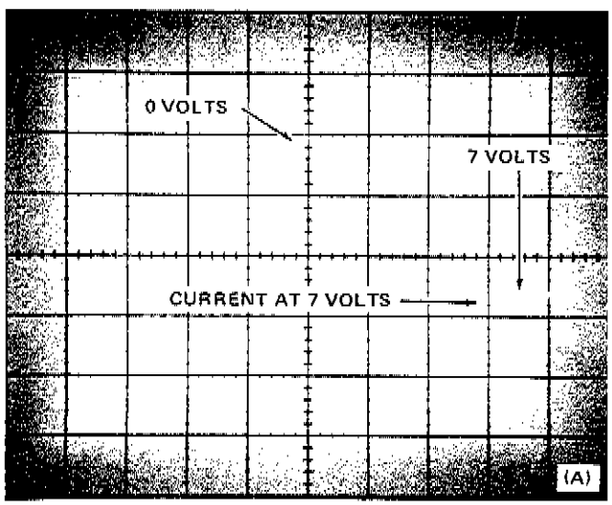
c. Pull X10 VERT MAG and vertically position the spot to approximately graticule center. Note the vertical spot position for reference.

d. Switch LEFT-RIGHT to RIGHT.

e. Switch SERIES RESISTORS to 7.5.

f. Reset OFFSET MULT dial to 10.00.

g. Set VARIABLE COLLECTOR % to produce a trace that passes through 7 volts (3.5 divisions to the right of graticule center. See Fig. 5-5A).



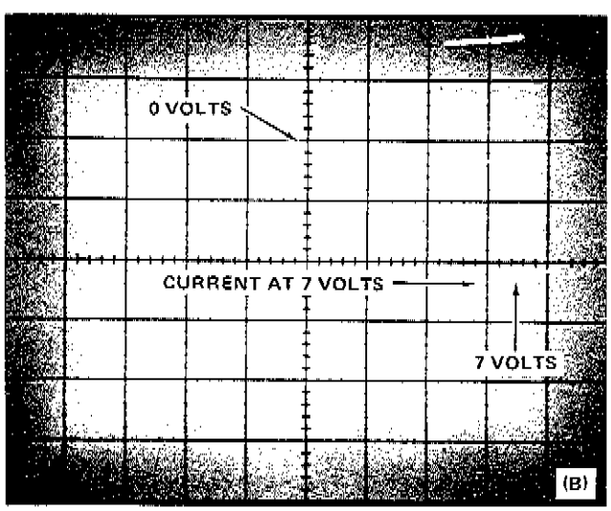


Fig. 5-5. Typical displays of Step Generator current at maximum voltage. (A) Illustrating step g and (B) illustrating step j.

h. CHECK—At 7 volts, the trace should be displaced not more than 1.2 divisions downward from the reference noted in part c, and not above the vertical reference.

i. Push OFFSET ZERO and STEP FAMILY REP buttons in.

j. CHECK—At 7 volts, the trace should not be greater than 1.2 divisions below the reference noted in part c, and should not be above the vertical reference. See Fig. 5-5B.

k. Reset the controls as follows:

MAX PEAK VOLTS	6.5
SERIES RESISTORS	.12
VARIABLE COLLECTOR %	0

All Dark Gray Buttons and Knobs in except:

STEP FAMILY	
SINGLE	press
OFFSET	
ZERO	out
STEP/OFFSET	
POLARITY	
NORM	out
LEFT-RIGHT	LEFT

l. Set the OFFSET MULT for a DVM reading of 0.97 volts. Vertically position the spot to graticule center. Do NOT change horizontal position. Leave Vertical magnified.

m. Switch LEFT-RIGHT to RIGHT.

n. Reset SERIES RESISTORS to 7.5.

o. Set the OFFSET MULT dial to 10.00.

p. Set VARIABLE COLLECTOR % to produce a horizontal trace that passes through 7 volts (3.5 divisions to the left of graticule center. See Fig. 5-6A).

q. CHECK—The trace, at 7 volts, should be displaced vertically not more than 1.2 divisions above the reference set in part l, and not below the reference.

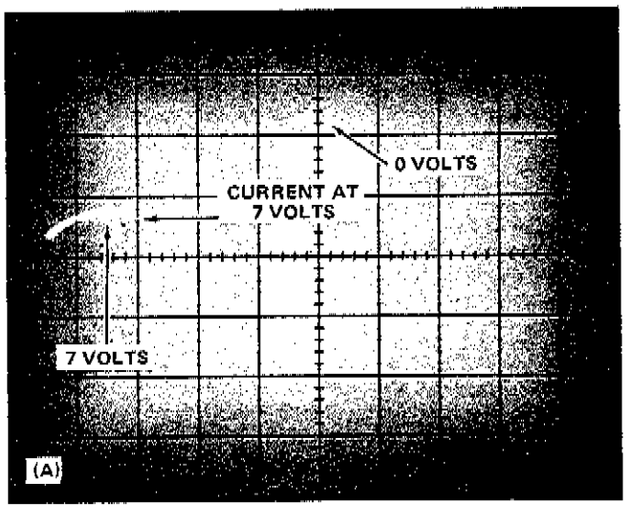
r. Push the OFFSET ZERO and STEP FAMILY REP buttons in.

s. CHECK—The trace, at 7 volts should be displaced vertically not more than 1.2 divisions above the reference set in part l, and not below the vertical reference. See Fig. 5-6B.

22. Check Step/Offset Amplitude Absolute Accuracy, Step X1

a. Set the controls as follows:

MAX PEAK VOLTS	6.5
SERIES RESISTORS	.12
VARIABLE COLLECTOR %	0
COLLECTOR SUPPLY POLARITY	AC



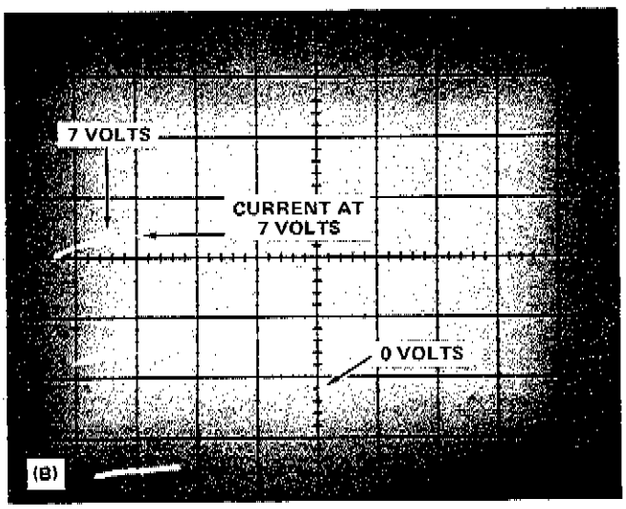


Fig. 5-6. Typical displays of Step Generator current at maximum voltage. (A) Illustrating step p and (B) illustrating step s.

All Dark Gray Buttons and Knobs in except:

STEP FAMILY	
SINGLE	press
STEP RATE	SLOW
OFFSET	
ZERO	out
X10 VERT MAG	out
STEP/OFFSET AMPL	50 mA
HORIZ VOLTS/DIV	200 V, COLLECTOR
VERTICAL CURRENT/DIV (MAG On)	10 mA
LEFT-RIGHT	Off
NUMBER OF STEPS	fully clockwise

b. Connect a 1 Ω, 1/4%, 10-watt resistor between B and C, left side and connect the DVM across the 1 Ω resistor.

c. Set the LEFT-RIGHT switch to LEFT.

d. Adjust the OFFSET MULT for a DVM reading as shown in Table 5-8 for the appropriate STEP/OFFSET AMPL setting.

e. Position the spot vertically and horizontally approximately to graticule center. Note the spot position.

f. Set the OFFSET MULT dial to 10.00.

g. CHECK—The spot should be within the limits shown in column 5 in Table 5-8 (≤30 mA = 3 divisions, or less, vertically, from the reference point noted in part e).

h. Reset the following controls:

OFFSET	
ZERO	in
STEP FAMILY	
REP	in

i. CHECK—The spot should be within the limits shown in column 5 in Table 5-8 (≤ 30 mA = 3 divisions, or less, vertically, from the reference point noted in part e).

j. Reset the controls as follows:

STEP FAMILY	
SINGLE	press
OFFSET	
ZERO	out
STEP-OFFSET POLARITY	
NORM	out

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k. Set the OFFSET MULT for a DVM reading as shown in Table 5-8 for the appropriate STEP/OFFSET AMPL setting.

l. Position the spot vertically to approximately graticule center and note the spot position.

m. Set the OFFSET MULT dial to 10.00.

n. CHECK—The spot should be within the limits shown in column 5, Table 5-8.

o. Press OFFSET ZERO and STEP FAMILY REP buttons in.

p. CHECK—The top spot should be within the limits shown in column 5, Table 5-8.

q. Push the STEP FAMILY SINGLE and STEP/OFFSET POLARITY NORM buttons in and push to release OFFSET ZERO to the out position.

r. Using the next entry in Table 5-8, repeat parts d through q, using the setting, limits, and resistors shown in Table 5-8. Repeat for each entry.

TABLE 5-8

STEP OFFSET AMPL	B-C Resistor	DVM Reading	VERTICAL CURRENT/DIV (MAG On)	Limit in divisions from reference
50 mA	1 Ω	0.485 V	10 mA	3
20 mA	10 Ω	1.940 V	5 mA	2.4
10 mA	10 Ω	0.970 V	2 mA	3
5 mA	10 Ω	0.485 V	1 mA	3
2 mA	100 Ω	1.940 V	.5 mA	2.4

s. Reset the controls as follows:

MAX PEAK VOLTS	100
SERIES RESISTORS	30
STEP/OFFSET AMPL	1 mA
VERTICAL CURRENT/DIV	.2 mA

t. Connect a shorting patch cord between C and B, right side.

u. Set the OFFSET MULT for a DVM reading as shown in Table 5-9 for the appropriate STEP/OFFSET AMPL setting. Vertically position the spot to a point near graticule center and note the spot position.

v. Switch LEFT-RIGHT switch to RIGHT.

w. Set the OFFSET MULT dial to 10.00.

x. CHECK—The spot should be within the limits shown in column 5, Table 5-9.

y. Set the OFFSET ZERO and STEP FAMILY REP buttons in.

z. CHECK—The bottom spot should be within the limits shown in the table, with respect to the reference noted in part u.

aa. Push STEP FAMILY SINGLE and push to release ZERO, AID, and STEP/OFFSET POLARITY NORM buttons to the out position.

ab. CHECK—The spot should be within the limits shown in column 5, Table 5-9.

ac. Switch LEFT-RIGHT to LEFT and press AID button in.

ad. Reset OFFSET MULT for the DVM reading indicated for the STEP/OFFSET AMPL setting in Table 5-9. Vertically position the spot to near graticule center. Note the spot position.

ae. Switch LEFT-RIGHT switch to RIGHT.

af. Set OFFSET MULT dial to 10.00.

ag. CHECK—The spot should be within the limits shown in the table, with respect to the reference noted in part ad.

ah. Push STEP FAMILY REP and ZERO buttons in.

ai. CHECK—The top spot should be within the limits shown in the table, with respect to the reference noted in part ad.

aj. Press STEP FAMILY SINGLE and POLARITY NORM buttons and push to release ZERO and AID buttons to the out position.

ak. CHECK—The spot should be within the limits shown in column 5, Table 5-9.

TABLE 5-9

STEP OFFSET AMPL	C-B Resistor	DVM Reading	VERTICAL CURRENT/ DIV	Limit in divisions to reference
1 mA	100 Ω	0.970 V	.2 mA	3
.5 mA		0.485 V	.1 mA	3
.2 mA	1 kΩ	1.940 V	50 μA	2.4
.1 mA		0.970 V	20 μA	3
50 μA		0.485 V	10 μA	3
20 μA	10 kΩ[3]	1.940 V	5 μA	2.4
10 μA		0.970 V	2 μA	3
5 μA		0.485 V	1 μA	3
2 μA	100 kΩ[4]	1.940 V	.5 μA	2.4
1 μA		0.970 V	.2 μA	3
.5 μA		0.485 V	.1 μA	3
.2 μA	1 MΩ[4]	1.940 V	50 nA	2.4
.1 μA		0.970 V	20 nA	3
50 nA		0.485 V	10 nA	3

[3]When the C to B resistor is 10 kΩ and greater, the DISPLAY FILTER may have to be used to decrease the Vertical noise on DC measurements. Switch the DISPLAY FILTER out of the circuit (NORM button in) when checking STEP FAMILY (REP button in). If objectionable vertical noise is present, read the center of the display to set the reference point, then disconnect the voltmeter.

[4]If a DC voltmeter having an input impedance of 500 MΩ or less is used, calculate the actual voltage using the formula: —

$$V_2 = V_1 \frac{R_m}{R_m + R_s}$$

Where:

V_2 = actual voltage,

V_1 = indicated voltage,

R_m = meter impedance,

R_s = current sensing resistor in the table.

al. Switch LEFT-RIGHT switch to LEFT. Press AID button in.

am. Proceed to the next settings in the table and repeat parts u through am.

NOTE

Observe the footnotes to Table 5-9 when the 10 kΩ, 100 kΩ, and 1 MΩ resistors are used.

23. Check Maximum Current and Voltage Limits with Opposing Offset

a. Set the controls as follows:

MAX PEAK VOLTS	6.5
SERIES RESISTORS	.12
VARIABLE COLLECTOR %	0
COLLECTOR SUPPLY POLARITY	+DC

All Dark Gray Buttons and Knobs in except:

STEP FAMILY SINGLE	press
STEP/OFFSET AMPL	10 mA
HORIZ VOLTS/DIV	1 V, COLLECTOR
VERTICAL CURRENT/ DIV	5 mA

b. Vertically and horizontally position the spot to graticule center, or near center and note the spot position.

c. Switch LEFT-RIGHT to RIGHT (C to B patch).

d. Push to release ZERO and AID buttons.

e. CHECK—The vertical deflection from the center reference should be > 10 mA, but < 20 mA (> 2 divisions, but < 4 divisions).

f. Switch SERIES RESISTORS to 8 k.

g. CHECK—The horizontal deflection from the center reference should be > 1 volt, but < 5 volts (> 1 division, but > 5 divisions).

h. Switch COLLECTOR SUPPLY POLARITY to −DC and push DISPLAY INVERT NORM button to release to the out position.

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i. CHECK—The horizontal deflection from the center reference should be > 1 volt, but < 5 volts (> 1 division, but < 5 divisions).

j. Switch SERIES RESISTORS to .12.

k. CHECK—The vertical deflection from the center reference should be > 10 mA, but < 20 mA (> 2 divisions, but < 4 divisions).

24. Check Pulsed 300 μs and Step Rates

a. Set the controls as follows:

COLLECTOR SUPPLY POLARITY	+
MAX PEAK VOLTS	6.5
SERIES RESISTORS	2 k
VARIABLE COLLECTOR %	0
PULSED 300 μs	out

All Dark Gray Buttons and Knobs in except:

STEP FAMILY SINGLE	press
STEP RATE	SLOW
STEP/OFFSET AMPL	.5 V
HORIZ VOLTS/DIV	.5 V, BASE
VERTICAL CURRENT/DIV	2 mA
LEFT-RIGHT	Off

b. Patch from C to B, right side.

c. Position the spot horizontally and vertically to lower-left corner of graticule.

d. Push the STEP FAMILY REP button in and adjust NUMBER OF STEPS for 3 steps (4 spots).

e. Switch LEFT-RIGHT to RIGHT.

f. Increase VARIABLE COLLECTOR % to 100.

g. CHECK—The display should resemble that of Fig. 5-7

h. Push to release the STEP X.1 button and note the step rate.

i. Press the STEP RATE NORM button.

j. CHECK The step rate increased.

k. Press the STEP RATE FAST button.

l. CHECK—The step rate increased.

m. Push the PULSED 300 μs button and the STEP X.1 button in.

n. CHECK—Note that the sweeps have been replaced with a short-duration pulse, except for the zero line. The pulse appears at what would have been the peaks of the sweep. See Fig. 5-8.

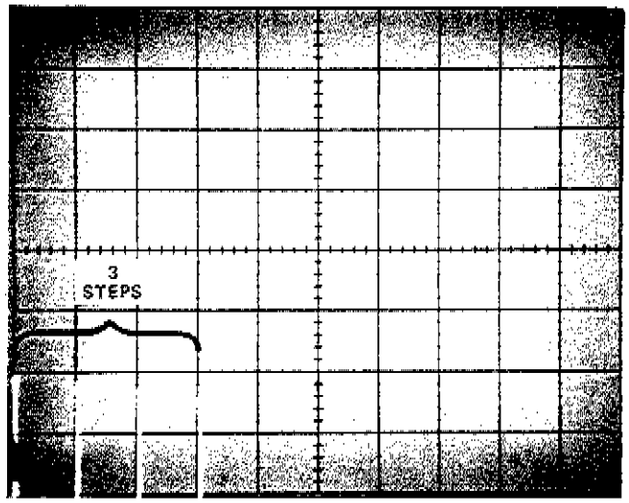


Fig. 5-7. Typical display illustrating step g.

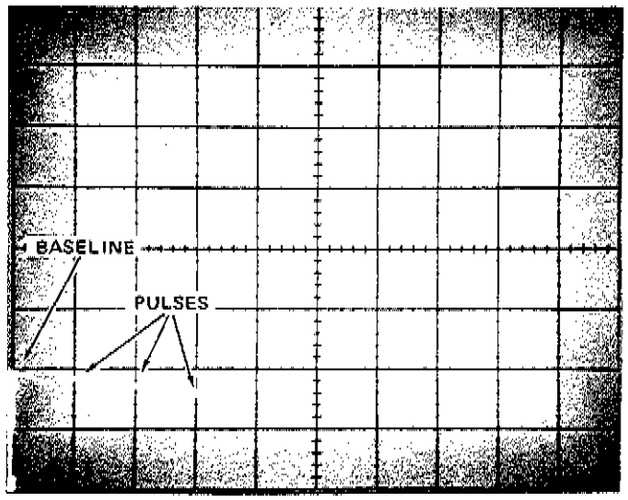


Fig. 5-8. Typical display illustrating step n.

o. Push the STEP RATE SLOW button.

p. CHECK—That the base line is also a pulse (see Fig. 5-9).

q. Set the COLLECTOR SUPPLY POLARITY to AC.

r. CHECK—The display should resemble Fig. 5-10 or inverted from top to bottom.

s. Push the STEP RATE NORM button.

t. CHECK—The display should resemble that of Fig. 5-11A or B (pulses at both the peaks and zero points).

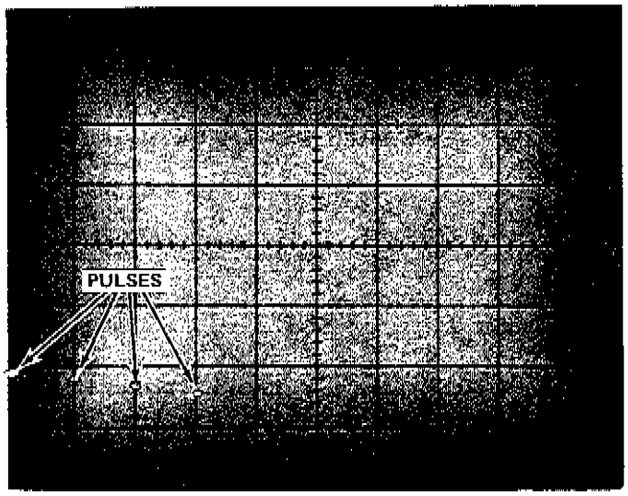


Fig. 5-9. Typical display illustrating step p.

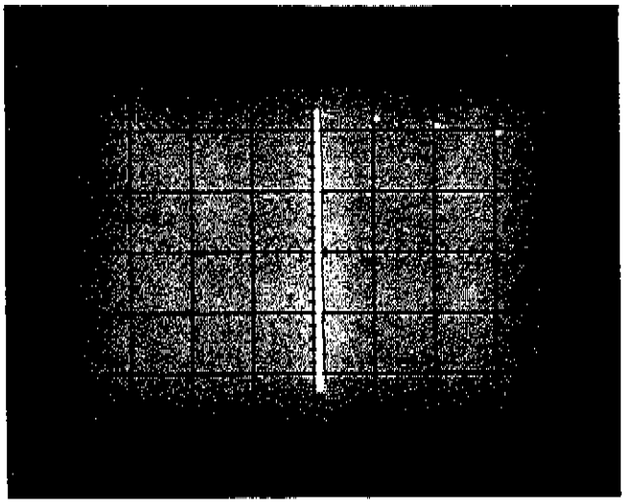
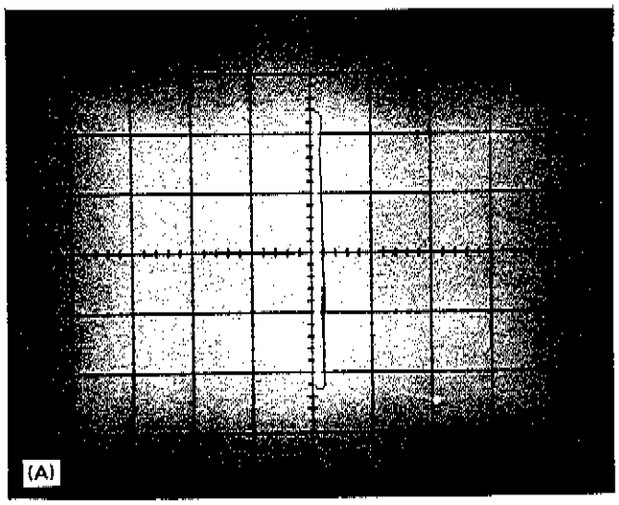


Fig. 5-10. Typical display illustrating step r.



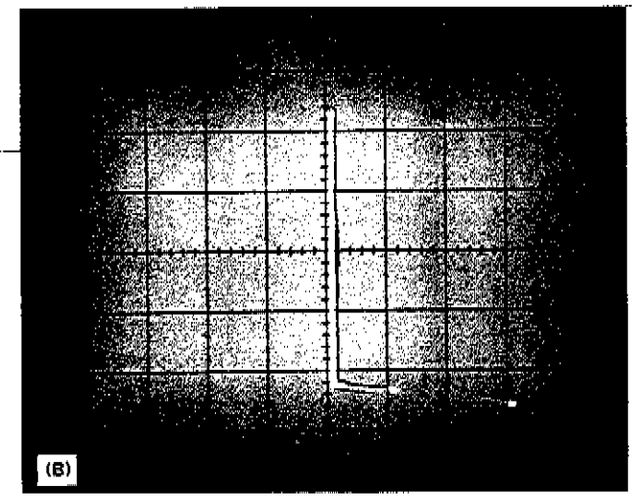


Fig. 5-11. Typical displays illustrating step t.

SHORT-FORM ADJUSTMENT PROCEDURE

1. Adjust −30-Volt Supply Page 5-24

Adjust R775, −30-V Adj, for −30 volts, ±0.075 volt.

2. Adjust +30-Volt Supply Page 5-25

Adjust R765, +30-V Adj, for +30 volts, ±0.075 volt.

3. Adjust −3400-Volt Supply Page 5-25

Adjust R1275, H V Adj, for −3400 volts, ±170 volts.

4. Adjust Intensity Range Page 5-25

Adjust R1245, Intensity Range, as detailed in step 4.

5. Adjust Astigmatism Page 5-25

Adjust R1286, Astig, for a circular spot.

6. Adjust Trace Rotation Page 5-25

Adjust R1291, TRACE ROTATION, to align the trace parallel to the center graticule line.

7. Adjust Geometry Page 5-26

Adjust R1285, Geom, for not more than 0.1 division of bowing.

8. Adjust Storage Operation (D1 only) Page 5-26

+370-VOLT SUPPLY

Adjust R1387, +370 V Adj, for +370 volts, ±7 volts.

OPERATING LEVEL

Adjust R1350, Store Level, for best stored display with Erase Selector pushed in.

STORE BALANCE

Adjust R1370, Store Bal, for best stored display with Erase Selector in the out position. Operating level and store balance level must match.

COLLIMATION

Adjust R1390, CE1, to the point at which the bright area is pulled in from the graticule line by one-half major division.

NON STORE

Adjust R1395, to erase the screen within 1 second when placed in the non-store mode.

9. Adjust Vertical Gain Page 5-28

Adjust R1116 for 8 divisions of vertical display.

10. Adjust Horizontal Amplifier Balance Page 5-28

Adjust R530, Horiz Amp Bal, for no spot movement while switching HORIZ VOLTS/DIV from 20 V/DIV, COLLECTOR to 2 V/DIV, COLLECTOR.

11. Adjust Horizontal Amplifier Gain Page 5-29

Adjust R1136, Horiz Gain Adj, for 10 divisions of horizontal deflection.

12. Adjust Sensitivity Correction Page 5-29

Adjust R1385, Sens Corr, for the same deflection sensitivity in store and nonstore.

13. Adjust Horizontal Compensation Page 5-30

Adjust C503, the yellow wire, for the smallest spot size. Adjust C511 for the least slash.

14. Adjust Step Generator Polarity Balance, Pulse Zero, and Step Zero Page 5-30

Adjust R365, Polarity Bal, for equal deflection of the brighter spot while pushing STEP/OFFSET POLARITY button in and out.

Adjust R355, Pulse Zero, to position the brighter spot to graticule center.

Adjust R300, Step Zero, to position the dim spot to graticule center.

Adjust R455, Amp Bal, to center the spot horizontally.

15. Adjust Polarity Positioning Page 5-31

Adjust R528, Horiz Pos Adj, and R570, Vert Pos Adj, to position the spot to lower-left corner of the graticule.

16. Adjust Step and Offset Amplitude Page 5-31

Adjust R278, X1 Step Amplitude, R352, Offset Ampl, and R281, X.1 Step Ampl, as detailed in the procedure.

17. Adjust Step Generator Output Impedance Page 5-32

Adjust R456, Output Z, for no spot shift as the 1 kΩ and 15 kΩ resistors are switched.

ADJUSTMENT PROCEDURE

Initial Control Settings

	D1 or D2
INTENSITY	counterclockwise
	577
MAX PEAK VOLTS	6.5
MAX PEAK POWER-WATTS	.15
VARIABLE COL-LECTOR %	0

1. Adjust −30-Volt Supply

a. Connect the DVM between GND and the −30-volt test point on the Power Supply circuit board. See Fig. 7-1A for location.

NOTE

For all references to figures calling out locations of adjustments and test points, see the pullout pages preceding the Schematic Diagrams near the rear of the manual.

WARNING

Turn the instrument power off while connecting and disconnecting the DVM, since lethal voltages exist in areas adjacent to the test points. These danger areas are shown in Fig. 5-12.

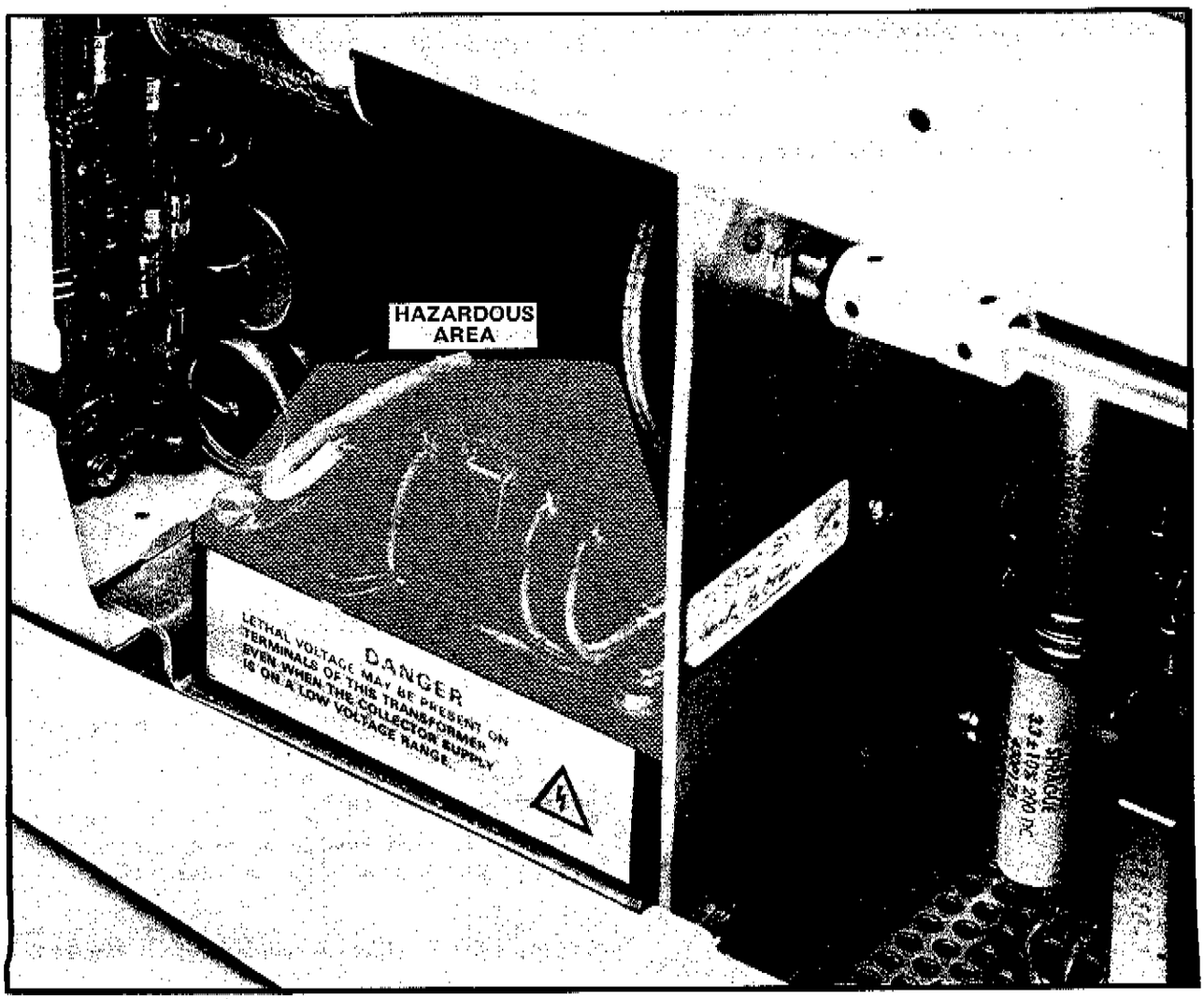


Fig. 5-12. Location of the danger areas adjacent to the Power Supply test points.

b. ADJUST—R775 (through the back panel of the 577) for −30 volts, ±0.075 volts (−29.925 V to −30.075 V).

c. INTERACTION—The −30-volt supply affects the entire instrument. Adjust this supply only if the voltage is out of tolerance or if a complete calibration is being performed. + and −30-volt supplies must be within 1/2% of 30 volts and must be within 1/2% of each other.

NOTE

Table 4-1 (Maintenance section of this manual) lists the voltage tolerance and regulation characteristics of each of the supplies in the 577.

2. Adjust +30-Volt Supply

a. Connect the DVM between GND and the +30-volt test point on the Power Supply circuit board. See Fig. 7-1A for location.

b. ADJUST—R765, +30 V Adj (see Fig. 7-1B for location) for a reading of +30 volts, ±0.075 V (+29.925 V to +30.075 V). For serial numbers B050000 and up, R765 is adjusted through the rear panel.

c. INTERACTION—The +30-volt supply affects the entire instrument. Adjust the supply only if the voltage is out of tolerance or if a complete calibration is being performed. + and −30-volt supplies must be within 1/2% of 30 volts, and within 1/2% of each other.

3. Adjust −3400-Volt Supply

a. Set the DC voltmeter to measure approximately 3400 volts.

b. Remove the CRT base cover from the display unit back panel. See Fig. 7-2A.

c. Read the voltage between pin 2 of the CRT socket (through a hole in the CRT socket) and GND on the Power Supply circuit board. See Fig. 7-2A.

d. ADJUST—R1275, H V Adj, for −3400 volts, ±170 volts (3230 volts to 3570 volts). See Fig. 7-2B.

e. INTERACTION—Adjust this voltage only if out of tolerance or if performing a complete calibration.

4. Adjust Intensity Range

a. Set the controls as follows:

VARIABLE COLLECTOR %	20
MAX PEAK VOLTS	6.5
SERIES RESISTORS	.12
COLLECTOR SUPPLY POLARITY	AC
HORIZ VOLTS/DIV	200 V, COLLECTOR
Horizontal POSITION	centered
VERTICAL CURRENT/DIV	2 A
Vertical POSITION	centered

All Light Gray Buttons out

All Dark Gray Buttons and Knobs in except:

STEP RATE	SLOW

b. Turn the INTENSITY control clockwise and check that a spot can be obtained. Turn the INTENSITY control fully counterclockwise.

c. ADJUST—R1245, Intensity Range, (see Fig. 7-2B) using an insulated screwdriver (hazardous voltages adjacent to R1245) until a faint spot is visible. Slowly turn the INTENSITY control clockwise 30° beyond the point at which the trace starts to brighten (30° equals 1 panel mark). To make final adjustment, turn R1245 counterclockwise until the spot just disappears.

5. Adjust Astigmatism

a. Set the FOCUS control fully counterclockwise and the INTENSITY control fully clockwise.

b. ADJUST—R1286, Astig, for a circular spot. See Fig. 7-3 for location of R1286.

6. Adjust Trace Rotation

a. Turn the INTENSITY control counterclockwise to reduce the spot intensity.

b. Adjust the FOCUS control for the smallest possible spot.

c. Set the HORIZ VOLTS/DIV switch to .5 V, COLLECTOR and adjust VARIABLE COLLECTOR % for a 10 division horizontal trace.

d. Vertically position the trace to the center graticule line.

e. ADJUST--R1291, TRACE ROTATION (on rear panel), to align the trace parallel with the center graticule line.

7. Adjust Geometry

a. Vertically position the trace to the bottom graticule line.

b. ADJUST--R1285, Geom (see Fig. 7-3 for location) for 0.1 division, or less, of bowing.

c. Vertically position the trace to the top graticule line.

d. Check for bowing of the trace, 0.1 division or less.

e. Vertically position the trace to the graticule centerline.

f. Connect a banana-banana patch cord between C and E on the right set of jacks on the 177.

g. Set the HORIZ VOLTS/DIV to STEP GEN.

h. Switch the LEFT-RIGHT switch to RIGHT.

i. Check for trace parallel with the center vertical graticule lines. See Fig. 5-13A and B for correct and incorrect adjustment of R1285.

j. READJUST--R1285, if necessary, for the best compromise between vertical and horizontal bowing.

k. If R1285, Geom, has been readjusted, recheck trace alignment by switching LEFT-RIGHT to center, remove C-E short and set HORIZ VOLTS/DIV to .1 V, COLLECTOR.

8. Adjust Storage Operation (D1 only)

Set the controls as follows:

STORE (UPPER and LOWER)	in
Erase Selector (UPPER and LOWER)	in

+370-VOLT SUPPLY

a. Connect a DC voltmeter (20 kΩ/volt or greater), set to measure at least +400 volts, between ground and the +370-volt test point (TP2 in Fig. 7-4).

b. ADJUST--R1387, +370-Volt Adj, for +370 volts, ±7 volts.

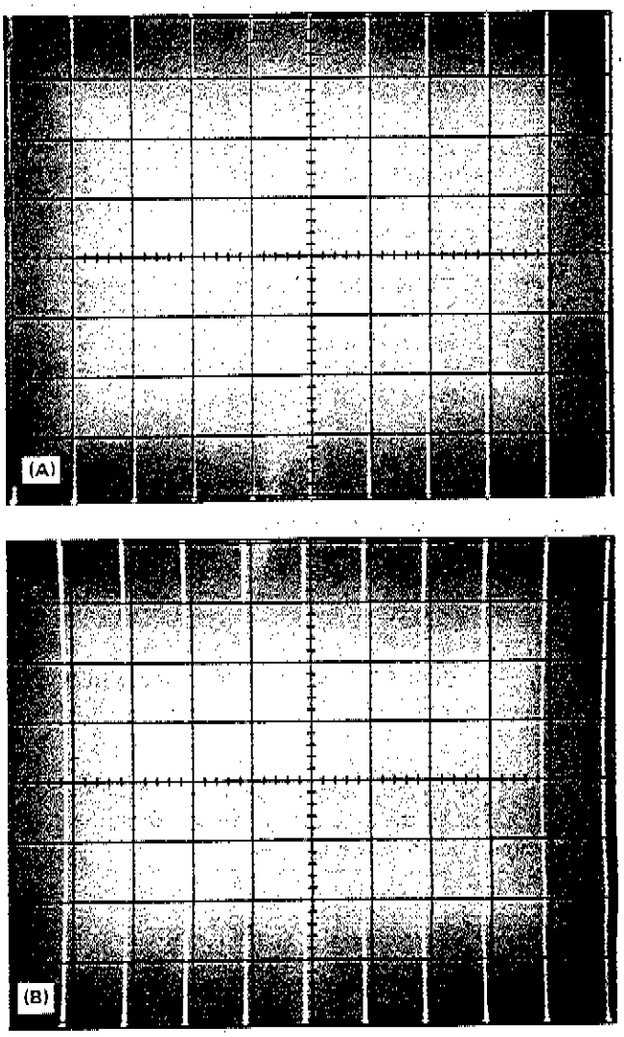


Fig. 5-13. Typical displays of (A) correct, and (B) incorrect adjustment of R1285.

Ⓐ

OPERATING LEVEL

a. Connect the DC voltmeter (20 kΩ/volt or greater) between the flood-gun cathodes (pin 3 of P389, Fig. 7-4 and the Store Level test point, TP1. Record the voltmeter reading, so that if necessary, the operating level can be returned to the original setting.

NOTE

If CRT performance has been satisfactory, adjustment of the Store Level control is not necessary. Proceed to the Store Bal adjustment. For replacement CRTs, an information card is provided to show the optimum levels established by the factory for the individual CRT. All voltage levels associated with storage operation are made with respect to the flood-gun cathodes.

Reset the controls as follows:

HORIZ VOLTS/DIV	1 V, COLLECTOR
STEP FAMILY	
REP	in
VARIABLE COL-LECTOR %	10 div of horiz display

b. Locate the writing threshold (minimum store level) as follows:

(1) Turn the INTENSITY control clockwise until the trace starts to defocus rapidly. Press the ERASE button to prepare the target for storage.

(2) Write about 3 lines per division across both targets by slewing the free-running trace vertically using the vertical POSITION control.

(3) Carefully check the written lines for breaks or gaps of 0.025-inch or more. If no breaks or gaps are evident after 10 seconds, adjust R1350, Store Level, to reduce the operating level by 5 volts.

(4) Erase twice, wait 10 seconds, then write again and check for breaks or gaps.

(5) Repeat this procedure, decreasing the operating voltage in 5-volt increments until breaks or gaps of about 0.025-inch occur. This is the writing threshold. Note the voltage and rotate the Store Level control clockwise until the original level, noted in part a, is reached.

NOTE

Do not change the INTENSITY or FOCUS control settings.

c. Locate the Upper Writing Limit (maximum store level) as follows:

(1) Again write about 3 lines per division. Carefully check the stored lines and background for trace spreading or background fadeup. If no trace spreading or fadeup is evident after 10 seconds, adjust R1250, Store Level, to increase the operating level by 5 volts.

(2) Erase twice, wait 10 seconds, then write again and check for spreading or fadeup.

(3) Repeat this procedure until spreading of about 0.025-inch, or background fadeup occurs. This is the Upper Writing Limit. Note the voltage.

d. ADJUST—R1350 for an operating point midway between the upper writing limit and writing threshold.

e. INTERACTION—Collimation and gain are affected if the change in operating level is significant.

STORE BALANCE

a. Move the positive DC voltmeter lead from TP1 to the Store Bal Test Point, TP4.

b. ADJUST—R1370, Store Bal, to set the store level to the same voltage level as that recorded at TP1.

COLLIMATION

a. Move the positive DC voltmeter lead from TP4 to the CE1 test point, TP3.

b. Write the entire screen by slowly positioning the trace vertically. If the screen fails to write, adjust the INTENSITY control slightly clockwise and repeat the process until the screen is fully written. Then turn the INTENSITY control fully counterclockwise.

c. Record the voltage at TP3.

d. With the screen fully written, turn R1390, CE1, fully counterclockwise, noting that the bright area is pulled in.

e. ADJUST—CE1 slowly clockwise until the bright area is pulled in from the top and bottom graticule lines by one-half major division at the top (see Fig. 5-14).

f. Erase the screen and disconnect the DC voltmeter.

g. INTERACTION—Display geometry (step 7) and storage capability (step 8) should be rechecked if a significant change was made in the collimation voltage.

NON STORE

a. Fully write the entire screen by slowly positioning the trace vertically.

b. ADJUST—R1395, Non Store, so that the screen erases in approximately 1 second when placed in the non-store mode (STORE buttons out). Repeat the step as necessary to achieve correct adjustment of R1395.

9. Adjust Vertical Gain

a. Set the controls as follows:

MAX PEAK VOLTS	6.5
SERIES RESISTORS	8 k
COLLECTOR SUPPLY POLARITY	+DC
VARIABLE COLLECTOR %	0
STEP/OFFSET AMPL	0.5 μA

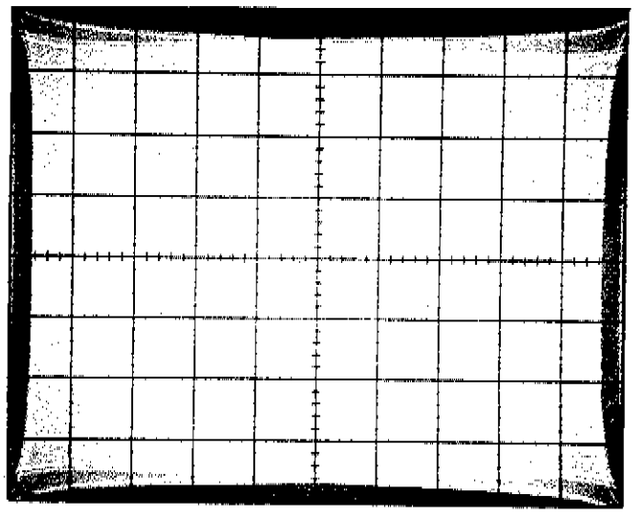


Fig. 5-14. Illustration of Collimation adjustment.

All Dark Gray Buttons and Knobs in except:

STEP FAMILY	SINGLE
STEP/OFF POLARITY NORM	out
OFFSET ZERO	out
AID (light gray button)	in
DISPLAY FILTER NORM	out
HORIZ VOLTS/DIV	200 V, COLLECTOR
Horizontal POSITION	centered
VERTICAL CURRENT/DIV	50 nA
LEFT-RIGHT	Off (center)

b. Connect a patch cord from the base (B) to the collector (C), right side jacks on the 177. Connect the DVM between pin 4 of P129 (see Fig. 7-5) and the white-green wire on the back of the MAX PEAK VOLTS switch.

CAUTION

If the VARIABLE COLLECTOR % control is not at zero, lethal voltages may be present on the MAX PEAK VOLTS switch.

c. Position the spot to the bottom-center graticule. Set the LEFT-RIGHT switch to RIGHT and adjust the OFFSET MULT control for a DVM reading of 4.00 volts.

d. ADJUST—R1116, Vertical Gain (on the display unit), to move the spot one-half the remaining distance to the top graticule line.

e. Switch the LEFT-RIGHT switch to center. Vertically reposition the spot to the bottom graticule line. Set the LEFT-RIGHT switch to RIGHT and repeat parts d and e.

10. Adjust Horizontal Amplifier Balance

a. Set the controls as follows:

MAX PEAK VOLTS	25
SERIES RESISTORS	30 k
VARIABLE COLLECTOR %	0
COLLECTOR SUPPLY POLARITY	AC

All Dark Gray Buttons and Knobs in except:

STEP FAMILY	
SINGLE	press
STEP RATE	SLOW
HORIZ VOLTS/DIV	200 V, COLLECTOR
VERTICAL CURRENT/DIV	2 A
Vertical POSITION	centered
Horizontal POSITION	centered
LEFT-RIGHT	RIGHT

b. Patch the base (B) and collector (C) to the emitter (E) of the right-hand set of jacks on the 177.

c. Position the spot to graticule center, using the Horizontal POSITION control.

d. Pull the Horizontal POSITION control to the out position.

e. Reposition the spot to about graticule center, using the Horizontal POSITION control.

f. Set the HORIZ VOLTS/DIV switch to 2 V, COLLECTOR.

g. If the spot shifts: ADJUST—R530, Horiz Amp Bal, to minimize spot shift while switching HORIZ VOLTS/DIV from 20 V, COLLECTOR through 2 V, COLLECTOR. See Fig. 7-6 for control location.

h. Check all other HORIZ VOLTS/DIV, COLLECTOR, positions for not more than 0.5 major division of horizontal shift from the graticule centerline.

i. Push the Horizontal POSITION control to the in position (magnifier off). Remove the patch cord.

11. Adjust Horizontal Amplifier Gain

a. Set the controls as follows:

All Dark Gray Buttons and Knobs in except:

STEP FAMILY	
SINGLE	press
OFFSET	
ZERO	out
AID (light gray button)	in
VERTICAL CURRENT/DIV	2 A
HORIZ VOLTS/DIV	50 mV, BASE
STEP/OFFSET AMPL	.1 VOLT
COLLECTOR SUPPY	
POLARITY	AC
LEFT-RIGHT	RIGHT

b. Connect the DVM between the emitter (E) and base (B) jacks, right side on the 177 Test Fixture.

c. Adjust the OFFSET MULT dial to 0.00. Position the spot to left-center graticule. Note the DVM reading.

d. Adjust the OFFSET MULT for 0.500 volt greater than the DVM reading in part c, and check the spot position. The spot should be within ±0.05 division of the right (10th) graticule line.

e. ADJUST—R1136, Horiz Gain Adj (see Fig. 7-15 or 7-17 for location), if the spot is not at the 10th graticule line. Adjust R1136 to bring the spot one-half the distance to the 10th graticule line and repeat parts c through e until the spot is at the 10th line at part d.

12. ADJUST Sensitivity Correction (D1 Only)

a. Set the controls as follows:

MAX PEAK VOLTS	6.5
SERIES RESISTORS	.12
VARIABLE COLLECTOR %	0
COLLECTOR SUPPLY POLARITY	+

All Dark Gray Buttons and Knobs in except:

STEP FAMILY	SINGLE
HORIZ VOLTS/DIV	1 V, COLLECTOR
VERTICAL CURRENT/DIV	5 mA

b. Vertically and horizontally position the spot to the lower-left corner of the graticule.

c. Push both STORE buttons and both Erase Selector buttons in.

d. Push the ERASE button to erase the screen.

e. Set INTENSITY and FOCUS controls for a small, focused spot.

f. ADJUST—R1385, Sens Corr, for minimum spot shift while switching from store to non store (press and release the UPPER and LOWER STORE buttons).

13. Adjust Horizontal Compensaton (do not adjust unless out of tolerance)

a. Connect a 1 MΩ resistor (using clip leads) between the right end of C306 and any terminal of R455, Amp Bal. See Fig. 7-6.

b. Set the controls as follows:

MAX PEAK VOLTS	6.5
SERIES RESISTORS	8 k
VARIABLE COL-LECTOR %	0
COLLECTOR SUPPLY POLARITY	AC

All Dark Gray Buttons and Knobs in except:

STEP RATE	SLOW and FAST
STEP/OFFSET AMPL	2 VOLTS
NUMBER OF STEPS	10
OFFSET MULT	0.00
PULSED, 300 μs	in
Horizontal POSITION	centered
Vertical POSITION	centered
HORIZ VOLTS/DIV	50 V, COLLECTOR
VERTICAL CUR-RENT/DIV	2 A
LOOPING COMPENSATION	as is
Terminal Selector	EMITTER GROUNDED BASE TERM, STEP GEN
LEFT-RIGHT	Off

For D1 Only

BRIGHTNESS	ccw
VARIABLE COL-LECTOR %	cw just far enough to brighten the trace. Adjust INTENSITY as required

c. Short circuit B to C, right side.

d. Switch LEFT-RIGHT to RIGHT.

e. Reset INTENSITY as necessary to obtain two spots.

f. Pull X10 HORIZ MAG.

g. Horizontally position both spots on screen.

h. Decrease INTENSITY until the left spot disappears.

i. ADJUST—Position the yellow wire, C503 (see Fig. 7-6) for the smallest spot size.

j. Reset STEP/OFFSET AMPL to .2 V and HORIZ VOLTS/DIV to 50 mV.

k. Horizontally position the spot back on screen.

l. ADJUST—C511 (see Fig. 7-6) for least slash, using an insulated adjusting tool. Turn up INTENSITY as necessary to see the slash.

m. Reset HORIZ VOLTS/DIV to .5 V, COLLECTOR, and STEP/OFFSET AMPL to 2 V.

n. CHECK—Slash should be less than 1 major division (compromise the preceding adjustment, if necessary).

o. Reset HORIZ VOLTS/DIV to 20 mV, COLLECTOR, and STEP/OFFSET AMPL to .1 V.

p. Horizontally position the spot back on screen.

q. CHECK—Slash should be less than 1 major division (compromise the preceding adjustments, if necessary).

r. Shut off the ac power and remove the 1 MΩ resistor and clip leads.

14. Adjust Step Generator Polarity Balance, Pulse Zero, and Step Zero (see Fig. 7-6 for location of controls and for remainder of tests)

a. Set the controls as follows:

MAX PEAK VOLTS	6.5
SERIES RESISTORS	.12
VARIABLE COL-LECTOR %	0
COLLECTOR SUPPLY POLARITY	AC
All Dark Gray Buttons and Knobs	in

PULSED, 300 μs	in
NUMBER OF STEPS	ccw
STEP/OFFSET AMPL	2 V
HORIZ VOLTS/DIV	200 V, COLLECTOR
Horizontal POSITION	centered
Vertical POSITION	centered
VERTICAL CURRENT/DIV	20 mA
LEFT-RIGHT	Off
BRIGHTNESS (D1)	clockwise

b. Horizontally position the spot to graticule center.

c. Pull the X10 HORIZ MAG and horizontally and vertically reposition the spot to about graticule center.

d. Switch the HORIZ VOLTS/DIV switch to STEP GEN X10 and observe that one of the two spots displayed (two spots are displayed only if the circuit is out of calibration. One spot is much brighter than the other). If the spot is small and well-defined with normal viewing intensity, omit the Polarity Bal (R365), Pulse Zero (R355), and Step Zero (R300) adjustments and proceed to part i.

If two spots are displayed, increase the INTENSITY to determine which spot is the brighter.

e. ADJUST—R365, Polarity Bal, for equal deflection of the brighter spot from the graticule center line while pressing the STEP/OFFSET POLARITY button alternately to the in and out positions.

f. ADJUST—R355, Pulse Zero, to position the brighter spot to graticule center.

g. READJUST—R365, if necessary, and then repeat part f.

h. ADJUST—R300, Step Zero, to position the dim spot to graticule center.

i. Press STEP/OFFSET POLARITY NORM button in and set the HORIZ VOLTS/DIV to .2 V, BASE.

j. ADJUST—R455, Amp Bal, to center the spot horizontally. Set HORIZ VOLTS/DIV to 5 mV, BASE.

k. READJUST—R455 to center the spot horizontally.

15. Adjust Polarity Positioning

a. Set the controls as follows:

MAX PEAK VOLTS	6.5
SERIES RESISTORS	.12
VARIABLE COLLECTOR %	0
COLLECTOR SUPPLY POLARITY	AC

All Dark Gray Buttons and Knobs in except:

STEP FAMILY	SINGLE
PULSED, 300 μs	out
NUMBER OF STEPS	ccw
STEP/OFFSET AMPL	1 VOLT
HORIZ VOLTS/DIV	200 V, COLLECTOR
Horizontal POSITION	centered
Vertical POSITION	centered
VERTICAL CURRENT/DIV	2 A

b. Horizontally and vertically position the spot to graticule center.

c. Switch the COLLECTOR SUPPLY POLARITY to +.

d. ADJUST—R528, Horiz Pos Adj, and R570, Vert Pos Adj, to position the spot to the lower-left corner of the graticule.

e. Switch the COLLECTOR SUPPLY POLARITY to —. The spot should shift to the upper-right corner of the graticule, within ±0.1 division.

f. Switch the DISPLAY INVERT NORM button to release the button to the out position. The spot should shift to the lower-left graticule corner, within ±0.1 division.

16. Adjust Step and Offset Amplitude

a. Set the controls as follows:

COLLECTOR SUPPLY POLARITY	AC
HORIZ VOLTS/DIV	1 V, BASE
Horizontal POSITION	centered
Vertical POSITION	centered

All Dark Gray Buttons and Knobs in except:

STEP RATE	FAST
STEP/OFFSET AMPL	1 V
NUMBER OF STEPS	10

b. Observe a series of spots displayed horizontally. Position the first spot to the left graticule line.

c. ADJUST—R278, X1 Step Amplitude, for approximately one spot per major division.

d. Reset the controls as follows:

STEP FAMILY	
SINGLE	press
OFFSET	
ZERO	out
OFFSET MULT	10.00
COLLECTOR SUPPLY	
POLARITY	+

Remove Shorting Strap from C to B

e. Connect the DVM between B and E on the 177 Test Fixture, right side. Switch the LEFT-RIGHT switch to RIGHT.

f. ADJUST—R352, Offset Amplitude, for +10.00 volts, ±3 mV on the DVM.

g. Push the OFFSET AID button to release the button to the out position.

h. Check for −10.00 volts, ±50 mV, on the DVM. If out of specs, check that the + and − supplies are within 1/2% of each other.

i. Push the AID button to the in position.

j. Pull the X10 HORIZ MAG and position the spot to graticule center, or note the spot postion.

k. Push the OFFSET ZERO button in and the STEP FAMILY REP button in.

l. READJUST—R278 to position the spot to graticule center, or to the position noted in part j.

m. Reset the following controls:

STEP X.1	out
X10 HORIZ MAG	in
HORIZ VOLTS/DIV	.1V, BASE
COLLECTOR SUPPLY	
POLARITY	AC
OFFSET MULT	1.00
STEP FAMILY	
REP	in

n. Observe a series of spots displayed horizontally. Position the first spot to the left graticule line.

o. ADJUST—R281, X.1 Step Amplitude, for approximately one spot per graticule division.

p. Reset the controls as follows:

STEP FAMILY	
SINGLE	press
OFFSET	
ZERO	out
COLLECTOR SUPPLY	
POLARITY	+

q. Adjust OFFSET MULT for a DVM reading of 1.00 volts, ±1 mV.

r. Pull the X10 HORIZ MAG and horizontally position the spot to graticule center, or note the spot position.

s. Push the OFFSET ZERO button in and the STEP FAMILY REP in.

t. READJUST—R281, to position the spot to graticule center, or to the position noted in part r.

17. Adjust Step Generator Output Z

a. Set the controls as follows:

All Dark Gray Buttons and Knobs in except:

X10 VERT MAG	out
VERTICAL CURRENT/DIV	50 μA
Vertical POSITION	centered
NUMBER OF STEPS	≈ 4
STEP/OFFSET AMPL	50 μA
VARIABLE COLLECTOR %	0
HORIZ VOLTS/DIV	200 V, COLLECTOR

b. Connect a 1 kΩ resistor between B and C terminals, left side.

c. Connect a 15 kΩ resistor between B and C terminals, right side. Switch LEFT-RIGHT to LEFT.

d. Adjust NUMBER OF STEPS for five displayed spots. Note the vertical position of the fifth spot.

e. Switch the LEFT-RIGHT switch alternately between LEFT and RIGHT.

f. ADJUST—R465, Output Z, for no spot shift (fifth spot) while switching between the 1 kΩ and 15 kΩ resistors.

REPLACEABLE ELECTRICAL PARTS

PARTS ORDERING INFORMATION

Replacement parts are available from or through your local Tektronix, Inc. Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc. Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

SPECIAL NOTES AND SYMBOLS

X000	Part first added at this serial number
00X	Part removed after this serial number

ITEM NAME

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

ABBREVIATIONS

ACTR	ACTUATOR	PLSTC	PLASTIC
ASSY	ASSEMBLY	QTZ	QUARTZ
CAP	CAPACITOR	RECP	RECEPTACLE
CER	CERAMIC	RES	RESISTOR
CKT	CIRCUIT	RF	RADIO FREQUENCY
COMP	COMPOSITION	SEL	SELECTED
CONN	CONNECTOR	SEMICOND	SEMICONDUCTOR
ELCTLT	ELECTROLYTIC	SENS	SENSITIVE
ELEC	ELECTRICAL	VAR	VARIABLE
INCAND	INCANDESCENT	WW	WIREWOUND
LED	LIGHT EMITTING DIODE	XFMR	TRANSFORMER
NONWIR	NON WIREWOUND	XTAL	CRYSTAL

CROSS INDEX MFR. CODE NUMBER TO MANUFACTURER

MFR.CODE	MANUFACTURER	ADDRESS	CITY,STATE,ZIP
00853	SANGAMO ELECTRIC CO., S. CAROLINA DIV.	P. O. BOX 128	PICKENS, SC 29671
01121	ALLEN-BRADLEY CO.	1201 2ND ST. SOUTH	MILWAUKEE, WI 53204
01295	TEXAS INSTRUMENTS, INC., SEMICONDUCTOR GROUP	P. O. BOX 5012	DALLAS, TX 75222
02735	RCA CORP., SOLID STATE DIVISION	ROUTE 202	SOMERVILLE, NY 08876
03508	GENERAL ELECTRIC CO., SEMI-CONDUCTOR PRODUCTS DEPT.	ELECTRONICS PARK	SYRACUSE, NY 13201
04713	MOTOROLA, INC., SEMICONDUCTOR PRODUCTS DIV.	5005 E. MCDOWELL RD.	PHOENIX, AZ 85036
07263	FAIRCHILD SEMICONDUCTOR, A DIV. OF FAIRCHILD CAMERA AND INSTRUMENT CORP.	464 ELLIS ST.	MOUNTAIN VIEW, CA 94042
07910	TELEDYNE SEMICONDUCTOR	12515 CHADRON AVE.	HAWTHORNE, CA 90250
08806	GENERAL ELECTRIC CO., MINIATURE LAMP PRODUCTS DEPT.	NELA PK.	CLEVELAND, OH 44112
12040	NATIONAL SEMICONDUCTOR CORP.	COMMERCE DRIVE	DANBURY, CT 06810
12697	CLAROSTAT MFG. CO., INC.	LOWER WASHINGTON ST.	DOVER, NH 03820
15818	TELEDYNE SEMICONDUCTOR	1300 TERRA BELLA AVE.	MOUNTAIN VIEW, CA 94040
16758	DELCO ELECTRONICS, DIV. OF GENERAL MOTORS CORP.	700 E. FIRMIN ST.	KOKOMO, IN 46901
18324	SIGNETICS CORP.	811 E. ARQUES	SUNNYVALE, CA 94086
22229	SOLITRON DEVICES, INC., DIODES, INTEGRATED CIRCUITS AND CMOS	8808 BALBOA AVE.	SAN DIEGO, CA 92123
24796	AMF, INC., POTTER AND BRUMFIELD DIV.	26181 AVENIDA AEROPUORTO	SAN JUAN CAPISTRANO, CA 9267
56289	SPRAGUE ELECTRIC CO.		NORTH ADAMS, MA 01247
71400	BUSSMAN MFG., DIVISION OF MCGRAW-EDISON CO.	2536 W. UNIVERSITY ST.	ST. LOUIS, MO 63107
71450	CTS CORP.	1142 W. BEARDSLEY AVE.	ELKHART, IN 46514
71590	CENTRALAB ELECTRONICS, DIV. OF GLOBE-UNION, INC.	5757 N. GREEN BAY AVE.	MILWAUKEE, WI 53201
72982	ERIE TECHNOLOGICAL PRODUCTS, INC.	644 W. 12TH ST.	ERIE, PA 16512
74970	JOHNSON, E. F., CO.	299 10TH AVE. S. W.	WASECA, MN 56093
75042	TRW ELECTRONIC COMPONENTS, IRC FIXED RESISTORS, PHILADELPHIA DIVISION	401 N. BROAD ST.	PHILADELPHIA, PA 19108
80009	TEKTRONIX, INC.	P. O. BOX 500	BEAVERTON, OR 97077
81073	GRAYHILL, INC.	561 HILLGROVE AVE.	LA GRANGE, IL 60525
81483	INTERNATIONAL RECTIFIER CORP.	9220 SUNSET BlVD.	LOS ANGELES, CA 90069
82389	SWITCHCRAFT, INC.	5555 N. ELSTON AVE.	CHICAGO, IL 60630
83003	VARO, INC.	800 W. GARLAND AVE.	GARLAND, TX 75040
90201	MALLORY CAPACITOR CO., DIV. OF P. R. MALLORY CO., INC.	3029 E. WASHINGTON ST.	INDIANAPOLIS, IN 46206
91637	DALE ELECTRONICS, INC.	P. O. BOX 609	COLUMBUS, NB 68601
91929	HONEYWELL, INC., MICRO SWITCH DIV.	CHICAGO & SPRING STS.	FREEPORT, IL 61032

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A1	670-2428-00	B010100	B049999	CKT BOARD ASSY:--MAIN	80009	670-2428-00
A1	670-2428-02	B500000	B050000	CKT BOARD ASSY:--MAIN	80009	670-2428-02
A1	670-2428-03	B060000		CKT BOARD ASSY:--MAIN	80009	670-2428-03
A2	670-2426-00	B010100	B059999	CKT BOARD ASSY:--COLLECTOR SWEEP	80009	670-2426-00
A2	670-2426-01	B060000		CKT BOARD ASSY:--COLLECTOR SWEEP	80009	670-2426-01
A3	670-2427-00	B010100	B049999	CKT BOARD ASSY:--POWER SUPPLY	80009	670-2427-00
A3	670-2427-02	B050000		CKT BOARD ASSY:--POWER SUPPLY	80009	670-2427-02
C101	285-0925-00			CAP.,FXD,PLSTC:3.3UF,10%,200V		
C121	285-1036-00			CAP.,FXD,PLSTC:0.2UF,20%,2000V	56289	430P519
C124	290-0647-00			CAP.,FXD,ELCTLT:10UF,+50-10%,475V	56289	43D100F475GJ4
C126	290-0334-00			CAP.,FXD,ELCTLT:1250UF,+75-10%,50V	56289	D46468
C201	283-0134-00			CAP.,FXD,CER DI:47UF,+80-20%,50V	72982	8141N078651474Z
C206	283-0198-00			CAP.,FXD,CER DI:0.22UF,20%,50V	72982	8131N075651224M
C215	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C218	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C223	283-0068-00	B010100	B010209	CAP.,FXD,CER DI:0.01UF,+100-0%,500V	56289	19C241
C223	283-0002-00	B010210		CAP.,FXD,CER DI:0.01UF,+80-20%,500V	72982	811-546E103Z
C226	283-0068-00	B010100	B010209	CAP.,FXD,CER DI:0.01UF,+100-0%,500V	56289	19C241
C226	283-0002-00	B010210		CAP.,FXD,CER DI:0.01UF,+80-20%,500V	72982	811-546E103Z
C231	283-0167-00			CAP.,FXD,CER DI:0.1UF,10%,100V	72982	8131N147W5R104K
C242	285-0703-00			CAP.,FXD,PLSTC:0.1UF,5%,100V	56289	410P112
C264	283-0002-00	XB060000		CAP.,FXD,CER DI:0.01UF,+80-20%,500V	72982	811-546E103Z
C265	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C268	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C270	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-547E103Z
C273	283-0023-00			CAP.,FXD,CER DI:0.1UF,+80-20%,10V	56289	20C374
C274	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-547E103Z
C276	283-0041-00			CAP.,FXD,CER DI:0.0033UF,5%,500V	72982	841-541B332J
C279	285-0703-00			CAP.,FXD,PLSTC:0.1UF,5%,100V	56289	410P112
C280	285-0719-00			CAP.,FXD,PLSTC:0.015UF,5%,100V	56289	410P113
C291	283-0068-00	B010100	B010209	CAP.,FXD,CER DI:0.01UF,+100-0%,500V	56289	19C241
C291	283-0002-00	B010210		CAP.,FXD,CER DI:0.01UF,+80-20%,500V	72982	811-546E103Z
C293	290-0525-00			CAP.,FXD,ELCTLT:4.7UF,20%,50V	56289	196D475X0050KA1
C295	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020NLF
C297	290-0527-00			CAP.,FXD,ELCTLT:15UF,20%,20V	90201	TDC156M020NLF
C299	290-0525-00			CAP.,FXD,ELCTLT:4.7UF,20%,50V	56289	196D475X0050KA1
C306	285-0576-00			CAP.,FXD,PLSTC:1UF,10%,100V	56289	410P10591
C321	283-0002-00	XB060000		CAP.,FXD,CER DI:0.01UF,+80-20%,500V	72982	811-546E103Z
C322	283-0003-00	B010100	B010209	CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-547E103Z
C322	283-0002-00	B010210		CAP.,FXD,CER DI:0.01UF,+80-20%,500V	72982	811-546E103Z
C380	281-0543-00			CAP.,FXD,CER DI:270PF,10%,500V	72982	301-055X5P1271K
C382	283-0002-00	XB060000		CAP.,FXD,CER DI:0.01UF,+80-20%,500V	72982	811-546E103Z
C380	281-0543-00			CAP.,FXD,CER DI:270PF,10%,500V	72982	301-055X5P1271K
C384	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C386	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C391	290-0410-00			CAP.,FXD,ELCTLT:15UF,+50-10%,100V	56289	30D156F100DD4
C393	290-0410-00			CAP.,FXD,ELCTLT:15UF,+50-10%,100V	56289	30D156F100DD4
C396, C503[1]	283-0116-00			CAP.,FXD,CER DI:820PF,5%,500V	72982	801-547B821J
C505	281-0564-00			CAP.,FXD,CER DI:24PF,5%,500V	72982	301-000C0G0240J
C507	281-0638-00			CAP.,FXD,CER DI:240PF,5%,500V	72982	301-000Z5D0241J
C509	283-0119-00			CAP.,FXD,CER DI:2200PF,5%,200V	72982	855-535B222J

[1]Order 2 inches of 175-0503-00.

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
C511	281-0638-00			CAP.,FXD,CER DI:240PF,5%,500V	72982	301-000Z5D0241J
C513	281-0168-00			CAP.,VAR,AIR DI:1.3-5.4PF,250V	74970	187-0103-035
C530	281-0605-00			CAP.,FXD,CER DI:200PF,10%,500V	72982	301-000Y5D0201K
C537	281-0576-00			CAP.,FXD,CER DI:11PF,5%,500V	72982	301-050C0G0110J
C540	290-0525-00			CAP.,FXD,ELCTLT:4.7UF,20%,50V	56289	196D475X0050KA1
C541	283-0035-00			CAP.,FXD,CER DI:0.005UF,4000V	72982	811-000Z5U0152Z
C544	283-0103-00			CAP.,FXD,CER DI:180PF,5%,500V	56289	40C638
C545	290-0525-00			CAP.,FXD,ELCTLT:4.7UF,20%,50V	56289	196D475X0050KA1
C546	283-0103-00			CAP.,FXD,CER DI:180PF,5%,500V	56289	40C638
C547	290-0525-00			CAP.,FXD,ELCTLT:4.7UF,20%,50V	56289	196D475X0050KA1
C548	283-0068-00			CAP.,FXD,CER DI:0.01UF,+100-0%,500V	56289	19C241
C549	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C550	283-0110-00			CAP.,FXD,CER DI:0.005UF,+80-20%,150V	56289	19C242B
C551	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-547E103Z
C562	283-0076-00			CAP.,FXD,CER DI:27PF,10%,500V	56289	40C287A2
C564	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C565	283-0110-00			CAP.,FXD,CER DI:0.005UF,+80-20%,150V	56289	19C242B
C567	281-0509-00			CAP.,FXD,CER DI:15PF,+/-1.5PF,500V	72982	301-000C0G0150K
C568	290-0525-00			CAP.,FXD,ELCTLT:4.7UF,20%,50V	56289	196D475X0050KA1
C569	290-0525-00			CAP.,FXD,ELCTLT:4.7UF,20%,50V	56289	196D475X0050KA1
C570	281-0605-00			CAP.,FXD,CER DI:200PF,10%,500V	72982	301-000Y5D0201K
C577	281-0576-00			CAP.,FXD,CER DI:11PF,5%,500V	72982	301-050C0G0110J
C581	290-0325-00			CAP.,FXD,ELCTLT:330UF,+75-10%,50V	56289	601D337G050FL4
C586	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C587	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C588	290-0525-00			CAP.,FXD,ELCTLT:4.7UF,20%,50V	56289	196D475X0050KA1
C591	290-0517-00			CAP.,FXD,ELCTLT:6.8UF,20%,35V	56289	196D685X0035KA1
C596	290-0517-00			CAP.,FXD,ELCTLT:6.8UF,20%,35V	56289	196D685X0035KA1
C711	290-0325-00			CAP.,FXD,ELCTLT:330UF,+75-10%,50V	56289	601D337G050FL4
C716	290-0506-00			CAP.,FXD,ELCTLT:9600UF,+100-10%,25V	56289	68D10471
C721	290-0437-00			CAP.,FXD,ELCTLT:3500UF,+100-10%,25V		
C724	283-0068-00	XB050000		CAP.,FXD,CER DI:0.01UF,+100-0%,500V	56289	19C241
C731	290-0437-00			CAP.,FXD,ELCTLT:3500UF,+100-10%,25V		
C733	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C744	290-0587-00			CAP.,FXD,ELCTLT:170UF,+50-10%,250VDC		
C751	290-0334-00			CAP.,FXD,ELCTLT:1250UF,+75-10%,50V	56289	D46468
C757	281-0550-00	B010100	B049999	CAP.,FXD,CER DI:120PF,10%,500V	72982	301-000X5P0121K
C757	281-0543-00	B050000		CAP.,FXD,CER DI:270PF,10%,500V	72982	301-055X5P1271K
C763	283-0068-00			CAP.,FXD,CER DI:0.01UF,+100-0%,500V	56289	19C241
C767	290-0517-00			CAP.,FXD,ELCTLT:6.8UF,20%,35V	56289	196D685X0035KA1
C771	290-0334-00			CAP.,FXD,ELCTLT:1250UF,+75-10%,50V	56289	D46468
C772	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025NLF
C773	281-0572-00	B010100	B049999X	CAP.,FXD,CER DI:6.8PF,+/-0.5PF,500V	72982	301-000C0H0689D
C775	283-0068-00			CAP.,FXD,CER DI:0.01UF,+100-0%,500V	56289	19C241
C781	290-0517-00			CAP.,FXD,ELCTLT:6.8UF,20%,35V	56289	196D685X0035KA1
C788	281-0543-00	B010100	B049999	CAP.,FXD,CER DI:270PF,10%,500V	72982	301-055X5P1271K
C788	281-0623-00	B050000		CAP.,FXD,CER DI:650PF,5%,500V	72982	301-000Y5D0651J
CR103	152-0385-00			SEMICOND DEVICE:SILICON,2000V,100MA	83003	VB20
CR104	152-0385-00			SEMICOND DEVICE:SILICON,2000V,100MA	83003	VB20
CR105	152-0385-00			SEMICOND DEVICE:SILICON,2000V,100MA	83003	VB20
CR106	152-0385-00			SEMICOND DEVICE:SILICON,2000V,100MA	83003	VB20
CR107	152-0557-00			SEMICOND DEVICE:FULL WAVE BRIDGE,200V,12A		

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
CR115	152-0141-02	XB060000		SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR125	152-0141-02	XB060000		SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR209	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR221	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR230	152-0141-02	XB050000		SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR234	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR241	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR259	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR277	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR321	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR322	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR326	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR330	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR384	152-0198-00			SEMICOND DEVICE:SILICON,200V,3A	04713	1N4721
CR386	152-0198-00			SEMICOND DEVICE:SILICON,200V,3A	04713	1N4721
CR391	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	02735	37304
CR393	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	02735	37304
CR429	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR436	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR438	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR439	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR440	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR441	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR452	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR512	152-0324-00			SEMICOND DEVICE:SILICON,35V,100MA	03508	SE416
CR513	152-0324-00			SEMICOND DEVICE:SILICON,35V,100MA	03508	SE416
CR538	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR540	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR551	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR552	152-0141-02	B010100	B029999X	SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR553	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR554	152-0141-02	B010100	B029999X	SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR555	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR556	152-0141-02	B010100	B029999X	SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR557	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR558	152-0141-02	B010100	B029999X	SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR561	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR562	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR563	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR564	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR568	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR569	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR582	152-0488-00			SEMICOND DEVICE:SILICON,200V,1500MA	80009	152-0488-00
CR584	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR586	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR591	152-0107-00			SEMICOND DEVICE:SILICON,375V,400MA	80009	152-0107-00
CR711	152-0488-00			SEMICOND DEVICE:SILICON,200V,1500MA	80009	152-0488-00
CR712	152-0423-00			SEMICOND DEVICE:SILICON,300V,3A	04713	1N5000
CR716	152-0462-00			SEMICOND DEVICE:SILICON,200V,2.5A	04713	MDA960-3
CR721	152-0488-00			SEMICOND DEVICE:SILICON,200V,1500MA	80009	152-0488-00
CR722	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	02735	37304
CR724	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	02735	37304
CR731	152-0488-00			SEMICOND DEVICE:SILICON,200V,1500MA	80009	152-0488-00

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
CR732	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	02735	37304
CR741	152-0107-00			SEMICOND DEVICE:SILICON,375V,400MA	80009	152-0107-00
CR742	152-0107-00			SEMICOND DEVICE:SILICON,375V,400MA	80009	152-0107-00
CR743	152-0107-00			SEMICOND DEVICE:SILICON,375V,400MA	80009	152-0107-00
CR744	152-0107-00			SEMICOND DEVICE:SILICON,375V,400MA	80009	152-0107-00
CR751	152-0488-00			SEMICOND DEVICE:SILICON,200V,1500MA	80009	152-0488-00
CR754	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR755	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR767	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	02735	37304
CR773	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
CR781	152-0066-00			SEMICOND DEVICE:SILICON,400V,750MA	02735	37304
CR785	152-0141-02			SEMICOND DEVICE:SILICON,30V,150MA	07910	1N4152
DS125	150-0133-01			LAMP,INCAND:14V,80MA		
DS310	150-0048-00	B010100	B069999X	LAMP,INCAND:5V,60MA	08806	683
DS311	150-0048-00			LAMP,INCAND:5V,60MA	08806	683
DS535	150-0048-00			LAMP,INCAND:5V,60MA	08806	683
DS536	150-0048-00	B010100	B069999X	LAMP,INCAND:5V,60MA	08806	683
F391	159-0114-00	XB050000		FUSE,CARTRIDGE:1A,125VAC,FAST-BLOW	71400	GFA1
F711	159-0053-00	XB050000		WIRE LEAD:5A,1AG FAST-BLOW		
F714	159-0053-00			WIRE LEAD:5A,1AG FAST-BLOW		
F721[1]	159-0053-00			WIRE LEAD:5A,1AG FAST-BLOW		
F731[1]	159-0053-00			WIRE LEAD:5A,1AG FAST-BLOW		
F744	159-0028-00			FUSE,CARTRIDGE:3AG,0.25A,250V,FAST-BLOW	71400	AGC1-4
J110	131-1008-00			CONNECTOR,RCPT:24/28 CONTACTS		
K115	148-0047-00			RELAY,ARMATURE:5A,28VDC	24796	R10-E697
K125	148-0047-00			RELAY,ARMATURE:5A,28VDC	24796	R10-E697
K436	148-0045-00			RELAY,ARMATURE:12VDC,185 OHM COIL		
L101	108-0725-00			COIL,RF,6MH		
L540	108-0368-00			COIL,RF:10UH	80009	108-0368-00
L545	108-0368-00			COIL,RF:10UH	80009	108-0368-00
L547	108-0368-00			COIL,RF:10UH	80009	108-0368-00
L550	108-0368-00			COIL,RF:10UH	80009	108-0368-00
L551	108-0368-00			COIL,RF:10UH	80009	108-0368-00
L552	108-0368-00			COIL,RF:10UH	80009	108-0368-00
L553	108-0368-00			COIL,RF:10UH	80009	108-0368-00
L564	108-0368-00			COIL,RF:10UH	80009	108-0368-00
L579	108-0368-00			COIL,RF:10UH	80009	108-0368-00
Q210	151-0341-00			TRANSISTOR:SILICON,NPN	07263	2N3565
Q212	151-0341-00			TRANSISTOR:SILICON,NPN	07263	2N3565
Q224	151-0342-00			TRANSISTOR:SILICON,PNP	07263	2N4249
Q234	151-0341-00			TRANSISTOR:SILICON,NPN	07263	2N3565
Q260	151-0341-00			TRANSISTOR:SILICON,NPN	07263	2N3565
Q262	151-0341-00			TRANSISTOR:SILICON,NPN	07263	2N3565
Q276	151-0341-00			TRANSISTOR:SILICON,NPN	07263	2N3565
Q306	151-0302-00			TRANSISTOR:SILICON,NPN	04713	2N2222A
Q310	151-0302-00			TRANSISTOR:SILICON,NPN	04713	2N2222A
Q324	151-0190-01			TRANSISTOR:SILICON,NPN	07910	TE23652
Q330	151-0341-00			TRANSISTOR:SILICON,NPN	07263	2N3565
Q384	151-0415-00			TRANSISTOR:SILICON,NPN	04713	MJE1102
Q386	151-0414-00			TRANSISTOR:SILICON,NPN		
Q436	151-0302-00			TRANSISTOR:SILICON,NPN	04713	2N2222A

[1]Part of Circuit Board.

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
Q440	151-0342-00			TRANSISTOR:SILICON,PNP	07263	2N4249
Q450A,B	151-1011-00	B010100	B039999	TRANSISTOR:SILICON,JFE,N-CHANNEL,DUAL	22229	FD1167
Q450A,B	151-1081-00	B040000		TRANSISTOR:SILICON,JFE,N-CHANNEL,DUAL		
Q514A,B	151-1054-00			TRANSISTOR:SILICON,JFE,N-CHANNEL,DUAL	22229	FD1644
Q544	151-0302-00			TRANSISTOR:SILICON,NPN	04713	2N2222A
Q546	151-0302-00			TRANSISTOR:SILICON,NPN	04713	2N2222A
Q552	151-1059-00			TRANSISTOR:SILICON,FE,N-CHANNEL	15818	U1897E
Q554	151-1059-00			TRANSISTOR:SILICON,FE,N-CHANNEL	15818	U1897E
Q556	151-1059-00			TRANSISTOR:SILICON,FE,N-CHANNEL	15818	U1897E
Q558	151-1059-00			TRANSISTOR:SILICON,FE,N-CHANNEL	15818	U1897E
Q586	151-0342-00			TRANSISTOR:SILICON,PNP	07263	2N4249
Q588	151-0302-00			TRANSISTOR:SILICON,NPN	04713	2N2222A
Q594	151-0341-00			TRANSISTOR:SILICON,NPN	07263	2N3565
Q754	151-0341-00			TRANSISTOR:SILICON,NPN	07263	2N3565
Q760	151-0341-00			TRANSISTOR:SILICON,NPN	07263	2N3565
Q766	151-0405-00			TRANSISTOR:SILICON,NPN,SEL FROM MJE800	04713	SJE943
Q772	151-0342-00			TRANSISTOR:SILICON,PNP	07263	2N4249
Q786	151-0341-00			TRANSISTOR:SILICON,NPN	07263	2N3565
Q788	151-0405-00			TRANSISTOR:SILICON,NPN,SEL FROM MJE800	04713	SJE943
R101	308-0568-00			RES.,FXD,WW:35 OHM,5%,5W	91637	RS5-K35R00J
R111	306-0684-00			RES.,FXD,CMPSN:680K OHM,10%,2W	01121	HB6841
R112	306-0684-00			RES.,FXD,CMPSN:680K OHM,10%,2W	01121	HB6841
R114	305-0473-00			RES.,FXD,CMPSN:47K OHM,5%,2W	01121	HB4735
R116	306-0471-00			RES.,FXD,CMPSN:470 OHM,10%,2W	01121	HB4711
R121	306-0475-00			RES.,FXD,CMPSN:4.7M OHM,10%,2W	01121	HB4751
R122	306-0475-00			RES.,FXD,CMPSN:4.7M OHM,10%,2W	01121	HB4751
R124	306-0154-00			RES.,FXD,CMPSN:150K OHM,10%,2W	01121	HB1541
R126	304-0152-00			RES.,FXD,CMPSN:1.5K OHM,10%,1W	01121	GB1521
R128	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R129	306-0121-00			RES.,FXD,CMPSN:120 OHM,10%,2W	01121	HB1211
R130	306-0121-00			RES.,FXD,CMPSN:120 OHM,10%,2W	01121	HB1211
R131	308-0691-00			RES.,FXD,WW:0.3 OHM,5%,25W		
R132	308-0745-00			RES.,FXD,WW:1.4 OHM,5%,25W		
R133	308-0219-00			RES.,FXD,WW:6 OHM,5%,25W	91637	HL2502Z66R000J
R134	306-0820-00			RES.,FXD,CMPSN:82 OHM,10%,2W	01121	HB8201
R135	308-0233-00			RES.,FXD,WW:25 OHM,5%,25W		
R136	308-0744-00			RES.,FXD,WW:90 OHM,5%25W		
R137	308-0416-00			RES.,FXD,WW:380 OHM,5%,20W		
R138	308-0040-00			RES.,FXD,WW:1.5K OHM,5%,25W		
R139	308-0034-00			RES.,FXD,WW:6000 OHM,5%,20W		
R140	308-0743-00			RES.,FXD,WW:22K OHM,5%,25W		
R141	307-0402-00			RES.,FXD,FILM:90K OHM,5%,20W		
R142	305-0204-00			RES.,FXD,CMPSN:200K OHM,5%,2W	01121	HB2045
R143	305-0204-00			RES.,FXD,CMPSN:200K OHM,5%,2W	01121	HB2045
R144	306-0824-00			RES.,FXD,CMPSN:820K OHM,10%,2W	01121	HB8241
R145	306-0824-00			RES.,FXD,CMPSN:820K OHM,10%,2W	01121	HB8241
R146	305-0475-00			RES.,FXD,CMPSN:4.7M OHM,5%,2W	01121	HB4755
R147	305-0475-00			RES.,FXD,CMPSN:4.7M OHM,5%,2W	01121	HB4755
R149	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R201	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R202	315-0623-00			RES.,FXD,CMPSN:62K OHM,5%,0.25W	01121	CB6235
R203	315-0275-00			RES.,FXD,CMPSN:2.7M OHM,5%,0.25W	01121	CB2755
R204	315-0623-00			RES.,FXD,CMPSN:62K OHM,5%,0.25W	01121	CB6235

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R206	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R208	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R209	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R211	315-0122-00			RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
R212	315-0561-00			RES.,FXD,CMPSN:560 OHM,5%,0.25W	01121	CB5615
R213	315-0561-00			RES.,FXD,CMPSN:560 OHM,5%,0.25W	01121	CB5615
R214	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R215	315-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	01121	CB6825
R216	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R218	315-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	01121	CB6825
R221	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
R222	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
R224	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R225	315-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	01121	CB6825
R227	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R228	315-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	01121	CB6825
R230	315-0103-00	XB050000		RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R231	315-0432-00			RES.,FXD,CMPSN:4.3K OHM,5%,0.25W	01121	CB4325
R232	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R234	315-0274-00			RES.,FXD,CMPSN:270K OHM,5%,0.25W	01121	CB2745
R235	315-0332-00			RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
R237	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R241	315-0102-00	B010100	B049999	RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R241	315-0242-00	B050000		RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	01121	CB2425
R242	315-0223-00			RES.,FXD,CMPSN:22K OHM,5%,0.25W	01121	CB2235
R243	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R244	315-0473-00			RES.,FXD,CMPSN:47K OHM,5%,0.25W	01121	CB4735
R245	315-0473-00			RES.,FXD,CMPSN:47K OHM,5%,0.25W	01121	CB4735
R258	315-0123-00			RES.,FXD,CMPSN:12K OHM,5%,0.25W	01121	CB1235
R259	315-0122-00			RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
R261	315-0122-00			RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
R262	315-0681-00			RES.,FXD,CMPSN:680 OHM,5%,0.25W	01121	CB6815
R263	315-0681-00			RES.,FXD,CMPSN:680 OHM,5%,0.25W	01121	CB6815
R264	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R265	315-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	01121	CB6825
R266	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
R268	315-0682-00			RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	01121	CB6825
R269	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
R273	315-0223-00			RES.,FXD,CMPSN:22K OHM,5%,0.25W	01121	CB2235
R274	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R276	321-0267-00			RES.,FXD,FILM:5.9K OHM,1%,0.125W	75042	CEAT0-5901F
R277	321-0193-00	B010100	B010199	RES.,FXD,FILM:1K OHM,1%,0.125W	75042	CEAT0-1001F
R277	321-0184-00	B010200		RES.,FXD,FILM:806 OHM,1%,0.125W	75042	CEAT0-8060F
R278	311-1362-00	B010100	B010199	RES.,VAR,NONWIR:500 OHM,30%,0.25W		
R278	311-1123-00	B010200		RES.,VAR,NONWIR:1K OHM,30%,0.25W		
R279	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	75042	CEAT0-1001F
R280	321-0193-00	B010100	B010199	RES.,FXD,FILM:1K OHM,1%,0.125W	75042	CEAT0-1001F
R280	321-0184-00	B010200		RES.,FXD,FILM:806 OHM,1%,0.125W	75042	CEAT0-8060F
R281	311-1362-00	B010100	B010199	RES.,VAR,NONWIR:500 OHM,30%,0.25W		
R281	311-1123-00	B010200		RES.,VAR,NONWIR:1K OHM,30%,0.25W		
R300	311-1302-00			RES.,VAR,NONWIR:100K OHM,30%,0.25W	71450	U201R104B
R303	315-0155-00			RES.,FXD,CMPSN:1.5M OHM,5%,0.25W	01121	CB1555
R304	315-0272-00			RES.,FXD,CMPSN:2.7K OHM,5%,0.25W	01121	CB2725

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R305	315-0566-00			RES.,FXD,COMP:56M OHM,5%,0.25W	01121	CB5665
R308	315-0513-00			RES.,FXD,CMPSN:51K OHM,5%,0.25W	01121	CB5135
R310	321-0289-00			RES.,FXD,FILM:10K OHM,1%,0.125W	75042	CEAT0-1002F
R312	315-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.25W	01121	CB3305
R313	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R315	311-1316-00			RES.,VAR,NONWIR,20K OHM,20%,1W		
R316	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R317	315-0131-00			RES.,FXD,CMPSN:130 OHM,5%,0.25W	01121	CB1315
R318	321-0288-00			RES.,FXD,FILM:9.76K OHM,1%,0.125W	75042	CEAT0-9761F
R319	321-0222-00			RES.,FXD,FILM:2K OHM,1%,0.125W	75042	CEAT0-2001F
R321	315-0332-00			RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
R322	315-0393-00	XB060000		RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
R323	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R324	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R326	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R327	315-0682-00	XB060000		RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	01121	CB6825
R328	315-0471-00			RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R329	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R331	315-0153-00			RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
R332	315-0106-00			RES.,FXD,CMPSN:10M OHM,5%,0.25W	01121	CB1065
R350	311-1183-00			RES.,VAR,WW:2K OHM,5%,0.25W		
R351	321-0285-00			RES.,FXD,FILM:9.09K OHM,1%,0.125W	75042	CEAT0-9091F
R352	311-1370-00			RES.,VAR,NONWIR:2K OHM,30%,0.25W		
R353	315-0275-00			RES.,FXD,CMPSN:2.7M OHM,5%,0.25W	01121	CB2755
R354	321-0289-00			RES.,FXD,FILM:10K OHM,1%,0.125W	75042	CEAT0-1002F
R255	311-1302-00			RES.,VAR,NONWIR:100K OHM,30%,0.25W	71450	U201R104B
R356	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R357	321-0280-00			RES.,FXD,FILM:8.06K OHM,1%,0.125W	75042	CEAT0-8061F
R358	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R361	321-0316-03			RES.,FXD,FILM:10K OHM,0.25%,0.125W		
R362	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R363	321-0316-03			RES.,FXD,FILM:10K OHM,0.25%,0.125W		
R364	315-0302-00	B010100	B029999	RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
R364	315-0622-00	B030000		RES.,FXD,CMPSN:6.2K OHM,5%,0.25W	01121	CB6225
R365	311-1199-00			RES.,VAR,NONWIR:10K OHM, 30%, 0.25W		
R371	322-0239-00			RES.,FXD,FILM:3.01K OHM,1%,0.25W	75042	CEBT0-3011F
R372	322-0239-00			RES.,FXD,FILM:3.01K OHM,1%,0.25W	75042	CEBT0-3011F
R374	322-0335-00			RES.,FXD,FILM:30.1K OHM,1%,0.25W		
R375	322-0335-00			RES.,FXD,FILM:30.1K OHM,1%,0.25W		
R380	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R381	315-0681-00			RES.,FXD,CMPSN:680 OHM,5%,0.25W	01121	CB6815
R382	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R387	301-0130-00			RES.,FXD,CMPSN:13 OHM,5%,0.50W	01121	EB1305
R388	308-0677-00			RES.,FXD,WW:1 OHM,5%,2W	75042	BWH-1R000J
R389	308-0677-00			RES.,FXD,WW:1 OHM,5%,2W	75042	BWH-1R000J
R391	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R393	308-0291-00			RES.,FXD,WW:2K OHM,5%,3W	91637	RS2B-B2000J
R396	321-0277-00			RES.,FXD,FILM:7.5K OHM,1%,0.125W	75042	CEAT0-7501F
R397	321-0219-02			RES.,FXD,FILM:1.87K OHM,0.5%,0.125W	75042	CEAT2-1871D
R404	323-0510-00			RES.,FXD,FILM:2M OHM,1%,0.50W		
R405	323-0510-00			RES.,FXD,FILM:2 OHM,1%,0.50W		
R407	323-0414-00			RES.,FXD,FILM:200K OHM,1%,0.50W	75042	CECT0-2003F
R408	323-0414-00			RES.,FXD,FILM:200K OHM,1%,0.50W	75042	CECT0-2003F

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R411	323-0318-00			RES.,FXD,FILM:20K OHM,1%,0.50W	75042	CECT0-2002F
R412	323-0318-00			RES.,FXD,FILM:20K OHM,1%,0.50W	75042	CECT0-2002F
R414	323-0222-00			RES.,FXD,FILM:2K OHM,1%,0.50W	75042	CECT0-2001F
R415	323-0222-00			RES.,FXD,FILM:2K OHM,1%,0.50W	75042	CECT0-2001F
R417	308-0736-00			RES.,FXD,WW:200 OHM 1%,3W		
R418	308-0736-00			RES.,FXD,WW:200 OHM,1%,3W		
R421	308-0740-00			RES.,FXD,FILM:20 OHM,1%,3W		
R422	308-0740-00			RES.,FXD,FILM:20 OHM,1%,3W		
R424	308-0739-00			RES.,FXD,WW:40 OHM,1%,3W		
R425	308-0739-00			RES.,FXD,WW:40 OHM,1%,3W		
R426	308-0739-00			RES.,FXD,WW:40 OHM,1%,3W		
R427	308-0739-00			RES.,FXD,WW:40 OHM,1%,3W		
R430	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R431	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
R432	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
R433	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
R434	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R435	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	01121	CB3315
R438	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R439	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R440	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R450	321-0164-00			RES.,FXD,FILM:499 OHM,1%,0.125W	75042	CEAT0-4990F
R451	315-0223-00			RES.,FXD,CMPSN:22K OHM,5%,0.25W	01121	CB2235
R452	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R453	321-0160-00			RES.,FXD,FILM:453 OHM,1%,0.125W	75042	CEAT0-4530F
R455	311-1120-00			RES.,VAR,NONWIR:100 OHM,30%,0.25W	71450	U201R101B
R456	311-1124-00			RES,VAR,NONWIR:250 OHM,30%,0.25W		
R457	321-0234-00			RES.,FXD,FILM:2.67K OHM,1%,0.125W	75042	CEAT0-2671F
R459	321-0266-00			RES.,FXD,FILM:5.76K OHM,1%,0.125W	75042	CEAT0-5761F
R501	306-0224-00			RES.,FXD,CMPSN:220K OHM,10%,2W	01121	HB2241
R502A R502B R502C R502D	307-0363-00			11.25M OHM RES.,FXD,FILM:2.25 M OHM 220K OHM 25K OHM		
R511	321-0385-00			RES.,FXD,FILM:100K OHM,1%,0.125W	75042	CEAT0-1003F
R512	321-0385-00			RES.,FXD,FILM:100K OHM,1%,0.125W	75042	CEAT0-1003F
R513	315-0224-00	B010100	B029999	RES.,FXD,CMPSN:220K OHM,5%,0.25W	01121	CB2245
R513	316-0103-00	B030000		RES.,FXD,CMPSN:10K OHM,10%,0.25W	01121	CB1031
R514	321-0344-00			RES.,FXD,FILM:37.4K OHM,1%,0.125W	75042	CEAT0-3742F
R515	321-0344-00			RES.,FXD,FILM:37.4K OHM,1%,0.125W	75042	CEAT0-3742F
R517	321-0979-01			RES.,FXD,FILM:125K OHM,0.5%,0.125W		
R518	321-0979-01			RES.,FXD,FILM:125K OHM,0.5%,0.125W		
R519	321-0979-01			RES.,FXD,FILM:125K OHM,0,5%,0.125W		
R521	321-0979-01			RES,FXD,FILM:125K OHM,0.5%,0.125W		
R523	321-0980-01			RES.,FXD,FILM:667 OHM,0.5%,0.125W		
R524	323-0222-01			RES.,FXD,FILM:2K OHM,0.5%,0.50W		
R526	323-0222-01			RES.,FXD,FILM:2K OHM,0.5%,0.50W		
R527	321-0362-00			RES.,FXD,FILM:57.6K OHM,1%,0.125W	75042	CEAT0-5762F
R528	311-1133-00			RES.,VAR,NONWIR:10K OHM,30%,0.25W		
R530	311-1206-00			RES.,VAR,NONWIR:250K OHM,30%,0.25W	71450	X201R254B
R531	315-0474-00			RES.,FXD,CMPSN:470K OHM,5%,0.25W	01121	CB4745
R532	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R534	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R535[1]	311-1310-00			RES.,VAR,NONWIR:20K OHM,20%,1W	01121	10M654
R536	323-0720-01			RES.,FXD,FILM:5.556 OHM,0.5%,0.50W		
R537	323-0636-01			RES.,FXD,FILM:50K OHM,0.5%,0.50W		
R538	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R539	315-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.25W	01121	CB3305
R540	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R541	315-0561-00			RES.,FXD,CMPSN:560 OHM,5%,0.25W	01121	CB5615
R542	315-0361-00			RES.,FXD,CMPSN:360 OHM,5%,0.25W	01121	CB3615
R544	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R545	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R546	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R547	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R548	301-0330-00			RES.,FXD,CMPSN:33 OHM,5%,0.50W	01121	EB3305
R549	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
R552	315-0432-00			RES.,FXD,CMPSN:4.3K OHM,5%,0.25W	01121	CB4325
R554	315-0432-00			RES.,FXD,CMPSN:4.3K OHM,5%,0.25W	01121	CB4325
R556	315-0432-00			RES.,FXD,CMPSN:4.3K OHM,5%,0.25W	01121	CB4325
R558	315-0432-00			RES.,FXD,CMPSN:4.3K OHM,5%,0.25W	01121	CB4325
R560	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R561	315-0222-00			RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	01121	CB2225
R562	315-0151-00			RES.,FXD,CMPSN:150 OHM,5%,0.25W	01121	CB1515
R563	315-0222-00			RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	01121	CB2225
R564	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R567	321-0353-01	B010100	B029999	RES.,FXD,FILM:46.4K OHM,1%,0.125	91637	MFF1-8-16-4642D
R567	321-0692-00	B030000		RES.,FXD,FILM:49.9K OHM,0.5%,0.125W	75042	CEAT0-4992D
R568	321-0353-01	B010100	B029999	RES.,FXD,FILM:46.4K OHM,1%,0.125	91637	MFF1-8-16-4642D
R568	321-0692-00	B030000		RES.,FXD,FILM:49.9K OHM,0.5%,0.125W	75042	CEAT0-4992D
R569	323-0496-00			RES.,FXD,FILM:1.43 M OHM,1%,0.50W		
R570	311-1302-00			RES.,VAR,NONWIR:100K OHM,30%,0.25W	71450	U201R104B
R574	315-0624-00			RES.,FXD,CMPSN:620K OHM,5%,0.25W	01121	CB6245
R575[2]	311-1310-00			RES.,VAR,NONWIR:20K OHM,20%,1W	01121	10M654
R576	321-1389-01			RES.,FXD,FILM:111K OHM,0.5%,0.125W	75042	CEAT0-1113D
R577	321-0481-01			RES.,FXD,FILM:1M OHM,0.5%,0.125W	75042	CEAT0-1004D
R581	308-0075-00	B010100	B039999	RES.,FXD,WW:100 OHM,5%,3W	91637	RS2B-B100ROJ
R581	308-0431-00	B040000		RES.,FXD,WW:120 OHM,5%,3W		
R583	308-0075-00	B010100	B039999	RES.,FXD,WW:100 OHM,5%,3W	91637	RS2B-B100ROJ
R583	308-0431-00	B040000		RES.,FXD,WW:120 OHM,5%,3W		
R584	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R585	315-0274-00			RES.,FXD,CMPSN:270K OHM,5%,0.25W	01121	CB2745
R586	315-0274-00			RES.,FXD,CMPSN:270K OHM,5%,0.25W	01121	CB2745
R587	315-0333-00			RES.,FXD,CMPSN:33K OHM,5%,0.25W	01121	CB3335
R588	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R591	315-0473-00			RES.,FXD,CMPSN:47K OHM,5%,0.25W	01121	CB4735
R592	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R594	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R596	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R597	315-0393-00			RES.,FXD,CMPSN:39K OHM,5%,0.25W	01121	CB3935
R711	307-0023-00	XB030000	B049999X	RES.,FXD,CMPSN:4.7 OHM,10%,0.50W	01121	EB47G1
R744	315-0683-00			RES.,FXD,CMPSN:68K OHM,5%,0.25W	01121	CB6835
R754	315-0684-00			RES.,FXD,CMPSN:680K OHM,5%,0.25W	01121	CB6845
R755	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R757	315-0681-00			RES.,FXD,CMPSN:680 OHM,5%,0.25W	01121	CB6815
R761	315-0391-00			RES.,FXD,CMPSN:390 OHM,5%,0.25W	01121	CB3915

[1]Furnished as a unit with S535.
[2]Furnished as a unit with S575.

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R762	315-0183-00			RES.,FXD,CMPSN:18K OHM,5%,0.25W	01121	CB1835
R763	321-0268-08			RES.,FXD,FILM:6.04K OHM,1%,0.125W	75042	CEAT2-6041F
R764	321-0268-08			RES.,FXD,FILM:6.04K OHM,1%,0.125W	75042	CEAT2-6041F
R765	311-1308-00	B010100	B049999	RES.,VAR,NONWIR:250 OHM,30%,0.25W		
R765	311-1124-00	B050000		RES.,VAR,NONWIR:250 OHM,30%,0.25W		
R766	307-0105-00			RES.,FXD,CMPSN:3.9 OHM,5%,0.25W	01121	CB39G5
R772	315-0562-00			RES.,FXD,CMPSN:5.6K OHM,5%,0.25W	01121	CB5625
R773	315-0221-00	B010100	B049999X	RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
R774	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R775	311-1124-00			RES.,VAR,NONWIR:250 OHM,30%,0.25W		
R776	321-0202-02	B010100	B039999	RES.,FXD,FILM:1.24K OHM,0.5%,0.125W		
R776	321-0206-02	B040000		RES.,FXD,FILM:1.37K OHM,0.5%,0.125W	75042	CEAT0-1371F
R777	321-0256-00	B010100	B039999	RES.,FXD,FILM:4.53K OHM,1%,0.125W	75042	CEAT0-4531F
R777	321-0259-09	B040000		RES.,FXD,FILM:4.87K OHM,1%,0.125W		
R781	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R784	315-0621-00			RES.,FXD,CMPSN:620 OHM,5%,0.25W	01121	CB6215
R785	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R786	307-0105-00			RES.,FXD,CMPSN:3.9 OHM,5%,0.25W	01121	CB39G5
R787	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
R788	315-0301-00	B010100	B049999	RES.,FXD,CMPSN:300 OHM,5%,0.25W	01121	CB3015
R788	315-0201-00	B050000		RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
S101	260-1478-00			SWITCH,PUSH:CIRCUIT BREAKER		
S120A, S120B	260-1457-00	B010100	B010199	SWITCH,ROTARY:MAX PEAK VOLTS SERIES RESISTORS		
S120A, S120B	260-1457-01	B010200		SWITCH,ROTARY:MAX PEAK VOLTS SERIES RESISTORS		
S120C	260-0735-00	XB010200		SWITCH,PUSH:MAX PEAK POWER WATTS	81073	39-1
S130	260-1456-00			SWITCH,ROTARY:POLARITY		
S310	260-1453-00			SWITCH,PUSH:STEP X .1		
S330	260-1455-00			SWITCH,PUSH:STEP FAMILY		
S350A, S350B	260-1452-00			SWITCH,PUSH:AID ZERO		
S404	105-0359-00			ACTR ASSY:STEP/OFFSET AMPL		
S426	260-1454-00			SWITCH,PUSH:STEP RATE		
S429	260-1211-00			SWITCH,PUSH:DPDT,PUSH-PUSH,PULSED	71590	2KAB010000-357
S430	260-1211-00			SWITCH,PUSH:DPDT,PUSH-PUSH,POLARITY	71590	2KAB010000-357
S502	105-0360-00			ACTR ASSY:HORIZ VOLTS/DIV		
S512, S535[1]	260-1363-00			SWITCH,PUSH:DISPLAY		
S568, S575[2]	260-1211-00			SWITCH,PUSH:DPDT,PUSH-PUSH,DISPLAY	71590	2KAB010000-357
T101	120-0808-00			XFMR0:0-132 VRMS,1.75Z		
T102	120-0831-00			XFMR:COLLECTOR SWEEP		
T550	120-0832-00			XFMR:BASE DRIVE,POT CORE		
T560	120-0833-00			XFMR:PRECISION ISOLATION,POT CORE		
T701	120-0830-00	B010100	B039999	XFMR:POWER		
T701	120-0830-01	B040000		XFMR:POWER		
T701	120-0830-01	B040000		XFMR:POWER		
U206	156-0067-00			MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	80009	156-0067-00
U220	156-0030-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND GATE	01295	SN7400N
U230	156-0072-00			MICROCIRCUIT,DI:MONOSTABLE MV,TTL	12040	DM74121N
U268	156-0031-00			MICROCIRCUIT,DI:2-INPUT AND/OR/INVERT GATE	01295	SN7454N
U270	156-0072-00			MICROCIRCUIT,DI:MONOSTABLE MV,TTL	12040	DM74121N

[1]Furnished as a unit with R535.
[2]Furnished as a unit with R575.

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
U305	156-0158-02			MICROCIRCUIT,DI:DUAL OPERATIONAL AMPLIFIER		
U350	156-0158-00			MICROCIRCUIT,LI:DUAL OPERATIONAL AMPLIFIER	18324	S5558V
U360	156-0067-00			MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	80009	156-0067-00
U380	156-0158-00			MICROCIRCUIT,LI:DUAL OPERATIONAL AMPLIFIER	18324	S5558V
U430	156-0062-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS EXCL GATE	04713	MC7486P
U520	156-0200-00			MICROCIRCUIT,LI:LOW INPUT/OFFSET CURRENT	18324	N5556V
U530	156-0200-00			MICROCIRCUIT,LI:LOW INPUT/OFFSET CURRENT	18324	N5556V
U542	156-0058-00			MICROCIRCUIT,DI:HEX INVERTER	04713	MC7404P
U570	156-0200-00			MICROCIRCUIT,LI:LOW INPUT/OFFSET CURRENT	18324	N5556V
U722	156-0285-00			MICROCIRCUIT,LI:VOLTAGE REGULATOR,12V,1A	07263	UGH7812393
U724	156-0277-00			MICROCIRCUIT,LI:QUAD 2-INPUT OR GATE	07263	UGH7805393
U732	156-0285-00			MICROCIRCUIT,LI:VOLTAGE REGULATOR,12V,1A	07263	UGH7812393
VR581	152-0024-00			SEMICOND DEVICE:ZENER,1W,15V,5%	04713	1N3024B
VR582	152-0024-00			SEMICOND DEVICE:ZENER,1W,15V,5%	04713	1N3024B
VR772	152-0280-00			SEMICOND DEVICE:ZENER,0.4W,6.2V,5%	04713	1N753A

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Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A4	670-2560-00			CKT BOARD ASSY--STORAGE	80009	670-2560-00
A5	670-2559-00			CKT BOARD ASSY--HIGH VOLTAGE	80009	670-2559-00
C1212	283-0119-00	XB040000		CAP.,FXD,CER DI:2200PF,5%,200V	72982	855-535B222J
C1224	283-0065-00			CAP.,FXD,CER DI:0.001UF,5%,100V	72982	805-505B102J
C1227	281-0537-00			CAP.,FXD,CER DI:0.68PF,20%,600V	80009	281-0537-00
C1236	285-0526-00			CAP.,FXD,PLSTC:0.1UF,20%,400V		
C1241	283-0270-00			CAP.,FXD,CER DI:0.0068UF,+80-20%,4000V		
C1242	283-0261-00			CAP.,FXD,CER DI:0.01UF,20%,4000V	56289	41C421
C1248	283-0270-00			CAP.,FXD,CER DI:0.0068UF,+80-20%,4000V		
C1249	283-0270-00			CAP.,FXD,CER DI:0.0068UF,+80-20%,4000V		
C1251	290-0194-00			CAP.,FXD,ELCTLT:10UF,+50-10%,100V	56289	30D106F100DC4
C1252	283-0617-00			CAP.,FXD,MICA D:4700PF,10%,300V	00853	D193F472K0
C1253	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-547E103Z
C1254	283-0059-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8141N038651105Z
C1258	283-0059-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8141N038651105Z
C1259	283-0164-00			CAP.,FXD,CER DI:2.2UF,20%,25V	72982	8141N038651225M
C1272	283-0021-00			CAP.,FXD,CER DI:0.001UF,20%,5000V	72982	828-005Y5S0102M
C1273	283-0208-00			CAP.,FXD,CER DI:0.22UF,10%,200V	72982	8151N230W5R224K
C1274	283-0142-00			CAP.,FXD,CER DI:0.0027UF,5%,200V	72982	875-551B272J
C1279	283-0065-00			CAP.,FXD,CER DI:0.001UF,5%,100V	72982	805-505B102J
C1281	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-547E103Z
C1303	283-0067-00			CAP.,FXD,CER DI:0.001UF,10%,200V	72982	835-515B102K
C1307	283-0067-00	B010100	B039999X	CAP.,FXD,CER DI:0.001UF,10%,200V	72982	835-515B102K
C1311	281-0500-00			CAP.,FXD,CER DI:2.2PF,+/-0.5PF,500V	72982	301-000C0J0229D
C1321	281-0500-00			CAP.,FXD,CER DI:2.2PF,+/-0.5PF,500V	72982	301-000C0J0229D
C1325	283-0026-00			CAP.,FXD,CER DI:0.2UF,+80-20%,25V	56289	274C3
C1330	290-0267-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	162D105X0035CD2
C1331	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-547E103Z
C1337	290-0188-00			CAP.,FXD,ELCTLT:0.1UF,10%,35V		
C1342	290-0135-00			CAP.,FXD,ELCTLT:15UF,20%,20V	56289	150D156X0020B2
C1385	290-0134-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	150D226X0015B2
C1386	285-0562-00			CAP.,FXD,PLSTC:0.47UF,20%,400V	56289	410P47404
C1387	283-0067-00			CAP.,FXD,CER DI:0.001UF,10%,200V	72982	835-515B102K
C1389	283-0013-00			CAP.,FXD,CER DI:0.01UF,+100-0%,1000V	56289	33C29A7
C1391	283-0008-00			CAP.,FXD,CER DI:0.1UF,500V	72982	8151N501651104M
C1394	283-0057-00			CAP.,FXD,CER DI:0.1UF,+80-20%,200V	56289	274C10
C1398	290-0267-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	162D105X0035CD2
C1399	290-0247-00			CAP.,FXD,ELCTLT:5.6UF,10%,6V	56289	162D565X9006CD2
CR1209	152-0061-00			SEMICOND DEVICE:SILICON,175V,100MA	80009	152-0061-00
CR1224	152-0061-00			SEMICOND DEVICE:SILICON,175V,100MA	80009	152-0061-00
CR1241	152-0409-00			SEMICOND DEVICE:SILICON,12,000V,5MA	83003	VG-12X
CR1247	152-0409-00			SEMICOND DEVICE:SILICON,12,000V,5MA	83003	VG-12X
CR1253	152-0414-00			SEMICOND DEVICE:200V,0.75A	80009	152-0414-00
CR1255	152-0185-00			SEMICOND DEVICE:SILICON,40PIV,150MA	07910	1N4152
CR1256	152-0061-00			SEMICOND DEVICE:SILICON,175V,100MA	80009	152-0061-00
CR1259	152-0061-00			SEMICOND DEVICE:SILICON,175V,100MA	80009	152-0061-00
CR1262	152-0185-00			SEMICOND DEVICE:SILICON,40PIV,150MA	07910	1N4152

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CR1264	152-0185-00			SEMICOND DEVICE:SILICON,40PIV,150MA	07910	1N4152
CR1269	152-0061-00			SEMICOND DEVICE:SILICON,175V,100MA	80009	152-0061-00
CR1329	152-0488-00			SEMICOND DEVICE:SILICON,200V,1500MA	80009	152-0488-00
CR1332	152-0185-00			SEMICOND DEVICE:SILICON,40PIV,150MA	07910	1N4152
CR1343	152-0185-00			SEMICOND DEVICE:SILICON,40PIV,150MA	07910	1N4152
CR1351	152-0185-00			SEMICOND DEVICE:SILICON,40PIV,150MA	07910	1N4152
CR1358	152-0185-00			SEMICOND DEVICE:SILICON,40PIV,150MA	07910	1N4152
CR1386	152-0331-00			SEMICOND DEVICE:SILICON,800V,25MA	80009	152-0331-00
CR1392	152-0061-00			SEMICOND DEVICE:SILICON,175V,100MA	80009	152-0061-00
CR1237	152-0283-00			SEMICOND DEVICE:ZENER,0.4W,43V,5%	04713	1N976B
CR1258	152-0438-00			SEMICOND DEVICE:ZENER,0.75W,9.1V,5%		
DS1271	150-0030-00			LAMP,GLOW:	08806	A2B-T
DS1272	150-0030-00			LAMP,GLOW:	08806	A2B-T
DS1273	150-0030-00			LAMP,GLOW:	08806	A2B-T
DS1390	150-0048-00	XB070000		LAMP,INCAND:5V,60MA	08806	683
F1201	159-0023-00			FUSE,CARTRIDGE:2A,3AG,SLOW-BLOW		
L1259	108-0564-00			COIL,RF:75 UH		
L1291	108-0644-00			COIL,RF:TRACE ROTATION		
Q1104	151-0279-00			TRANSISTOR:SILICON,NPN	07263	S25381
Q1106	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q1114	151-0279-00			TRANSISTOR:SILICON,NPN	07263	S25381
Q1116	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q1124	151-0279-00			TRANSISTOR:SILICON,NPN	07263	S25381
Q1126	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q1134	151-0279-00			TRANSISTOR:SILICON,NPN	07263	S25381
Q1136	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q1214	151-0341-00			TRANSISTOR:SILICON,NPN	07263	2N3565
Q1222	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q1226	151-0347-00			TRANSISTOR:SILICON,NPN	80009	151-0347-00
Q1234	151-0406-00			TRANSISTOR:SILICON,PNP	07263	S37880
Q1252	151-0256-00			TRANSISTOR:SILICON,NPN	16758	7305762
Q1262	151-0207-00			TRANSISTOR:SILICON,NPN	03508	GET3415
Q1264	151-0342-00			TRANSISTOR:SILICON,PNP	07263	2N4249
Q1278	151-1005-00			TRANSISTOR:SILICON,JFE,N-CHANNEL	15818	U1490
Q1302	151-0341-00			TRANSISTOR:SILICON,NPN	07263	2N3565
Q1304	151-0188-00			TRANSISTOR:SILICON,PNP	04713	2N3906
Q1308	151-0279-00			TRANSISTOR:SILICON,NPN	07263	S25381
Q1310	151-0188-00			TRANSISTOR:SILICON,PNP	04713	2N3906
Q1320	151-0188-00			TRANSISTOR:SILICON,PNP	04713	2N3906
Q1334	151-0341-00			TRANSISTOR:SILICON,NPN	07263	2N3565
Q1336	151-0207-00			TRANSISTOR:SILICON,NPN	03508	GET3415
Q1356	151-0341-00			TRANSISTOR:SILICON,NPN	07263	2N3565
Q1358	151-0169-00			TRANSISTOR:SILICON,NPN	02735	2N3439
Q1362	151-0279-00			TRANSISTOR:SILICON,NPN	07263	S25381
Q1372	151-0279-00			TRANSISTOR:SILICON,NPN	07263	S25381
Q1384	151-0216-00			TRANSISTOR:SILICON,PNP	04713	MPS6523
Q1386	151-0342-00			TRANSISTOR:SILICON,PNP	07263	2N4249
Q1388	151-0331-00			TRANSISTOR:SILICON,NPN		
Q1392	151-0169-00			TRANSISTOR:SILICON,NPN	02735	2N3439
Q1396	151-0279-00			TRANSISTOR:SILICON,NPN	07263	S25381

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R1101	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1102	316-0221-00			RES.,FXD,CMPSN:220 OHM,10%,0.25W	01121	CB2211
R1103	316-0390-00	B010100	B049999	RES.,FXD,CMPSN:39 OHM,10%,0.25W	01121	CB3901
R1103	315-0111-00	B050000		RES.,FXD,CMPSN:110 OHM,5%,0.25W	01121	CB1115
R1104	308-0564-00			RES.,FXD,WW:20K OHM,1%,4W		
R1106	321-0179-00			RES.,FXD,FILM:715 OHM,1%,0.125W	75042	CEAT0-7150F
R1108	301-0752-00			RES.,FXD,CMPSN:7.5K OHM,5%,0.50W	01121	EB7525
R1112	316-0221-00			RES.,FXD,CMPSN:220 OHM,10%,0.25W	01121	CB2211
R1113	316-0390-00	B010100	B049999	RES.,FXD,CMPSN:39 OHM,10%,0.25W	01121	CB3901
R1113	315-0111-00	B050000		RES.,FXD,CMPSN:110 OHM,5%,0.25W	01121	CB1115
R1114	308-0564-00			RES.,FXD,WW:20K OHM,1%,4W		
R1116	311-1308-00			RES.,VAR,NONWIR:250 OHM,30%,0.25W		
R1118	301-0752-00			RES.,FXD,CMPSN:7.5K OHM,5%,0.50W	01121	EB7525
R1122	316-0221-00			RES.,FXD,CMPSN:220 OHM,10%,0.25W	01121	CB2211
R1123	316-0390-00	B010100	B049999	RES.,FXD,CMPSN:39 OHM,10%,0.25W	01121	CB3901
R1123	315-0111-00	B050000		RES.,FXD,CMPSN:110 OHM,5%,0.25W	01121	CB1115
R1124	308-0564-00	B010100	B019999	RES.,FXD,WW:20K OHM,1%,4W		
R1124	308-0053-00	B020000		RES.,FXD,WW:8K OHM,5%,5W		
R1125	301-0272-00	B010100	B019999	RES.,FXD,CMPSN:2.7K OHM,5%,0.50W	01121	EB2725
R1125	301-0152-00	B020000		RES.,FXD,CMPSN:1.5K OHM,5%,0.50W	01121	EB1525
R1126	321-0179-00	B010100	B019999	RES.,FXD,FILM:715 OHM,1%,0.125W	75042	CEAT0-7150F
R1126	321-0139-00	B020000		RES.,FXD,FILM:274 OHM,1%,0.125W	75042	CEAT0-2740F
R1128	301-0752-00	B010100	B019999	RES.,FXD,CMPSN:7.5K OHM,5%,0.50W	01121	EB7525
R1128	303-0302-00	B020000		RES.,FXD,CMPSN:3K OHM,5%,1W	01121	GB3025
R1132	316-0221-00			RES.,FXD,CMPSN:220 OHM,10%,0.25W	01121	CB2211
R1133	316-0390-00	B010100	B049999	RES.,FXD,CMPSN:39 OHM,10%,0.25W	01121	CB3901
R1133	315-0111-00	B050000		RES.,FXD,CMPSN:110 OHM,5%,0.25W	01121	CB1115
R1134	308-0564-00	B010100	B019999	RES.,FXD,WW:20K OHM,1%,4W		
R1134	308-0053-00	B020000		RES.,FXD,WW:8K OHM,5%,5W		
R1136	311-1308-00	B010100	B019999	RES.,VAR,NONWIR:250 OHM,30%,0.25W		
R1136	311-1328-00	B020000		RES.,VAR,NONWIR:100 OHM,30%,0.25W		
R1138	301-0752-00	B010100	B019999	RES.,FXD,CMPSN:7.5K OHM,5%,0.50W	01121	EB7525
R1138	303-0302-00	B020000		RES.,FXD,CMPSN:3K OHM,5%,1W	01121	GB3025
R1200	311-1160-00			RES.,VAR,NONWIR:100K OHM,20%,1W		
R1202	315-0563-00			RES.,FXD,CMPSN:56K OHM,5%,0.25W	01121	CB5635
R1203	316-0103-00			RES.,FXD,CMPSN:10K OHM,10%,0.25W	01121	CB1031
R1207	316-0822-00			RES.,FXD,CMPSN:8.2K OHM,10%,0.25W	01121	CB8221
R1208	316-0473-00			RES.,FXD,CMPSN:47K OHM,10%,0.25W	01121	CB4731
R1211	315-0564-00			RES.,FXD,CMPSN:560K OHM,5%,0.25W	01121	CB5645
R1213	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R1217	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
R1218	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R1222	316-0102-00			RES.,FXD,CMPSN:1K OHM,10%,0.25W	01121	CB1021
R1223	316-0472-00			RES.,FXD,CMPSN:4.7K OHM,10%,0.25W	01121	CB4721
R1226	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1227	321-0399-00			RES.,FXD,FILM:140K OHM,1%,0.125W	75042	CEAT0-1403F
R1231	316-0472-00			RES.,FXD,CMPSN:4.7K OHM,10%,0.25W	01121	CB4721
R1232	316-0274-00			RES.,FXD,CMPSN:270K OHM,10%,0.25W	01121	CB2741
R1234	304-0223-00			RES.,FXD,CMPSN:22K OHM,10%,1W	01121	GB2231
R1236	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1239	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1242	316-0223-00			RES.,FXD,CMPSN:22K OHM,10%,0.25W	01121	CB2231
R1243	316-0105-00			RES.,FXD,CMPSN:1M OHM,10%,0.25W	01121	CB1051

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R1245	311-1205-00			RES.,VAR,NONWIR:2M OHM,30%,0.25W		
R1248	316-0223-00			RES.,FXD,CMPSN:22K OHM,10%,0.25W	01121	CB2231
R1251	307-0058-00			RES.,FXD,CMPSN:5.6 OHM,5%,0.50W		
R1252	308-0075-00			RES.,FXD,WW:100 OHM,5%,3W	91637	RS2B-B100ROJ
R1254	308-0690-00			RES.,FXD,WW:3 OHM,10%,3W		
R1262	302-0472-00			RES.,FXD,CMPSN:4.7K OHM,10%,050W	01121	EB4721
R1263	316-0183-00			RES.,FXD,CMPSN:18K OHM,10%,0.25W	01121	CB1831
R1266	316-0334-00			RES.,FXD,CMPSN:330K OHM,10%,0.25W	01121	CB3341
R1267	316-0333-00			RES.,FXD,CMPSN:33K OHM,10%,0.25W	01121	CB3331
R1268	316-0103-00			RES.,FXD,CMPSN:10K OHM,10%,0.25W	01121	CB1031
R1269	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1270	316-0223-00			RES.,FXD,CMPSN:22K OHM,10%,0.25W	01121	CB2231
R1271	316-0395-00			RES.,FXD,CMPSN:3.9M OHM,10%,0.25W	01121	CB3951
R1272A	307-0296-00			40M OHM		
R1272B				150M OHM		
R1272C				RES.,FXD,FILM:13M OHM		
R1272D				4M OHM		
R1272E				2.2M OHM		
R1273	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R1274	316-0105-00			RES.,FXD,CMPSN:1M OHM,10%,0.25W	01121	CB1051
R1275	311-1136-00			RES.,VAR,NONWIR:100K OHM,30%,0.25W	71450	X201R104B
R1276	316-0105-00			RES.,FXD,CMPSN:1M OHM,10%,0.25W	01121	CB1051
R1278	316-0562-00			RES.,FXD,CMPSN:5.6K OHM,10%,0.25W	01121	CB5621
R1279	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R1282	315-0163-00			RES.,FXD,CMPSN:16K OHM,5%,0.25W	01121	CB1635
R1285	311-1136-00			RES.,VAR,NONWIR:100K OHM,30%,0.25W	71450	X201R104B
R1286	311-1136-00			RES.,VAR,NONWIR:100K OHM,30%,0.25W	71450	X201R104B
R1287	301-0183-00			RES.,FXD,CMPSN:18K OHM,5%,0.50W	01121	EB1835
R1291	311-1189-00			RES.,VAR,WW:5K OHM,20%,0.50W		
R1395	311-0254-00			RES.,VAR,NONWIR:5M OHM,10%,0.20W	12697	CM29709
R1302	316-0102-00			RES.,FXD,CMPSN:1K OHM,10%,0.25W	01121	CB1021
R1303	315-0513-00			RES.,FXD,CMPSN:51K OHM,5%,0.25W	01121	CB5135
R1304	316-0474-00			RES.,FXD,CMPSN:470K OHM,10%,0.25W	01121	CB4741
R1307	315-0223-00			RES.,FXD,CMPSN:22K OHM,5%,0.25W	01121	CB2235
R1308	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
R1310	315-0223-00			RES.,FXD,CMPSN:22K OHM,5%,0.25W	01121	CB2235
R1311	315-0125-00			RES.,FXD,CMPSN:1.2M OHM,5%,0.25W	01121	CB1255
R1312	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R1313	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R1321	315-0125-00			RES.,FXD,CMPSN:1.2M OHM,5%,0.25W	01121	CB1255
R1322	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R1324	315-0243-00			RES.,FXD,CMPSN:24K OHM,5%,0.25W	01121	CB2435
R1325	311-1155-00			RES.,VAR,NONWIR:20K OHM,10%,0.50W		
R1329	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R1330	316-0105-00			RES.,FXD,CMPSN:1M OHM,10%,0.25W	01121	CB1051
R1331	315-0202-00	XB030000		RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R1332	315-0201-00	B010100	B029999	RES.,FXD,CMPSN:200 OHM,5%,0.25W	01121	CB2015
R1332	315-0202-00	B030000		RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R1334	316-0472-00	B011000	B029999	RES.,FXD,CMPSN:4.7K OHM,10%,0.25W	01121	CB4721
R1334	315-0622-00	B030000		RES.,FXD,CMPSN:6.2K OHM,5%,0.25W	01121	CB6225
R1336	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R1337	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R1339	315-0623-00			RES.,FXD,CMPSN:62K OHM,5%,0.25W	01121	CB6235

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R1341	315-0753-00			RES.,FXD,CMPSN:75K OHM,5%,0.25W	01121	CB7535
R1342	316-0101-00			RES.,FXD,CMPSN:100 OHM,10%,0.25W	01121	CB1011
R1343	316-0473-00			RES.,FXD,CMPSN:47K OHM,10%,0.25W	01121	CB4731
R1346	315-0183-00			RES.,FXD,CMPSN:18K OHM,5%,0.25W	01121	CB1835
R1347	321-0359-00			RES.,FXD,FILM:53.6K OHM,1%,0.125W	75042	CEAT0-5362F
R1350	311-1153-00			RES.,VAR,NONWIR:5K OHM,30%,0.50W		
R1351	315-0203-00			RES.,FXD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R1352	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R1354	315-0154-00			RES.,FXD,CMPSN:150K OHM,5%,0.25W	01121	CB1545
R1355	323-0452-00			RES.,FXD,FILM:499K OHM,1%,0.50W	75042	CECT0-4993F
R1364	303-0473-00			RES.,FXD,CMPSN:47K OHM,5%,1W	01121	GB4735
R1365	303-0473-00			RES.,FXD,CMPSN:47K OHM,5%,1W	01121	GB4735
R1370	311-1166-00			RES.,VAR,NONWIR:250K OHM,30%,0.50W		
R1371	316-0393-00			RES.,FXD,CMPSN:39K OHM,10%,0.25W	01121	CB3931
R1381	316-0334-00			RES.,FXD,CMPSN:330K OHM,10%,0.25W	01121	CB3341
R1382	316-0334-00			RES.,FXD,CMPSN:330K OHM,10%,0.25W	01121	CB3341
R1384	316-0123-00			RES.,FXD,CMPSN:12K OHM,10%,0.25W	01121	CB1231
R1385	311-1153-00			RES.,VAR,NONWIR:5K OHM,30%,0.50W		
R1386	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
R1387	311-1154-00			RES.,VAR,NONWIR:10K OHM,30%,0.50W		
R1388	321-0261-00			RES.,FXD,FILM:5.11K OHM,1%,0.125W	75042	CEAT0-5111F
R1389	323-0436-00			RES.,FXD,FILM:340K OHM,1%,0.50W		
R1390	311-1166-00			RES.,VAR,NONWIR:250K OHM,30%,0.50W		
R1392	301-0753-00			RES.,FXD,CMPSN:75K OHM,5%,0.50W	01121	EB7535
R1295	311-1152-00			RES.,VAR,NONWIR:100K OHM,30%,0.50W		
R1396	315-0623-00			RES.,FXD,CMPSN:62K OHM,5%,0.25W	01121	CB6235
R1397	316-0101-00			RES.,FXD,CMPSN:100 OHM,10%,0.25W	01121	CB1011
S1125	260-1238-00			SWITCH,PUSH:0.5A AT 115VAC	81073	39-2
S1200	260-0227-00			SW THERMOSTATIC:OPEN 73.9 DEG,CLOSE 51.7 DEG C		
S1201	260-1222-00			SWITCH,PUSH-PUL:10A,250VAC	91929	2DM301
S1330	260-1223-00			SWITCH,PUSH:ERASE		
S1372A	260-1232-00	B010100	B019999	SWITCH,PUSH:ERASE SELECT(UPPER)		
S1272B				ERASE SELECT(LOWER)		
S1372A	260-1332-01	B020000		SWITCH,PUSH:ERASE SELECT(UPPER)		
S1372B				ERASE SELECT(LOWER)		
S1375A	260-1207-00			SWITCH,PUSH:2 MODULE	71590	2KBB020000-459
S1375B				STORE(LOWER)		
T1240	120-0761-00			XFMR:HV POWER		
V1291	154-0634-00	B010000	B019999	ELECTRON TUBE:CRT		
V1291	154-0634-10	B020000		ELECTRON TUBE:CRT		
VR1281	152-0357-00			SEMICOND DEVICE:ZENER,0.4W,82V,5%	04713	1N983B
VR1282	152-0255-00			SEMICOND DEVICE:ZENER,0.4W,51V,5%	04713	1N978B
VR1370	152-0287-00			SEMICOND DEVICE:ZENER,0.4W,110V,5%	04713	1N986B
VR1387	152-0283-00			SEMICOND DEVICE:ZENER,0.4W,43V,5%	04713	1N976B
VR1388	152-0166-00			SEMICOND DEVICE:ZENER,0.4W,6.2V,5%	81483	69-9035
VR1396	152-0288-00			SEMICOND DEVICE:ZENER,0.4W,140V,5%	04713	4-10M14025

D2

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A6	670-2561-00			CKT BOARD ASSY:HIGH VOLTAGE		
C1224	283-0065-00			CAP.,FXD,CER DI:0.001UF,5%,100V	72982	805-505B102J
C1227	281-0537-00			CAP.,FXD,CER DI:0.68PF,20%,600V	80009	281-0537-00
C1236	285-0526-00			CAP.,FXD,PLSTC:0.1UF,20%,400V		
C1241	283-0270-00			CAP.,FXD,CER DI:0.0068UF,+80-20%,4000V		
C1242	283-0261-00			CAP.,FXD,CER DI:0.01UF,20%,4000V	56289	41C421
C1248	283-0270-00			CAP.,FXD,CER DI:0.0068UF,+80-20%,4000V		
C1249	283-0270-00			CAP.,FXD,CER DI:0.0068UF,+80-20%,4000V		
C1251	290-0194-00			CAP.,FXD,ELCTLT:10UF,+50-10%,100V	56289	30D106F100DC4
C1252	283-0617-00			CAP.,FXD,MICA D:4700PF,10%,300V	00853	D193F472K0
C1253	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-547E103Z
C1254	283-0059-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8141N038651105Z
C1258	283-0059-00			CAP.,FXD,CER DI:1UF,+80-20%,25V	72982	8141N038651105Z
C1259	283-0198-00			CAP.,FXD,CER DI:0.22UF,20%,50V	72982	8131N075651224M
C1272	283-0021-00			CAP.,FXD,CER DI:0.001UF,20%,5000V	72982	828-005Y5S0102M
C1273	283-0208-00			CAP.,FXD,CER DI:0.22UF,10%,200V	72982	8151N230W5R224K
C1274	283-0142-00			CAP.,FXD,CER DI:0.0027UF,5%,200V	72982	875-551B272J
C1279	283-0065-00			CAP.,FXD,CER DI:0.001UF,5%,100V	72982	805-505B102J
C1281	283-0003-00			CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-547E103Z
CR1209	152-0061-00			SEMICOND DEVICE:SILICON,175V,100MA	80009	152-0061-00
CR1224	152-0061-00			SEMICOND DEVICE:SILICON,175V,100MA	80009	152-0061-00
CR1239	152-0061-00			SEMICOND DEVICE:SILICON,175V,100MA	80009	152-0061-00
CR1241	152-0409-00			SEMICOND DEVICE:SILICON,12,000V,5MA	83003	VG-12X
CR1247	152-0409-00			SEMICOND DEVICE:SILICON,12,000V,5MA	83003	VG-12X
CR1235	152-0414-00			SEMICOND DEVICE:200V,0.75A	80009	152-0414-00
CR1255	152-0185-00			SEMICOND DEVICE:SILICON,40PIV,150MA	07910	1N4152
CR1256	152-0061-00			SEMICOND DEVICE:SILICON,175V,100MA	80009	152-0061-00
CR1262	152-0185-00			SEMICOND DEVICE:SILICON,40PIV,150MA	07910	1N4152
CR1264	152-0185-00			SEMICOND DEVICE:SILICON,40PIV,150MA	07910	1N4152
CR1269	152-0061-00			SEMICOND DEVICE:SILICON,175V,100MA	80009	152-0061-00
DS1255	150-0048-00	XB070000		LAMP,INCAND:5V,60MA	08806	683
DS1271	150-0030-00			LAMP,GLOW:	08806	A2B-T
DS1272	150-0030-00			LAMP,GLOW:	08806	A2B-T
DS1273	150-0030-00			LAMP,GLOW:	08806	A2B-T
F1201	159-0023-00			FUSE,CARTRIDGE:2A 3AG,SLOW-BLOW		
L1259	108-0564-00			COIL,RF:75UH		
L1291	108-0644-00			COIL,R:TRACE ROTATION		
Q1104	151-0279-00			TRANSISTOR:SILICON,NPN	07263	S25381
Q1106	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q1114	151-0279-00			TRANSISTOR:SILICON,NPN	07263	S25381
Q1116	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q1124	151-0279-00			TRANSISTOR:SILICON,NPN	07263	S25381
Q1126	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q1134	151-0279-00			TRANSISTOR:SILICON,NPN	07263	S25381
Q1136	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q1222	151-0190-00			TRANSISTOR:SILICON,NPN	80009	151-0190-00
Q1226	151-0347-00			TRANSISTOR:SILICON,NPN	80009	151-0347-00
Q1234	151-0406-00			TRANSISTOR:SILICON,PNP	07263	S37880
Q1252	151-0256-00			TRANSISTOR:SILICON,NPN	16758	7305762
Q1262	151-0207-00			TRANSISTOR:SILICON,NPN	03508	GET3415

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
Q1264	151-0342-00			TRANSISTOR:SILICON,PNP	07263	2N4249
Q1278	151-1005-00			TRANSISTOR:SILICON,JFE,N-CHANNEL	15818	U1490
R1101	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1102	316-0221-00			RES.,FXD,CMPSN:220 OHM,10%,0.25W	01121	CB2211
R1103	316-0390-00	B010100	B01999	RES.,FXD,CMPSN:39 OHM,10%,0.25W	01121	CB3901
R1103	315-0111-00	B020000		RES.,FXD,CMPSN:110 OHM,5%,0.25W	01121	CB1115
R1104	308-0564-00			RES.,FXD,WW:20K OHM,1%,4W		
R1106	321-0179-00			RES.,FXD,FILM:715 OHM,1%,0.125W	75042	CEAT0-7150F
R1108	301-0752-00			RES.,FXD,CMPSN:7.5K OHM,5%,0.50W	01121	EB7525
R1112	316-0221-00			RES.,FXD,CMPSN:220 OHM,10%,0.25W	01121	CB2211
R1113	316-0390-00	B010100	B019999	RES.,FXD,CMPSN:39 OHM,10%,0.25W	01121	CB3901
R1113	315-0111-00	B020000		RES.,FXD,CMPSN:110 OHM,5%,0.25W	01121	CB1115
R1114	308-0564-00			RES.,FXD,WW:20K OHM,1%,4W		
R1116	311-1308-00			RES.,VAR,NONWIR:250 OHM,30%,0.25W		
R1118	301-0752-00			RES.,FXD,CMPSN:7.5K OHM,5%,0.50W	01121	EB7525
R1122	316-0221-00			RES.,FXD,CMPSN:220 OHM,10%,0.25W	01121	CB2211
R1123	316-0390-00	B010100	B019999	RES.,FXD,CMPSN:39 OHM,10%,0.25W	01121	CB3901
R1123	315-0511-00	B020000		RES.,FXD,CMPSN:110 OHM,5%,0.25W	01121	CB5115
R1124	308-0564-00			RES.,FXD,WW:20K OHM,1%,4W		
R1125	301-0272-00			RES.,FXD,CMPSN:2.7K OHM,5%,0.50W	01121	EB2725
R1126	321-0179-00			RES.,FXD,FILM:715 OHM,1%,0.125W	75042	CEAT0-7150F
R1128	301-0752-00			RES.,FXD,CMPSN:7.5K OHM,5%,0.50W	01121	EB7525
R1132	316-0221-00			RES.,FXD,CMPSN:220 OHM,10%,0.25W	01121	CB2211
R1133	316-0390-00	B010100	B019999	RES.,FXD,CMPSN:39 OHM,10%,0.25W	01121	CB3901
R1133	315-0111-00	B020000		RES.,FXD,CMPSN:110 OHM,5%,0.25W	01121	CB1115
R1134	308-0564-00			RES.,FXD,WW:20K OHM,1%,4W		
R1136	311-1308-00			RES.,VAR,NONWIR:250 OHM,30%,0.25W		
R1138	301-0752-00			RES.,FXD,CMPSN:7.5K OHM,5%,0.50W	01121	EB7525
R1200	311-1160-00			RES.,VAR,NONWIR:100K OHM,20%,0.25W		
R1202	315-0563-00			RES.,FXD,CMPSN:56K OHM,5%,0.25W	01121	CB5635
R1203	316-0103-00			RES.,FXD,CMPSN:10K OHM,10%,0.25W	01121	CB1031
R1206	315-0474-00			RES.,FXD,CMPSN:470K OHM,5%,0.25W	01121	CB4745
R1207	316-0822-00			RES.,FXD,CMPSN:8.2K OHM,10%,0.25W	01121	CB8221
R1208	316-0473-00			RES.,FXD,CMPSN:47K OHM,10%,0.25W	01121	CB4731
R1209	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R1222	316-0102-00			RES.,FXD,CMPSN:1K OHM,10%,0.25W	01121	CB1021
R1223	316-0472-00			RES.,FXD,CMPSN:4.7K OHM,10%,0.25W	01121	CB4721
R1226	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1227	321-0399-00			RES.,FXD,FILM:140K OHM,1%,0.125W	75042	CEAT0-1403F
R1231	316-0472-00			RES.,FXD,CMPSN:4.7K OHM,10%,0.25W	01121	CB4721
R1232	316-0274-00			RES.,FXD,CMPSN:270K OHM,10%,0.25W	01121	CB2741
R1234	304-0223-00			RES.,FXD,CMPSN:22K OHM,10%,1W	01121	GB2231
R1236	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1239	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1242	316-0223-00			RES.,FXD,CMPSN:22K OHM,10%,0.25W	01121	CB2231
R1243	316-0105-00			RES.,FXD,CMPSN:1M OHM,10%,0.25W	01121	CB1051
R1245	311-1205-00			RES.,VAR,NONWIR:2M OHM,30%,0.25W		
R1248	316-0223-00			RES.,FXD,CMPSN:22K OHM,10%,0.25W	01121	CB2231
R1251	307-0058-00			RES.,FXD,CMPSN:5.6 OHM,5%,0.50W		
R1252	308-0075-00			RES.,FXD,WW:100 OHM,5%,3W	91637	RS2B-B100ROJ
R1254	308-0690-00			RES.,FXD,WW:3 OHM,10%,3W		
R1257	306-0104-00			RES.,FXD,CMPSN:100K OHM,10%,2W	01121	HB1041
R1262	302-0472-00			RES.,FXD,CMPSN:4.7K OHM,10%,050W	01121	EB4721
R1263	316-0183-00			RES.,FXD,CMPSN:18K OHM,10%,0.25W	01121	CB1831

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R1266	316-0334-00			RES.,FXD,CMPSN:330K OHM,10%,0.25W	01121	CB3341
R1267	316-0333-00			RES.,FXD,CMPSN:33K OHM,10%,0.25W	01121	CB3331
R1268	316-0103-00			RES.,FXD,CMPSN:10K OHM,10%,0.25W	01121	CB1031
R1269	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1270	316-0223-00			RES.,FXD,CMPSN:22K OHM,10%,0.25W	01121	CB2231
R1271	316-0395-00			RES.,FXD,CMPSN:3.9M OHM,10%,0.25W	01121	CB3951
R1272A				40M OHM		
R1272B				150K OHM		
R1272C	307-0296-00			RES.,FXD,FILM:13 M OHM		
R1272D				4M OHM		
R1272E				2.2M OHM		
R1273	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R1274	316-0105-00			RES.,FXD,CMPSN:1M OHM,10%,0.25W	01121	CB1051
R1275	311-1136-00			RES.,VAR,NONWIR:100K OHM,30%,0.25W	71450	X201R104B
R1276	316-0105-00			RES.,FXD,CMPSN:1M OHM,10%,0.25W	01121	CB1051
R1278	316-0562-00			RES.,FXD,CMPSN:5.6K OHM,10%,0.25W	01121	CB5621
R1279	316-0104-00			RES.,FXD,CMPSN:100K OHM,10%,0.25W	01121	CB1041
R1282	315-0163-00			RES.,FXD,CMPSN:16K OHM,5%,0.25W	01121	CB1635
R1285	311-1136-00			RES.,VAR,NONWIR:100K OHM,30%,0.25W	71450	X201R104B
R1286	311-1136-00			RES.,VAR,NONWIR:100K OHM,30%,0.25W	71450	X201R104B
R1287	301-0183-00			RES.,FXD,CMPSN:18K OHM,5%,0.50W	01121	EB1835
R1291	311-1189-00			RES.,FAR,WW:5K OHM,20%,0.50W		
R1295	311-0254-00			RES.,VAR,NONWIR:5M OHM,10%,0.20W	12697	CM29709
S1125	260-0688-00			SWITCH,PUSH:DPDT,BEAM FINDER	82389	12S1025D
S1200	260-0227-00			SW THERMOSTATIC:OPEN 73.9 DEG,CLOSE 51.7 DEG C		
S1201	260-1222-00			SWITCH,PUSH-PUL:POWER	91929	2DM301
T1240	120-0761-00			XFRM:HV POWER		
V1291	154-0633-00	B010100	B010149	ELECTRON TUBE:CRT		
V1291	154-0633-05	B010150		ELECTRON TUBE:CRT		
VR1237	152-0283-00			SEMICOND DEVICE:ZENER,0.4W,43V,5%	04713	1N976B
VR1258	152-0438-00			SEMICOND DEVICE,ZENER:3W,9.1V,5%		
VR1281	152-0357-00			SEMICOND DEVICE:ZENER,0.4W,82V,5%	04713	1N983B
VR1282	152-0255-00			SEMICOND DEVICE:ZENER,0.4W,51V,5%	04713	1N978B

DIAGRAMS AND CIRCUIT BOARDS ILLUSTRATIONS

Symbols and Reference Designators

Electrical components shown on the diagrams are in the following units unless noted otherwise:

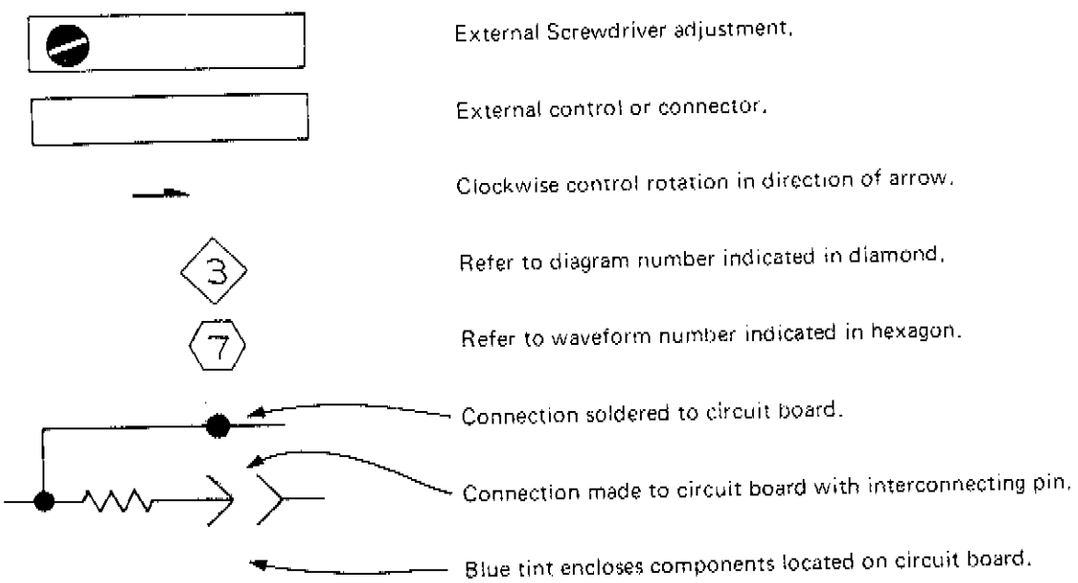
Capacitors = Values one or greater are in picofarads (pF). Values less than one are in microfarads (μF).

Resistors = Ohms (Ω)

Symbols used on the diagrams are based on USA Standard Y32.2-1967.

Logic symbology is based on MIL-STD-806B in terms of positive logic. Logic symbols depict the logic function performed and may differ from the manufacturer's data.

The following special symbols are used on the diagrams:



External Screwdriver adjustment.

External control or connector.

Clockwise control rotation in direction of arrow.

Refer to diagram number indicated in diamond.

Refer to waveform number indicated in hexagon.

Connection soldered to circuit board.

Connection made to circuit board with interconnecting pin.

Blue tint encloses components located on circuit board.

The following prefix letters are used as reference designators to identify components or assemblies on the diagrams.

A	Assembly, separable or repairable (circuit board, etc.)
AT	Attenuator, fixed or variable
B	Motor
BT	Battery
C	Capacitor, fixed or variable
CR	Diode, signal or rectifier
DL	Delay line
DS	Indicating device (lamp)
F	Fuse
FL	Filter
H	Heat dissipating device (heat sink, heat radiator, etc.)
HR	Heater
J	Connector, stationary portion
K	Relay
L	Inductor, fixed or variable
LR	Inductor/resistor combination
M	Meter
Q	Transistor or silicon-controlled rectifier
P	Connector, movable portion
R	Resistor, fixed or variable
RT	Thermistor
S	Switch
T	Transformer
TP	Test point
U	Assembly, inseparable or non-repairable (integrated circuit, etc.)
V	Electron tube
VR	Voltage regulator (zener diode, etc.)
Y	Crystal

(A)

Voltage and Waveform Test Conditions

577-177-D1 or D2

Voltages and waveforms (shown in blue) in the diagrams are not absolute and may vary from instrument to instrument because of differing component tolerances or internal calibration.

Typical DC voltage measurements were obtained using the following settings:

577-D1 or D2

VARIABLE COLLECTOR %	0
COLLECTOR SUPPLY POLARITY	AC
SERIES RESISTORS	.12
MAX PEAK VOLTS	6.5
STEP/OFFSET AMPL	1 VOLT
HORIZ VOLTS/DIV	200 V, COLLECTOR

All Dark Gray Buttons and Knobs in except:

STEP FAMILY	SINGLE
All Light Gray Buttons	out
INTENSITY	midrange
FOCUS	clockwise
BRIGHTNESS	clockwise
STORE buttons	out

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Terminal Selector	EMITTER GROUNDED, BASE TERM, STEP GEN
VERTICAL CURRENT/DIV	2 A

The waveforms shown are idealized. The waveforms actually observed may vary somewhat from these idealized waveforms.

The waveforms shown were obtained using the same settings as for voltage measurements, with the following exceptions:

STEP FAMILY	REP
BRIGHTNESS	centered

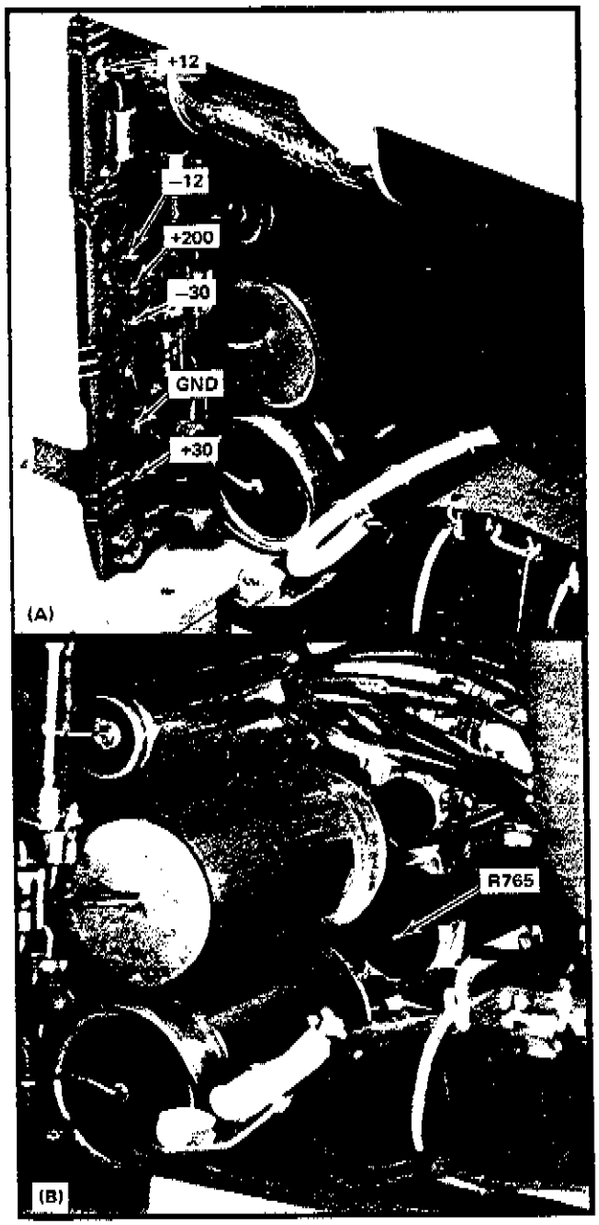

Fig. 7-1. (A) Location of test points on the Power Supply circuit board. (B) Location of R765.

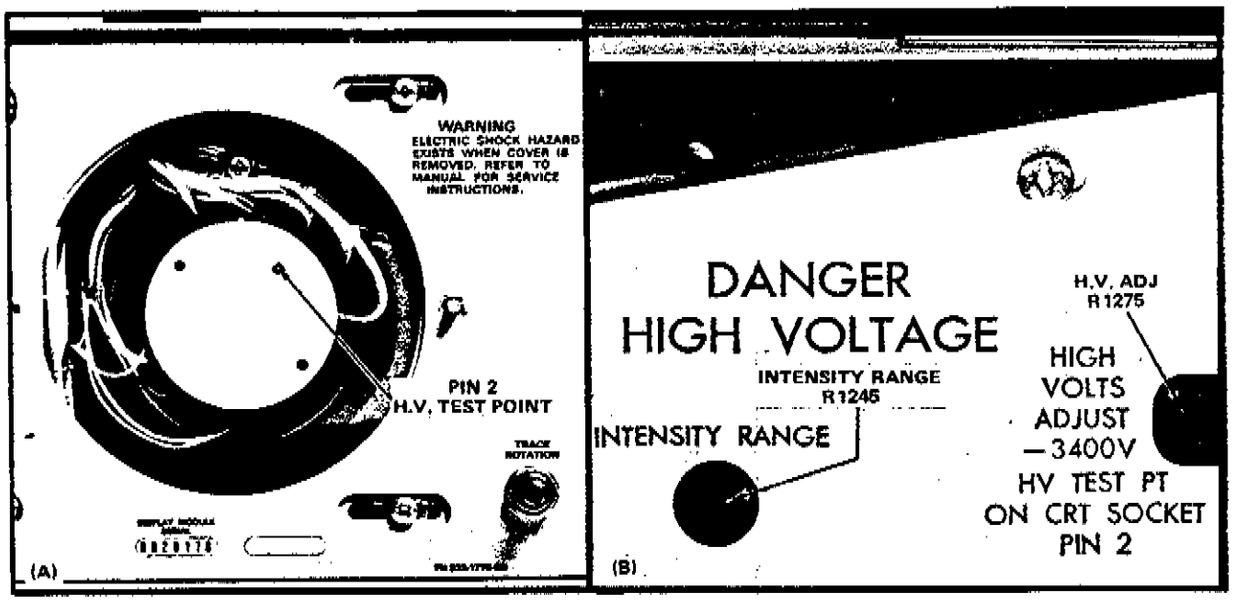

Fig. 7-2. Location of (A) CRT socket access and (B) R1275, H V Adj R1245, Intensity Range.

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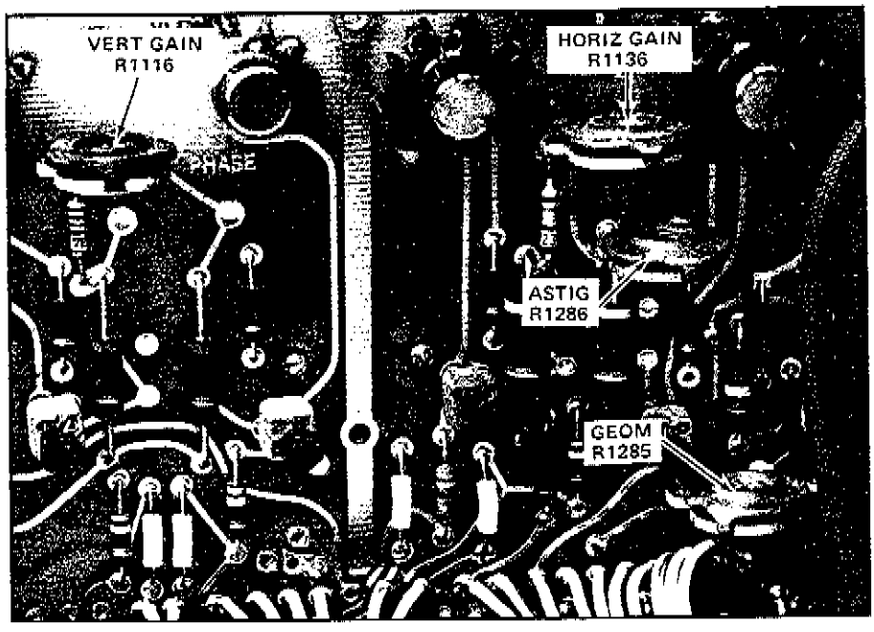


Fig. 7-3. Location of VERT GAIN, HORIZ GAIN, ASTIG, and GEOM controls.

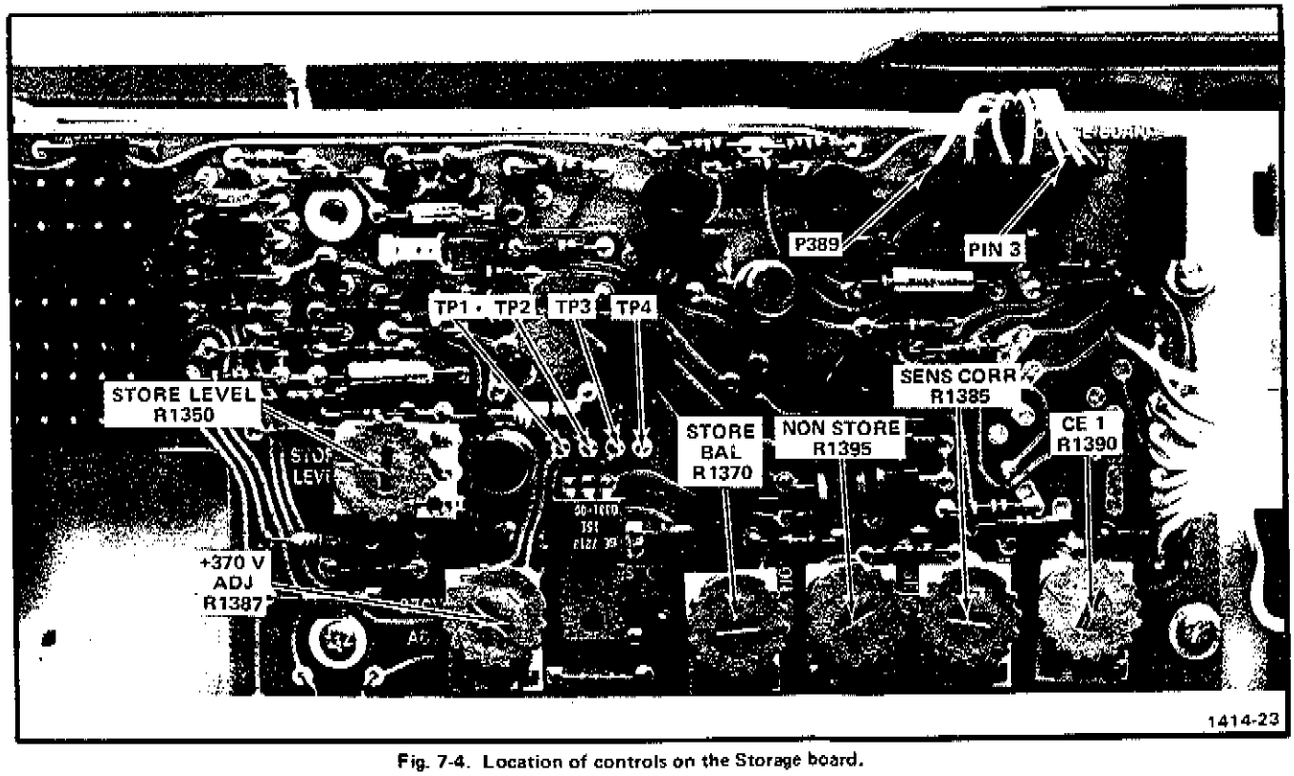


Fig. 7-4. Location of controls on the Storage board.

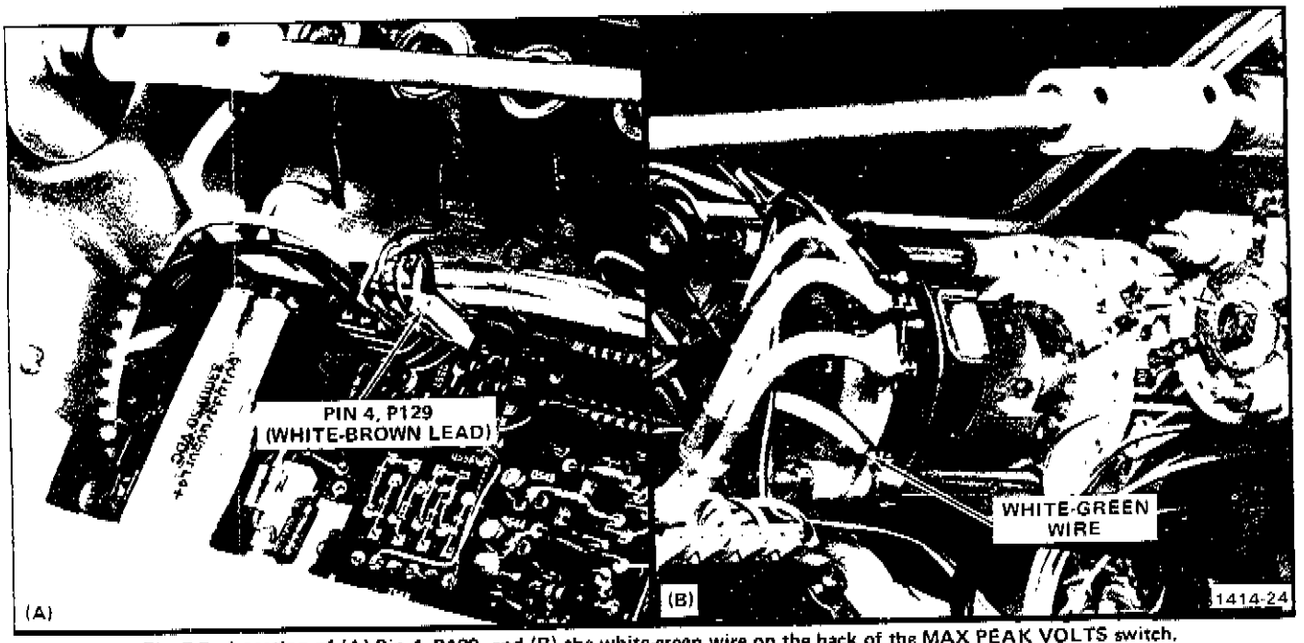


Fig. 7-5. Location of (A) Pin 4, P129, and (B) the white-green wire on the back of the MAX PEAK VOLTS switch.

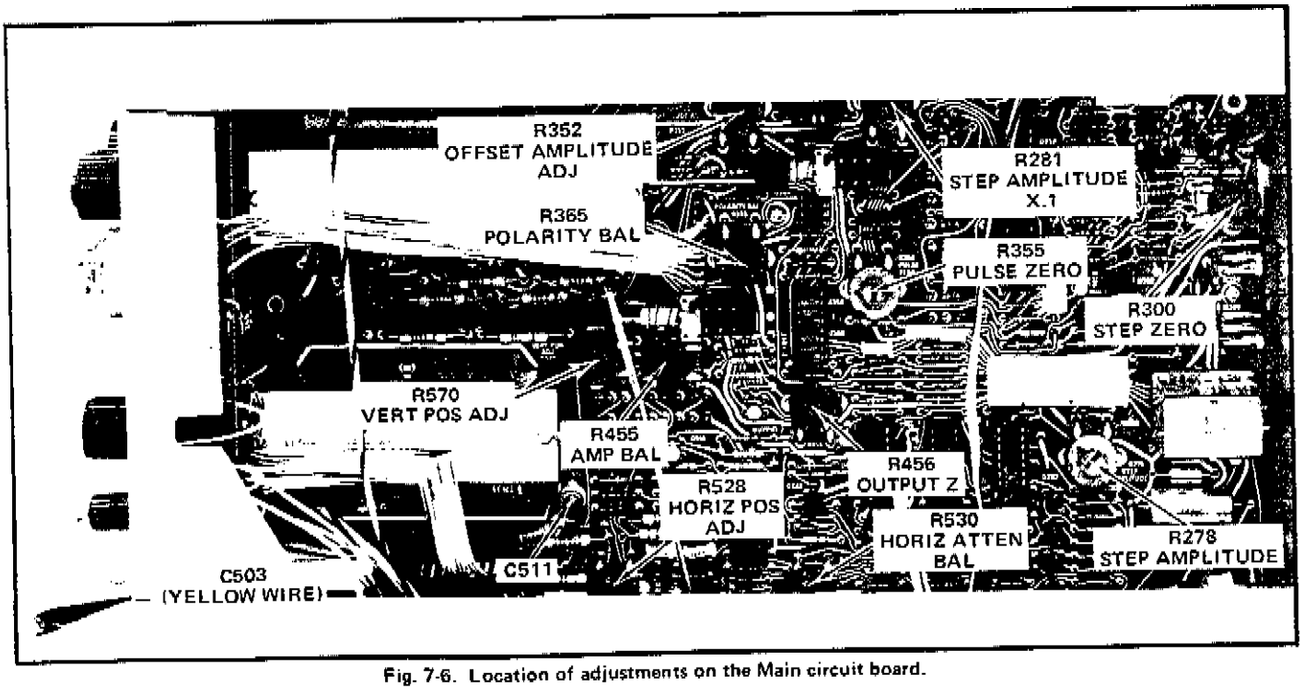
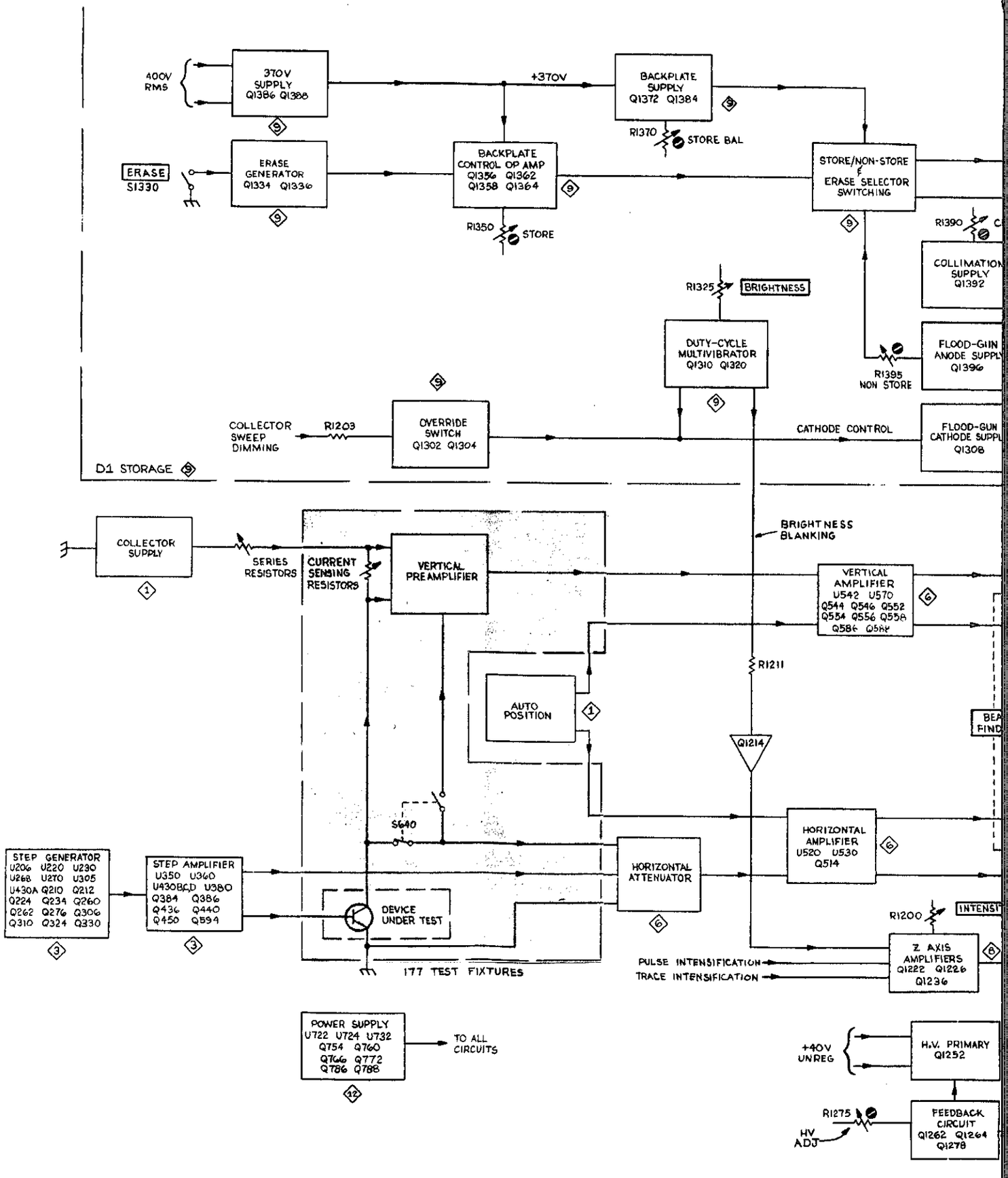


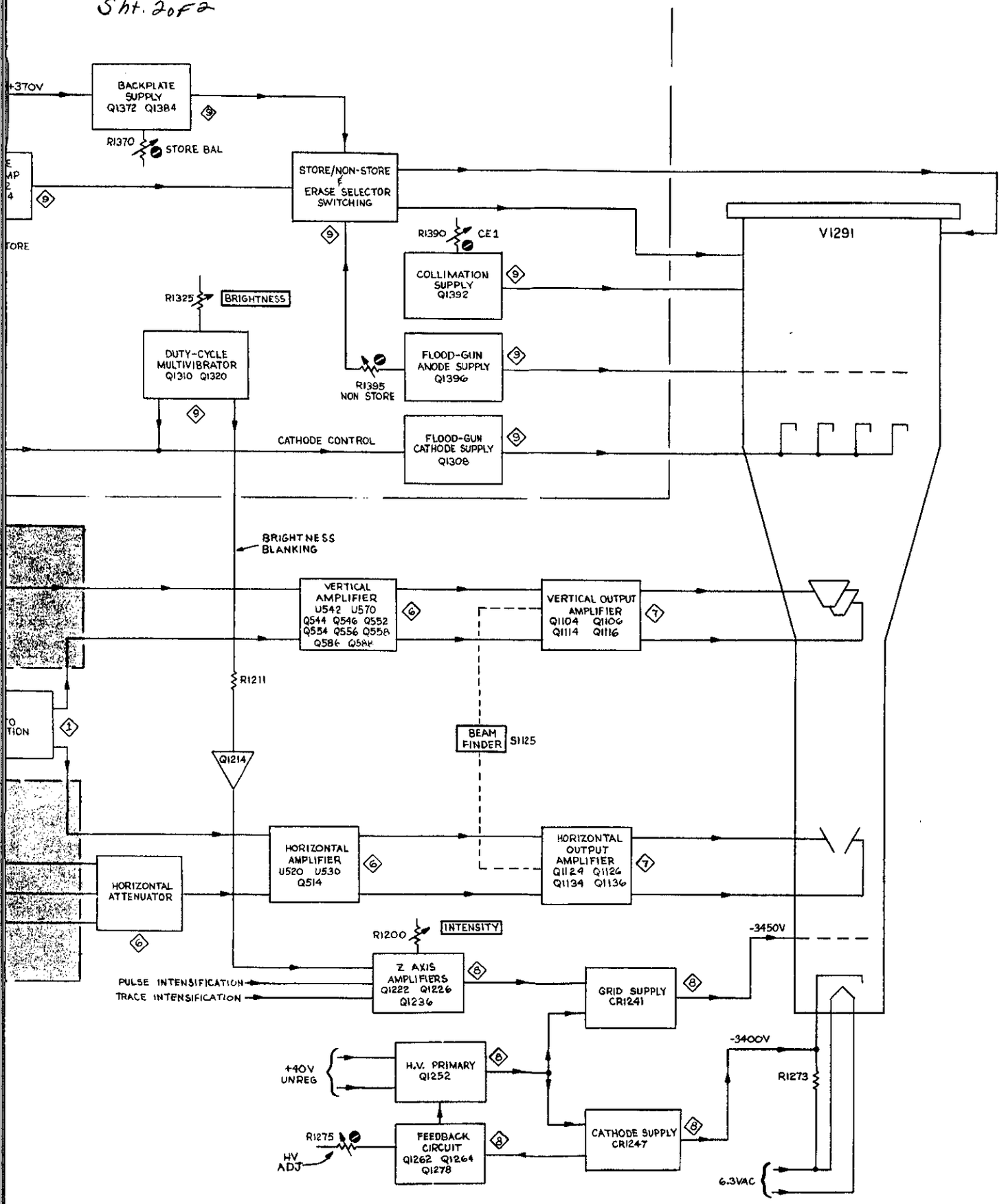
Fig. 7-6. Location of adjustments on the Main circuit board.

ADJUSTMENT LOCATIONS

BLOCK DIAGRAM
Sht. 1 OF 2



BLOCK DIAGRAM
Sht. 2 of 2



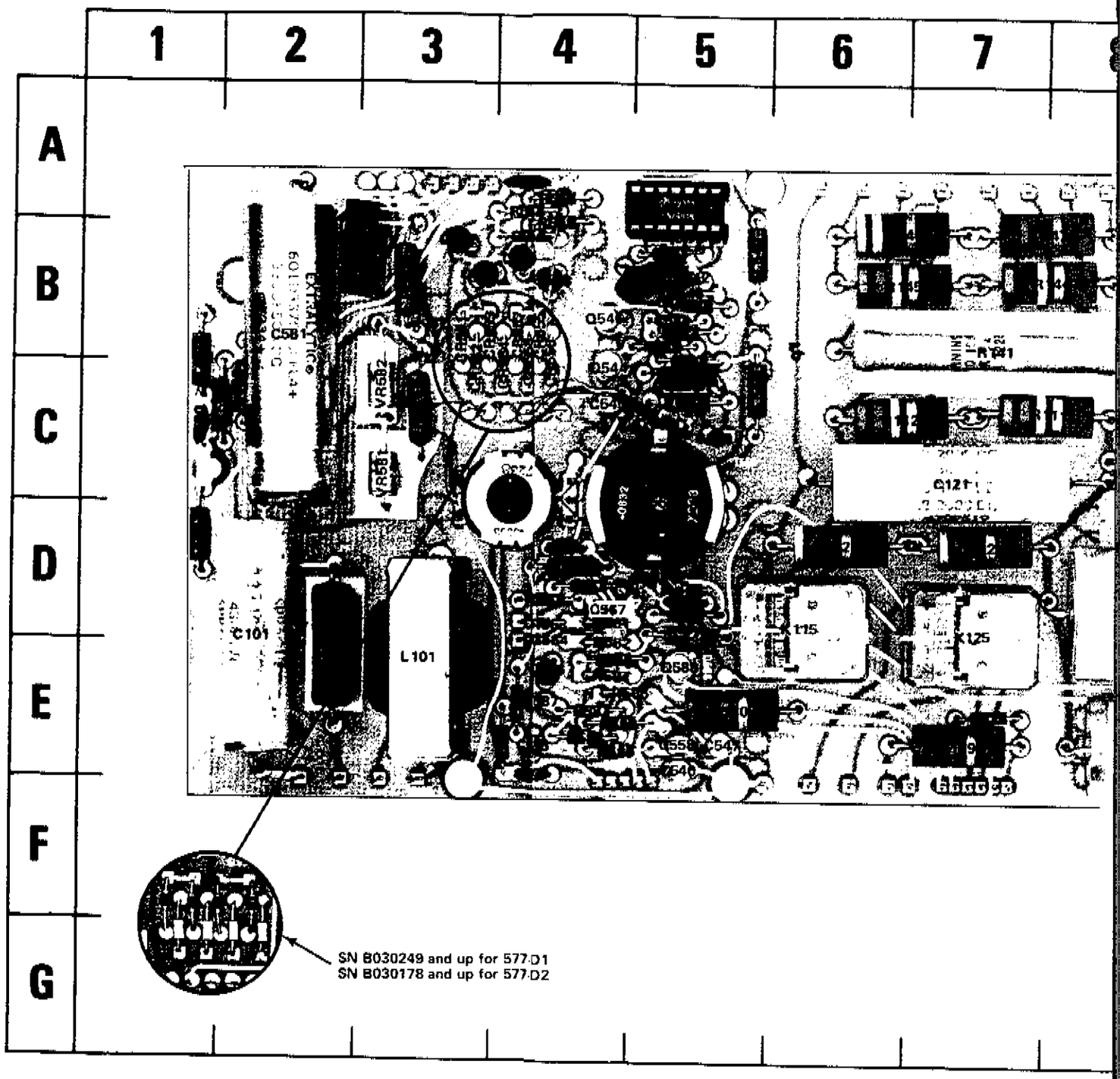
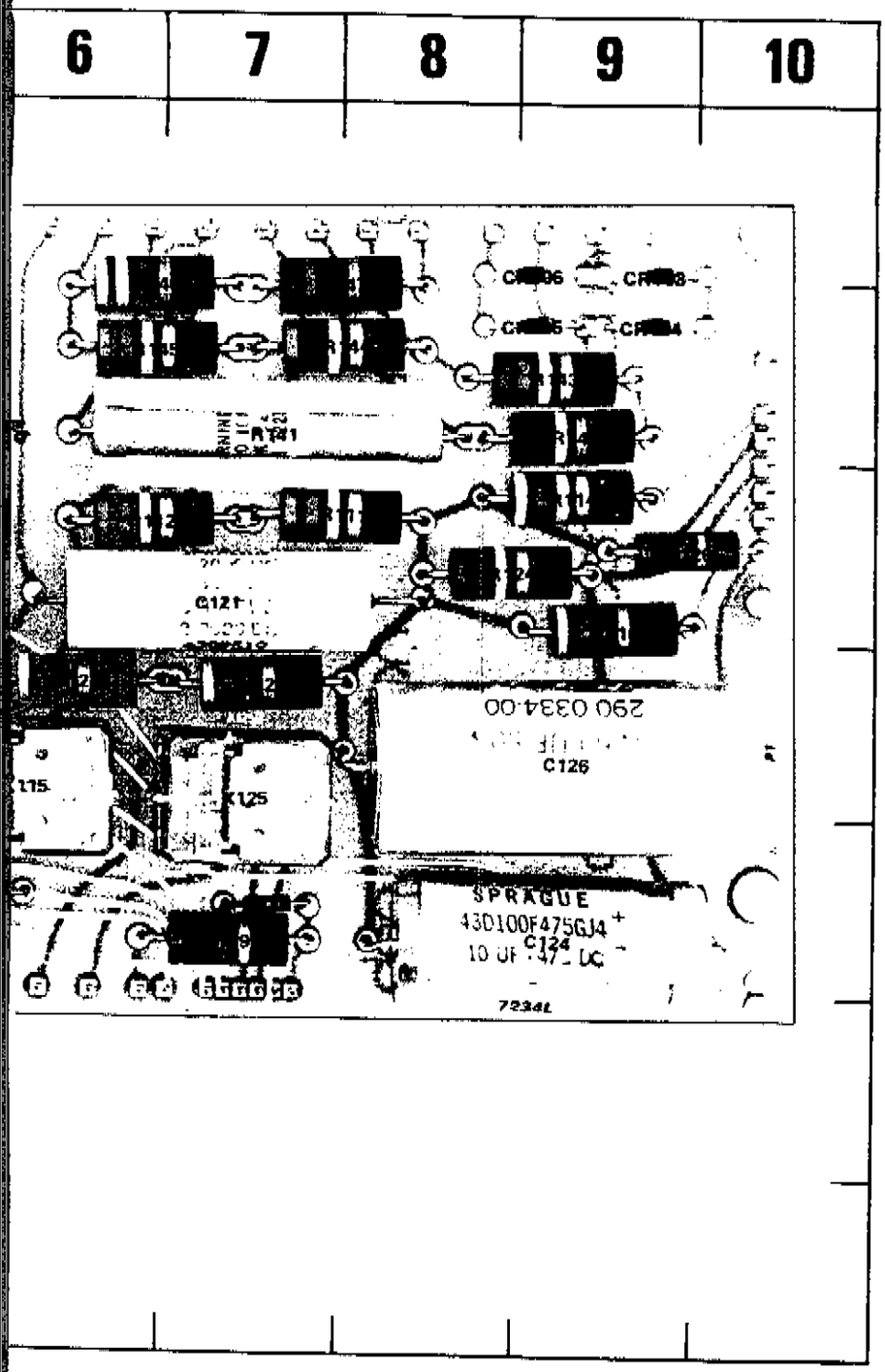


Fig. 7-7. A2 Collector Supply circuit board.

GRID LOCATOR

Fig. 7-7
Sht. 2 of 2



circuit board.

CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
C101	2D	K115	6D	R147	7B
C121	7C	K125	7D	R541	5B
C124	9E			R542	5B
C126	9D	L101	3E	R544	5B
C540	5E	L540	5B	R545	5B
C541	5B	L545	5C	R546	5B
C544	5B	L547	5D	R547	5B
C545	4C	L550	1B	R548	5C
C546	5B	L551	1D	R549	5C
C547	5E	L552	1C	R552	4A
C548	5C	L553	2C	R554	4B
C549	5C	L564	4D	R556	4A
C550	1C			R558	4A
C551	4A	Q544	4B	R560	4E
C558	5E	Q546	4B	R561	4D
C562	5D	Q552	3B	R562	5D
C564	4D	Q554	3B	R563	4D
C565	4E	Q556	4B	R564	4E
C567	4D	Q558	4B	R581	3C
C581	2B	Q586	4E	R583	3B
C587	4E	Q588	5E	R584	4E
C588	4E			R585	4E
		R101	2E	R586	4E
CR103	9A	R111	8C	R587	4E
CR104	9B	R112	6C	R588	4E
CR105	9B	R114	9C		
CR106	9A	R116	9C	T550	5C
CR551	3B	R121	6D	T560	4C
CR552	3C	R122	7D		
CR553	3B	R124	8C	U542	5A
CR554	4C	R126	9C		
CR555	4B	R128	7E	VR581	3C
CR556	4C	R129	7E	VR582	3C
CR557	4C	R130	5E		
CR558	4C	R141	7B		
CR561	4D	R142	9B		
CR562	4D	R143	9B		
CR563	4D	R144	7B		
CR564	4D	R145	6B		
CR577	4B	R146	6B		
CR582	2B				
CR584	4E				
CR586	4E				

ID LOCATOR

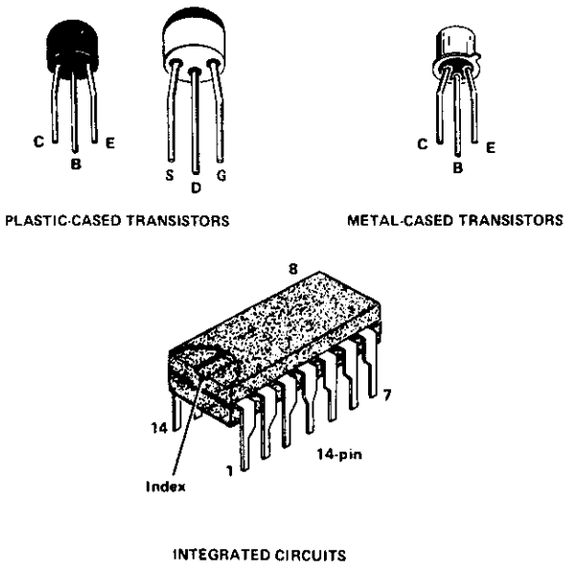
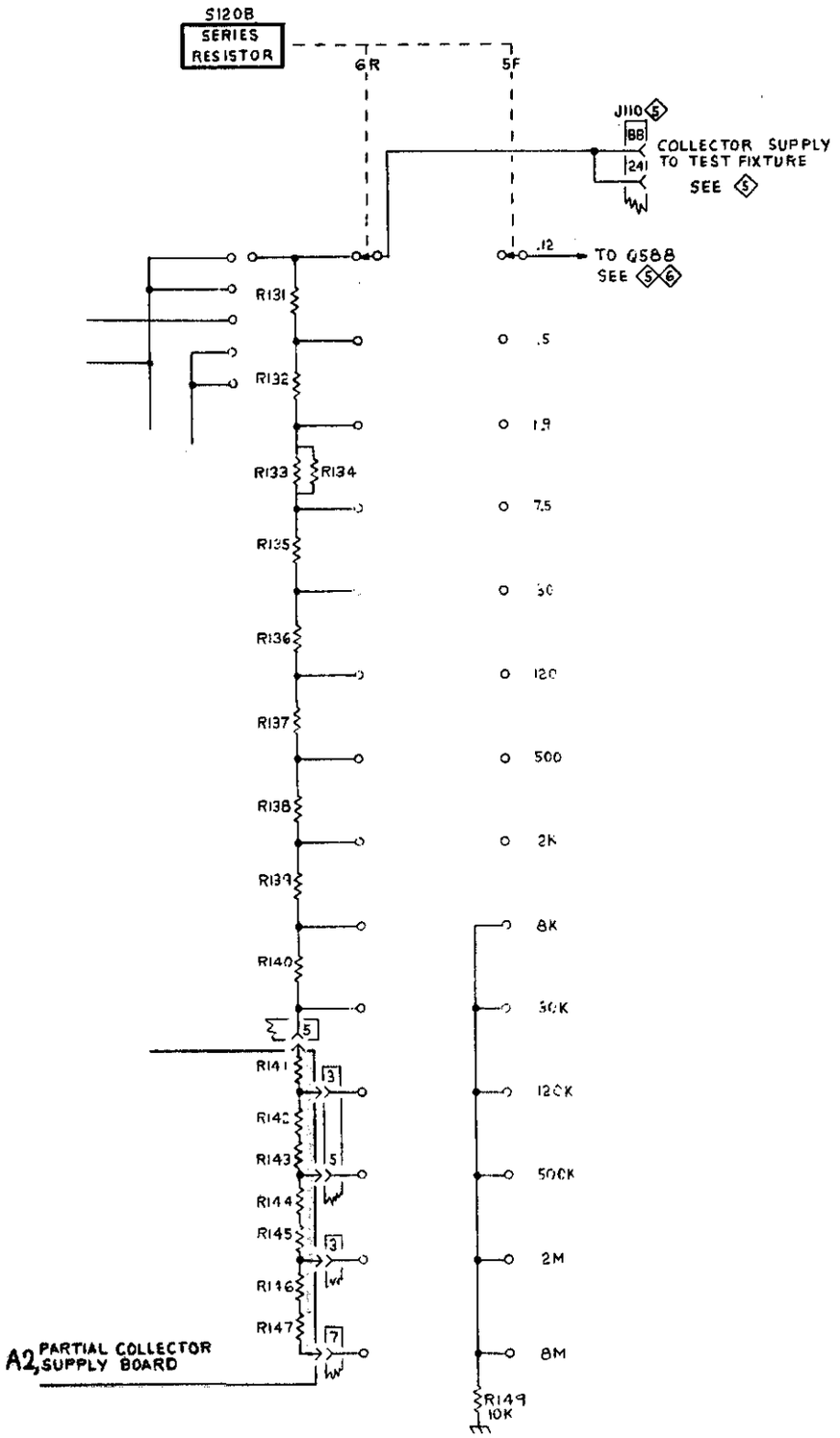


Fig. 7-8. Semiconductor lead configuration for Collector Supply circuit board.

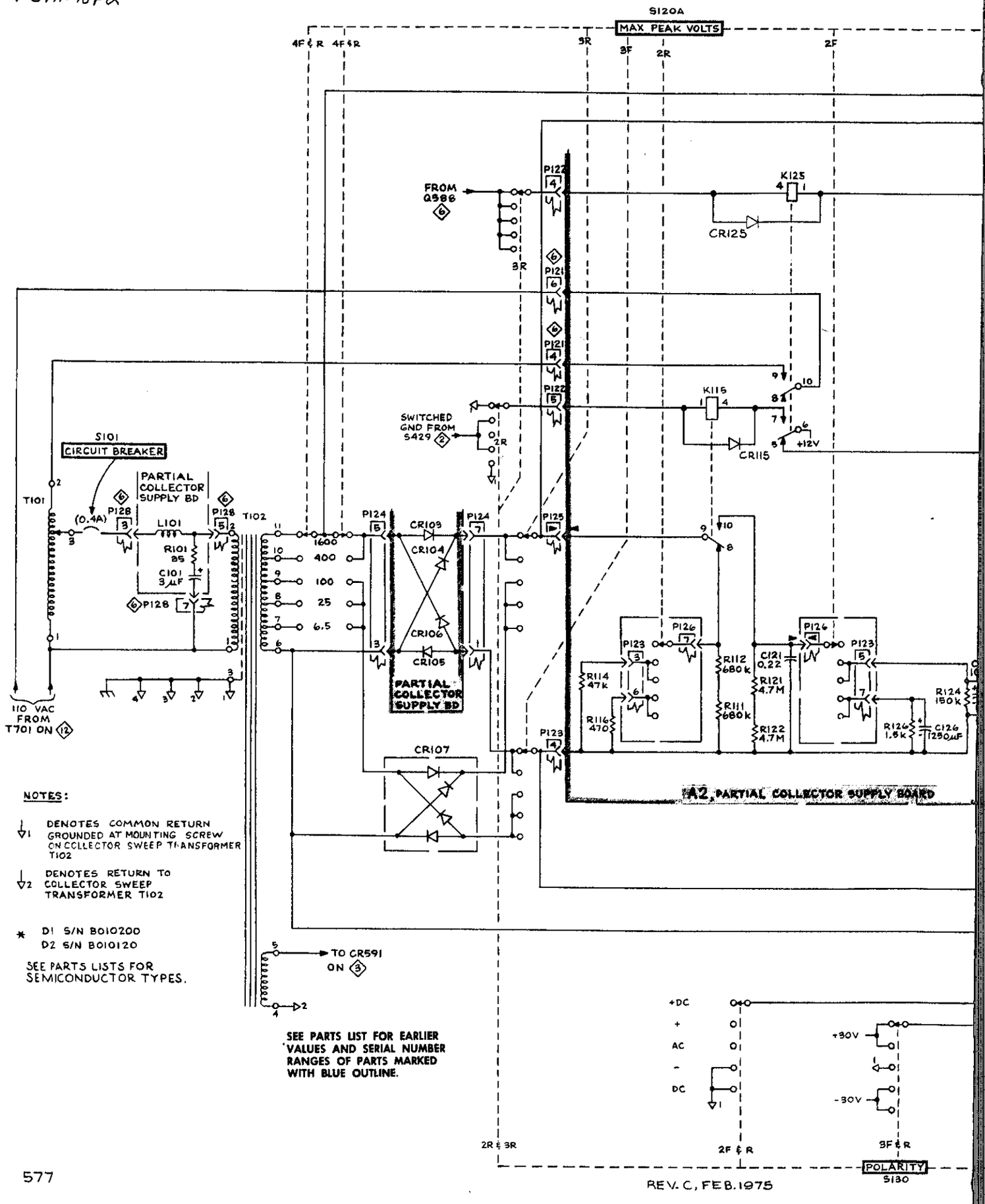


Ⓐ

D1 SN B010100 TO B 10199
D2 SN B010100 TO B010119

COLLECTOR SUPPLY ADDENDUM TO ◇1

1 Sht. 1 of 2



NOTES:

1. DENOTES COMMON RETURN GROUNDED AT MOUNTING SCREW ON COLLECTOR SWEEP TRANSFORMER T102

2. DENOTES RETURN TO COLLECTOR SWEEP TRANSFORMER T102

* D1 S/N B010200
D2 S/N B010120

SEE PARTS LISTS FOR SEMICONDUCTOR TYPES.

SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS MARKED WITH BLUE OUTLINE.

REV. C, FEB. 1975

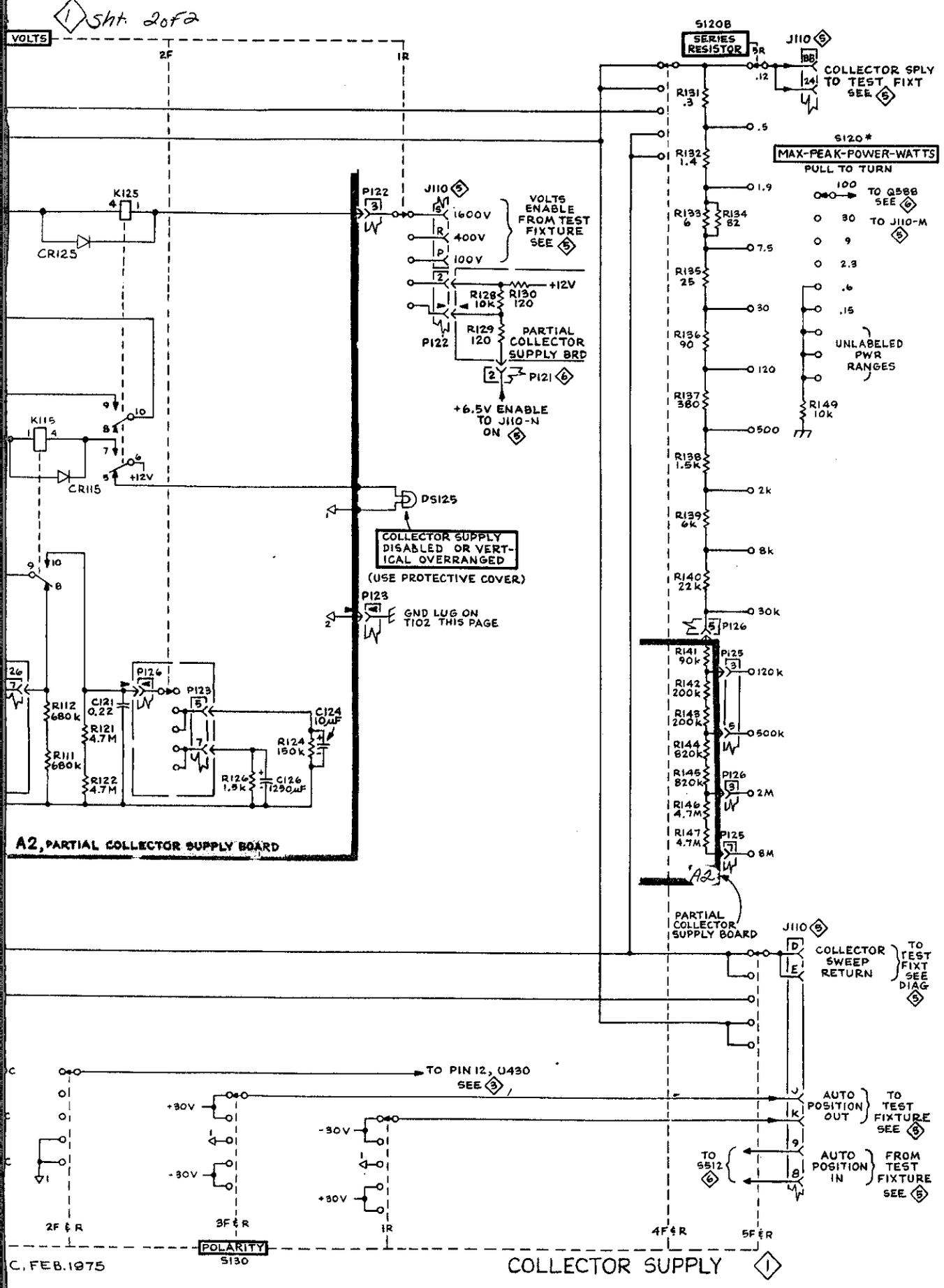

1 Sht. 2 of 2
VOLTS
2F
1R
S120B
SERIES RESISTOR
J110
COLLECTOR SPLY TO TEST FIXT SEE 5
S120*
MAX-PEAK-POWER-WATTS
PULL TO TURN
TO Q588 SEE 6
TO J110-M 5
UNLABELED PWR RANGES
R131 .3
R132 1.4
R133 6
R134 82
R135 25
R136 90
R137 380
R138 1.5k
R139 6k
R140 22k
R141 90k
R142 200k
R143 200k
R144 620k
R145 820k
R146 4.7M
R147 4.7M
R149 10k
P122
P121
P123
P124
P125
P126
K125
K115
CR125
CR115
+12V
VOLTS ENABLE FROM TEST FIXTURE SEE 5
1600V
400V
100V
R128 10k
R130 120
R129 120
PARTIAL COLLECTOR SUPPLY BRD
+6.5V ENABLE TO J110-N ON 5
DS125
COLLECTOR SUPPLY DISABLED OR VERTICAL OVERRANGED
(USE PROTECTIVE COVER)
GND LUG ON T102 THIS PAGE
R112 680k
R111 680k
R121 4.7M
R122 4.7M
C121 0.22
R124 150k
R126 1.5k
C124 10μF
C126 1200μF
A2, PARTIAL COLLECTOR SUPPLY BOARD
A2
PARTIAL COLLECTOR SUPPLY BOARD
COLLECTOR SWEEP RETURN
TO TEST FIXT SEE DIAG 5
TO PIN 12, U430 SEE 3
+30V
-30V
AUTO POSITION OUT
AUTO POSITION IN
TO TEST FIXTURE SEE 5
TO S512 6
FROM TEST FIXTURE SEE 5
2F & R
3F & R
1R
4F & R
5F & R
POLARITY S130
C, FEB. 1975
COLLECTOR SUPPLY 1

Fig. 7-9
Sht. 1 of 2

ASSEMBLY A1

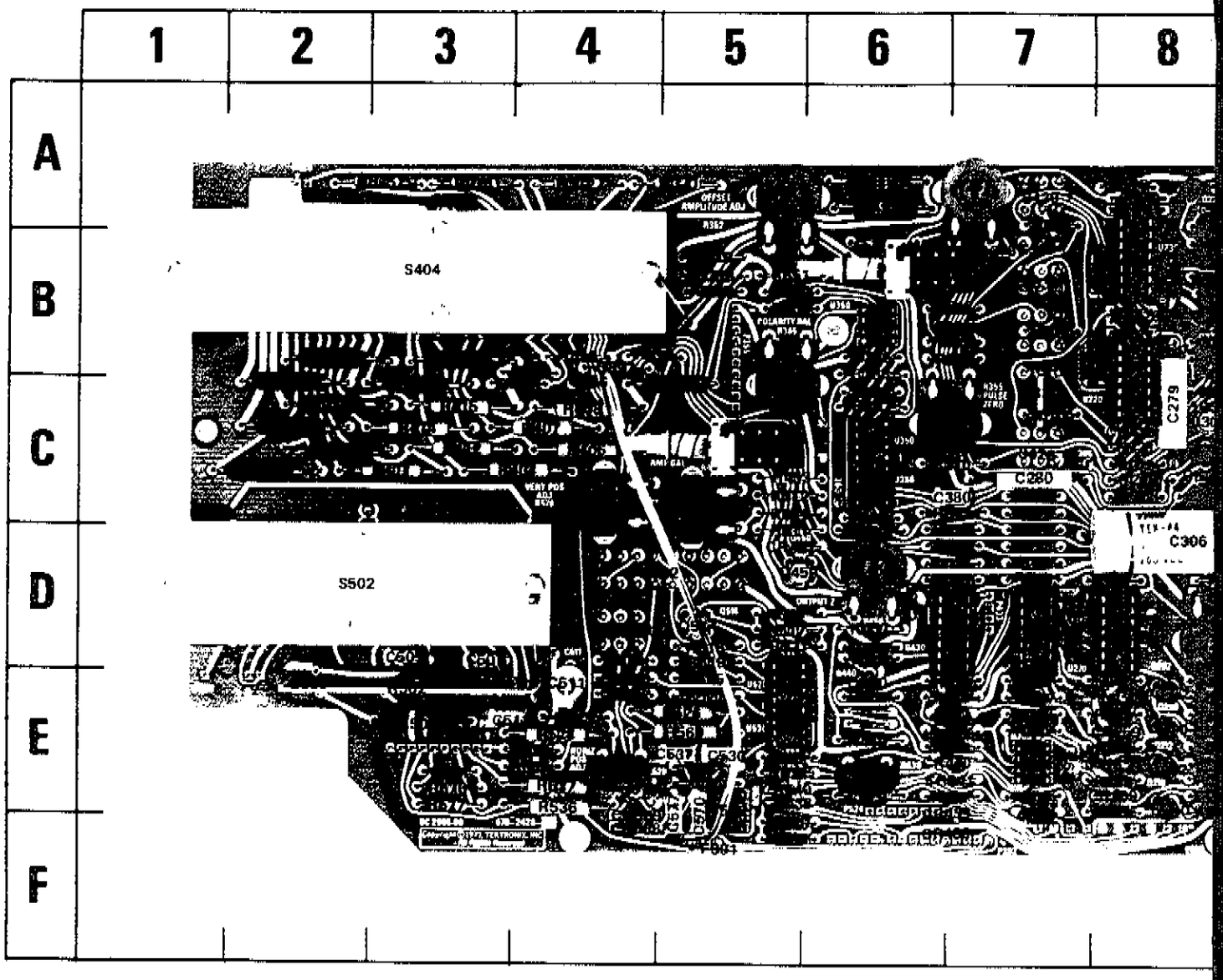
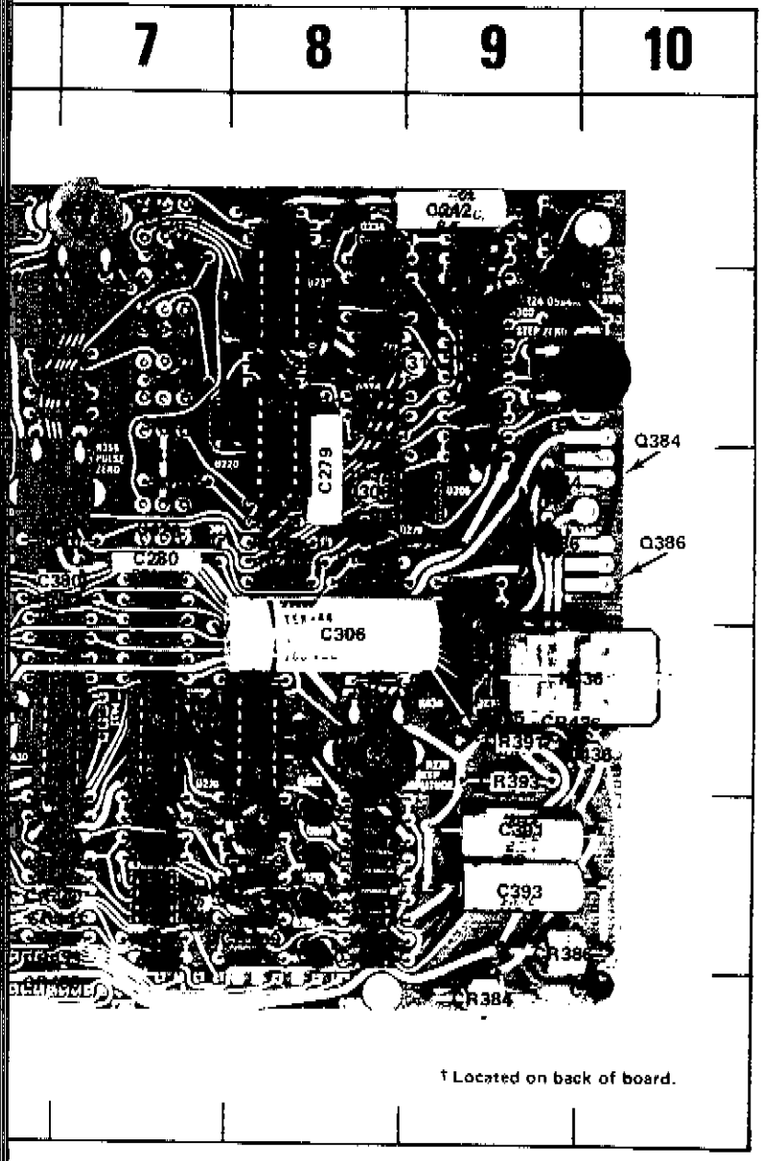


Fig. 7-9. A1 Main circuit board.

*See Parts List for serial number ranges.

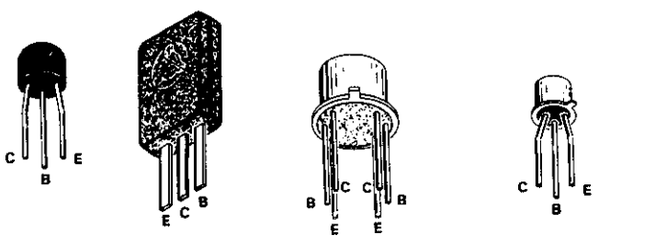
GRID LOCATOR

Fig. 7-9
Sht. 20F2



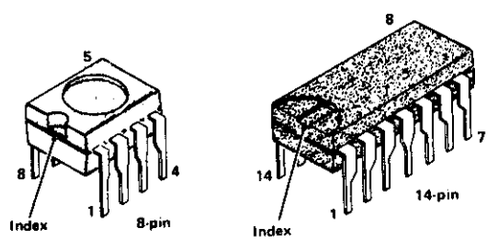
† Located on back of board.

CKT NO	GRID LOC
C201	7E
C206	7E
C215	8E
C218	8E
C231	8B
C242	9A
C264	7D
C265	8E
C268	7E
C270	7D
C273	8D
C276	9C
C279	8C
C291	8B
C293	7E
C294	7D
C295	9B
C297	10F
C299	8D
C306	8D
C321	7B
C332	7B
C380	7C
C382	5C
C384	9C
C386	9C
C391	9E
C393	9E
C396	4C
C503	2E
C505	3D
C507	3D
C509	4E
C511	4E
C513	3E
C530	5E
C537	5E
C568	4E
C569	4E
C570	5F
C577	5F
C591	9A
C596	10B
CR209	8E
CR221	8C
CR230	8B
CR234	8B
CR241	8A
CR259	8E
CR277	8D
CR278	7B
CR322	8B
CR326	8B
CR330	8C
CR384	9F
CR386	9E
CR391	9D
CR393	9D
CR429	8C
CR436	7E
CR438	6E
CR439	6E
CR440	6E
CR441	7E
CR452	5D
CR512	4E
CR513	4E
CR538	5E
CR540	5E
CR568	4F
CR569	4E
CR591	10B
F391	F5
K436	10D
L579	6E
Q210	8E
Q212	8E
Q224	9B
Q234	8A
Q260	8E
Q262	8E
Q276	8C
Q306	8C
Q310	9B
Q324	8B
Q330	8B
Q384	10C
Q386	10C
Q436	10D
Q440	6D
Q450	5D
Q514	5D
Q594	9B
R201	7E
R202	7E
R203	7E
R204	7E
R206	7E
R208	8E
R209	8E
R211	8E
R212	8E
R213	8E
R214	8E
R215	7E
R216	7D
R218	7E
R221	8C
R222	7C
R224	7D
R225	7D
R227	7C
R228	7C
R230	8B
R231	8B
R232	8A
R234	8B
R235	8A
R237	8A
R241	8A
R242	9A
R243	9A
R244	9B
R258	8E
R259	8E
R261	8E
R262	8E
R263	8E
R264	8E
R265	7E
R266	7D
R268	7E
R269	8E
R273	8E
R274	8C
R276	8C
R278	8D
R279	8C
R281	7A
R300	10B
R303	9B
R304	9C
R305	8B
R308	9B
R310	7C
R312	7B
R313	8C
R316	5B
R318	5B
R319	5B
R320	6C
R321	8B
R322	7C
R323	8B
R324	9B
R326	7A
R327	8C
R329	9B
R331	7B
R332	7B
R351	5A
R352	5A
R353	7B
R354	6B
R355	6C
R356	6B
R357	6C
R358	6C
R313	8C
R361	7C
R362	5B
R363	6D
R364	5B
R365	5C
R371	5A
R372	4A
R374	3A
R375	3A
R380	6C
R381	9C
R382	9C
R387	9C
R388	6A
R389	6A
R391	4B
R393	5C
R396	4B
R397	4B
R404	4C
R405	4C
R407	4C
R408	4C
R411	3C
R412	3C
R414	3C
R415	3C
R417	3C
R418	3B
R421	2C
R422	2C
R424	2B
R425	2C
R426	2C
R427	2C
R430	7D
R431	7D
R432	7D
R433	6D
R434	7D
R435	9D
R438	6D
R439	6E
R440	7E
R450	5C
R451	4C
R452	4C
R453	5C
R455	5C
R456	6D
R457	6D
R459	6E
R501	3E
R502	3E
R511	5D
R512	5C
R513	4D
R514	5D
R515	5E
R517	5D
R518	5D
R519	5D
R521	5D
R523	4E
R524	4E
R526	5E
R527	5E
R528	4E
R530	6E
R531	5E
R532	5E
R534	4E
R536	4E
R537	4E
R538	5F
R539	4E
R540	5F
R545	9B
R567	5E
R568	5E
R569	5E
R570	4C
R574	3E
R576	3E
R577	3E
R591	9A
R592	9A
R594	9B
R596	9B
R597	9B
S310	6B
S329	7B
S330	7B
S404	3B
S426	7C
S428	7C
S429	7A
S430	5C
S502	2D
S512	5D
S568	4D
U206	7E
U220	8B
U230	8B
U268	7D
U270	8D
U305	9C
U350	6C
U360	6B
U380	6C
U430	7D
U520	5E
U530	5E
U570	5E



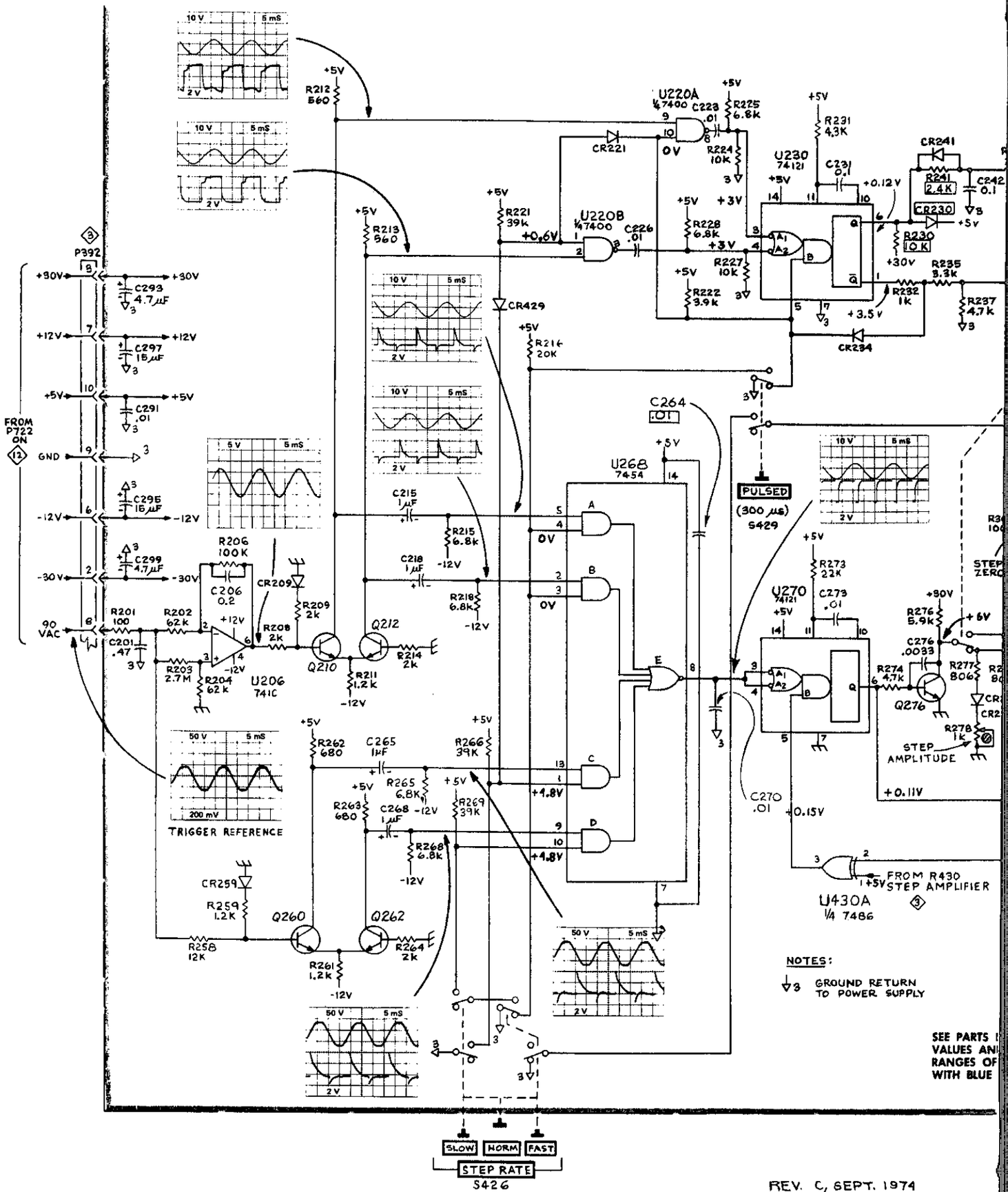
PLASTIC-CASED TRANSISTORS

METAL-CASED TRANSISTORS

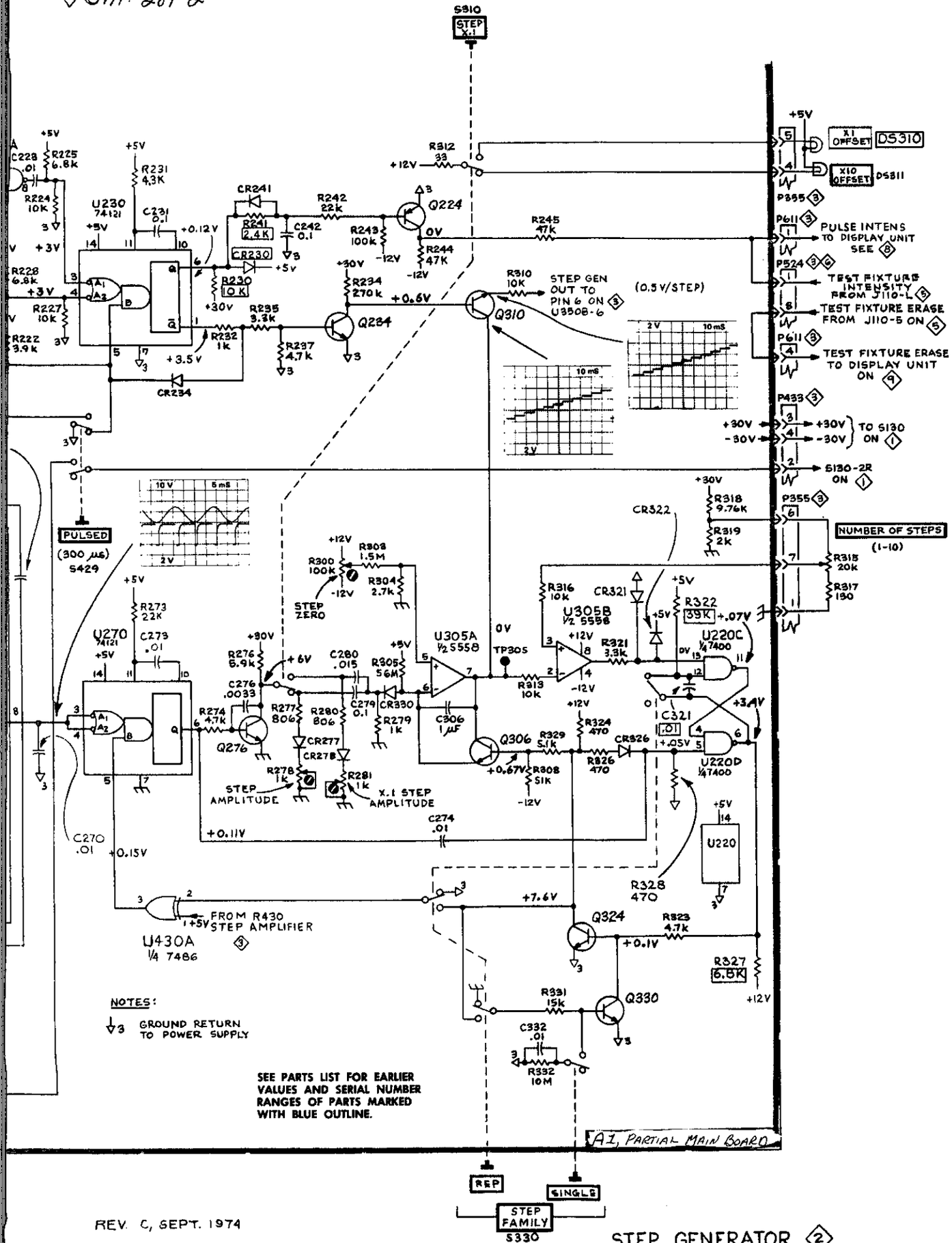


INTEGRATED CIRCUITS

Fig. 7-10. Semiconductor lead configuration for Main circuit board.



REV. C, SEPT. 1974



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STEP GENERATOR 2

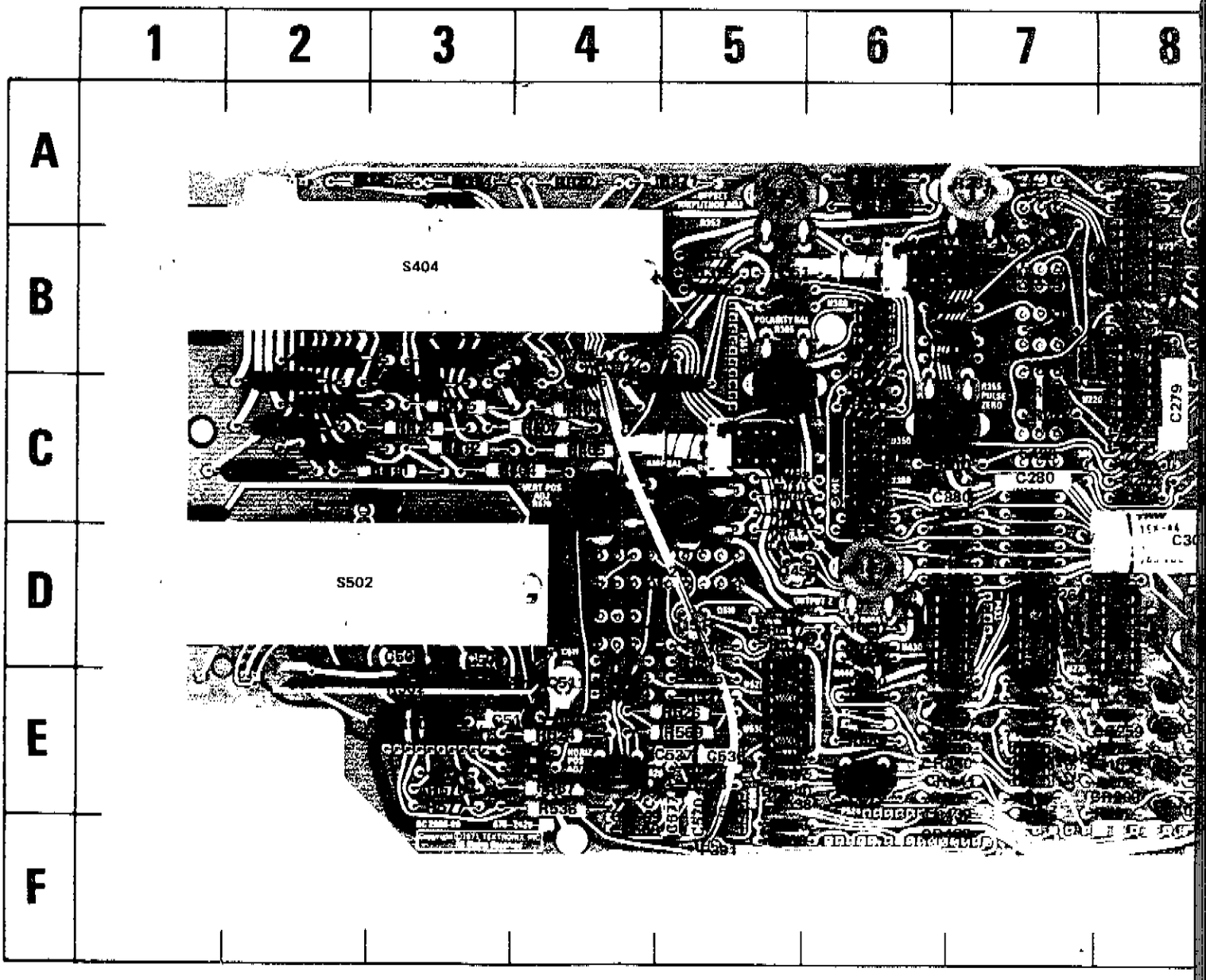


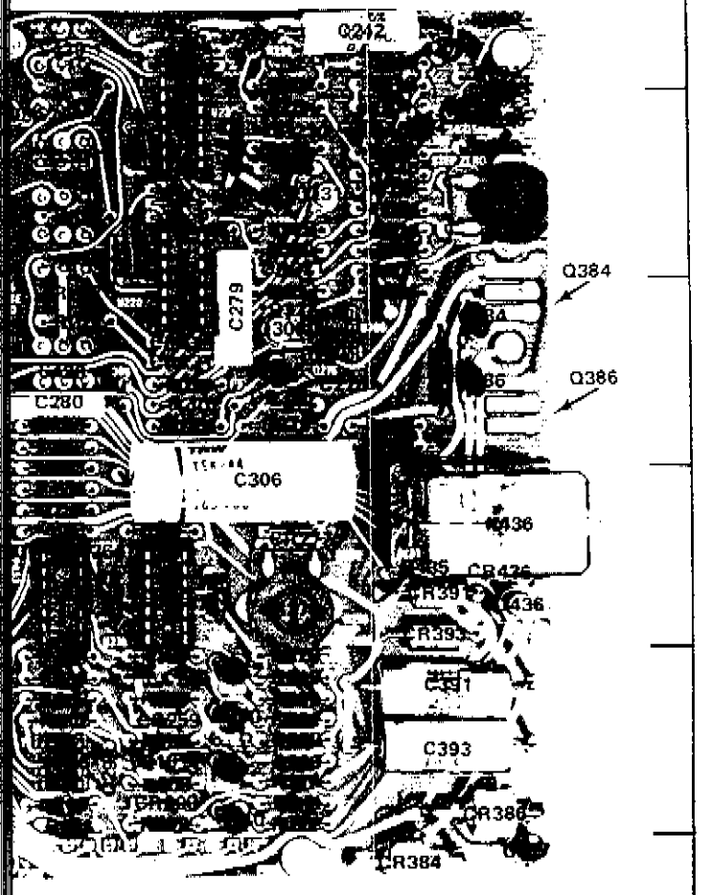
Fig. 7-11. A1 Main circuit board.

*See Parts List for serial number ranges.

GRID LOCATOR

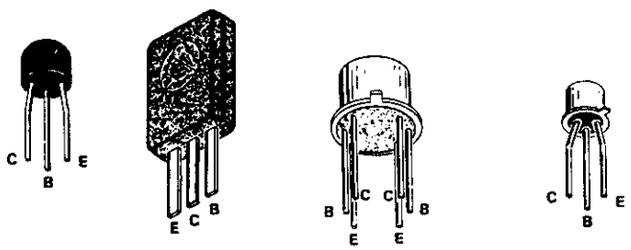
Fig. 7-11
Sht. 2 of 2

7	8	9	10



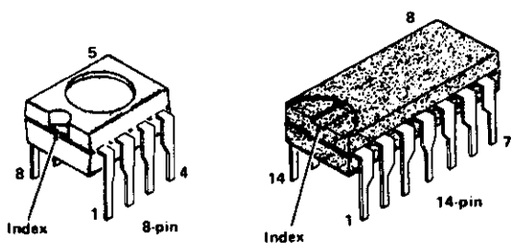
† Located on back of board.

CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
C201	7E	CR436	7E	R227	7C	R362	5B	R515	5E
C206	7E	CR438	6E	R228	7C	R363	6D	R517	5D
C215	8E	CR439	6E	R230	8B	R364	5B	R518	5D
C218	8E	CR440	6E	R231	8B	R365	5C	R519	5D
C231	8B	CR441	7E	R232	8A	R371	5A	R521	5D
C242	9A	CR452	5D	R234	8B	R372	4A	R523	4E
C264	7D	CR512	4E	R235	8A	R374	3A	R524	4E
C265	8E	CR513	4E	R237	8A	R375	3A	R526	5E
C268	7E	CR538	5E	R241	8A	R380	6C	R527	5E
C270	7D	CR540	5E	R242	9A	R381	9C	R528	4E
C273	8D	CR568	4F	R243	9A	R382	9C	R530	6E
C276	9C	CR569	4E	R244	9B	R387	9C	R531	5E
C279	8C	CR591	10B	R258	8E	R388	6A	R532	5E
C291	8B			R259	8E	R389	6A	R534	4E
C293	7E	F391	F5	R261	8E	R391	4B	R536	4E
C294	7D			R262	8E	R393	5C	R537	4E
C295	9B	K436	10D	R263	8E	R396	4B	R538	5F
C297	10F			R264	8E	R397	4B	R539	4E
C299	8D	L579	6E	R265	7E	R404	4C	R540	5F
C306	8D			R266	7D	R405	4C	R545	9B
C321	7B	Q210	8E	R268	7E	R407	4C	R567	5E
C332	7B	Q212	8E	R269	8E	R408	4C	R568	5E
C380	7C	Q224	9B	R273	8E	R411	3C	R569	5E
C382	5C	Q234	8A	R274	8C	R412	3C	R570	4C
C384	9C	Q260	8E	R276	8C	R414	3C	R574	3E
C386	9C	Q262	8E	R278	8D	R415	3C	R576	3E
C391	9E	Q276	8C	R279	8C	R417	3C	R577	3E
C393	9E	Q306	8C	R281	7A	R418	3B	R591	9A
C396	4C	Q310	9B	R300	10B	R421	2C	R592	9A
C503	2E	Q324	8B	R303	9B	R422	2C	R594	9B
C505	3D	Q330	8B	R304	9C	R424	2B	R596	9B
C507	3D	Q384	10C	R305	8B	R425	2C	R597	9B
C509	4E	Q386	10C	R308	9B	R426	2C		
C511	4E	Q436	10D	R310	7C	R427	2C	S310	6B
C513	3E	Q440	6D	R312	7B	R430	7D	S329	7B
C530	5E	Q450	5D	R313	8C	R431	7D	S330	7B
C537	5E	Q514	5D	R316	5B	R432	7D	S404	3B
C568	4E	Q594	9B	R318	5B	R433	6D	S426	7C
C569	4E			R319	5B	R434	7D	S428	7C
C570	5F	R201	7E	R320	6C	R435	9D	S429	7A
C577	5F	R202	7E	R321	8B	R438	6D	S430	5C
C591	9A	R203	7E	R322	7C	R439	6E	S502	2D
C596	10B	R204	7E	R323	8B	R440	7E	S512	5D
		R206	7E	R324	9B	R450	5C	S568	4D
CR209	8E	R208	8E	R326	7A	R451	4C		
CR221	8C	R209	8E	R327	8C	R452	4C	U206	7E
CR230	8B	R211	8E	R329	9B	R453	5C	U220	8B
CR234	8B	R212	8E	R331	7B	R455	5C	U230	8B
CR241	8A	R213	8E	R332	7B	R456	6D	U268	7D
CR259	8E	R214	8E	R351	5A	R457	6D	U270	8D
CR277	8D	R215	7E	R352	5A	R459	6E	U305	9C
CR278	7B	R216	7D	R353	7B	R501	3E	U350	6C
CR322	8B	R218	7E	R354	6B	R502	3E	U360	6B
CR326	8B	R221	8C	R355	6C	R511	5D	U380	6C
CR330	8C	R222	7C	R356	6B	R512	5C	U430	7D
CR384	9F	R224	7D	R357	6C	R513	4D	U520	5E
CR386	9E	R225	7D	R358	6C	R514	5D	U530	5E
CR391	9D			R313	8C			U570	5E
CR393	9D			R361	7C				
CR429	8C								



PLASTIC-CASED TRANSISTORS

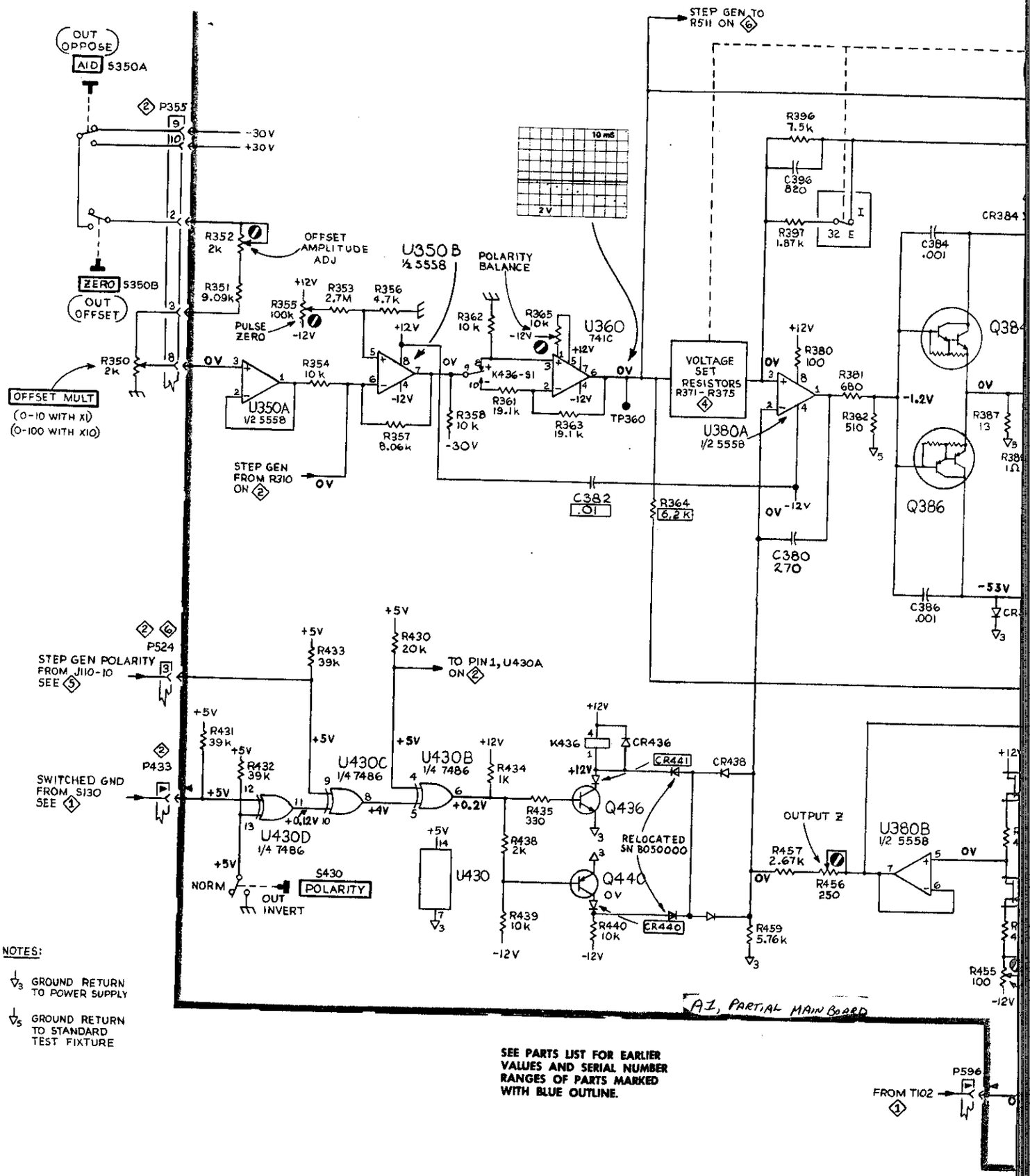
METAL-CASED TRANSISTORS



INTEGRATED CIRCUITS

Fig. 7-12. Semiconductor lead configuration for Main circuit board.

3 Sht. 1 of 2



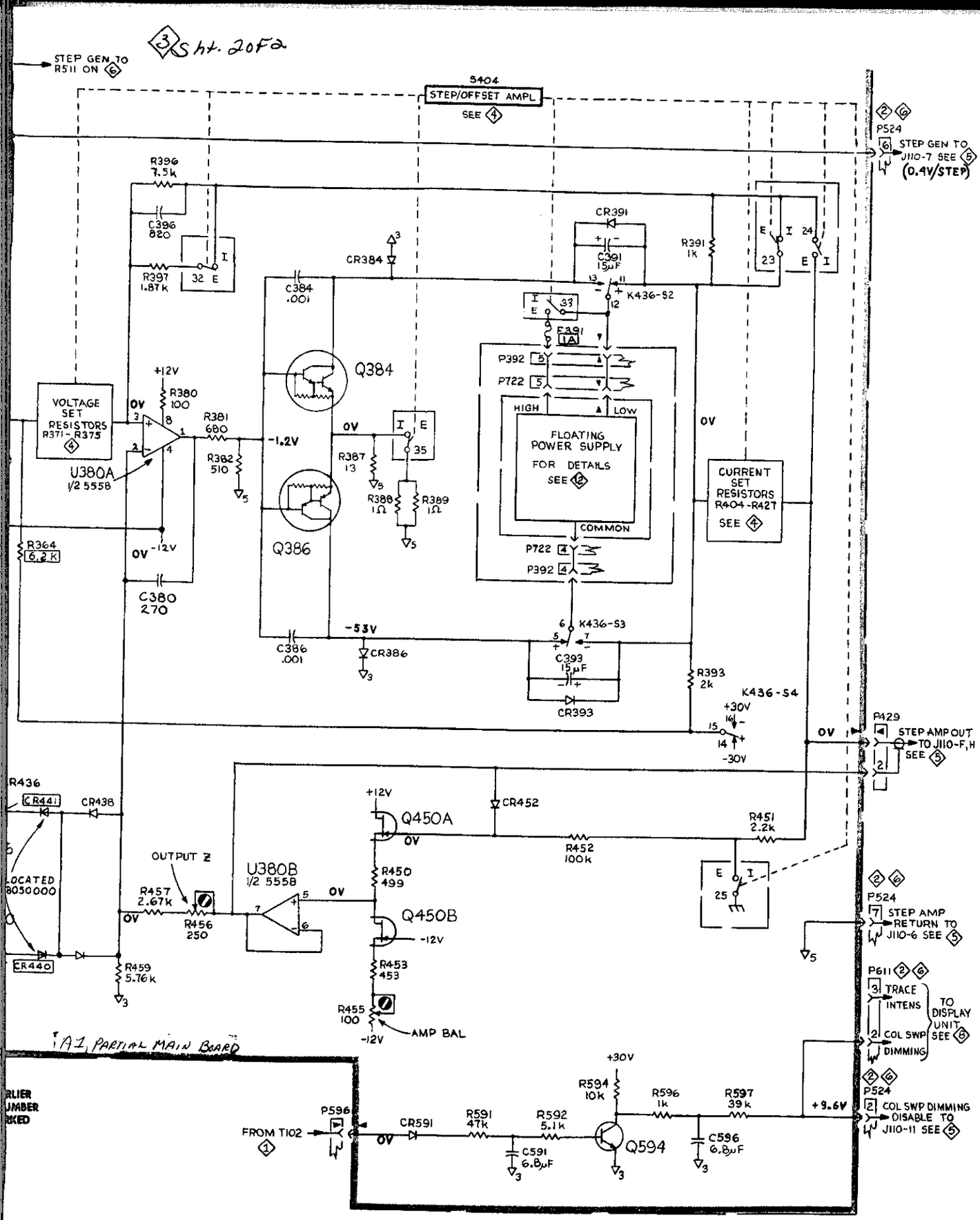
NOTES:

∇_3 GROUND RETURN TO POWER SUPPLY

∇_5 GROUND RETURN TO STANDARD TEST FIXTURE

A1, PARTIAL MAIN BOARD

SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS MARKED WITH BLUE OUTLINE.



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STEP AMPLIFIER 3

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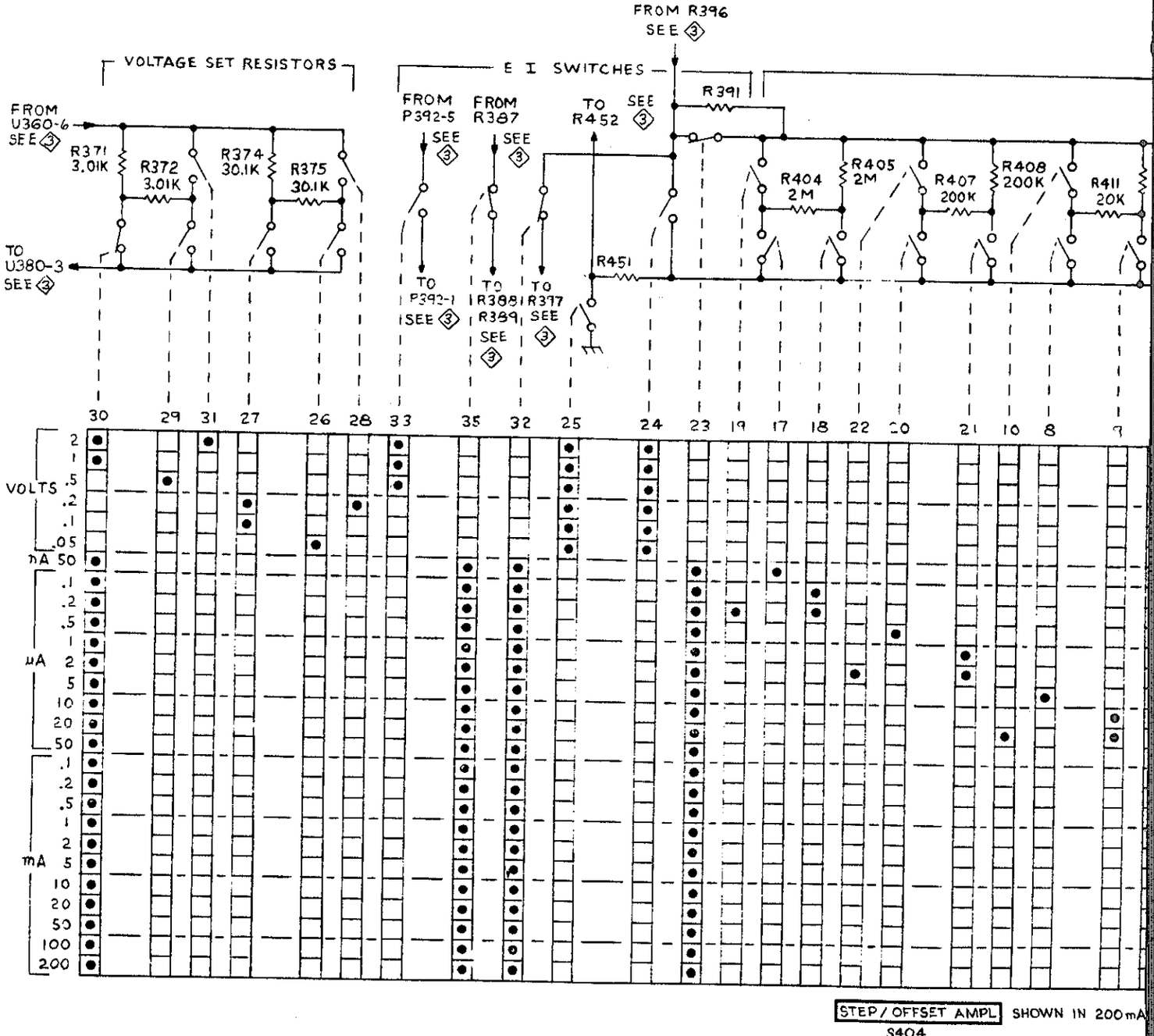
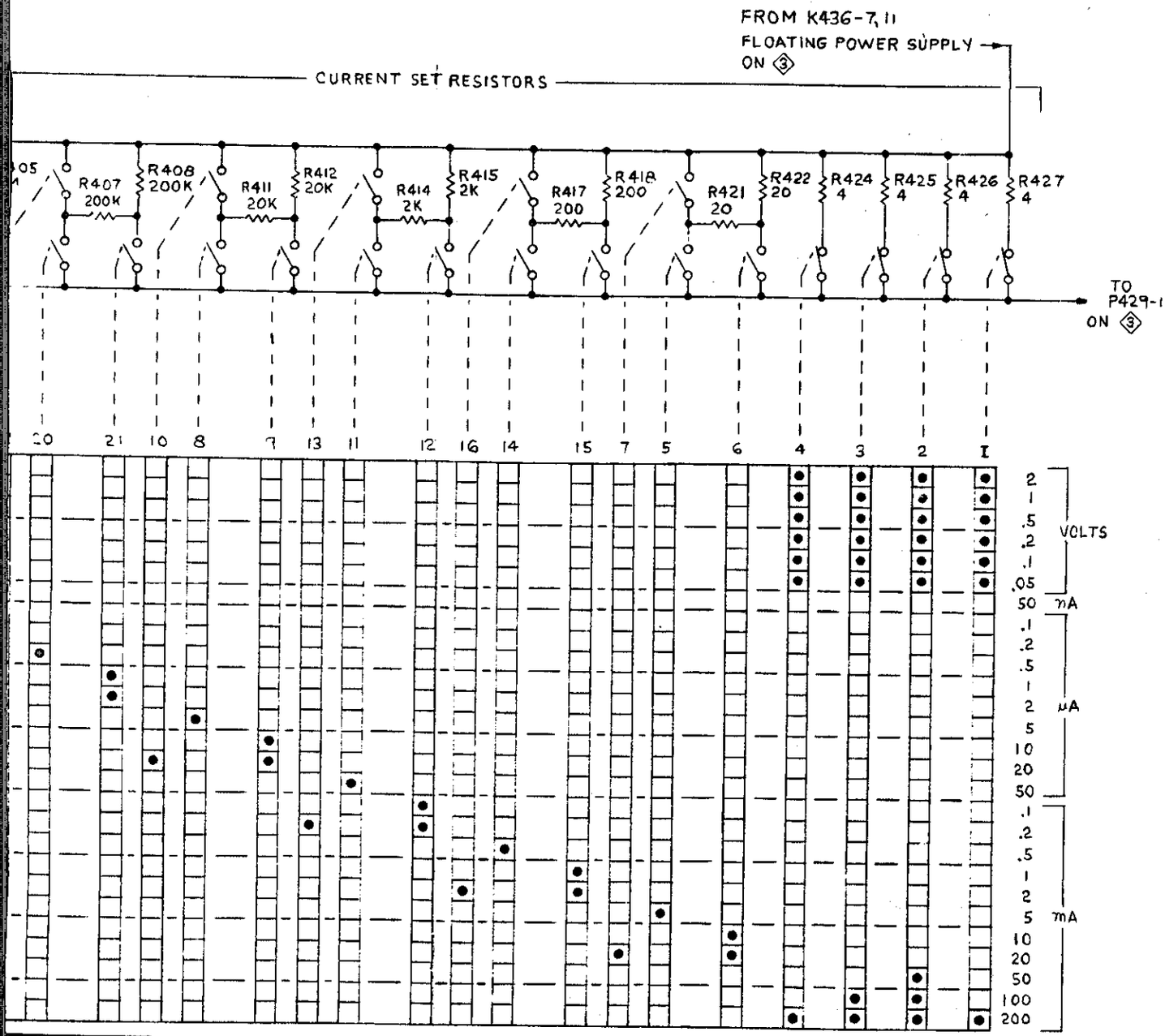
4 Sht 1 of 2



STEP/OFFSET AMPL S404 SHOWN IN 200mA

SEE PARTS LIST FOR EAR VALUES AND SERIAL NU RANGES OF PARTS MAR WITH BLUE OUTLINE.

(A)

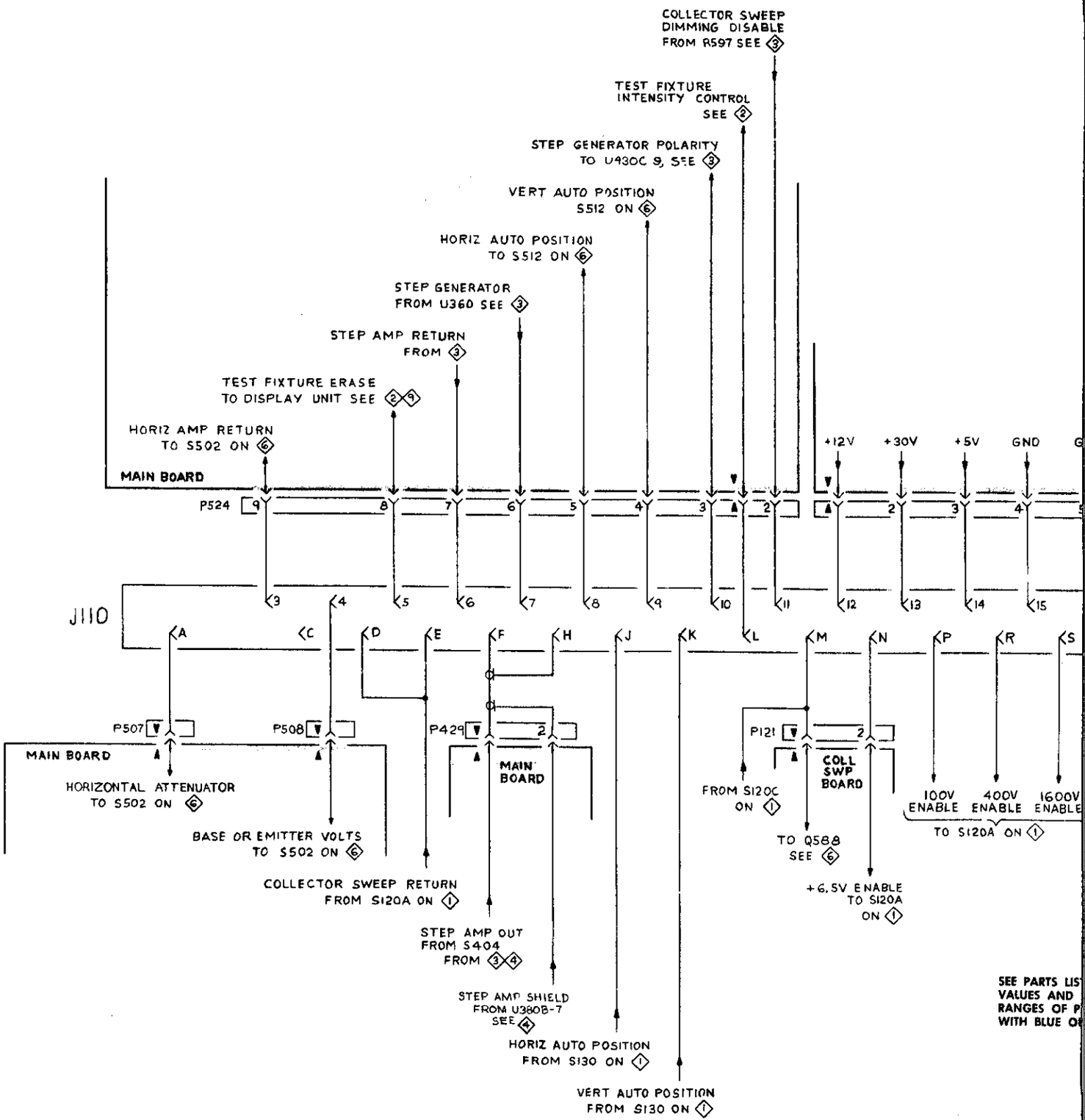


EP/OFFSET AMPL S404 SHOWN IN 200mA POSITION

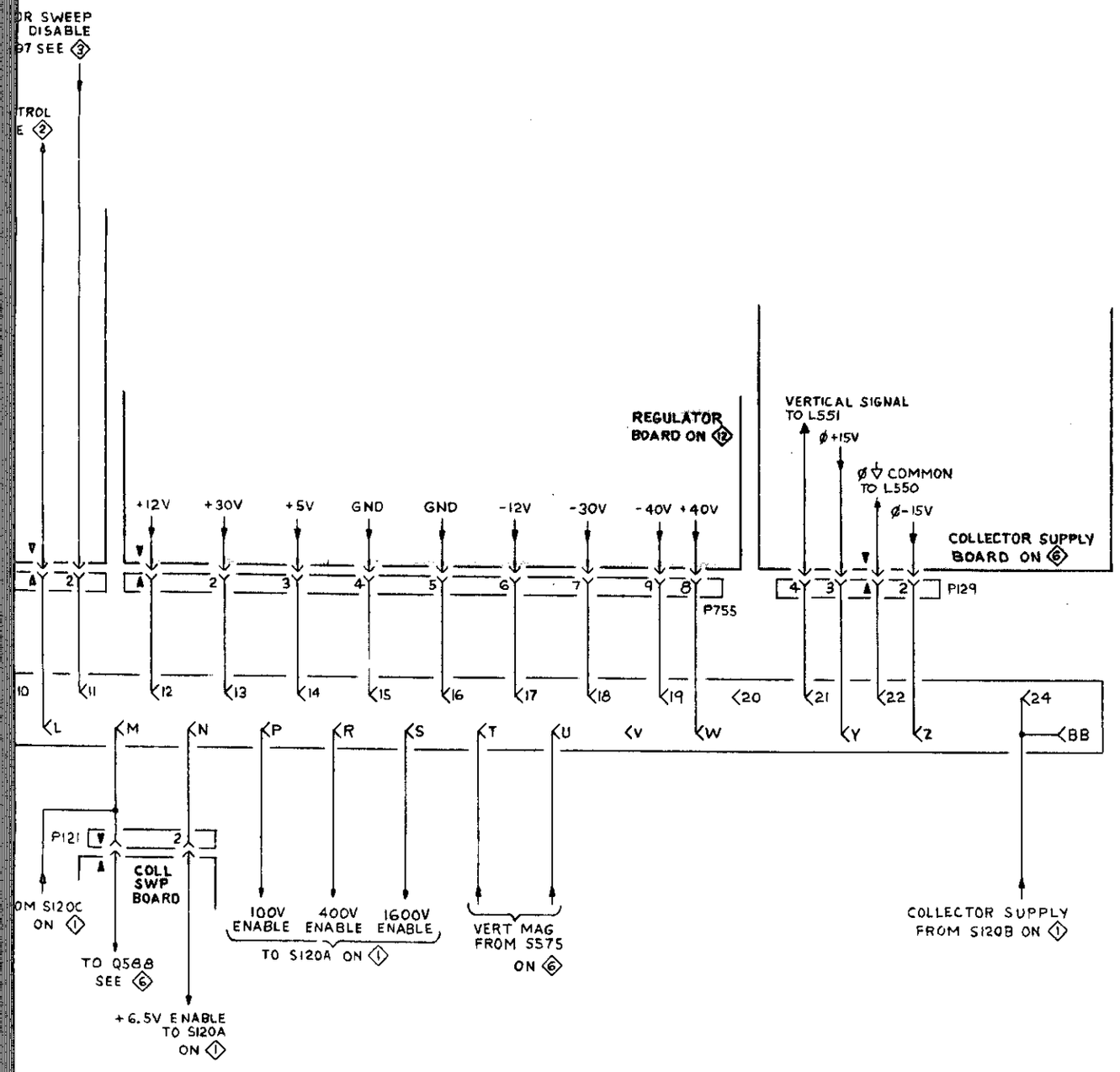
SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS MARKED WITH BLUE OUTLINE.

Ⓐ

STEP/OFFSET AMPLIFIER SWITCH ④


COLLECTOR SWEEP DIMMING DISABLE FROM A597 SEE 3
TEST FIXTURE INTENSITY CONTROL SEE 2
STEP GENERATOR POLARITY TO U430C 9, SEE 3
VERT AUTO POSITION S512 ON 6
HORIZ AUTO POSITION TO S512 ON 6
STEP GENERATOR FROM U360 SEE 3
STEP AMP RETURN FROM 3
TEST FIXTURE ERASE TO DISPLAY UNIT SEE 2 9
HORIZ AMP RETURN TO S502 ON 6
MAIN BOARD
+12V
+30V
+5V
GND
P524
J110
P507
P508
P429
P121
MAIN BOARD
HORIZONTAL ATTENUATOR TO S502 ON 6
BASE OR EMITTER VOLTS TO S502 ON 6
COLLECTOR SWEEP RETURN FROM S120A ON 1
STEP AMP OUT FROM S404 FROM 3 4
STEP AMP SHIELD FROM U380B-7 SEE 4
HORIZ AUTO POSITION FROM S130 ON 1
VERT AUTO POSITION FROM S130 ON 1
MAIN BOARD
COLL SWP BOARD
FROM S120C ON 1
TO Q588 SEE 6
+6.5V ENABLE TO S120A ON 1
100V ENABLE
400V ENABLE
1600V ENABLE
TO S120A ON 1
SEE PARTS LIST
VALUES AND
RANGES OF P
WITH BLUE O

5 Sht. 2 of 2



SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS MARKED WITH BLUE OUTLINE.

Fig. 7-13
Sht. 1 of 2

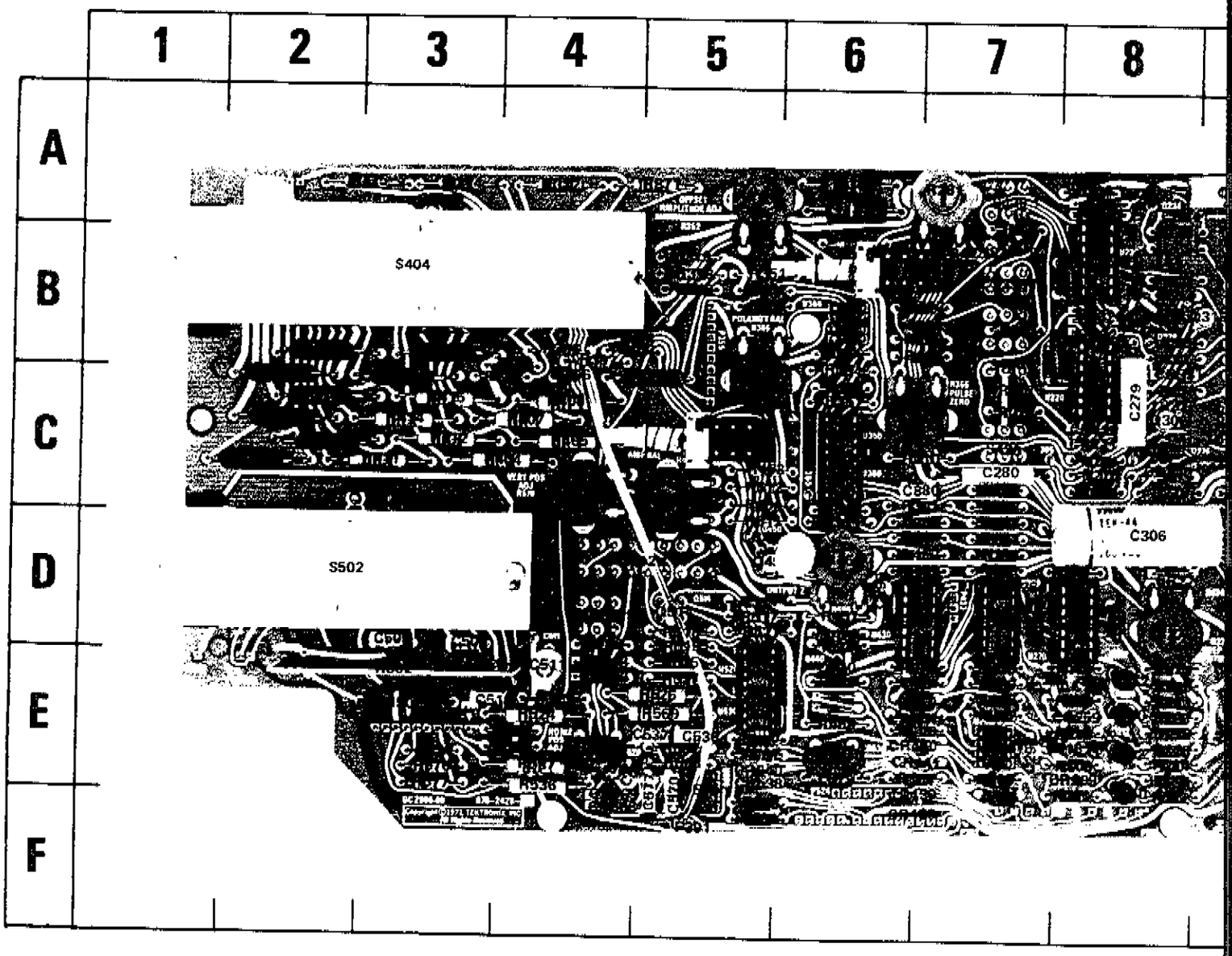
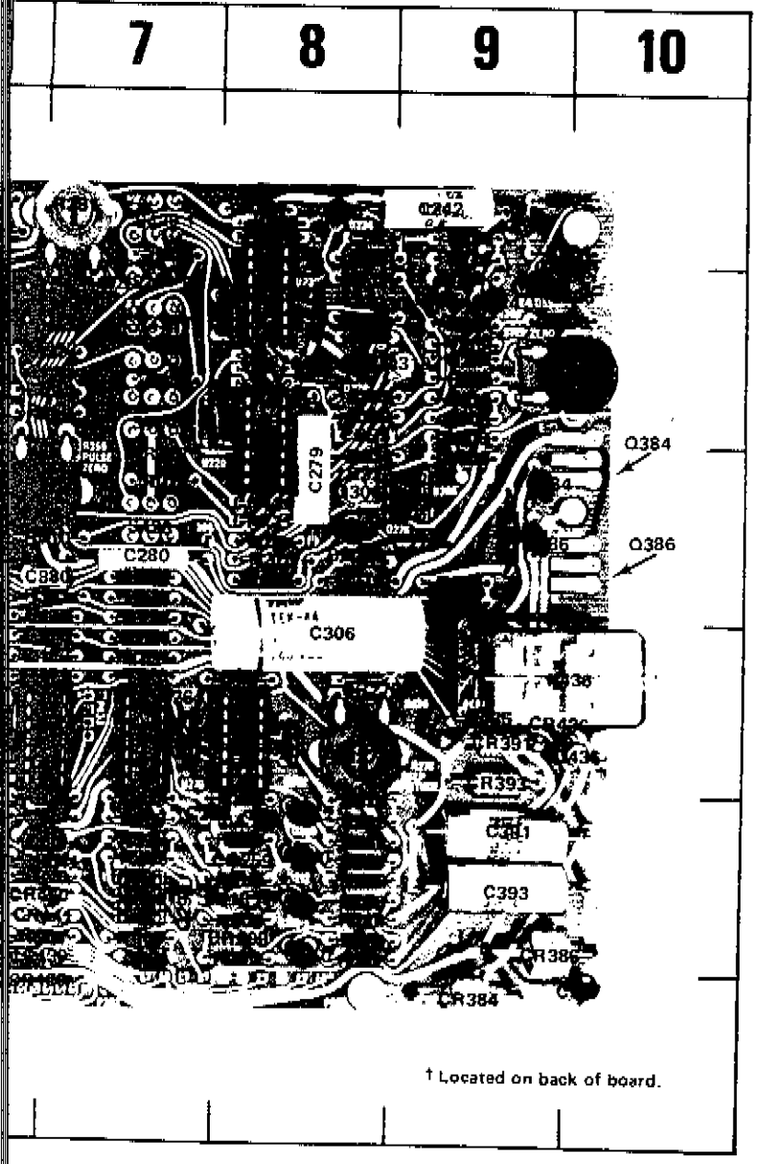


Fig. 7-13, A1 Main circuit board.

*See Parts List for serial number ranges.

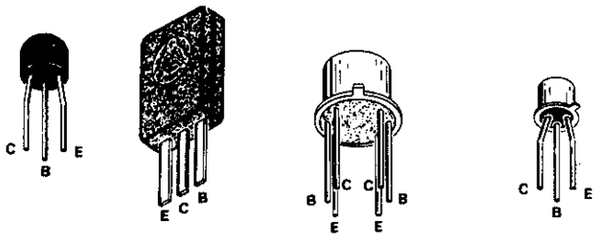
GRID LOCATOR

Fig. 7-13
Sht. 2 of 2

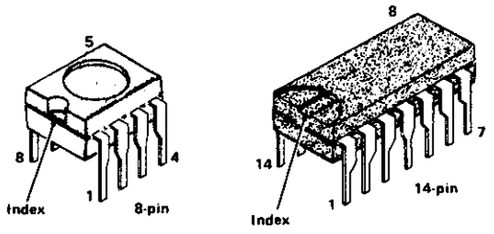


† Located on back of board.

CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
C201	7E	CR436	7E	R227	7C	R362	5B	R515	5E
C206	7E	CR438	6E	R228	7C	R363	6D	R517	5D
C215	8E	CR439	6E	R230	8B	R364	5B	R518	5D
C218	8E	CR440	6E	R231	8B	R365	5C	R519	5D
C231	8B	CR441	7E	R232	8A	R371	5A	R521	5D
C242	9A	CR452	5D	R234	8B	R372	4A	R523	4E
C264	7D	CR512	4E	R235	8A	R374	3A	R524	4E
C265	8E	CR513	4E	R237	8A	R375	3A	R526	5E
C268	7E	CR538	5E	R241	8A	R380	6C	R527	5E
C270	7D	CR540	5E	R242	9A	R381	9C	R528	4E
C273	8D	CR568	4F	R243	9A	R382	9C	R530	6E
C276	9C	CR569	4E	R244	9B	R387	9C	R531	5E
C279	8C	CR591	10B	R258	8E	R388	6A	R532	5E
C291	8B			R259	8E	R389	6A	R534	4E
C293	7E	F391	F5	R261	8E	R391	4B	R536	4E
C294	7D			R262	8E	R393	5C	R537	4E
C295	9B	K436	10D	R263	8E	R396	4B	R538	5F
C297	10F			R264	8E	R397	4B	R539	4E
C299	8D	L579	6E	R265	7E	R404	4C	R540	5F
C306	8D			R266	7D	R405	4C	R545	9B
C321	7B	Q210	8E	R268	7E	R407	4C	R567	5E
C332	7B	Q212	8E	R269	8E	R408	4C	R568	5E
C380	7C	Q224	9B	R273	8E	R411	3C	R569	5E
C382	5C	Q234	8A	R274	8C	R412	3C	R570	4C
C384	9C	Q260	8E	R276	8C	R414	3C	R574	3E
C386	9C	Q262	8E	R278	8D	R415	3C	R576	3E
C391	9E	Q276	8C	R279	8C	R417	3C	R577	3E
C393	9E	Q306	8C	R281	7A	R418	3B	R591	9A
C396	4C	Q310	9B	R300	10B	R421	2C	R592	9A
C503	2E	Q324	8B	R303	9B	R422	2C	R594	9B
C505	3D	Q330	8B	R304	9C	R424	2B	R596	9B
C507	3D	Q384	10C	R305	8B	R425	2C	R597	9B
C509	4E	Q386	10C	R308	9B	R426	2C		
C511	4E	Q436	10D	R310	7C	R427	2C	S310	6B
C513	3E	Q440	6D	R312	7B	R430	7D	S329	7B
C530	5E	Q450	5D	R313	8C	R431	7D	S330	7B
C537	5E	Q514	5D	R316	5B	R432	7D	S404	3B
C568	4E	Q594	9B	R318	5B	R433	6D	S426	7C
C569	4E			R319	5B	R434	7D	S428	7C
C570	5F	R201	7E	R320	6C	R435	9D	S429	7A
C577	5F	R202	7E	R321	8B	R438	6D	S430	5C
C591	9A	R203	7E	R322	7C	R439	6E	S502	2D
C596	10B	R204	7E	R323	8B	R440	7E	S512	5D
		R206	7E	R324	9B	R450	5C	S568	4D
CR209	8E	R208	8E	R326	7A	R451	4C		
CR221	8C	R209	8E	R327	8C	R452	4C	U206	7E
CR230	8B	R211	8E	R329	9B	R453	5C	U220	8B
CR234	8B	R212	8E	R331	7B	R455	5C	U230	8B
CR241	8A	R213	8E	R332	7B	R456	6D	U268	7D
CR259	8E	R214	8E	R351	5A	R457	6D	U270	8D
CR277	8D	R215	7E	R352	5A	R459	6E	U305	9C
CR278	7B	R216	7D	R353	7B	R501	3E	U350	6C
CR322	8B	R218	7E	R354	6B	R502	3E	U360	6B
CR326	8B	R221	8C	R355	6C	R511	5D	U380	6C
CR330	8C	R222	7C	R356	6B	R512	5C	U430	7D
CR384	9F	R224	7D	R357	6C	R513	4D	U520	5E
CR386	9E	R225	7D	R358	6C	R514	5D	U530	5E
CR391	9D			R313	8C			U570	5E
CR393	9D			R361	7C				
CR429	8C								



PLASTIC-CASED TRANSISTORS METAL-CASED TRANSISTORS

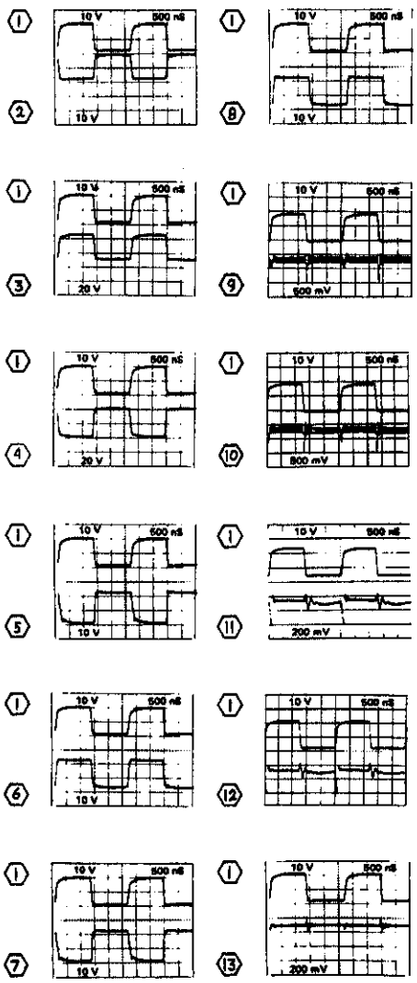


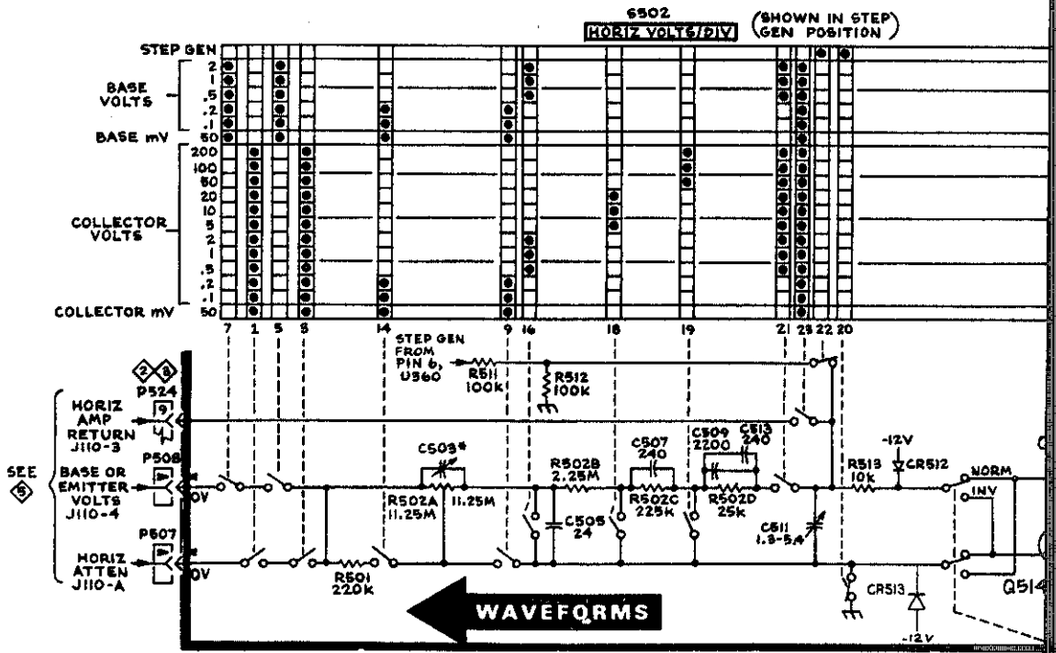
INTEGRATED CIRCUITS

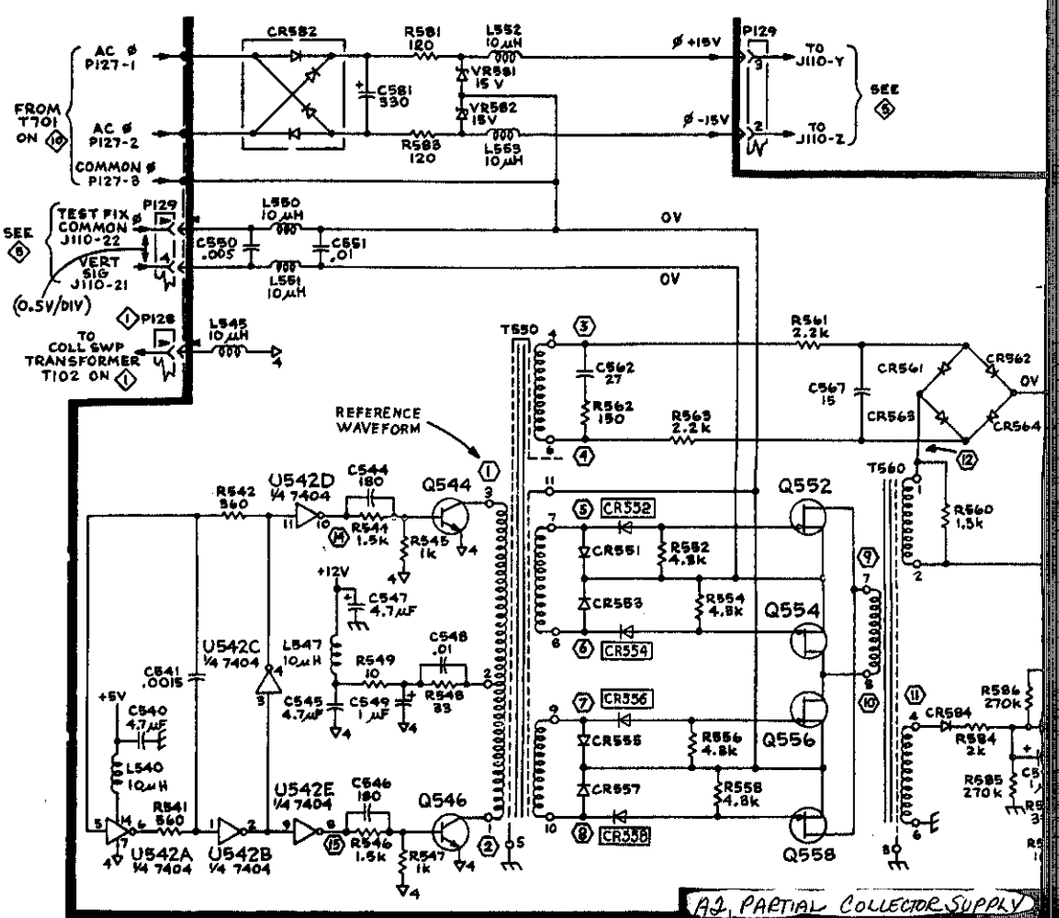
Fig. 7-14. Semiconductor lead configuration for Main circuit board.

6 Sht. 1 of 2

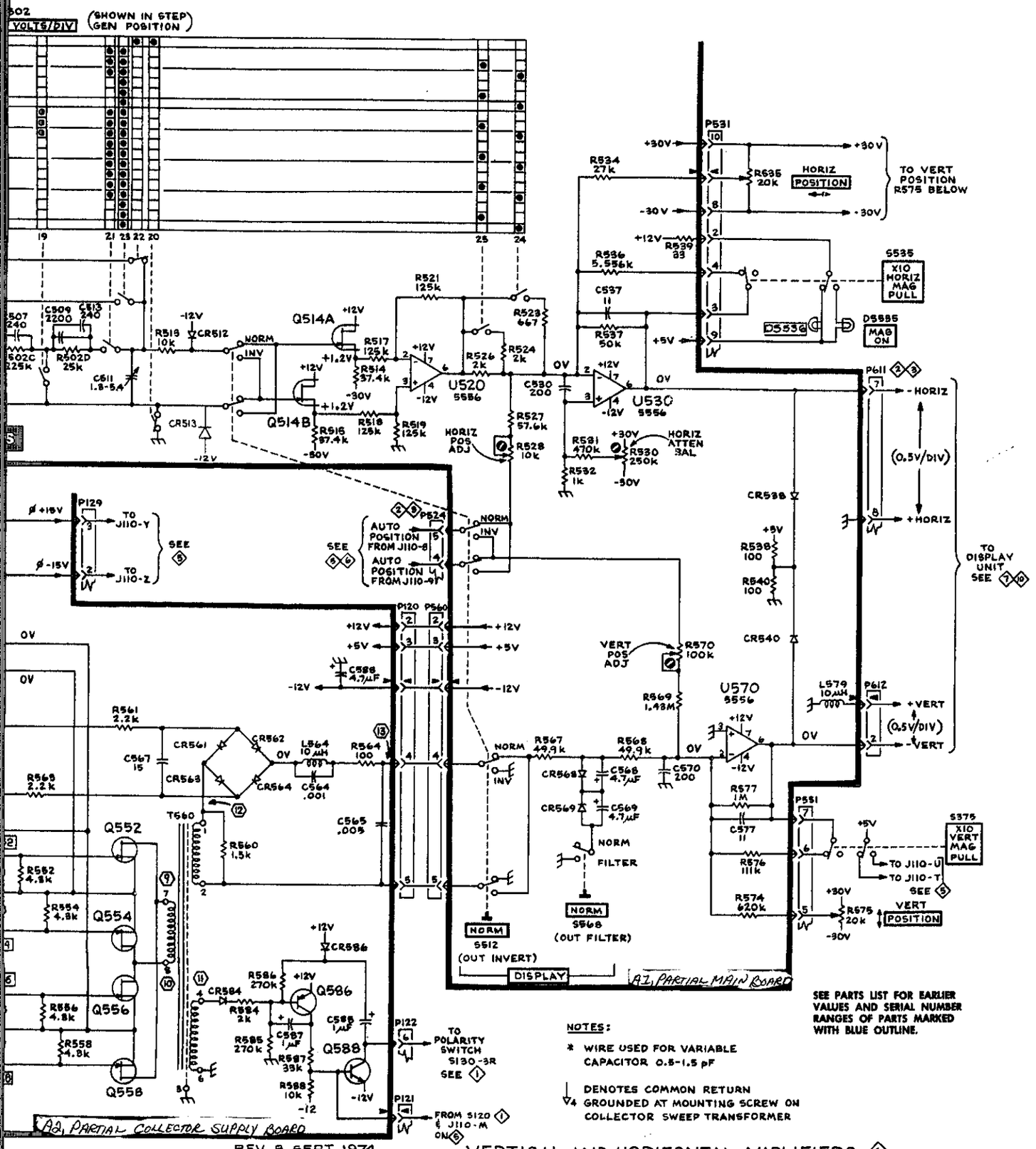
THE TOP WAVEFORM IN EACH OF THE ILLUSTRATIONS IS THE REFERENCE WAVEFORM, AND IS INCLUDED TO SHOW THE AMPLITUDE AND PHASE RELATIONSHIP OF THE REFERENCE POINT TO EACH OF THE OTHER POINTS MEASURED.







REV. B,



SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS MARKED WITH BLUE OUTLINE.

NOTES:

* WIRE USED FOR VARIABLE CAPACITOR 0.5-1.5 pF

DENOTES COMMON RETURN
4 GROUNDED AT MOUNTING SCREW ON COLLECTOR SWEEP TRANSFORMER

VERTICAL AND HORIZONTAL AMPLIFIERS 6

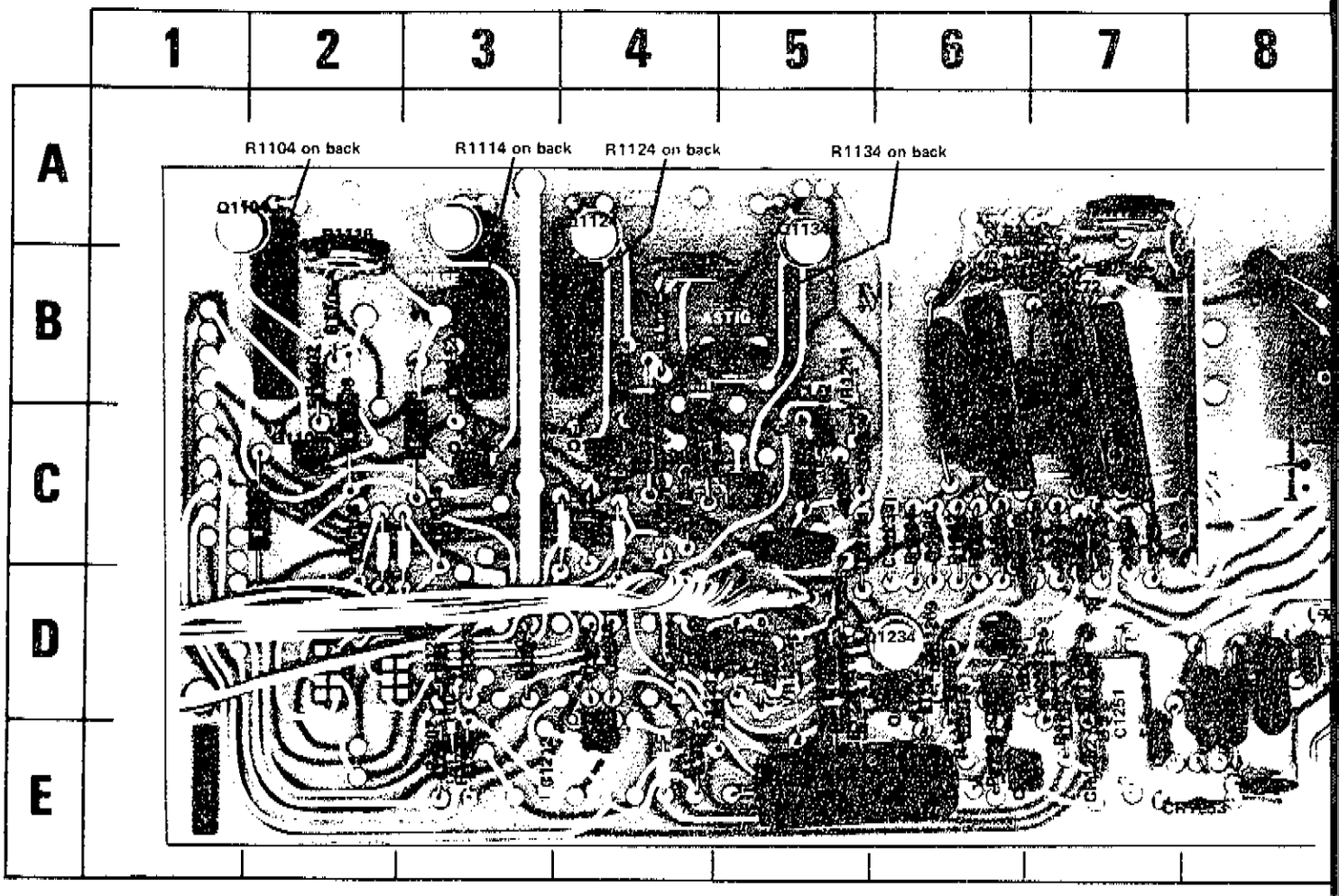
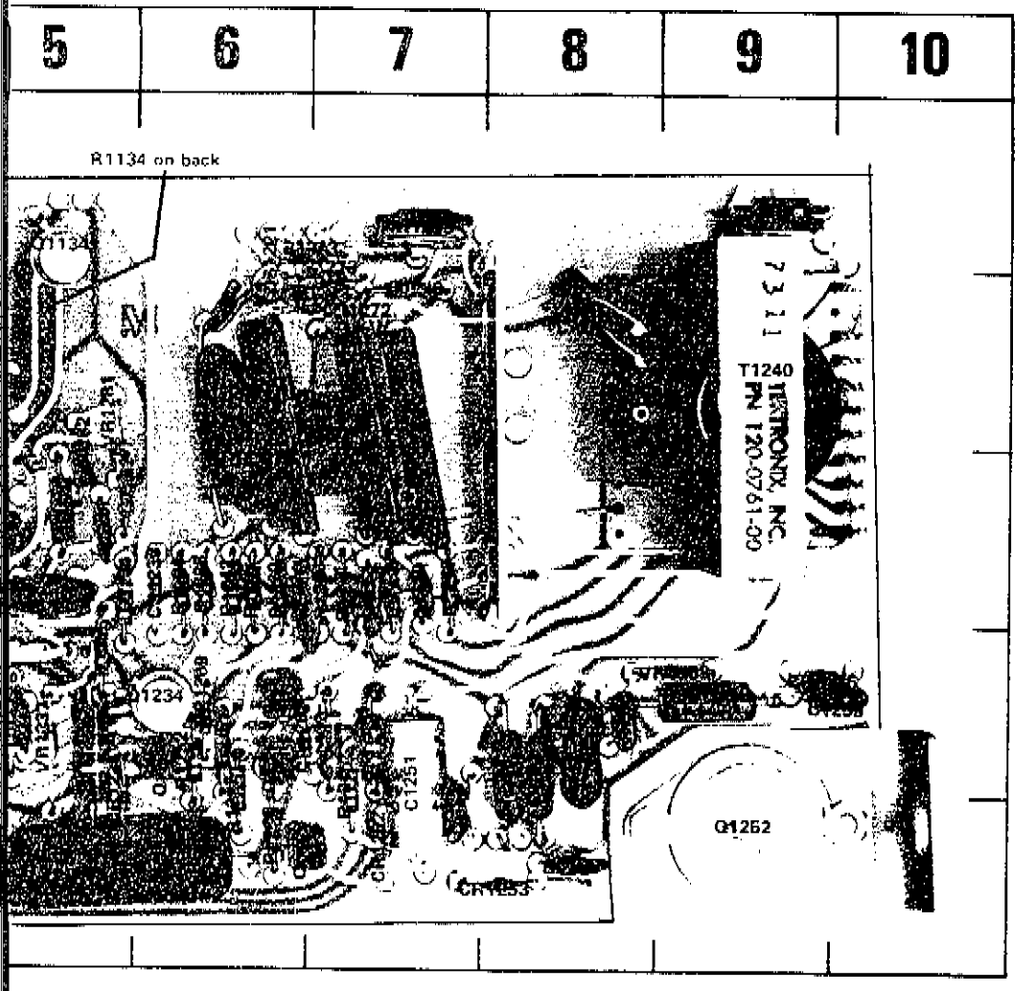


Fig. 7-15. A5 Deflection Amplifier/High Voltage circuit board.

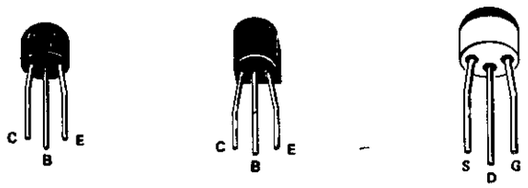
Fig. 7-15
Sht. 2 of 2



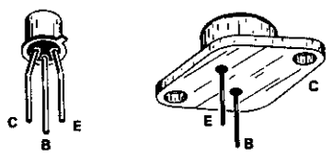
ction Amplifier/High Voltage circuit board.

GRID LOCATOR

CKT NO	GRID LOC	CKT NO	GRID LOC
C1212	3E	R1114	3B
C1224	5D	R1116	2A
C1227	5D	R1118	3C
C1236	5E	R1122	4B
C1241	6B	R1123	4C
C1242	6B	R1124	4B
C1248	7B	R1125	2C
C1249	7B	R1126	4B
C1251	7D	R1128	4C
C1252	8D	R1133	4C
C1253	8E	R1134	5B
C1254	7E	R1136	4B
C1258	8D	R1138	4C
C1259	9D	R1202	3E
C1272	7B	R1203	3D
C1273	7C	R1207	3D
C1274	6C	R1208	3D
C1279	7C	R1211	3D
C1281	5C	R1213	3E
		R1217	4D
CR1204	4D	R1218	4D
CR1224	5D	R1222	4E
CR1239	6C	R1223	4D
CR1241	8B	R1227	5D
CR1249	8B	R1231	5C
CR1253	8E	R1232	6D
CR1255	9D	R1234	6C
CR1262	7E	R1236	5D
CR1264	6D	R1239	6C
CR1269	6D	R1242	6C
		R1243	6A
DS1221	6B	R1245	7A
DS1222	7B	R1248	7B
DS1272	7B	R1251	7D
		R1252	8D
L1259	9D	R1254	8D
		R1262	7D
Q1104	1A	R1263	6E
Q1106	2C	R1266	7D
Q1116	3C	R1267	6E
Q1124	4A	R1268	7C
Q1126	4C	R1269	6C
Q1134	5A	R1270	6B
Q1136	5C	R1273	7B
Q1214	4D	R1274	6C
Q1222	4D	R1275	9A
Q1226	6D	R1276	7C
Q1234	6D	R1278	6D
Q1252	9E	R1279	7C
Q1262	6E	R1281	7C
Q1264	6E	R1282	5C
Q1278	6D	R1285	5C
		R1286	5B
R1101	4C	R1287	5C
R1103	2C	T1240	9B
R1104	2B		
R1106	2B		
R1107	2B	VR1237	5D
R1108	2B	VR1258	9D
R1112	3B	VR1281	5B
R1113	3C	VR1282	5C



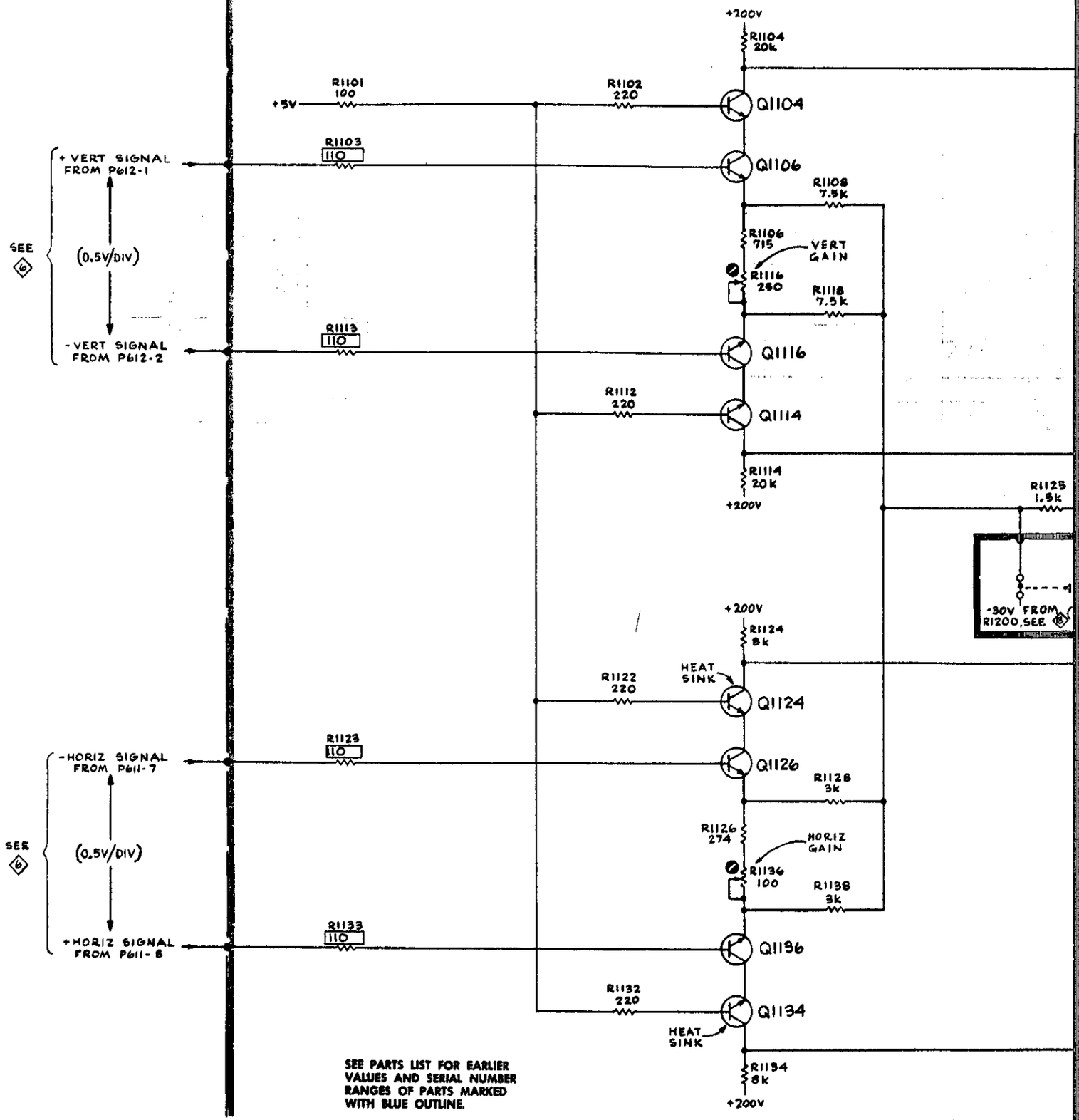
PLASTIC-CASED TRANSISTORS



METAL-CASED TRANSISTORS

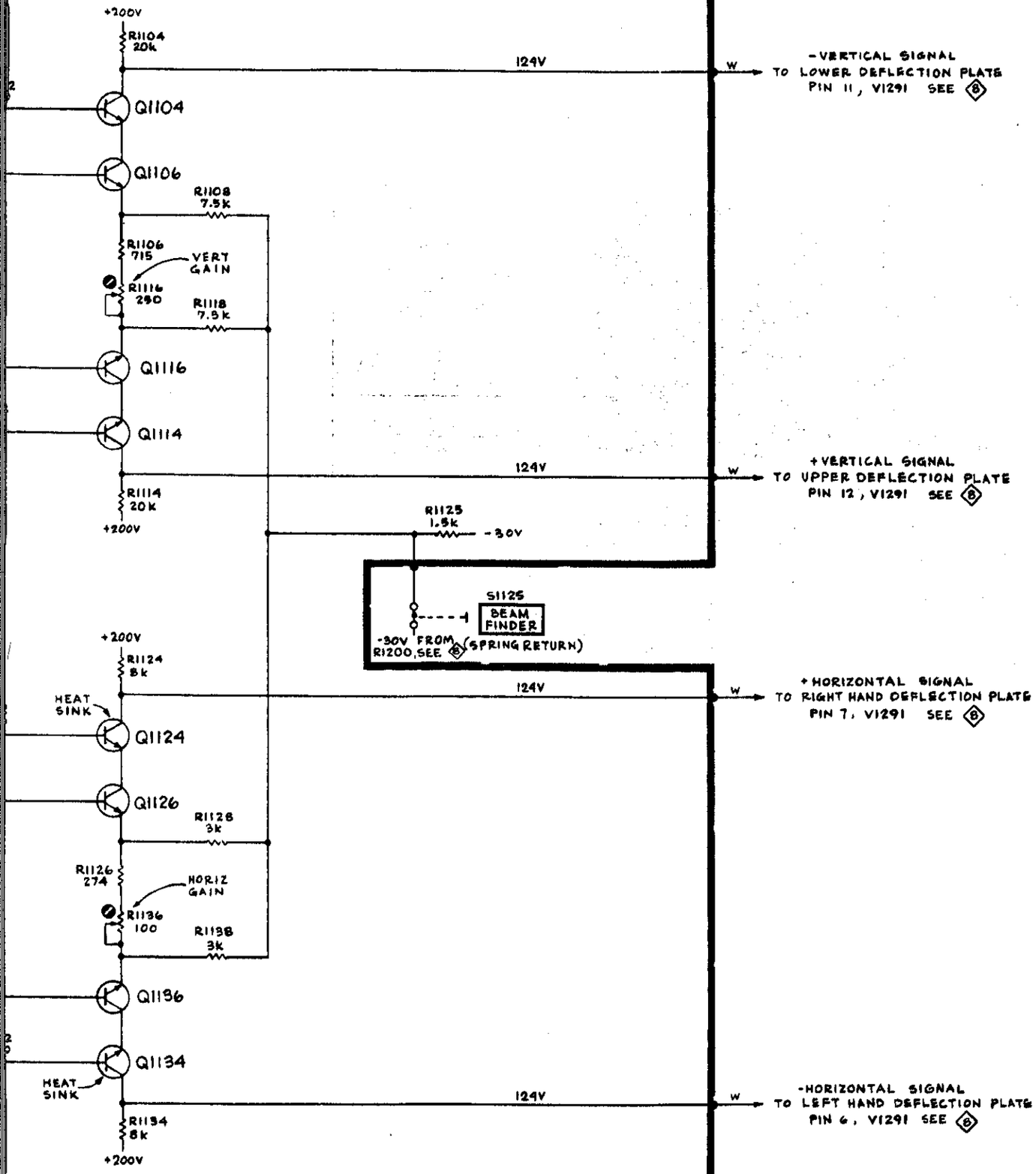
Fig. 7-16. Semiconductor lead configuration for Deflection Amplifier/High Voltage circuit board.

A5, PARTIAL DEFLECTOR AMPLIFIER (HG)



SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS MARKED WITH BLUE OUTLINE.

A5 PARTIAL DEFLECTOR AMPLIFIER/HIGH VOLTAGE BOARD



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VERTICAL AND HORIZONTAL OUTPUT AMPLIFIER ◇7

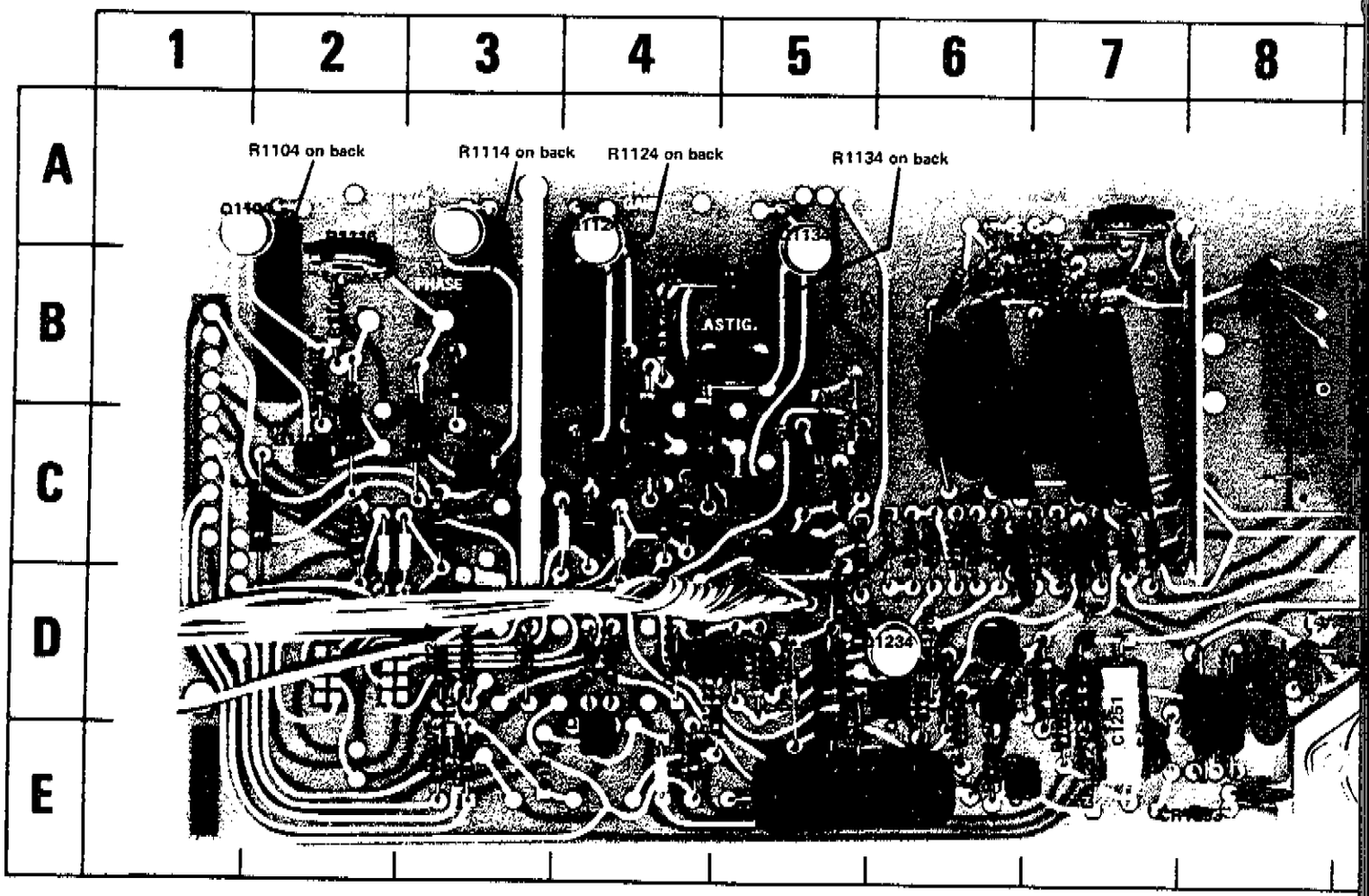
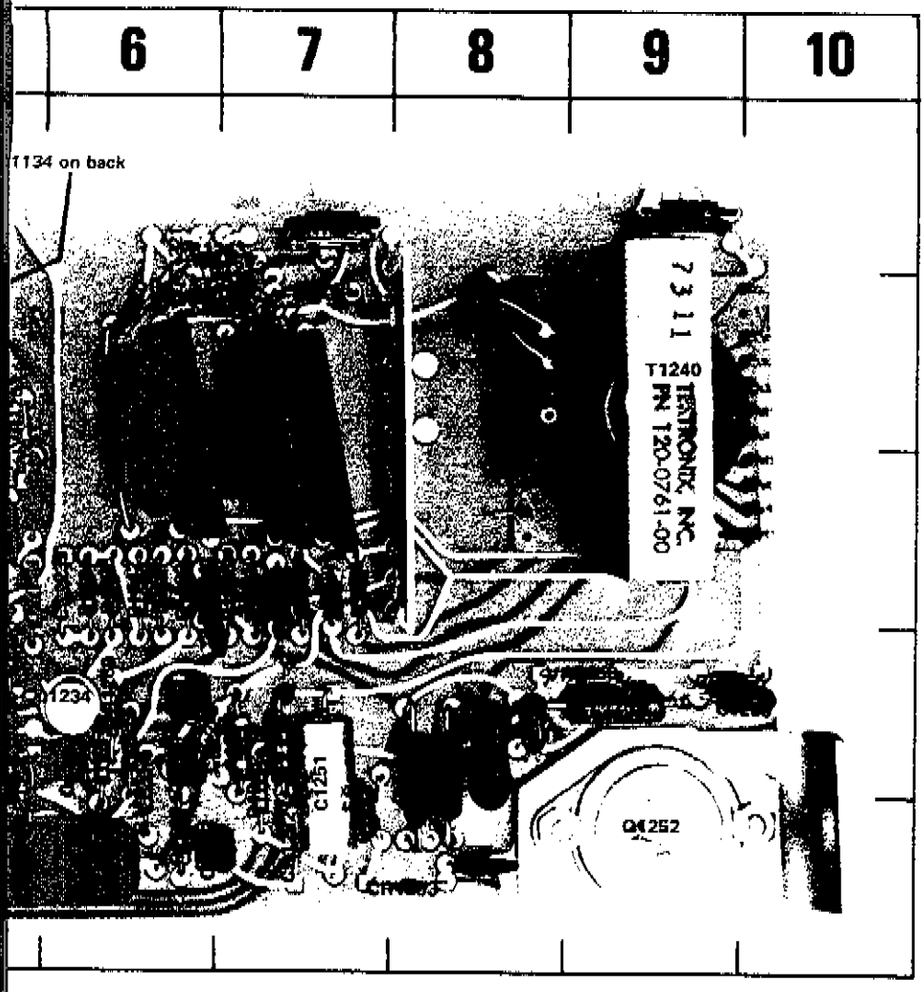


Fig. 7-17. A5 Deflection Amplifier/High Voltage circuit board.

GRID LOCATOR

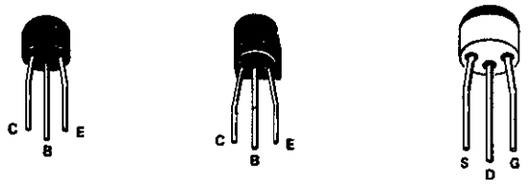
Fig. 7-17
Sht. 20F 2



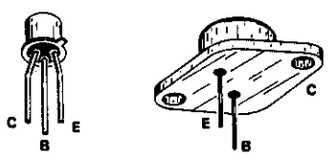
plifier/High Voltage circuit board.

GRID LOCATOR

CKT NO	GRID LOC	CKT NO	GRID LOC
C1212	3E	R1114	3B
C1224	5D	R1116	2A
C1227	5D	R1118	3C
C1236	5E	R1122	4B
C1241	6B	R1123	4C
C1242	6B	R1124	4B
C1248	7B	R1125	2C
C1249	7B	R1126	4B
C1251	7D	R1128	4C
C1252	8D	R1133	4C
C1253	8E	R1134	5B
C1254	7E	R1136	4B
C1258	8D	R1138	4C
C1259	9D	R1202	3E
C1272	7B	R1203	3D
C1273	7C	R1207	3D
C1274	6C	R1208	3D
C1279	7C	R1211	3D
C1281	5C	R1213	3E
		R1217	4D
CR1204	4D	R1218	4D
CR1224	5D	R1222	4E
CR1239	6C	R1223	4D
CR1241	8B	R1227	5D
CR1249	8B	R1231	5C
CR1253	8E	R1232	6D
CR1255	9D	R1234	6C
CR1262	7E	R1236	5D
CR1264	6D	R1239	6C
CR1269	6D	R1242	6C
		R1243	6A
DS1221	6B	R1245	7A
DS1222	7B	R1248	7B
DS1272	7B	R1251	7D
		R1252	8D
L1259	9D	R1254	8D
		R1262	7D
Q1104	1A	R1263	6E
Q1106	2C	R1266	7D
Q1116	3C	R1267	6E
Q1124	4A	R1268	7C
Q1126	4C	R1269	6C
Q1134	5A	R1270	6B
Q1136	5C	R1273	7B
Q1214	4D	R1274	6C
Q1222	4D	R1275	9A
Q1226	6D	R1276	7C
Q1234	6D	R1278	6D
Q1252	9E	R1279	7C
Q1262	6E	R1281	7C
Q1264	6E	R1282	5C
Q1278	6D	R1285	5C
		R1286	5B
R1101	4C	R1287	5C
R1103	2C	T1240	9B
R1104	2B		
R1106	2B		
R1107	2B	VR1237	5D
R1108	2B	VR1258	9D
R1112	3B	VR1281	5B
R1113	3C	VR1282	5C



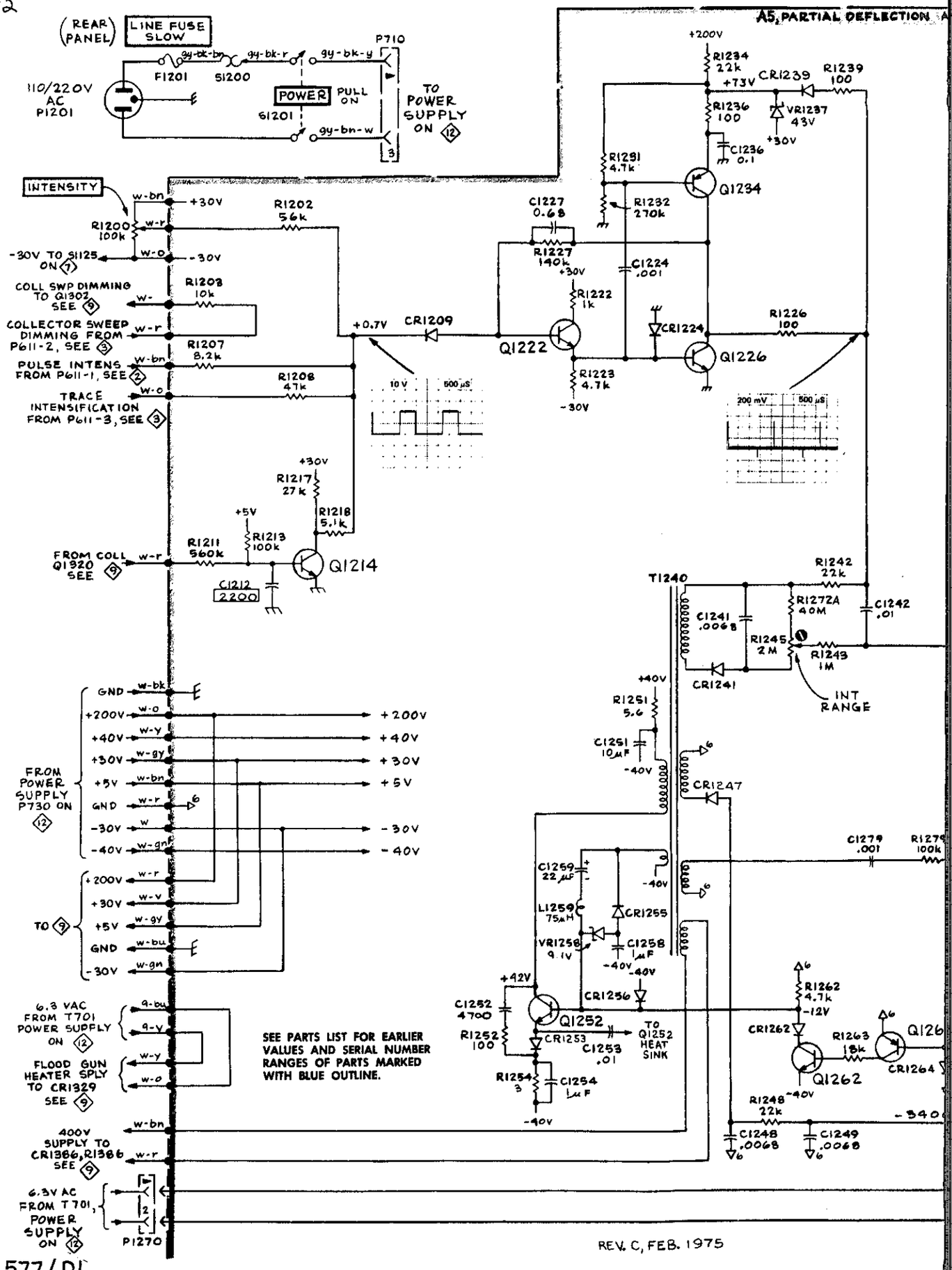
PLASTIC-CASED TRANSISTORS



METAL-CASED TRANSISTORS

Fig. 7-18. Semiconductor lead configuration for Deflection Amplifier/High Voltage circuit board.

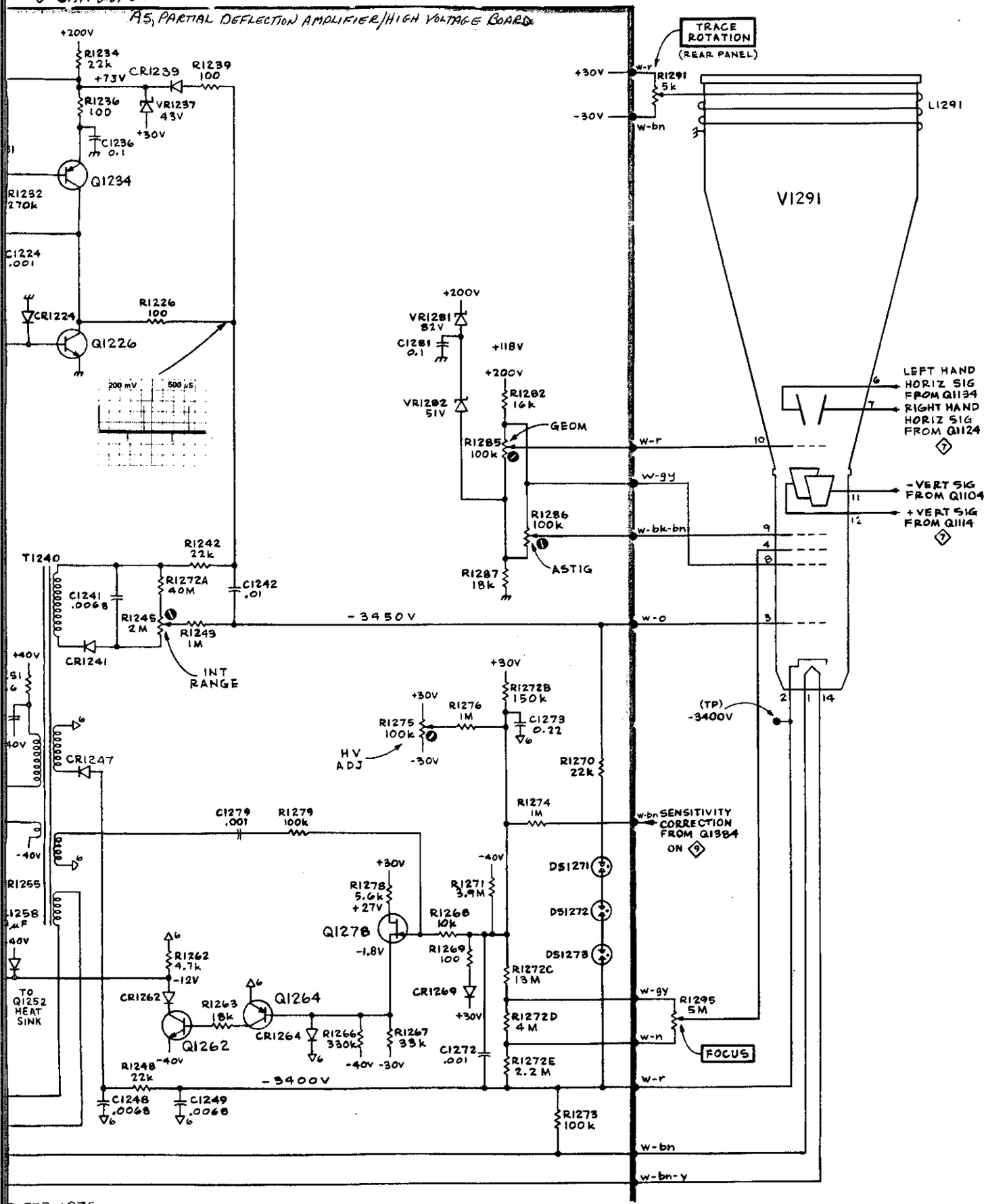
8 Sht. 1 of 2



577/D1

REV. C, FEB. 1975

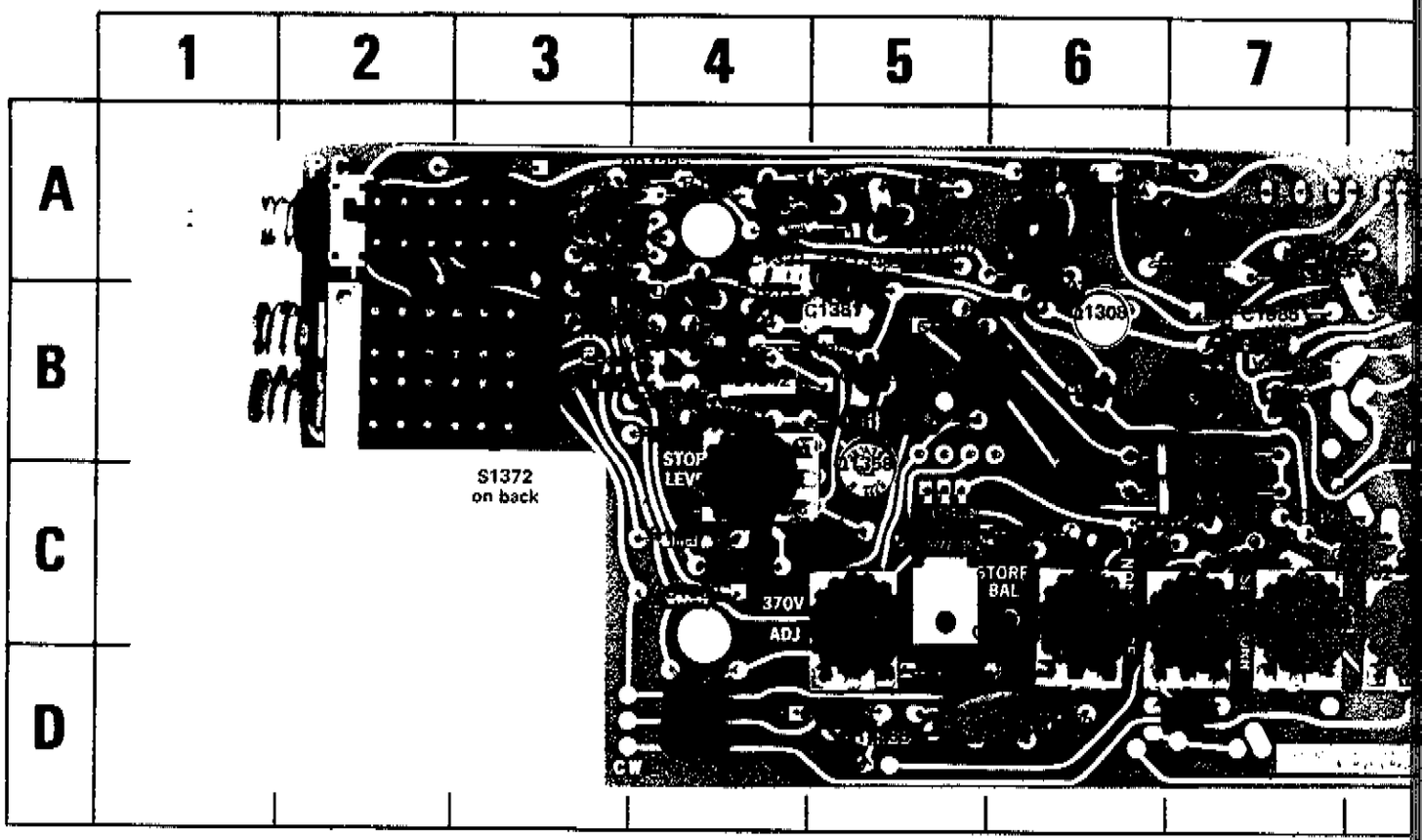
A5, PARTIAL DEFLECTION AMPLIFIER/HIGH VOLTAGE BOARD



C, FEB. 1975

CRT CIRCUIT 8

Fig. 7-19 & 7-20
Sht. 1 of 2



*See Parts List for serial number ranges.

Fig. 7-19. A4 Storage circuit board.

*See Parts L
serial numbe

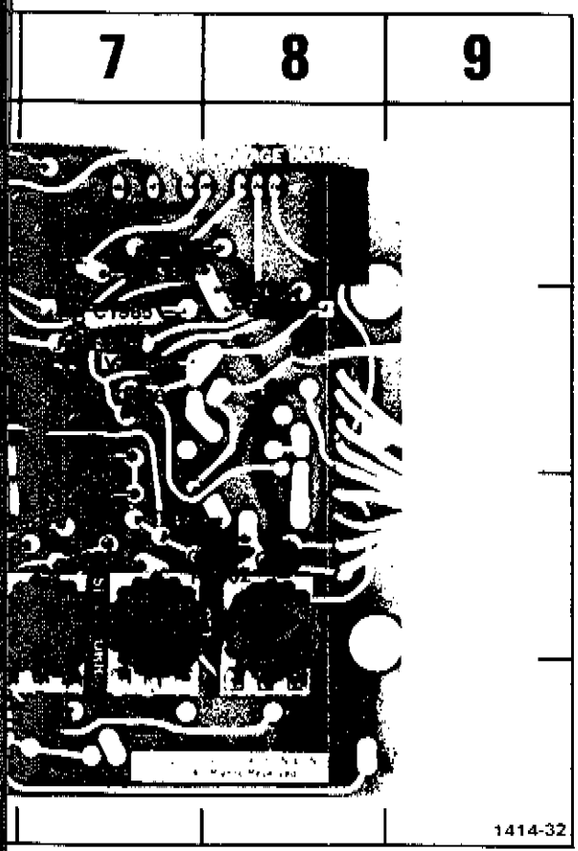
†Relocated at S

CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
C1303	8C	CR1329	8A	Q1362	6B	R1312	5A	R1351	5C	R1390	8C
C1307	6B	CR1332	4A	Q1364	6C	R1313	3B	R1354	4B	R1392	7A
C1321	4A	CR1343	3B	Q1372	7B	R1321	4B	R1355	5B	R1395	7C
C1325	3A	CR1351	4B	Q1384	7B	R1322	5A	R1359	4C	R1396	7A
C1330	3A	CR1358	5B	Q1386	6C	R1324	3A	R1364	7C	R1397	6A
C1331	3A	CR1386	5D	Q1388	5C	R1329	7B	R1365	7B		
C1337	4A	CR1392	7A	Q1392	7A	R1330	3A	R1370	6C	S1330	3A
C1342	4B			Q1396	6A	R1332	5A	R1371	6C	S1372	3C
C1381	5B	Q1302	8C			R1334	3A	R1381	6A	S1375	2B
C1385	7B	Q1304	6B	R1302	8C	R1336	4B	R1382	6A		
C1387	6C	Q1308	6B	R1304	7C	R1337	3B	R1384	8B	VR1370	7C
C1389	6D	Q1310	4A	R1305	8C	R1339	3A	R1385	7C	VR1387	6C
C1391	4D	Q1320	5A	R1307	5A	R1341	4B	R1386	7C	VR1388	5D
C1394	7D	Q1334	4A	R1308	6B	R1342	3B	R1387	5C	VR1396	7B
C1398	8B	Q1336	4A	R1310	6B	R1343	3B	R1388	5D		
C1399	4C	Q1356	5B	R1311	4B	R1346	4B	R1389	6D		
		Q1358	5B			R1347	4C				
						R1350	4C				

MORE

R

Fig. 7-19 & 7-20
Sht. 2 of 2



*See Parts List for serial number ranges.

†Relocated at SN B050000

CKT NO	GRID LOC
R1390	8C
R1392	7A
R1395	7C
R1396	7A
R1397	6A
S1330	3A
S1372	3C
S1375	2B
VR1370	7C
VR1387	6C
VR1388	5D
VR1396	7B

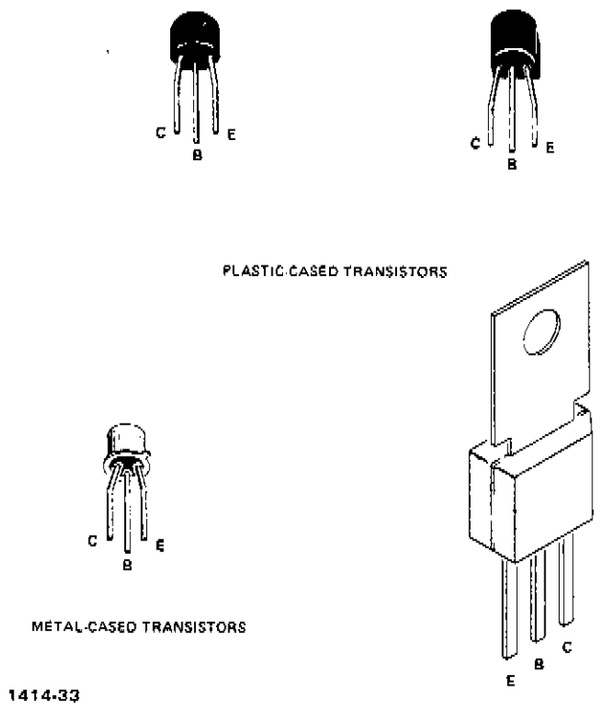
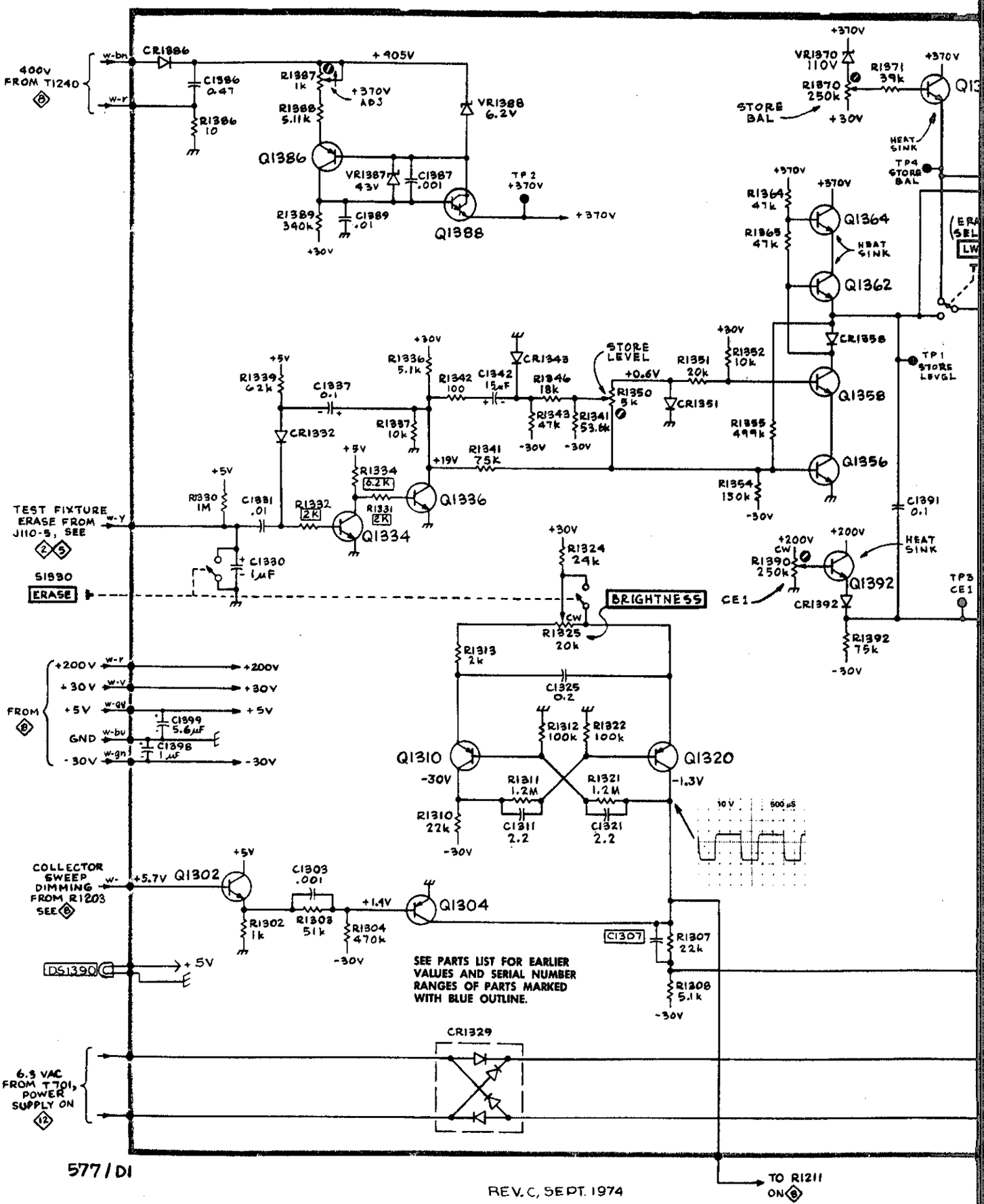


Fig. 7-20. Semiconductor lead configuration for Storage circuit board.

9 Sht. 1 of 2



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REV. C, SEPT. 1974

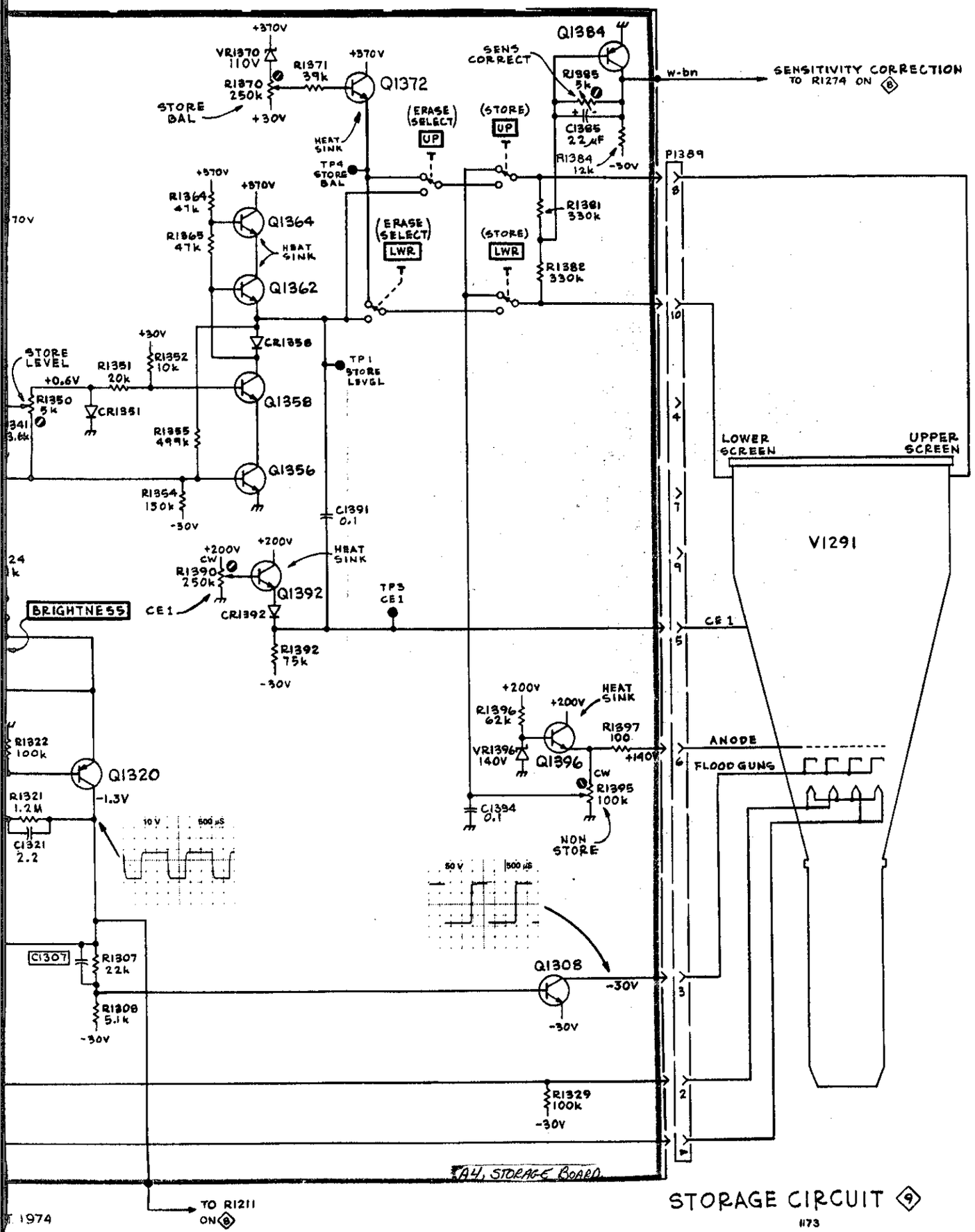

+370V
VR1370 110V
R1370 250k
STORE BAL
+30V
R1371 39k
Q1372
HEAT SINK
TP4 STORE BAL
Q1384
SENS CORRECT
R1385 5k
C1385 22 µF
R1384 12k
-30V
w-bn
SENSITIVITY CORRECTION TO R1274 ON 8
(ERASE SELECT) UP
(STORE) UP
P1389
R1364 47k
R1365 47k
Q1364
Q1362
HEAT SINK
(ERASE SELECT) LWR
(STORE) LWR
R1381 330k
R1382 330k
CR1358
TP1 STORE LEVEL
STORE LEVEL
+0.6V
R1350 5k
R1351 20k
R1352 10k
CR1351
Q1358
R1355 499k
Q1356
R1354 150k
C1391 0.1
LOWER SCREEN
UPPER SCREEN
V1291
+200V CW
R1390 250k
+200V
HEAT SINK
Q1392
CR1392
TP3 CE1
CE1
BRIGHTNESS
R1392 75k
R1396 62k
HEAT SINK
R1397 100
VR1396 140V
Q1396
+140V
ANODE
FLOOD GUNS
CW
R1395 100k
C1394 0.1
NON STORE
R1322 100k
Q1320
-1.3V
R1321 1.2M
C1321 2.2
10 V
500 µS
50 V
500 µS
C1307
R1307 22k
R1308 5.1k
Q1308
-30V
R1329 100k
A4, STORAGE BOARD
TO R1211 ON 8
STORAGE CIRCUIT 9
1173

Fig. 7-21
Sht. 2 of 2

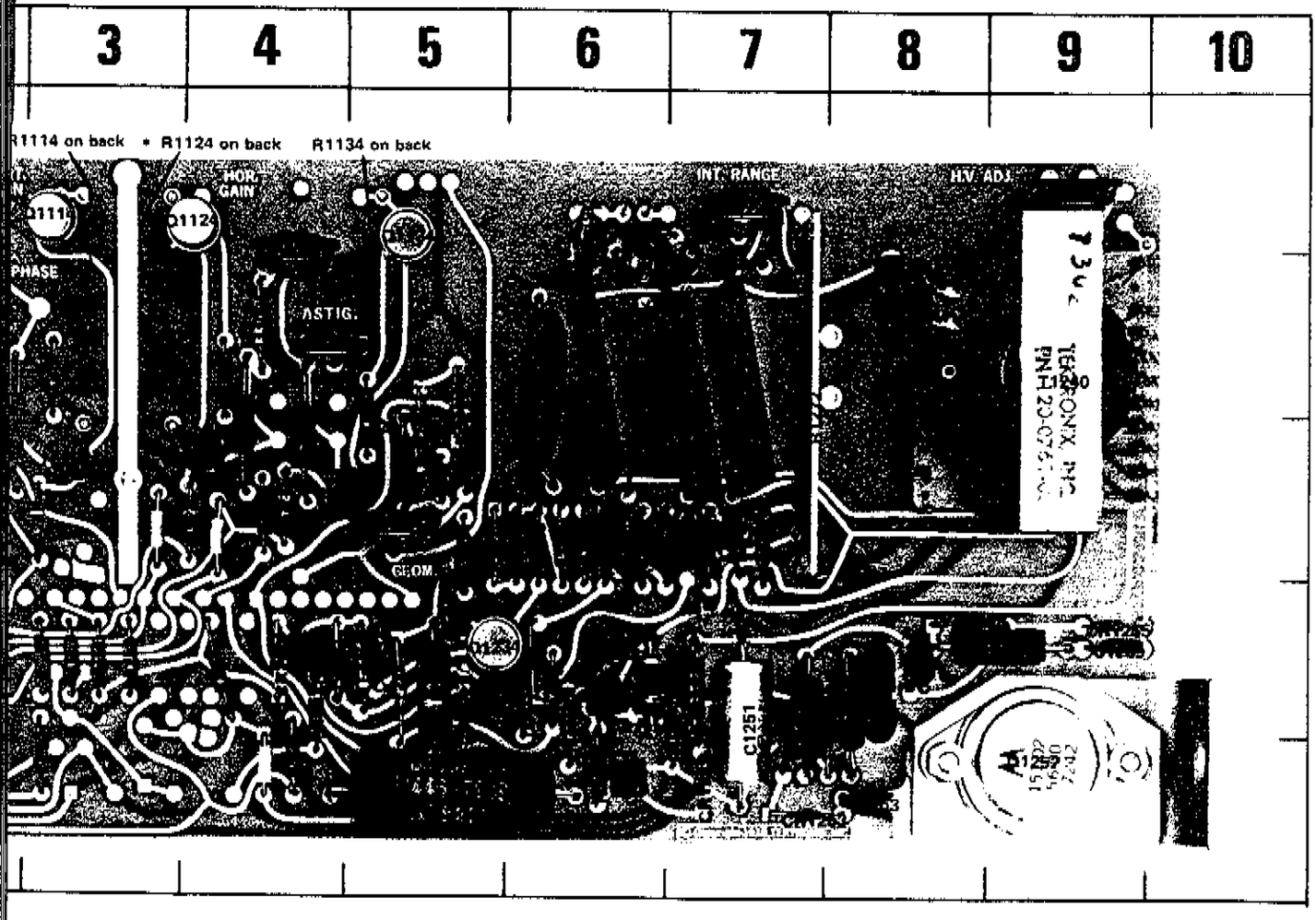


Fig. 7-21. A6 Deflection Amplifier/High Voltage circuit board.

*See Parts List for serial number ranges.

CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
C1224	5D	C1279	7C	L1259	9D	R1101	4C	R1133	4C	R1236	6C	R1272	7C
C1227	4D	C1281	5C	Q1104	1A	R1102	2B	R1134	4A	R1239	6C	R1273	6A
C1236	5E			Q1106	2C	R1103	2C	R1136	4A	R1242	6C	R1274	6C
C1241	6B	CR1204	4D	Q1114	3A	R1104	1A	R1138	4C	R1243	6A	R1275	9A
C1242	6B	CR1224	5D	Q1116	3C	R1106	2B	R1202	3E	R1245	7A	R1276	7C
C1248	7B	CR1239	5C	Q1124	3A	R1108	2C	R1203	3D	R1251	7D	R1278	6D
C1249	7B	CR1241	8B	Q1126	4C	R1112	3B	R1206	3D	R1252	7D	R1279	7C
C1251	7D	CR1247	8B	Q1134	5A	R1113	3C	R1207	3D	R1254	7D	R1282	5C
C1252	8D	CR1255	9D	Q1136	4C	R1114	3A	R1208	3D	R1262	6D	R1285	5C
C1253	8E	CR1256	8E	Q1222	4D	R1116	2A	R1209	4D	R1263	6E	R1286	4B
C1254	7E	CR1256	8D	Q1226	5D	R1118	2C	R1220	6B	R1266	7D	R1287	5C
C1258	8D	CR1262	7E	Q1234	5D	R1122	4B	R1222	4E	R1267	6D		
C1259	9D	CR1264	6D	Q1252	9E	R1123	4C	R1223	4D	R1268	6C	T1240	9B
C1272	6B	CR1269	6D	Q1262	6E	R1124	3B	R1226	6C	R1269	6C		
C1273	7C			Q1264	6D	R1125	1C	R1227	5D	R1271	7C	VR1237	5D
C1274	6C	DS1271	6A	Q1278	6D	R1126	4B	R1231	5C			VR1258	9D
		DS1272	6B			R1127	4C	R1232	6D			VR1281	5B
		DS1273	7B			R1132	5C	R1234	5D			VR1282	5C

REV. JUNE 1974 (A)

Fig. 7-21 Sht. 1 of 2

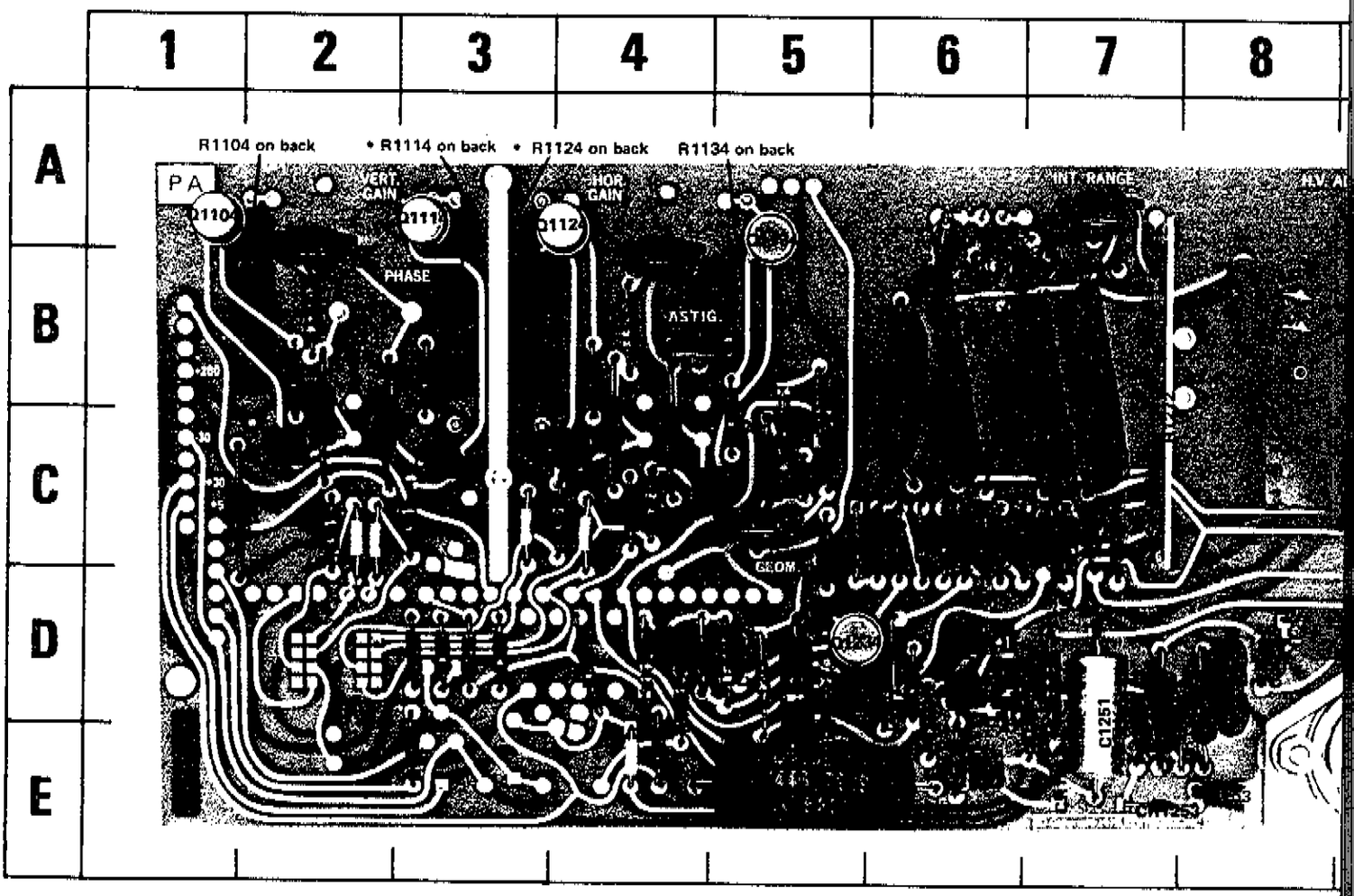
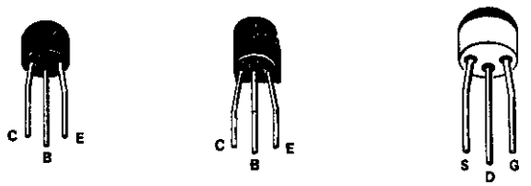
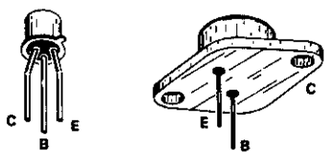


Fig. 7-21. A6 Deflection Amplifier/High Voltage circuit board.

CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GR LO
C1224	5D	C1279	7C	L1259	9D	R1101	4C	R1133	4C	R1236	6C	R1272	7C
C1227	4D	C1281	5C	Q1104	1A	R1102	2B	R1134	4A	R1239	6C	R1273	6A
C1236	5E			Q1106	2C	R1103	2C	R1136	4A	R1242	6C	R1274	6C
C1241	6B	CR1204	4D	Q1114	3A	R1104	1A	R1138	4C	R1243	6A	R1275	9A
C1242	6B	CR1224	5D	Q1116	3C	R1106	2B	R1202	3E	R1245	7A	R1276	7C
C1248	7B	CR1239	5C	Q1124	3A	R1108	2C	R1203	3D	R1251	7D	R1278	6D
C1249	7B	CR1241	8B	Q1126	4C	R1112	3B	R1206	3D	R1252	7D	R1279	7C
C1251	7D	CR1247	8B	Q1134	5A	R1113	3C	R1207	3D	R1254	7D	R1282	5C
C1252	8D	CR1255	9D	Q1136	4C	R1114	3A	R1208	3D	R1262	6D	R1285	5C
C1253	8E	CR1256	8E	Q1222	4D	R1116	2A	R1209	4D	R1263	6E	R1286	4B
C1254	7E	CR1256	8D	Q1226	5D	R1118	2C	R1220	6B	R1266	7D	R1287	5C
C1258	8D	CR1262	7E	Q1234	5D	R1122	4B	R1222	4E	R1267	6D		
C1259	9D	CR1264	6D	Q1252	9E	R1123	4C	R1223	4D	R1268	6C	T1240	9B
C1272	6B	CR1269	6D	Q1262	6E	R1124	3B	R1226	6C	R1269	6C		
C1273	7C			Q1264	6D	R1125	1C	R1227	5D	R1271	7C	VR1237	5D
C1274	6C	DS1271	6A	Q1278	6D	R1126	4B	R1231	5C			VR1258	9D
		DS1272	6B			R1127	4C	R1232	6D			VR1281	5B
		DS1273	7B			R1132	5C	R1234	5D			VR1282	5C

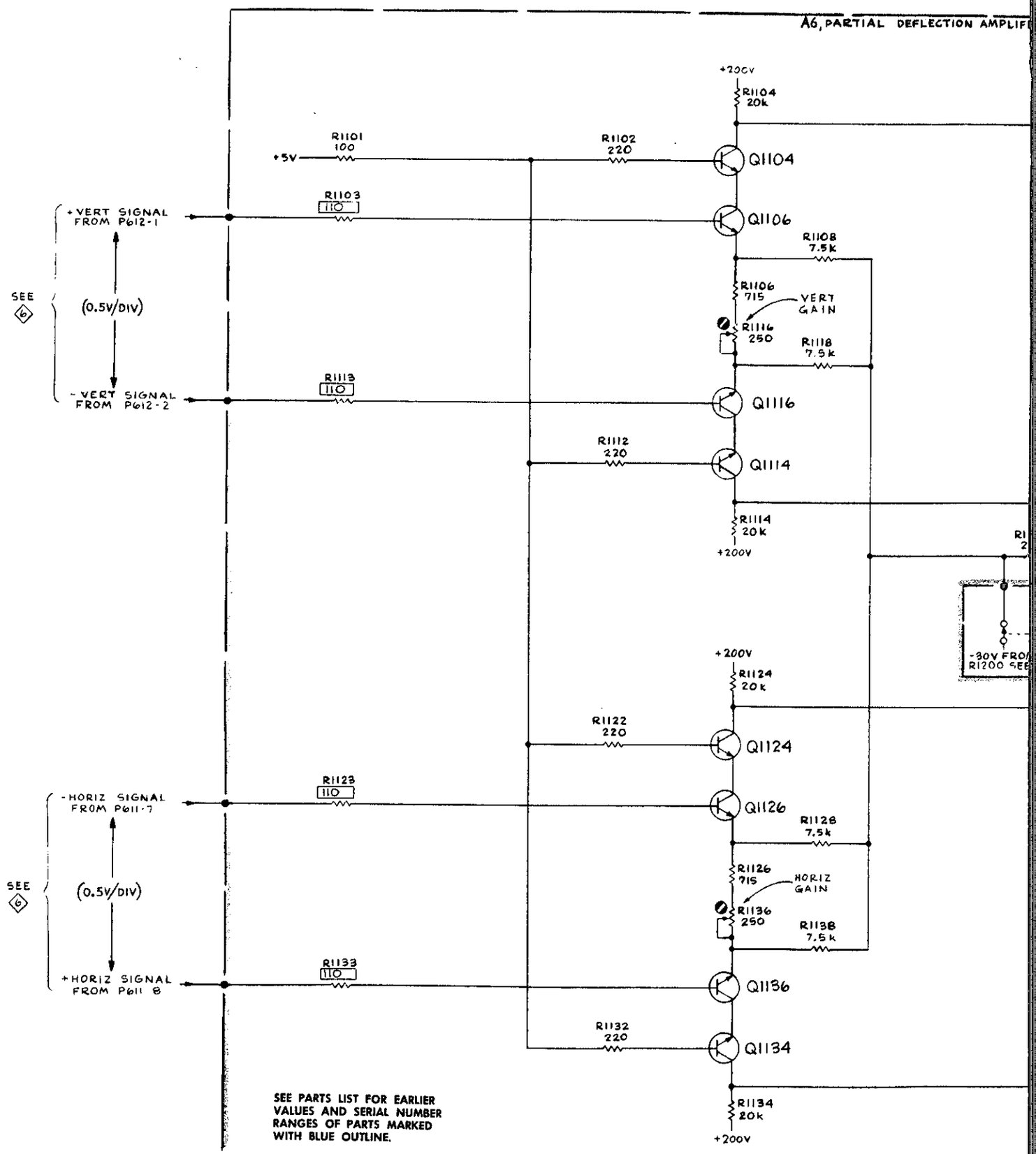


PLASTIC-CASED TRANSISTORS



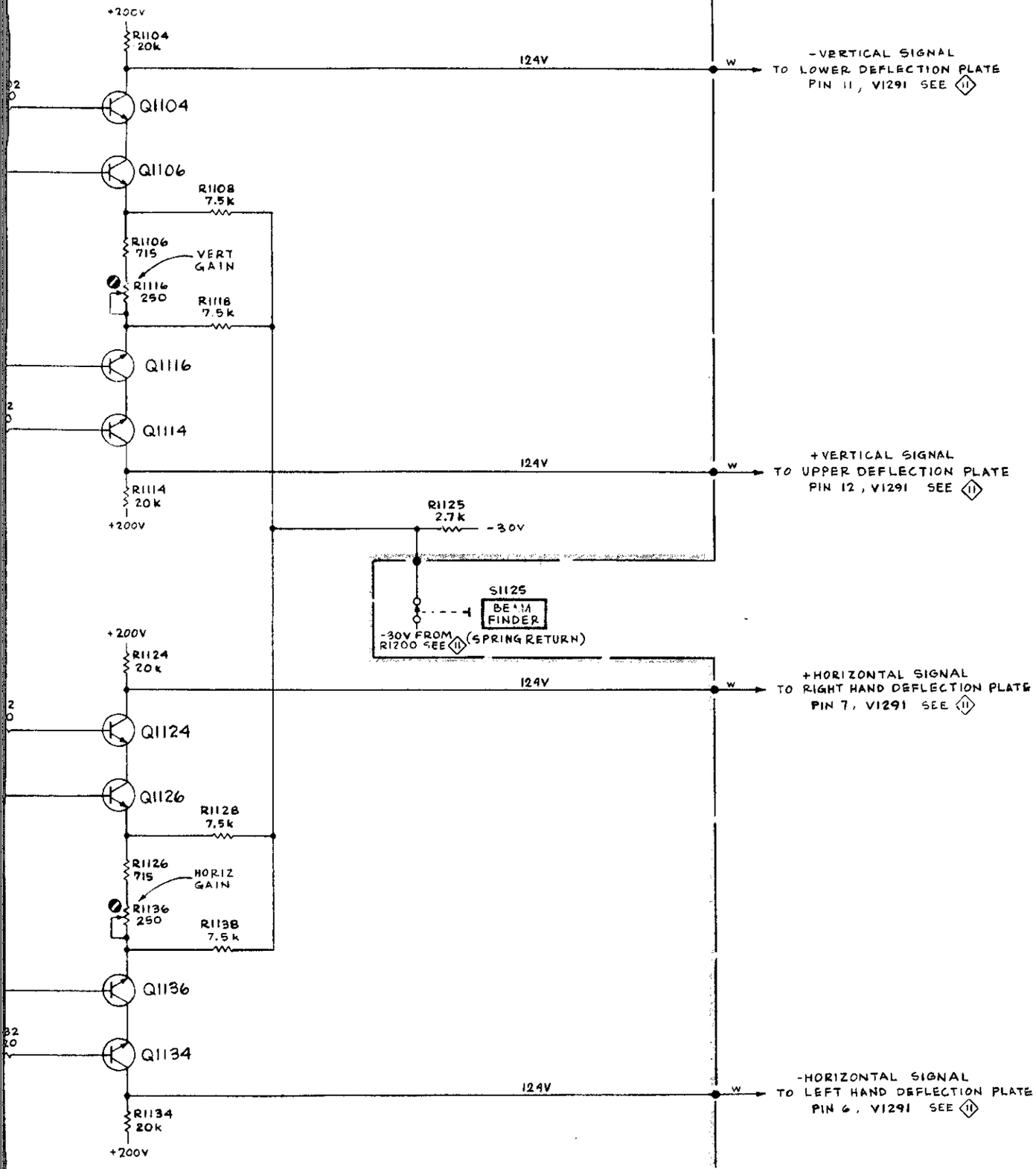
METAL-CASED TRANSISTORS

Fig. 7-22. Semiconductor lead configuration for Deflection Amplifier/High Voltage circuit board.



SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS MARKED WITH BLUE OUTLINE.

A6, PARTIAL DEFLECTION AMPLIFIER/HIGH VOLTAGE BOARD



VERTICAL AND HORIZONTAL OUTPUT AMPLIFIER (10)

REV. JUN 1974

Fig. 7-23 Sht. 1 of 2

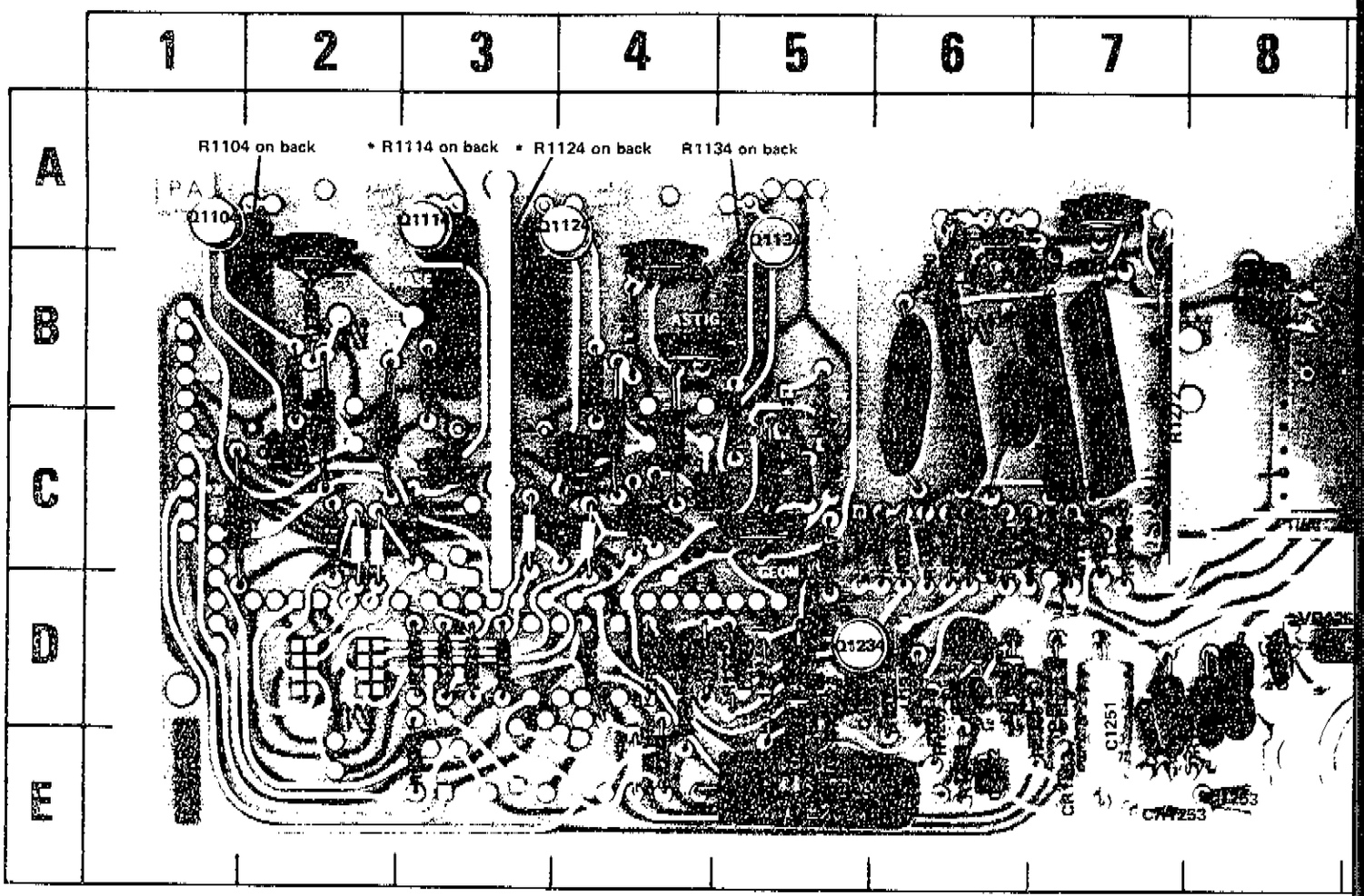


Fig. 7-23. A6 Deflection Amplifier/High Voltage circuit board.

CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRI LOC
C1224	5D	C1279	7C	L1259	9D	R1101	4C	R1133	4C	R1236	6C	R1272	7C
C1227	4D	C1281	5C	Q1104	1A	R1102	2B	R1134	4A	R1239	6C	R1273	6A
C1236	5E			Q1106	2C	R1103	2C	R1136	4A	R1242	6C	R1274	6C
C1241	6B	CR1204	4D	Q1114	3A	R1104	1A	R1138	4C	R1243	6A	R1275	9A
C1242	6B	CR1224	5D	Q1116	3C	R1106	2B	R1202	3E	R1245	7A	R1276	7C
C1248	7B	CR1239	5C	Q1124	3A	R1108	2C	R1203	3D	R1251	7D	R1278	6D
C1249	7B	CR1241	8B	Q1126	4C	R1112	3B	R1206	3D	R1252	7D	R1279	7C
C1251	7D	CR1247	8B	Q1134	5A	R1113	3C	R1207	3D	R1254	7D	R1282	5C
C1252	8D	CR1255	9D	Q1136	4C	R1114	3A	R1208	3D	R1262	6D	R1285	5C
C1253	8E	CR1256	8E	Q1222	4D	R1116	2A	R1209	4D	R1263	6E	R1286	4B
C1254	7E	CR1256	8D	Q1226	5D	R1118	2C	R1220	6B	R1266	7D	R1287	5C
C1258	8D	CR1262	7E	Q1234	5D	R1122	4B	R1222	4E	R1267	6D		
C1259	9D	CR1264	6D	Q1252	9E	R1123	4C	R1223	4D	R1268	6C	T1240	9B
C1272	6B	CR1269	6D	Q1262	6E	R1124	3B	R1226	6C	R1269	6C		
C1273	7C			Q1264	6D	R1125	1C	R1227	5D	R1271	7C	VR1237	5D
C1274	6C	DS1271	6A	Q1278	6D	R1126	4B	R1231	5C			VR1258	9D
		DS1272	6B			R1127	4C	R1232	6D			VR1281	5B
		DS1273	7B			R1132	5C	R1234	5D			VR1282	5C

Fig. 7-23
Sht. 2 of 2

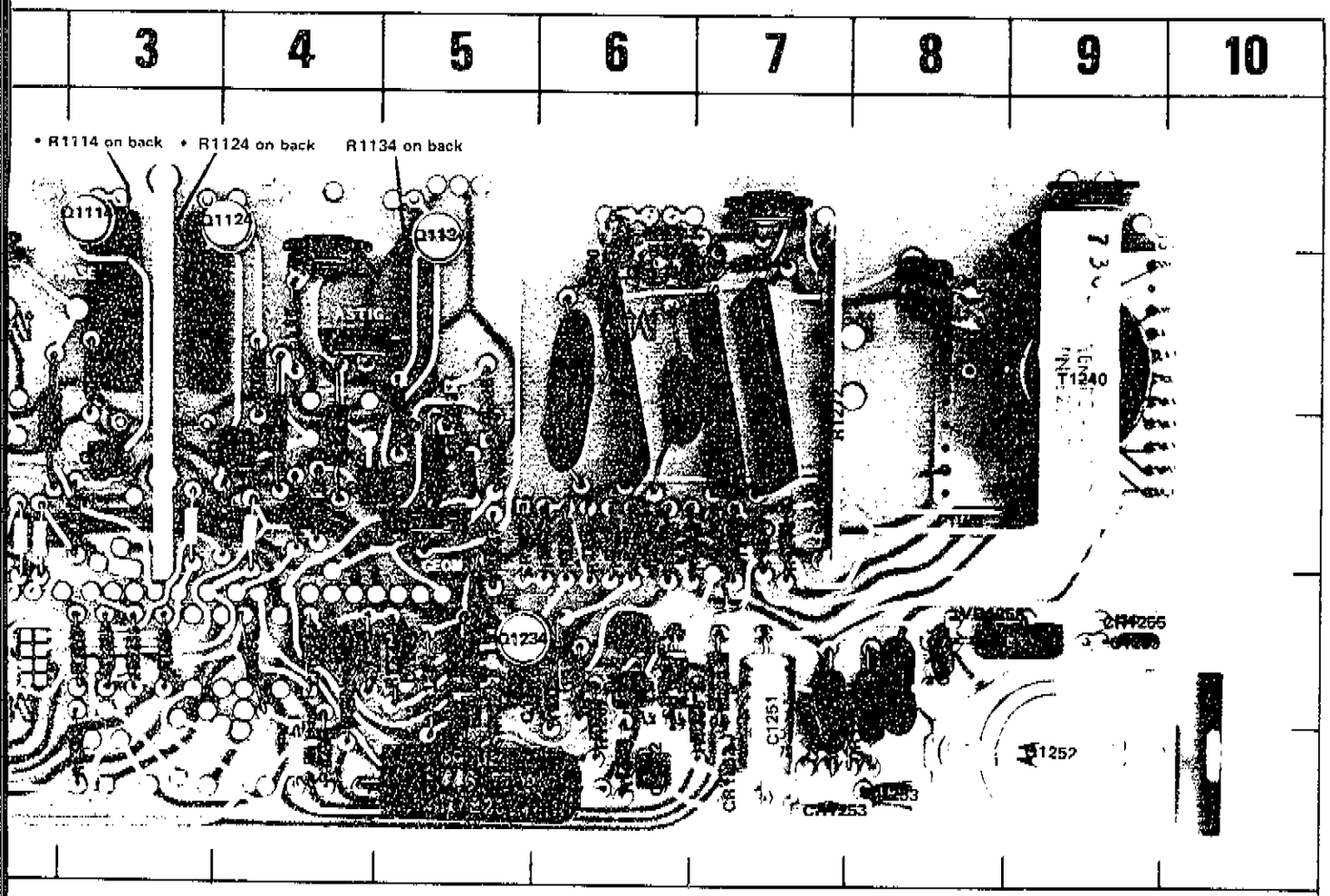
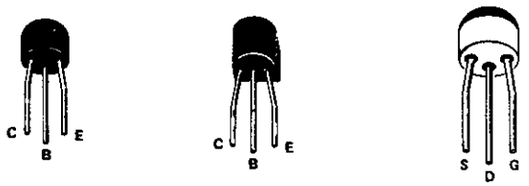


Fig. 7-23. A6 Deflection Amplifier/High Voltage circuit board.

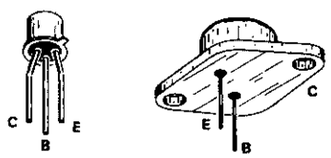
*See Parts List for serial number ranges.

CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
C1224	5D	C1279	7C	L1259	9D	R1101	4C	R1133	4C	R1236	6C	R1272	7C
C1227	4D	C1281	5C	Q1104	1A	R1102	2B	R1134	4A	R1239	6C	R1273	6A
C1236	5E			Q1106	2C	R1103	2C	R1136	4A	R1242	6C	R1274	6C
C1241	6B	CR1204	4D	Q1114	3A	R1104	1A	R1138	4C	R1243	6A	R1275	9A
C1242	6B	CR1224	5D	Q1116	3C	R1106	2B	R1202	3E	R1245	7A	R1276	7C
C1248	7B	CR1239	5C	Q1124	3A	R1108	2C	R1203	3D	R1251	7D	R1278	6D
C1249	7B	CR1241	8B	Q1126	4C	R1112	3B	R1206	3D	R1252	7D	R1279	7C
C1251	7D	CR1247	8B	Q1134	5A	R1113	3C	R1207	3D	R1254	7D	R1282	5C
C1252	8D	CR1255	9D	Q1136	4C	R1114	3A	R1208	3D	R1262	6D	R1285	5C
C1253	8E	CR1256	8E	Q1222	4D	R1116	2A	R1209	4D	R1263	6E	R1286	4B
C1254	7E	CR1256	8D	Q1226	5D	R1118	2C	R1220	6B	R1266	7D	R1287	5C
C1258	8D	CR1262	7E	Q1234	5D	R1122	4B	R1222	4E	R1267	6D		
C1259	9D	CR1264	6D	Q1252	9E	R1123	4C	R1223	4D	R1268	6C	T1240	9B
C1272	6B	CR1269	6D	Q1262	6E	R1124	3B	R1226	6C	R1269	6C		
C1273	7C			Q1264	6D	R1125	1C	R1227	5D	R1271	7C	VR1237	5D
C1274	6C	DS1271	6A	Q1278	6D	R1126	4B	R1231	5C			VR1258	9D
		DS1272	6B			R1127	4C	R1232	6D			VR1281	5B
		DS1273	7B			R1132	5C	R1234	5D			VR1282	5C

REV JUNE 1974 (A)



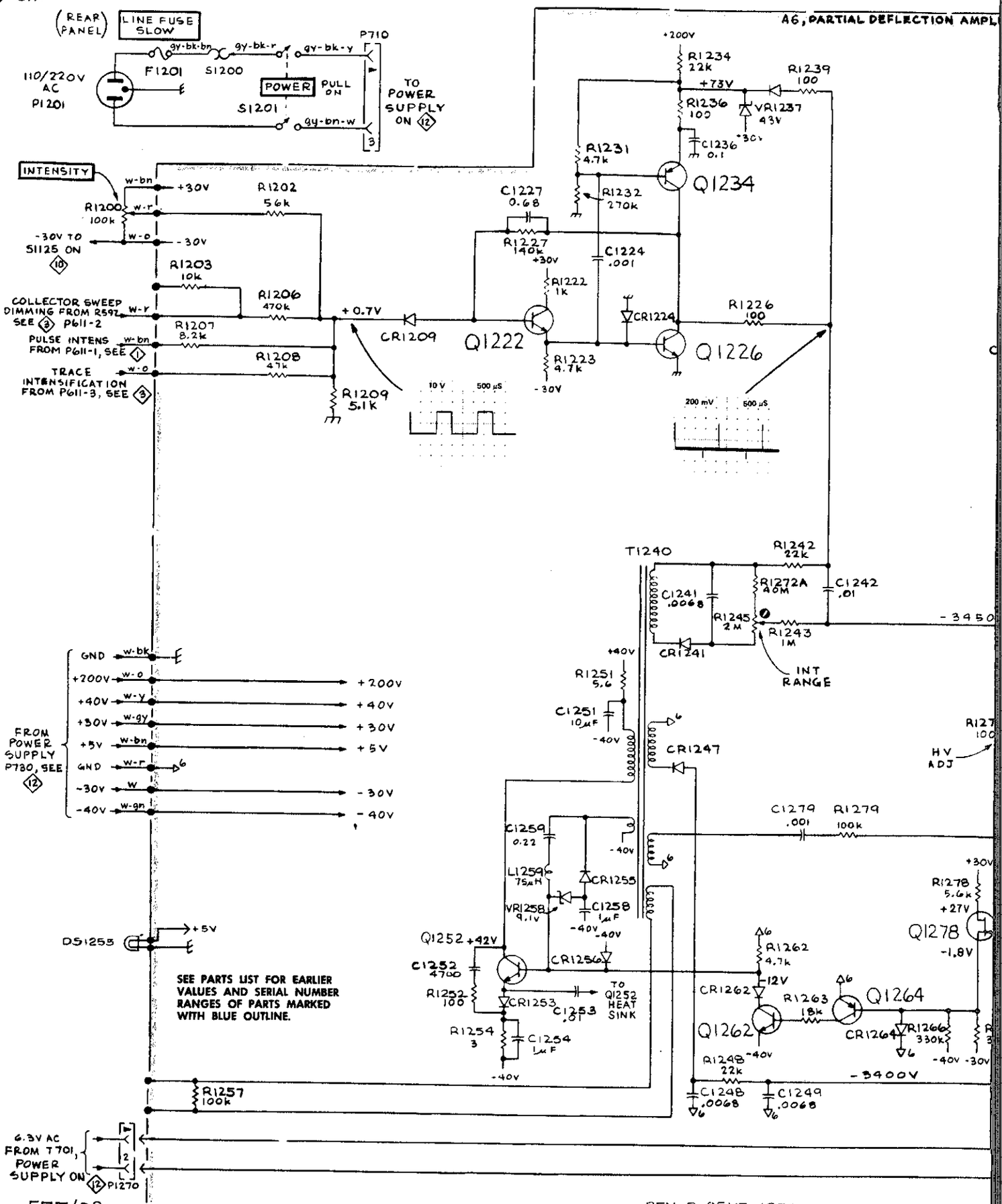
PLASTIC-CASED TRANSISTORS



METAL-CASED TRANSISTORS

Fig. 7-24. Semiconductor lead configuration for Deflection Amplifier/High Voltage circuit board.

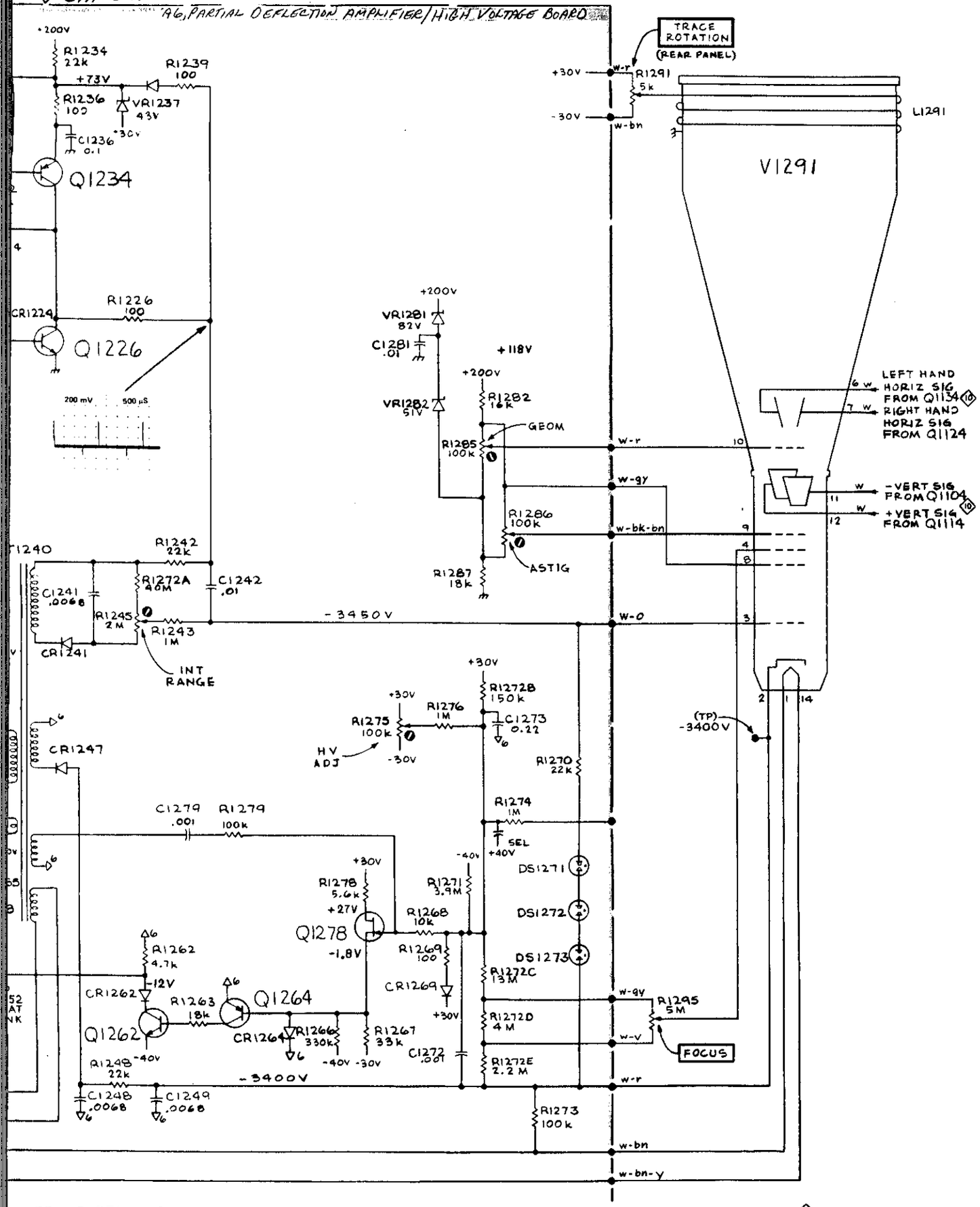
A6, PARTIAL DEFLECTION AMPL



577/D2

REV. B, SEPT. 1974

A6, PARTIAL DEFLECTION AMPLIFIER/HIGH VOLTAGE BOARD



REV. B, SEPT. 1974

CRT CIRCUIT (11)

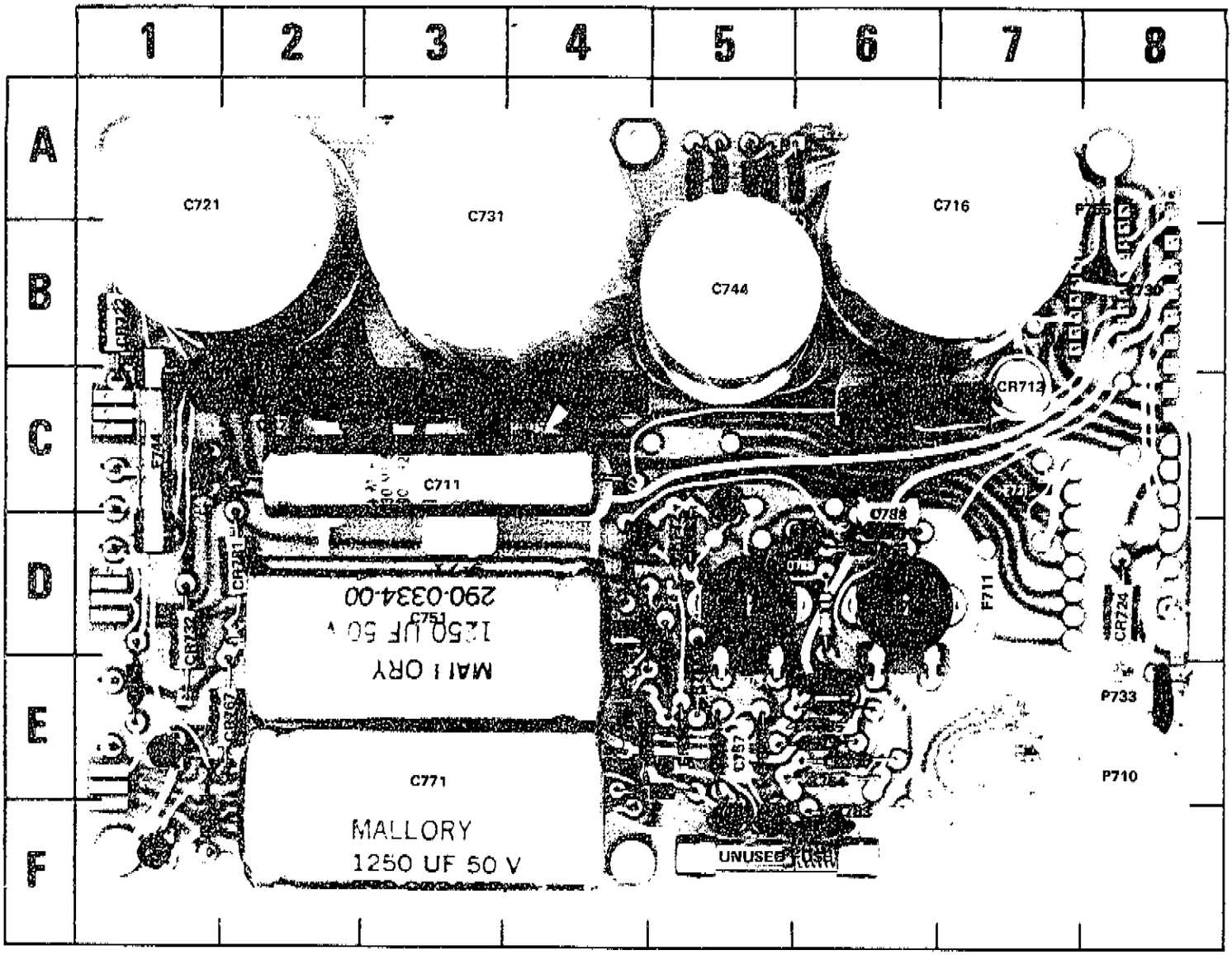


Fig. 7-25A. A3 Regulator circuit board SN B050000-up.

CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
C711	3C	C771	3E	CR722	1B	CR755	5E	R754	1E	R775	5D	Q754	5F
C716	7A	C772	4D	CR724	3D	CR767	2E	R755	5E	R776	5E	Q760	5F
C721	1A	C775	6E	CR731	4C	CR773	5D	R757	5E	R777	6E	Q772	5C
C724	8E	C781	1E	CR732	1D	CR781	2D	R761	5E	R781	6E	Q786	6D
C731	3A	C788	6C	CR741	5A	CR785	6E	R762	5E	R784	6D		
C733	1C			CR742	5A			R763	6F	R785	4D	VR772	5D
C744	5B	CR711	2C	CR743	5A	F711	7D	R764	6E	R786	4E		
C757	5E	CR712	7C	CR744	6A	F744	1C	R765	6D	R787	4D		
C763	6F	CR716	6C	CR751	3C			R766	1F	R788	6C		
C767	1F	CR721	3C	CR754	5E	R744	5A	R772	6E				

Fig. 7-25B
Sht. 1 of 2

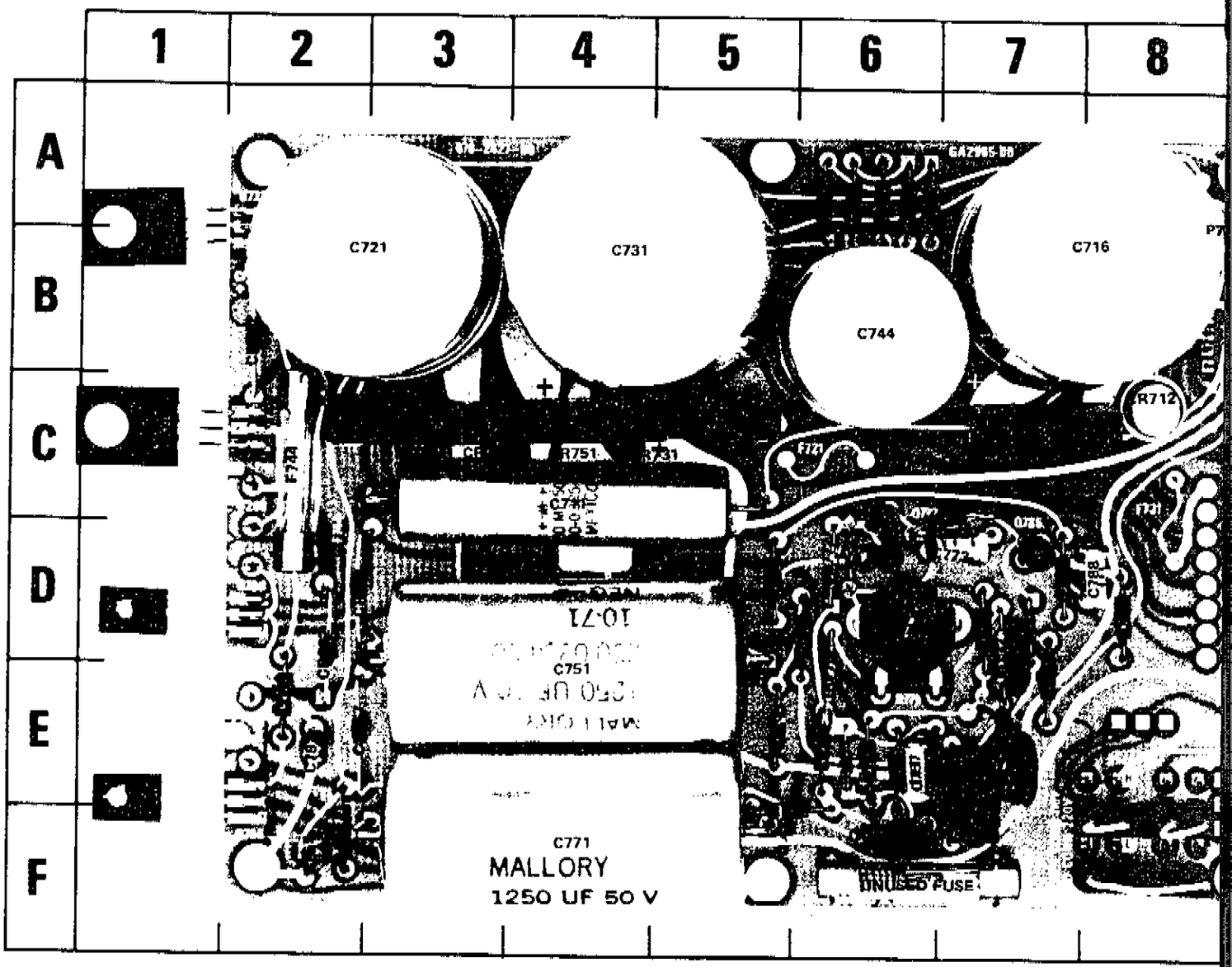


Fig. 7-25B. A3 Regulator circuit board below SN B050000.

CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
C711	4C	C772	6D	CR724	9D	CR773	6D	Q786	7D	R765	7E	R786	5E
C716	8B	C773	6D	CR731	5C	CR781	2D	Q788	1D	R766	2F	R787	5D
C721	2B	C775	7D	CR732	2D	CR785	7D			R772	7D	R788	7D
C731	4B	C781	2E	CR741	6A			R744	6A	R773	7D		
C733	2C	C788	8D	CR742	6A	F714	9C	R754	2E	R774	7C	U722	1A
C744	6B			CR743	6A	F744	2C	R755	6E	R775	6D	U732	1C
C751	4E	CR711	3C	CR744	6A			R757	6E	R776	6E		
C757	6E	CR712	8C	CR751	4C	Q754	6F	R761	5E	R777	7D	VR772	6D
C763	7E	CR716	7C	CR754	6E	Q760	6F	R762	6E	R781	7E		
C767	2F	CR721	3C	CR755	6E	Q766	1E	R763	7E	R784	8D		
C771	4F	CR722	2B	CR767	2E	Q772	6C	R764	7E	R785	8D		

REV

Fig. 7-25B
Sht. 2 of 2

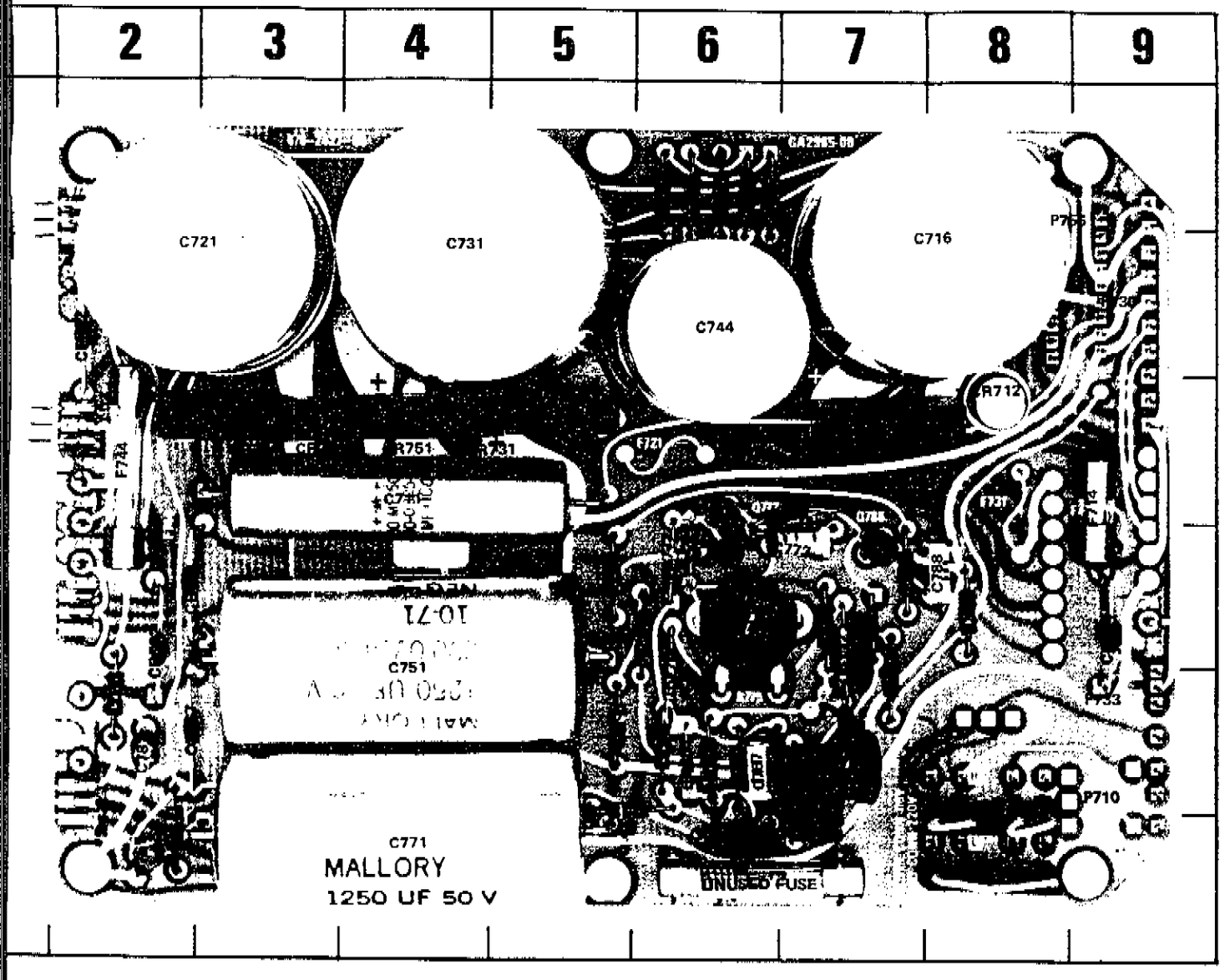
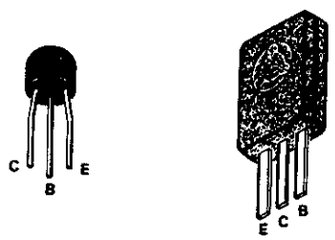
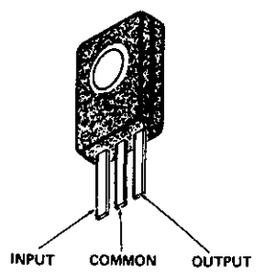


Fig. 7-25B. A3 Regulator circuit board below SN B050000.

CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
C711	4C	C772	6D	CR724	9D	CR773	6D	Q786	7D	R765	7E	R786	5E
C716	8B	C773	6D	CR731	5C	CR781	2D	Q788	1D	R766	2F	R787	5D
C721	2B	C775	7D	CR732	2D	CR785	7D			R772	7D	R788	7D
C731	4B	C781	2E	CR741	6A			R744	6A	R773	7D		
C733	2C	C788	8D	CR742	6A	F714	9C	R754	2E	R774	7C	U722	1A
C744	6B			CR743	6A	F744	2C	R755	6E	R775	6D	U732	1C
C751	4E	CR711	3C	CR744	6A			R757	6E	R776	6E		
C757	6E	CR712	8C	CR751	4C	Q754	6F	R761	5E	R777	7D	VR772	6D
C763	7E	CR716	7C	CR754	6E	Q760	6F	R762	6E	R781	7E		
C767	2F	CR721	3C	CR755	6E	Q766	1E	R763	7E	R784	8D		
C771	4F	CR722	2B	CR767	2E	Q772	6C	R764	7E	R785	8D		

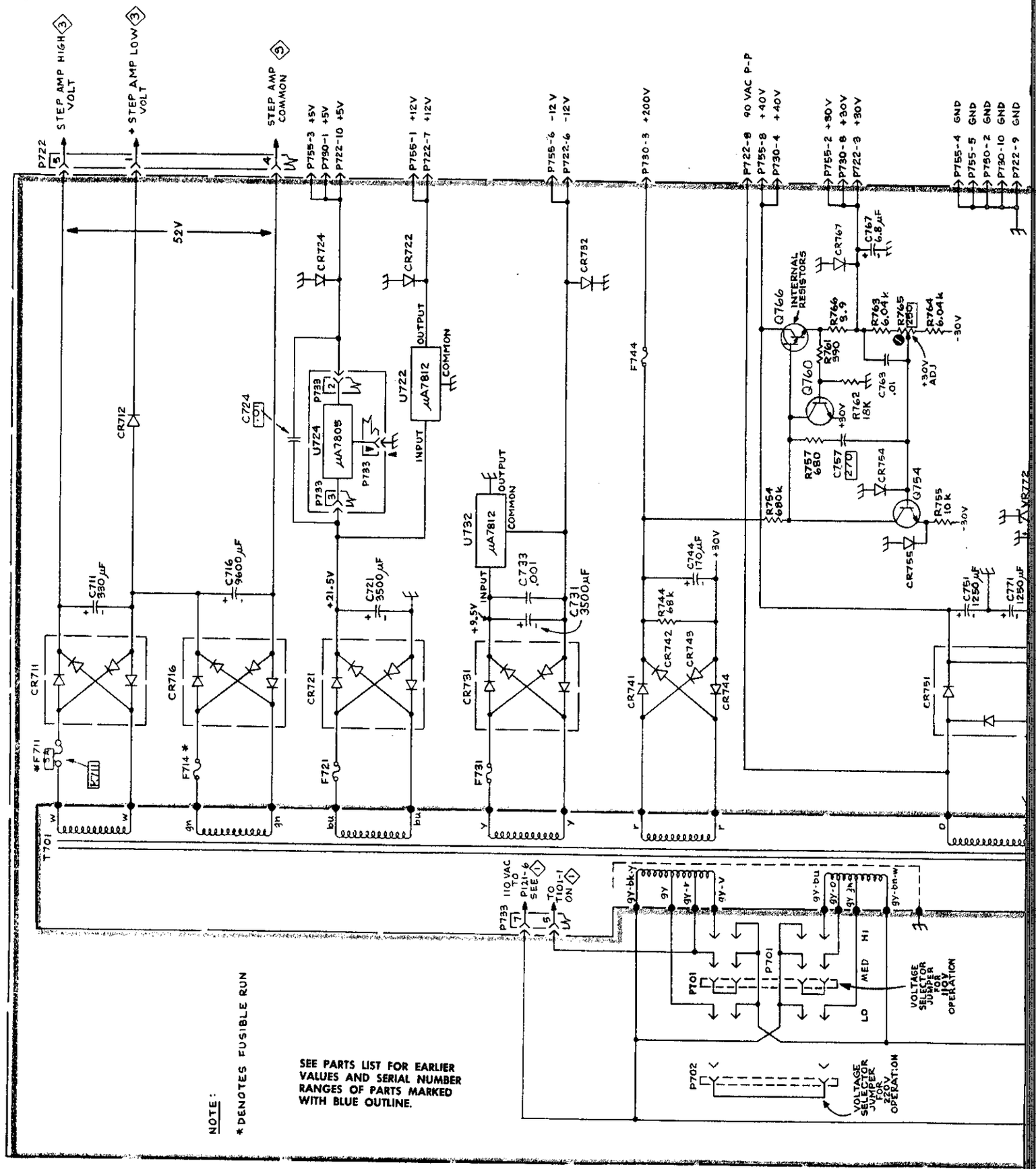


PLASTIC-CASED TRANSISTORS



INTEGRATED CIRCUITS

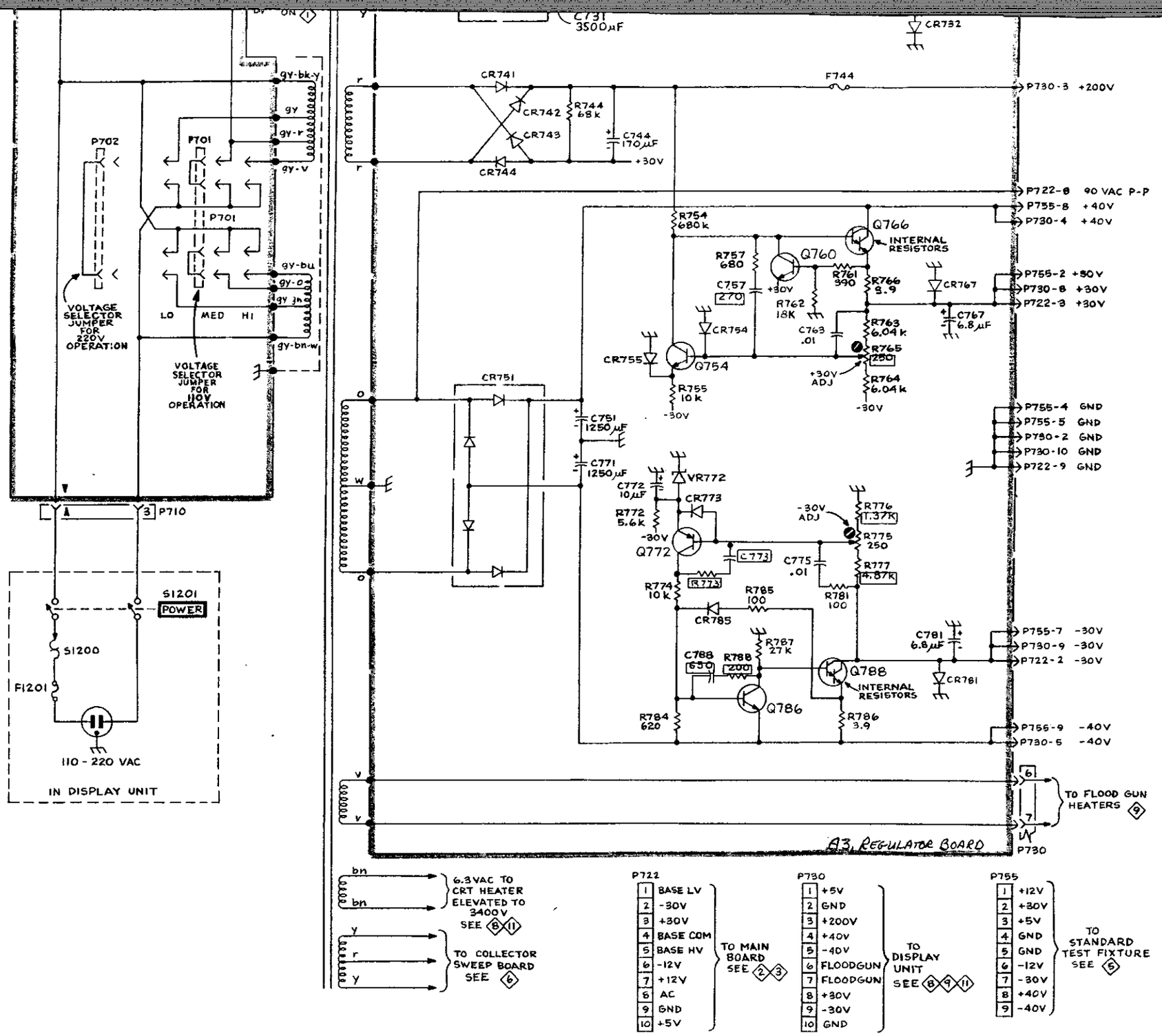
Fig. 7-26. Semiconductor lead configuration for Regulator circuit board.



NOTE:

*DENOTES FUSIBLE RUN

SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS MARKED WITH BLUE OUTLINE.



REV. C FEB. 1975

POWER SUPPLY 12

Fig. 1 UNIT ASSEMBLY
Sht. 1 OF 2

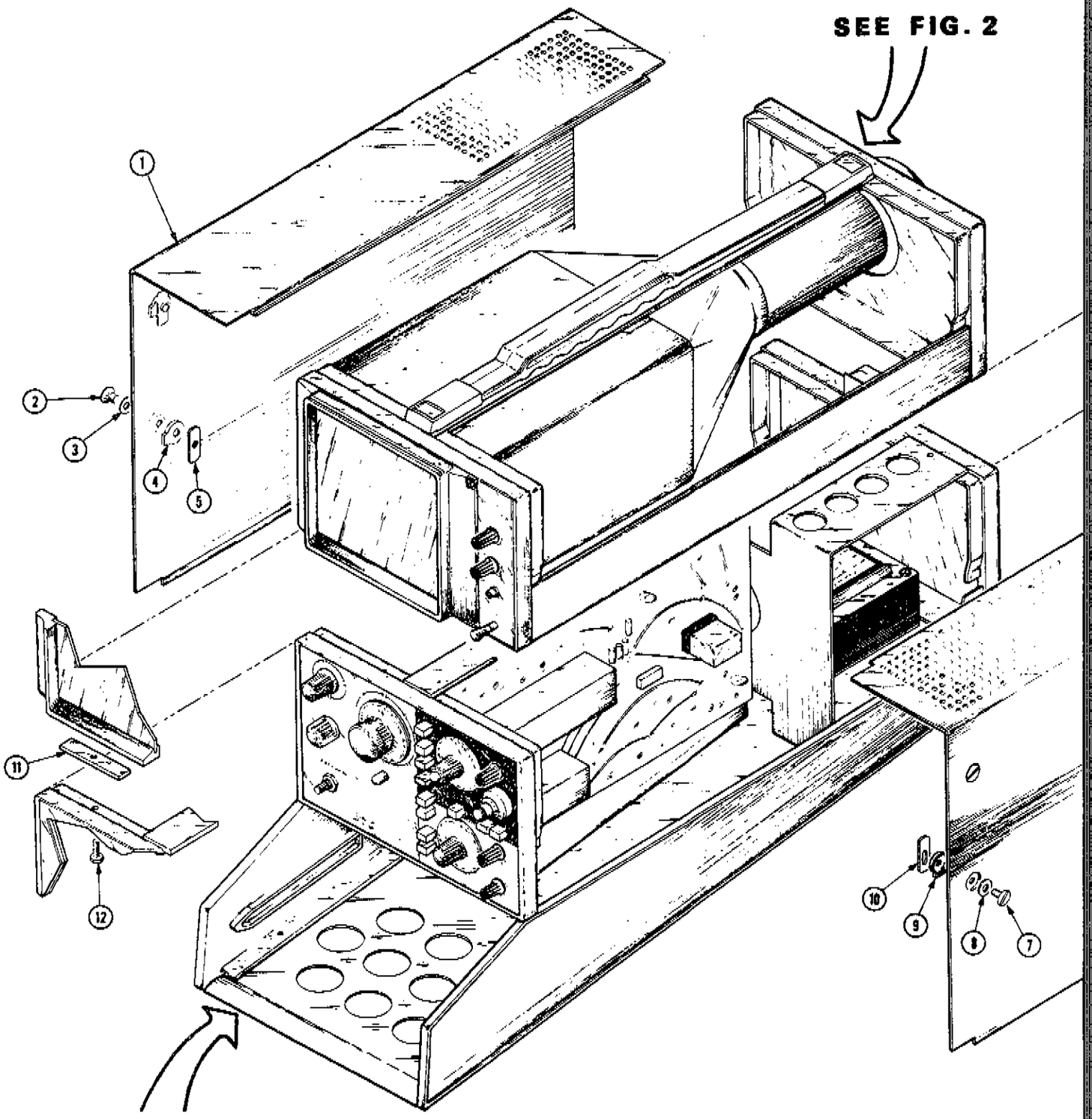


Fig. 1 UNIT ASSEMBLY
Sht. 2 of 2

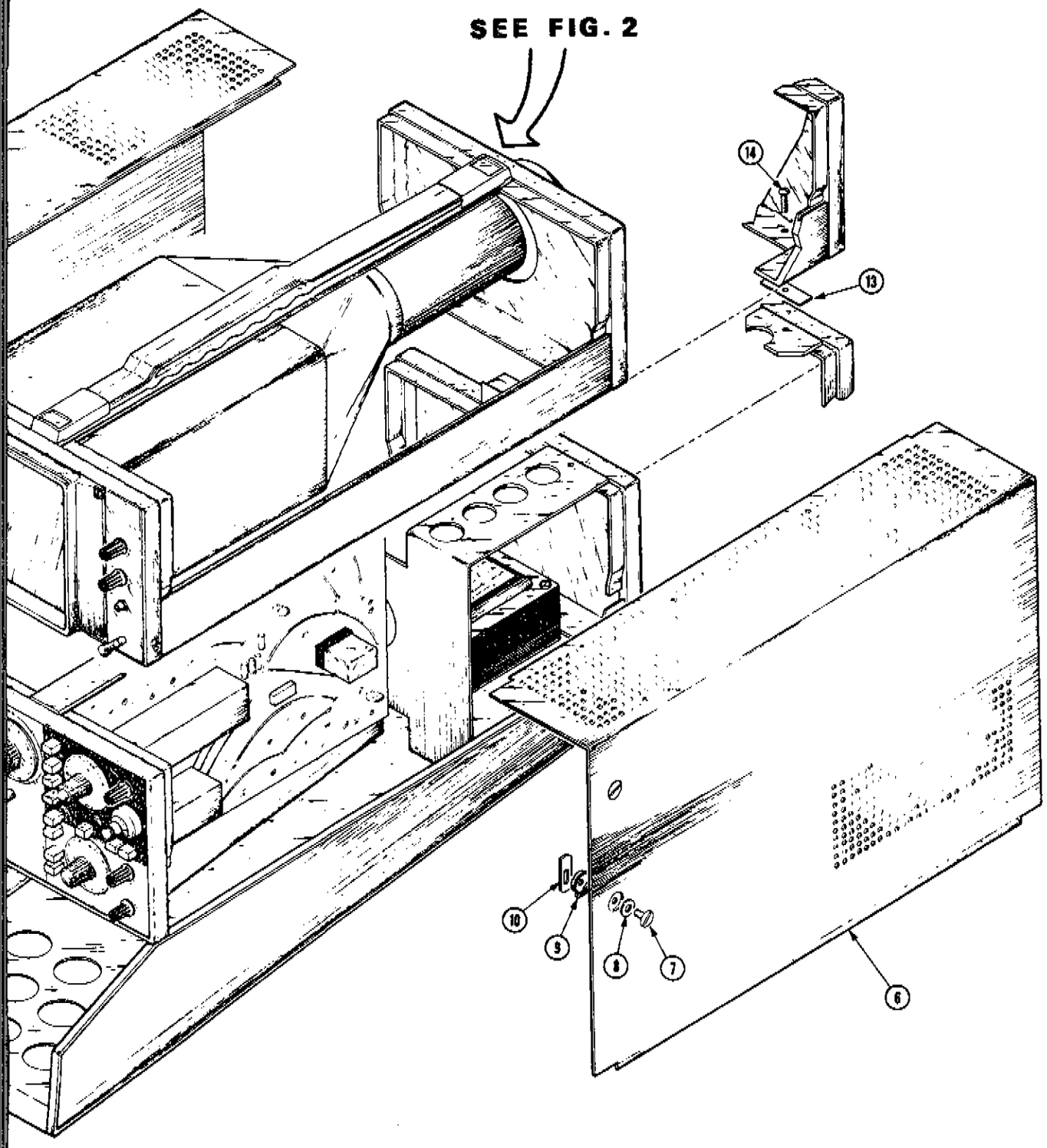
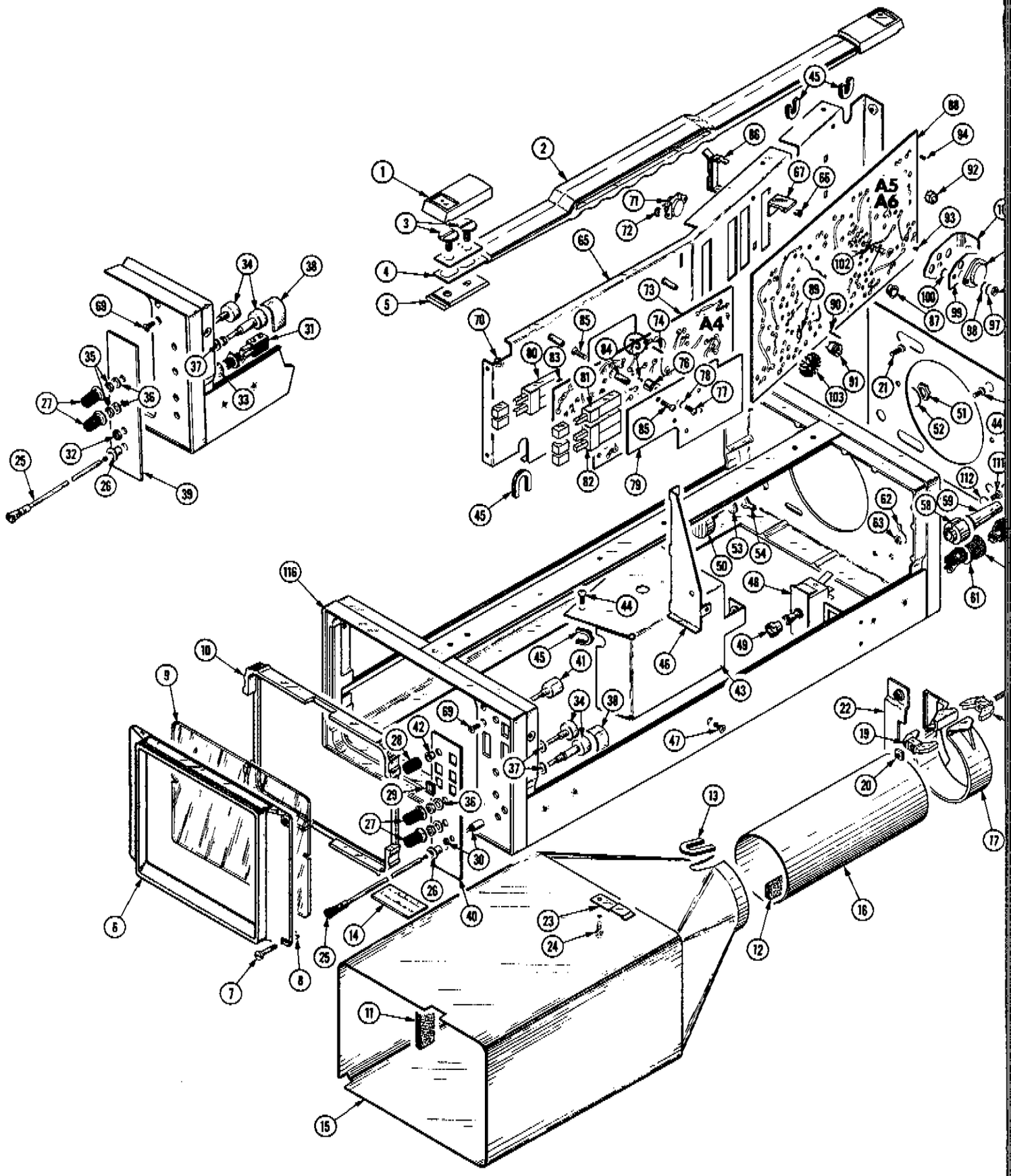
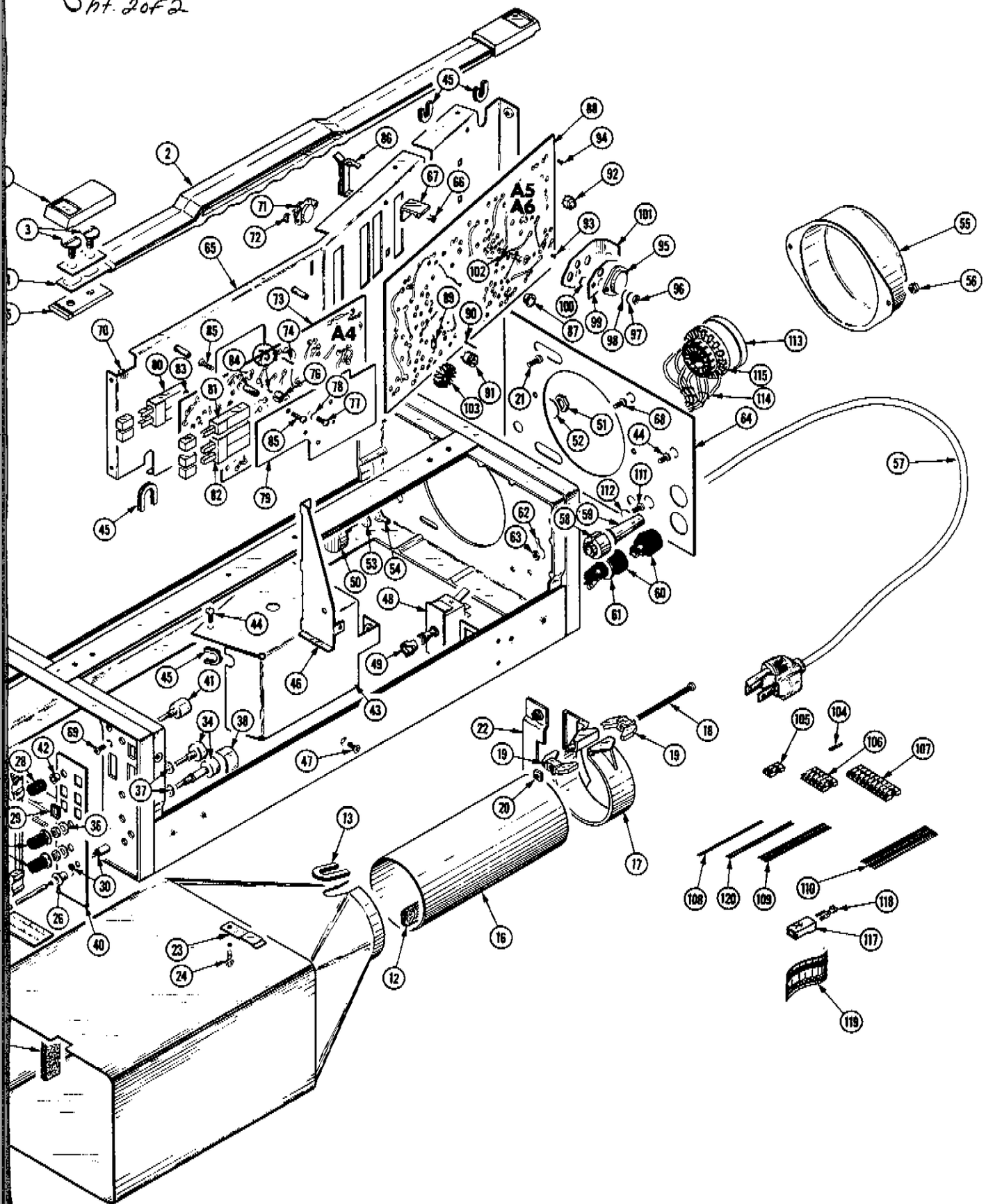


Fig. 2 D1 or D2
Sht. 1 of 2



ER

Fig 2 01 or 02
Sht. 2 of 2



7-29

Fig. 3 577 FRONT & REAR
Sht. 10 F 2

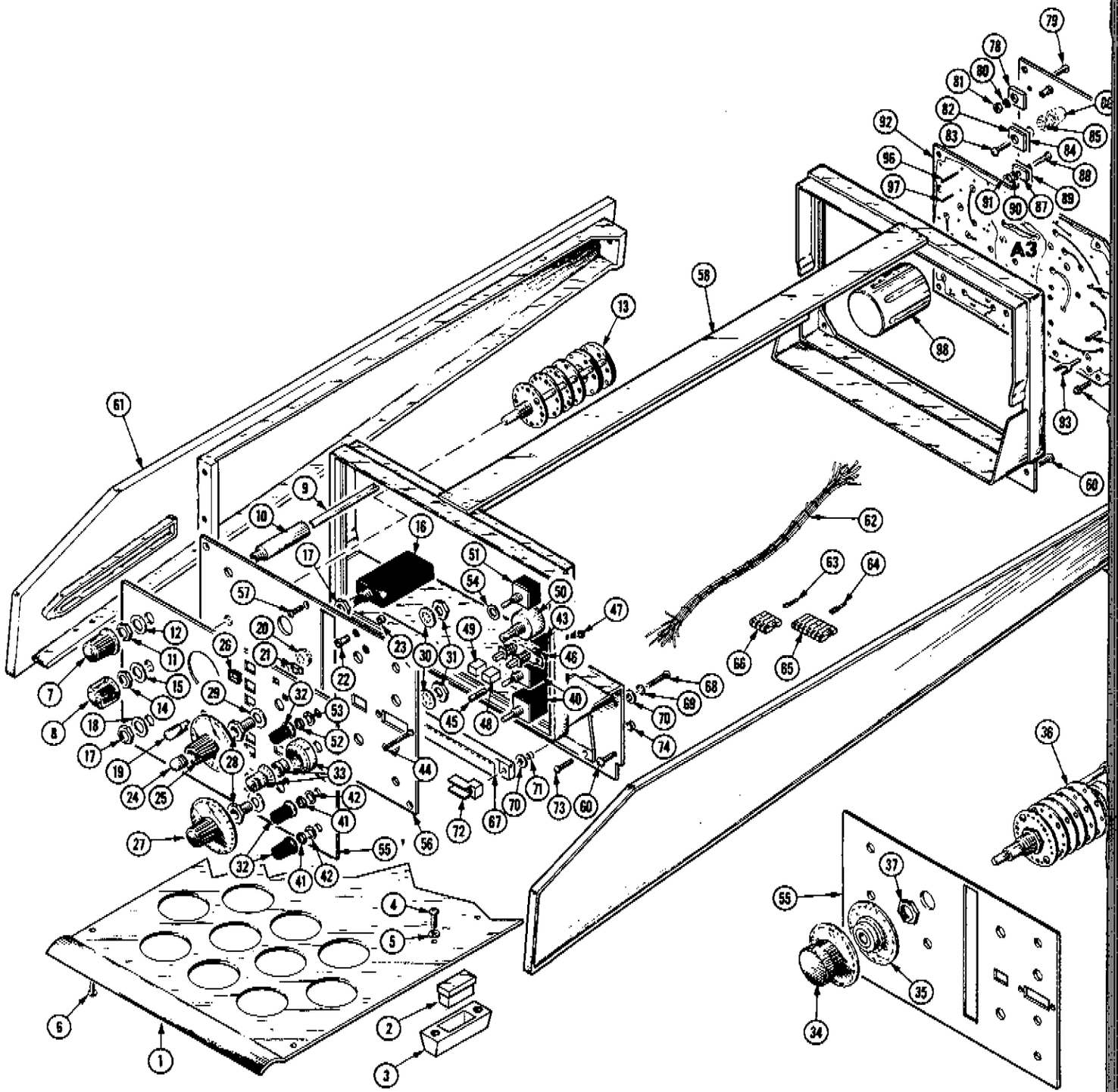


Fig 3 577 FRONT & REAR
Sht. 2 OF 2

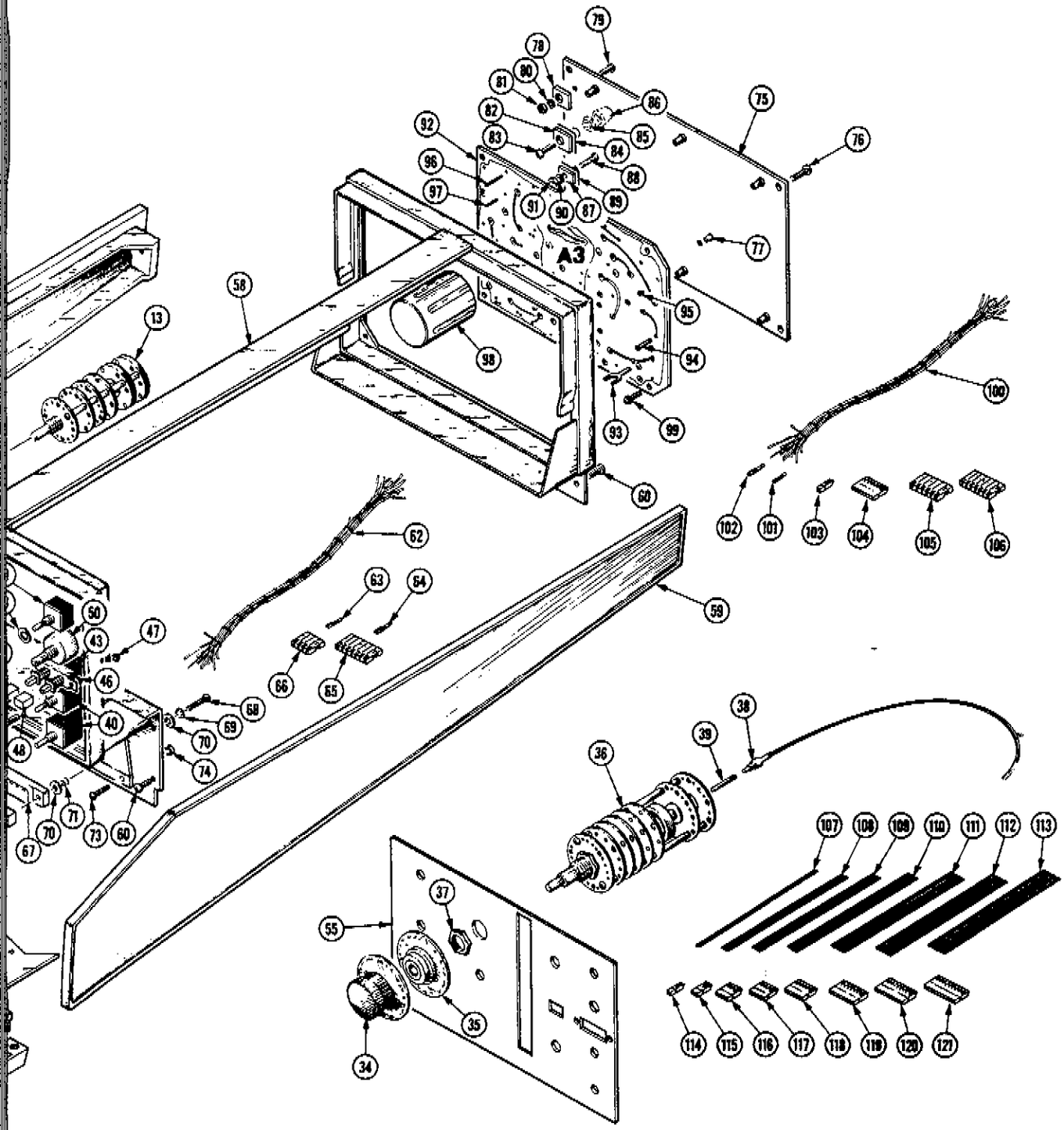


Fig. 4 577 MAIN FRAME
Sht. 1 of 2

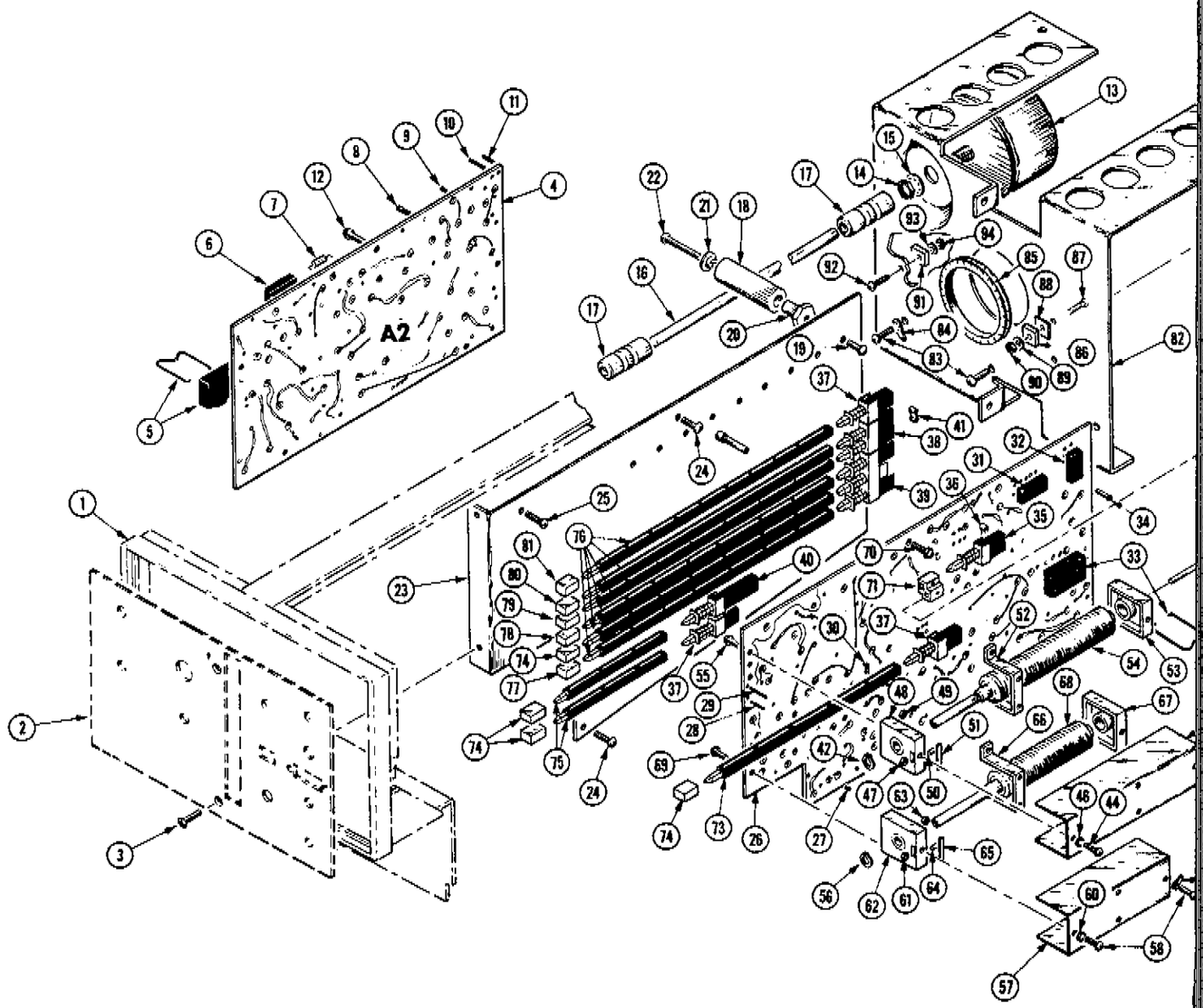
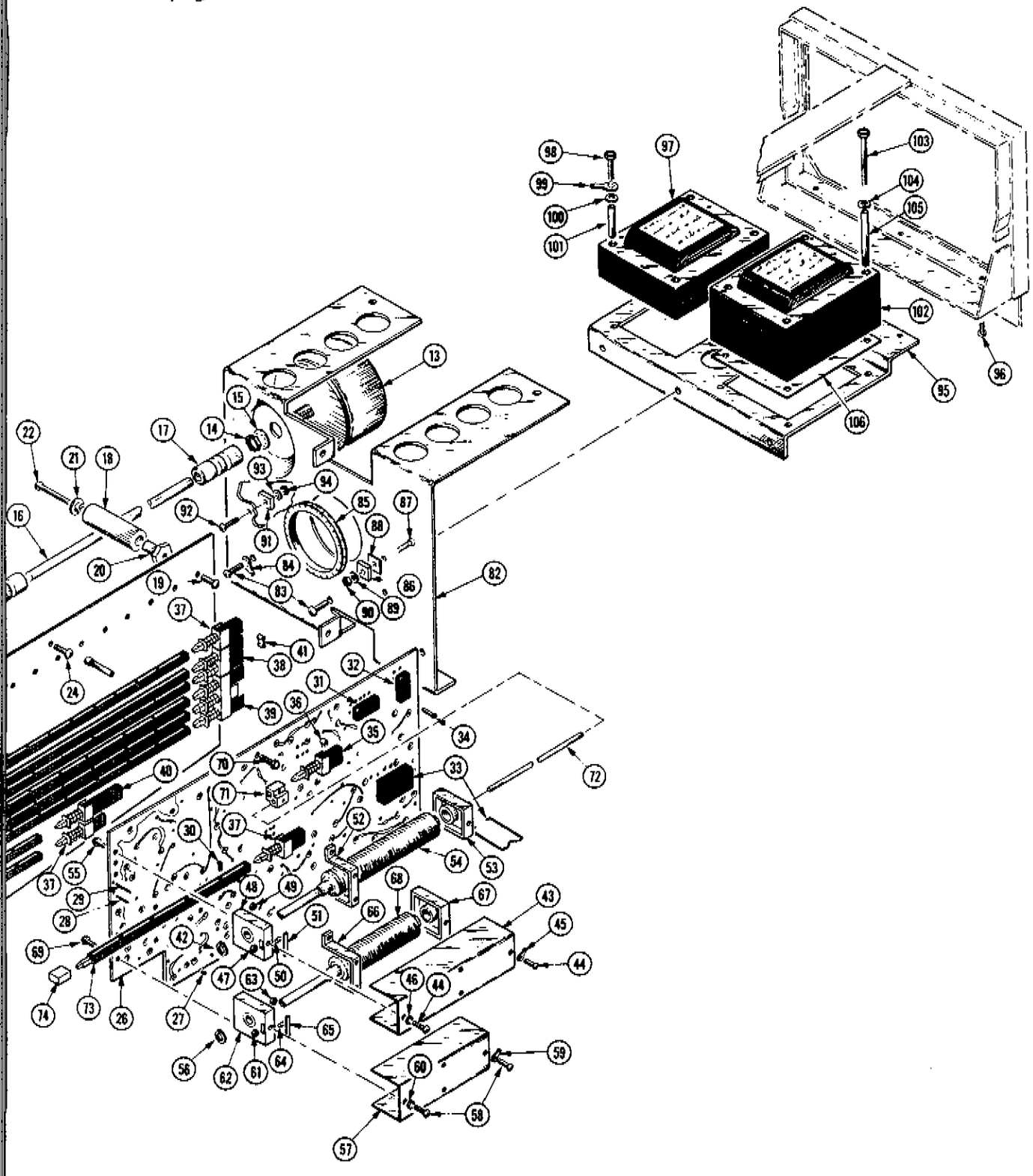


Fig. 4 577 MAIN FRAME
Sht. 2 of 2



REPLACEABLE MECHANICAL PARTS

PARTS ORDERING INFORMATION

Replacement parts are available from or through your local Tektronix, Inc. Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc. Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

SPECIAL NOTES AND SYMBOLS

X000	Part first added at this serial number
00X	Part removed after this serial number

FIGURE AND INDEX NUMBERS

Items in this section are referenced by figure and index numbers to the illustrations.

INDENTATION SYSTEM

This mechanical parts list is indented to indicate item relationships. Following is an example of the indentation system used in the description column.

1 2 3 4 5 *Name & Description*

Assembly and/or Component
Attaching parts for Assembly and/or Component
- - - * - - -
Detail Part of Assembly and/or Component
Attaching parts for Detail Part
- - - * - - -
Parts of Detail Part
Attaching parts for Parts of Detail Part
- - - * - - -

Attaching Parts always appear in the same indentation as the item it mounts, while the detail parts are indented to the right. Indented items are part of, and included with, the next higher indentation. The separation symbol - - - * - - - indicates the end of attaching parts.

Attaching parts must be purchased separately, unless otherwise specified.

ITEM NAME

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

ABBREVIATIONS

"	INCH
#	NUMBER SIZE
ACTR	ACTUATOR
ADPTR	ADAPTER
ALIGN	ALIGNMENT
AL	ALUMINUM
ASSEM	ASSEMBLED
ASSY	ASSEMBLY
ATTEN	ATTENUATOR
AWG	AMERICAN WIRE GAGE
BD	BOARD
BRKT	BRACKET
BRS	BRASS
BRZ	BRONZE
BSHG	BUSHING
CAB	CABINET
CAP	CAPACITOR
CER	CERAMIC
CHAS	CHASSIS
CKT	CIRCUIT
COMP	COMPOSITION
CONN	CONNECTOR
COV	COVER
CPLG	COUPLING
CRT	CATHODE RAY TUBE
DEG	DEGREE
DWR	DRAWER
ELCTRN	ELECTRON
ELEC	ELECTRICAL
ELCTLT	ELECTROLYTIC
ELEM	ELEMENT
EPL	ELECTRICAL PARTS LIST
EQPT	EQUIPMENT
EXT	EXTERNAL
FIL	FILLISTER HEAD
FLEX	FLEXIBLE
FLH	FLAT HEAD
FLTR	FILTER
FR	FRAME or FRONT
FSTNR	FASTENER
FT	FOOT
FXD	FIXED
GSKT	GASKET
HDL	HANDLE
HEX	HEXAGON
HEX HD	HEXAGONAL HEAD
HEX SOC	HEXAGONAL SOCKET
HLCPS	HELICAL COMPRESSION
HLEXT	HELICAL EXTENSION
HV	HIGH VOLTAGE
IC	INTEGRATED CIRCUIT
ID	INSIDE DIAMETER
IDENT	IDENTIFICATION
IMPLR	IMPELLER
IN	INCH
INCAND	INCANDESCENT
INSUL	INSULATOR
INTL	INTERNAL
LPHLDR	LAMPHOLDER
MACH	MACHINE
MECH	MECHANICAL
MTG	MOUNTING
NIP	NIPPLE
NON WIRE	NOT WIRE WOUND
OBD	ORDER BY DESCRIPTION
OD	OUTSIDE DIAMETER
OVH	OVAL HEAD
PH BRZ	PHOSPHOR BRONZE
PL	PLAIN or PLATE
PLSTC	PLASTIC
PN	PART NUMBER
PNH	PAN HEAD
PWR	POWER
RCPT	RECEPTACLE
RES	RESISTOR
RGD	RIGID
RLF	RELIEF
RTNR	RETAINER
SCH	SOCKET HEAD
SCOPE	OSCILLOSCOPE
SCR	SCREW
SE	SINGLE END
SECT	SECTION
SEMICOND	SEMICONDUCTOR
SHLD	SHIELD
SHLDR	SHOULDERED
SKT	SOCKET
SL	SLIDE
SLFLKG	SELF-LOCKING
SLVG	SLEEVING
SPR	SPRING
SQ	SQUARE
SST	STAINLESS STEEL
STL	STEEL
SW	SWITCH
T	TUBE
TERM	TERMINAL
THD	THREAD
THK	THICK
TNSN	TENSION
TPG	TAPPING
TRH	TRUSS HEAD
V	VOLTAGE
VAR	VARIABLE
W/	WITH
WSHR	WASHER
XFMR	TRANSFORMER
XSTR	TRANSISTOR

CROSS INDEX MFR. CODE NUMBER TO MANUFACTURER

MFR.CODE	MANUFACTURER	ADDRESS	CITY,STATE,ZIP
0000C	GETTIG ENGINEERING AND MANUFACTURING CO.		SPRINGMILL, PA 16875
00779	AMP, INC.	P. O. BOX 3608	HARRISBURG, PA 17105
01295	TEXAS INSTRUMENTS, INC., SEMICONDUCTOR GROUP	P. O. BOX 5012	DALLAS, TX 75222
05820	WAKEFIELD ENGINEERING, INC.	AUDUBON ROAD	WAKEFIELD, MA 01880
06982	MOORE, HOWARD J., CO.	105 E. 16TH ST.	NEW YORK, NY 10003
08261	SPECTRA-STRIP CORP.	7100 LAMPSON AVE.	GARDEN GROVE, CA 92642
12327	FREEWAY CORP.	9301 ALLEN DR.	CLEVELAND, OH 44125
12697	CLAROSTAT MFG. CO., INC.	LOWER WASHINGTON ST.	DOVER, NH 03820
22526	BERG ELECTRONICS, INC.	YOUK EXPRESSWAY	NEW CUMBERLAND, PA 17070
23499	GAVITT WIRE AND CABLE, DIVISION OF RSC INDUSTRIES, INC.	455 N. QUINCE ST.	ESCONDIDO, CA 92025
63743	WARD LEONARD ELECTRIC CO., INC.	31 SOUTH ST.	MOUNT VERNON, NY 10550
70276	ALLEN MFG. CO.	P. O. DRAWER 570	HARTFORD, CT 06101
70485	ATLANTIC INDIA RUBBER WORKS, INC.	571 W. POLK ST.	CHICAGO, IL 60607
71590	CENTRALAB ELECTRONICS, DIV. OF GLOBE-UNION, INC.	5757 N. GREEN BAY AVE.	MILWAUKEE, WI 53201
71785	TRW ELECTRONIC COMPONENTS, CINCH CONNECTOR OPERATIONS	1501 MORSE AVE.	ELK GROVE VILLAGE, IL 60007
73743	FISCHER SPECIAL MFG. CO.	446 MORGAN ST.	CINCINNATI, OH 45206
74445	HOLO-KROME CO.	31 BROOK ST. WEST	HARTFORD, CT 06110
75915	LITTELFUSE, INC.	800 E. NORTHWEST HWY	DES PLAINES, IL 60016
77250	PHEOLL MANUFACTURING CO., DIVISION OF ALLIED PRODUCTS CORP.	5700 W. ROOSEVELT RD.	CHICAGO, IL 60650
77342	AMF, INC., POTTER AND BRUMFIELD DIV.	1200 E. BROADWAY	PRINCETON, IN 47570
78189	ILLINOIS TOOL WORKS, INC. SHAKEPROOF DIVISION	ST. CHARLES ROAD	ELGIN, IL 60120
78471	TILLEY MFG. CO.	900 INDUSTRIAL RD.	SAN CARLOS, CA 94070
79136	WALDES, KOHINOOR, INC.	47-16 AUSTEL PLACE	LONG ISLAND CITY, NY 11101
79807	WROUGHT WASHER MFG. CO.	2100 S. O BAY ST.	MILWAUKEE, WI 53207
80009	TEKTRONIX, INC.	P. O. BOX 500	BEAVERTON, OR 97077
81073	GRAYHILL, INC.	561 HILLGROVE AVE.	LA GRANGE, IL 60525
82389	SWITCHCRAFT, INC.	5555 N. ELSTON AVE.	CHICAGO, IL 60630
82647	TEXAS INSTRUMENTS, INC., CONTROL PRODUCTS DIV.	34 FOREST ST.	ATTLEBORO, MA 02703
83385	CENTRAL SCREW CO.	2530 CRESCENT DR.	BROADVIEW, IL 60153
83501	GAVITT WIRE AND CABLE, DIVISION OF RSC INDUSTRIES, INC.	CENTRAL ST.	BROOKFIELD, MA 01506
86445	PENN FIBRE AND SPECIALTY CO., INC.	2032 E. WESTMORELAND ST.	PHILADELPHIA, PA 19134
89663	REESE, J. RAMSEY, INC.	71 MURRAY ST.	NEW YORK, NY 10007
91929	HONEYWELL, INC., MICRO SWITCH DIV.	CHICAGO & SPRING STS.	FREEPORT, IL 61032

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5 Name & Description	Mfr Code	Mfr Part Number
1-1	390-0322-00			1	CABINET SIDE:LEFT	80009	390-0322-00
	214-0812-00			3	. FASTENER,PAWL:	80009	214-0812-00
	----- -----			-	. . EACH ASSEMBLY INCLUDES:		
-2	214-0603-01			1	. . PIN,SECURING:0.27 INCH LONG	80009	214-0603-01
-3	214-0604-00			1	. . WASH.,SPG TNSN:0.26 ID X 0.47 INCH OD	80009	214-0604-00
-4	386-0227-00			1	. . PL,LATCH INDEX:	80009	386-0227-00
-5	386-0226-00			1	. . PL,LATCH LKG:FOR 0.080 INCH THICKNESS	80009	386-0226-00
-6	390-0321-00			1	CABINET,SIDE:RIGHT	80009	390-0321-00
	214-0812-00			2	. FASTENER,PAWL:	80009	214-0812-00
	----- -----			-	. . EACH ASSEMBLY INCLUDES:		
-7	214-0603-01			1	. . PIN,SECURING:0.27 INCH LONG	80009	214-0603-01
-8	214-0604-00			1	. . WASH.,SPG TNSN:0.26 ID X 0.47 INCH OD	80009	214-0604-00
-9	386-0227-00			1	. . PL,LATCH INDEX:	80009	386-0227-00
-10	386-0226-00			1	. . PL,LATCH LKG:FOR 0.080 INCH THICKNESS	80009	386-0226-00
-11	361-0507-00			2	SPACER,CHASSIS:FRONT	80009	361-0507-00
					(ATTACHING PARTS FOR EACH)		
-12	212-0084-00			1	SCREW,MACHINE:8-32 X 0.312 INCH,HHS STL		
					- - - * - - -		
-13	361-0508-00			2	SPACER,CHASSIS:REAR	80009	361-0508-00
					(ATTACHING PARTS FOR EACH)		
-14	212-0008-00			1	SCREW,MACHINE:8-32 X 0.312 INCH,PNH STL	83385	OBD
					- - - * - - -		

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5 Name & Description	Mfr Code	Mfr Part Number
2-1	200-1728-00			2	COVER,HANDLE		
-2	367-0108-00			1	HANDLE,SCOPE:	80009	367-0108-00
					(ATTACHING PARTS)		
-3	212-0597-00			4	SCREW,MACHINE:10-32 X 0.50 INCH,STL	80009	212-0597-00
-4	386-1283-00			2	PLATE,HDL MTG:PLASTIC	80009	386-1283-00
-5	386-1624-00			2	PL,RET.,HANDLE:	80009	386-1624-00
					- - - * - - -		
-6	200-1218-00			1	BEZEL,CRT:	80009	200-1218-00
-7	211-0188-00			2	. SCREW,MACHINE:4-40 X 0.30 INCH,SST	80009	211-0188-00
-8	354-0233-00			2	. RING,RETAINING:0.100 ID X 0.203 INCH OD	79136	X5133-14
-9	337-1440-00			1	SHIELD,CRT:IMPLOSION	80009	337-1440-00
-10	386-1946-00			1	SUPPORT,CRT:FRONT	80009	386-1946-00
-11	348-0279-00			2	PAD,CUSHIONING:3.50 INCH LONG	80009	348-0279-00
-12	348-0070-01			4	PAD,CUSHIONING:0.69 INCH,RUBBER	80009	348-0070-01
-13	348-0145-00			2	GROMMET,PLASTIC:U-SHP,1.0 X 0.42 INCH	80009	348-0145-00
-14	334-1379-00			1	LABEL:CRT,ADHESIVE BACK	80009	334-1379-00
-15	337-1419-05			1	SHIELD,CRT:FRONT(D1 ONLY)	80009	337-1419-05
	337-1419-05			1	SHIELD,CRT:FRONT(D2 ONLY)	80009	337-1419-05
-16	337-1420-00			1	SHIELD,CRT:REAR	80009	337-1420-00
-17	354-0409-00			1	RING,CRT CLMAP:	80009	354-0409-00
					(ATTACHING PARTS)		
-18	211-0632-00			1	SCREW,MACHINE:6-32 X 2.25 INCH,FLH STL		
-19	343-0123-01			2	CLP,ELCTRN TU:	80009	343-0123-01
-20	220-0444-00			1	NUT,PLAIN,SQ:6-32 X 0.250 INCH,STL	77250	OBD
-21	211-0507-00			2	SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
-22	407-0922-00			1	BRKT,CRT CLAMP:	80009	407-0922-00
					- - - * - - -		
-23	344-0226-00			1	CLIP,CABLE:(D1 ONLY)	80009	344-0226-00
					(ATTACHING PARTS)		
-24	211-0587-00			1	SCREW,MACHINE:6-32 X 0.188 INCH,HEX HD(D1 ONLY)		
					- - - * - - -		
-25	384-1064-00			1	SHAFT,EXTENSION:10.185 INCH LONG,W/KNOB	80009	384-1064-00
-26	358-0216-00			1	BUSHING,PLASTIC:0.257 ID X 0.412 INCH OD	80009	358-0216-00
-27	366-0494-00			2	KNOB:GRAY	80009	366-0494-00
	----- -----			-	. EACH KNOB INCLUDES:		
	213-0153-00			1	. SETSCREW:5-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-28	366-1023-01			1	KNOB:GRAY,BRIGHTNESS(D1 ONLY)	80009	366-1023-01
	213-0153-00			1	. SETSCREW:5-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-29	426-0681-00			5	FR,PUSH BUTTON:GRAY PLASTIC(D1 ONLY)	80009	426-0681-00
-30	260-1238-00			1	SWITCH,PUSH:0.5A AT 115VAC(D1 ONLY)	81073	39-2
-31	260-0688-00			1	SWITCH,PUSH:DPDT,1A,120VAC(D2 ONLY)	82389	12S1025D
					(ATTACHING PARTS)		
-32	210-0583-00			2	NUT,PLAIN,HEX.:0.25-32 X 0.312",BRS(D2 ONLY)	73743	2X20319-402
-33	210-0046-00			1	WSHR,LOCK:INTL,0.26 ID X 0.40" OD(D2 ONLY)	78189	1214-05-00-0541C
					- - - * - - -		
	200-0935-00	XB070000		1	BASE,LAMPHOLDER:0.29 OD X 0.19 CASE	80009	200-0935-00
	352-0157-00	XB070000		1	LAMPHOLDER:WHITE PLASTIC	80009	352-0157-00
	378-0602-00	XB070000		1	LENS,LIGHT:GREEN	80009	378-0602-00
-34	----- -----[1]			2	RES,VARIABLE:		
					(ATTACHING PARTS FOR EACH)		
-35	210-0583-00			1	NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS	73743	2X20319-402
-36	210-0940-00			1	WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL	79807	OBD
-37	210-0046-00			1	WASHER,LOCK:INTL,0.26 ID X 0.40" OD,STL	78189	1214-05-00-0541C
					- - - * - - -		
-38	200-0608-00			1	COVER,VAR RES.:PLASTIC	80009	200-0608-00
-39	333-1706-00	B010100	B069999	1	PANEL,FRONT:(D1 ONLY)	80009	333-1706-00
	333-1706-01	B070000		1	PANEL,FRONT:(D1 ONLY)	80009	333-1706-01
-40	333-1707-00	B010100	B069999	1	PANEL,FRONT:(D2 ONLY)	80009	333-1707-00
	333-1707-01	B070000		1	PANEL,FRONT:(D2 ONLY)	80009	333-1707-01
-41	----- -----[1]			1	RES,VARIABLE:(D1 ONLY)		
-42	358-0378-00			1	BUSHING,SLEEVE:PRESS MOUNT(D1 ONLY)	80009	358-0378-00
-43	337-1421-00			1	SHIELD:HIGH VOLTAGE	80009	337-1421-00
					(ATTACHING PARTS)		
-44	211-0504-00			3	SCREW,MACHINE:6-32 X 0.25 INCH,PNH STL	83385	OBD
					- - - * - - -		

[1]Refer to Electrical Parts List for part number.

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5 Name & Description	Mfr Code	Mfr Part Number
2-45	348-0115-00			4	GROMMET,PLASTIC:U-SHP,0.548 X 0.462(D2 ONLY)	80009	348-0115-00
	348-0115-00			3	GROMMET,PLASTIC:U-SHP,0.548 X0.462 0.462"(D2 ONLY)	80009	348-0115-0
-46	407-0896-00			1	BRKT,CHASSIS:	80009	407-0896-00
					(ATTACHING PARTS)		
-47	211-0541-00			1	SCREW,MACHINE:6-32 X 0.25"100 DEG,FLH STL	83385	OBD
-48	260-1222-00			1	SWITCH,PUSH-PUL:10A,250VAC	91929	2DM301
-49	376-0127-00			1	COUPLER,SHAFT:PLASTIC	80009	376-0127-00
-50	----- -----[1]			1	RES.,VARIABLE:		
					(ATTACHING PARTS)		
-51	210-0590-00			1	NUT,PLAIN,HEX.:0.375 X 0.438 INCH,STL	73743	2X28269-402
-52	210-0978-00			1	WASHER,FLAT:0.375 ID X 0.50 INCH OD,STL	78471	OBD
-53	210-0012-00			1	WASHER,LOCK:INTL,0.375 ID X 0.50" OD STL	78189	1220-02-00-0541C
-54	210-0207-00			1	TERMINAL,LUG:0.375 INCH DIAMETER	12697	01136902
					- - - * - - -		
-55	200-1204-01			1	COVER,CRT:		80009 200-1204-0
					(ATTACHING PARTS)		
-56	210-0401-00			2	NUT,PLAIN,HEX.:6-32 X 0.312 INCH,CD PLATED	73743	3262-402
					- - - * - - -		
-57	161-0033-08			1	CABLE ASSY:POWER		
-58	358-0366-00			1	BSHG,STRAIN RLF:BOTTOM	80009	358-0366-00
	358-0365-00			1	BSHG,STRAIN RLF:TOP	80009	358-0365-00
-59	200-1004-00			1	CABLE,NIP.,ELEC:0.265 ID X 0.38"OD W/FLG	80009	200-1004-00
-60	352-0076-00			1	FUSEHOLDER:W/HARDWARE	75915	342012
					(ATTACHING PARTS)		
-61	210-0873-00			1	WASHER,NONMETAL:0.5 ID X 0.688 INCH OD,NPRN	70485	OBD
					- - - * - - -		
-62	210-0201-00			1	TERMINAL,LUG:SE #4	78189	2104-04-00-2520N
					(ATTACHING PARTS)		
-63	210-0586-00			1	NUT,PLAIN,EXT W:4-40 X 0.25 INCH,STL	78189	OBD
					- - - * - - -		
-64	333-1715-00			1	PANEL,REAR:	80009	333-1715-00
-65	441-0991-00			1	CHAS,DSPL UNIT:	80009	441-0991-00
-66	210-0659-01			4	. EYELET,METALLIC:0.121 OD X 0.156 INCH LONG	80009	210-0659-01
-67	344-0131-00			4	. CLIP,SPG TENS:CIRCUIT BOARDMOUNTING	80009	344-0131-00
					(ATTACHING PARTS FOR CHASSIS)		
-68	211-0504-00			2	SCREW,MACHINE:6-32 X 0.25 INCH,PNH STL	83385	OBD
-69	211-0538-00			2	SCREW,MACHINE:6-32 X 0.312"100 DEG,FLH STL	83385	OBD
-70	210-0457-00			2	NUT,PLAIN,EXT W:6-32 X 0.312 INCH,STL	83385	OBD
					- - - * - - -		
-71	----- -----[1]			1	THERMO CUTOUT:		
					(ATTACHING PARTS)		
-72	210-0586-00			2	NUT,PLAIN,EXT W:4-40 X 0.25 INCH,STL	78189	OBD
					- - - * - - -		
-73	----- -----[1]			1	CKT,BOARD ASSY:STORAGE,A4(D1 ONLY)		
-74	131-0608-00			7	. CONTACT,ELEC:0.365 INCH LONG	22526	47357
	131-0589-00			4	. CONTACT,ELEC:0.46 INCH LONG	22526	47350
-75	136-0252-04			45	. CONTACT,ELEC:0.188 INCH LONG	22526	75060
-76	214-1611-00			5	. HEAT SINK,ELEC:		
					(ATTACHING PARTS FOR EACH)		
-77	211-0007-00			1	. SCREW,MACHINE:4-40 X 0.188 INCH,PNH STL	83385	OBD
-78	210-0003-00			1	. WASHER,LOCK:EXT,0.123 ID X 0.245" OD,STL	78189	1104-00-00-0541C
					- - - * - - -		
-79	214-1612-01			1	. HEAT SINK,ELEC:		
-80	260-1207-00			1	. SWITCH,PUSH:2 MODULE,STORE,UPPER & LOWER	71590	2KBB020000-459
-81	260-1223-00			1	. SWITCH,PUSH:ERASE		
-82	260-1232-00	B010100	B019999	1	. SWITCH,PUSH:ERASE SELECT,UPPER & LOWER		
	260-1232-01	B020000		1	. SWITCH,PUSH:ERASE SELECT,UPPER & LOWER		
-83	361-0411-00	B010100	B019999	10	. SPACER,PUSH SW:0.13 W X 0.375 INCH L,PLSTC	71590	J64285-00
	361-0411-00	B020000		6	. SPACER,PUSH SW:0.13 W X 0.375 INCH L,PLSTC	71590	J64285-00
	361-0542-00			4	. SPACER,SWITCH:PLASTIC	71590	J-64281
-84	166-0169-00			1	. SPACER,SLEEVE:0.114 ID X 0.562 INCH LONG		
					(ATTACHING PARTS)		
-85	211-0118-00			2	. SCREW,MACHINE:4-40 X 0.875 INCH,PNG STL		
					- - - * - - -		

[1]Refer to Electrical Parts List for part number.

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5 Name & Description	Mfr Code	Mfr Part Number
2-84	166-0169-00			1	. SPACER,SLEEVE:0.114 ID X 0.562 INCH LONG		
					(ATTACHING PARTS)		
-85	211-0118-00			2	. SCREW,MACHINE:4-40 X 0.875 INCH,PNG STL		
					- - - * - - -		
					(ATTACHING PARTS FOR CKT BOARD ASSY)		
	211-0008-00			4	SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL	83385	OBD
					- - - * - - -		
-86	344-0225-00			2	CLIP,CALBE:	80009	344-0225-00
-87	348-0067-00			1	GROMMET,PLASTIC:0.312 INCH DIA	80009	348-0067-00
-88	----- -----[1]			1	CKT BOARD ASSY:HIGH VOLTAGE,A5-D1,A6-D2		
-89	131-0566-00			5	. LINK,TERM.CONNE:0.086 DIA X 2.375 INCH L	0000C	L-2007-1
-90	131-0589-00			2	. CONTACT,ELEC:0.46 INCH LONG	22526	47350
-91	136-0183-00			3	. SOCKET,PLUG-IN:3 PIN	80009	136-0183-00
-92	136-0220-00			10	. SOCKET,PLUG-IN:3 PIN,D1 ONLY	71785	133-23-11-034
	136-0220-00			9	. SOCKET,PLUG-IN:3 PIN,D2 ONLY	71785	133-23-11-034
-93	136-0254-00			2	. CONTACT,ELEC:0.088 OD X 0.145 INCH LONG	00779	1-331892-5
-94	136-0252-04			12	. CONTACT,ELEC:0.188 INCH LONG	22526	75060
-95	----- -----[1]			1	. TRANSISTOR:		
					(ATTACHING PARTS)		
-96	210-0407-00			2	. NUT,PLAIN,HEX.:6-32 X 0.25 INCH,BRS	73743	3038-0228-402
-97	210-0055-00			2	. WASHER,LOCK:SPLIT,0.145 ID X 0.253" OD,STL		
-98	210-0801-00			2	. WASHER,FLAT:0.14 ID X 0.281 INCH OD,STL		
-99	214-1610-00			1	. HEAT SINK,ELEC:TRANSISTOR	80009	214-1610-00
-100	210-1133-00			2	. WASHER,NONMETAL:0.142 ID X 0.25"OD FIBER	86445	OBD
-101	214-1536-00			1	. HEAT SINK,ELEC:1.75 INCH LONG		
-102	211-0511-00			2	. SCREW,MACHINE:6-32 X 0.50 INCH,PNH STL	83385	OBD
					- - - * - - -		
-103	214-1291-00	XB020000		4	. HEAT SINK,ELEC:0.72 OD X 0.375 H(D1 ONLY)	05820	207-AB
-104	131-0621-00			18	. CONTACT,ELEC:0.577"L,22-26 AWG WIRE	22526	46231
-105	352-0198-00			1	. CONN BODY,PL,EL:2 WIRE BLACK	80009	352-0198-00
-106	352-0204-00			1	. CONN BODY,PL,EL:8 WIRE BLACK	80009	352-0204-00
-107	352-0206-00			1	. CONN BODY,PL,EL:10 WIRE BLACK	80009	352-0206-00
-108	175-0863-00			FT	. WIRE,ELECTRICAL:2 WIRE RIBBON 10 INCHES		
-109	175-0859-00			FT	. WIRE,ELECTRICAL:6 WIRE RIBBON,0.688 FEET	23499	TEK-175-0859-00
-110	175-0855-00			FT	. WIRE,ELECTRICAL:10 WIRE RIBBON,12 INCHES	23499	TEK-175-0855-00
					(ATTACHING PARTS FOR CKT BOARD ASSY)		
-111	211-0510-00			1	SCREW,MACHINE:6-32 X 0.375 INCH,PNH STL	83385	OBD
-112	210-0975-00			1	WASH.,SHOULDERE:0.14 ID X 0.247" OD,PLSTC	80009	210-0975-00
					- - - * - - -		
-113	200-0616-01			1	COV,CRT SOCKET:	80009	200-0616-01
-114	136-0492-01			1	WIRING HARNESS:CRT	80009	136-0492-01
-115	136-0301-01			1	. SOCKET,CRT:W/CONNECTORS	80009	136-0301-01
-116	426-0739-00	B010100	B069999	1	FRAME ASSEMBLY:(D1 ONLY)	80009	426-0739-00
	426-0739-01	B070000		1	FRAME ASSEMLBY:(D1 ONLY)	80009	426-0739-01
	426-0740-00	B010100	B069999	1	FRAME ASSEMBLY:(D2 ONLY)	80009	426-0740-00
	426-0740-01	B070000		1	FRAME ASSEMBLY:(D2 ONLY)	80009	426-0740-01
-117	200-1075-00			4	COVER,ELEC CONN:PLASTIC	00779	1-480435-0
-118	131-0861-00			4	CONTACT,ELEC:QUICK DISCONNECT	00779	42617-2
-119	195-0086-00			1	LEAD SET:CRT DEFLECTION		
	131-0621-00			2	CONTACT,ELEC:0.577 INCH LONG		
	352-0198-00			1	HLOR,TERM CONN:2 WIRE BLACK	80009	131-0198-00
-120	175-0862-00			FT	CABLE,SP,ELEC:3 WIRE RIBBON,0.729 FT LONG	80009	175-0862-00

[1]Refer to Electrical Parts List for part number.

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5 Name & Description	Mfr Code	Mfr Part Number
3-1	390-0320-00			1	CABINET,BOTTOM:	80009	390-0320-00
-2	348-0177-00			4	. PAD,CABINET FT:1.25 W X 0.50INCH H	80009	348-0177-00
-3	348-0178-00			4	. BUMPER,PLASTIC:2.0 W X 0.40 INCH H	80009	348-0178-00
					(ATTACHING PARTS FOR EACH)		
-4	213-0054-00			1	. SCR,TPG,THD FOR:6-32 X 0.312 INCH,PNH STL	83385	OBD
-5	210-0803-00			1	. WASHER,FLAT:0.15 ID X 0.375 INCH OD,STL	12327	OBD
					- - - * - - -		
					(ATTACHING PARTS FOR CABINET BOTTOM)		
-6	211-0503-00			2	SCREW,MACHINE:6-32 X 0.188 INCH,PNH STL	83385	OBD
	211-0504-00			6	SCREW,MACHINE:6-32 X 0.25 INCH,PNH STL	83385	OBD
					- - - * - - -		
-7	366-1026-00			1	KNOB:ROUND	80009	366-1026-00
	213-0153-00			2	. SETSCREW:5-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-8	366-1028-00			1	KNOB:GRAY	80009	366-1028-00
	213-0153-00			2	. SETSCREW:5-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-9	384-1184-00			1	SHAFT,EXTENSION:2.875 INCH LONG	80009	384-1184-00
-10	358-0480-00			1	BSHG,SLEEVE:1.50 INCH LONG	80009	358-0480-00
					(ATTACHING PARTS)		
011	210-0590-00			1	NUT,PLAIN,HEX.:0.375 X 0.438 INCH,STL	73743	2X28269-402
-12	210-0978-00			1	WASHER,FLAT:0.375 ID X 0.50 INCH OD,STL	78471	OBD
					- - - * - - -		
-13	260-1456-00			1	SWITCH,ROTARY:POLARITY		
					(ATTACHING PARTS)		
-14	210-0590-00			1	NUT,PLAIN,HEX.:0.375 X 0.438 INCH,STL	73743	2X28269-402
-15	210-0978-00			1	WASHER,FLAT:0.375 ID X 0.50 INCH OD,STL	78471	OBD
					- - - * - - -		
-16	260-1478-00			1	SW,PUSH BUTTON:CIRCUIT BREAKER		
					(ATTACHING PARTS)		
-17	210-0505-00			2	NUT,PLAIN HEX:0.375-27 X 0.5 INCH		
-18	210-0840-00			1	WASHER,FLAT:0.39 ID X 0.562 INCH OD,STL	89663	644R
					- - - * - - -		
-19	----- -----[1]			1	LAMP:W/LENS		
-20	348-0004-00			1	GROMMET,RUBBER:0.281 ID X 0.563 INCH OD	70485	763
-21	378-0635-00	B010100	B069999	4	LENS,LIGHT:WHITE	80009	378-0635-00
	378-0635-00	B070000		2	LENS,LIGHT:WHITE	80009	378-0635-00
-22	352-0157-01	B010100	B069999	4	LAMPHOLDER:BLACK PLASTIC	80009	352-0157-01
	352-0157-01	B070000		2	LAMPHOLDER:BLACK PLASTIC	80009	352-0157-01
-23	200-0935-00	B010100	B069999	4	BASE,LAMPHOLDER:0.29 OD X 0.19 CASE	80009	200-0935-00
	200-0935-00	B070000		2	BASE,LAMPHOLDER:0.29 OD X 0.19 CASE	80009	200-0935-00
-24	366-1431-01			1	KNOB:STEP X .1	80009	366-1431-01
-25	366-1417-00	B010100	B069999	1	KNOB:STEPS/OFFSET,W/SKIRT	80009	366-1417-00
	366-1417-01	B070000		1	KNOB:STEPS/OFFSET,W/SKIRT	80009	366-1417-01
	213-0153-00			2	. SKNOB:STEPS/OFFSET,W/SKIRT	80009	213-0153-00
-26	426-0681-00			11	FR,PUSH BUTTON:GRAY PLASTIC	80009	426-0681-00
-27	366-1418-00	B010100	B069999	1	KNOB:HORIZONTAL VOLTS/DIV,W/SKIRT	80009	366-1418-00
	366-1418-01	B070000		1	KNOB:HORIZONTAL VOLTS/DIV,W/SKIRT	80009	366-1418-01
	213-0153-00			2	. SETSCREW:5-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-28	358-0029-00			2	BSHG,MACH.THD:HEX,0.375-32 X 0.438"LONG	80009	358-0029-00
					(ATTACHING PARTS FOR EACH)		
-29	210-0978-00			1	WASHER,FLAT:0.375 ID X 0.50 INCH OD,STL	78471	OBD
-30	210-0012-00			1	WASHER,LOCK:INTL,0.375 ID X 0.50" OD STL	78189	1220-02-00-0541C
-31	210-0590-00			1	NUT,PLAIN,HEX.:0.375 X 0.438 INCH,STL	73743	2X28269-402
					- - - * - - -		
-32	366-0494-00			3	KNOB:GRAY	80009	366-0494-00
	----- -----			-	. EACH KNOB INCLUDES:		
	213-0153-00			1	. SETSCREW:5-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-33	331-0139-00			1	DIAL,CONTROL:OFF-SET MULT		
-34	366-1462-00			1	KNOB:COLLECTOR SWEEP,W/SKIRT	80009	366-1462-00
	213-0153-00			2	. SETSCREW:5-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-35	354-0337-00			1	RING:KNOB SKIRT		
-36	260-1457-00	B010100	B010199	1	SWITCH,ROTARY:COLLECTOR SWEEP		
	260-1457-01	B010200		1	SWITCH,ROTARY:COLLECTOR SWEEP		
					(ATTACHING PARTS)		
-37	210-0579-00			1	NUT,PLAIN HEX:0.625-24 X 0.75 INCH,STL		
					- - - * - - -		

[1] Refer to Electrical Parts List for part number.

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5 Name & Description	Mfr Code	Mfr Part Number
3-38	260-0735-00	XB010200		1	SWITCH,PUSH:SPST	81073	39-1
-39	214-1749-00	XB010200		1	PIN,HINGE:0.75 INCH LONG	80009	214-1749-00
-40	----- -----[1]			2	RES,VARIABLE:W/SWITCH		
					(ATTACHING PARTS FOR EACH)		
-41	210-0583-00			1	NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS	73743	2X20319-402
-42	210-0940-00			1	WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL	79807	OBD
					- - - * - - -		
-43	260-1452-00			1	SWITCH,PUSH:ON ZERO/AID OPPOSE		
					(ATTACHING PARTS)		
-44	213-0202-00			2	SCREW,MACHINE:2-56 X 0.625 INCH,FLH STL		
-45	166-0418-00			2	TUBE SHIELD:0.094 ID X 0.437 INCH LONG		
-46	210-0001-00			2	WASHER,LOCK:INTL,0.092 ID X 0.18"OD,STL	78189	1202-00-00-0541C
-47	210-0405-00			2	NUT,PLAIN,HEX.:2-56 X 0.188 INCH,BRS	73743	2X12157-402
					- - - * - - -		
-48	366-1402-51			1	PUSH BUTTON:AID		80009 366-1402-5
-49	366-1328-24[1]			1	PUSH BUTTON:ZERO	80009	366-1328-24
-50	----- -----[1]			1	RES,VARIABLE:		
-51	----- -----[1]			1	RES,VARIABLE:		
					(ATTACHING PARTS)		
-52	210-0583-00			1	NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS	73743	2X20319-402
-53	210-0940-00			1	WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL	79807	OBD
-54	210-0046-00			1	WASHER,LOCK:INTL,0.26 ID X 0.40" OD,STL	78189	1214-05-00-0541C
					- - - * - - -		
-55	333-1652-00	B010100	B069999	1	PANEL,FRONT:	80009	333-1652-00
	333-1652-01	B070000		1	PANEL,FRONT:	80009	333-1652-01
-56	386-2392-00	B010100	B069999	1	SUBPANEL,FRONT:	80009	386-2392-00
	386-2392-01	B070000		1	SUBPANEL,FRONT:	80009	386-2392-01
					(ATTACHING PARTS)		
-57	211-0541-00			6	SCREW,MACHINE:6-32 X 0.25"100 DEG,FLH STL	83385	OBD
					- - - * - - -		
-58	426-0936-00			1	FRAME ASSEMBLY:	80009	426-0936-00
-59	426-0473-04			1	FRAME SECTION:LOWER RIGHT	80009	426-0473-04
					(ATTACHING PARTS)		
-60	212-0023-00			3	SCREW,MACHINE:8-32 X 0.375 INCH,PNH STL	83385	OBD
	211-0507-00			1	SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
					- - - * - - -		
-61	426-0472-04			1	FRAME SECTION:LOWER LEFT	80009	426-0472-04
					(ATTACHING PARTS)		
	212-0023-00			3	SCREW,MACHINE:8-32 X 0.375 INCH,PNH STL	83385	OBD
	211-0507-00			1	SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
					- - - * - - -		
-62	179-1856-00			1	WIRING HARNESS:MAIN	80009	179-1856-00
-63	131-0621-00			18	. CONTACT,ELEC:0.577"L,22-26 AWG WIRE	22526	46231
-64	131-0792-00			4	. CONTACT,ELEC:0.577"L,18-20 AWG WIRE	22526	46221
-65	352-0203-03			1	. HLDR TERM CONN:7 WIRE,ORANGE	80009	352-0203-03
	352-0203-04			1	. HLDR,TERM CONN:7 WIRE,YELLOW	80009	352-0203-04
	352-0203-05			1	. HLDR,TERM CONN:7 WIRE, GREEN	80009	352-0203-05
	352-0303-06			1	. HLDR,TERM CONN:7 WIRE,BLUE	80009	352-0303-06
-66	352-0200-09			1	. HLDR,TERM CONN:4 WIRE,WHITE	80009	352-0200-09
-67	131-1008-00			1	. CONN,RCPT,ELEC:24/48 CONTACT		
					(ATTACHING PARTS FOR WIRING HARNESS)		
-68	211-0016-00			2	SCREW,MACHINE:4-40 X 0.625 INCH,PNH STL	83385	OBD
-69	210-0004-00			2	WASHER,LOCK:INTL,0.12 ID X 0.26"OD,STL	78189	1204-00-00-0541C
-70	210-0851-00			4	WASHER,FLAT:0.119 ID X 0.375 INCH OD,STL	12327	OBD
-71	361-0552-00			2	SPACER,SLEEVE:0.93 INCH LONG		
-72	351-0352-00			2	GUIDE CKT BD:	80009	351-0352-00
					- - - * - - -		
-73	211-0008-00			2	SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL	83385	OBD
-74	210-0586-00			2	NUT,PLAIN,EXT W:4-40 X 0.25 INCH,STL	78189	OBD
-75	200-1433-00	B010100	B049999	1	COVER, REAR:	80009	200-1433-00
	200-1433-01	B050000		1	COVER,REAR:	80009	200-1433-01
					(ATTACHING PARTS)		
-76	211-0504-00			4	SCREW,MACHINE:6-32 X 0.25 INCH,PNH STL	83385	OBD
					- - - * - - -		

[1]Refer to Electrical Parts List for part number.

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5 Name & Description	Mfr Code	Mfr Part Number
3-77	348-0031-00			2	GROMMET,PLASTIC:0.156 INCH DIA	80009	348-0031-00
-78	----- -----[1]			1	MICROCIRCUIT:		
					(ATTACHING PARTS)		
-79	211-0097-00			1	SCREW,MACHINE:4-40 X 0.312 INCH,PNH STL	83385	OBD
-80	210-1122-00			1	WASHER,LOCK:DISHED,0.12 ID X 0.375"OD,STL	78189	4704-04-02
-81	210-0551-00			1	NUT,PLAIN,HEX.:4-40 X 0.25 INCH,STL	83385	OBD
					- - - * - - -		
-82	----- -----[1]			1	MICROCIRCUIT:		
					(ATTACHING PARTS)		
-83	211-0507-00			1	SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
-84	342-0163-00			1	INSULATOR,PLATE:XSTR,0.675 X 0.625 X 0.001"	80009	342-0163-00
-85	210-0967-00			1	WSHR,SHOULDERED:0.157 ID X 0.375 INCH OD	80009	210-0967-00
-86	348-0187-00			1	FOOT,BLACK	80009	348-187-00
					- - - * - - -		
-87	----- -----[1]			2	TRANSISTOR:		
					(ATTACHING PARTS FOR EACH)		
-88	211-0012-00			1	SCREW,MACHINE:4-40 X 0.375 INCH,PNH STL	83385	OBD
-89	342-0163-00			1	INSULATOR,PLATE:XSTR,0.675 X 0.625 X 0.001"	80009	342-0163-00
-90	210-1122-00			1	WASHER,LOCK:DISHED,0.12 ID X 0.375"OD,STL	78189	4704-04-02
-91	210-0551-00			1	NUT,PLAIN,HEX.:4-40 X 0.25 INCH,STL	83385	OBD
					- - - * - - -		
-92	----- -----[1]			1	CKT BOARD ASSY:POWER SUPPLYA3		
-93	344-0154-00			4	. CLIP,ELECTRICAL:FOR 0.25 INCH DIA FUSE	80009	344-0154-00
-94	214-0579-00			7	. TERM.,TEST PT:0.40 INCH LONG	80009	214-0579-00
-95	136-0252-04	B010100	B051109	12	. CONTACT,ELEC:0.188 INCH LONG	22526	75060
	136-0220-00	B051110		4	. SOCKET,PLUG-IN:3 PIN	71785	133-23-11-034
-96	131-0589-00			10	. CONTACT,ELEC:0.46 INCH LONG	22526	47350
-97	131-0608-00			40	. CONTACT,ELEC:0.365 INCH LONG	22526	47357
-98	200-0260-00			1	. COV,CAPACITOR:PLASTIC	80009	200-0260-00
					(ATTACHING PARTS FOR CKT BOARD ASSY)		
-99	211-0116-00			6	SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	OBD
					- - - * - - -		
-100	179-1855-00			1	WIRING HARNESS:AC	80009	179-1855-00
-101	131-0707-00			6	. CONTACT,ELEC:0.48"L,22-26 AWG WIRE	22526	47439
-102	131-0621-00			10	. CONTACT,ELEC:0.577"L,22-26 AWG WIRE	22526	46231
-103	352-0171-06			1	. CONN BODY,PL,EL:1 WIRE BLUE	80009	352-0171-06
-104	352-0165-03			1	. CONN BODY,PL,EL:7 WIRE ORANGE	80009	352-0165-03
-105	352-0202-01			1	. CONN BODY,PL,EL:6 WIRE BROWN	80009	352-0202-01
-106	352-0203-08			1	. CONN BODY,PL,EL:7 WIRE GRAY	80009	352-0203-08
	131-0707-00			90	CONTACT,ELEC:0.48"L,22-26 AWG WIRE	22526	47439
-107	175-0825-00	XB010200		FT	WIRE,ELECTRICAL:2 WIRE RIBBON	23499	TEK-175-0825-00
-108	175-0827-00			FT	WIRE,ELECTRICAL:4 WIRE RIBBON	08261	TEK-175-0827-00
-109	175-0828-00			FT	WIRE,ELECTRICAL:5 WIRE RIBBON	23499	TEK-175-0828-00
-110	175-0829-00			FT	WIRE,ELECTRICAL:6 WIRE RIBBON	83501	TEK-175-0829-00
-111	175-0831-00	B010100	B010199	FT	WIRE,ELECTRICAL:8 WIRE RIBBON	08261	TEK-175-0831-00
-112	175-0832-00	B010200		FT	WIRE,ELECTRICAL:9 WIRE RIBBON	23499	TEK-175-0832-00
-113	175-0833-00			FT	WIRE,ELECTRICAL:10 WIRE RIBBON	23499	TEK-175-0833-00
-114	352-0171-07			1	CONN BODY,PL,EL:1 WIRE VIOLET	80009	352-0171-07
-115	352-0169-08			1	CONN BODY,PL,EL:2 WIRE GRAY	80009	352-0169-08
	352-0169-09			1	CONN BODY,PL,EL:2 WIRE WHITE	80009	352-0169-09
-116	352-0162-03			1	CONN BODY,PL,EL:4 WIRE ORANGE	80009	352-0162-03
-117	352-0163-00			2	CONN BODY,PL,EL:5 WIRE BLACK	80009	352-0163-00
-118	352-0164-02			2	CONN BODY,PL,EL:6 WIRE RED	80009	352-0164-02
-119	352-0166-01			1	CONN BODY,PL,EL:8 WIRE BROWN	80009	352-0166-01
	352-0166-04	B010100	B010199	1	CONN BODY,PL,EL:8 WIRE YELLOW	80009	352-0166-04
-120	352-0167-04	B010200		1	CONN BODY,PL,EL:9 WIRE YELLOW	80009	352-0167-04
	352-0167-05			1	CONN BODY,PL,EL:9 WIRE GREEN	80009	352-0167-05
-121	352-0168-01			1	CONN BODY,PL,EL:10 WIRE BROWN	80009	352-0168-01
	352-0168-02			2	CONN BODY,PL,EL:10 WIRE RED	80009	352-0168-02
	352-0168-05			1	CONN BODY,PL,EL:10 WIRE GREEN	80009	352-0168-05

[1]Refer to Electrical Parts List for part number.

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5 Name & Description	Mfr Code	Mfr Part Number
4-1	426-0936-00			1	FRAME ASSEMBLY:		
-2	386-2392-00			1	SUBPANEL,FRONT:	80009	386-2392-00
					(ATTACHING PARTS)		
-3	211-0541-00			6	SCREW,MACHINE:6-32 X 0.25"100 DEG,FLH STL	83385	OBD
					- - - * - - -		
-4	----- -----[1]			1	CKT BOARD ASSY:COLLECTOR SWEEP,A2		
-5	136-0394-00			2	. SOCKET,RELAY:10 PIN,W/SPRING		
-6	136-0269-00	B010100	B051109	1	. SOCKET,PLUG-IN:14 PIN DUAL INLINE	71785	133-59-02-073
	136-0269-02	B051110		1	. SOCKET,PLUG-IN:14 CONTACT,LOW CLEARANCE	01295	C931402
-7	131-0506-00	XB030000		4	. LINK,TERM,CONN:		
-8	214-0479-00			1	. TERM,TEST PT:0.40 INCH LONG	80009	214-0479-00
-9	136-0252-04	B010100	B051109	24	. CONTACT,ELEC:0.188 INCH LONG	22526	75060
	136-0220-00	B051110		8	. SOCKET,PLUG-IN:3 PIN	71785	133-23-11-034
-10	131-0589-00			30	. CONTACT,ELEC:0.46 INCH LONG	22526	47350
-11	131-0608-00			11	. CONTACT,ELEC:0.365 INCH LONG	22526	47357
					(ATTACHING PARTS FOR CKT BOARD ASSY)		
-12	211-0116-00			6	SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	OBD
					- - - * - - -		
-13	----- -----[1]			1	TRANSFORMER:VARIAC		
					(ATTACHING PARTS)		
-14	210-0590-00			1	NUT,PLAIN,HEX.:0.375 X 0.438 INCH,STL	73743	2X28269-402
-15	210-0978-00			1	WASHER,FLAT:0.375 ID X 0.50 INCH OD,STL	78471	OBD
					- - - * - - -		
-16	384-1182-00			1	SHAFT EXTENSION:8.5 INCH LONG	80009	384-1182-00
-17	376-0005-00			2	CPLG,SHAFT:UNIVERSAL	80009	376-0005-00
	213-0153-00[1]			4	. SETSCREW:5-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-18	----- -----			9	RES,VARIABLE:		
					(ATTACHING PARTS FOR EACH)		
-19	212-0004-00			1	SCREW,MACHINE:8-32 X 0.312 INCH,PNH STL	83385	OBD
-20	210-0462-00			1	INSERT,SCR THD:SHOULDERED,0.719 INCH LONG	80009	210-0462-00
-21	210-0808-00			1	EYELET,METALLIC:CENTERING	63743	2515113-3TP-909
-22	212-0037-00			1	SCREW,MACHINE:8-32 X 1.75 INCH,PNH STL		
					- - - * - - -		
-23	441-1063-00			1	CHASSIS,MAIN:	80009	441-1063-00
					(ATTACHING PARTS)		
-24	211-0504-00			4	SCREW,MACHINE:6-32 X 0.25 INCH,PNH STL	83385	OBD
-25	211-0501-00			1	SCREW,MACHINE:6-32 X 0.375 INCH,PNH STL		
					- - - * - - -		
-26	----- -----[1]			1	CKT BOARD ASSY:MAIN A1		
-27	136-0252-04	B010100	B051109	86	. CONTACT,ELEC:0.188 INCH LONG	22526	75060
	136-0252-04	B051110		12	. CONTACT,ELEC:0.188 INCH LONG	22526	75060
	136-0220-00	B051110		14	. SOCKET,PLUG-IN:3 PIN	71785	133-23-11-034
	136-0514-00	B051110		4	. SOCKET,PLUG-IN:MICROCIRCUIT,8 CONTACT	82647	C930802
-28	131-0608-00			54	. CONTACT,ELEC:0.365 INCH LONG	22526	47357
-29	131-0589-00			7	. CONTACT,ELEC:0.46 INCH LONG	22526	47350
-30	131-0604-00			49	. CONTACT,ELEC:0.025 SQ X 0.365 INCH LONG	80009	131-0604-00
-31	136-0260-01	B010100	B051109	4	. SOCKET,PLUG-IN:16 CONTACT,RECT SHAPE	71785	133-51-02-075
	136-0260-02	B051110		4	. SOCKET,PLUG-IN:16 CONTACT,LOW CLEARANCE	01295	C931602
-32	136-0269-00	B010100	B051109	5	. SOCKET,PLUG-IN:14 PIN DUAL INLINE	71785	133-59-02-073
	136-0269-02	B051110		5	. SOCKET,PLUG-IN:14 CONTACT,LOW CLEARANCE	01295	C931402
-33	136-0393-00			1	. SOCKET,PLUG-IN:16 PIN	77342	A11-2
-34	214-0579-00			2	. TERM.,TEST PT:0.40 INCH LONG	80009	214-0579-00
	175-0825-00			FT	. WIRE,ELECTRICAL:2 WIRE RIBBON	23499	TEK-175-0825-00
-35	260-1453-00			1	. SWITCH,PUSH:X.1		
-36	361-0385-00			4	. SPACER,PB SW:0.164 INCH LONG	80009	361-0385-00
-37	260-1211-00			3	. SWITCH,PUSH:DPDT,PUSH-PUSH,STEPS OFFSET/PLS	71590	2KAB010000-357
-38	260-1455-00			1	. SWITCH,PUSH:STEP FAMILY		
-39	260-1454-00			1	. SWITCH,PUSH:STEP RATE		
-40	260-1363-00			1	. SWITCH,PUSH:INVERT		
-41	361-0383-00			14	. SPACER,PB SW:CHARCOAL,0.33 INCH LONG	80009	361-0383-00
	105-0359-00			1	. ACTUATOR ASSY:		
-42	354-0219-00			1	. . RING,RETAINING:FOR 0.25 INCH SHAFT	79136	5103-25-MD-R
-43	200-1484-00			1	. . COVER,CAM SW:	80009	200-1484-00
					(ATTACHING PARTS)		
-44	211-0022-00			4	. . SCREW,MACHINE:2-56 X 0.188 INCH,PNH STL	83385	OBD
-45	210-0259-00			1	. . TERMINAL,LUG:0.099"ID INT TOOTH,SE	80009	210-0259-00
-46	210-0001-00			3	. . WASHER,LOCK:INTL,0.092 ID X 0.18"OD,STL	78189	1202-00-00-0541C
-47	210-0405-00			4	. . NUT,PLAIN,HEX.:2-56 X 0.188 INCH,BRS	73743	2X12157-402
					- - - * - - -		

[1] Refer to Electrical Parts for part number.

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty 1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
4-48	401-0057-00			1	. . BEARING,CAM SW:	80009	401-0057-00
-49	210-0406-00			6	. . NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
-50	214-1127-00			1	. . ROLLER,DETENT:0.125 DIA X 0.125 INCH L	80009	214-1127-00
-51	214-1139-02			1	. . SPRING,FLAT:GREEN COLORED	80009	214-1139-02
	214-1139-03			1	. . SPRING,FLAT:RED COLORED	80009	214-1139-03
-52	407-0653-00			1	. . BRACKET ,CAM SW:	80009	407-0653-00
-53	401-0056-00			1	. . BEARING,CAM SW:REAR	80009	401-0056-00
-54	105-0358-00			1	. . ACTUATOR,CAM SW:	80009	105-0358-00
					(ATTACHING PARTS FOR ACTUATOR ASSY)		
-55	211-0116-00			6	. SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	OBD
					- - - * - - -		
	105-0360-00			1	. ACTUATOR ASSY:	80009	105-0360-00
-56	354-0219-00			1	. . RING,RETAINING:FOR 0.25 INCH SHAFT	79136	5103-25-MD-R
-57	200-1417-00			1	. . COVER,CAM SW:	80009	200-1417-00
					(ATTACHING PARTS)		
-58	211-0022-00			4	. . SCREW,MACHINE:2-56 X 0.188 INCH,PNH STL	83385	OBD
-59	210-0259-00			1	. . TERMINAL,LUG:0.099"ID INT TOOTH,SE	80009	210-0259-00
-60	210-0001-00			3	. . WASHER,LOCK:INTL,0.092 ID X 0.18"OD,STL	78189	1202-00-00-0541C
-61	210-0405-00			4	. . NUT,PLAIN,HEX.:2-56 X 0.188 INCH,BRS	73743	2X12157-402
					- - - * - - -		
-62	401-0057-00			1	. . BEARING,CAM SW:	80009	401-0057-00
-63	210-0406-00			6	. . NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
-64	214-1127-00			1	. . ROLLER,DETENT:0.125 DIA X 0.125 INCH L	80009	214-1127-00
-65	214-1139-02			1	. . SPRING,FLAT:GREEN COLORED	80009	214-1139-02
	214-1139-03			1	. . SPRING,FLAT:RED COLORED	80009	214-1139-03
-66	407-0653-00			1	. . BRACKET,CAM SW:	80009	407-0653-00
-67	401-0056-00			1	. . BEARING,CAM SW:REAR	80009	401-0056-00
-68	105-0357-00			1	. . ACTUATOR,CAM SW:	80009	105-0357-00
					(ATTACHING PARTS FOR ACTUATOR ASSY)		
-69	211-0116-00			6	. SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	OBD
					- - - * - - -		
					(ATTACHING PARTS FOR CKT BOARD ASSY)		
-70	211-0116-00			4	SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	OBD
					- - - * - - -		
-71	376-0114-00			1	CPLG,SHAFT,FLEX:PUSH BUTTON SWITCH	80009	376-0114-00
	213-0140-00			2	. SETSCREW,HEX SOC STL	70276	OBD
-72	384-0656-00			1	EXTENSION SHAFT:8.026 INCH LONG	80009	384-0656-00
-73	384-1129-00			1	EXTENSION SHAFT:5.607 INCH LONG	80009	384-1129-00
-74	366-1328-25			4	PUSH BUTTON:NORM	80009	366-1328-25
-75	384-1061-00			2	EXTENSION SHAFT:3.981 INCH LONG	80009	384-1061-00
-76	384-1058-00			6	EXTENSION SHAFT:8.157 INCH LONG	80009	384-1058-00
-77	366-1402-12			1	PUSH BUTTON:FAST	80009	366-1402-12
-78	366-1402-62			1	PUSH BUTTON:SLOW	80009	366-1402-62
-79	366-1402-54			1	PUSH BUTTON:SINGLE	80009	366-1402-54
-80	366-1328-23			1	PUSH BUTTON:REP	80009	366-1328-23
-81	366-1402-52			1	PUSH BUTTON:300US	80009	366-1402-52
-82	407-1139-00			1	BRKT TRANSFORMER:	80009	407-1139-00
					(ATTACHING PARTS)		
-83	210-0504-00			3	NUT,PLAIN,HEX.:0-8 X 0.156 INCH,BRS	73743	3004-402
-84	210-0202-00			2	TERMINAL,LUG:SE #6	78189	2104-06-00-2520N
					- - - * - - -		
-85	255-0334-00			FT	PLASTIC CHANNEL:12.75 INCHES LONG	80009	255-0334-00
-86	----- -----[1]			2	TRANSISTOR:		
					(ATTACHING PARTS)		
-87	211-0012-00			1	SCREW,MACHINE:4-40 X 0.375 INCH,PNH	83385	OBD
-88	342-0163-00			1	INSULATOR,PLATE:XSTR,0.675 X 0.625 X 0.001"	80009	342-0163-00
-89	210-1122-00			1	WASHER,LOCK:DISHED,0.12 ID X 0.375"OD,STL	78189	4704-04-02
-90	210-0551-00			1	NUT,PLAIN,HEX.:4-40 X 0.25 INCH,STL	83385	OBD
					- - - * - - -		
-91	----- -----[1]			1	MICROCIRCUIT:		
					(ATTACHING PARTS)		
-92	211-0097-00			1	SCREW,MACHINE:4-40 X 0.312 INCH,PNH STL	83385	OBD
-93	210-1122-00			1	WASHER,LOCK:DISHED,0.12 ID X 0.375"OD,STL	78189	4704-04-02
-94	210-0406-00			1	NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
					- - - * - - -		

Refer to Electrical Parts List for part number.

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5 Name & Description	Mfr Code	Mfr Part Number
4-95	407-1143-00			1	BRKT,TRANSFORMER:	80009	407-1143-00
					(ATTACHING PARTS)		
-96	211-0504-00			3	SCREW,MACHINE:6-32 X 0.25 INCH,PNH STL	83385	OBD
					- - - * - - -		
-97	----- -----[1]			1	TRANSFORMER:COLLECTOR SWEEP		
					(ATTACHING PARTS)		
-98	212-0517-00			4	SCREW,MACHINE:10-32 X 1.750INCH,HEX HD STL	83385	OBD
-99	210-0206-00			1	TERMINAL,LUG:SE #10	78189	2103-10-00-2520N
-100	210-0812-00			4	WASHER,NONMETAL:#10,FIBER	06982	OBD
-101	166-0226-00			4	INSUL SLVG,ELEC:1.125 INCH LONG		
					- - - * - - -		
-102	----- -----[1]			1	TRANSFORMER:POWER		
-103	212-0523-00			4	. SCREW,MACHINE:10-32 X 2.75 INCH,HEX HD STL		
-104	210-0812-00			4	. WASHER,NONMETAL:#10,FIBER	06982	OBD
-105	166-0434-00			4	. SPACER,SLEEVE:2.25 INCH LONG		
-106	200-0772-02			1	. COVER,ELEC XFMR:	80009	200-0772-02

[1] Refer to Electrical Parts for part number.

INTRODUCTION:

The Cross Reference Index provides a method of identifying Tektronix, Inc. part number, circuit number and figure and index number to true manufacturer's code and manufacturer's part number.

HOW TO USE THE CROSS REFERENCE INDEX:

(1) When the Tektronix, Inc. part number is known, go directly to the Cross Reference Index and look up the part number. Read the manufacturer's code and manufacturer's part number from the appropriate column.

NOTE: The Cross Reference index is arranged in numerical order by Tektronix, Inc. part number.

(2) When the Tektronix, Inc. part number is not known, go to the parts list section of this instruction manual to locate needed part number. Then go to the Cross Reference Index as described in paragraph one (1).

(3) If the circuit number or figure and index number is known, go to the parts list section of this instruction manual to locate the Tektronix, Inc. part number. Then go to the Cross Reference Index as described in paragraph one (1).

(4) A listing of manufacturer's name and manufacturer's address is provided at the end of your Cross Reference Index.

NOTE: This listing is in numerical order by manufacturer's code number.

TEKTRONIX PART NUMBER	CKT. / FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
004-0298-00	6-4	80009	004-0298-00		
004-0825-00	6-2	80009	004-0825-00		
004-0826-00	6-1	80009	004-0826-00		
004-1134-00	6-3	80009	004-1134-00		
065-0197-00	6-	80009	065-0197-00		
070-1414-00	5-	80009	070-1414-00		
105-0357-00	4-68	80009	105-0357-00		
105-0358-00	4-54	80009	105-0358-00		
105-0359-00	S404	80009	105-0359-00		
	4-41				
105-0360-00	S502	80009	105-0360-00		
	4-55				
108-0368-00	L540	80009	108-0368-00		
	L545				
	L547				
	L550				
	L551				
	L552				
	L553				
	L564				
	L579				
108-0564-00	L1259	80009	108-0564-00		
108-0644-0	L1291	80009	108-0644-00		
108-0644-00	L1291	80009	108-0644-00		
108-0725-00	L101	08116	IN-0006		
120-0761-00	T1240	80009	120-0761-00		
120-0808-00	T101	83008	171		
120-0830-00	T701	80009	120-0830-00		
120-0830-01	T701	80009	120-0830-01		
120-0831-00	T102	80009	120-0831-00		
120-0832-00	T550	80009	120-0832-00		
120-0833-00	T560	80009	120-0833-00		
131-0506-00	4-7	80009	131-0506-00		
131-0566-00	2-89	0000C	L-2007-1		
131-0589-00	2-74	22526	47350		
	2-90				
	3-96				
	4-10				
	4-29				
131-0604-00	4-30	80009	131-0604-00		
131-0608-00	2-74	22526	47357		
	3-97				
	4-11				
	4-28				
131-0621-00	2-104	22526	46231		
	2-119				
	3-63				
	3-102				
131-0707-00	3-101	22526	47439		

TEKTRONIX PART NUMBER	CKT. / FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
131-0707-00	3-106	22526	47439		
131-0792-00	3-64	22526	46221		
131-0861-00	2-118	00779	42617-2		
131-1008-00	J110	95238	K600-13PC-24		
	3-67				
136-0183-00	2-91	80009	136-0183-00		
136-0220-00	2-92	71785	133-23-11-034		
	2-92				
	3-95				
	4-9				
	4-27				
136-0252-04	2-75	22526	75060		
	2-94				
	3-95				
	4-9				
	4-27				
	4-27				
136-0254-00	2-93	00779	1-331892-5		
136-0260-01	4-31	71785	133-51-02-075		
136-0260-02	4-31	01295	C931602		
136-0269-00	4-6	71785	133-59-02-073		
	4-32				
136-0269-02	4-6	01295	C931402		
	4-32				
136-0301-01	2-115	80009	136-0301-01		
136-0393-00	4-33	77342	A11-2		
136-0394-00	4-5	80009	136-0394-00		
136-0492-01	2-114	80009	136-0492-01		
136-0514-00	4-27	82647	C930802		
148-0045-00	K436	24796	R10-E1-X4-V185		
148-0047-00	K115	24796	R10-E697		
	K125				
150-0030-00	DS1271	08806	A2B-T		
	DS1272				
	DS1273				
	DS1271				
	DS1272				
	DS1273				
150-0048-00	DS310	08806	683		
	DS311				
	DS535				
	DS536				
	DS1390				
	DS1255				
150-0133-01	DS125	18788	T100-6-H538		
151-0169-00	Q1358	02735	2N3439		
	Q1392				
151-0188-00	Q1304	04713	2N3906		
	Q1310				

TEKTRONIX PART NUMBER	CKT. / FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
151-0188-00	Q1320	04713	2N3906		
151-0190-00	Q1106	80009	151-0190-00		
	Q1116				
	Q1126				
	Q1136				
	Q1222				
	Q1106				
	Q1116				
	Q1126				
	Q1136				
	Q1222				
151-0190-01	Q324	07910	TE23652		
151-0207-00	Q1262	03508	GET3415		
	Q1336				
	Q1262				
151-0216-00	Q1384	04713	MPS6523		
151-0256-00	Q1252	16758	7305762		
151-0279-00	Q1104	07263	S25381		
	Q1114				
	Q1124				
	Q1134				
	Q1308				
	Q1362				
	Q1372				
	Q1396				
	Q1104				
	Q1114				
	Q1124				
	Q1134				
151-0302-00	Q306	04713	2N2222A		
	Q310				
	Q436				
	Q544				
	Q546				
	Q588				
151-0331-00	Q1388	04713	SPS6737		
151-0341-00	Q210	07263	2N3565		
	Q212				
	Q234				
	Q260				
	Q262				
	Q276				
	Q330				
	Q594				
	Q754				
	Q760				
	Q786				
	Q1214				
	Q1302				

TEKTRONIX PART NUMBER	CKT. / FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
151-0341-00	Q1334	07263	2N3565		
	Q1356				
151-0342-00	Q224	07263	2N4249		
	Q440				
	Q586				
	Q772				
	Q1264				
	Q1386				
	Q1264				
151-0347-00	Q1226	80009	151-0347-00		
151-0405-00	Q766	04713	SJE943		
	Q788				
151-0406-00	Q1234	07263	S37880		
151-0414-00	Q386	04713	MJE1092		
151-0415-00	Q384	04713	MJE1102		
151-1005-00	Q1278	15818	U1490		
151-1011-00	Q450A,B	22229	FD1167		
151-1054-00	Q514A,B	22229	FD1644		
151-1059-00	Q552	15818	U1897E		
	Q554				
	Q556				
	Q558				
151-1081-00	Q450A,B	32293	ITS3231		
152-0024-00	VR581	04713	1N3024B		
	VR582				
152-0061-00	CR1209	80009	152-0061-00		
	CR1224				
	CR1256				
	CR1259				
	CR1269				
	CR1392				
	CR1209				
	CR1224				
	CR1239				
	CR1256				
	CR1269				
152-0066-00	CR391	02735	37304		
	CR393				
	CR722				
	CR724				
	CR732				
	CR767				
	CR781				
152-0107-00	CR591	80009	152-0107-00		
	CR741				
	CR742				
	CR743				
	CR744				
152-0141-02	CR115	07910	1N4152		

TEKTRONIX PART NUMBER	CKT./FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
152-0141-02	CR125	07910	1N4152		
	CR209				
	CR221				
	CR230				
	CR234				
	CR241				
	CR259				
	CR277				
	CR321				
	CR322				
	CR326				
	CR330				
	CR429				
	CR436				
	CR438				
	CR439				
	CR440				
	CR441				
	CR452				
	CR538				
	CR540				
	CR551				
	CR552				
	CR553				
	CR554				
	CR555				
	CR556				
	CR557				
	CR558				
	CR561				
	CR562				
	CR563				
	CR564				
	CR568				
	CR569				
	CR584				
	CR586				
	CR754				
	CR755				
	CR773				
	CR785				
152-0166-00	VR1388	81483	69-9035		
152-0185-00	CR1255	07910	1N4152		
	CR1262				
	CR1264				
	CR1332				
	CR1343				
	CR1351				
	CR1358				

TEKTRONIX PART NUMBER	CKT. / FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
152-0185-00	CR1255	07910	1N4152		
	CR1262				
	CR1264				
152-0198-00	CR384	04713	1N4721		
	CR386				
152-0255-00	VR1282	04713	1N978B		
152-0280-00	VR772	04713	1N753A		
152-0283-00	CR1237	04713	1N976B		
	VR1387				
	VR1237				
152-0287-00	VR1370	04713	1N986B		
152-0288-00	VR1396	04713	4-10M14025		
152-0324-00	CR512	03508	SE416		
	CR513				
152-0331-00	CR1386	80009	152-0331-00		
152-0357-00	VR1281	04713	1N983B		
152-0385-00	CR103	83003	VB20		
	CR104				
	CR105				
	CR106				
152-0409-00	CR1241	83003	VG-12X		
	CR1247				
	CR1241				
	CR1247				
152-0414-00	CR1253	80009	152-0414-00		
	CR1235				
152-0423-00	CR712	04713	1N5000		
152-0438-00	CR1258	04713	SZG14K		
	VR1258				
152-0462-00	CR716	04713	MDA960-3		
152-0488-00	CR582	80009	152-0488-00		
	CR711				
	CR721				
	CR731				
	CR751				
	CR1329				
152-0557-00	CR107	04713	MDA980-3		
154-0633-00	V1291	80009	154-0633-00		
154-0633-05	V1291	80009	154-0633-05		
154-0634-00	V1291	80009	154-0634-00		
154-0634-10	V1291	80009	154-0634-10		
156-0030-00	U220	01295	SN7400N		
156-0031-00	U268	01295	SN7454N		
156-0058-00	U542	04713	MC7404P		
156-0062-00	U430	04713	MC7486P		
156-0067-00	U206	80009	156-0067-00		
	U360				
156-0072-00	U230	12040	DM7412IN		
	U270				

TEKTRONIX PART NUMBER	CKT./FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
156-0158-00	U350	18324	MC1458V		
	U380				
156-0158-02	U305	80009	156-0158-02		
156-0200-00	U520	18324	N5556V		
	U530				
	U570				
156-0277-00	U724	07263	UGH7805393		
156-0285-00	U722	07263	UGH7812393		
	U732				
159-0023-00	F1201	71400	MDX2		
159-0028-00	F744	71400	AGC1-4		
159-0053-00	F711	71400	GKN5		
	F714				
	F721				
	F731				
159-0114-00	F391	71400	GFA1		
161-0033-08	2-57	80009	161-0033-08		
166-0169-00	2-84	80009	166-0169-00		
166-0226-00	4-101	80009	166-0226-00		
166-0418-00	3-45	80009	166-0418-00		
166-0434-00	4-105	80009	166-0434-00		
175-0825-00	3-107	23499	TEK-175-0825-00		
	4-34				
175-0827-00	3-108	08261	TEK-175-0827-00		
175-0828-00	3-109	23499	TEK-175-0828-00		
175-0829-00	3-110	83501	TEK-175-0829-00		
175-0831-00	3-111	08261	TEK-175-0831-00		
175-0832-00	3-112	23499	TEK-175-0832-00		
175-0833-00	3-113	23499	TEK-175-0833-00		
175-0855-00	2-110	23499	TEK-175-0855-00		
175-0859-00	2-109	23499	TEK-175-0859-00		
175-0862-00	2-120	80009	175-0862-00		
175-0863-00	2-108	23499	TEK-175-0863-00		
179-1855-00	3-100	80009	179-1855-00		
179-1856-00	3-62	80009	179-1856-00		
195-0086-00	2-119	80009	195-0086-00		
200-0260-00	3-98	80009	200-0260-00		
200-0608-00	2-38	80009	200-0608-00		
200-0616-01	2-113	80009	200-0616-01		
200-0772-02	4-106	80009	200-0772-02		
200-0935-00	2-33	80009	200-0935-00		
	3-23				
	3-23				
200-1004-00	2-59	80009	200-1004-00		
200-1075-00	2-117	00779	1-480435-0		
200-1204-01	2-55	80009	200-1204-01		
200-1218-00	2-6	80009	200-1218-00		
200-1417-00	4-57	80009	200-1417-00		
200-1433-00	3-75	80009	200-1433-00		

TEKTRONIX PART NUMBER	CKT./ FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
200-1433-01	3-75	80009	200-1433-01		
200-1484-00	4-43	80009	200-1484-00		
200-1728-00	2-1	80009	200-1728-00		
210-0001-00	3-46	78189	1202-00-00-0541C		
	4-46				
	4-60				
210-0003-00	2-78	78189	1104-00-00-0541C		
210-0004-00	3-69	78189	1204-00-00-0541C		
210-0012-00	2-53	78189	1220-02-00-0541C		
	3-30				
210-0046-00	2-33	78189	1214-05-00-0541C		
	2-37				
	3-54				
210-0055-00	2-97	83385	OBD		
210-0201-00	2-62	78189	2104-04-00-2520N		
210-0202-00	4-84	78189	2104-06-00-2520N		
210-0206-00	4-99	78189	2103-10-00-2520N		
210-0207-00	2-54	12697	01136902		
210-0259-00	4-45	80009	210-0259-00		
	4-59				
210-0401-00	2-56	73743	3262-402		
210-0405-00	3-47	73743	2X12157-402		
	4-47				
	4-61				
210-0406-00	4-49	73743	2X12161-402		
	4-63				
	4-94				
210-0407-00	2-96	73743	3038-0228-402		
210-0457-00	2-70	83385	OBD		
210-0462-00	4-20	80009	210-0462-00		
210-0504-00	4-83	73743	3004-402		
210-0505-00	3-17	73743	OBD		
210-0551-00	3-81	83385	OBD		
	3-91				
	4-90				
210-0579-00	3-37	73743	OBD		
210-0583-00	2-32	73743	2X20319-402		
	2-35				
	3-41				
	3-52				
210-0586-00	2-63	78189	OBD		
	2-72				
	3-74				
210-0590-00	2-51	73743	2X28269-402		
	3-11				
	3-14				
	3-31				
	4-14				
210-0659-01	2-66	80009	210-0659-01		

TEKTRONIX PART NUMBER	CKT./FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
210-0801-00	2-98	12327	OBD		
210-0803-00	3-5	12327	OBD		
210-0808-00	4-21	63743	2515113-3TP-909		
210-0812-00	4-100	06982	OBD		
	4-104				
210-0840-00	3-18	89663	644R		
210-0851-00	3-70	12327	OBD		
210-0873-00	2-61	70485	OBD		
210-0940-00	2-36	79807	OBD		
	3-42				
	3-53				
210-0967-00	3-85	80009	210-0967-00		
210-0975-00	2-112	80009	210-0975-00		
210-0978-00	2-52	78471	OBD		
	3-12				
	3-15				
	3-29				
	4-15				
210-1122-00	3-80	78189	4704-04-02		
	3-90				
	4-89				
	4-93				
210-1133-00	2-100	86445	OBD		
211-0007-00	2-77	83385	OBD		
211-0008-00	2-85	83385	OBD		
	3-73				
211-0012-00	3-88	83385	OBD		
	4-87				
211-0016-00	3-68	83385	OBD		
211-0022-00	4-44	83385	OBD		
	4-58				
211-0097-00	3-79	83385	OBD		
	4-92				
211-0116-00	3-99	83385	OBD		
	4-12				
	4-55				
	4-69				
	4-70				
211-0118-00	2-85	83385	OBD		
211-0188-00	2-7	80009	211-0188-00		
211-0501-00	4-25	83385	OBD		
211-0503-00	3-6	83385	OBD		
211-0504-00	2-44	83385	OBD		
	2-68				
	3-6				
	3-76				
	4-24				
	4-96				
211-0507-00	2-21	83385	OBD		

TEKTRONIX PART NUMBER	CKT. / FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
211-0507-00	3-60	83385	OBD		
	3-61				
	3-83				
211-0510-00	2-111	83385	OBD		
211-0511-00	2-102	83385	OBD		
211-0538-00	2-69	83385	OBD		
211-0541-00	2-47	83385	OBD		
	3-57				
	4-3				
211-0587-00	2-24	83385	OBD		
211-0632-00	2-18	83385	OBD		
212-0004-00	4-19	83385	OBD		
212-0008-00	1-14	83385	OBD		
212-0023-00	3-60	83385	OBD		
	3-61				
212-0037-00	4-22	83385	OBD		
212-0084-00	1-12	83385	OBD		
212-0517-00	4-98	83385	OBD		
212-0523-00	4-103	83385	OBD		
212-0597-00	2-3	80009	212-0597-00		
213-0054-00	3-4	83385	OBD		
213-0140-00	4-71	70276	OBD		
213-0153-00	2-27	74445	OBD		
	2-28				
	3-7				
	3-8				
	3-25				
	3-27				
	3-32				
	3-34				
	4-17				
213-0202-00	3-44	83385	OBD		
214-0479-00	4-8	80009	214-0479-00		
214-0579-00	3-94	80009	214-0579-00		
	4-34				
214-0603-01	1-2	80009	214-0603-01		
	1-7				
214-0604-00	1-3	80009	214-0604-00		
	1-8				
214-0812-00	1-1	80009	214-0812-00		
	1-6				
214-1127-00	4-50	80009	214-1127-00		
	4-64				
214-1139-02	4-51	80009	214-1139-02		
	4-65				
214-1139-03	4-51	80009	214-1139-03		
	4-65				
214-1291-00	2-103	05820	207-AB		
214-1536-00	2-101	80009	214-1536-00		

TEKTRONIX PART NUMBER	CKT. / FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
214-1610-00	2-99	80009	214-1610-00		
214-1611-00	2-76	80009	214-1611-00		
214-1612-01	2-79	80009	214-1612-01		
214-1749-00	3-39	80009	214-1749-00		
220-0444-00	2-20	77250	OBD		
255-0334-00	4-85	80009	255-0334-00		
260-0227-00	S1200	93410	110-357		
260-0688-00	S1125	82389	12S1025D		
	2-31				
260-0735-00	S120C	81063	39-1		
	3-38				
260-1207-00	S1375A	71590	2KBB020000-459		
	2-80				
260-1211-00	S429	71590	2KAB010000-357		
	S430				
	S568				
	4-37				
260-1222-00	S1201	91929	2DM301		
	2-48				
260-1223-00	S1330	80009	260-1223-00		
	2-81				
260-1232-00	S1372A	80009	260-1232-00		
	2-82				
260-1232-01	2-82	80009	200-1232-01		
260-1238-00	S1125	81073	39-2		
	2-30				
260-1332-01	S1372A	80009	260-1332-01		
260-1363-00	S512	80009	260-1363-00		
	4-40				
260-1452-00	S350A	80009	260-1452-00		
	3-43				
260-1453-00	S310	80009	260-1453-00		
	4-35				
260-1454-00	S426	80009	260-1454-00		
	4-39				
260-1455-00	S330	80009	260-1455-00		
	4-38				
260-1456-00	S130	80009	260-1456-00		
	3-13				
260-1457-00	S120A	80009	260-1457-01		
	3-36				
260-1457-01	S120A	80009	260-1457-01		
	3-36				
260-1478-00	S101	80009	260-1478-00		
	3-16				
281-0168-00	C513	74970	187-0103-035		
281-0500-00	C1311	72982	301-000C0J0229D		
	C1321				
281-0509-00	C567	72982	301-000C0G0150K		

TEKTRONIX PART NUMBER	CKT. / FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
281-0537-00	C1227	80009	281-0537-00		
281-0543-00	C380	72982	301-055X5P1271K		
	C757				
	C788				
281-0550-00	C757	72982	301-000X5P0121K		
281-0564-00	C505	72982	301-000C0G0240J		
281-0572-00	C773	72982	301-000C0H0689D		
281-0576-00	C537	72982	301-050C0G0110J		
	C577				
281-0605-00	C530	72982	301-000Y5D0201K		
	C570				
281-0623-00	C788	72982	301-000Y5D0651J		
281-0638-00	C507	72982	301-000Z5D0241J		
	C511				
283-0000-00	C384	72982	831-516E102P		
	C386				
	C564				
	C733				
283-0002-00	C223	72982	811-546E103Z		
	C226				
	C264				
	C291				
	C321				
	C322				
	C382				
283-0003-00	C270	72982	855-547E103Z		
	C274				
	C322				
	C551				
	C1253				
	C1281				
	C1331				
	C1253				
	C1281				
283-0008-00	C1391	72982	8151N501651104M		
283-0013-00	C1389	56289	33C29A7		
283-0021-00	C1272	72982	828-005Y5S0102M		
283-0023-00	C273	56289	20C374		
283-0026-00	C1325	56289	274C3		
283-0035-00	C541	72982	811-000Z5U0152Z		
283-0041-00	C276	72982	841-541B332J		
283-0057-00	C1394	56289	274C10		
283-0059-00	C1254	72982	8141N038651105Z		
	C1258				
	C1254				
	C1258				
283-0065-00	C1224	72982	805-505B102J		
	C1279				
	C1224				

TEKTRONIX PART NUMBER	CKT. / FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
283-0065-00	C1279	72982	805-505B102J		
283-0067-00	C1303	72982	835-515B102K		
	C1307				
	C1387				
283-0068-00	C223	56289	19C241		
	C226				
	C291				
	C548				
	C724				
	C763				
	C775				
283-0076-00	C562	56289	40C287A2		
283-0103-00	C544	56289	40C638		
	C546				
283-0110-00	C550	56289	19C242B		
	C565				
283-0116-00	C396	72982	801-547B821J		
283-0119-00	C509	72982	855-535B222J		
	C1212				
283-0134-00	C201	72982	8141N078651474Z		
283-0142-00	C1274	72982	875-551B272J		
283-0164-00	C1259	72982	8141N038651225M		
283-0167-00	C231	72982	8131N147W5R104K		
283-0198-00	C206	72982	8131N075651224M		
	C1259				
283-0208-00	C1273	72982	8151N230W5R224K		
283-0261-00	C1242	56289	41C421		
283-0270-00	C1241	56289	45C17		
	C1248				
	C1249				
	C1241				
	C1248				
	C1249				
283-0617-00	C1252	00853	D193F472K0		
285-0526-00	C1236	56289	410P10404		
285-0562-00	C1386	56289	410P47404		
285-0576-00	C306	56289	410P10591		
285-0703-00	C242	56289	410P112		
	C279				
285-0719-00	C280	56289	410P113		
285-0925-00	C101	56289	430P176		
285-1036-00	C121	56289	430P519		
290-0134-00	C1385	56289	150D226X0015B2		
290-0135-00	C1342	56289	150D156X0020B2		
290-0188-00	C1337	56289	162D104X9035		
290-0194-00	C1251	56289	30D106F100DC4		
290-0247-00	C1399	56289	162D565X9006CD2		
290-0267-00	C1330	56289	162D105X0035CD2		
	C1398				

TEKTRONIX PART NUMBER	CKT. / FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
290-0325-00	C581	56289	601D337G050FL4		
	C711				
290-0334-00	C126	56289	D46468		
	C751				
	C771				
290-0410-00	C391	56289	30D156F100DD4		
	C393				
290-0437-00	C721	56289	66D10108		
	C731				
290-0506-00	C716	56289	68D10471		
290-0517-00	C591	56289	196D685X0035KA1		
	C596				
	C767				
	C781				
290-0525-00	C293	56289	196D475X0050KA1		
	C299				
	C540				
	C545				
	C547				
	C568				
	C569				
	C588				
290-0527-00	C295	90201	TDC156M020NLF		
	C297				
290-0534-00	C215	56289	196D105X0035HA1		
	C218				
	C265				
	C268				
	C549				
	C586				
	C587				
290-0536-00	C772	90201	TDC106M025NLF		
290-0587-00	C744	56289	68D10496		
290-0647-00	C124	56289	43D100F475GJ4		
301-0130-00	R387	01121	EB1305		
301-0152-00	R1125	01121	EB1525		
301-0183-00	R1287	01121	EB1835		
301-0272-00	R1125	01121	EB2725		
301-0330-00	R548	01121	EB3305		
301-0752-00	R1108	01121	EB7525		
	R1118				
	R1128				
	R1138				
	R1108				
	R1118				
	R1128				
	R1138				
301-0753-00	R1392	01121	EB7535		
302-0472-00	R1262	01121	EB4721		

TEKTRONIX PART NUMBER	CKT. / FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
303-0302-00	R1128 R1138	01121	GB3025		
303-0473-00	R1364 R1365	01121	GB4735		
304-0152-00	R126	01121	GB1521		
304-0223-00	R1234	01121	GB2231		
305-0204-00	R142 R143	01121	HB2045		
305-0473-00	R114	01121	HB4735		
305-0475-00	R146 R147	01121	HB4755		
306-0104-00	R1257	01121	HB1041		
306-0121-00	R129 R130	01121	HB1211		
306-0154-00	R124	01121	HB1541		
306-0224-00	R501	01121	HB2241		
306-0471-00	R116	01121	HB4711		
306-0475-00	R121 R122	01121	HB4751		
306-0684-00	R111 R112	01121	HB6841		
306-0820-00	R134	01121	HB8201		
306-0824-00	R144 R145	01121	HB8241		
307-0023-00	R711	01121	EB47G1		
307-0058-00	R1251	01121	EB56G5		
307-0105-00	R766 R786	01121	CB39G5		
307-0296-00	R1272C	80009	307-0296-00		
307-0363-00	R502B	80009	307-0363-00		
307-0402-00	R141	91637	FP35G90001J		
308-0034-00	R139	91637	HL2502Z660000J		
308-0040-00	R138	91637	HL2517Z6-15000J		
308-0053-00	R1124 R1134	91637	RS2-B80000J		
308-0075-00	R581 R583 R1252	91637	RS2B-B100R0J		
308-0219-00	R133	91637	HL2502Z66R000J		
308-0233-00	R135	91637	HL2517Z6-25R00J		
308-0291-00	R393	91637	RS2B-B2000J		
308-0416-00	R137	91637	HL2502Z6380R0J		
308-0431-00	R581 R583	91637	RS2B-B120R0J		
308-0564-00	R1104 R1114 R1124 R1134 R1104	91637	RS2-B20001F		

TEKTRONIX PART NUMBER	CKT. / FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
308-0564-00	R1114	91637	RS2-B20001F		
	R1124				
	R1134				
308-0568-00	R101	91637	RS5-K35R00J		
308-0677-00	R388	75042	BWH-1R000J		
	R389				
308-0690-00	R1254	91637	RS2B-D3R000K		
308-0691-00	R131	91637	HL2502Z6-R300J		
308-0736-00	R417	91637	RS2B-B200R0F		
	R418				
308-0739-00	R424	91637	RS2B-D4R000F		
	R425				
	R426				
	R427				
308-0740-00	R421	91637	RS2B-K20R00F		
	R422				
308-0743-00	R140	91637	HL2502Z6-22001J		
308-0744-00	R136	91637	HL2502Z6-90R00J		
308-0745-00	R132	91637	HL2502Z6-1R400J		
311-0254-00	R1395	12697	CM29709		
	R1295				
311-1120-00	R455	71450	U201R101B		
311-1123-00	R278	11237	U201R102B		
	R281				
311-1124-00	R456	71450	201-YA5533		
	R765				
	R775				
311-1133-00	R528	71450	201-YA5534		
311-1136-00	R1275	71450	X201R104B		
	R1285				
	R1286				
	R1275				
	R1285				
	R1286				
311-1152-00	R1295	73138	91D-R100K		
311-1153-00	R1350	73138	91D-R5.0K		
	R1385				
311-1154-00	R1387	73138	91D-R1.0K		
311-1155-00	R1325	01121	W-7796		
311-1160-00	R1200	71482	381-CM39689		
311-1166-00	R1370	73138	91D-R250K		
	R1390				
311-1183-00	R350	02111	534-9514202J		
311-1189-00	R1291	10582	AW-3349		
311-1199-00	R365	71450	201-YA5543		
311-1205-00	R1245	71450	201-YA5545		
311-1206-00	R530	71450	X201R254B		
311-1302-00	R300	71450	U201R104B		
	R255				

TEKTRONIX PART NUMBER	CKT./ FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
311-1302-00	R570	71450	U201R104B		
311-1308-00	R765	71450	201-YA5550		
	R1116				
	R1136				
311-1310-00	R535	01121	10M654		
	R575				
311-1316-00	R315	01121	10M481		
311-1328-00	R1136	71451	201-YA5553		
311-1362-00	R278	71450	201-YA5554		
	R281				
311-1370-00	R352	71450	201-YA5556		
315-0100-00	R549	01121	CB1005		
	R1386				
315-0101-00	R201	01121	CB1015		
	R380				
	R538				
	R540				
	R564				
	R781				
	R785				
	R1101				
	R1226				
	R1236				
	R1239				
	R1269				
	R1101				
	R1226				
	R1236				
	R1239				
	R1269				
315-0102-00	R232	01121	CB1025		
	R241				
	R391				
	R434				
	R532				
	R545				
	R547				
	R596				
315-0103-00	R128	01121	CB1035		
	R149				
	R224				
	R227				
	R230				
	R313				
	R316				
	R358				
	R362				

TEKTRONIX PART NUMBER	CKT./FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
315-0103-00	R439	01121	CB1035		
	R440				
	R588				
	R594				
	R755				
	R774				
	R1337				
	R1352				
315-0104-00	R206	01121	CB1045		
	R243				
	R452				
	R1213				
	R1273				
	R1279				
	R1312				
	R1322				
	R1329				
	R1273				
315-0106-00	R332	01121	CB1065		
315-0111-00	R1103	01121	CB1115		
	R1113				
	R1123				
	R1133				
	R1103				
	R1113				
	R1133				
315-0122-00	R211	01121	CB1225		
	R259				
	R261				
315-0123-00	R258	01121	CB1235		
315-0125-00	R1311	01121	CB1255		
	R1321				
315-0131-00	R317	01121	CB1315		
315-0151-00	R562	01121	CB1515		
315-0152-00	R544	01121	CB1525		
	R546				
	R560				
	R1308				
315-0153-00	R331	01121	CB1535		
315-0154-00	R1354	01121	CB1545		
315-0155-00	R303	01121	CB1555		
315-0163-00	R1282	01121	CB1635		
315-0183-00	R762	01121	CB1835		
	R1346				
315-0201-00	R788	01121	CB2015		
	R1332				
315-0202-00	R208	01121	CB2025		
	R209				
	R214				

TEKTRONIX PART NUMBER	CKT. / FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
315-0202-00	R264	01121	CB2025		
	R438				
	R584				
	R1313				
	R1331				
	R1332				
315-0203-00	R216	01121	CB2035		
	R430				
	R1351				
315-0221-00	R773	01121	CB2215		
315-0222-00	R561	01121	CB2225		
	R563				
315-0223-00	R242	01121	CB2235		
	R273				
	R451				
	R1307				
	R1310				
315-0224-00	R513	01121	CB2245		
315-0242-00	R241	01121	CB2425		
315-0243-00	R1324	01121	CB2435		
315-0272-00	R304	01121	CB2725		
315-0273-00	R534	01121	CB2735		
	R787				
	R1217				
315-0274-00	R234	01121	CB2745		
	R585				
	R586				
315-0275-00	R203	01121	CB2755		
	R353				
315-0301-00	R788	01121	CB3015		
315-0302-00	R364	01121	CB3025		
315-0330-00	R312	01121	CB3305		
	R539				
315-0331-00	R435	01121	CB3315		
315-0332-00	R235	01121	CB3325		
	R321				
315-0333-00	R587	01121	CB3335		
315-0361-00	R542	01121	CB3615		
315-0391-00	R761	01121	CB3915		
315-0393-00	R221	01121	CB3935		
	R222				
	R266				
	R269				
	R322				
	R431				
	R432				
	R433				
	R597				
315-0432-00	R231	01121	CB4325		

TEKTRONIX PART NUMBER	CKT./FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
315-0432-00	R552	01121	CB4325		
	R554				
	R556				
	R558				
315-0471-00	R324	01121	CB4715		
	R326				
	R328				
315-0472-00	R237	01121	CB4725		
	R274				
	R323				
	R356				
315-0473-00	R244	01121	CB4735		
	R245				
	R591				
315-0474-00	R531	01121	CB4745		
	R1206				
315-0511-00	R382	01121	CB5115		
	R1123				
315-0512-00	R329	01121	CB5125		
	R592				
	R1218				
	R1336				
	R1209				
315-0513-00	R308	01121	CB5135		
	R1303				
315-0561-00	R212	01121	CB5615		
	R213				
	R541				
315-0562-00	R772	01121	CB5625		
315-0563-00	R1202	01121	CB5635		
315-0564-00	R1211	01121	CB5645		
315-0566-00	R305	01121	CB5665		
315-0621-00	R784	01121	CB6215		
315-0622-00	R364	01121	CB6225		
	R1334				
315-0623-00	R202	01121	CB6235		
	R204				
	R1339				
	R1396				
315-0624-00	R574	01121	CB6245		
315-0681-00	R262	01121	CB6815		
	R263				
	R381				
	R757				
315-0682-00	R215	01121	CB6825		
	R218				
	R225				
	R228				
	R265				

TEKTRONIX PART NUMBER	CKT. / FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
315-0682-00	R268	01121	CB6825		
	R327				
315-0683-00	R744	01121	CB6835		
315-0684-00	R754	01121	CB6845		
315-0753-00	R1341	01121	CB7535		
316-0101-00	R1342	01121	CB1011		
	R1397				
316-0102-00	R1222	01121	CB1021		
	R1302				
	R1222				
316-0103-00	R513	01121	CB1031		
	R1203				
	R1268				
	R1203				
	R1268				
316-0104-00	R1279	01121	CB1041		
316-0105-00	R1243	01121	CB1051		
	R1274				
	R1276				
	R1330				
	R1243				
	R1274				
	R1276				
316-0123-00	R1384	01121	CB1231		
316-0183-00	R1263	01121	CB1831		
316-0221-00	R1102	01121	CB2211		
	R1112				
	R1122				
	R1132				
	R1102				
	R1112				
	R1122				
	R1132				
316-0223-00	R1242	01121	CB2231		
	R1248				
	R1270				
	R1242				
	R1248				
	R1270				
316-0274-00	R1232	01121	CB2741		
316-0333-00	R1267	01121	CB3331		
316-0334-00	R1266	01121	CB3341		
	R1381				
	R1382				
	R1266				
316-0390-00	R1103	01121	CB3901		
	R1113				
	R1123				
	R1133				

TEKTRONIX PART NUMBER	CKT./ FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
316-0390-00	R1103	01121	CB3901		
	R1113				
	R1123				
316-0393-00	R1371	01121	CB3931		
316-0395-00	R1271	01121	CB3951		
316-0472-00	R1223	01121	CB4721		
	R1231				
	R1334				
	R1223				
	R1231				
316-0473-00	R1208	01121	CB4731		
	R1343				
	R1208				
316-0474-00	R1304	01121	CB4741		
316-0562-00	R1278	01121	CB5621		
316-0822-00	R1207	01121	CB8221		
321-0139-00	R1126	75042	CEAT0-2740F		
321-0160-00	R453	75042	CEAT0-4530F		
321-0164-00	R450	75042	CEAT0-4990F		
321-0179-00	R1106	75042	CEAT0-7150F		
	R1126				
	R1106				
	R1126				
321-0184-00	R277	75042	CEAT0-8060F		
	R280				
321-0193-00	R277	75042	CEAT0-1001F		
	R279				
	R280				
321-0202-02	R776	80009	321-0202-02		
321-0206-02	R776	75042	CEAT0-1371F		
321-0219-02	R397	75042	CEAT2-1871D		
321-0222-00	R319	75042	CEAT0-2001F		
321-0234-00	R457	75042	CEAT0-2671F		
321-0256-00	R777	75042	CEAT0-4531F		
321-0259-09	R777	91637	MFF1816C48700F		
321-0261-00	R1388	75042	CEAT0-5111F		
321-0266-00	R459	75042	CEAT0-5761F		
321-0267-00	R276	75042	CEAT0-5901F		
321-0268-08	R763	75042	CEAT2-6041F		
	R764				
321-0277-00	R396	75042	CEAT0-7501F		
321-0280-00	R357	75042	CEAT0-8061F		
321-0285-00	R351	75042	CEAT0-9091F		
321-0288-00	R318	75042	CEAT0-9761F		
321-0289-00	R310	75042	CEAT0-1002F		
	R354				
321-0316-03	R361	91637	MFF1816D19101C		
	R363				
321-0344-00	R514	75042	CEAT0-3742F		

TEKTRONIX PART NUMBER	CKT. / FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
321-0344-00	R515	75042	CEAT0-3742F		
321-0353-01	R567	91637	MFF1-8-16-4642D		
	R568				
321-0359-00	R1347	75042	CEAT0-5362F		
321-0362-00	R527	75042	CEAT0-5762F		
321-0385-00	R511	75042	CEAT0-1003F		
	R512				
321-0399-00	R1227	75042	CEAT0-1403F		
321-0481-01	R577	75042	CEAT0-1004D		
321-0692-00	R567	75042	CEAT0-4992D		
	R568				
321-0979-01	R517	91637	MFF1816G12502D		
	R518				
	R519				
	R521				
321-0980-01	R523	91637	MFF1816G45002F		
321-1389-01	R576	75042	CEAT0-1113D		
322-0239-00	R371	75042	CEBT0-3011F		
	R372				
322-0335-00	R374	91637	MFF1421G30101F		
	R375				
323-0222-00	R414	75042	CECT0-2001F		
	R415				
323-0222-01	R524	91637	MFF1226G0000D		
	R526				
323-0318-00	R411	75042	CECT0-2002F		
	R412				
323-0414-00	R407	75042	CECT0-2003F		
	R408				
323-0436-00	R1389	91637	MFF1226G34002F		
323-0452-00	R1355	75042	CECT0-4993F		
323-0496-00	R569	91637	MFF1226G14303F		
323-0510-00	R404	91637	MFF1226G20003F		
	R405				
323-0636-01	R537	91637	MFF1226G50001D		
323-0720-01	R536	91637	MFF1226G55560D		
331-0139-00	3-33	05129	461-S 41		
333-1652-00	3-55	80009	333-1652-00		
333-1652-01	3-55	80009	333-1652-01		
333-1706-00	2-39	80009	333-1706-00		
333-1706-01	2-39	80009	333-1706-01		
333-1707-00	2-40	80009	333-1707-00		
333-1707-01	2-40	80009	333-1707-01		
333-1715-00	2-64	80009	333-1715-00		
334-1379-00	2-14	80009	334-1379-00		
337-1419-05	2-15	80009	337-1419-05		
	2-15				
337-1420-00	2-16	80009	337-1420-00		
337-1421-00	2-43	80009	337-1421-00		

TEKTRONIX PART NUMBER	CKT. / FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
337-1440-00	2-9	80009	337-1440-00		
342-0163-00	3-84	80009	342-0163-00		
	3-89				
	4-88				
343-0123-01	2-19	80009	343-0123-01		
344-0131-00	2-67	80009	344-0131-00		
344-0154-00	3-93	80009	344-0154-00		
344-0225-00	2-86	80009	344-0225-00		
344-0226-00	2-23	80009	344-0226-00		
348-0004-00	3-20	70485	763		
348-0031-00	3-77	80009	348-0031-00		
348-0067-00	2-87	80009	348-0067-00		
348-0070-01	2-12	80009	348-0070-01		
348-0115-00	2-45	80009	348-0115-00		
	2-45				
348-0145-00	2-13	80009	348-0145-00		
348-0177-00	3-2	80009	348-0177-00		
348-0178-00	3-3	80009	348-0178-00		
348-0187-00	3-86	80009	348-187-00		
348-0279-00	2-11	80009	348-0279-00		
351-0352-00	3-72	80009	351-0352-00		
352-0076-00	2-60	75915	342012		
352-0157-00	2-33	80009	352-0157-00		
352-0157-01	3-22	80009	352-0157-01		
	3-22				
352-0162-03	3-116	80009	352-0162-03		
352-0163-00	3-117	80009	352-0163-00		
352-0164-02	3-118	80009	352-0164-02		
352-0165-03	3-104	80009	352-0165-03		
352-0166-01	3-119	80009	352-0166-01		
352-0166-04	3-119	80009	352-0166-04		
352-0167-04	3-120	80009	352-0167-04		
352-0167-05	3-120	80009	352-0167-05		
352-0168-01	3-121	80009	352-0168-01		
352-0168-02	3-121	80009	352-0168-02		
352-0168-05	3-121	80009	352-0168-05		
352-0169-08	3-115	80009	352-0169-08		
352-0169-09	3-115	80009	352-0169-09		
352-0171-06	3-103	80009	352-0171-06		
352-0171-07	3-114	80009	352-0171-07		
352-0198-00	2-105	80009	352-0198-00		
	2-119				
352-0200-09	3-66	80009	352-0200-09		
352-0202-01	3-105	80009	352-0202-01		
352-0203-03	3-65	80009	352-0203-03		
352-0203-04	3-65	80009	352-0203-04		
352-0203-05	3-65	80009	352-0203-05		
352-0203-08	3-106	80009	352-0203-08		
352-0204-00	2-106	80009	352-0204-00		

TEKTRONIX PART NUMBER	CKT. / FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
352-0206-00	2-107	80009	352-0206-00		
352-0303-06	3-65	80009	352-0303-06		
354-0219-00	4-42	79136	5103-25-MD-R		
	4-56				
354-0233-00	2-8	79136	X5133-14		
354-0337-00	3-35	80009	354-0337-00		
354-0409-00	2-17	80009	354-0409-00		
358-0029-00	3-28	80009	358-0029-00		
358-0216-00	2-26	80009	358-0216-00		
358-0365-00	2-58	80009	358-0365-00		
358-0366-00	2-58	80009	358-0366-00		
358-0378-00	2-42	80009	358-0378-00		
358-0480-00	3-10	80009	358-0480-00		
361-0383-00	4-41	80009	361-0383-00		
361-0385-00	4-36	80009	361-0385-00		
361-0411-00	2-83	71590	J64285-00		
	2-83				
361-0507-00	1-11	80009	361-0507-00		
361-0508-00	1-13	80009	361-0508-00		
361-0542-00	2-83	71590	J-64281		
361-0552-00	3-71	80009	361-0552-00		
366-0494-00	2-27	80009	366-0494-00		
	3-32				
366-1023-01	2-28	80009	366-1023-01		
366-1026-00	3-7	80009	366-1026-00		
366-1028-00	3-8	80009	366-1028-00		
366-1328-23	4-80	80009	366-1328-23		
366-1328-24	3-49	80009	366-1328-24		
366-1328-25	4-74	80009	366-1328-25		
366-1402-12	4-77	80009	366-1402-12		
366-1402-51	3-48	80009	366-1402-51		
366-1402-52	4-81	80009	366-1402-52		
366-1402-54	4-79	80009	366-1402-54		
366-1402-62	4-78	80009	366-1402-62		
366-1417-00	3-25	80009	366-1417-00		
366-1417-01	3-25	80009	366-1417-01		
366-1418-00	3-27	80009	366-1418-00		
366-1418-01	3-27	80009	366-1418-01		
366-1431-01	3-24	80009	366-1431-01		
366-1462-00	3-34	80009	366-1462-00		
367-0108-00	2-2	80009	367-0108-00		
376-0005-00	4-17	80009	376-0005-00		
376-0114-00	4-71	80009	376-0114-00		
376-0127-00	2-49	80009	376-0127-00		
378-0602-00	2-33	80009	378-0602-00		
378-0635-00	3-21	80009	378-0635-00		
	3-21				
384-0656-00	4-72	80009	384-0656-00		
384-1058-00	4-76	80009	384-1058-00		

TEKTRONIX PART NUMBER	CKT. / FIG. & INDEX NO.	MFR. CODE	MFR. PART NUMBER	SOURCE CODE	REPAIR CODE
384-1061-00	4-75	80009	384-1061-00		
384-1064-00	2-25	80009	384-1064-00		
384-1129-00	4-73	80009	384-1129-00		
384-1182-00	4-16	80009	384-1182-00		
384-1184-00	3-9	80009	384-1184-00		
386-0226-00	1-5	80009	386-0226-00		
	1-10				
386-0227-00	1-4	80009	386-0227-00		
	1-9				
386-1283-00	2-4	80009	386-1283-00		
386-1624-00	2-5	80009	386-1624-00		
386-1946-00	2-10	80009	386-1946-00		
386-2392-00	3-56	80009	386-2392-00		
	4-2				
386-2392-01	3-56	80009	386-2392-01		
390-0320-00	3-1	80009	390-0320-00		
390-0321-00	1-6	80009	390-0321-00		
390-0322-00	1-1	80009	390-0322-00		
401-0056-00	4-53	80009	401-0056-00		
	4-67				
401-0057-00	4-48	80009	401-0057-00		
	4-62				
407-0653-00	4-52	80009	407-0653-00		
	4-66				
407-0896-00	2-46	80009	407-0896-00		
407-0922-00	2-22	80009	407-0922-00		
407-1139-00	4-82	80009	407-1139-00		
407-1143-00	4-95	80009	407-1143-00		
426-0472-04	3-61	80009	426-0472-04		
426-0473-04	3-59	80009	426-0473-04		
426-0681-00	2-29	80009	426-0681-00		
	3-26				
426-0739-00	2-116	80009	426-0739-00		
426-0739-01	2-116	80009	426-0739-01		
426-0740-00	2-116	80009	426-0740-00		
426-0740-01	2-116	80009	426-0740-01		
426-0936-00	3-58	80009	426-0936-00		
	4-1				
441-0991-00	2-65	80009	441-0991-00		
441-1063-00	4-23	80009	441-1063-00		
670-2426-00	A2	80009	670-2426-00		
670-2426-01	A2	80009	670-2426-01		
670-2427-00	A3	80009	670-2427-00		
670-2427-02	A3	80009	670-2427-02		
670-2428-00	A1	80009	670-2428-00		
670-2428-02	A1	80009	670-2428-02		
670-2428-03	A1	80009	670-2428-03		
670-2559-00	A5	80009	670-2559-00		
670-2560-00	A4	80009	670-2560-00		
670-2561-00	A6	80009	670-2561-00		

CROSS INDEX MFR. CODE NUMBER TO MANUFACTURER

MFR.CODE	MANUFACTURER	ADDRESS	CITY,STATE,ZIP
0000C	GETTIG ENGINEERING AND MANUFACTURING CO.		SPRINGMILL, PA 16875
00779	AMP, INC.	P. O. BOX 3608	HARRISBURG, PA 17105
00853	SANGAMO ELECTRIC CO., S. CAROLINA DIV.	P. O. BOX 128	PICKENS, SC 29671
01121	ALLEN-BRADLEY CO.	1201 2ND ST. SOUTH	MILWAUKEE, WI 53204
01295	TEXAS INSTRUMENTS, INC., SEMICONDUCTOR GROUP	P. O. BOX 5012	DALLAS, TX 75222
02111	SPECTROL ELECTRONICS CORP.	17070 EAST GALE AVE.	CITY OF INDUSTRY, CA 91745
02735	RCA CORP., SOLID STATE DIVISION	ROUTE 202	SOMERVILLE, NY 08876
03508	GENERAL ELECTRIC CO., SEMI-CONDUCTOR PRODUCTS DEPT.	ELECTRONICS PARK	SYRACUSE, NY 13201
04713	MOTOROLA, INC., SEMICONDUCTOR PRODUCTS DIV.	5005 E. MCDOWELL RD.	PHOENIX, AZ 85036
05129	KILO ENGINEERING CO.	2015 D	LA VERNE, CA 91750
05820	WAKEFIELD ENGINEERING, INC.	AUDUBON ROAD	WAKEFIELD, MA 01880
06982	MOORE, HOWARD J., CO.	105 E. 16TH ST.	NEW YORK, NY 10003
07263	FAIRCHILD SEMICONDUCTOR, A DIV. OF FAIRCHILD CAMERA AND INSTRUMENT CORP.	464 ELLIS ST.	MOUNTAIN VIEW, CA 94042
07910	TELEDYNE SEMICONDUCTOR	12515 CHADRON AVE.	HAWTHORNE, CA 90250
08116	BOURNS INC., PACIFIC MAGNETICS DIV.	P. O. BOX 1398	ROMOLAND, CA 92380
08261	SPECTRA-STRIP CORP.	7100 LAMPSON AVE.	GARDEN GROVE, CA 92642
08806	GENERAL ELECTRIC CO., MINIATURE LAMP PRODUCTS DEPT.	NELA PK.	CLEVELAND, OH 44112
10582	CTS OF ASHEVILLE, INC.	MILLS GAP ROAD	SKYLAND, NC 28776
11237	CTS KEENE, INC.		PASO ROBLES, CA 93446
12040	NATIONAL SEMICONDUCTOR CORP.	COMMERCE DRIVE	DANBURY, CT 06810
12327	FREEWAY CORP.	9301 ALLEN DR.	CLEVELAND, OH 44125
12697	CLAROSTAT MFG. CO., INC.	LOWER WASHINGTON ST.	DOVER, NH 03820
12969	UNITRODE CORP.	580 PLEASANT ST.	WATERTOWN, MA 02172
15818	TELEDYNE SEMICONDUCTOR	1300 TERRA BELLA AVE.	MOUNTAIN VIEW, CA 94040
16758	DELCO ELECTRONICS, DIV. OF GENERAL MOTORS CORP.	700 E. FIRMIN ST.	KOKOMO, IN 46901
18324	SIGNETICS CORP.	811 E. ARQUES	SUNNYVALE, CA 94086
18788	GENERAL ILLUMINATION INC.	2958 N. CLEVELAND ST.	ST. PAUL, MN 55113
22229	SOLITRON DEVICES, INC., DIODES, INTEGRATED CIRCUITS AND CMOS	8808 BALBOA AVE.	SAN DIEGO, CA 92123
22526	BERG ELECTRONICS, INC.	YOUK EXPRESSWAY	NEW CUMBERLAND, PA 17070
23499	GAVITT WIRE AND CABLE, DIVISION OF RSC INDUSTRIES, INC.	455 N. QUINCE ST.	ESCONDIDO, CA 92025
24796	AMF, INC., POTTER AND BRUMFIELD DIV.	26181 AVENIDA AEROPUORTO	SAN JUAN CAPISTRANO, CA 9267
32293	INTERSIL, INC.	10900 N. TANTAU AVE.	CUPERTINO, CA 95014
56289	SPRAGUE ELECTRIC CO.		NORTH ADAMS, MA 01247
63743	WARD LEONARD ELECTRIC CO., INC.	31 SOUTH ST.	MOUNT VERNON, NY 10550
70276	ALLEN MFG. CO.	P. O. DRAWER 570	HARTFORD, CT 06101
70485	ATLANTIC INDIA RUBBER WORKS, INC.	571 W. POLK ST.	CHICAGO, IL 60607
71400	BUSSMAN MFG., DIVISION OF MCGRAW-EDISON CO.	2536 W. UNIVERSITY ST.	ST. LOUIS, MO 63107
71450	CTS CORP.	1142 W. BEARDSLEY AVE.	ELKHART, IN 46514
71482	CLARE, C. P., AND CO.	3101 PRATT BLVD.	CHICAGO, IL 60645
71590	CENTRALAB ELECTRONICS, DIV. OF GLOBE-UNION, INC.	5757 N. GREEN BAY AVE.	MILWAUKEE, WI 53201
71785	TRW ELECTRONIC COMPONENTS, CINCH CONNECTOR OPERATIONS	1501 MORSE AVE.	ELK GROVE VILLAGE, IL 60007
72982	ERIE TECHNOLOGICAL PRODUCTS, INC.	644 W. 12TH ST.	ERIE, PA 16512
73138	BECKMAN INSTRUMENTS, INC., HELIPOT DIV.	2500 HARBOR BLVD.	FULLERTON, CA 92634
73743	FISCHER SPECIAL MFG. CO.	446 MORGAN ST.	CINCINNATI, OH 45206
74445	HOLO-KROME CO.	31 BROOK ST. WEST	HARTFORD, CT 06110
74970	JOHNSON, E. F., CO.	299 10TH AVE. S. W.	WASECA, MN 56093
75042	TRW ELECTRONIC COMPONENTS, IRC FIXED RESISTORS, PHILADELPHIA DIVISION	401 N. BROAD ST.	PHILADELPHIA, PA 19108
75915	LITTELFUSE, INC.	800 E. NORTHWEST HWY	DES PLAINES, IL 60016
77250	PHEOLL MANUFACTURING CO., DIVISION OF ALLIED PRODUCTS CORP.	5700 W. ROOSEVELT RD.	CHICAGO, IL 60650