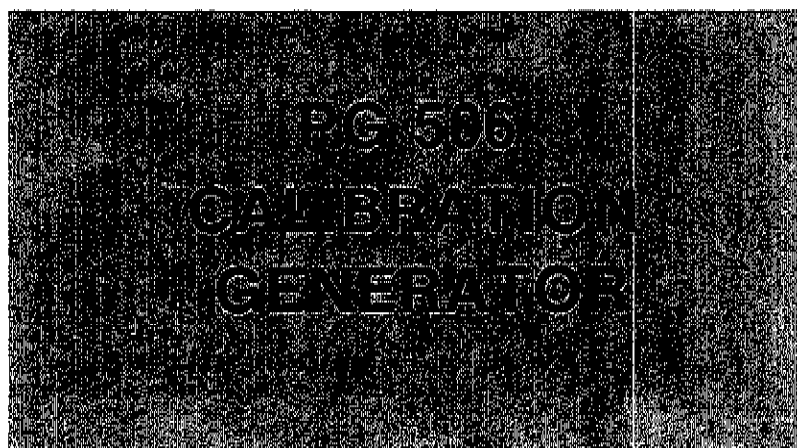


Tektronix

PG 506



TEKTRONIX®



INSTRUCTION MANUAL

Tektronix, Inc.
P.O. Box 500
Beaverton, Oregon 97077

Serial Number _____

TEK INTER-OFFICE COMMUNICATION

TO John Martin 94-540 DATE June 25, 1991
FROM Frank Gray, 50-PAT
SUBJECT GIDEP permit request

In response to the request to grant permission to the Government Industry Exchange Program (GPDEP) to reproduce Tektronix operator, service and instruction manuals, Tektronix, Inc. hereby grants such permission for distribution of such documents to any GIDEP user that is a full participant in the Metrology Data Interchange Data Base of GIDEP provided that all copies of the original work include the entire copyright notice and ownership statement exactly as it appears in the original, together with the Legend "Reproduced with permission."

This permission has been approved by the Intellectual Property Committee of Tektronix, and a copy of this memo may be provided to GIDEP to provide the requested permission.

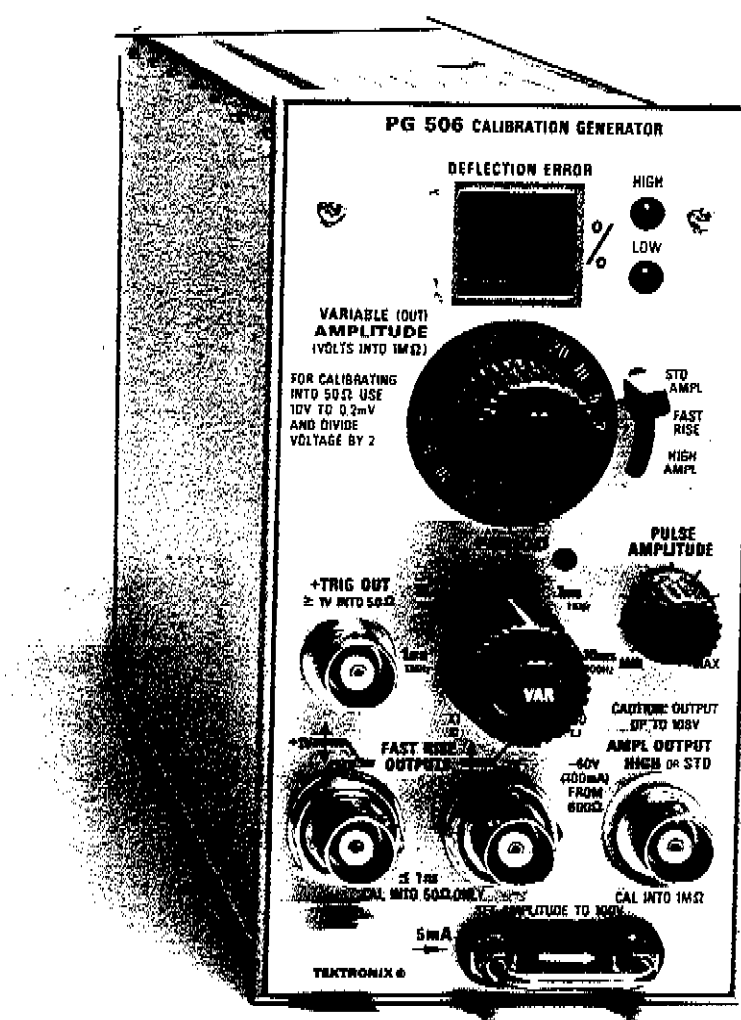

Francis I. Gray
Group Patent Counsel

imp

TABLE OF CONTENTS

SECTION 1	OPERATING INSTRUCTIONS	Page
	Introduction	1-1
	Description	1-1
	Installation and Removal	1-1
	Preliminary Checks	1-1
	Amplitude Calibrator Mode	1-2
	Connections and Terminations	1-2
	Oscilloscope Controls	1-2
	Deflection Error Readout	1-3
	Current Loop	1-3
	Pulse Generator Mode	1-3
	General	1-3
	High Amplitude Output	1-3
	Fast Rise Outputs	1-4
	General Information	1-4
	Risettime Considerations	1-4
	Checking Amplifier Response	1-6
	Electrical Characteristics	1-8
SECTION 2	THEORY OF OPERATION	
	Primary Power	2-1
	Standard Amplitude	2-2
	Digital Voltmeter	2-3
	Period Generator and Display	2-4
	High Amplitude	2-5
	Fast Rise	2-6
SECTION 3	SERVICING INFORMATION	
	Calibration Procedure	3-1
	Calibration Interval	3-1
	Services Available	3-1
	System Maintenance	3-1
	Test Equipment and Accessories Required	3-1
	Preparation	3-2
	Adjustments	3-2
	Diagrams and Parts List	3-8
	Replaceable Electrical Parts List	
	Adjustment Locations	
	Parts Location Grid (Main Board "A" side)	
	Parts Location Grid (Main Board "B" side)	
	Parts Location Grid (DVM, Fast Rise and Display Boards)	
	Controls, Connectors and Rear Connector Pin Assignments	
	Block Diagram	
	Primary Power (Schematic)	
	Standard Amplitude (Schematic)	
	Digital Voltmeter (Schematic)	
	Period Generator and Display (Schematic)	
	High Amplitude (Schematic)	
	Fast Rise (Schematic)	
	Replaceable Mechanical Parts List	
	Accessories Included	
	Fig. 1 Exploded View	

CHANGE INFORMATION



OPERATING INSTRUCTIONS

INTRODUCTION

Description

The PG 506 Calibration Generator is designed to operate in a TM 500 Series Power Module. The instrument is a combination Amplitude Calibrator and Square Wave Pulse Generator intended for calibration and adjustments of oscilloscope amplifier systems with a 50-ohm or 1-megohm input resistance.

The Amplitude Calibrator function provides either a + dc voltage or a 1 kHz square-wave output, as selected by an internal switch. Peak-to-peak amplitudes from 0.2 millivolt to 100 volts across a 1-megohm load and amplitudes of 100 microvolts to 5 volts across a 50-ohm load are available. Output amplitudes are selected in a 1, 2, 5 sequence.

Because errors are often stated as a percentage, an internal digital differential voltmeter with front-panel light-emitting diode (LED) readout is used to provide a display equal to oscilloscope vertical or horizontal deflection errors. If the indicated deflection on an oscilloscope graticule does not agree with the proper reference line, the output amplitude from the PG 506 Amplitude Calibrator can be varied until the proper alignment is obtained. In this operating mode, the front-panel readout is a direct display of the oscilloscope deflection error.

A 5 mA Current Loop is provided, which supplies current (dc or 1 kHz) for calibration of current probes.

The Pulse Generator provides three square-wave outputs: variable High Amplitude pulses and simultaneous positive- and negative-going Fast Rise, variable-amplitude pulses. In the Pulse Generator mode, the Period is selectable from one microsecond to 10 milliseconds in decade steps. A variable control extends the maximum period to at least 100 milliseconds (for each decade step, the period is variable over a 10:1 range). A positive going pretrigger output is also provided for triggering external

Installation and Removal

WARNING

Dangerous voltage may be present on the front-panel BNC connector labeled AMPL OUTPUT (HIGH or STD). Before installation, turn the control labeled AMPLITUDE (VOLTS INTO 1 MΩ) fully counter-clockwise (ccw), and the control labeled PULSE AMPLITUDE to MIN. It is not recommended that the PG 506 be inserted into a live Power Module.

The PG 506 is calibrated and ready to use as received.

Referring to Fig. 1-1, install the PG 506.

To remove the PG 506 from the Power Module, pull release latch to disengage the plug-in and pull straight out.

Refer to the foldout pages for a description of front panel controls, connectors, and rear connector assignments.

Preliminary Checks

Make all desired connections to equipment under test before applying power to the PG 506. The power switch on the Power Module. Power application to the PG 506 is indicated by the PERIOD light turning on, or the light behind the knob skirt of the AMPLITUDE control switch being lighted.

The front-panel LED's can be tested (888 display) setting the three-position Mode switch to STD AM position, then pushing and holding the VARIABLE knob concentric with the AMPLITUDE switch.

To test the digital voltmeter system, release VARIABLE knob to the out position and rotate the control

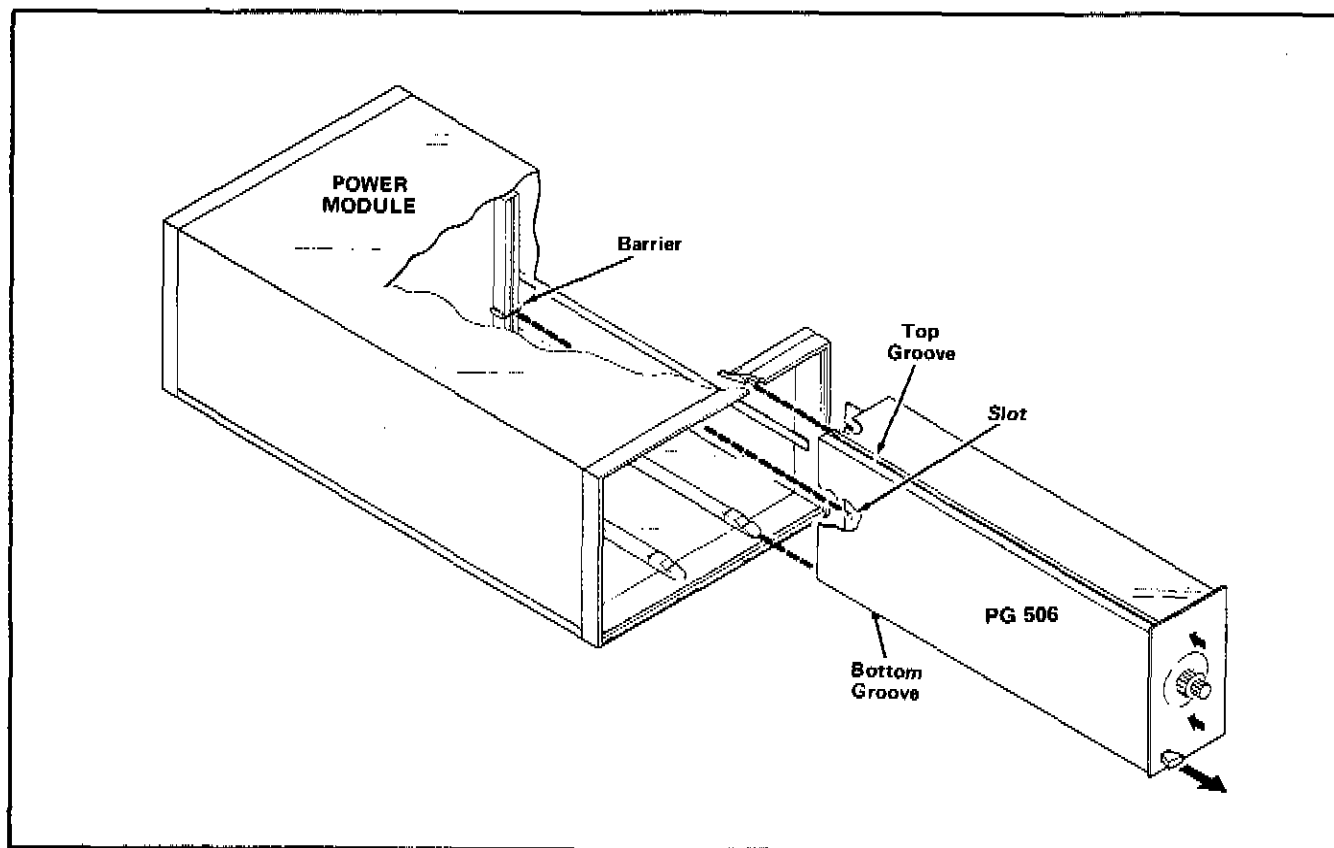


Fig. 1-1. PG 506 Installation and Removal.

Allow 15 to 20 minutes warmup time for all equipment before using the PG 506.

AMPLITUDE CALIBRATOR MODE

Connections and Terminations

To use the PG 506 Amplitude Calibrator system, set the mode switch to the STD AMPL position. Connect the 1 kHz calibrated amplitude signal at the AMPL OUTPUT connector to the input of an oscilloscope through a coaxial cable that has a 50-ohm characteristic impedance (RG-58/U) with a maximum length of 42 inches (shorter cables can be used).

With a cable termination of 1 M Ω and the DEFLECTION ERROR display off, the 1 kHz signal peak-to-peak output amplitude will be equal to the indicated reading on the AMPLITUDE switch. If the cable is terminated into a 50-ohm load, use an output amplitude in the 10-volt to 0.2-millivolt range; the output amplitude will then be one-half the indicated reading on the AMPLITUDE switch.

Oscilloscope Controls

The deflection factor (either vertical or horizontal) for oscilloscopes is the ratio of the amplitude of the input signal to the amount of beam deflection produced on the cathode-ray tube (crt), usually stated as volts per division of deflection (Volts/Div). Calibration procedures for some oscilloscopes require that the gain be set and the deflection accuracy be checked with a probe (properly compensated) connected between the PG 506 and the oscilloscope input connector.

For oscilloscope gain adjustments and checking of deflection accuracies, it is always best to set all oscilloscope controls exactly as called out in the calibration and performance sections of the oscilloscope instruction manual. However, it may be found desirable to set the oscilloscope sweep controls to a 0.1 millisecond/division (or faster) sweep rate and free-run the sweep when performing vertical deflection (amplitude) checks and adjustments. This procedure produces two horizontal traces that are separated vertically by an amount proportional to the peak-to-peak amplitude of the 1 kHz square-wave from the PG 506. At faster sweep rates, the display becomes more readable.

Deflection Error Readout

When performing gain adjustments on oscilloscope or amplifier systems, it is mandatory that the DEFLECTION ERROR readout be turned off in order to obtain calibrated output amplitudes. The PG 506 DEFLECTION ERROR readout feature finds its greatest use in its ability to allow an operator to verify the oscilloscope deflection accuracy associated with amplifier gain and input attenuators.

Gain adjustments for oscilloscope amplifiers are usually made at low levels, for example; at a 10 mV/div deflection factor and a 50 mV signal from the PG 506. This ratio corresponds to five major graticule divisions of beam deflection. If the gain of the oscilloscope amplifier system is low, the indicated deflection will be less than five major graticule divisions, for example; 4.8 major divisions. The VARIABLE AMPLITUDE (OUT) control on the PG 506 can then be used to increase the output amplitude until the total deflection is exactly five major divisions. At this point, the DEFLECTION ERROR readout will read 4.0% LOW. Conversely, if the oscilloscope amplifier system gain is too high, the indicated deflection on the crt will be above the proper reference line, for example; 5.2 major divisions. Using the VARIABLE AMPLITUDE control on the PG 506 to reduce the output amplitude for exactly five major divisions of deflection will produce a DEFLECTION ERROR readout of 4.0% HIGH.

For some oscilloscopes the deflection factor may not be constant throughout the full vertical dimension of the graticule, due to compression or expansion nonlinearities. To check for this type of nonlinearity; center a two-division display, then position the display to the top of the graticule. Measure any deflection errors with the PG 506 VARIABLE AMPLITUDE control. Next, position the two-division display to the bottom of the graticule and measure the deflection errors. These nonlinearities should be taken into account when making measurements with full graticule deflection, or with the crt trace positioned towards the top or bottom graticule limits and using small deflection factors.

Current Loop

One end of the Current Loop is grounded and terminates a precision voltage divider. The direction of the arrow is oriented for conventional current. To obtain a calibrated 5 mA from the Current Loop, set the mode switch to STD AMPL position and the AMPLITUDE control switch to the 100 V position. The DEFLECTION ERROR readout should be off, or adjusted to read 0.0%. The current signal can be either dc or 1 kHz square-wave current, as selected by an internal switch.

PULSE GENERATOR MODE

General

In order to ensure waveform fidelity when using the Pulse Generator function of the PG 506, the following precautions should be observed.

1. Use high quality 50-ohm coaxial cable, connectors, and terminations (where applicable). Make all connections as tight and short as possible.
2. Reduce capacitive and inductive loads to a minimum. Risetime degradation occurs with long cable lengths.
3. Minimum risetime and pulse aberrations are obtained with 50-ohm loads and loads must be capable of dissipating the power available at any output connector in any operating mode.
4. The external equipment is assumed to have no dc voltage across the load to which the PG 506 is connected. If a dc voltage exists, the output amplitude from the PG 506 will be in error by the amount of the dc offset. To prevent dc-offset errors, couple the PG 506 outputs through a dc blocking capacitor to the load. The time constant of the coupling capacitor and the total resistance in series must be long enough to maintain pulse flatness.

High Amplitude Output

To use the PG 506 Pulse Generator system to produce high amplitude square-waves, set the mode switch to HIGH AMPL position and connect external equipment to the AMPL OUTPUT HIGH connector. Set the Period controls for the period or frequency desired. The output amplitude of this signal can be adjusted with the PULSE AMPLITUDE control.

Operating Instructions—PG 506

This signal can be used to adjust oscilloscope amplifier input capacitance, attenuator compensation networks, and other internal frequency compensation networks. The AMPL OUTPUT HIGH signal is negative with respect to ground, with its risetime related to the rising portion (from a negative potential) of the waveform. Refer to Fig. 1-2. The absolute peak-to-peak value of the square-wave is determined by the load resistance and the setting of the PULSE AMPLITUDE control. Table 1-1 lists the *typical amplitudes* available when the PG 506 is terminated into three different load resistances.

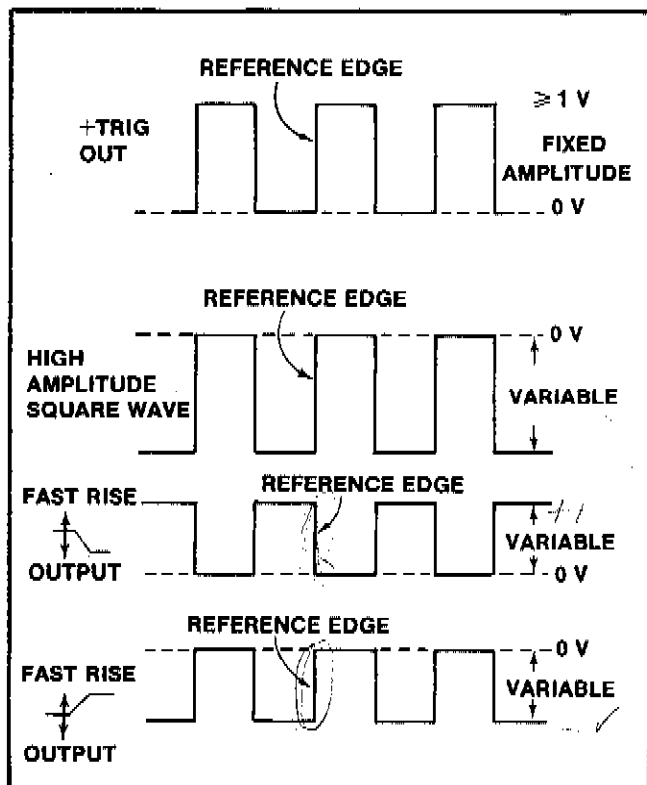


Fig. 1-2. Output signals from PG 506 Square Wave Generator system. Dashed line is zero volt level for each waveform. +TRIG OUT signal leads HIGH AMPL pulse by about 18 nanoseconds and leads FAST RISE pulse by about 8 nanoseconds.

TABLE 1-1

HIGH AMPL OUTPUT Termination	PULSE AMPLITUDE Control ¹	
	MIN	MAX
50 Ω Load	0.3 V p-p	5.2 V p-p
600 Ω Load	1.9 V p-p	32.5 V p-p
1 M Ω Load	3.8 V p-p	≥60.0 V p-p

¹Approximate amplitudes.

Fast Rise Outputs

To use the PG 506 Pulse Generator system to produce low amplitude, fast-rise square-waves, set the mode switch to FAST RISE position and connect external equipment to the FAST RISE OUTPUTS connector(s). Set the PERIOD controls for the period or frequency desired. The output amplitude can be adjusted by the PULSE AMPLITUDE control. Coaxial cable, PN 012-0482-00 should be used when operating the PG 506 in a FAST RISE mode.

These signals are usually used to adjust high-frequency compensation networks in oscilloscope amplifier circuits. The adjustments are made for optimum response (minimum aberrations). The risetime and amplitude specifications for the FAST RISE outputs apply only when they are terminated into a 50-ohm load. Larger amplitudes (greater than 1 volt peak-to-peak) can be obtained from these output connectors under unterminated conditions, but the risetime specification is no longer applicable.

GENERAL INFORMATION

Risetime Considerations

The PG 506 can be used in conjunction with an oscilloscope to determine the risetime of a device under test (dut). Risetime is normally measured (unless otherwise specified) between the 10% and 90% amplitude levels on the leading edge of a waveform. The risetime of a displayed waveform is illustrated in Fig. 1-3.

Before measuring the risetime of a device under test, the combined risetime of the PG 506 output signal and the oscilloscope vertical amplifier system must be known. Refer to Fig. 1-3 for the percentage error to be expected when the two devices are cascaded. Sweep timing accuracy should be verified before any risetime measurements are made. Inaccuracies in the sweep timing and display reading errors must be added algebraically to the percentage error obtained from computations related to Fig. 1-3.

The graph for Fig. 1-3 can be used as a guideline for the following general conclusions.

1. Oscilloscopes should have a vertical system risetime about one-seventh of the fastest signal applied to keep system errors to a minimum.

2. Conversely, if the signal risetime is at least seven times faster than the risetime of the oscilloscope vertical system, the displayed (observed) waveform will have a risetime that is very close to the risetime of the vertical system.

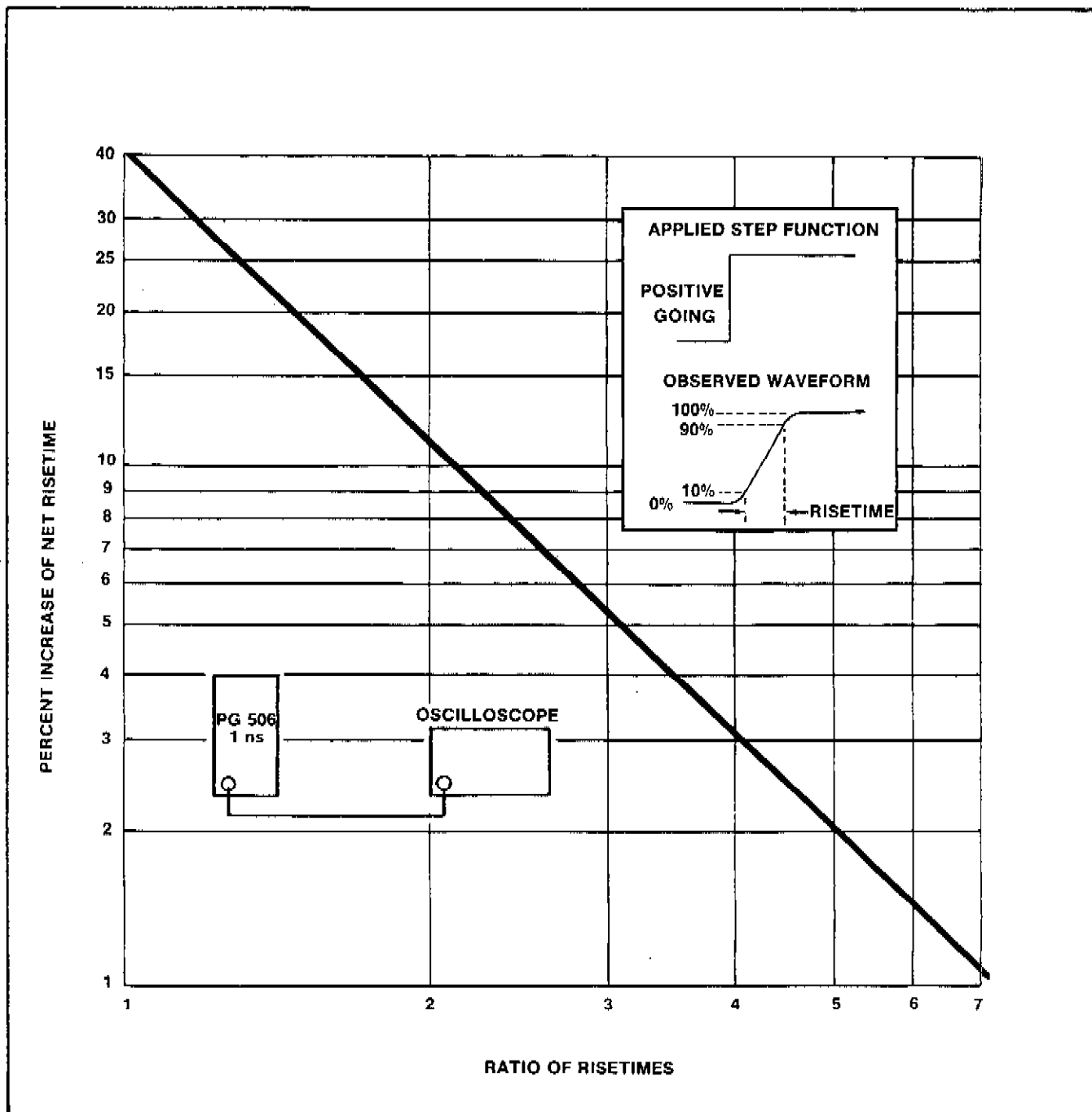


Fig. 1-3. Percentage increase of net risetime vs ratio of risetimes for two cascaded devices. For example, a 2-ns oscilloscope monitoring a 10-ns signal (5:1 ratio) would permit an observation with an error of 2%. Note that if the risetimes are equal the error is 41.4%. Sweep timing and display-reading errors not included.

3. The displayed risetime as observed on any oscilloscope can never be faster than the risetime of the slowest device in the system.

Risetime of a displayed waveform is related to total system bandwidth. A system with limited high-frequency response will produce a displayed risetime that is slower

than expected. If a fast-step signal produces a crt display with little or no overshoot or ringing, the product of oscilloscope risetime and oscilloscope bandwidth should result in a factor whose value lies between 0.329 and 0.350.

The following steps describe the procedure to follow in determining the risetime of a device under test.

Operating Instructions—PG 506

1. Connect the appropriate output signal from the PG 506 to the oscilloscope vertical input with a short 50-ohm coaxial cable terminated into a 50-ohm load.

2. Set the oscilloscope controls to display the leading edge of the waveform. Risettime measurements should be made over the largest part of the graticule area possible. When the fastest sweep rate is relatively slow compared with the vertical system risetime (or the scale is small), measurements become confined to small sections of the graticule, and the probability of display reading errors becomes greater.

3. Measure the time duration between the 10% and 90% amplitude levels. This is the combined risetime of the PG 506 and the oscilloscope (T_{rc}).

4. Disconnect the coaxial cable and 50-ohm termination from the oscilloscope.

5. Connect the coaxial cable from the PG 506 to the input of the device under test and connect the output of the device under test to the oscilloscope vertical input. Terminate the dut in its characteristic impedance for optimum performance.

6. Set the oscilloscope controls to display the leading edge of the displayed waveform and measure the time duration between the 10% and 90% amplitude levels (over the same graticule area, if possible). This is the total system risetime (T_r).

7. Calculate the risetime of the device under test using the following formula:

$$T_r(\text{dut}) = \left[(T_r)^2 - (T_{rc})^2 \right]^{1/2}$$

Checking Amplifier Response

The square-wave output signals from the PG 506 can be used to check the response of active or passive systems. Because the characteristics of a pulse from the PG 506 is known (see ELECTRICAL CHARACTERISTICS), distortion of the waveform beyond these limits is due to the device under test.

The compensation of an ac-voltage divider, such as used in the input attenuator of an oscilloscope or a passive attenuator probe, can be checked by observing its response when a square-wave signal is applied. Correct response is shown by optimum square corner on the displayed waveform. If the waveform has overshoot, rolloff, or front-corner rounding, the system is not correct-

ly compensated. Fig. 1-4 shows typical waveforms illustrating correct and incorrect compensation adjustments. When performing these compensation checks, the repetition rate of the applied square-wave signal should be at least 3 to 4 decades above the low-frequency cutoff point (frequency where the equivalent sine-wave amplitude is 30% down).

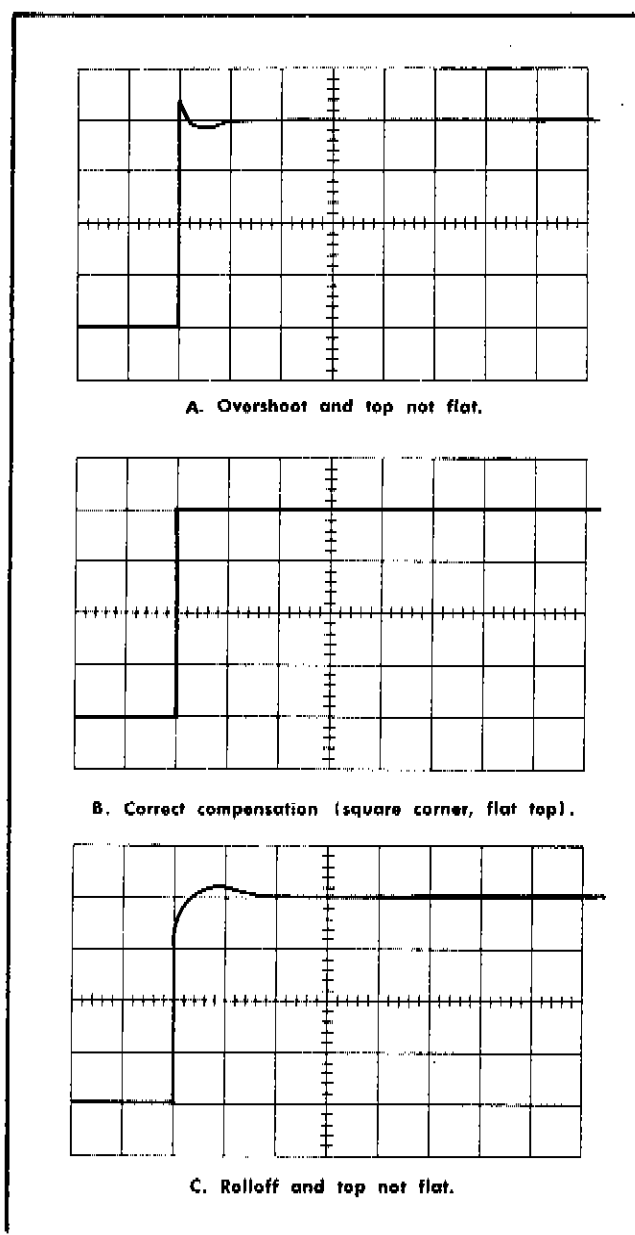


Fig. 1-4. Typical waveforms showing correct and incorrect compensation adjustments.

The low end cut-off frequency (due to RC coupling) for an amplifier can be approximated very closely by using the following procedure.

1. Apply a square-wave at a repetition rate that is not affected by the low-frequency limit.

2. Slowly reduce the square-wave frequency and adjust the oscilloscope (amplifier) controls to display a signal similar to Fig. 1-5.

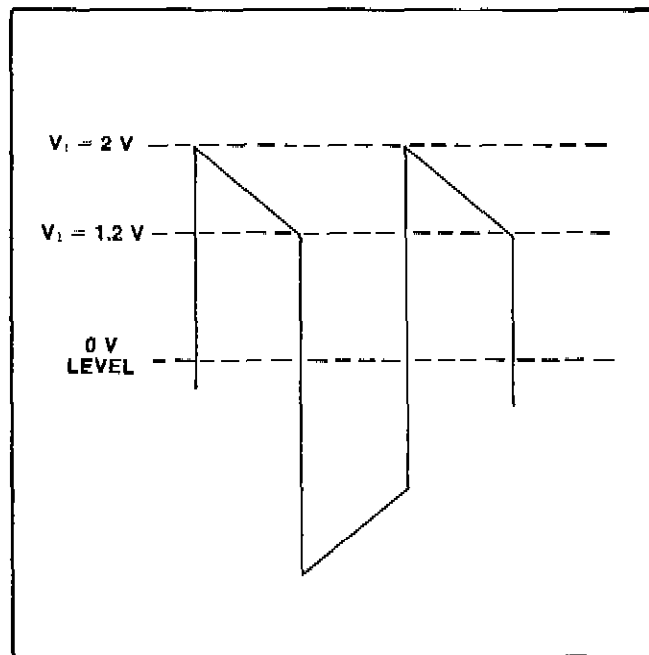


Fig. 1-5. Limited low frequency response due to RC coupling. Ratio V_1/V_2 can be used to determine the low end cut-off frequency (see text). Waveform is due to phase lead and low amplitude for low frequencies.

3. Determine the ratio between the amplitude levels, V_1 and V_2 . Note that V_1 and V_2 are peak values above the zero-volt reference level.

4. The equivalent RC product can be determined by using the following formula; where F_s is the applied frequency for a given ratio of V_1/V_2 (greater than unity).

$$\frac{1}{2 F_s \ln V_1/V_2} = RC \text{ (for square-waves only)}$$

5. Using the RC product obtained in step 4, calculate the low-end cut-off frequency.

$$F_L \text{ (3 dB)} \approx \frac{159 \times 10^3}{RC}$$

For example; if the applied frequency, F_s , is 10 Hz and the amplitude values shown in Fig. 1-5 are used, the lower cut-off frequency is calculated to be about 1.6 Hz.

Fig. 1-6 illustrates other waveform distortion effects that may be observed if amplifier circuits are not properly compensated for low frequencies.

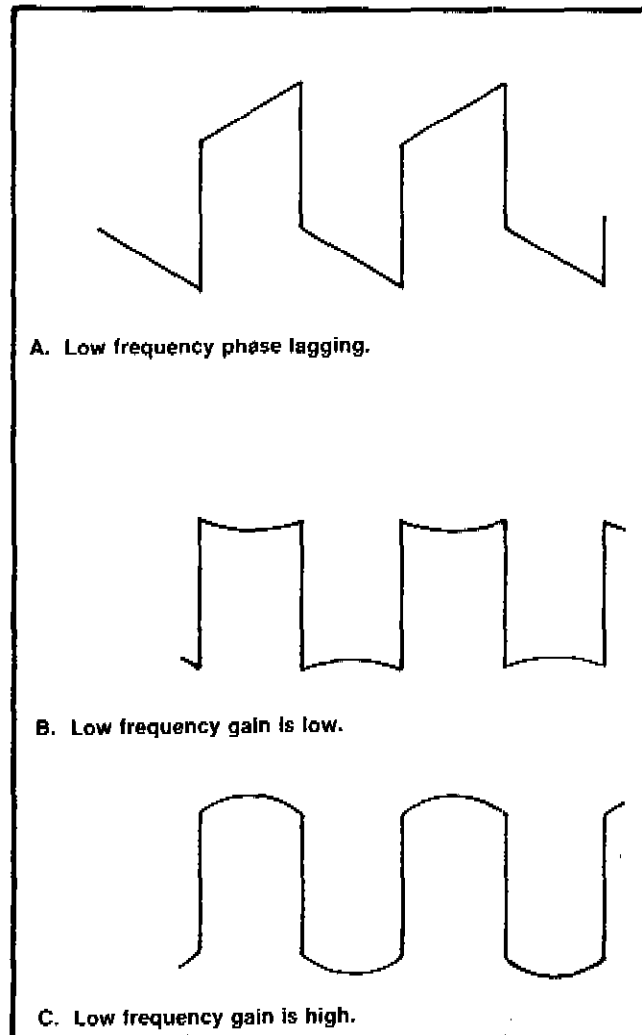


Fig. 1-6. Distortion of square waves caused by low frequency effects.

Fig. 1-7 illustrates waveform distortion due to incorrect high-frequency compensations. Ringing indicates incorrect peaking adjustments or undesired inductive effects, while excessive overshoot and rolloff indicates incorrect capacitive adjustments. Limited high-frequency response is also indicated by risetime measurements that are much slower than expected (see Risetime Considerations). Impedance mismatching will usually show up as excessive aberrations somewhere along the flat portion of the waveform.

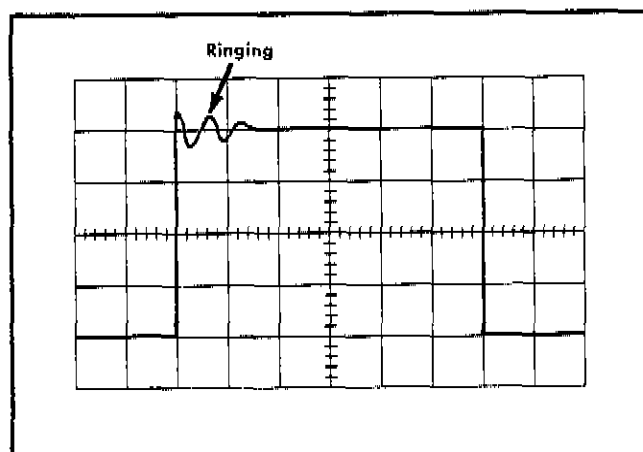


Fig. 1-7. Typical waveform showing ringing at front corner.

ELECTRICAL CHARACTERISTICS

STANDARD AMPLITUDE OUTPUT

Amplitude (Peak-to-Peak)

1 M Ω Load:	200 microvolts to 100 volts in a 1,2,5 sequence.
50 Ω Load:	100 microvolts to 5 volts in a 1,2,5 sequence.
Accuracy:	Within 0.25%, ± 1 μ V.
Period:	Approximately one millisecond (1 kHz square-wave, chopped dc).

Amplitude (dc)	Selected by internal switch.
Accuracy:	Same as stated for peak-to-peak values, except that accuracy is not specified for amplitudes below 100 mV.

Deflection Error
Readout

Range:	$\pm 7.5\%$.
Resolution:	Within 0.1%.

HIGH AMPLITUDE OUTPUT

Amplitude (Peak-to-Peak)

Unterminated:	6 volts or less to at least 60 volts.
---------------	---------------------------------------

50- Ω Load:	0.5 volts or less to at least 5 volts.
Polarity:	Positive. Measured from a negative potential to ground.
Output Resistance:	600 Ω , within 5%.
Output Period:	1 μ s to 10 ms in decade steps.
Accuracy:	Within 5%.
Variable:	Extends output period to at least 100 ms. X1 to greater than X10 range for each decade step.

Duty Cycle:	Approximately 50%.
-------------	--------------------

Risetime

Unterminated:	100 nanoseconds or less at output connector.
---------------	--

50- Ω Load:	10 nanoseconds or less.
--------------------	-------------------------

Leading Edge
Aberrations:

During first 50 nanoseconds. Within 2% of signal peak-to-peak amplitude or 50 millivolts, whichever is greater.

FAST RISE OUTPUTS

Amplitude (Peak-to-Peak)

50- Ω Load:	100 millivolts or less to at least 1 volt.
--------------------	--

Polarity:	Simultaneous positive and negative. Positive is measured from a negative potential to ground. Negative is measured from a positive potential to ground.
-----------	---

Output Resistance:	50 Ω , within 3% at either output connector.
--------------------	---

Risetime

50- Ω Load:	One nanosecond or less.
--------------------	-------------------------

Leading Edge
Aberrations:

During first 10 nanoseconds. Within 2% of signal peak-to-peak amplitude or 10 millivolts, whichever is greater.

Operating Instructions—PG 506

Flatness: Within 0.5% after first 10 nano-seconds.

Output Period: 1 μ s to 10 ms in decade steps.

Accuracy: Within 5%.

Variable: Extends output period to at least 100 ms. X1 to greater than X10 range for each decade step.

Duty Cycle: Approximately 50%.

THEORY OF OPERATION

Primary Power

The 120-volt dc supply is the main power source for the Standard Amplitude system.

The ± 16.5 -volt dc supply is the main power source for the Digital Voltmeter circuitry, the Fast Rise stages, and two operational amplifier circuits in the Standard Amplitude system.

The -72 -volt, variable dc supply is the main power source for the High Amplitude section. This supply can vary from about -10 volts to about -72 volts, dependent upon operating conditions.

All of the above dc supplies are produced by conventional, full-wave bridge rectifier circuits that are driven by an inverter system that changes a dc voltage to 25 kHz power in the primary and secondaries of T130. Each supply is switched on or off, dependent upon the operating modes.

The 5.2-volt dc supply is derived from a 11.5-volt dc source in the Power Module and is distributed mainly to the Period Generator, Counter circuits, and certain logic gates. This supply is also used as a return for the High Amplitude circuits.

CR10 and CR11, together with C10, convert 25 volts ac (rms) from two transformer secondaries in the Power Module to about 35 volts dc. VR10 sets and regulates the base voltage of emitter-follower Q15 to about 15 volts, establishing a fixed 14 volt supply for the 25-kHz free-running multivibrator (Q90-Q100).

The output at the collectors of the free-running multivibrator circuit has a peak-to-peak amplitude of about 5 volts, and the positive swing is limited to about +5.8 volts by CR86 and CR105. This signal drives the bases of Q85 and Q120 for the inverter system. The feedback connections from the collectors of Q80 and Q125, through CR80 and CR125, ensures that both transistors are never on at the same time.

The maximum voltage swing at the collectors of Q80 and Q125 is about twice the dc level established at the junction of L35 and C36 in any operating mode. For the High Amplitude mode, this dc level is dependent on the setting of the PULSE AMPLITUDE control and the external load that terminates the PG 506. With a 1-megohm (unterminated) load, the dc level will be about 3.5 volts for the MIN position and about 20 volts for the MAX position.

Remote voltage sensing to regulate the -72 -volt variable supply originates in the High Amplitude circuit and is applied through CR27 to pin 4 of voltage regulator U20.

When the PG 506 is in a Standard Amplitude or Fast Rise mode, the junction of L35 and C36 is about 20 volts dc, with the -72 -volt variable supply disconnected from the High Amplitude circuitry.

Voltage regulation for the Standard Amplitude and Fast Rise modes is dependent upon the peak voltage (about 10 volts) developed across C75 by the half-wave rectifier action of CR78, which obtains its ac voltage from a sense winding of T130. The peak level across C75 is applied to a voltage divider composed of R31, R30, and R29. The quiescent level set on pin 4 of U20 by the adjustment of R30 determines the quiescent current through the NPN series-pass transistor. Pin 4 of U20 is the inverting input terminal for an internal comparator, and any voltage change on pin 4 causes a voltage change in the opposite direction on pin 10. R30 is adjusted to produce a potential difference of exactly 33.00 volts across the ± 16.5 -volt supplies.

Current limiting for the 35-volt dc input is controlled by the voltage drop across R22. If pin 2 of U20 goes about 0.6 volt more positive than pin 3, pin 10 goes negative to limit current through the NPN series-pass transistor and the load. CR22 protects a transistor internal to U20. C22 frequency compensates the voltage regulator. VR30 is not normally on; it protects the supply from over-voltage conditions if the potential difference across it exceeds 12 volts.

U20 sets its own reference voltage of about 7 volts on pin 6, with pin 5 being the non-inverting input to an internal comparator. The reference voltage on pin 6 is divided down by R40 and R42 to set a reference level of 5.2 volts on pin 2 of error amplifier U50.

Voltage regulation of the 5.2-volt supply is accomplished by comparing the voltage level on pin 3 of U50 with the voltage reference on pin 2. If the voltage on pin 3 is higher than the reference level, the output of U50 goes positive. This voltage increase is applied through emitter-follower Q60 to the base of the PNP series-pass transistor. This action decreases current in the PNP series-pass transistor and the load, returning the 5.2-volt supply to its original level.

Theory of Operation—PG 506

VR55 and CR55 operate as current limiting control devices. The normal operating potential at the base of Q60 is about 9.2 volts, with VR55 and CR55 not conducting. If the load current increases (due to lower load resistance), pin 3 of U50 goes negative. This drives the base of Q60 negative to about 8.3 volts. The action is sufficient to cause VR55 and CR55 to conduct, clamping the emitter of Q60 and the base of the PNP series-pass transistor to about 9 volts. R65 limits the load current to about 1.5 amperes.

An over-voltage condition of about one volt on the 5.2-volt supply causes VR45 to conduct, developing a SCR firing pulse across R45. If Q45 turns on, the output level is clamped to about 0.2 volt.

The collector of Q70 serves as a 5-volt source for the Digital Voltmeter and Display circuits when the PG 506 is in a Standard Amplitude mode.

Standard Amplitude

2

The Standard Amplitude system consists of two sections, a high-voltage section and a 50-ohm source section. Output amplitudes of 100 V, 50 V, and 20 V originate directly from a precision voltage divider composed of R278, R277, R276, R275, and the 5 mA Current Loop. For these three output amplitudes, the input to the 50-ohm source section is disconnected and pin 2 of U375 is grounded through R380. With pin 2 of U375 grounded, its output locks the base of Q365 to +16 volts, disabling the current drive for the 50-ohm source section.

120 V from the Primary Power system is applied to the emitter of Q280, a 10 mA current source. This 10 mA is split between two branches containing matched diodes; 5 mA through CR280A and the precision divider, 2 and 5 mA through CR280B from the 100-volt bus. In the dc mode, Q255 and Q270 are cut off (due to saturation of U255) and the quiescent level at the anodes of the matched diodes is about 100.7 volts.

With S225 closed, (VARIABLE AMPLITUDE control pushed in, and DEFLECTION ERROR readout off), a 100-volt bus is established across a voltage divider composed of R237 and R234. The reference source for the 100-volt bus originates with Zener diode VR210, which produces an exact 9-volt drop when drawing exactly 7.5 mA through R210. The 9-volt level across R210 also serves as a reference voltage for the Digital Voltmeter circuit.

When R205 has been adjusted to produce exactly 100.000 volts across an external 1-megohm load, pins 2 and 3 of U200 will be essentially at the same potential (9 V) and pin 6 of U200 is at a quiescent level of about 4 volts. The emitter of Q190 will be at 18 volts and this point serves as a regulated voltage source to power operational amplifiers in the 50-ohm source section. Because Q190 is included in the feedback loop around U200, the current through VR210 and R210 remains constant.

One milliampere through R237 and R234 sets a 9-volt level on pin 2 of U240. Pin 3 of U240 is returned to the 9-volt Zener reference through R225A and R215. With almost equal potentials on each side of R225A, the current through this network is in the low microampere range. R225A tracks with R225B and serves only as a variable Thévenin input impedance for the non-inverting input terminal of U240, which aids in stabilizing the offset bias current.

U240 and the circuitry associated with Q245 and Q290 operate as a voltage regulating circuit for the 100-volt bus. Any voltage change on the 100-volt bus is sensed across R237 (or through C237) and applied to pin 2 of U240. Q245 operates as a level shifter and signal inversion through Q290 returns the 100-volt bus to its calibrated level. CR290 and CR291 operate to limit turn-on surge current through Q290.

When the VARIABLE AMPLITUDE control is released to the out position, R237 is disconnected from ground and R227 is inserted in series with R225B. The 100-volt bus now becomes a variable level. R225B can adjust the 100-volt bus over a range of approximately 92—108 volts ($\pm 8.0\%$), and the regulating circuit will hold the selected level. The difference in potential between the adjustable level on the 100-volt bus and the 9-volt Zener reference is applied to the Digital Voltmeter circuitry for DEFLECTION ERROR readout (100 volts equals 0.0%).

When the 1 kHz (calibrated amplitude) mode is selected, a 1 kHz square-wave is applied to the base of Q270 through U255 and emitter follower, Q255. The positive step on the base of Q270 saturates this transistor, pulling its collector below 0.4 volt. This action disconnects CR280A and CR280B, allowing the voltage swing across the precision divider to start from ground and rise to the level selected on the variable bus when Q270 is cut off by the negative step of the 1 kHz signal.

The 50-ohm source section must drive either a 1-megohm or 50-ohm external load resistance. This requirement is met by using a constant-current supply; which, by definition, will alter its output voltage by just the proper amount to maintain its total output current at a constant value when the load resistance changes. The 50-ohm source section operates only when amplitude settings of 10 volts or lower are selected.

A nominal 14-volt input to the 50-ohm source section is derived from the precision divider at the junction of R275 and R276 and applied to pin 2 of U375 (R380 is disconnected from ground). This input voltage will always be a dc level proportional to the dc level established on the 100-volt bus. U375 and Q365 operate as a tracking voltage source. If the input to U375 changes by 5%, the collector voltage of Q365 changes by 5%.

The constant-current supply is programmed by current-setting resistors in series with the emitter of Q325 and the collector of Q365 to produce three selected output current levels through CR320. Selected calibrated currents of 200 mA, 100 mA, or 40 mA split between three branches consisting of R316, the symmetrical pi (ladder) attenuator network, and the external load. With R340 properly adjusted, three voltage levels (10 V, 5 V, or 2 V) can be selected to appear across R316 for an external termination of one megohm. With an external termination of 50 ohms, the three selected levels across R316 will drop to 5 V, 2.5 V, or 1 V. Each section of the ladder attenuator divides by 10 and if the level across R316 is considered to be a 0 dB reference, the total attenuation is 80 dB (20 dB per section). The attenuator presents an output impedance of 50 ohms at any voltage take-off point.

Regulation for the constant-current supply is provided by the operational amplifier feedback connections from the low level end of the current-setting resistors through U330 to the base of Q326. Q320 is cut off for the dc mode and operates as a saturating switch for the 1 kHz mode.

Digital Voltmeter



The Digital Voltmeter circuitry is an analog-to-digital converter, which operates on the principle of a modified dual-slope integrating system. A change in input current to integrator U460 causes a ramp voltage to appear at pin 6. At a given time during the ramp, C462 is discharged by a reference current of opposite polarity. At the time the discharge current is applied, a counter is at a count of 200 (00). When the integrated waveform on pin 3 of differential comparator U470 (zero crossing detector) reaches zero, a number in the counter is stored. The accumulated counts are displayed as being proportional to the value of the input voltage applied; a higher input voltage means a longer time to zero crossing, thus a higher count. It takes a few cycles of dual-slope integration for the analog-to-digital converter system to settle down for a stable readout.

A non-linear reciprocal relationship exists between the Standard Amplitude output from the PG 506 and the actual deflection error of an oscilloscope amplifier system. Consequently, to indicate a deflection error that is 6.8% LOW, the output from the PG 506 must be adjusted to be 7.3% high (variable 100-volt bus set to 107.3 volts). For an indicated deflection error of 7.3% HIGH, the variable 100-volt bus must be adjusted for 93.2 volts. It is the voltage changes on the variable 100-volt bus that result in a DEFLECTION ERROR readout.

Assume that the Latch Pulse for the counter has just occurred. The nominal calibrated level (0.0%) on pin 3 of U460 is 9 volts. A decrease in voltage on the 100-volt bus pulls pin 3 of U470 negative below zero and C462 begins to charge through R460, producing the first ramp after the Latch Pulse. During this charge time the output of U470 is high and the counter is counting up to a count of 200 (00). Q475 is turned on and light-coupled through U480 to the base of Q480. The collector of Q480 is high, turning on CR480 and HIGH indicator light DS480.

The system contains two reference current sources; a +I_s source from the collector of Q415, and a -I_s source from the collector of Q440. Only one of these current sources is switched on at a given time, dependent on the polarity of the voltage change on the 100-volt bus. For a ramp that is negative, pin 5 of U400B is set to a high and pin 1 of U400A is set to a low. Pins 2 and 4 of these NAND gates connect to a common control line, and while the counter is counting up to a count of 200 (00), pin 8 of U400C is at a low level. During the first ramp period, the output levels of U400A and U400B are high and both reference current sources are cut off. See Fig. 2-1.

When the counter has reached a count of 200 (00), a negative-going Full Pulse appears on pin 9 of U400C. This Full Pulse switches the common control line (pin 8) to a high level. Pin 3 of U400A remains high while pin 6 of U400B goes low, turning off Q410. Q415 is switched on for the +I_s discharge current to C462. The ramp on pin 3 of U470 switches polarity (runs toward zero). The counter begins to accumulate the necessary counts for display. Q535 has been turned on by the Full Pulse and light-coupled through U535 to the emitter of Q540, cutting this transistor off.

When the ramp crosses the zero-volt level, a negative-going Latch Pulse occurring on pin 7 of U470 is transmitted through C506 and CR502 to pin 13 of U400D. This Latch Pulse switches pin 8 (common control line) of U400C to a low, locking out both reference current sources and turning off Q535. A positive-going Latch Pulse appears at the collector of Q565 to store the count in the counters for display. After the Latch Pulse has been produced at zero crossing, C462 again starts to charge through R460 (ramp increases in a negative direction) and the cycle repeats.

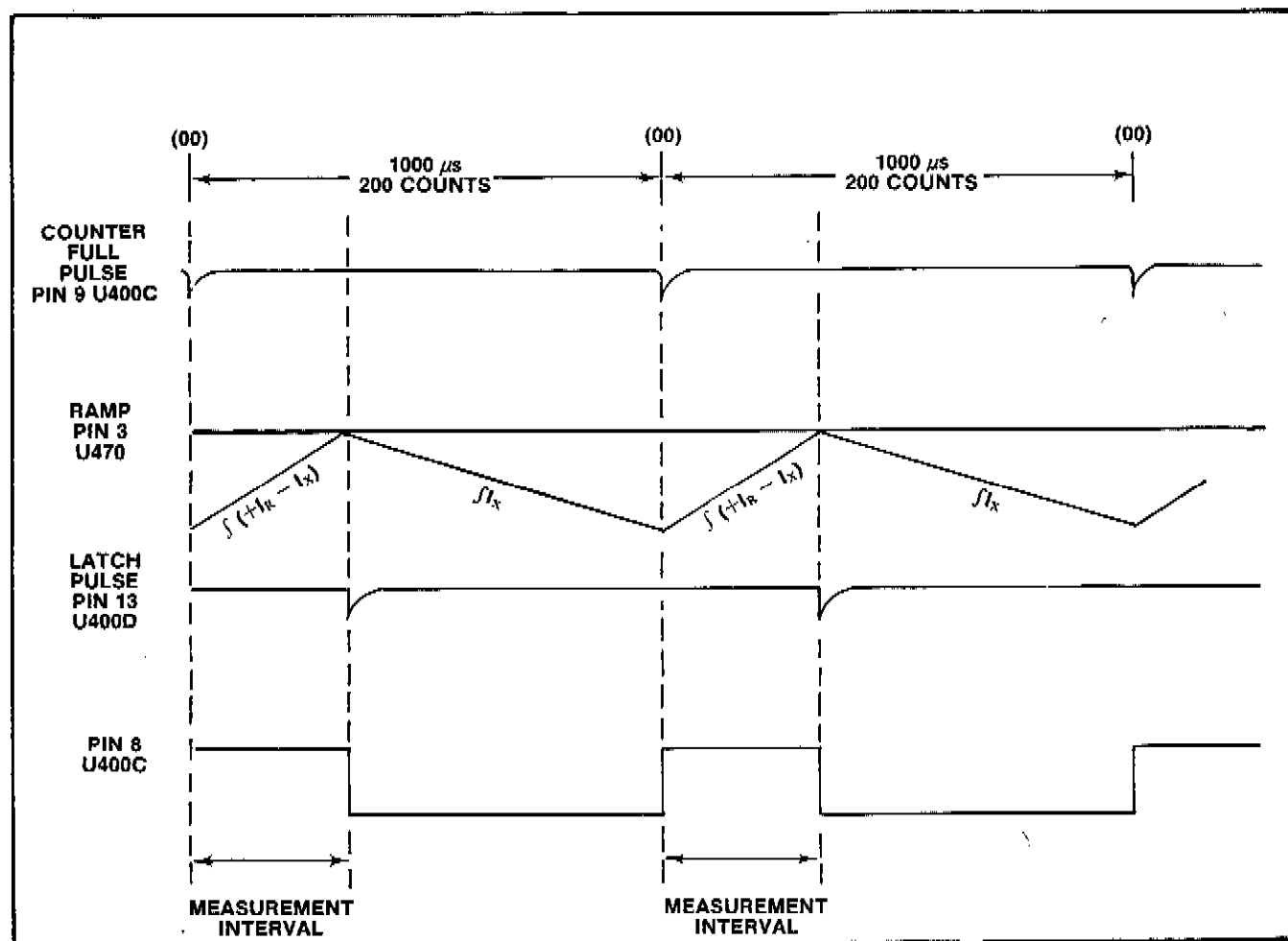


Fig. 2-1. DVM timing diagram for a negative input to the Integrator U460.

For input voltages above 100 volts, the circuit action is similar to the action just discussed; except that the dual ramps on pin 3 of U470 are positive, DS482 is turned on for a LOW indication of DEFLECTION ERROR, and the $-I_x$ reference current source is used to discharge C462. For positive ramps, the Latch Pulse occurring at zero crossing is transmitted through C500 and CR500 to pin 13 of U400D.

Reference currents from both reference sources track with changes on the 100-volt bus and in the same direction, allowing the instrument to be calibrated directly for oscilloscope deflection error rather than output amplitude from the PG 506. The adjustment of R415 calibrates the HIGH indication, while the adjustment of R425 calibrates the LOW indication.

CR395 and CR397 protect components in the DVM circuitry if the ± 16.5 -volt input connections are accidentally reversed.

Period Generator and Display



The Period Generator circuit consists of six transistors (Q575, Q580, Q585, Q595, Q605 and Q610) and timing capacitor C580 in series with main timing resistors R587, R590, and R593. These components set a basic 0.5 microsecond period (2 MHz square-wave signal) for the entire instrument.

The timing capacitor and resistor(s) have a common connection at the base of Q580. The signal on the base of Q580 is basically a linear ramp (with switching transients) that causes the output level at the collector of Q605 to go high and low when the ramp crosses the hysteresis limits of the circuit.

Assume that when power is applied, Q575 turns on and Q580 turns off. This action also turns off Q595, setting one end of the timing resistors to the saturated level at the collector of Q595. The base of Q580 now begins a ramp rundown toward the lower limit of the hysteresis window. C580 is charging toward a 5-volt supply through R582 and the timing resistors. When the ramp at the base of Q580 crosses the lower limit of the hysteresis window, Q580 turns on and Q575 turns off. This action turns Q585 on and Q595 off. R593 is now disconnected from essentially a ground potential and connected to a 5-volt supply through Q610. The effective voltage across the timing resistors has now changed polarity and C580 begins to discharge because the emitter of Q585 is essentially at zero. The base of Q580 begins a ramp runup toward the upper limit of the hysteresis window. When the ramp crosses the upper limit, Q580 is again turned off and Q575 turned on, reconnecting the timing resistors to the collector level of Q595. The voltage swings across R600 (caused by Q580 turning on and off) are inverted by Q605 and applied as TTL levels to pin 14 of U665.

U665, U666, U667, and U668 operate as divide-by-ten frequency dividers (multiplies input period by ten) with a 0.2 kHz (5 millisecond) square-wave on pin 11 of U668 and a 5 microsecond (200 kHz) square-wave on pin 11 of U665. Input data for the counter latch circuits originates on pins 1, 12, 9, 8 and 11 of U666 and U667, respectively. BCD data from the counter latches (U670-U671) is decoded by U673 and U675 to drive the seven-segment LED displays (DS700-DS702).

U610A and U610B are each one-half of a Dual J-K Master-Slave Flip-Flop. The input to pin 1 of U610A is always a 2-kHz signal, obtained from pin 11 of U667. Pin 12 of U610 is a Q terminal and the 1-kHz output signal is used to drive the diode section of U255 in the Standard Amplitude circuitry. To remove the 1 kHz drive to the Standard Amplitude circuitry when it is not needed, pin 2 of U610A is held low, which sets pin 12 to a logical zero. The Standard Amplitude circuitry is in a dc mode when pin 2 is grounded by the closure of S660. For the High Amplitude mode, pin 2 is grounded through CR661; for the Fast Rise mode, through CR660. CR656 and CR657 provide ground connections for the PERIOD light when the instrument is used as a Pulse Generator.

The input signals to U610B (as selected by the PERIOD control) are obtained from pin 11 of the frequency dividers or directly from the 2 MHz Period Generator. The period of the output signals on pins 8 and 9 of U610B are twice the selected input period. These signals are applied to NAND gates U615B and U615C to drive the High Amplitude or Fast Rise circuits. The drive signals on one input terminal of a NAND logic device are gated through with inverted polarity if the other input terminal is held high. The + TRIG OUT signals are supplied by inverter connections of U615A and U615D. To remove (lockout) drive signals

through both NAND gates when they are not needed (Standard Amplitude mode), pin 6 of U610B is held low by the closure of S180A-5B. This action sets pin 9 of U610B to a logical zero (low) and pin 8 to a logical one (high).

The closure of S180A-7B locks out drive signals to the High Amplitude circuitry when the instrument is in a Fast Rise mode; for the High Amplitude mode, the closure of S180A-6B locks out signals to the Fast Rise circuitry.

To disable the High Amplitude power supply when operating in a Standard Amplitude mode, CR616 is grounded through S180A-5B. When operating in a Fast Rise mode, CR615 is grounded through S180A-7B.

High Amplitude



The negative-going output, with Q745 and Q755 supplying the current, is developed across 600-ohm resistor R805 and the external load. CR755 and CR756 operate as disconnect diodes at the zero volt output levels. The specified reference is the positive-going edge of the output waveform, requiring that Q745 and Q755 be switched off for the output to swing from a negative potential to ground. Q760 serves as a 2 mA current shunt through disconnect diodes CR766 and CR767. This circuit absorbs the leakage currents from Q745 and Q755 during transitions and adds a slight amount of reverse bias to the output disconnect diodes, improving the risetime and ensuring very sharp corners for the output voltage swing.

The bases of Q745 and Q755 are connected in parallel and the voltage transitions at this point determine the output current swing. A negative transition at the bases of Q745 and Q755 requires a negative-going transition at the base of Q715 to saturate Q730 and cut off the output current. The RC networks associated with Q725 and in the base circuit of Q755 are wave-shaping components.

The High Amplitude circuitry is floating on a variable power supply with limits of about -10 volts to a maximum of about -72 volts. The collectors of Q725, Q740, and Q790 translate the dc (and signal) levels from ground to a negative supply for the output stages and amplitude control circuitry. Q790 is a 4 mA current source that floats the amplitude control circuitry at about 6 volts more positive than the variable supply voltage level.

Theory of Operation—PG 506

R736 in the emitter of Q736, along with R746 and R749 in the emitters of Q745 and Q755 are chosen so that the current into these nodes is a function of the actual supply voltage. The actual current that enters Q745 and Q755 is controlled by their base voltages and the voltage drops across R745 and R748. The emitter of Q736 is a low-impedance driving point that controls the limits of the output current. Q736 also temperature-compensates the base junctions of Q745 and Q755. The base of Q736 (and the collector of Q782) is considered to be a zero temperature coefficient voltage point.

The PULSE AMPLITUDE control is R785A, located in the base circuit of Q784. This control obtains its reference voltage from across VR790. Q780 and Q784 form a differential circuit with Q780 connected as a diode for temperature compensation. Q736 is driven by Q782, which adds additional gain to set the base of Q780 equal to the base of Q784. R784 sets the minimum output current limit, and R790 is adjusted to set a 5.2-volt output amplitude across a 50-ohm load. CR734, connected between the variable supply and the most negative level of the amplitude control circuitry, allows an additional 0.7 voltage drop across Q780 and Q782, thereby improving the amplitude linearity.

The sensing point to regulate any one level of the variable supply is at the collector of Q790. A drift in the supply voltage is level shifted through VR790 and applied to pin 2 of U840. CR27 is turned on to control the level at pin 4 of U20, the voltage regulator in the Primary Power supply.

The actual voltage of the variable supply is made a function of the negative peak levels of the output signal. The negative peaks are sampled through CR800 and emitter-follower Q800 to store a charge on memory capacitor C800. If the output signal amplitude is increased (larger negative peaks), pin 3 of U840 goes negative. A negative charge on pin 4 of U840 results in a larger dc supply for the inverter system in the Primary Power circuit and the variable supply to the High Amplitude circuit goes more negative. The net result is that the voltage drop across the output transistors remains relatively constant. The variable supply tracks with the selected output amplitude and in the same direction. The emitters of Q745 and Q755 are connected through VR790 to pin 2 of U840, and the collectors are connected through Q800 to U840 pin 3. Because an operational amplifier (U840) always attempts to reduce the voltage difference between its input terminals to zero, the constant voltage drop across the output transistor network is essentially equal to the drop across VR790 plus about two to seven volts across other components in the feedback loop.

K810 and K812 are energized to connect a noise filter network in series with output terminal J820 only when the 50-ohm source section of the Standard Amplitude circuitry is being used.

Fast Rise



The Fast Rise circuit produces two output signals that occur simultaneously. Q935 and Q995 operate as non-saturated current-mode switching sources for the output signals. CR944 and CR1004 are disconnect diodes that have very low leakage current characteristics at zero-bias levels. These levels occur when Q935 and Q995 are cut off.

In order to produce 1 volt across a 25-ohm load (50-ohm termination in parallel with either R950 or R1010) it requires 40 mA. This current is available through resistors in series with the emitters of Q935 and Q995. A negative transition occurs at J950 when Q935 is turned off and a positive transition occurs at J1010 when Q995 is turned off. Both transistors turn off simultaneously with R935 and R995 providing return paths for leakage currents. C940 and C1000 are provided to reduce excessive overshoot and ringing.

Simultaneous amplitude control of the output signals is accomplished by diverting current from the emitters of Q935 and Q995 through the series path of Q1036 and Q1045. The voltage drop across R1040 is controlled by the adjustable voltage level at the emitter of Q1030, a low impedance source for the base of Q1036. Q1020 operates as a current switch to set the collector of Q1030 to about 5 volts when the Fast Rise mode is selected. R1025 sets the minimum amplitude available at the output and R785B controls the minimum and maximum amplitudes.

When the Fast-Rise mode is switched off, the ± 16.5 -volt supply is switched off. The collectors of Q1020 and Q1030 drop to about zero, driving the base of Q1036 negative. This action completely cuts off the leakage currents that might have existed in the collectors of Q935, Q1036, Q995, and Q1045 if the collector of Q1030 had been tied to a fixed 5-volt source. This arrangement ensures that the output connectors rest at a zero-volt level when the instrument is not in a Fast Rise mode.

Q860 and Q862 operate as a Schmitt trigger for the Fast Rise circuit, with VR866 providing positive feedback and Q850 serving as a constant-current source. A positive-going pulse at the base of Q860 results in a negative-going pulse at the collector of Q880 and a positive-going pulse at the collector of Q890, where the transitions are speeded up and translated to ground levels by R882 and R892. At this point, the signal currents are split into two paths through differential amplifiers (Q900-Q910 and Q960-Q970). For a positive-going input to the base of Q860, the emitter of Q935 is driven negative by the saturation of Q920 and the emitter of Q995 is driven positive by the saturation of Q980.

CR1062 and CR1067 protect the Fast Rise circuit components if the wiring plug to the circuit board is accidentally reversed. The diodes in the base circuits of Q1030 and Q1045 are for temperature compensation.

SERVICING INFORMATION

CALIBRATION PROCEDURE

Calibration Interval

To ensure instrument accuracy, check the calibration of the PG 506 every 500 hours of operation, or every three months, if used infrequently. Before calibration, thoroughly clean and inspect this instrument as outlined in the service section of the Power Module instruction manual.

Services Available

Tektronix, Inc. provides complete instrument repair and calibration at local Field Service Centers and at the Factory Service Center. Contact your local Tektronix Field Office or representative for further information.

System Maintenance

System maintenance procedures are provided in the Power Module manual; i.e., preventive maintenance, trouble-shooting aids, parts removal and replacement procedures, parts ordering information, etc.

Test Equipment and Accessories Required

The following test equipment and accessories, or their equivalents, is required for complete calibration of the PG 506. Specifications given for the test equipment are the minimum necessary for accurate calibration or measurement. All test equipment is assumed to be correctly calibrated and operating within specifications.

If other test equipment is substituted, control settings or calibration setups may need to be altered to meet the requirements of the equipment used. Detailed operating instructions for the test equipment used are not given in the adjustment or calibration procedures. Refer to instruction manual for the test equipment if more information is desired.

1. TM 500 Series Power Module.
2. TM 500 Series Plug-in Extender. Tektronix Part Number 062-0645-01.
3. Variable autotransformer, such as a General Radio W10MT3A for 115-volt nominal line or a General Radio W20HMT3A for 230-volt nominal line operation.

4. Precision Dc Voltmeter. This should be a 5 1/2-digit DVM, accurate to within 0.025% or better on any range from 100 V down to and including 100 mV. A John Fluke Model 8375A or equivalent is suggested.

5. Resistor. 1 M Ω , 1/2 W, 0.1%.

6. Resistor. 50 Ω precision, 0.05%, 2 W minimum.

7. Stable 20 mA current source. Output current variable over a 0.5% range (± 0.1 mA).

8. Real-time oscilloscope. Minimum bandwidth 50 MHz with a Dual-Trace Vertical Amplifier, 1 M Ω input resistance. A Tektronix 7603 Mainframe, 7A26 Dual-Trace Amplifier, and 7B53A Time Base was used for this procedure.

9. Sampling oscilloscope. A Tektronix 7603 Mainframe, 7M11 50 Ω Delay Line, 7S11 Sampling Unit with S-1 Sampling Head, and 7T11 Sampling Sweep Unit was used for this procedure.

10. Calibration Fixture (Tunnel Diode Pulser). Tektronix Part Number 067-0681-01.

11. Coaxial Cable, 50 Ω , 18 inches. Tektronix Part Number 012-0076-00.

12. Coaxial Cable, 50 Ω , 42 inches. Tektronix Part Number 012-0057-01.

13. Coaxial Cable, 50 Ω Precision, 36 inches. Tektronix Part Number 012-0482-00. Supplied with PG 506 (substitution may cause fast rise calibration to be difficult).

14. Coaxial Cable, GR Connectors, 50 Ω , 2 ns RG58A/U. Tektronix Part Number 017-0505-00.

15. Adapter, BNC Female to GR. Tektronix Part Number 017-0063-00.

Servicing Information—PG 506

16. Adapter, SMA Male to BNC Female. Tektronix Part Number 015-1018-00.

17. Adapter, BNC Female to BNC Female. Tektronix Part Number 103-0028-00.

18. Two 50 Ω Feed-Through Terminations. Tektronix Part Number 011-0049-01.

19. One 2.5X 50 Ω Attenuator. Tektronix Part Number 011-0076-01.

20. One 5X 50 Ω Attenuator. Tektronix Part Number 011-0060-02.

21. Adjustment Tool. Tektronix Part Number 003-0675-00 or equivalent.

22. Marking Pencil; for example, Dixon Phano (for glazed surfaces).

Preparation

WARNING

Dangerous potentials exist at several points throughout this instrument. When the instrument is operated with the covers removed, do not touch exposed connections or components. Disconnect power before cleaning or replacing parts.

1. Check that the correct nominal line selector block has been installed on the line selector pins on the Power Module interface and that the regulating range selected includes the input line voltage. See the installation section of the Power Module manual.

2. Remove the PG 506 side covers and connect the PG 506 to the Power Module using the Plug-in Extender. Connect the Power Module to the variable autotransformer and autotransformer to the input line. Adjust the autotransformer for nominal line voltage output.

NOTE

Refer to the foldout page labeled ADJUSTMENT LOCATIONS before proceeding with the next step.

3. Set the PG 506 AMPLITUDE switch to the 10 V position and the mode switch to STD AMPL position. Apply power to the PG 506 and allow at least 20 minutes warmup time for all equipment. Make adjustments at an ambient temperature between +20°C (+68°F) and +30°C (+86°F).

NOTE

The numerical quantities listed in this procedure are adjustment aids only and are not to be interpreted as a specification that contradicts the items as listed under ELECTRICAL CHARACTERISTICS.

Adjustments

1. Primary Power Adjustment (R30)

Change the PG 506 mode switch to the FAST RISE position. Set internal switch S660 to the dc position (up). The front-panel LED display must be off. Using the precision dc voltmeter, measure the potential difference between the + and -16.5 V test points. Adjust R30, 16 V Set, for a voltmeter indication of 33.00 volts. Check the +5.2-volt supply; the voltage must be between 4.9 and 5.5 volts.

2. 100 V Regulator Adjustment (R205)

a. Connect the precision coaxial cable (Tektronix Part Number 012-0482-00) from the PG 506 AMPL OUTPUT connector to the input of the precision dc voltmeter. If necessary, shunt the input terminals of the dc voltmeter with a precision resistor that ensures that the total load resistance on the AMPL OUTPUT connector is 1 M Ω (within 0.1%).

b. Set the voltmeter to the 100 V range and change the PG 506 AMPLITUDE switch to the 100 V position. Change the PG 506 mode switch to STD AMPL position. Adjust R205 (100 V Set) for a voltmeter indication of 100.000 volts (as close as possible). After R205 has been adjusted, use the variable autotransformer to check that the voltmeter indications change less than 4 mV from high-line to low-line voltage. Reset the autotransformer for the nominal line voltage output and recheck the adjustment of R205. Switch the PG 506 AMPLITUDE control to the 50 V and 20 V positions and verify that the accuracy of the 50 V and 20 V outputs are within 0.15%.

NOTE

Refer to Table 3-1 for voltage limits associated with a 0.15% tolerance and the PG 506 AMPLITUDE control settings.

TABLE 3-1
Voltage Limits (1 MΩ Load)

PG 506 Ampli- tude Switch Setting	±0.15% Tolerance	Voltage Limits	
		High	Low
100 V	±150 mV	Set for 100.000 (as close as possible)	
50 V	±75 mV	50.075	49.925
20 V	±30 mV	20.030	19.970
10 V	±15 mV	Set for 10.000 (as close as possible)	
5 V	±7.5 mV	5.0075	4.9925
2 V	±3.0 mV	2.0030	1.9970
1 V	±1.5 mV	1.0015	0.9985
0.5 V	±0.75 mV	0.50075	0.49925
0.2 V	±0.30 mV	0.20030	0.19970
0.1 V	±0.15 mV	0.10015	0.09985

3. 10 V Regulator Adjustment (R340)

a. Change the PG 506 AMPLITUDE switch to the 10 V position. Adjust R340, 10 V Set, for a dc voltmeter indication of 10.0000 volts (as close as possible). Switch the PG 506 AMPLITUDE control and the dc voltmeter controls down range to verify the output amplitudes down to and including 0.1 V (100 mV). Accuracy of each selected amplitude setting must be within 0.15%.

b. Note and record the actual 6-digit voltage readout on the precision dc voltmeter for the 0.1 V position. This actual voltage value is needed for the next step.

4. Check Attenuator Accuracy Below 0.1 V

a. Remove the plug-in extender to disconnect power from the PG 506. Retain the 0.1 V position of the PG 506 AMPLITUDE switch and connections to the precision dc voltmeter. Apply a stable, adjustable 20 mA current source to R308. Connect the negative probe to common floating ground and the positive probe to the top of R308.

b. Adjust the current source so that the precision dc voltmeter indicates a 6-digit voltage readout that is exactly ten times the 6-digit voltage readout recorded for step 3b. Change the PG 506 AMPLITUDE control to the 10 mV position. The precision dc voltmeter should indicate 100 mV within 0.15%. Note and record this actual 6-digit voltage readout for the next step.

c. Retain the 10 mV position of the PG 506 AMPLITUDE switch. Move the positive probe to the top of R304. Adjust the current source so that the precision dc

voltmeter indicates a 6-digit voltage readout that is exactly ten times the readout recorded for step 4b. Change the PG 506 AMPLITUDE control to the 1 mV position. The precision dc voltmeter should again indicate 100 mV within 0.15%.

d. Disconnect both current-source probes. Reset the PG 506 AMPLITUDE switch and dc voltmeter controls to the 100 V range. Reapply power to the PG 506. Allow 10 minutes for the temperature to stabilize. Retain connections to precision dc voltmeter.

5. DEFLECTION ERROR Readout Adjustments (R450-R425-R415)

a. Release the VARIABLE (OUT) control to turn on the front-panel LED display for the PG 506. Rotate the VARIABLE (OUT) control for a dc voltmeter indication of 100.000 volts. Adjust R450, Zero Set, for a 0.1% HIGH and 0.1% LOW with the final adjustment of R450 resulting in a 0.0% display with both the HIGH and LOW indicator lights slightly on.

b. Rotate the VARIABLE (OUT) control for a voltmeter indication of 107.3 volts. Adjust R425, -6.8% Set, for a display of 6.8% LOW. Adjust R425 to center on 6.8%.

c. Rotate the VARIABLE (OUT) control for a dc voltmeter indication of 93.2 volts. Adjust R415, +7.3% Set, for a display of 7.3% HIGH. Adjust R415 to center on 7.3%.

d. Recheck the 0.0%, 6.8% and 7.3% indications. If necessary, repeat steps 5a through 5c until no further adjustments are required. The final performance of the DEFLECTION ERROR readout can be verified over its complete range by referring to Table 3-2.

TABLE 3-2

Output Amplitude (100 V Range)	PG 506 Display
108.7	8.0% LOW
107.3	6.8% LOW
106.5	6.1% LOW
105.6	5.3% LOW
104.6	4.4% LOW
103.2	3.1% LOW
100.000	0.0%
96.9	3.2% HIGH
95.6	4.6% HIGH
94.7	5.6% HIGH
93.9	6.5% HIGH
93.2	7.3% HIGH
92.6	8.0% HIGH

Servicing Information—PG 506

6. Check DEFLECTION ERROR Tracking and Accuracy into a 50 Ω Load

a. Set the PG 506 AMPLITUDE switch to the 10 V position. Adjust the VARIABLE (OUT) control for a display of 0.0%. The voltmeter should indicate 10.000 volts (for a 1 M Ω load). Rotate the VARIABLE (OUT) control until the voltmeter indicates 10.73 volts. The PG 506 display should indicate 6.8% LOW. Rotate the VARIABLE (OUT) control until the voltmeter indicates 9.32 volts. The PG 506 display should indicate 7.3% HIGH. Return the VARIABLE (OUT) control on the PG 506 to 0.0% and turn off the LED display. Retain the 10 V output position in STD AMPL mode.

NOTE

The actual output voltage from the PG 506 (in the STD AMPL mode) when operating into a 50 Ω load is highly dependent on the TOTAL load resistance; including coaxial cable resistance, all contact resistances, and the accuracy of the 50 Ω termination. For the next step all connections must be made in a manner to eliminate (as much as possible) the inaccuracies caused by external factors. If desired, the 50 Ω precision resistor can be installed (soldered) in an accessory housing with the proper input and output BNC connectors. The total errors caused by external factors should not exceed 0.1%.

b. Remove the coaxial cable and 1 M Ω termination from the system. Connect the 50 Ω precision resistor as close as possible to the AMPL OUTPUT connector on the PG 506. If an accessory housing is being used, reconnect the coaxial cable to the input of the precision dc voltmeter. Check for 5 V, 2.5 V, and 1 V outputs on the 10 V, 5 V and 2 V positions of the PG 506 AMPLITUDE switch, respectively. Output amplitudes must be within specifications.

c. Reset the PG 506 AMPLITUDE switch to the 10 V position and release the VARIABLE (OUT) control. A DEFLECTION ERROR readout of 0.0% corresponds to a 5 V output. 5.365 V corresponds to 6.8% LOW and 4.66 V corresponds to 7.3% HIGH, respectively. Disconnect all terminations, cables and the dc voltmeter from the system.

7. Adjust Period in STD AMPL Mode (R587)

Connect the coaxial cable from the PG 506 AMPL OUTPUT terminal directly to the 1 M Ω input on the Dual-Trace Amplifier unit of the real-time oscilloscope. Change S660 (PG 506 internal switch) to the $\square$ position. Adjust the oscilloscope controls to display a 1 kHz square-wave at a sweep rate of 200 μ s/div. Adjust R587, Period, for exactly 1 complete period over the first 5 horizontal divisions. After R587 has been adjusted, change the PG 506 AMPLITUDE switch to the 20 V position and check for a 20 V peak-to-peak, 1 kHz output signal. Return to the 10 V position of the PG 506 AMPLITUDE switch and insert a

50 Ω feed-through termination between the coaxial cable and the oscilloscope input. Check for a 5 V peak-to-peak, 1 kHz output signal.

8. Adjust Max Ampl Set into 50 Ω (R790)

Retain connection and 50 Ω termination into one channel. Switch the PG 506 to HIGH AMPL mode and set the PERIOD control to 1 μ s/1 MHz (X1) position. Set the PG 506 PULSE AMPLITUDE control to MAX (fully clockwise). Adjust the oscilloscope controls for a convenient amplitude and sweep rate display. Adjust R790 (Max Ampl Set) for exactly 5.2 V peak-to-peak of displayed signal. After R790 has been adjusted for a 50 Ω load, use the oscilloscope controls to check for output signals for every position of the PG 506 PERIOD control and check operation of the Period Variable control on at least one range (greater than X10). Also check for a + TRIG OUT signal from the PG 506.

✓ 9. Check High Amplitude Output (Unterminated)

Remove the 50 Ω feed-through termination and connect coaxial cable from the PG 506 AMPL OUTPUT terminal directly to the 1 M Ω input of the oscilloscope. Reset PG 506 controls for a 1 μ s/1 MHz (X1) output period in a HIGH AMPL mode. Retain the PULSE AMPLITUDE controls at the MAX position. Use the oscilloscope controls to check for at least a 60 V peak-to-peak displayed signal. For oscilloscopes with a maximum calibrated vertical deflection factor of 5 V/div, the vertical system can be calibrated for a 10V/div deflection factor by using the PG 506 STD AMPL mode (1 kHz and 10 V output) and adjusting the oscilloscope vertical variable control for a one-division signal. After checking for a 60 V output signal, rotate the PG 506 PULSE AMPLITUDE control to the MIN position and check for a 6 V (or less) peak-to-peak output signal. Retain the MIN position of PG 506 PULSE AMPLITUDE control. Retain the position of the PERIOD controls.

NOTE

If risetime measurements are made for an unterminated condition of the PG 506, the displayed risetime on the real-time oscilloscope crt is dependent on the oscilloscope system used. Refer to the Operating Instructions. The risetime for an unterminated condition can be calculated by using the formula $T_r = 2.2RC$; where R is the 600-ohm output resistance of the PG 506 and C is the total load capacitance, including about 32 pF/ft for 50 Ω coaxial cable.

10. Adjust Fast Rise Min Ampl (R1025)

Use two 50 Ω coaxial cables to connect both FAST RISE OUTPUTS to the Dual-Trace Amplifier unit. Terminate both cables with 50 Ω feed-through terminations. Connect

the positive-going signal to Channel 1 and the negative-going signal to Channel 2. Set the PG 506 to FAST RISE mode. Use the oscilloscope controls to display both signals in either a chopped or alternate mode at a $1 \mu\text{s}/\text{div}$ sweep rate. Adjust R1025 Min Ampl, located on the Fast Rise board until the larger signal at either of the FAST RISE OUTPUTS is 80 mV peak-to-peak. Rotate the PG 506 PULSE AMPLITUDE control to MAX and check for at least a 1 V signal from each FAST RISE OUTPUT. Disconnect all cables and terminations from the PG 506 and the real-time oscilloscope. Reset the PG 506 PULSE AMPLITUDE control to the MIN position.

11. Check and Adjust Fast Rise Aberrations (C1000-C940)

a. Connect an 18-inch, 50 Ω coaxial cable (Tektronix Part Number 012-0076-00) from the PG 506 AMPL OUTPUT connector to the input of the Tunnel Diode Pulser (Calibration Fixture No. 067-0681-01). Connect a BNC Female to BNC Female adapter to the output of the TD Pulser. Connect a precision coaxial cable (Tektronix Part Number 012-0482-00) between the TD Pulser and Input 2 on the 7M11 via a BNC Female to GR adapter. Connect a 2 ns GR to GR Cable from Output 2 on the 7M11 to the input of S-1 Sampling Head installed in the 7S11 Sampling Unit. Connect a 42-inch, 50 Ω coaxial cable (Tektronix Part Number 012-0057-01) from the Trigger Output on the 7M11 to the Trig Input connector on 7T11 via a 2.5X 50 Ω Attenuator and SMA Male to BNC Female adapter.

b. Set the following controls on the 7T11; Ext Trig (50 Ω , 2 V Max), + Slope Triggering, Sequential sampling, Scan (Rep), Time Pos Rng 50 ns, Time/Div 2 ns.

c. Set Trigger Selector on the 7M11 to 2. Set the following controls on 7S11; 50 mV/div (Cal In), + up, Delay (10 ns Range) centered, Smooth Dot Response, DC Offset for centered trace.

d. Set the TD Triggered Level on the TD Pulser fully counterclockwise. Set the PG 506 mode switch to HIGH AMPL and PERIOD controls for 10 $\mu\text{s}/100 \text{ kHz}$. Set the PG 506 PULSE AMPLITUDE control to the MAX position.

e. Rotate TD Triggered Level control on the TD Pulser slowly clockwise just to the point of obtaining a stable triggered display on the crt. It may be necessary to readjust the Time Position and Triggering controls on the 7T11 to locate the leading edge of a positive-going pulse. When a stable, triggered display is obtained, do not readjust the Trig Level or Stability controls on the 7T11. The display should be a positive-going pulse approximately 2 divisions in amplitude.

f. Use the Variable deflection and DC Offset controls on the 7S11 to expand and display an exact 5-division (vertical) signal on the crt. Use the Time Position control on the 7T11 to align the 50% level of the positive-going pulse with the first-division reference line. If stable triggering is lost after this time position reference point has been established, repeat step 11e and 11f up to this point.

g. Without changing the Variable deflection control on the 7S11, switch to a 5 mV/div deflection factor setting. Use the DC Offset controls to return the top of the waveform to center screen. Set the SCAN control on the 7T11 for the slowest convenient scanning rate just above an eye-flicker rate (about 15 Hz); faster scanning rates tend to smooth out the front-corner aberrations. A display similar to Fig. 3-1 should be obtained. Each major vertical division now represents 2% of the original 5-division signal. This display is the total sampling system response to a signal from the TD Pulser and is used as a reference for comparison purposes.

h. Use a grease-marking pencil to carefully reproduce the displayed signal on the crt graticule. Not all sampling systems will display a signal exactly as illustrated in Fig. 3-1. Once this reference graph has been drawn on the crt, do not erase it until all aberration checks (adjustments) and risetime measurements have been completed. If stable triggering or the Trig Level (Stability) control on the 7T11 have been readjusted before the graph has been drawn, repeat steps 11e through 11g.

i. Remove the TD Pulser and an 18-inch coaxial cable from the system. Connect the coaxial cable (Tektronix Part Number 012-0482-00) from Input 2 on the 7M11 to the positive-going FAST RISE output on the PG 506. Switch the PG 506 to FAST RISE mode. Set the 7S11 for a calibrated 100 mV/div (Cal In). Reset the 7T11 Trigger controls if necessary, to obtain a stable display. Use the PG 506 PULSE AMPLITUDE control and DC Offset controls on the 7S11 to establish an exact 5-division (1 volt peak-to-peak) signal from the PG 506. Use the Time Position controls on the 7T11 to set the 50% level of the positive-going pulse on the first-division reference line. Switch the deflection factor of the 7S11 to a calibrated 10 mV/div (Cal In). Use the DC Offset controls to return the top of the waveform to center screen. Align the displayed signal vertically with the reference graph in the area of the last horizontal division. Do not use the Time Position or Triggering controls on the 7T11 in an attempt to align the leading edges of the displayed signal with the leading edge of the reference graph. The signal from the TD Pulser has a faster risetime than the PG 506.

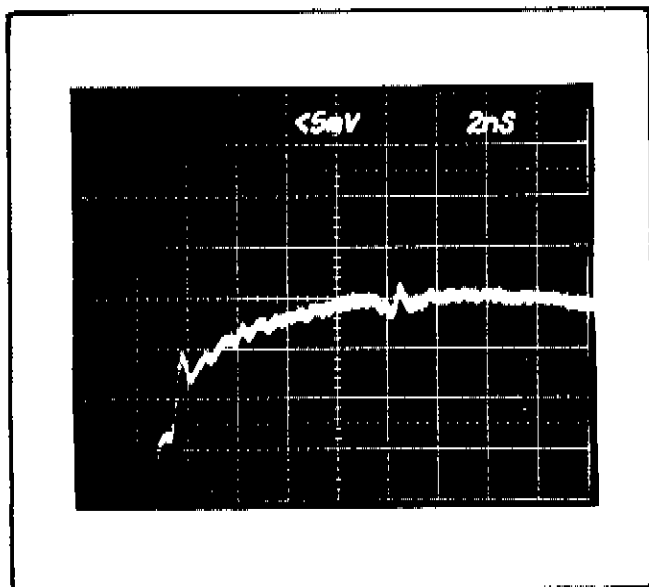


Fig. 3-1. Typical response curve of total sampling oscilloscope system when step 11g has been completed. The response curve is used as a graticule reference graph for all aberration checks and adjustments. See step 11h.

j. When the proper vertical alignment has been made, adjust C1000 so that the response curve for the positive-going FAST RISE output signal is aligned with the reference graph as close as possible. A very slight amount of front-corner overshoot relative to the graph is desirable. See Fig. 3-2. Do not expect to obtain the same aberration amplitudes as the reference graph. In no case should the displayed signal aberrations deviate from the reference graph by more than 1 vertical division.

k. Connect the coaxial cable to the negative-going FAST RISE Output from the PG 506. Reset the 7S11 for a calibrated, 100 mV/div deflection factor and push the INVERT button. Push the — Slope button on the 7T11 and adjust the Trig Level controls for a stable display. Use the PG 506 PULSE AMPLITUDE control and DC Offset controls on the 7S11 to establish an exact 5-division (1 volt peak-to-peak) signal on the crt. Use the Time Position controls on the 7T11 to position the 50% level of the pulse on the first-division reference line. Switch the deflection factor control on the 7S11 for a calibrated 10 mV/div. Use the DC Offset controls to return the top of the waveform to center screen and vertically align the displayed signal with the reference graph in the area of the last horizontal division. Do not readjust Triggering controls or Time Position controls on the 7T11.

l. When the proper vertical alignment has been made for the negative-going FAST RISE OUTPUT signal, adjust C940 so that the response curve is aligned with the reference graph as close as possible. A slight amount of front-corner overshoot relative to the graph is desirable. See Fig. 3-3. Do not expect to obtain the same aberration amplitudes as the reference graph. In no case should the displayed signal aberrations deviate from the reference graph by more than 1 vertical division.

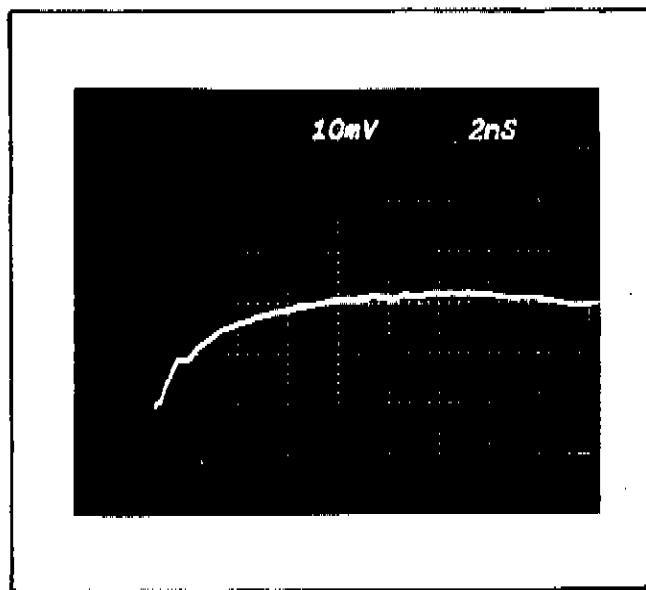


Fig. 3-2. Typical sampling oscilloscope system response curve obtained when C1000 has been properly adjusted (step 11j).

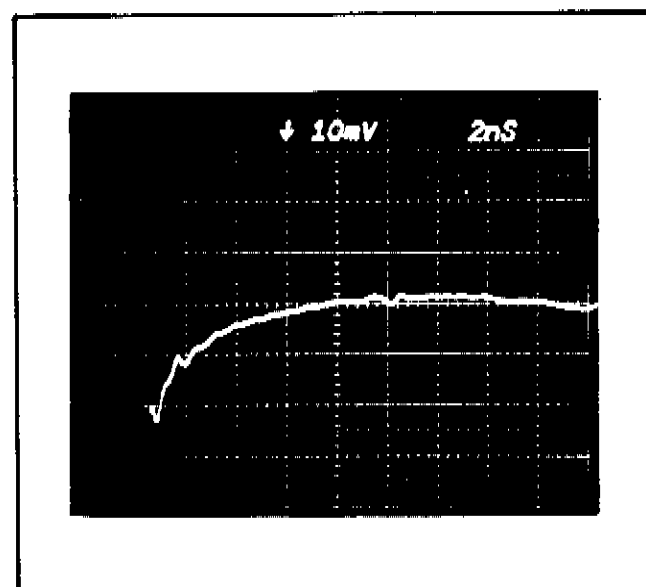


Fig. 3-3. Typical sampling oscilloscope system response curve obtained when C940 has been properly adjusted (step 11l).

12. Check Rise and Fall Times of Fast Rise Output Signals

Use the sampling system set-up to measure the risetime (between 10% and 90% levels) of a 1 volt peak-to-peak positive-going output signal from the PG 506 FAST RISE OUTPUT connector. Establish a 5-division signal at a calibrated 100 mV/div deflection factor. See Fig. 3-4. A risetime greater than 1 nanosecond can be caused by C1000 not being properly adjusted. Measure the fall time (between 90% and 10% levels) of a 1 volt peak-to-peak, negative-going output signal from the PG 506 FAST RISE OUT connector. Establish another 5-division displayed signal. See Fig. 3-5. A fall time greater than 1 nanosecond

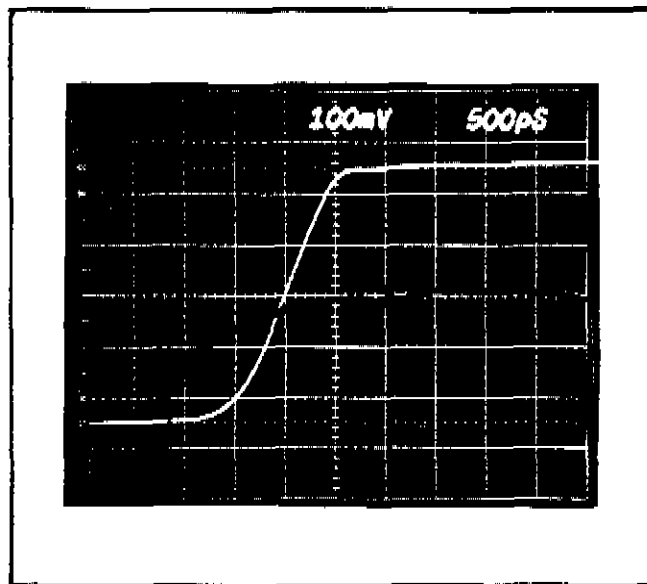


Fig. 3-4. Risetime measurement of a 1 volt peak-to-peak, positive-going Fast Rise Output signal from the PG 506. Signal has been attenuated 2X by sampling oscilloscope system. See step 12.

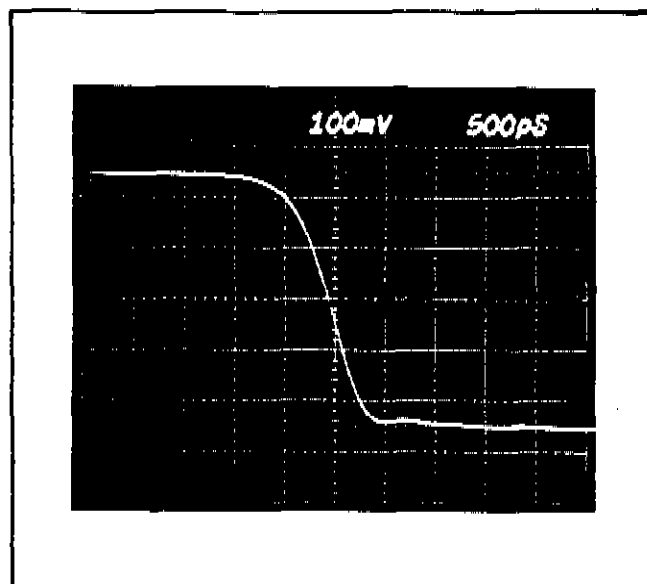


Fig. 3-5. Falltime measurement of a 1 volt peak-to-peak, negative-going Fast Rise Output signal from the PG 506. Signal has been attenuated 2X by sampling oscilloscope system. See step 12.

can be caused by C940 not being properly adjusted. If the rise or fall times are not within specifications, it may be necessary to repeat steps 11a through 11k and adjust C1000 or C940 for slightly more front-corner overshoot, but do not exceed the 2% aberration limits relative to the graph.

✓ 13. Check High Amplitude Risetime and Aberrations into 50 Ω

a. After the FAST RISE checks and adjustments have been made, the reference graph should still be on the crt graticule. Insert a 5X, 50 Ω Attenuator between the adapter on the 7M11 and the precision coaxial cable. Connect the

coaxial cable (Tektronix Part Number 012-0482-00) to the PG 506 AMPL OUTPUT connector and switch the PG 506 to HIGH AMPL mode. Use + Slope Triggering and 2 ns/div sweep rate for the 7T11. Push + Up button on the 7S11 and use a calibrated 100 mV/div deflection factor (Cal In).

b. Use the PG 506 PULSE AMPLITUDE control and DC Offset controls on the 7S11 to establish a stable 5-division (vertical) signal on the crt. It may be necessary to rotate the Delay Range control on the 7S11 to the right in order to display the complete leading edge of a positive-going, 5 volt signal from the PG 506. Total attenuation is 10X.

c. After a stable display has been achieved at this point, measure the risetime. It must be 10 ns or less (between 10% and 90% levels).

d. Rotate the Time Position control on the 7T11 to align the 50% level of the positive-going pulse with the first-division reference line. Switch to a calibrated, 10 mV/div deflection factor for the 7S11 and use the DC Offset controls to align the top of the waveform with the last horizontal division of the reference graph. The 1 major vertical division aberration limit applies for the High Amplitude signal only during the last 5 horizontal divisions of the reference graph. See Fig. 3-6. Switch to a 5 ns/div sweep rate for the 7T11. While rotating the Time Position control on the 7T11 fully counterclockwise, note displayed signal aberrations in the area of the last 5 horizontal divisions. Aberrations should not exceed 1 major vertical division.

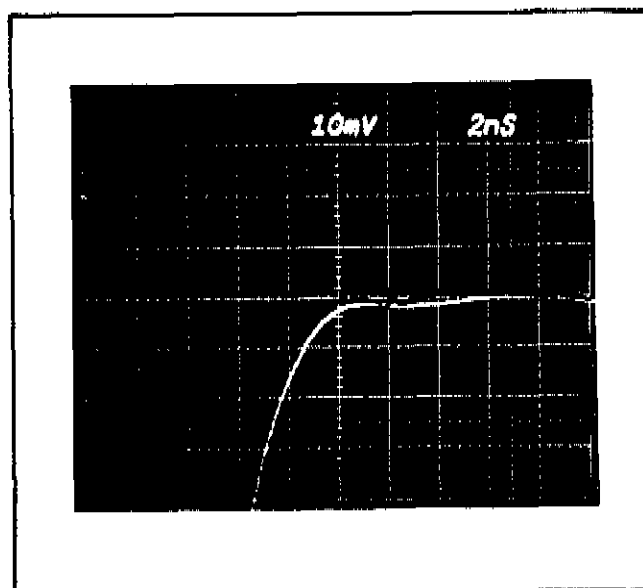


Fig. 3-6. Typical sampling oscilloscope system response curve obtained when performing High Amplitude aberration check (step 13d).

e. This completes the Calibration/Performance Check procedure for the PG 506.

SYMBOLS AND REFERENCE DESIGNATORS

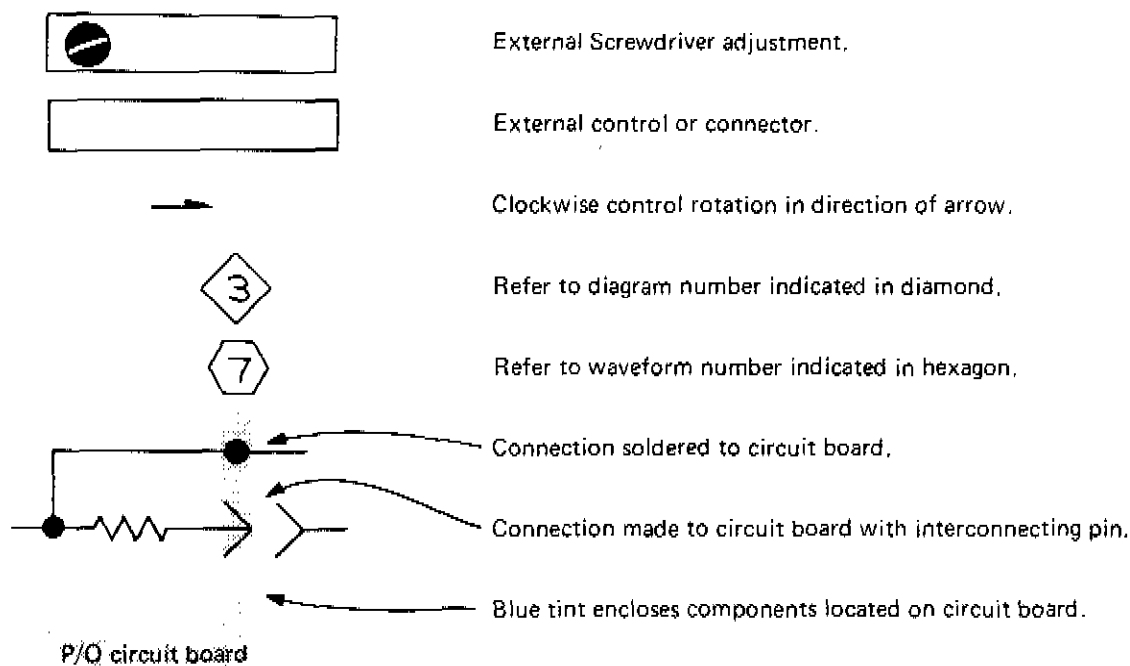
Electrical components shown on the diagrams are in the following units unless noted otherwise:

Capacitors = Values one or greater are in picofarads (pF).
 Values less than one are in microfarads (μ F).
 Resistors = Ohms (Ω)

Symbols used on the diagrams are based on ANSI Y32.2 - 1970.

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:



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., Components Group	P. O. Box 5012	Dallas, TX 75222
03877	Transitron Electronic Corp.	168-186 Albion St.	Wakefield, MA 01880
04713	Motorola, Inc., Semiconductor Products Div.	5005 E. McDowell Rd.	Phoenix, AZ 85008
07263	Fairchild Semiconductor, A Div. of Fairchild Camera and Instrument Corp.	464 Ellis St.	Mountain View, CA 94040
07910	Teledyne Semiconductor	12515 Chadron Ave.	Hawthorne, CA 90250
08806	General Electric Co., Miniature Lamp Products Dept.	Nela FK.	Cleveland, OH 44112
24931	Specialty Connector Co., Inc.	3560 Madison Ave.	Indianapolis, IN 46227
25403	Amperex Electronic Corp., Semiconductor and Microcircuits Div.	Providence Pike	Slatersville, RI 02876
27014	National Semi-Conductor Corp.	2900 San Ysidro Way	Santa Clara, CA 95051
34553	Amperex Electronic Corp., Component Div.	35 Hoffman Ave.	Happauge, NY 11787
50088	Mostek Corp.	1400 Upfield Dr.	Carrollton, TX 75006
50579	Litronix Inc.	19000 Homestead Rd.	Cupertino, CA 95014
56289	Sprague Electric Co.		North Adams, MA 01247
71034	Bliley Electric Co.	2545 W. Grandview Blvd.	Erie, PA 16512
71400	Bussman Mfg., Division of McGraw Edison Co.	2536 W. University St.	St. Louis, MO 63107
72982	Erie Technological Products, Inc.	644 W. 12th St.	Erie, PA 16512
73138	Beckman Instruments, Inc., Helipot Div.	2500 Harbor Blvd.	Fullerton, CA 92634
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 97005
81483	International Rectifier Corp.	9220 Sunset Blvd.	Los Angeles, CA 90069
90201	Mallory Capacitor Co., Div. of P. R. Mallory Co., Inc.	3029 E. Washington St.	Indianapolis, IN 46206
98291	Sealelectro Corp.	225 Hoyt	Mamaroneck, NY 10544

Electrical Parts List—PG 506

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
A1	670-3230-00		CKT BOARD ASSY:MAIN	80009	670-3230-00
A2	670-3234-00		CKT BOARD ASSY:D.V.M.-PERIOD	80009	670-3234-00
A3	670-3452-00		CKT BOARD ASSY:FAST RISE	80009	670-3452-00
A4	670-3314-00		CKT BOARD ASSY:DISPLAY	80009	670-3314-00
C10	290-0714-00		CAP.,FXD,ELCTLT:2000UF,+75-10%,40V	56289	39D641
C15	283-0134-00		CAP.,FXD,CER DI:47UF,+80-20%,50V	72982	8141N078651474Z
C20	283-0194-00		CAP.,FXD,CER DI:4.7UF,20%,50V	72982	8151N080651475M
C22	281-0523-00		CAP.,FXD,CER DI:100PF,+/-20PF,350V	72982	301-000U2M0101M
C27	290-0525-00		CAP.,FXD,ELCTLT:4.7UF,20%,50V	56289	196D475X0050KAL
C30	290-0525-00		CAP.,FXD,ELCTLT:47UF,20%,50V	56289	196D475X0050KAL
C32	290-0559-00		CAP.,FXD,ELCTLT:22UF,20%,35V	56289	196D226X0035MAL
C34	290-0559-00		CAP.,FXD,ELCTLT:22UF,20%,35V	56289	196D226X0035MAL
C36	290-0117-00		CAP.,FXD,ELCTLT:50UF,+75-10%,50V	56289	30D506G050DD4
C40	283-0134-00		CAP.,FXD,CER DI:47UF,+80-20%,50V	72982	8141N078651474Z
C42	283-0198-00		CAP.,FXD,CER DI:0.22UF,20%,50V	72982	8131N075651224M
C45	283-0024-00		CAP.,FXD,CER DI:0.1UF,+80-20%,30V	56289	273C16
C65	290-0529-00		CAP.,FXD,ELCTLT:47UF,20%,20V	56289	196D476X0020LA3
C67	290-0525-00		CAP.,FXD,ELCTLT:4.7UF,20%,50V	56289	196D475X0050KAL
C75	283-0134-00		CAP.,FXD,CER DI:47UF,+80-20%,50V	72982	8141N078651474Z
C78	290-0525-00		CAP.,FXD,ELCTLT:4.7UF,20%,50V	56289	196D475X0050KAL
C85	283-0065-01		CAP.,FXD,CER DI:0.001UF,5%,100V	80009	283-0065-01
C90	283-0051-00		CAP.,FXD,CER DI:0.0033UF,5%,100V	72982	8131N145C0G332J
C108	283-0065-01		CAP.,FXD,CER DI:0.001UF,5%,100V	80009	283-0065-01
C135	290-0405-00		CAP.,FXD,ELCTLT:10UF,+50-10%,150V	56289	30D106F150DD4
C140	290-0405-00		CAP.,FXD,ELCTLT:10UF,+50-10%,150V	56289	30D106F150DD4
C145	290-0159-00		CAP.,FXD,ELCTLT:2UF,+50-10%,150V	56289	30D205F150BB4
C150	290-0159-00		CAP.,FXD,ELCTLT:2UF,+50-10%,150V	56289	30D205F150BB4
C154	283-0167-00		CAP.,FXD,CER DI:0.1UF,10%,100V	72982	8131N147W5R104K
C165	290-0525-00		CAP.,FXD,ELCTLT:4.7UF,20%,50V	56289	196D475X0050KAL
C170	290-0529-00		CAP.,FXD,ELCTLT:47UF,20%,20V	56289	196D476X0020LA3
C175	290-0525-00		CAP.,FXD,ELCTLT:4.7UF,20%,50V	56289	196D475X0050KAL
C180	290-0529-00		CAP.,FXD,ELCTLT:47UF,20%,20V	56289	196D476X0020LA3
C190	290-0442-00		CAP.,FXD,ELCTLT:120UF,75-10%,150V	56289	39D127G150GL4
C196	283-0167-00		CAP.,FXD,CER DI:0.1UF,10%,100V	72982	8131N147W5R104K
C198	283-0024-00		CAP.,FXD,CER DI:0.1UF,+80-20%,30V	56289	273C16
C200	290-0117-00		CAP.,FXD,ELCTLT:50UF,+75-10%,50V	56289	30D506G050DD4
C210	290-0534-00		CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HAL
C212	283-0003-00		CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-547EL03Z
C237	283-0057-00		CAP.,FXD,CER DI:0.1UF,+80-20%,200V	56289	274C10
C240	283-0167-00		CAP.,FXD,CER DI:0.1UF,10%,100V	72982	8131N147W5R104K
C247	281-0523-00		CAP.,FXD,CER DI:100PF,+/-20PF,350V	72982	301-000U2M0101M
C295	283-0057-00		CAP.,FXD,CER DI:0.1UF,+80-20%,200V	56289	274C10
C317	281-0638-00		CAP.,FXD,CER DI:240PF,5%,500V	72982	301-000Z5D0241J
C330	283-0024-00		CAP.,FXD,CER DI:0.1UF,+80-20%,30V	56289	273C16
C365	290-0529-00		CAP.,FXD,ELCTLT:47UF,20%,20V	56289	196D476X0020LA3
C370	290-0215-00		CAP.,FXD,ELCTLT:100UF,+75-10%,25V	56289	30D107G025DC4
C375	283-0024-00		CAP.,FXD,CER DI:0.1UF,+80-20%,30V	56289	273C16
C380	283-0024-00		CAP.,FXD,CER DI:0.1UF,+80-20%,30V	56289	273C16
C390	283-0211-00		CAP.,FXD,CER DI:0.1UF,10%,200V	72982	8141208W5R104K
C392	283-0024-00		CAP.,FXD,CER DI:0.1UF,+80-20%,30V	56289	273C16
C400	290-0519-00		CAP.,FXD,ELCTLT:100UF,20%,20V	56289	196D107X0020MA3
C420	290-0536-00		CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
C435	290-0536-00		CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL

Electrical Parts List—PG 506

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Discont	Name & Description	Mfr Code	Mfr Part Number
C460	290-0536-00			CAP., FXD, ELCTLT:10UF, 20%, 25V	90201	TDC106M025FL
C462	285-0683-00			CAP., FXD, PLSTC:0.022UF, 5%, 100V	01002	64F15AC223
C465	290-0536-00			CAP., FXD, ELCTLT:10UF, 20%, 25V	90201	TDC106M025FL
C470	290-0536-00			CAP., FXD, ELCTLT:10UF, 20%, 25V	90201	TDC106M025FL
C474	290-0536-00			CAP., FXD, ELCTLT:10UF, 20%, 25V	90201	TDC106M025FL
C480	290-0536-00			CAP., FXD, ELCTLT:10UF, 20%, 25V	90201	TDC106M025FL
C500	283-0065-00			CAP., FXD, CER DI:0.001UF, 5%, 100V	72982	805-505B102J
C506	283-0065-00			CAP., FXD, CER DI:0.001UF, 5%, 100V	72982	805-505B102J
C520	283-0065-00			CAP., FXD, CER DI:0.001UF, 5%, 100V	72982	805-505B102J
C545	283-0204-00			CAP., FXD, CER DI:0.01UF, 20%, 50V	72982	8121N058651103M
C558	281-0543-00			CAP., FXD, CER DI:270PF, 10%, 500V	72982	301-055X5P1271K
C580	283-0666-00			CAP., FXD, MICA D:890PF, 2%, 100V	00853	D151P891G0
C582	290-0574-00			CAP., FXD, ELCTLT:47UF, 10%, 20V	56289	196D476X9020
C615	290-0519-00			CAP., FXD, ELCTLT:100UF, 20%, 20V	56289	196D107X0020MA3
C718	283-0024-00			CAP., FXD, CER DI:0.1UF, +80-20%, 30V	56289	273C16
C720	281-0511-00			CAP., FXD, CER DI:22PF, +/-2.2PF, 500V	72982	301-000C0G0220K
C726	281-0523-00			CAP., FXD, CER DI:100PF, +/-20PF, 350V	72982	301-000U2M0101M
C732	290-0159-00			CAP., FXD, ELCTLT:2UF, +50-10%, 150V	56289	30D205F150BB4
C734	283-0024-00			CAP., FXD, CER DI:0.1UF, +80-20%, 30V	56289	273C16
C736	283-0024-00			CAP., FXD, CER DI:0.1UF, +80-20%, 30V	56289	273C16
C752	281-0511-00			CAP., FXD, CER DI:22PF, +/-2.2PF, 500V	72982	301-000C0G0220K
C764	283-0024-00			CAP., FXD, CER DI:0.1UF, +80-20%, 30V	56289	273C16
C782	283-0024-00			CAP., FXD, CER DI:0.1UF, +80-20%, 30V	56289	273C16
C785	283-0057-00			CAP., FXD, CER DI:0.1UF, +80-20%, 200V	56289	274C10
C800	283-0079-00			CAP., FXD, CER DI:0.01UF, 20%, 250V	72982	8151B202C103M
C810	283-0176-00			CAP., FXD, CER DI:0.0022UF, 20%, 50V	72982	8121M050W5R222M
C812	283-0176-00			CAP., FXD, CER DI:0.0022UF, 20%, 50V	72982	8121M050W5R222M
C814	283-0198-00			CAP., FXD, CER DI:0.22UF, 20%, 50V	72982	8131N075651224M
C820	283-0024-00			CAP., FXD, CER DI:0.1UF, +80-20%, 30V	56289	273C16
C840	283-0024-00			CAP., FXD, CER DI:0.1UF, +80-20%, 30V	56289	273C16
C886	281-0618-00			CAP., FXD, CER DI:4.7PF, +/-0.5PF, 200V	72982	374-001C0H0479D
C904	283-0156-00			CAP., FXD, CER DI:1000PF, +100-0%, 200V	72982	8111A208E102Z
C906	281-0618-00			CAP., FXD, CER DI:4.7PF, +/-0.5PF, 200V	72982	374-001C0H0479D
C914	283-0024-00			CAP., FXD, CER DI:0.1UF, 80-20%, 30V	72982	835-000C0H0509D
C928	283-0024-00			CAP., FXD, CER DI:0.1UF, +80-20%, 30V	56289	273C16
C938	283-0324-00			CAP., FXD, CER DI:0.01UF, +80-20%, 50V	72982	CC080525U103Z
C940	281-0213-00			CAP., VAR, CER DI:8-3.8PF, 400V	80031	C004JA/3E
C962	283-0156-00			CAP., FXD, CER DI:1000PF, +100-0%, 200V	72982	8111A208E102Z
C966	281-0618-00			CAP., FXD, CER DI:4.7PF, +/-0.5PF, 200V	72982	374-001C0H0479D
C974	283-0024-00			CAP., FXD, CER DI:0.1UF, 80-20%, 30V	72982	835-000C0H0509D
C988	283-0024-00			CAP., FXD, CER DI:0.1UF, +80-20%, 30V	56289	273C16
C998	283-0324-00			CAP., FXD, CER DI:0.01UF, +80-20%, 50V	72982	CC080525U103Z
C1000	281-0213-00			CAP., VAR, CER DI:8-3.8PF, 400V	80031	C004JA/3E
C1026	290-0512-00			CAP., FXD, ELCTLT:22UF, 20%, 15V	56285	196D226X0015KAL
C1028	290-0512-00			CAP., FXD, ELCTLT:22UF, 20%, 15V	56285	196D226X0015KAL
C1034	283-0156-00			CAP., FXD, CER DI:1000PF, +100-0%, 200V	72982	8111A208E102Z
C1045	283-0156-00			CAP., FXD, CER DI:1000PF, +100-0%, 200V	72982	8111A208E102Z
C1060	283-0024-00			CAP., FXD, CER DI:0.1UF, +80-20%, 30V	56289	273C16
C1062	290-0527-00			CAP., FXD, ELCTLT:15UF, 20%, 20V	90201	TDC156M020FL
C1065	283-0024-00			CAP., FXD, CER DI:0.1UF, +80-20%, 30V	56289	273C16
C1067	290-0527-00			CAP., FXD, ELCTLT:15UF, 20%, 20V	90201	TDC156M020FL

Electrical Parts List—PG 506

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
C1070	290-0527-00		CAP., FXD, ELCTLT:15UF, 20%, 20V	90201	TDC156M020FL
CR10	152-0066-00		SEMICONV DEVICE:SILICON, 400V, 750MA	02735	37304
CR11	152-0066-00		SEMICONV DEVICE:SILICON, 400V, 750MA	02735	37304
CR22	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR27	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR55	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR67	152-0333-00		SEMICONV DEVICE:SILICON, 55V, 200MA	80009	152-0333-00
CR70	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR78	152-0333-00		SEMICONV DEVICE:SILICON, 55V, 200MA	80009	152-0333-00
CR80	152-0574-00		SEMICONV DEVICE:SILICON, 120V	80009	152-0574-00
CR86	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR105	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR125	152-0574-00		SEMICONV DEVICE:SILICON, 120V	80009	152-0574-00
CR135	152-0586-00		SEMICONV DEVICE:SILICON, 600V, 500MA	14936	RMP5060
CR136	152-0586-00		SEMICONV DEVICE:SILICON, 600V, 500MA	14936	RMP5060
CR137	152-0586-00		SEMICONV DEVICE:SILICON, 600V, 500MA	14936	RMP5060
CR138	152-0586-00		SEMICONV DEVICE:SILICON, 600V, 500MA	14936	RMP5060
CR145	152-0574-00		SEMICONV DEVICE:SILICON, 120V	80009	152-0574-00
CR146	152-0574-00		SEMICONV DEVICE:SILICON, 120V	80009	152-0574-00
CR147	152-0574-00		SEMICONV DEVICE:SILICON, 120V	80009	152-0574-00
CR148	152-0574-00		SEMICONV DEVICE:SILICON, 120V	80009	152-0574-00
CR165	152-0333-00		SEMICONV DEVICE:SILICON, 55V, 200MA	80009	152-0333-00
CR166	152-0333-00		SEMICONV DEVICE:SILICON, 55V, 200MA	80009	152-0333-00
CR167	152-0333-00		SEMICONV DEVICE:SILICON, 55V, 200MA	80009	152-0333-00
CR168	152-0333-00		SEMICONV DEVICE:SILICON, 55V, 200MA	80009	152-0333-00
CR170	152-0333-00		SEMICONV DEVICE:SILICON, 55V, 200MA	80009	152-0333-00
CR190	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR196	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR235	152-0246-00		SEMICONV DEVICE:SILICON, 400FIV, 200MA	07910	CD12676
CR245	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR275	152-0333-00		SEMICONV DEVICE:SILICON, 55V, 200MA	80009	152-0333-00
CR280A, B	153-0039-00		SEMICONV DVC SE:MATCHED PR.	80009	153-0039-00
CR290	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR291	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR320	152-0333-00		SEMICONV DEVICE:SILICON, 55V, 200MA	80009	152-0333-00
CR395	152-0333-00		SEMICONV DEVICE:SILICON, 55V, 200MA	80009	152-0333-00
CR397	152-0333-00		SEMICONV DEVICE:SILICON, 55V, 200MA	80009	152-0333-00
CR465	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR466	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR480	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR484	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR485	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR500	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR502	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR520	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR576	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR615	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR616	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR630	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR656	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR657	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR660	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR661	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR668	152-0141-02		SEMICONV DEVICE:SILICON, 30V, 150MA	07910	1N4152
CR734	152-0066-00		SEMICONV DEVICE:SILICON, 400V, 750MA	02735	37304

Electrical Parts List—PG 506

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
CR755	152-0333-00		SEMICON D DEVICE:SILICON,55V,200MA	80009	152-0333-00
CR756	152-0536-00		SEMICON D DEVICE:SILICON,HOT CARRIER,4V,280M	04713	MED101
CR764	152-0333-00		SEMICON D DEVICE:SILICON,55V,200MA	80009	152-0333-00
CR766	152-0141-02		SEMICON D DEVICE:SILICON,30V,150MA	07910	1N4152
CR767	152-0141-02		SEMICON D DEVICE:SILICON,30V,150MA	07910	1N4152
CR800	152-0333-00		SEMICON D DEVICE:SILICON,55V,200MA	80009	152-0333-00
CR825	152-0141-02		SEMICON D DEVICE:SILICON,30V,150MA	07910	1N4152
CR944	152-0536-00		SEMICON D DEVICE:SILICON,HOT CARRIER,4V,280M	04713	MED101
CR1004	152-0536-00		SEMICON D DEVICE:SILICON,HOT CARRIER,4V,280M	04713	MED101
CR1028	152-0141-02		SEMICON D DEVICE:SILICON,30V,150MA	07910	1N4152
CR1047	152-0141-02		SEMICON D DEVICE:SILICON,30V,150MA	07910	1N4152
CR1048	152-0141-02		SEMICON D DEVICE:SILICON,30V,150MA	07910	1N4152
CR1062	152-0333-00		SEMICON D DEVICE:SILICON,55V,200MA	80009	152-0333-00
CR1067	152-0333-00		SEMICON D DEVICE:SILICON,55V,200MA	80009	152-0333-00
DS480	150-1001-01		LAMP,LED:RED,2V,100MA	50579	RL2
DS482	150-1001-01		LAMP,LED:RED,2V,100MA	50579	RL2
DS650	150-0048-00		LAMP,INCAND:5V,60MA	08806	683
DS700	150-1011-00		LAMP,LED:RED,7-SEQUENCE	31718	FND70
DS702	150-1011-00		LAMP,LED:RED,7-SEQUENCE	31718	FND70
DS704	150-0048-00		LAMP,INCAND:5V,60MA	08806	683
F30	159-0022-00		FUSE,CARTRIDGE:3AG,1A,250V,FAST-BLOW	71400	AGC1
F65	159-0003-00		FUSE,CARTRIDGE:3AG,1.6A,250V,SLOW-BLOW	71400	MDX1 6-10
J640	131-1315-00		CONNECTOR,RCPT,:BNC,FEMALE	80009	131-1315-00
J820	131-1315-00		CONNECTOR,RCPT,:BNC,FEMALE	80009	131-1315-00
J950	131-1727-00		CONNECTOR,RCPT,:BNC,FEMALE	24931	28JR262-1
J1010	131-1727-00		CONNECTOR,RCPT,:BNC,FEMALE	24931	28JR262-1
K810	148-0070-01		RELAY,ARMATURE:800 OHM	05587	A1501
K812	148-0070-01		RELAY,ARMATURE:800 OHM	05587	A1501
L35	108-0317-00		COIL,RF:15UH	78526	71501M
L65	108-0808-00		COIL,RF:FIXED,500UH	80009	108-0808-00
L135	108-0808-00		COIL,RF:FIXED,500UH	80009	108-0808-00
L145	108-0317-00		COIL,RF:15UH	78526	71501M
L150	108-0317-00		COIL,RF:15UH	78526	71501M
L165	108-0317-00		COIL,RF:15UH	78526	71501M
L175	108-0317-00		COIL,RF:15UH	78526	71501M
L582	108-0317-00		COIL,RF:15UH	78526	71501M
L810	108-0574-00		COIL,RF:30UH	80009	108-0574-00
L812	108-0574-00		COIL,RF:30UH	80009	108-0574-00
Q15	151-0302-00		TRANSISTOR:SILICON,NPN	04713	2N2222A
Q45	151-0515-01		TRANSISTOR:50V,8A	04713	2N4441
Q60	151-0301-00		TRANSISTOR:SILICON,PNP	04713	2N2907A
Q70	151-0301-00		TRANSISTOR:SILICON,PNP	04713	2N2907A
Q80	151-0473-00		TRANSISTOR:SILICON,NPN	03508	D4409
Q85	151-0302-00		TRANSISTOR:SILICON,NPN	04713	2N2222A
Q90	151-0188-00		TRANSISTOR:SILICON,PNP	04713	2N3906
Q100	151-0188-00		TRANSISTOR:SILICON,PNP	04713	2N3906
Q120	151-0302-00		TRANSISTOR:SILICON,NPN	04713	2N2222A
Q125	151-0473-00		TRANSISTOR:SILICON,NPN	03508	D4409
Q190	151-0347-00		TRANSISTOR:SILICON,NPN	80009	151-0347-00
Q245	151-0347-00		TRANSISTOR:SILICON,NPN	80009	151-0347-00
Q255	151-0190-00		TRANSISTOR:SILICON,NPN	04713	2N3904

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
Q270	151-0347-00		TRANSISTOR:SILICON,NPN	80009	151-0347-00
Q280	151-0280-00		TRANSISTOR:SILICON,PNP	04713	SS8065
Q290	151-0280-00		TRANSISTOR:SILICON,PNP	04713	SS8065
Q320	151-0260-00		TRANSISTOR:SILICON,NPN	02735	2N5189
Q325	151-0134-00		TRANSISTOR:SILICON,PNP	04713	2N2905A
Q326	151-0276-00		TRANSISTOR:SILICON,PNP	04713	2N5087
Q365	151-0134-00		TRANSISTOR:SILICON,PNP	04713	2N2905A
Q410	151-0223-00		TRANSISTOR:SILICON,NPN	80009	151-0223-00
Q415	151-0223-00		TRANSISTOR:SILICON,NPN	80009	151-0223-00
Q435	151-0223-00		TRANSISTOR:SILICON,NPN	80009	151-0223-00
Q440	151-0221-00		TRANSISTOR:SILICON,PNP	07263	S24849
Q445	151-0223-00		TRANSISTOR:SILICON,NPN	80009	151-0223-00
Q475	151-0223-00		TRANSISTOR:SILICON,NPN	80009	151-0223-00
Q480	151-0221-00		TRANSISTOR:SILICON,PNP	07263	S24849
Q490	151-0223-00		TRANSISTOR:SILICON,NPN	80009	151-0223-00
Q535	151-0223-00		TRANSISTOR:SILICON,NPN	80009	151-0223-00
Q540	151-0223-00		TRANSISTOR:SILICON,NPN	80009	151-0223-00
Q550	151-0221-00		TRANSISTOR:SILICON,PNP	07263	S24849
Q560	151-0223-00		TRANSISTOR:SILICON,NPN	80009	151-0223-00
Q565	151-0223-00		TRANSISTOR:SILICON,NPN	80009	151-0223-00
Q575	151-0221-00		TRANSISTOR:SILICON,PNP	07263	S24849
Q580	151-0221-00		TRANSISTOR:SILICON,PNP	07263	S24849
Q585	151-0221-00		TRANSISTOR:SILICON,PNP	07263	S24849
Q595	151-0223-00		TRANSISTOR:SILICON,NPN	80009	151-0223-00
Q605	151-0223-00		TRANSISTOR:SILICON,NPN	80009	151-0223-00
Q610	151-0221-00		TRANSISTOR:SILICON,PNP	07263	S24849
Q715	151-0424-00		TRANSISTOR:SILICON,NPN	07263	2N5769
Q725	151-0350-00		TRANSISTOR:SILICON,PNP	07263	2N5401
Q730	151-0424-00		TRANSISTOR:SILICON,NPN	07263	2N5769
Q736	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q740	151-0350-00		TRANSISTOR:SILICON,PNP	07263	2N5401
Q745	151-0439-00		TRANSISTOR:SILICON,NPN	03508	D40E7
Q755	151-0439-00		TRANSISTOR:SILICON,NPN	03508	D40E7
Q760	151-0350-00		TRANSISTOR:SILICON,PNP	07263	2N5401
Q780	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q782	151-0190-00		TRANSISTOR:SILICON,NPN	04713	2N3904
Q784	151-0410-00		TRANSISTOR:SILICON,PNP	04713	SPS6765
Q790	151-0350-00		TRANSISTOR:SILICON,PNP	07263	2N5401
Q800	151-0350-00		TRANSISTOR:SILICON,PNP	07263	2N5401
Q850	151-0190-00		TRANSISTOR:SILICON,NPN	04713	2N3904
Q860	151-0225-00		TRANSISTOR:SILICON,NPN	07910	CS23365
Q862	151-0225-00		TRANSISTOR:SILICON,NPN	07910	CS23365
Q880	151-0434-00		TRANSISTOR:SILICON,PNP	04713	2N4261
Q890	151-0434-00		TRANSISTOR:SILICON,PNP	04713	2N4261
Q900	151-0441-00		TRANSISTOR:SILICON,NPN	80009	151-0441-00
Q910	151-0441-00		TRANSISTOR:SILICON,NPN	80009	151-0441-00
Q920	151-0271-00		TRANSISTOR:SILICON,PNP	01295	SKA4504
Q935	151-0271-00		TRANSISTOR:SILICON,PNP	01295	SKA4504
Q960	151-0434-00		TRANSISTOR:SILICON,PNP	04713	2N4261
Q970	151-0434-00		TRANSISTOR:SILICON,PNP	04713	2N4261
Q980	151-0447-00		TRANSISTOR:SILICON,NPN	80009	151-0447-00
Q995	151-0447-00		TRANSISTOR:SILICON,NPN	80009	151-0447-00
Q1020	151-0221-00		TRANSISTOR:SILICON,PNP	07263	S24849

Electrical Parts List—PG 506

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
Q1030	151-0190-00		TRANSISTOR:SILICON,NPN	04713	2N3904
Q1036	151-0424-00		TRANSISTOR:SILICON,NPN	07263	2N5769
Q1045	151-0221-00		TRANSISTOR:SILICON,PNP	07263	S24849
R10	315-0332-00		RES.,FXD,COMP:3.3K OHM,5%,0.25W	01121	CB3325
R15	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R20	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R22	308-0755-00		RES.,FXD,WW:0.75 OHM,5%,2W	75042	BWH-R7500J
R25	315-0512-00		RES.,FXD,COMP:5.1K OHM,5%,0.25W	01121	CB5125
R27	315-0202-00		RES.,FXD,COMP:2K OHM,5%,0.25W	01121	CB2025
R29	315-0391-00		RES.,FXD,COMP:390 OHM,5%,0.25W	01121	CB3915
R30	311-1223-00		RES.,VAR,NONWIR:250 OHM,10%,0.50W	80294	3389F-P32-251
R31	315-0202-00		RES.,FXD,COMP:2K OHM,5%,0.25W	01121	CB2025
R40	321-0287-00		RES.,FXD,FILM:9.53K OHM,1%,0.125W	75042	CBATO-9531F
R42	321-0328-00		RES.,FXD,FILM:25.5K OHM,1%,0.125W	75042	CBATO-2552F
R45	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R52	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R54	315-0202-00		RES.,FXD,COMP:2K OHM,5%,0.25W	01121	CB2025
R57	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R60	315-0131-00		RES.,FXD,COMP:130 OHM,5%,0.25W	01121	CB1315
R65	308-0677-00		RES.,FXD,WW:1 OHM,5%,2W	75042	BWHLR000J
R70	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R72	315-0221-00		RES.,FXD,COMP:220 OHM,5%,0.25W	01121	CB2215
R75	301-0511-00		RES.,FXD,COMP:510 OHM,5%,0.50W	01121	EB5115
R80	315-0271-00		RES.,FXD,COMP:270 OHM,5%,0.25W	01121	CB2715
R82	315-0330-00		RES.,FXD,COMP:33 OHM,5%,0.25W	01121	CB3305
R85	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R86	315-0392-00		RES.,FXD,COMP:3.9K OHM,5%,0.25W	01121	CB3925
R90	315-0822-00		RES.,FXD,COMP:8.2K OHM,5%,0.25W	01121	CB8225
R94	315-0623-00		RES.,FXD,COMP:62K OHM,5%,0.25W	01121	CB6235
R96	315-0913-00		RES.,FXD,COMP:91K OHM,5%,0.25W	01121	CB9135
R98	315-0913-00		RES.,FXD,COMP:91K OHM,5%,0.25W	01121	CB9135
R100	315-0822-00		RES.,FXD,COMP:8.2K OHM,5%,0.25W	01121	CB8225
R104	315-0623-00		RES.,FXD,COMP:62K OHM,5%,0.25W	01121	CB6235
R105	315-0392-00		RES.,FXD,COMP:3.9K OHM,5%,0.25W	01121	CB3925
R108	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R120	315-0330-00		RES.,FXD,COMP:33 OHM,5%,0.25W	01121	CB3305
R122	315-0271-00		RES.,FXD,COMP:270 OHM,5%,0.25W	01121	CB2715
R135	315-0124-00		RES.,FXD,COMP:120K OHM,5%,0.25W	01121	CB1245
R154	315-0683-00		RES.,FXD,COMP:68K OHM,5%,0.25W	01121	CB6835
R170	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R190	305-0512-00		RES.,FXD,COMP:5.1K OHM,5%,2W	01121	HB5125
R194	315-0104-00		RES.,FXD,COMP:100K OHM,5%,0.25W	01121	CB1045
R196	315-0203-00		RES.,FXD,COMP:20K OHM,5%,0.25W	01121	CB2035
R200	321-0289-00		RES.,FXD,FILM:10K OHM,1%,0.125W	75042	CBATO-1002F
R205	311-1754-00		RES.,VAR,NONWIR:TRMR,2K OHM,0.5W	80294	306P-1-202
R207	321-0289-00		RES.,FXD,FILM:10K OHM,1%,0.125W	75042	CBATO-1002F
R210	323-1200-07		RES.,FXD,FILM:1.20K OHM,0.1%,0.50W	91637	MFF1226C12000B
R212	321-0264-00		RES.,FXD,FILM:5.49K OHM,1%,0.125W	75042	CBATO-5491F
R215	321-0279-00		RES.,FXD,FILM:7.87K OHM,1%,0.125W	75042	CBATO-7871F
R220	321-0213-00		RES.,FXD,FILM:1.62K OHM,1%,0.125W	75042	CBATO-1621F
R225A,B ¹	311-1586-00		RES.,VAR,NONWIR:PNL 2 X 20K OHM,0.5W	01121	12M271
R227	321-1649-07		RES.,FXD,FILM:8.38K OHM,0.1%,0.125W	91637	MFF1816C8300B
R230	321-0213-00		RES.,FXD,FILM:1.62K OHM,1%,0.125W	75042	CBATO-1621F
R234	323-0381-07		RES.,FXD,FILM:90.9K OHM,0.1%,0.50W	91637	MFF1226C90901B

¹Furnished as a unit with S225

Electrical Parts List—PG 506

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
R237	321-1650-07		RES.,FXD,FILM:8.99K OHM,0.1%,0.125W	91637	MFF1816C89900B
R245	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R247	301-0513-00		RES.,FXD,COMP:51K OHM,5%,0.50W	01121	EB5135
R250	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R255	315-0391-00		RES.,FXD,COMP:390 OHM,5%,0.25W	01121	CB3915
R256	315-0203-00		RES.,FXD,COMP:20K OHM,5%,0.25W	01121	CB2035
R257	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R258	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R260	315-0241-00		RES.,FXD,COMP:240 OHM,5%,0.25W	01121	CB2415
R265	315-0241-00		RES.,FXD,COMP:240 OHM,5%,0.25W	01121	CB2415
R267	315-0202-00		RES.,FXD,COMP:2K OHM,5%,0.25W	01121	CB2025
R275					
R276					
R277	325-0193-00		RES.,SET,MATCHED:(1)9.95K OHM,(1)6.03K OHM		
R278			(1)1.25K OHM,(1)2.80K OHM	91637	0BD
R280	321-0154-00		RES.,FXD,FILM:392 OHM,1%,0.125W	75042	CEAT0-3920F
R287	303-0223-00		RES.,FXD,COMP:22K OHM,5%,1W	01121	GB2235
R290	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R295	315-0203-00		RES.,FXD,COMP:20K OHM,5%,0.25W	01121	CB2035
R300					
R302					
R304					
R306					
R308	325-0192-00		RES.,SET,MATCHED:(4) 495 OHM,(3) 61.1 OHM		
R310			(1) 55 OHM,0.1%,0.50W	91637	0BD
R312					
R314					
R316	308-0774-00		RES.,FXD,WW:55 OHM,0.05%,3W	91637	R52B-110
R317	315-0510-00		RES.,FXD,COMP:51 OHM,5%,0.25W	01121	CB5105
R330	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R332	321-0189-00		RES.,FXD,FILM:909 OHM,1%,0.125W	75042	CEAT0-9090F
R338	321-0296-07		RES.,FXD,FILM:11.8K OHM,0.1%,0.125W	91637	MFF1816C11801B
R340	311-1221-00		RES.,VAR,NONWIR:50 OHM,20%,0.50W	80294	3389F-P31-500
R342	321-0188-00		RES.,FXD,FILM:887 OHM,1%,0.125W	75042	CEAT0-8870F
R350					
R352					
R354					
R356	325-0191-00		RES.,SET,MATCHED:(7) 15 OHM,0.1%,0.125W	91637	0BD
R358					
R36C					
R362					
R375	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R377	321-0230-00		RES.,FXD,FILM:2.43K OHM,1%,0.125W	75042	CEAT0-2431F
R380	315-0242-00		RES.,FXD,COMP:2.4K OHM,5%,0.25W	01121	CB2425
R400	315-0242-00		RES.,FXD,COMP:2.4K OHM,5%,0.25W	01121	CB2425
R405	315-0242-00		RES.,FXD,COMP:2.4K OHM,5%,0.25W	01121	CB2425
R407	315-0132-00		RES.,FXD,COMP:1.3K OHM,5%,0.25W	01121	CB1325
R410	315-0163-00		RES.,FXD,COMP:16K OHM,5%,0.25W	01121	CB1635
R415	311-1225-00		RES.,VAR,NONWIR:1K OHM,20%,0.50W	80294	3389F-P31-102
R417	321-0287-00		RES.,FXD,FILM:9.53K OHM,1%,0.125W	75042	CEAT0-9531F
R420	321-0260-00		RES.,FXD,FILM:4.99K OHM,1%,0.125W	75042	CEAT0-4991F
R423	321-0227-00		RES.,FXD,FILM:2.26K OHM,1%,0.125W	75042	CEAT0-2261F

Electrical Parts List—PG 506

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
R425	311-1224-00		RES.,VAR, NONWIR:500 OHM,20%,0.50W	80294	3389F-P31-501
R427	321-0227-00		RES.,FXD,FILM:2.26K OHM,1%,0.125W	75042	CEAT0-2261F
R430	321-0263-00		RES.,FXD,FILM:5.36K OHM,1%,0.125W	75042	CEAT0-5361F
R435	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R440	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R445	315-0272-00		RES.,FXD,COMP:2.7K OHM,5%,0.25W	01121	CB2725
R447	315-0562-00		RES.,FXD,COMP:5.6K OHM,5%,0.25W	01121	CB5625
R450	311-1225-00		RES.,VAR, NONWIR:1K OHM,20%,0.50W	80294	3389F-P31-102
R452	323-0294-00		RES.,FXD,FILM:11.3K OHM,1%,0.50W	75042	CECT0-1132F
R454	323-0294-00		RES.,FXD,FILM:11.3K OHM,1%,0.50W	75042	CECT0-1132F
R460	321-0223-00		RES.,FXD,FILM:2.05K OHM,1%,0.125W	75042	CEAT0-2051F
R465	315-0332-00		RES.,FXD,COMP:3.3K OHM,5%,0.25W	01121	CB3325
R470	315-0242-00		RES.,FXD,COMP:2.4K OHM,5%,0.25W	01121	CB2425
R475	315-0332-00		RES.,FXD,COMP:3.3K OHM,5%,0.25W	01121	CB3325
R477	315-0391-00		RES.,FXD,COMP:390 OHM,5%,0.25W	01121	CB3915
R480	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R484	315-0392-00		RES.,FXD,COMP:3.9K OHM,5%,0.25W	01121	CB3925
R486	315-0202-00		RES.,FXD,COMP:2K OHM,5%,0.25W	01121	CB2025
R490	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R495	315-0431-00		RES.,FXD,COMP:430 OHM,5%,0.25W	01121	CB4315
R500	315-0133-00		RES.,FXD,COMP:13K OHM,5%,0.25W	01121	CB1335
R502	315-0822-00		RES.,FXD,COMP:8.2K OHM,5%,0.25W	01121	CB8225
R506	315-0133-00		RES.,FXD,COMP:13K OHM,5%,0.25W	01121	CB1335
R508	315-0822-00		RES.,FXD,COMP:8.2K OHM,5%,0.25W	01121	CB8225
R510	315-0273-00		RES.,FXD,COMP:27K OHM,5%,0.25W	01121	CB2735
R514	315-0202-00		RES.,FXD,COMP:2K OHM,5%,0.25W	01121	CB2025
R516	315-0272-00		RES.,FXD,COMP:2.7K OHM,5%,0.25W	01121	CB2725
R520	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R524	315-0391-00		RES.,FXD,COMP:390 OHM,5%,0.25W	01121	CB3915
R530	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R532	315-0392-00		RES.,FXD,COMP:3.9K OHM,5%,0.25W	01121	CB3925
R535	315-0391-00		RES.,FXD,COMP:390 OHM,5%,0.25W	01121	CB3915
R537	315-0751-00		RES.,FXD,COMP:750 OHM,5%,0.25W	01121	CB7515
R540	315-0202-00		RES.,FXD,COMP:2K OHM,5%,0.25W	01121	CB2025
R543	315-0911-00		RES.,FXD,COMP:910 OHM,5%,0.25W	01121	CB9115
R545	315-0162-00		RES.,FXD,COMP:1.6K OHM,5%,0.25W	01121	CB1625
R550	315-0202-00		RES.,FXD,COMP:2K OHM,5%,0.25W	01121	CB2025
R554	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R556	315-0273-00		RES.,FXD,COMP:27K OHM,5%,0.25W	01121	CB2735
R558	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R560	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R563	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R565	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R575	315-0242-00		RES.,FXD,COMP:2.4K OHM,5%,0.25W	01121	CB2425
R576	315-0132-00		RES.,FXD,COMP:1.3K OHM,5%,0.25W	01121	CB1325
R578	315-0511-00		RES.,FXD,COMP:510 OHM,5%,0.25W	01121	CB5115
R582	315-0241-00		RES.,FXD,COMP:240 OHM,5%,0.25W	01121	CB2415
R585	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R587	311-1223-00		RES.,VAR, NONWIR:TRMR,250 OHM,0.5W	80294	3389F-P32-251
R590	311-1747-00		RES.,VAR, NONWIR:PNL,10K OHM,1W	01121	12M670
R593	315-0471-00		RES.,FXD,COMP:470 OHM,5%,0.25W	01121	CB4715
R595	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R597	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025

Electrical Parts List—PG 506

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
R600	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R602	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R605	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R606	315-0271-00		RES.,FXD,COMP:270 OHM,5%,0.25W	01121	CB2715
R615	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R618	315-0511-00		RES.,FXD,COMP:510 OHM,5%,0.25W	01121	CB5115
R620	315-0273-00		RES.,FXD,COMP:27K OHM,5%,0.25W	01121	CB2735
R625	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R627	301-0131-00		RES.,FXD,COMP:130 OHM,5%,0.50W	01121	EB1315
R630	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R635	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R650	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R654	315-0511-00		RES.,FXD,COMP:510 OHM,5%,0.25W	01121	CB5115
R656	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R660	315-0103-00		RES.,FXD,COMP:10K OHM,5%,0.25W	01121	CB1035
R680	315-0681-00		RES.,FXD,COMP:680 OHM,5%,0.25W	01121	CB6815
R681	315-0681-00		RES.,FXD,COMP:680 OHM,5%,0.25W	01121	CB6815
R682	315-0681-00		RES.,FXD,COMP:680 OHM,5%,0.25W	01121	CB6815
R683	315-0681-00		RES.,FXD,COMP:680 OHM,5%,0.25W	01121	CB6815
R684	315-0681-00		RES.,FXD,COMP:680 OHM,5%,0.25W	01121	CB6815
R685	315-0681-00		RES.,FXD,COMP:680 OHM,5%,0.25W	01121	CB6815
R686	315-0681-00		RES.,FXD,COMP:680 OHM,5%,0.25W	01121	CB6815
R690	315-0681-00		RES.,FXD,COMP:680 OHM,5%,0.25W	01121	CB6815
R691	315-0681-00		RES.,FXD,COMP:680 OHM,5%,0.25W	01121	CB6815
R692	315-0681-00		RES.,FXD,COMP:680 OHM,5%,0.25W	01121	CB6815
R693	315-0681-00		RES.,FXD,COMP:680 OHM,5%,0.25W	01121	CB6815
R694	315-0681-00		RES.,FXD,COMP:680 OHM,5%,0.25W	01121	CB6815
R695	315-0681-00		RES.,FXD,COMP:680 OHM,5%,0.25W	01121	CB6815
R696	315-0681-00		RES.,FXD,COMP:680 OHM,5%,0.25W	01121	CB6815
R700	315-0681-00		RES.,FXD,COMP:680 OHM,5%,0.25W	01121	CB6815
R705	315-0200-00		RES.,FXD,COMP:20 OHM,5%,0.25W	01121	CB2005
R715	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R716	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R718	315-0621-00		RES.,FXD,COMP:620 OHM,5%,0.25W	01121	CB6215
R720	315-0391-00		RES.,FXD,COMP:390 OHM,5%,0.25W	01121	CB3915
R724	315-0152-00		RES.,FXD,COMP:1.5K OHM,5%,0.25W	01121	CB1525
R726	315-0101-00		RES.,FXD,COMP:100 OHM,5%,0.25W	01121	CB1015
R730	315-0392-00		RES.,FXD,COMP:3.9K OHM,5%,0.25W	01121	CB3925
R736	301-0223-00		RES.,FXD,COMP:22K OHM,5%,0.50W	01121	EB2235
R738	315-0330-00		RES.,FXD,COMP:33 OHM,5%,0.25W	01121	CB3305
R740	315-0112-00		RES.,FXD,COMP:1.1K OHM,5%,0.25W	01121	CB1125
R745	315-0470-00		RES.,FXD,COMP:47 OHM,5%,0.25W	01121	CB4705
R746	301-0133-00		RES.,FXD,COMP:13K OHM,5%,0.5W	01121	EB1335
R748	315-0470-00		RES.,FXD,COMP:47 OHM,5%,0.25W	01121	CB4705
R749	301-0133-00		RES.,FXD,COMP:13K OHM,5%,0.5W	01121	EB1335
R752	315-0390-00		RES.,FXD,COMP:39 OHM,5%,0.25W	01121	CB2905
R760	315-0301-00		RES.,FXD,COMP:300 OHM,5%,0.25W	01121	CB3015
R762	315-0222-00		RES.,FXD,COMP:2.2K OHM,5%,0.25W	01121	CB2225
R764	315-0222-00		RES.,FXD,COMP:2.2K OHM,5%,0.25W	01121	CB2225
R780	315-0182-00		RES.,FXD,COMP:1.8K OHM,5%,0.25W	01121	CB1825
R782	315-0122-00		RES.,FXD,COMP:1.2K OHM,5%,0.25W	01121	CB1225
R784	315-0561-00		RES.,FXD,COMP:560 OHM,5%,0.25W	01121	CB5615
R785A,R	311-1473-00		RES.,VAR, NONWIR:PNL, 2 X 5K OHM,0.5W	01121	11M079

Electrical Parts List—PG 506

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
R787	315-0362-00		RES.,FXD,COMP:3.6K OHM,5%,0.25W	01121	CB3625
R790	311-1562-00		RES.,VAR,NONWIR:2K OHM,20%,0.50W	73138	91A-20000M
R792	315-0112-00		RES.,FXD,COMP:1.1K OHM,5%,0.25W	01121	CB1125
R800	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R805	308-0392-00		RES.,FXD,WW:600 OHM,2%,14W	56289	459EX600ROJ
R808	321-0291-00		RES.,FXD,FILM:10.5K OHM,1%,0.125W(SELECTED)	75042	CEATO-1052F
R810	315-0201-00		RES.,FXD,COMP:200 OHM,5%,0.25W	01121	CB2015
R812	315-0201-00		RES.,FXD,COMP:200 OHM,5%,0.25W	01121	CB2015
R825	315-0273-00		RES.,FXD,COMP:27K OHM,5%,0.25W	01121	CB2735
R827	315-0104-00		RES.,FXD,COMP:100K OHM,5%,0.25W	01121	CB1045
R830	321-0256-00		RES.,FXD,FILM:4.53K OHM,1%,0.125W	75042	CEATO-4531F
R832	321-0385-00		RES.,FXD,FILM:100K OHM,1%,0.125W	75042	CEATO-1003F
R835	321-0256-00		RES.,FXD,FILM:4.53K OHM,1%,0.125W	75042	CEATO-4531F
R837	321-0385-00		RES.,FXD,FILM:100K OHM,1%,0.125W	75042	CEATO-1003F
R840	315-0104-00		RES.,FXD,COMP:100K OHM,5%,0.25W	01121	CB1045
R842	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R850	322-0164-00		RES.,FXD,FILM:499 OHM,1%,0.25W	75042	CEATO-4990F
R854	321-0251-00		RES.,FXD,FILM:4.02K OHM,1%,0.125W	75042	CEATO-4021F
R855	321-0239-00		RES.,FXD,FILM:3.01K OHM,1%,0.125W	75042	CEATO-3011F
R857	315-0511-00		RES.,FXD,COMP:510 OHM,5%,0.25W	01121	CB5115
R860	307-0106-00		RES.,FXD,COMP:4.7 OHM,5%,0.25W	01121	CB47G5
R862	307-0106-00		RES.,FXD,COMP:4.7 OHM,5%,0.25W	01121	CB47G5
R865	315-0822-00		RES.,FXD,COMP:8.2K OHM,5%,0.25W	01121	CB8225
R866	315-0101-00		RES.,FXD,COMP:100 OHM,5%,0.25W	01121	CB1015
R870	315-0390-00		RES.,FXD,COMP:39 OHM,5%,0.25W	01121	CB3905
R871	315-0360-00		RES.,FXD,COMP:36 OHM,5%,0.25W	01121	CB3605
R874	322-0164-00		RES.,FXD,FILM:499 OHM,1%,0.25W	75042	CEATO-4990F
R876	315-0750-00		RES.,FXD,COMP:75 OHM,5%,0.25W	01121	CB7505
R880	315-0243-00		RES.,FXD,COMP:24K OHM,5%,0.25W	01121	CB2435
R882	321-0069-00		RES.,FXD,FILM:51.1 OHM,1%,0.125W	75042	CEATO-51R10F
R884	315-0911-00		RES.,FXD,COMP:910 OHM,5%,0.25W	01121	CB9115
R886	317-0220-00		RES.,FXD,COMP:22 OHM,5%,0.125W	01121	BB2205
R890	315-0911-00		RES.,FXD,COMP:910 OHM,5%,0.25W	01121	CB9115
R892	321-0069-00		RES.,FXD,FILM:51.1 OHM,1%,0.125W	75042	CEATO-51R10F
R900	317-0220-00		RES.,FXD,COMP:22 OHM,5%,0.125W	01121	BB2205
R902	315-0162-00		RES.,FXD,COMP:1.6K OHM,5%,0.25W	01121	CB1625
R904	315-0162-00		RES.,FXD,COMP:1.6K OHM,5%,0.25W	01121	CB1625
R906	317-0220-00		RES.,FXD,COMP:22 OHM,5%,0.125W	01121	BB2205
R910	317-0220-00		RES.,FXD,COMP:22 OHM,5%,0.125W	01121	BB2205
R914	315-0101-00		RES.,FXD,COMP:100 OHM,5%,0.25W	01121	CB1015
R916	323-0148-00		RES.,FXD,FILM:340 OHM,1%,0.50W	75042	CECTO-3400F
R918	315-0151-00		RES.,FXD,COMP:150 OHM,5%,0.25W	01121	CB1515
R920	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R924	307-0106-00		RES.,FXD,COMP:4.7 OHM,5%,0.25W	01121	CB47G5
R928	323-0099-00		RES.,FXD,FILM:105 OHM,1%,0.50W	75042	CECTO-1050F
R930	323-0099-00		RES.,FXD,FILM:105 OHM,1%,0.50W	75042	CECTO-1050F
R935	317-0471-00		RES.,FXD,COMP:470 OHM,5%,0.125W	01121	BB4715
R937	315-0240-00		RES.,FXD,COMP:24 OHM,5%,0.25W	01121	CB2405
R938	315-0431-00		RES.,FXD,COMP:430 OHM,5%,0.25W	01121	CB4315
R940	317-0121-00		RES.,FXD,COMP:120 OHM,5%,0.125W	01121	BB1215
R944	317-0220-00		RES.,FXD,COMP:22 OHM,5%,0.125W	01121	BB2205
R950	307-0086-00		RES.,FXD,FILM:50 OHM,1%,1W	03888	62D350-50R0F
R960	317-0220-00		RES.,FXD,COMP:22 OHM,5%,0.125W	01121	BB2205
R962	315-0162-00		RES.,FXD,COMP:1.6K OHM,5%,0.25W	01121	CB1625

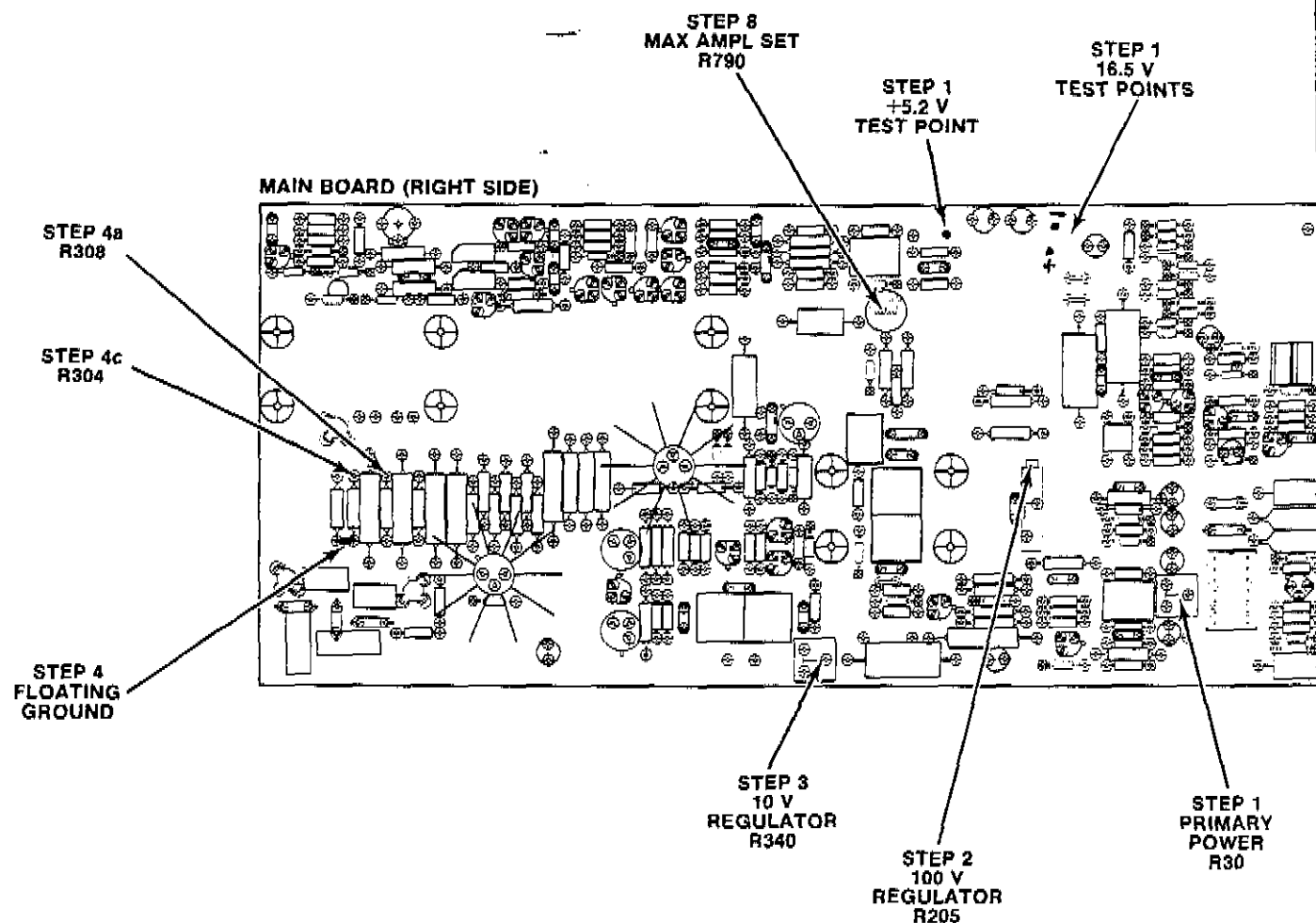
Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
R964	315-0162-00		RES.,FXD,COMP:1.6K OHM,5%,0.25W	01121	CB1625
R966	317-0220-00		RES.,FXD,COMP:22 OHM,5%,0.125W	01121	BB2205
R970	317-0220-00		RES.,FXD,COMP:22 OHM,5%,0.125W	01121	BB2205
R974	315-0101-00		RES.,FXD,COMP:100 OHM,5%,0.25W	01121	CB1015
R976	323-0150-00		RES.,FXD,FILM:357 OHM,1%,0.5W	75042	CECT0-3570F
R978	315-0151-00		RES.,FXD,COMP:150 OHM,5%,0.25W	01121	CB1515
R980	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R984	307-0106-00		RES.,FXD,COMP:4.7 OHM,5%,0.25W	01121	CB47G5
R988	323-0099-00		RES.,FXD,FILM:105 OHM,1%,0.50W	75042	CECT0-1050F
R990	323-0099-00		RES.,FXD,FILM:105 OHM,1%,0.50W	75042	CECT0-1050F
R995	317-0471-00		RES.,FXD,COMP:470 OHM,5%,0.125W	01121	BB4715
R997	315-0240-00		RES.,FXD,COMP:24 OHM,5%,0.25W	01121	CB2405
R998	315-0431-00		RES.,FXD,COMP:430 OHM,5%,0.25W	01121	CB4315
R1000	317-0121-00		RES.,FXD,COMP:120 OHM,5%,0.125W	01121	BB1215
R1004	317-0220-00		RES.,FXD,COMP:22 OHM,5%,0.125W	01121	BB2205
R1010	307-0086-00		RES.,FXD,FILM:50 OHM,1%,1W	03888	62D350-50R0F
R1020	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R1021	315-0123-00		RES.,FXD,COMP:12K OHM,5%,0.25W	01121	CB1235
R1025	311-1562-00		RES.,VAR,NONWTR:2K OHM,20%,0.50W	73138	91A-20000M
R1026	315-0332-00		RES.,FXD,COMP:3.3K OHM,5%,0.25W	01121	CB3325
R1028	315-0133-00		RES.,FXD,COMP:13K OHM,5%,0.25W	01121	CB1335
R1030	315-0332-00		RES.,FXD,COMP:3.3K OHM,5%,0.25W	01121	CB3325
R1034	315-0273-00		RES.,FXD,COMP:27K OHM,5%,0.25W	01121	CB2735
R1036	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R1040	315-0270-00		RES.,FXD,COMP:27 OHM,5%,0.25W	01121	CB2705
R1045	315-0100-00		RES.,FXD,COMP:10 OHM,5%,0.25W	01121	CB1005
R1047	315-0272-00		RES.,FXD,COMP:2.7K OHM,5%,0.25W	01121	CB2725
S180A,B	263-1098-00		ACTR,ASSY,CAM S:MODE/AMP	80009	263-1098-00
S610	263-1101-00		ACTR ASSY,CAM S:PERIOD	80009	263-1101-00
S660	260-0723-00		SWITCH,SLIDE:DPDT,0.5A,125VAC	80009	260-0723-00
S225 ¹	311-1586-00		RES.,VAR,NONWTR:PNL,2 X 20K OHM,0.5W	01121	12M271
T75	120-0951-00		TRANSFORMER,RF:BALVN	80009	120-0951-00
T130	120-0953-00		TRANSFORMER,RF:POT CORE BIFILAR 1-11 ALL	80009	120-0953-00
T520	120-0952-00		TRANSFORMER,RF:TOROID 2 WINDINGS TD-301	80009	120-0952-00
U20	156-0071-00		MICROCIRCUIT,LI:VOLTAGE REGULATOR	07263	723DC
U50	156-0067-00		MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	07263	U6T7741393
U200	156-0067-00		MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	07263	U6T7741393
U240	156-0067-00		MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	07263	U6T7741393
U255	156-0399-00		MICROCIRCUIT,DI:OPTOELECTRONIC ISOLATOR	80009	156-0399-00
U330	156-0067-00		MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	07263	U6T7741393
U375	156-0067-00		MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	07263	U6T7741393
U400	156-0113-00		MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND GATE	01295	SN74L00N
U430	156-0067-00		MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	07263	U6T7741393
U460	156-0067-00		MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	07263	U6T7741393
U470	156-0134-00		MICROCIRCUIT,DI:SINGLE DIFF COMP	18324	N5710V
U480	156-0399-00		MICROCIRCUIT,DI:OPTOELECTRONIC ISOLATOR	80009	156-0399-00
U535	156-0399-00		MICROCIRCUIT,DI:OPTOELECTRONIC ISOLATOR	80009	156-0399-00
U610	156-0039-00		MICROCIRCUIT,DI:DUAL J-K FLIP FLOP	04713	MC7473P
U615	156-0186-00		MICROCIRCUIT,DI:QUAD 2-INPUT NAND	01295	SN7403N
U665	156-0079-00		MICROCIRCUIT,DI:DECADE COUNTER,TTL	07263	9390PC
U666	156-0079-00		MICROCIRCUIT,DI:DECADE COUNTER,TTL	07263	9390PC
U667	156-0079-00		MICROCIRCUIT,DI:DECADE COUNTER,TTL	07263	9390PC

¹Furnished as a unit with R225A,B

Electrical Parts List—PG 506

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
U668	156-0079-00		MICROCIRCUIT,DI:DECADE COUNTER,TTL	07263	9390PC
U670	156-0040-00		MICROCIRCUIT,DI:QUAD LATCH,TTL	07263	7475PC
U671	156-0040-00		MICROCIRCUIT,DI:QUAD LATCH,TTL	07263	7475PC
U673	156-0379-00		MICROCIRCUIT,DI:BCD TO 7-SEGMENT DCDR/DRVR	18421	N8T06B
U675	156-0379-00		MICROCIRCUIT,DI:BCD TO 7-SEGMENT DCDR/DRVR	18421	N8T06B
U840	156-0067-00		MICROCIRCUIT,LI:OPERATIONAL AMPLIFIER	07263	U6T7741393
VR10	152-0243-00		SEMICON D DEVICE:ZENER,0.4W,15V,5%	81483	1N965B
VR30	152-0168-00		SEMICON D DEVICE:ZENER,0.4W,12V,5%	04713	1N963B
VR45	152-0280-00		SEMICON D DEVICE:ZENER,0.4W,6.2V,5%	04713	1N753A
VR55	152-0278-00		SEMICON D DEVICE:ZENER,400MA,3V,5%	07910	1N4372A
VR170	152-0279-00		SEMICON D DEVICE:ZENER,0.4W,5.1V,5%	07910	1N751A
VR210	152-0174-00		SEMICON D DEVICE:ZENER,9V	80009	152-0174-00
VR280	152-0279-00		SEMICON D DEVICE:ZENER,0.4W,5.1V,5%	07910	1N751A
VR395	152-0055-00		SEMICON D DEVICE:ZENER,0.4W,11V,5%	04713	1N962B
VR430	152-0279-00		SEMICON D DEVICE:ZENER,0.4W,5.1V,5%	07910	1N751A
VR470	152-0395-00		SEMICON D DEVICE:ZENER,0.4W,4.3V,5%	07910	1N749A
VR790	152-0279-00		SEMICON D DEVICE:ZENER,0.4W,5.1V,5%	07910	1N751A
VR866	152-0279-00		SEMICON D DEVICE:ZENER,0.4W,5.1V,5%	07910	1N751A

MAIN BD, RIGHT SIDE SHT. 1 OF 3



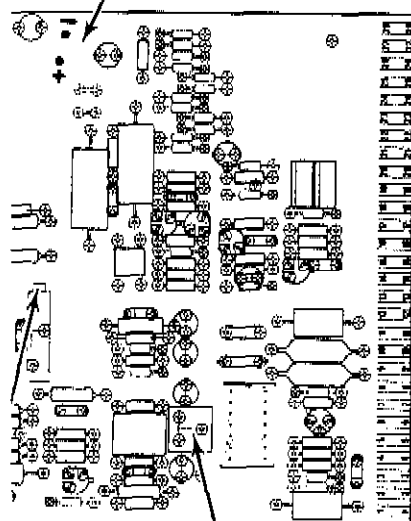
NOTE: STEP 4

A 20 mA current-source approximation can be built by inserting a 931 Ω , 1% resistor and a 50 Ω potentiometer in series with a 20 V source. A 20 mA current source can also be obtained from another PG 506 AMPL OUTPUT connector. Use the 2 V AMPLITUDE setting and adjust the VARIABLE (OUT) control in a STD AMPL mode.

MAIN BD. RIGHT SIDE
SHT. 2 of 3

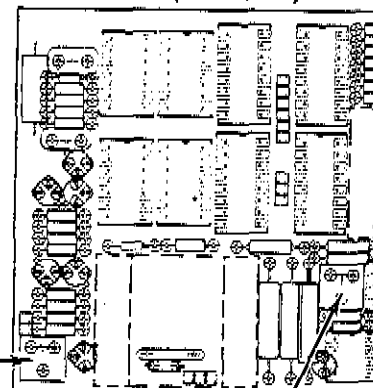
ADJUSTMENT LOCATIONS

STEP 1
16.5 V
TEST POINTS



STEP 1
PRIMARY
POWER
R30

DVM BOARD (LEFT SIDE)

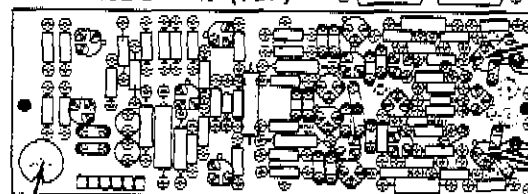


STEP 7
PERIOD
R587

STEP 5a
ZERO SET
R450

STEP
+7.3% S
R415

FAST RISE BOARD (TOP)



STEP 10
MIN AMPL SET
R1025

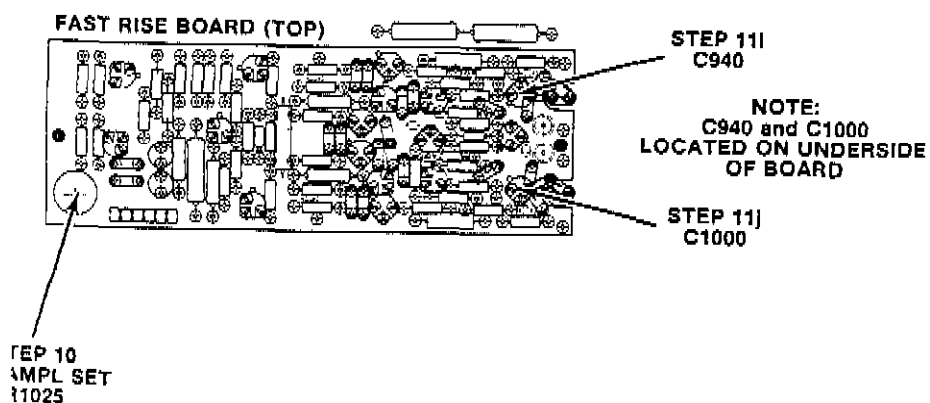
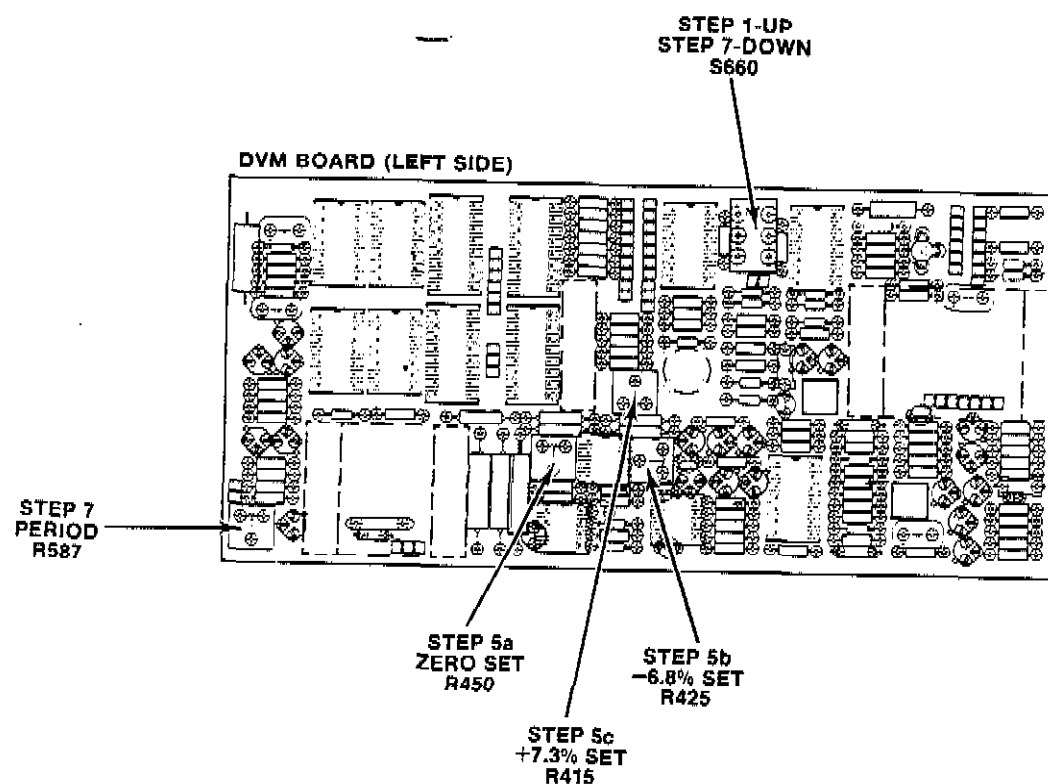
STEP 11i
C940

NOTE:
C940 and C1000
LOCATED ON UNDERSIDE
OF BOARD

STEP 11j
C1000

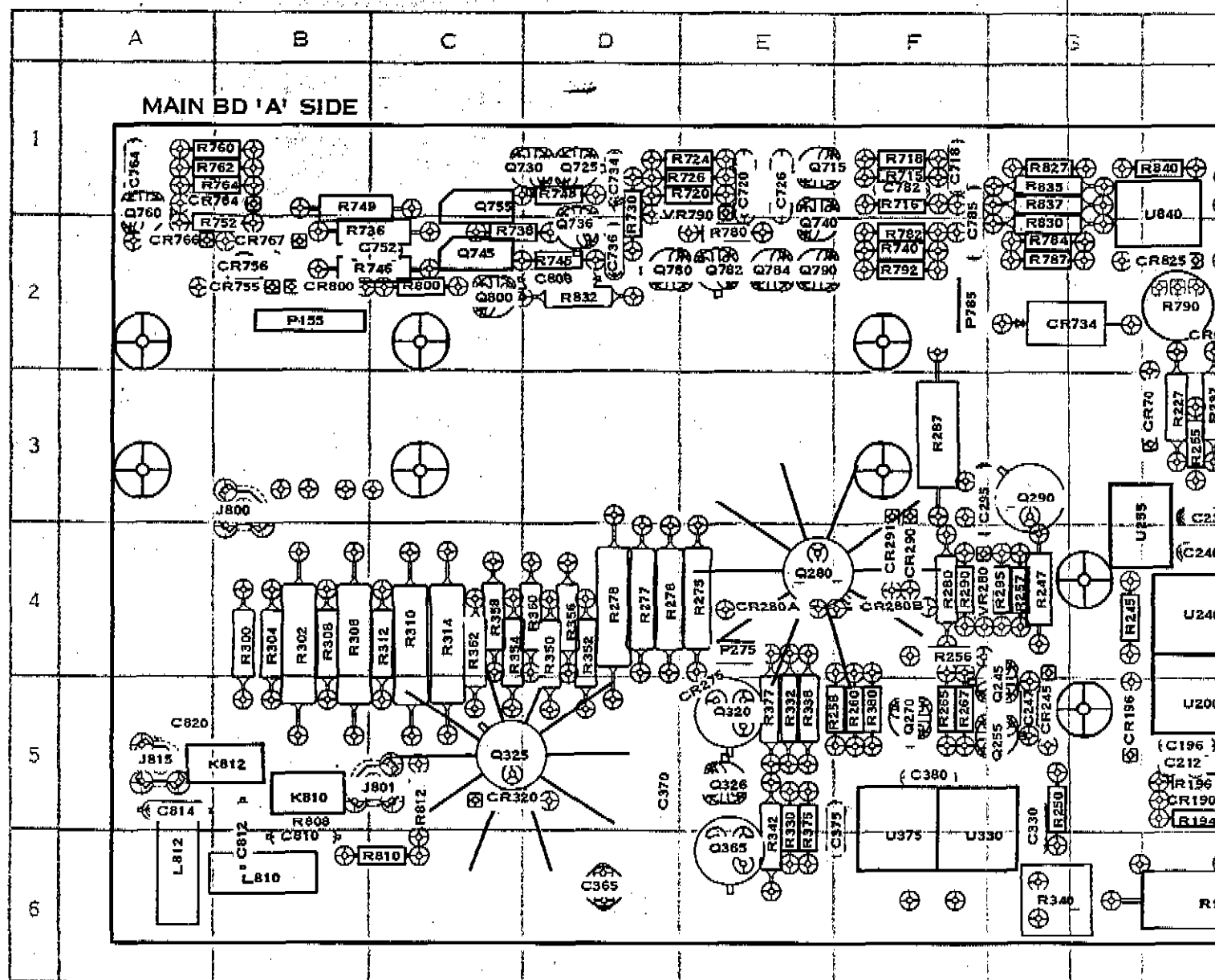
MAIN BD. RIGHT SIDE
SHT. 3 of 3

STMENT LOCATIONS



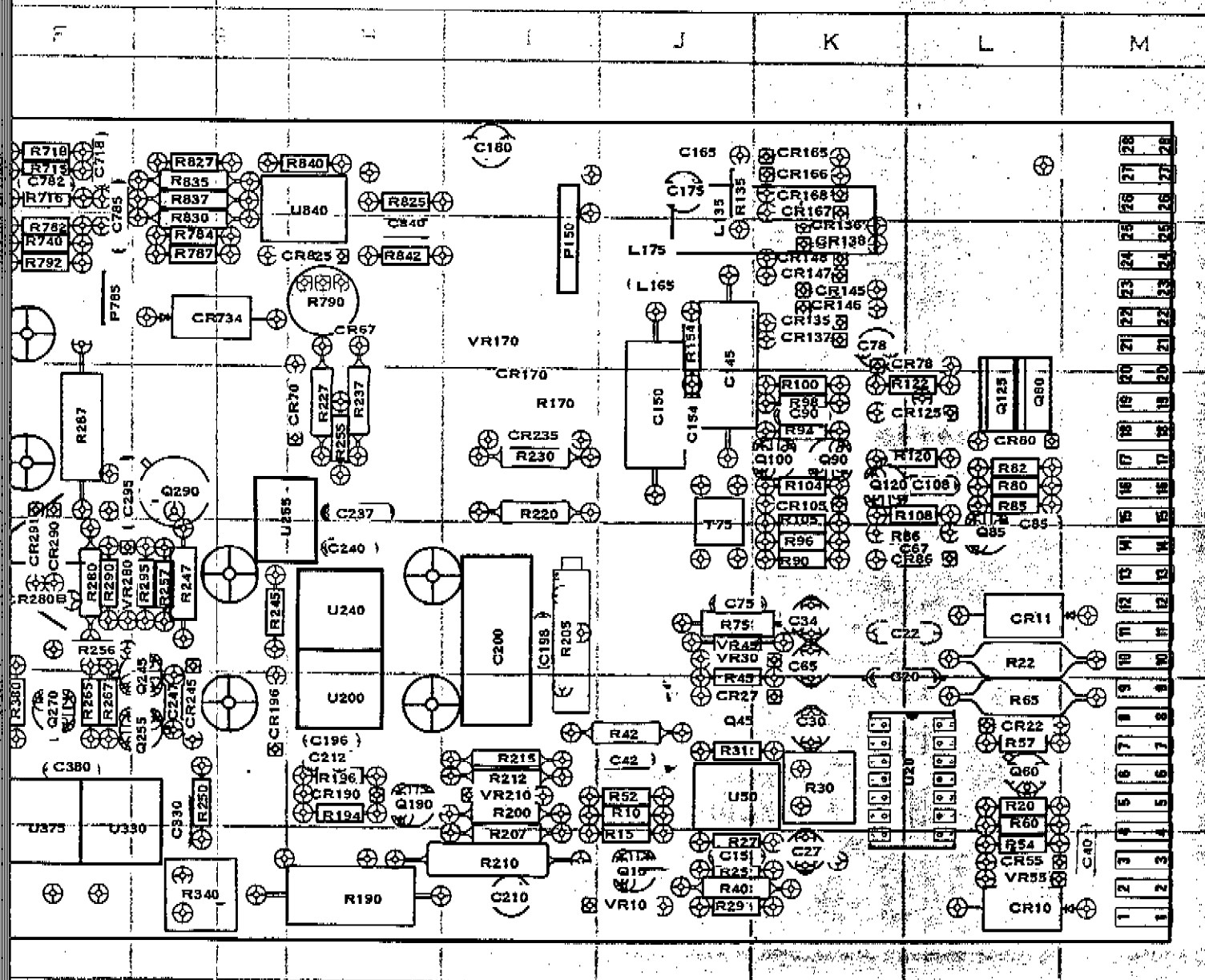
MAIN BD 'A' SIDE
SHT. 1 OF 3

PARTS LOCATION



MAIN BD. 'A' SIDE
SHT. 2 OF 3

PARTS LOCATION GRID

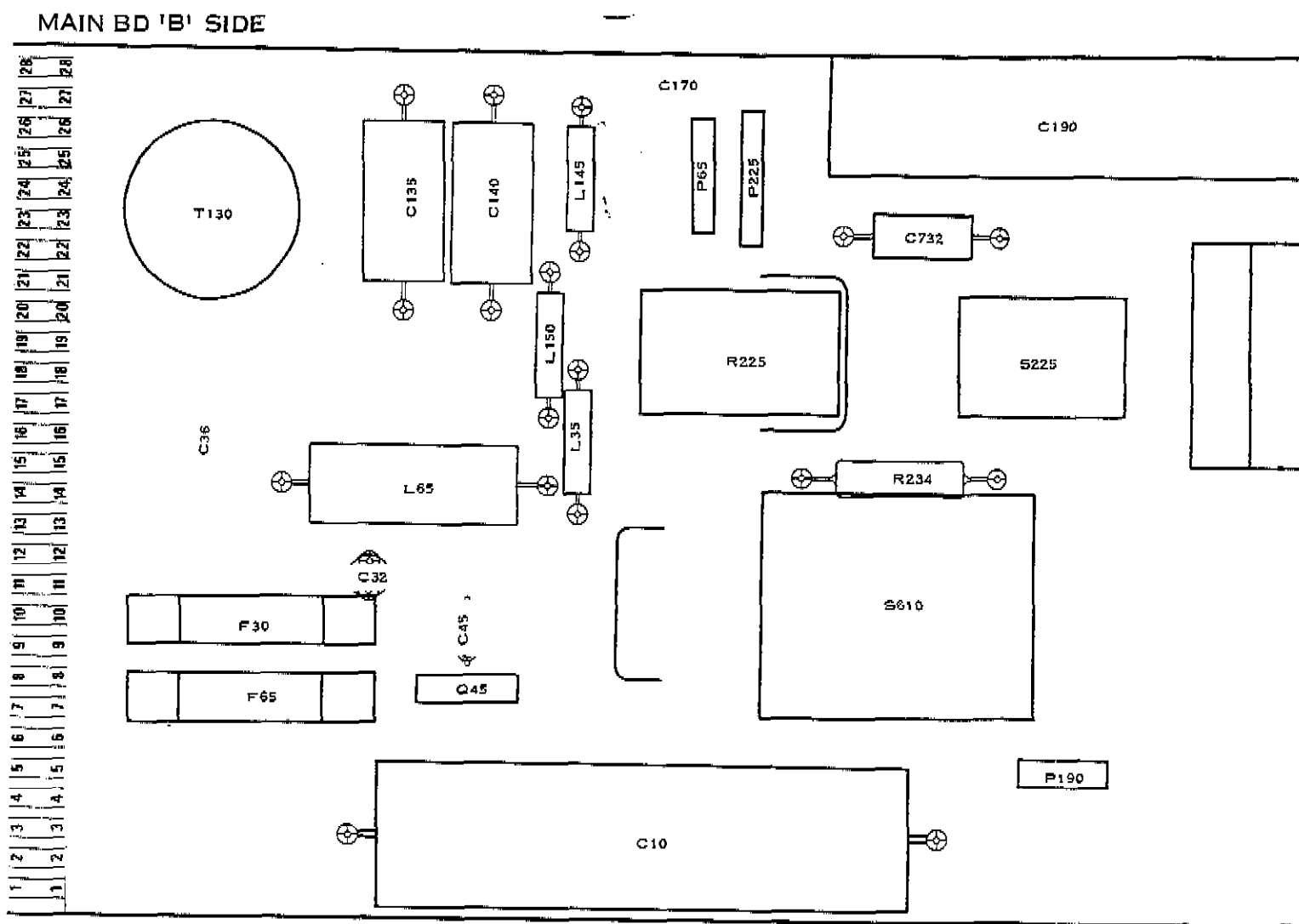


MAIN BD
SHT. 30F3

CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
C15	J6	CR10	L6	L135	J1	R30	K5	R267	F5	R780	E2
C20	K5	CR11	L4	L165	J2	R31	J5	R275	E4	R782	F2
C22	L4	CR22	L5	L175	J2	R40	J6	R276	D4	R784	G2
C27	K6	CR27	J5	L810	B6	R42	J5	R277	D4	R787	G2
C30	K5	CR55	L6	L812	A6	R45	J5	R278	D4	R790	H2
C34	K4	CR67	H2			R52	J5	R280	F4	R792	F2
C40	M6	CR70	H3	P150	I2	R54	L6	R287	F3	R800	C2
C42	J5	CR78	L2	P155	B2	R57	L5	R290	F4	R808	B5
C85	K4	CR80	L3	P275	E4	R60	L5	R295	G4	R810	C6
C87	L4	CR86	L4	P785	F2	R65	L5	R300	B4	R812	C5
C75	J4	CR105	K3			R75	J4	R302	B4	R825	H1
C78	K2	CR125	L3	Q15	J6	R80	L3	R304	B4	R827	G1
C85	L3	CR135	K2	Q60	L5	R82	L3	R306	B4	R830	G2
C90	K3	CR136	K2	Q80	L3	R85	L3	R308	B4	R832	D2
C108	L3	CR137	K2	Q85	L4	R86	L4	R310	C4	R835	G1
C145	J2	CR138	K2	Q90	K3	R90	K4	R312	C4	R837	G1
C150	J3	CR145	K2	Q100	K3	R94	K3	R314	C4	R840	H1
C154	J3	CR146	K2	Q120	K3	R96	K4	R330	E5	R842	H2
C165	J1	CR147	K2	Q125	L3	R98	K3	R332	E5		
C175	J1	CR148	K2	Q190	H5	R100	K3	R338	E5	T75	J4
C180	I1	CR165	K1	Q245	G5	R104	K3	R340	G6		
C196	H5	CR166	K1	Q255	G5	R105	K3	R342	E6	U20	L5
C198	I4	CR167	K1	Q270	F5	R108	L3	R350	D4	U50	J5
C200	I4	CR168	K1	Q280	E4	R120	L3	R352	D4	U200	H5
C210	I6	CR170	I3	Q290	G3	R122	L3	R354	C4	U240	H4
C212	H5	CR190	H5	Q320	E5	R135	J1	R356	D4	U255	G4
C237	H3	CR196	G5	Q325	C5	R154	J2	R358	C4	U330	F6
C240	H4	CR235	I3	Q326	E5	R170	I3	R360	D4	U840	H1
C247	G5	CR245	G5	Q365	E6	R190	H6	R362	C4		
C295	F3	CR275	E5	Q715	E1	R194	H5	R375	E5	VR10	J6
C330	G5	CR280A	E4	Q725	D1	R196	H5	R377	E5	VR30	J4
C365	D6	CR280B	F4	Q730	D1	R200	I5	R380	F5	VR45	J4
C370	D5	CR290	F4	Q736	D2	R205	I4	R715	F1	VR55	L6
C375	F5	CR291	F4	Q740	E2	R207	I6	R716	F1	VR170	I2
C380	F5	CR320	C5	Q745	C2	R210	I6	R718	F1	VR210	I5
C718	F1	CR734	G2	Q755	C1	R212	I5	R720	E1	VR280	F4
C720	E1	CR755	B2	Q760	A1	R215	I5	R724	E1	VR790	E1
C726	E1	CR756	B2	Q780	D2	R220	I3	R726	E1		
C734	D1	CR764	B1	Q782	E2	R227	H3	R730	D1		
C736	D2	CR766	A2	Q784	E2	R230	I3	R736	C2		
C752	C2	CR767	B2	Q790	E2	R237	H3	R738	C2		
C764	A1	CR800	B2	Q800	C2	R245	G4	R740	F2		
C782	F1	CR825	H2			R247	G4	R745	D2		
C785	F2			R10	J5	R250	G5	R746	C2		
C800	D2	J800	B3	R15	J6	R255	H3	R748	D1		
C810	B6	J801	C5	R20	L5	R256	F4	R749	B1		
C812	B6	J815	A5	R22	L4	R257	G4	R752	B2		
C814	A5			R25	J6	R258	F5	R760	B1		
C820	A5	K810	B5	R27	J6	R260	F5	R762	B1		
C840	H2	K812	B5	R29	J6	R265	F5	R764	B1		

MAIN BD 'B' SIDE
SHT. 1 OF 2

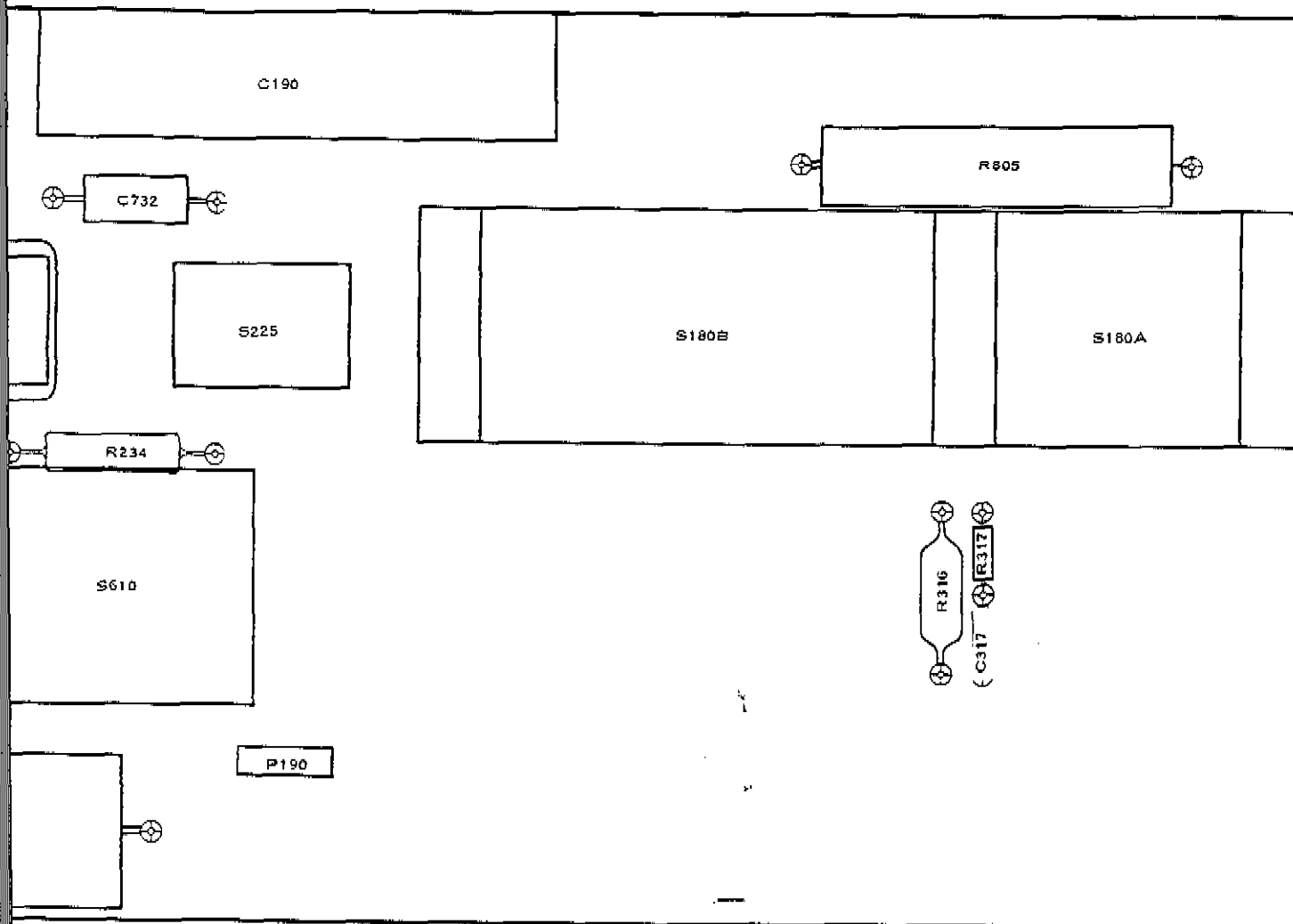
PARTS LOCATION GRID



MAID BD 1B' SIDE
SHT. 2 OF 2

PG 501

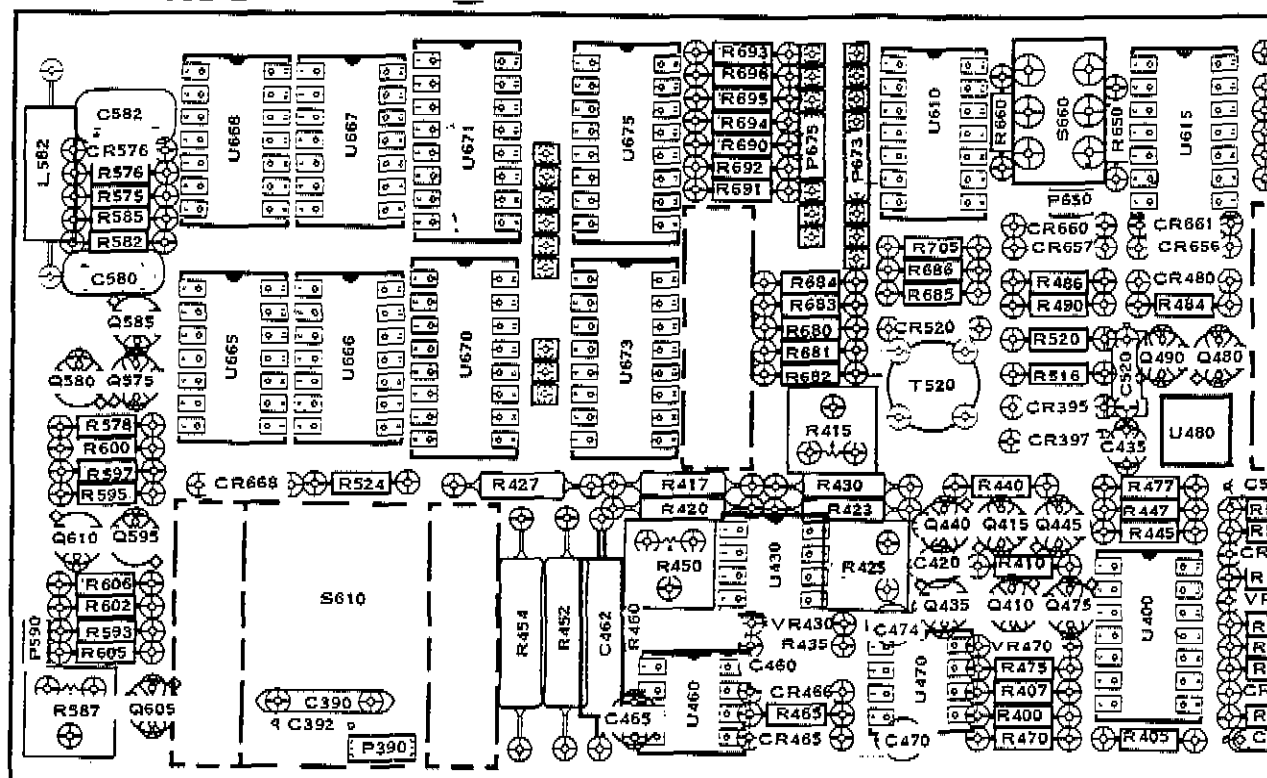
PARTS LOCATION GRID



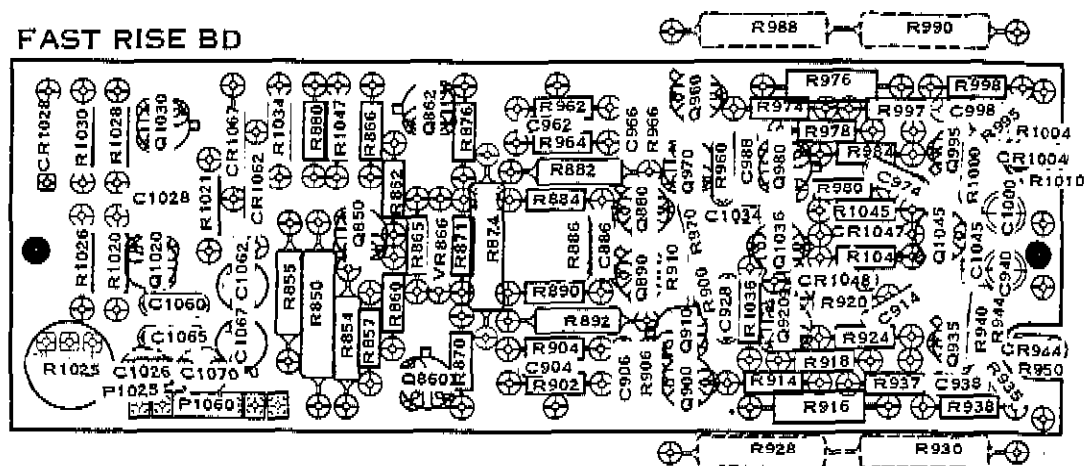
CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
C10	E6	C317	K4	L145	D2	R225	E3	S225	G3
C32	C4	C732	F2	L150	D3	R234	F3	S610	F4
C36	B3					R316	K4		
C45	D4	F30	B4	P65	E2	R317	K4	T130	B2
C135	C2	F65	B5	P190	G5	R805	K2		
C140	D2			P225	E2				
C170	E1	L35	D3			S180A	L3		
C190	G1	L65	C4	Q45	D5	S180B	J3		

PARTS LOCATION GRID

DVM PERIOD BD



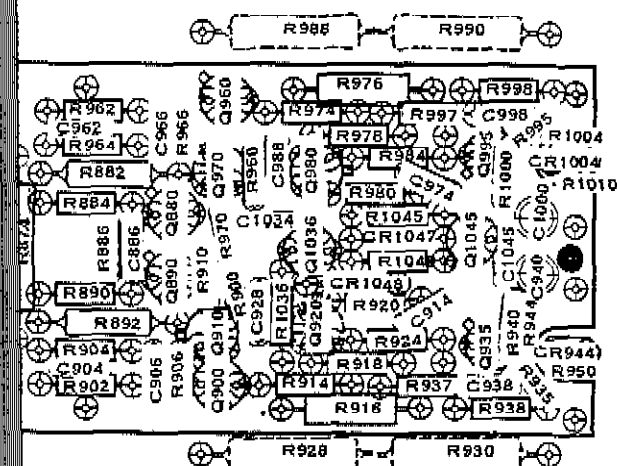
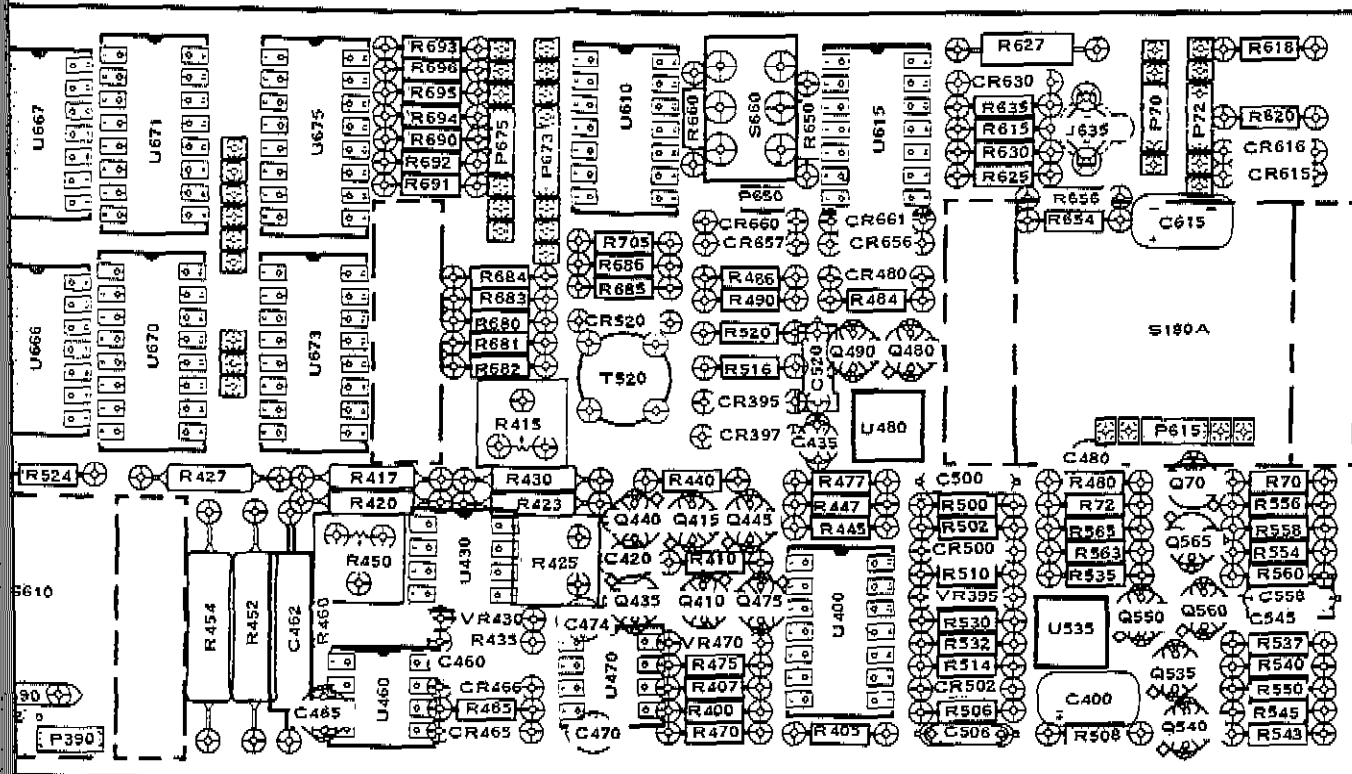
FAST RISE BD



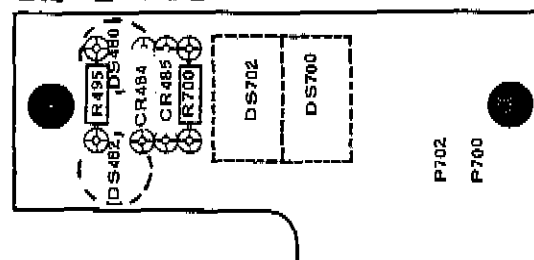
NOTE. COMPONENTS SHOWN WITH DASHED LINES ARE LOCATED ON BACK SIDE OF BD

4

PARTS LOCATION GRID



DISPLAY BD



ES ARE LOCATED ON BACK SIDE OF BD

DUM PERIOD B.D
SHT. 3 OF 3

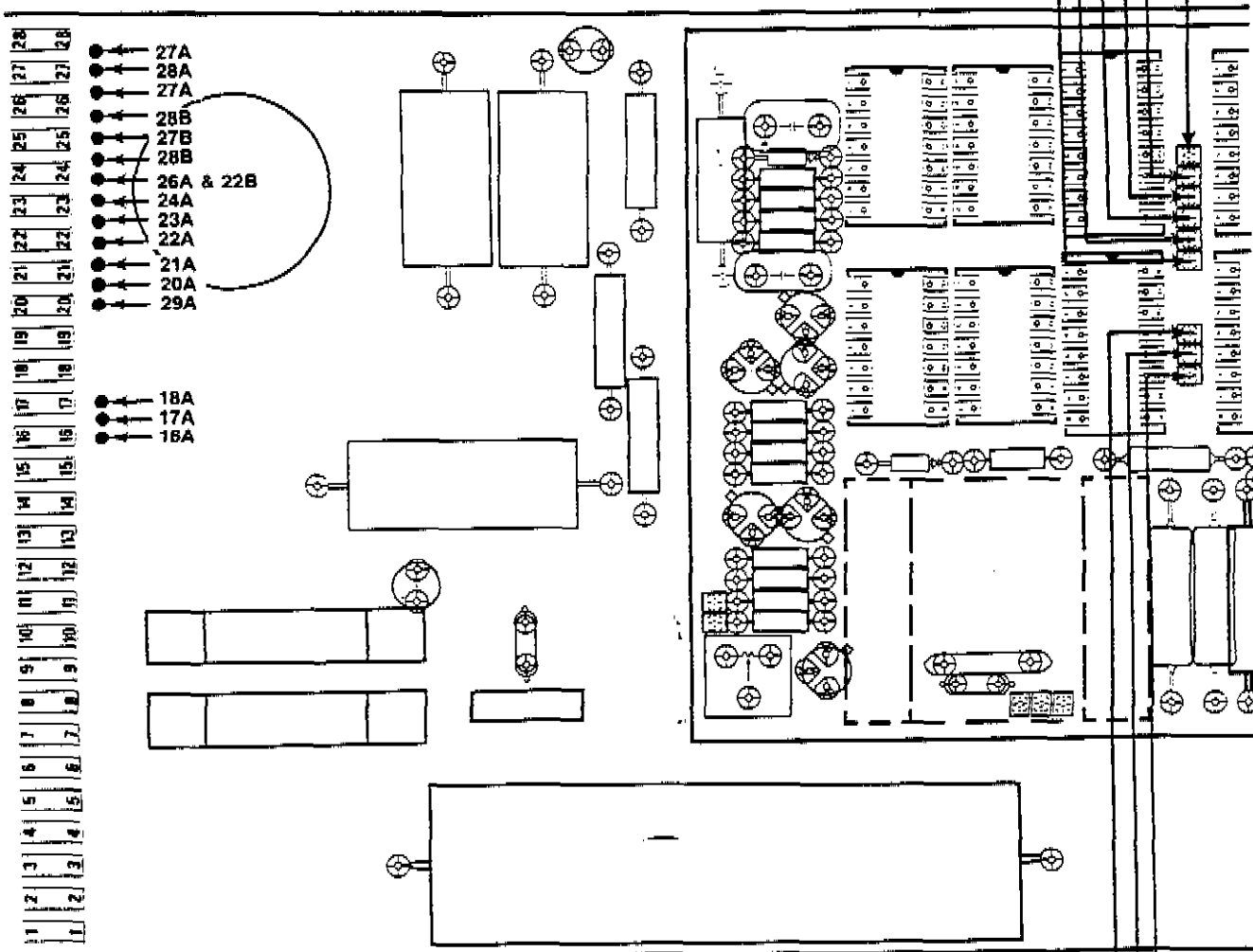
CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
C390	C4	CR657	G2	Q880	D6	R537	J4	R865	C6	R1045	E6
C392	C4	CR660	G2	Q890	D6	R540	J4	R866	C6	R1047	B6
C400	I4	CR661	H2	Q900	D7	R543	J4	R870	C7		
C420	F4	CR668	C3	Q910	D7	R545	J4	R871	C6	S180A	I2
C435	G3	CR944	F7	Q920	E7	R550	J4	R874	C6	S610	C4
C460	F4	CR1004	F6	Q935	F7	R554	J3	R876	C6	S660	G1
C462	E4	CR1028	A6	Q960	D6	R556	J3	R880	B6		
C465	E4	CR1047	E6	Q970	D6	R558	J3	R882	D6	T520	F3
C470	F4	CR1048	E6	Q980	E6	R560	J4	R884	D6		
C474	F4	CR1062	B6	Q995	F6	R563	I3	R886	D6	U400	H4
C480	I3	CR1067	B6	Q1020	B6	R565	I3	R890	D7	U430	F4
C500	H3			Q1030	B6	R575	B2	R892	D7	U460	E4
C506	H4	DS480	I6	Q1036	E6	R576	B1	R900	D7	U470	F4
C520	G2	DS482	I6	Q1045	F6	R578	B3	R902	D7	U480	A3
C545	J4	DS700	J6			R582	B2	R904	D7	U535	I4
C558	J4	DS702	I6	R70	J3	R585	B2	R906	D7	U610	F1
C580	B2			R72	I3	R587	B4	R910	D6	U615	H1
C582	B1	J635	I1	R400	G4	R593	B4	R914	E7	U665	C2
C615	I2			R405	H4	R595	B3	R916	E7	U666	C2
C666	D6	L582	B1	R407	G4	R597	B3	R918	E7	U667	C1
C904	D7			R410	G4	R600	B3	R920	E7	U668	C1
C906	D7	P70	I1	R415	F3	R602	B4	R924	E7	U670	D2
C914	E7	P72	I1	R417	E3	R605	B4	R928	E7	U671	D1
C928	D7	P390	D4	R420	E3	R606	B4	R930	F7	U673	E2
C938	F7	P590	B4	R423	F3	R615	H1	R935	F7	U675	E1
C940	F6	P615	I3	R425	F4	R618	J1	R937	E7		
C962	D6	P650	G2	R427	D3	R620	J1	R938	F7	VR395	H4
C966	D6	P673	F1	R430	F3	R625	H1	R940	F7	VR430	F4
C974	E6	P675	F1	R435	F4	R627	H1	R944	F7	VR470	G4
C988	E6	P700	J6	R440	G3	R630	H1	R950	F7	VR866	C6
C988	F6	P702	K6	R445	H3	R635	H1	R960	D6		
C1000	F6	P1025	A7	R447	H3	R650	H1	R962	D6		
C1026	A7	P1060	B7	R450	E3	R654	I2	R964	D6		
C1028	B6			R452	D4	R656	I2	R966	D6		
C1034	E6	Q70	I3	R454	D4	R660	G1	R970	D6		
C1045	F6	Q410	G4	R460	E4	R680	F2	R974	E6		
C1060	B7	Q415	G3	R465	F4	R681	F2	R976	E5		
C1062	B6	Q435	F4	R470	G4	R682	F2	R978	E6		
C1065	B7	Q440	F3	R475	G4	R683	F2	R980	E6		
C1067	B7	Q445	G3	R477	H3	R684	F2	R984	E6		
C1070	B7	Q475	G4	R480	I3	R685	F2	R988	E5		
		Q480	H2	R484	H2	R686	F2	R990	F5		
		Q490	H2	R486	G2	R690	E1	R995	F6		
CR395	G3	Q535	I4	R490	G2	R691	E1	R997	E6		
CR397	G3	Q540	I4	R495	I6	R692	E1	R998	F5		
CR465	F4	Q550	I4	R500	H3	R693	E1	R1000	F6		
CR466	H2	Q560	I4	R502	H3	R694	E1	R1004	F6		
CR484	I6	Q565	I3	R506	H4	R695	E1	R1010	F6		
CR485	I6	Q575	B3	R508	I4	R696	E1	R1020	A6		
CR500	H3	Q580	B3	R510	H4	R700	I6	R1021	B6		
CR502	H4	Q585	B2	R514	H4	R705	F2	R1025	A7		
CR520	F2	Q595	B3	R516	G2	R850	B7	R1026	A6		
CR576	B1	Q605	B4	R520	G2	R854	C7	R1028	A6		
CR615	J1	Q610	B3	R524	C3	R855	B7	R1030	A6		
CR616	J1	Q850	C6	R530	H4	R857	C7	R1034	B6		
CR630	H1	Q860	C7	R532	H4	R860	C7	R1036	E7		
CR656	H2	Q862	C6	R535	I4	R862	C6	R1040	E6		

LOCATIONS FOR USER WIRED REAR INTERFACE CONNECTIONS

TRIGGER OUT

Disconnect coax to front panel at J635 on DVM board and replace with proper length coax. Connect shield to either or both 28B and center conductor to 27B.

To 24A MSD A
To 23A MSD B
To 22A MSD C
To 21A MSD D
To 20A LSD A
To 19A LSD B



AMPLITUDE OUTPUT

Disconnect coax to front panel at J815 on main board and replace with proper length coax. Connect shield to either or both 27A and center conductor to 28A.

To 18A LSD C
To 17A LSD D
To 16A Hi-Lo

NOTE

Use flat ribbon-wire cable to connect digital information to rear interface.

REAR INTERFACE CONNECTOR ASSIGNMENTS

Remarks	Maximum Recommended Loads	Active Level	Output or Input	Pin B		Pin A	Output or Input	Active Level	Maximum Recommended Loads	Remarks
			Ground	28	Barrier Slot	28	Main output			Degrades performance slightly when used
			Trigger out	27		27	Ground			
				26		26	Ground			Factory wired
				25		25				
				24		24	MSD A out	H	One TTL	
				23	TM 500 Barrier Slot	23	MSD B out	H	One TTL	
Factory wired			BCD out ground	22		22	MSD C out	H	One TTL	
				21		21	MSD D out	H	One TTL	
				20		20	LSD A out	H	One TTL	
				19		19	LSD B out	H	One TTL	
				18		18	LSD C out	H	One TTL	
				17		17	LSD D out	H	One TTL	
				16		16	HIGH-LOW output	Output is low when HIGH display light is on.		
				15		15				
				14		14				
	*25 V ac winding			13		13	*25 V ac winding			
	+33.5 V filtered dc			12		12	+33.5 V filtered dc			
	*Collector lead of pnp series-pass			11		11	*Base of lead of pnp series-pass			
	Transformer shield			10		10	*Emitter lead of pnp series-pass			
	±33.5 V common return			9		9	±33.5 V common return			
	-33.5 V filtered dc			8		8	-33.5 V filtered dc			
	*Collector lead of npn series-pass			7		7	*Emitter lead of npn series-pass			
	No connection			6		6	*Base lead of npn series-pass			
	17.5 V ac winding			5		5	17.5 V ac winding			
	*+11.5 V common return			4		4	*+11.5 V common return			
	*+11.5 V common return			3		3	*+11.5 V common return			
	*+11.5 V filtered dc			2		2	*+11.5 V filtered dc			
	*25 V ac winding			1		1	*25 V ac winding			
				B		A				

Rear view of plug-in

Assignments listed for pins 1A—13A and 1B—13B are available in all power modules; however only those pins marked with an asterisk (*) are used by the PG 506. Only 22B and 26A, ground, are factory wired. See the accompanying illustration for wiring instructions.

DEFLECT
Readout

Two d
0.1%).
AMPL m
ABLE k
When V
is rotate
used to
centage
oscillosc
horizontal
light is o
AMPL m

AMPLITUDE

Selects
amplitude
50Ω load
connects
OUTPUT

+ TRIGGER

Used as
to pre
equipment

PERIODIC

Controls
period
signal for
AMPL
modes
on only
is in a
FAST RIS

CONTROLS AND CONNECTORS

DEFLECTION ERROR Readout

Two digits (resolution 0.1%). Operates in STD AMPL mode when VARIABLE knob is released. When VARIABLE control is rotated, LED display is used to indicate percentage errors related to oscilloscope vertical and horizontal deflection. Dial light is on only for the STD AMPL mode.

AMPLITUDE

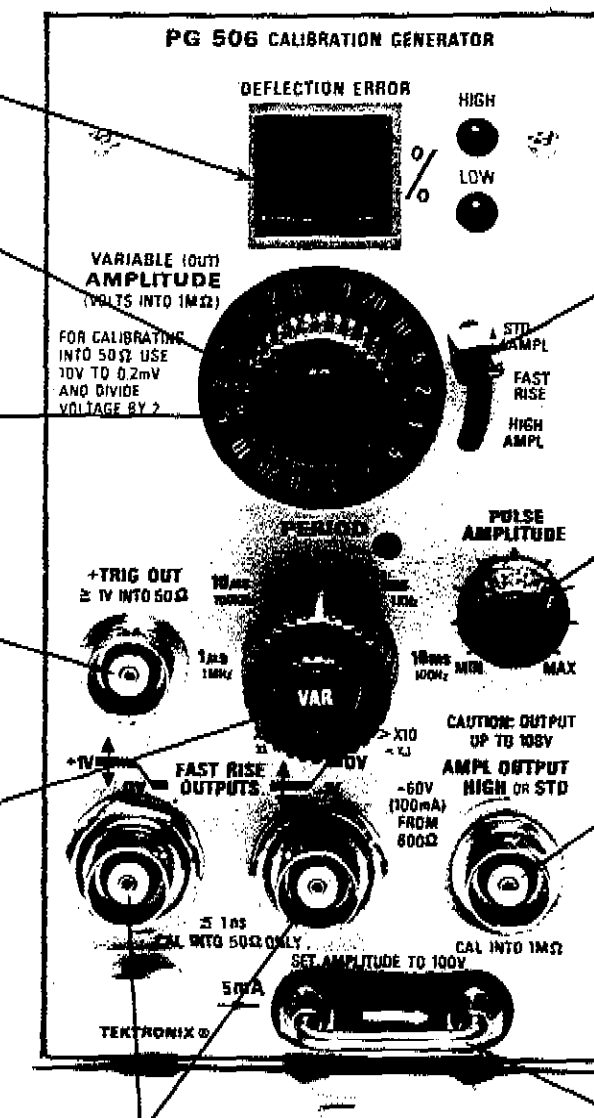
Selects calibrated output amplitudes across 1Ω or 50Ω load attached to BNC connector labeled AMPL OUTPUT (STD).

TRIG OUT

Used as a signal source to pretrigger external equipment.

PERIOD/VAR

Controls determine the period of square-wave signal for either the HIGH AMPL or FAST RISE modes. PERIOD light is on only when instrument is in a HIGH AMPL or FAST RISE mode.



Mode Switch

Determines whether instrument is operated in a STD AMPL, HIGH AMPL, or FAST RISE mode.

PULSE AMPLITUDE

Controls output amplitude at AMPL OUTPUT (HIGH) or FAST RISE BNC connectors.

AMPL OUTPUT (HIGH or STD)

Common BNC output connector for STD AMPL or HIGH AMPL modes. 1 kHz square wave or dc for STD AMPL. Period of HIGH AMPL square wave set by PERIOD controls.

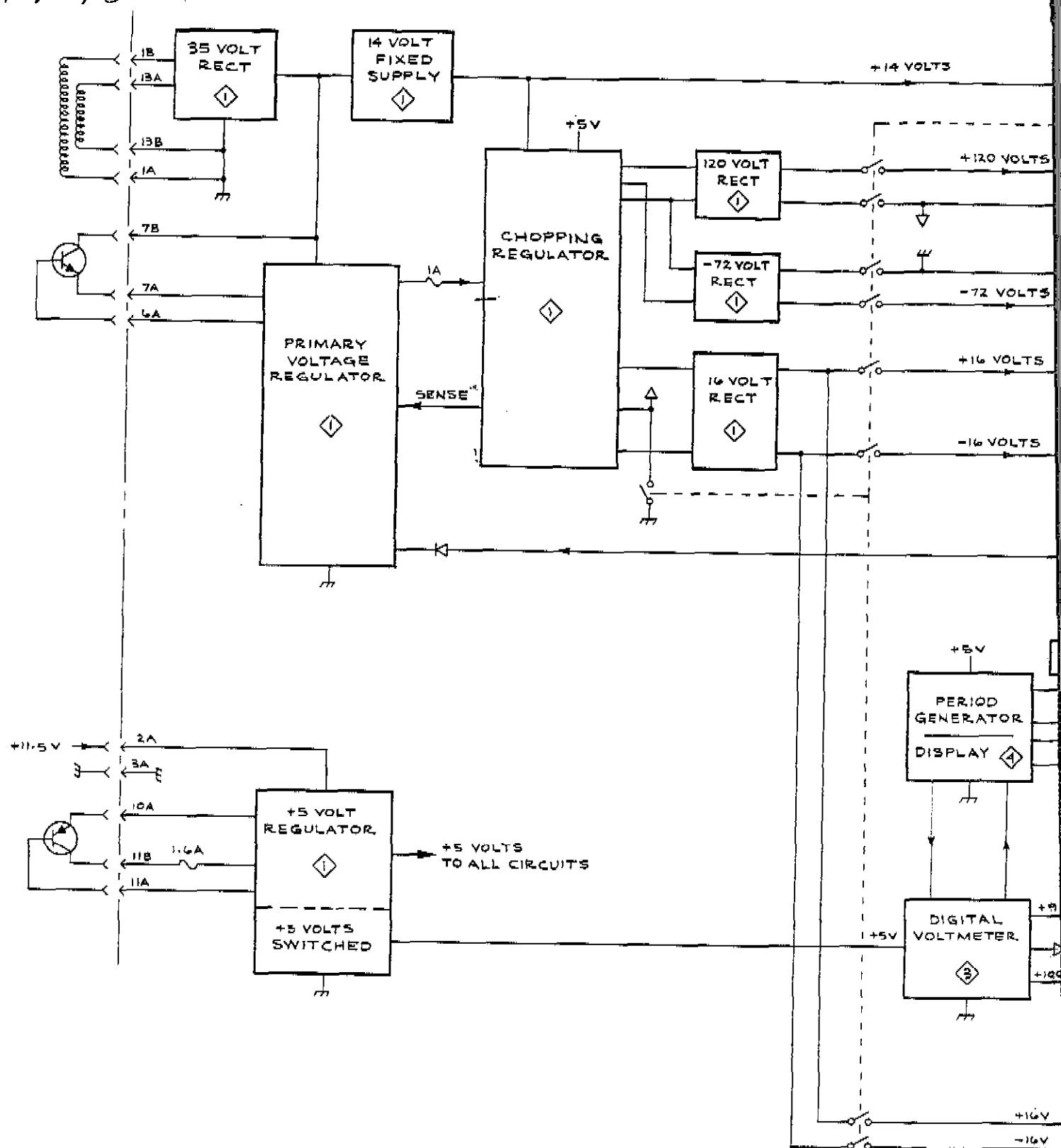
CURRENT LOOP

1 kHz square-wave current or dc as selected by internal switch. LED display must be off or adjusted to read 0.0% for calibrated 5 mA. VARIABLE (OUT) control will vary current through the loop, but DEFLECTION ERROR Readout is not directly related to current deviations.

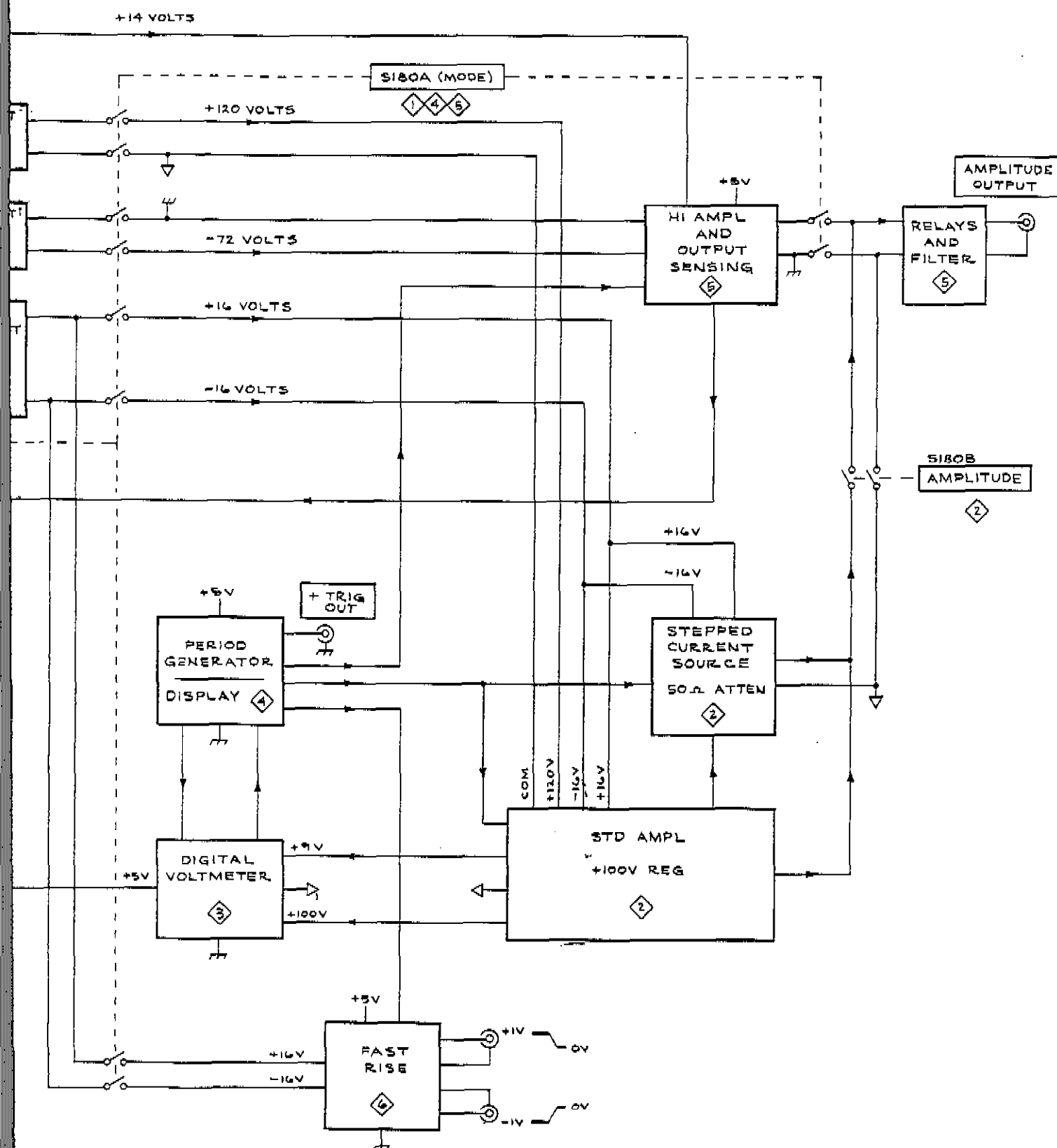
FAST RISE OUTPUTS

BNC connectors for simultaneous positive-going and negative-going square waves as selected by PERIOD/VAR controls.

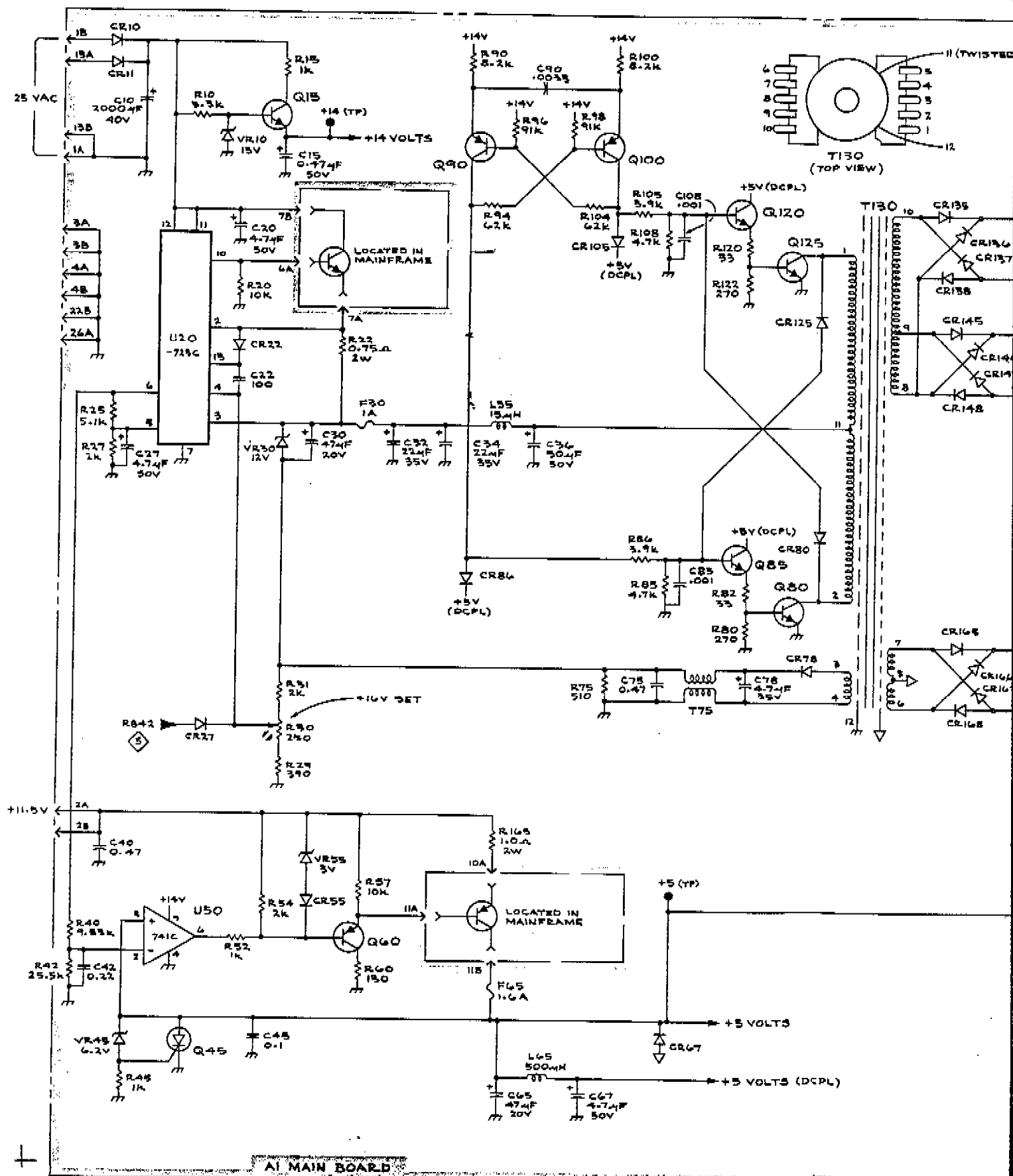
BLOCK DIAG. SHT. 1 of 2



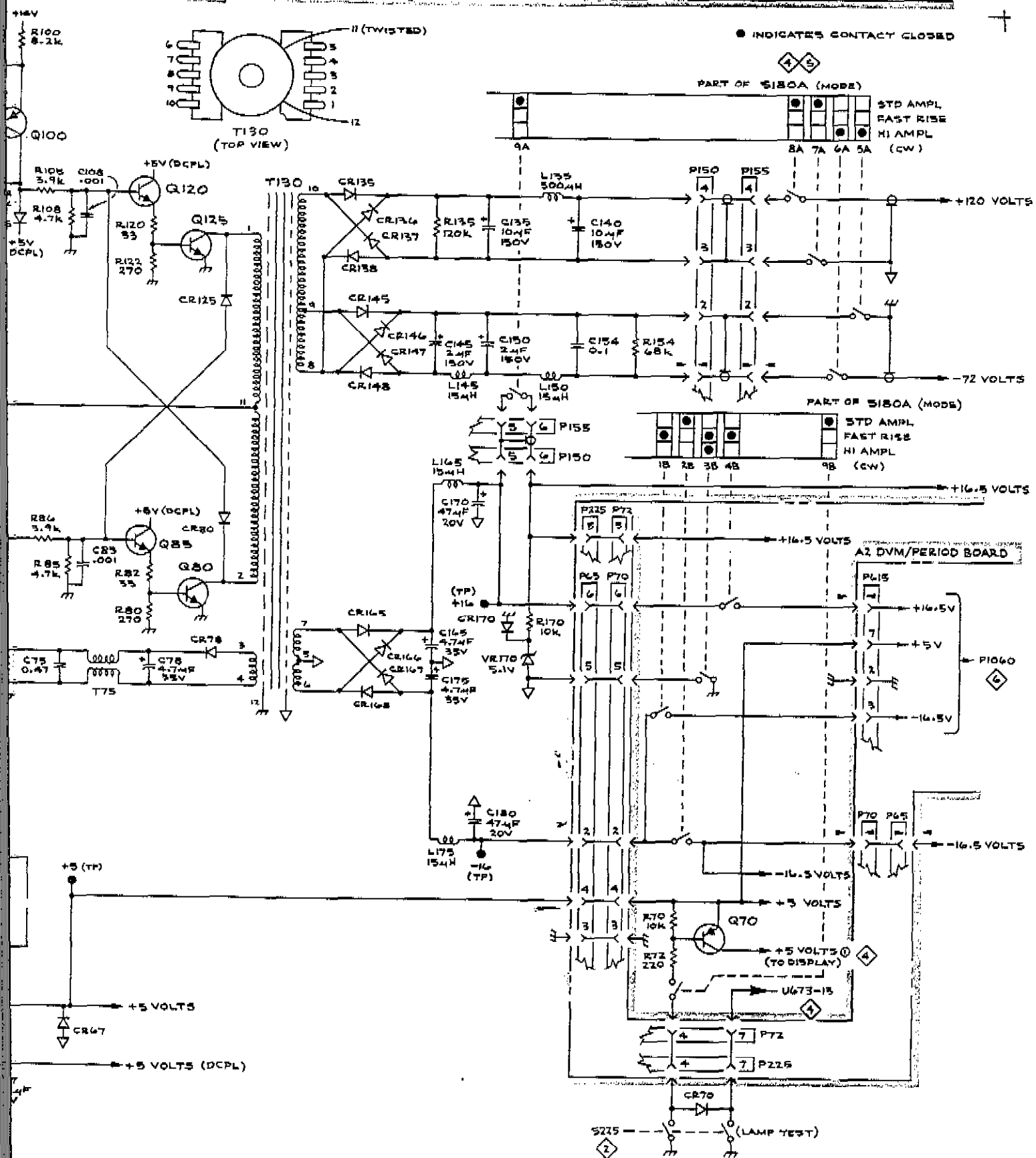
BLOCK DIAG.
SHT. 2 of 2



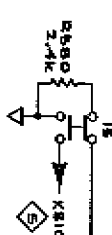
PRIMARY POWER SHT.10F2



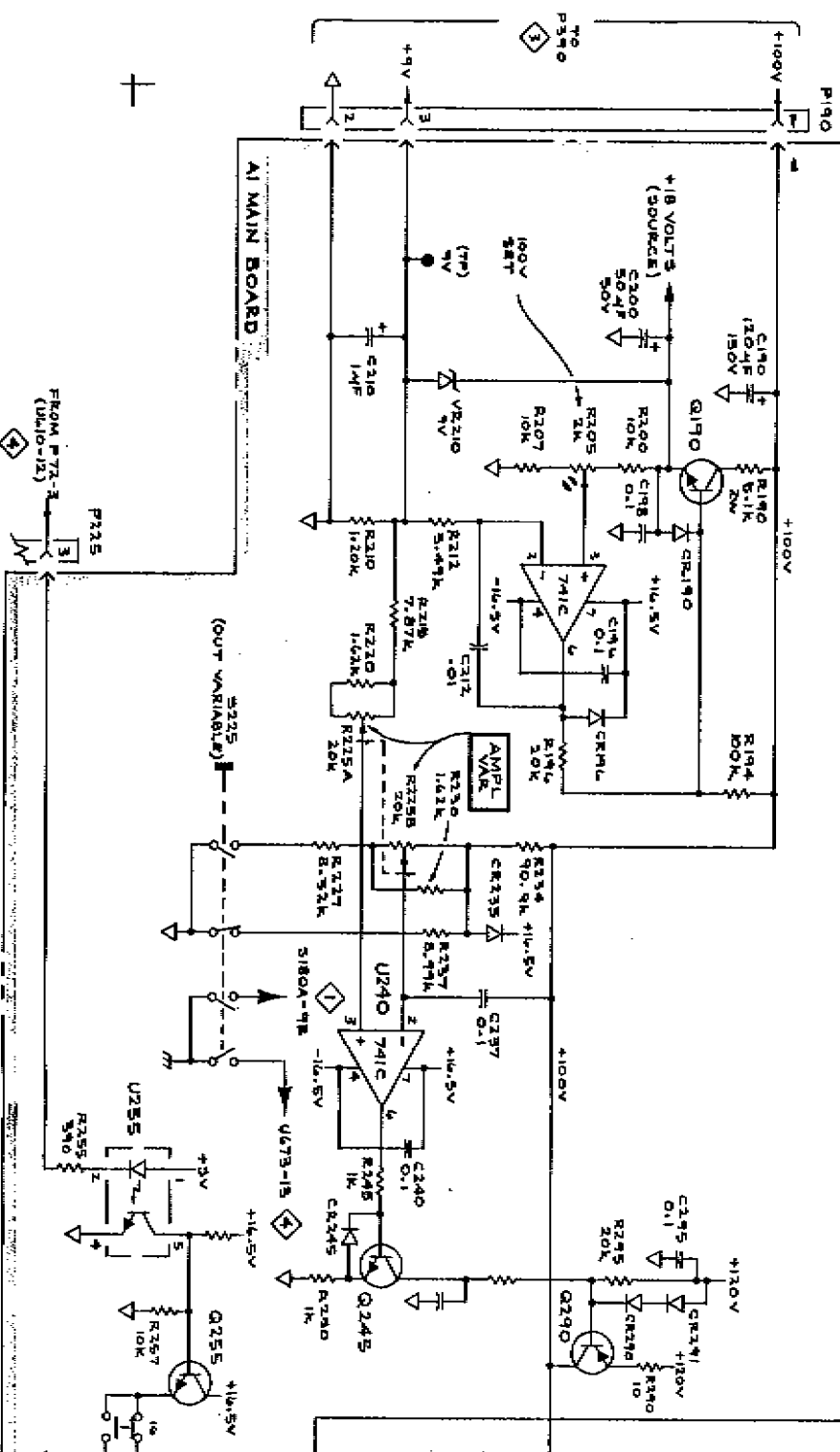
PRIMARY POWER
SHT. 2 OF 2



SHIT 1062



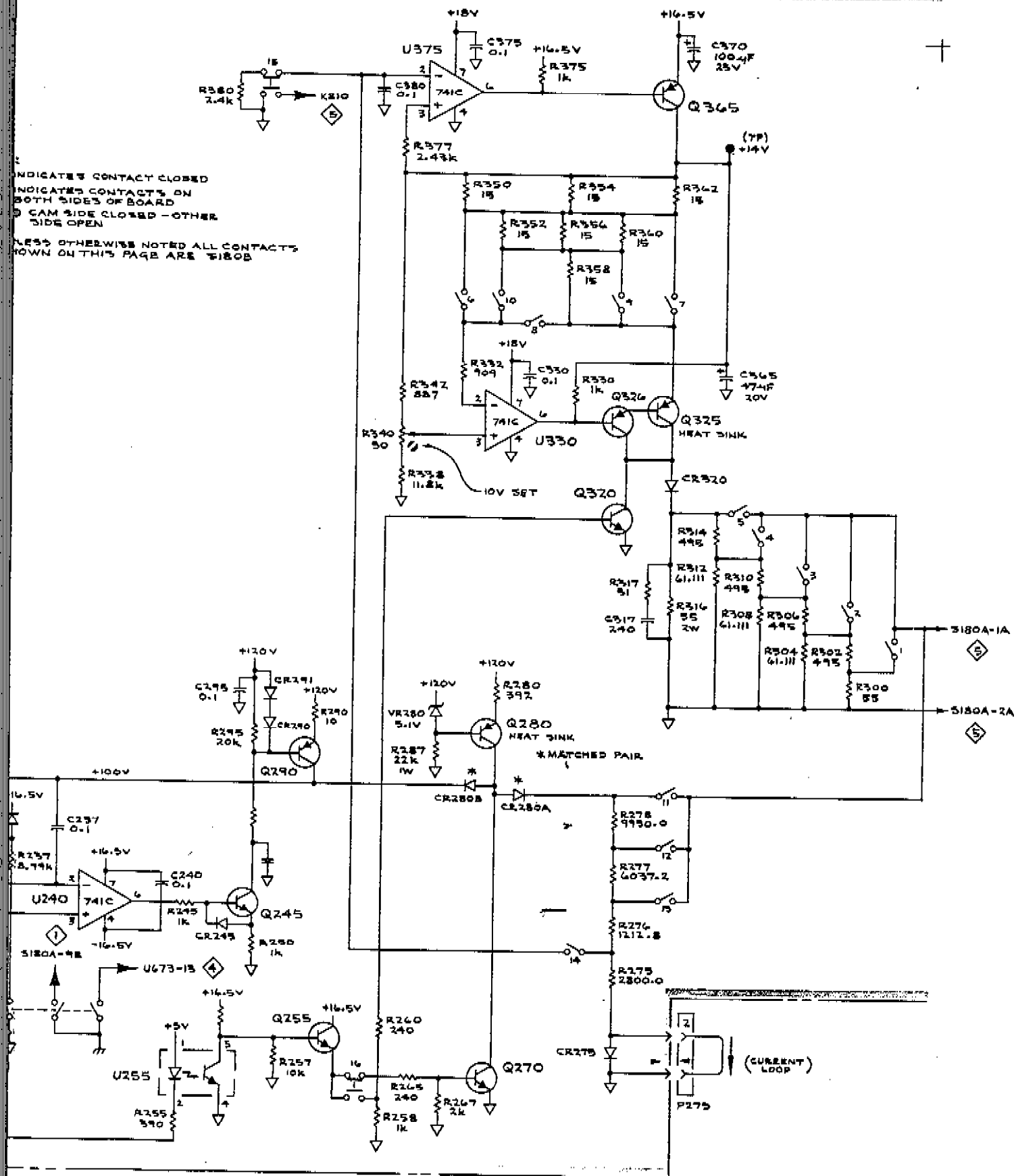
- Page 506



STANDARDAMP
SHT. 2012

INDICATES CONTACT CLOSED
INDICATES CONTACTS ON
BOTH SIDES OF BOARD
CAM SIDE CLOSED - OTHER
SIDE OPEN

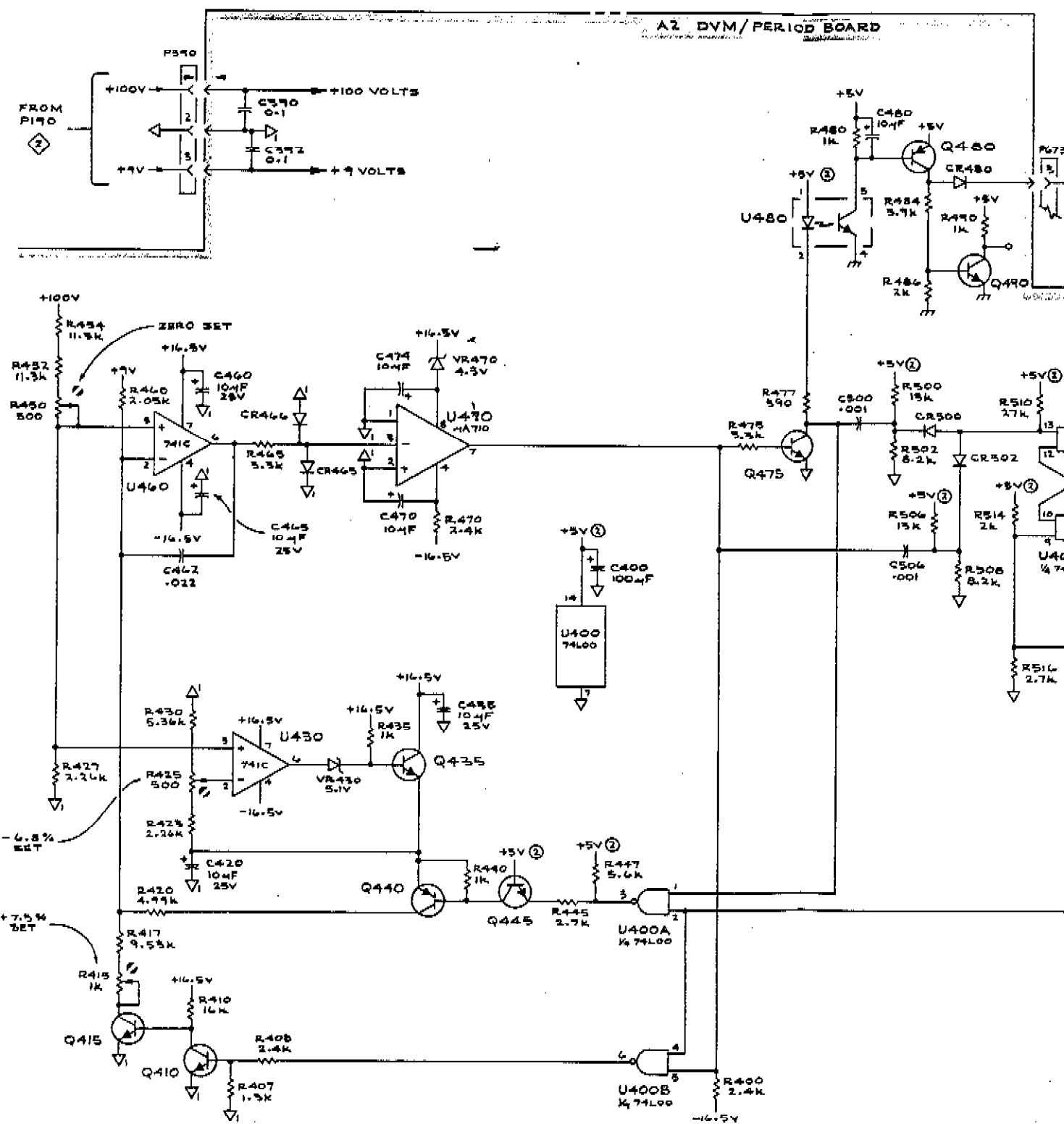
LESS OTHERWISE NOTED ALL CONTACTS
TOWN ON THIS PAGE ARE FIBOB



STANDARD AMPLITUDE

0974

DIGITAL VOLT METER SHT. 1 OF 2

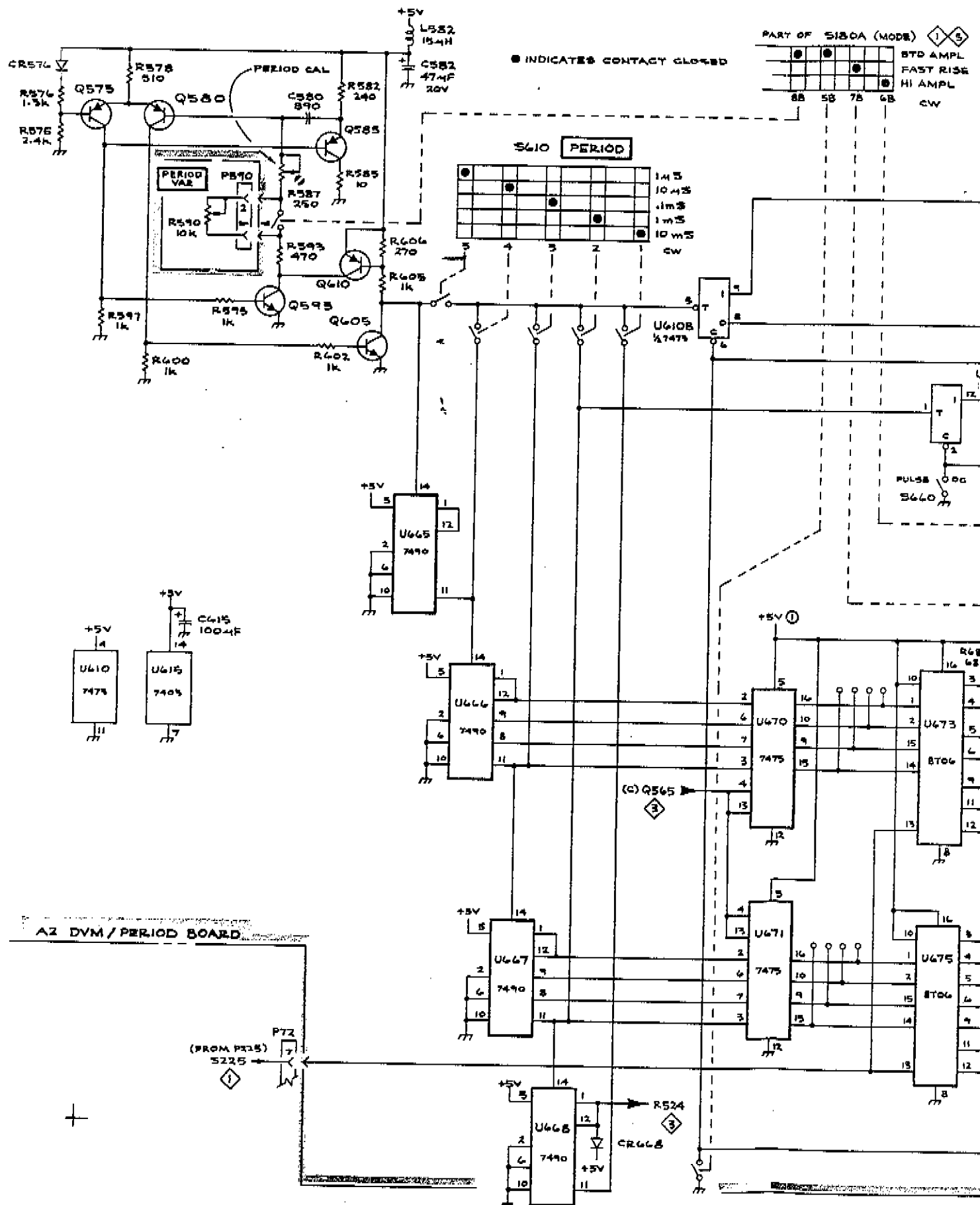


7Z OVM/PERIOD BOARD



PERIOD GENERATOR

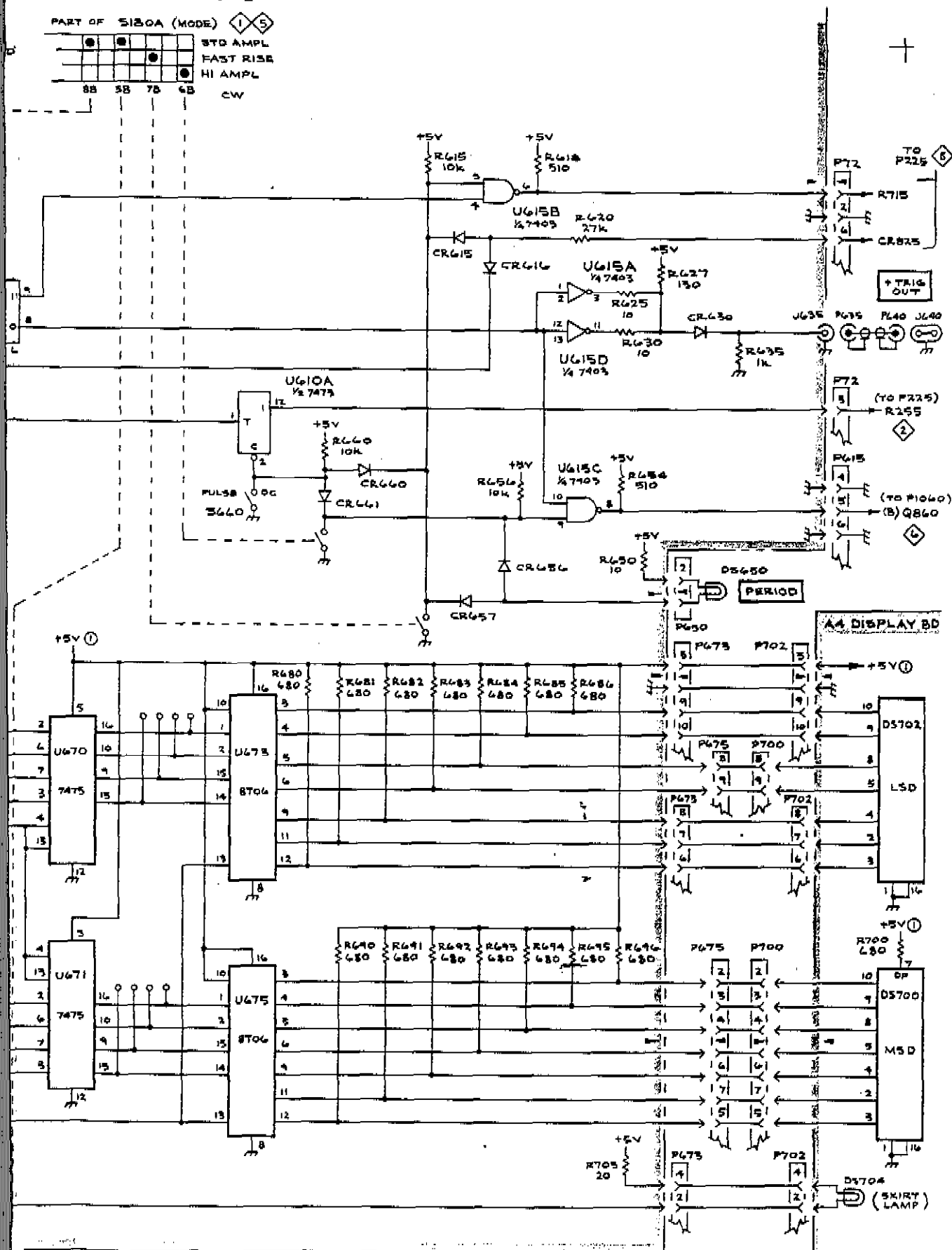
SHT. 1 OF 2



PERIOD GENERATOR SHT. 2 of 2

PART OF 5120A (MODE) 1 5

88	58	78	68
STD AMPL			
FAST RISE			
HI AMPL			
CW			

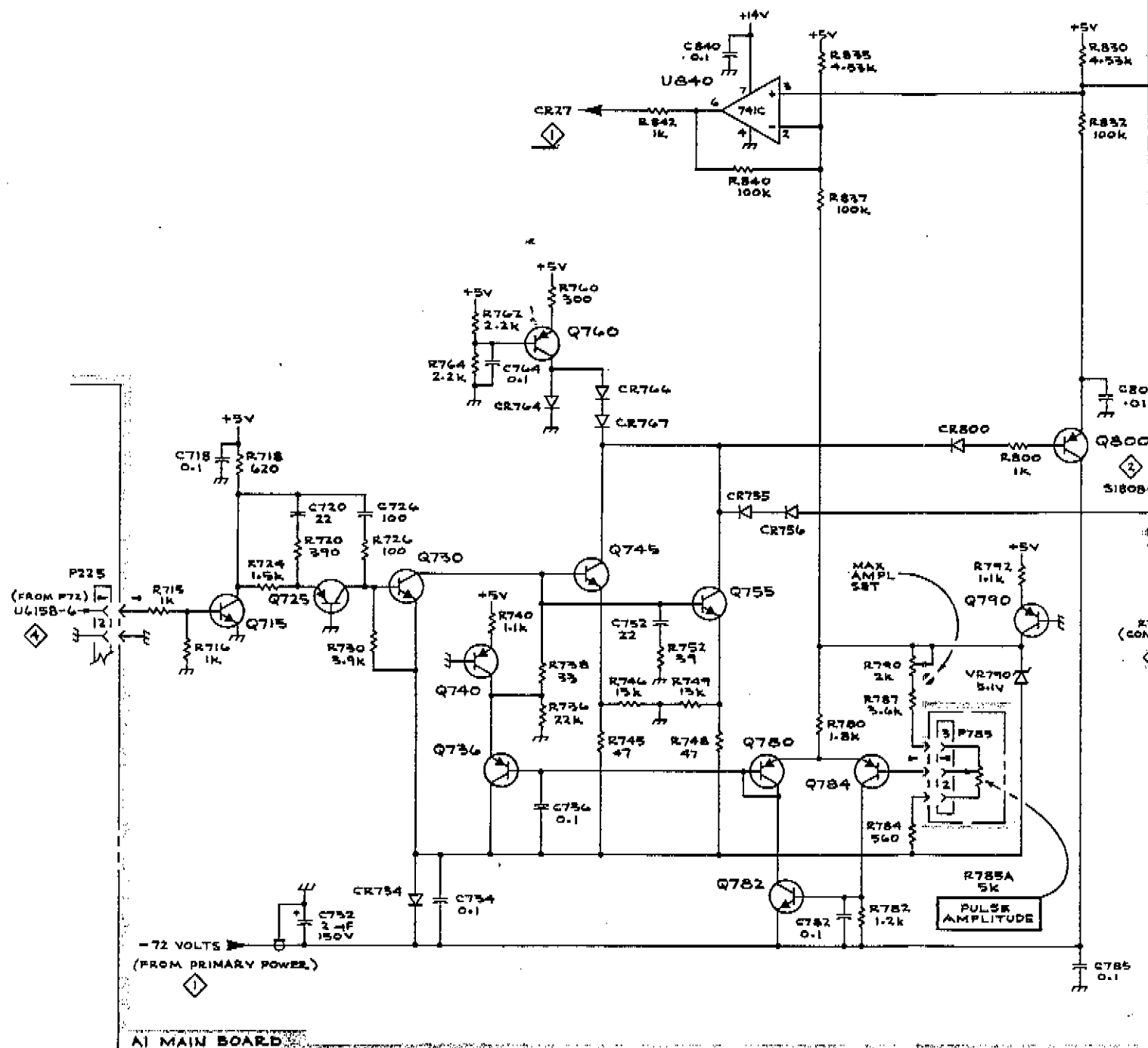


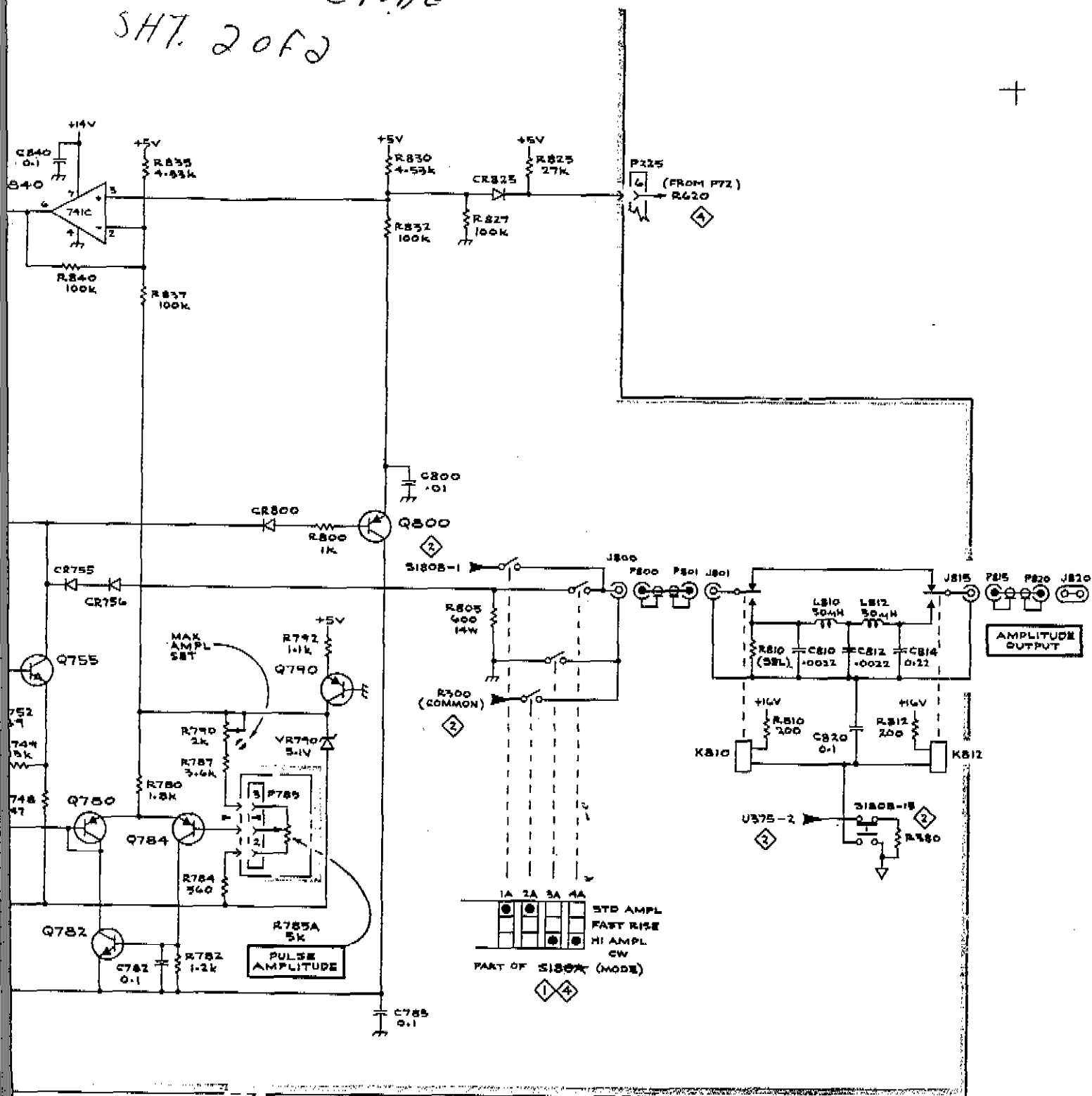
PERIOD GENERATOR AND DISPLAY

DEM 1074

PERIOD GENERATOR
AND DISPLAY

HIGH AMPLITUDE
SAT. 10F2





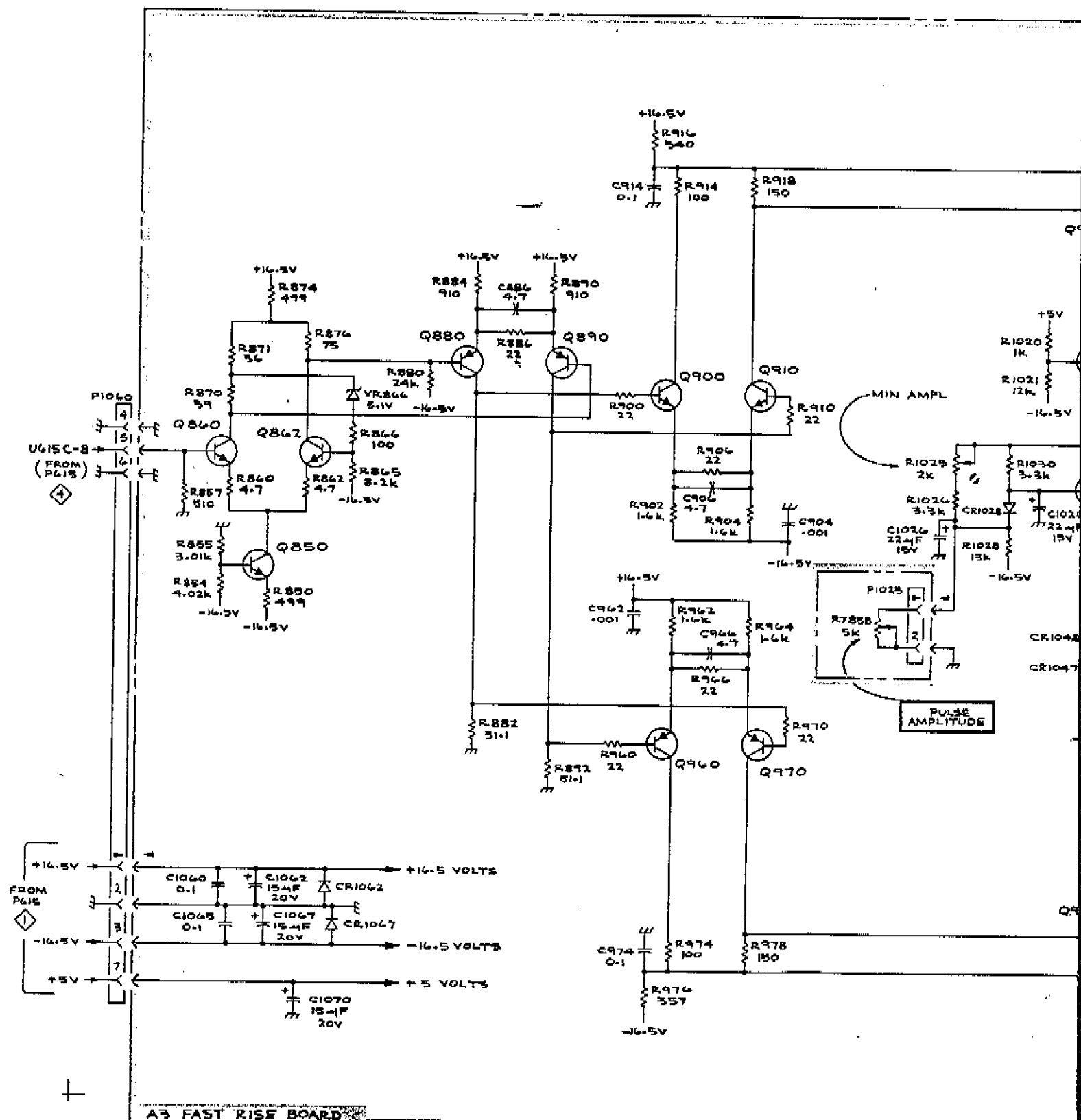
@

High Amplitude

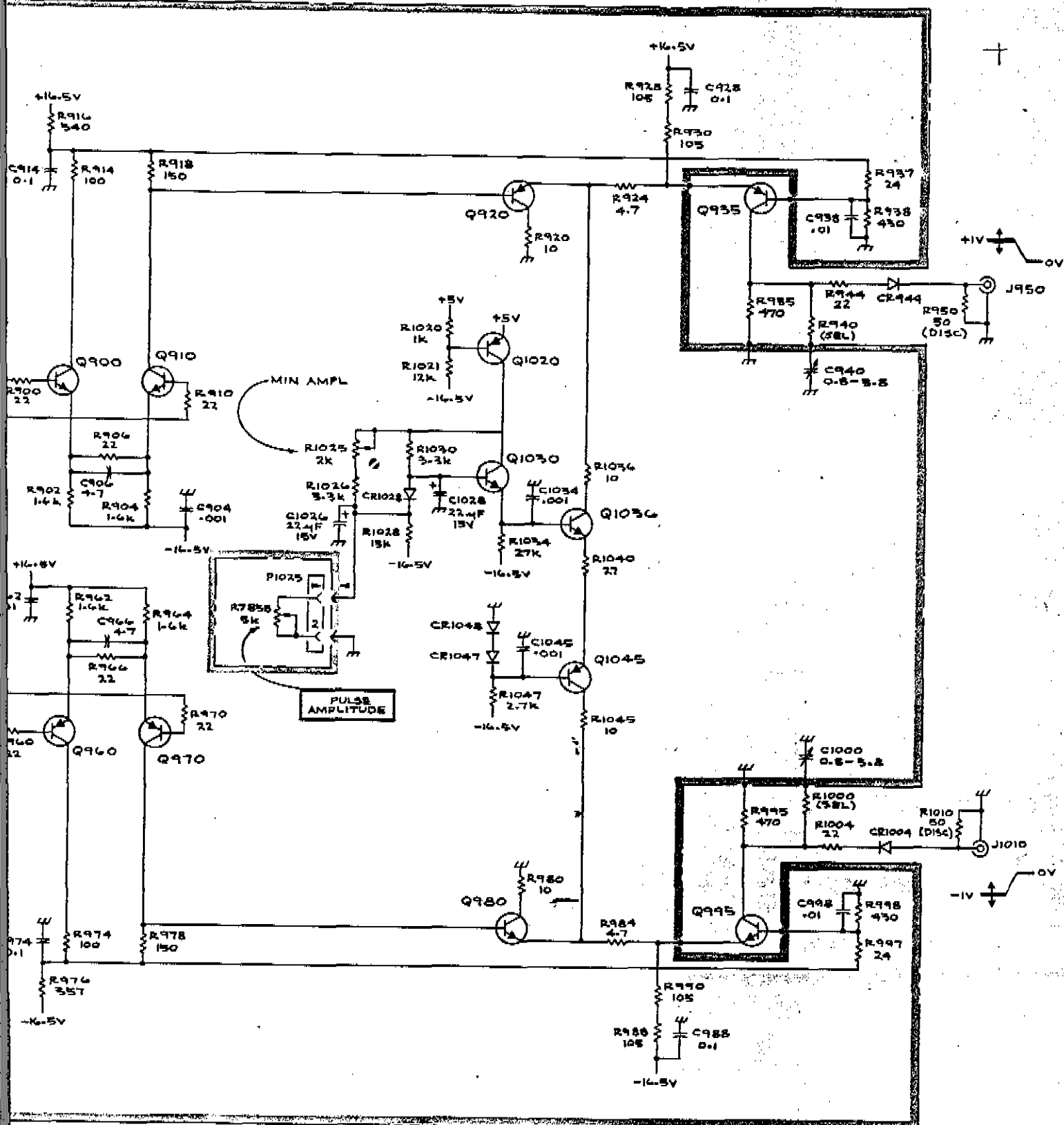
5

DEM 1074

FAST RISE
SHT. 10f2



FAST RISE 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	ELECTRN	ELECTRON	IN	INCH	SE	SINGLE END
ACTA	NUMBER SIZE	ELEC	ELECTRICAL	INCAND	INCANDESCENT	SECT	SECTION
ADPTR	ACTUATOR	ELECTLT	ELECTROLYTIC	INSUL	INSULATOR	SEMICOND	SEMICONDUCTOR
ALIGN	ADAPTER	ELEM	ELEMENT	INTL	INTERNAL	SHLD	SHIELD
AL	ALIGNMENT	EPL	ELECTRICAL PARTS LIST	LPHLDR	LAMPHOLDER	SHLDR	SHOULDERED
AL	ALUMINUM	EQPT	EQUIPMENT	MACH	MACHINE	SKT	SOCKET
ASSEM	ASSEMBLED	EXT	EXTERNAL	MECH	MECHANICAL	SL	SLIDE
ASSY	ASSEMBLY	FIL	FILLISTER HEAD	MTG	MOUNTING	SLFLKG	SELF-LOCKING
ATTEN	ATTENUATOR	FLEX	FLEXIBLE	NIP	NIPPLE	SLVG	SLEEVEING
AWG	AMERICAN WIRE GAGE	FLH	FLAT HEAD	NON WIRE	NOT WIRE WOUND	SPR	SPRING
BD	BOARD	FLTR	FILTER	OBD	ORDER BY DESCRIPTION	SQ	SQUARE
BRKT	BRACKET	FR	FRAME or FRONT	OD	OUTSIDE DIAMETER	SST	STAINLESS STEEL
BRS	BRASS	FSTNR	FASTENER	OVH	OVAL HEAD	STL	STEEL
BRZ	BRONZE	FT	FOOT	PH BRZ	PHOSPHOR BRONZE	SW	SWITCH
BUSHG	BUSHING	FXD	FIXED	PL	PLAIN or PLATE	T	TUBE
CAB	CABINET	GSKT	GASKET	PLSTC	PLASTIC	TERM	TERMINAL
CAP	CAPACITOR	HDL	HANDLE	PN	PART NUMBER	THD	THREAD
CER	CERAMIC	HEX	HEXAGON	PNH	PAN HEAD	THK	THICK
CHAS	CHASSIS	HEX HD	HEXAGONAL HEAD	PWR	POWER	TNSN	TENSION
CKT	CIRCUIT	HEX SOC	HEXAGONAL SOCKET	RCPT	RECEPTACLE	TPG	TAPPING
COMP	COMPOSITION	HLCPS	HELICAL COMPRESSION	RES	RESISTOR	YAH	TRAUSS HEAD
CONN	CONNECTOR	HLEXT	HELICAL EXTENSION	RGD	RIGID	V	VOLTAGE
COV	COVER	HV	HIGH VOLTAGE	RLF	RELIEF	VAR	VARIABLE
CPLG	COUPLING	IC	INTEGRATED CIRCUIT	RTNR	RETAINER	W/	WITH
CRT	CATHODE RAY TUBE	ID	INSIDE DIAMETER	SCH	SOCKET HEAD	WSHR	WASHER
DEG	DEGREE	IDNT	IDENTIFICATION	SCOPE	OSCILLOSCOPE	XFMR	TRANSFORMER
DWR	DRAWER	IMPLR	IMPELLER	SCR	SCREW	XSTR	TRANSISTOR

CROSS INDEX MFR. CODE NUMBER TO MANUFACTURER

MFR.CODE	MANUFACTURER	ADDRESS	CITY,STATE,ZIP
00779	AMP, Inc.	P. O. Box 3608	Harrisburg, PA 17105
01295	Texas Instruments, Inc., Semiconductor Group	P. O. Box 5012 Audubon Road	Dallas, TX 75222 Wakefield, MA 01880
05820	Wakefield Engineering, Inc.	7100 Lampsom Ave.	Garden Grove, CA 92642
08261	Spectra-Strip Corp.	Youk Expressway	New Cumberland, PA 17070
22526	Berg Electronics, Inc.		
23499	Gavitt Wire and Cable, Division of RSC Industries, Inc.	455 N. Quince St. 3560 Madison Ave.	Escondido, CA 92025 Indianapolis, IN 46227
24931	Specialty Connector Co., Inc.	1-21 East Jefferson St.	Waupun, WI 53963
42838	National Rivet and Mfg. Co.	1 Peekay Drive	Clifton, NJ 07014
45722	USM Corp., Parker-Kalon Fastener Div.		
70278	Allied Steel and Conveyors, Div. of Sparton Corp.	17333 Healy	Detroit, MI 48212
73743	Fischer Special Mfg. Co.	446 Morgan St.	Cincinnati, OH 45206
74445	Holo-Krome Co.	31 Brook St. West	Hartford, CT 06110
78189	Illinois Tool Works, Inc. Shakeproof Division	St. Charles Road	Elgin, IL 60120
79807	Wrought Washer Mfg. Co.	2100 S. O Bay St.	Milwaukee, WI 53207
80009	Tektronix, Inc.	P. O. Box 500	Beaverton, OR 97077
82647	Texas Instruments, Inc., Control Products Div.	34 Forest St.	Attleboro, MA 02703
83330	Smith, Herman H., Inc.	812 Snediker Ave.	Brooklyn, NY 11207
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
97464	Industrial Retaining Ring Co.	57 Cordier St.	Irvington, NJ 07111
98278	Malco A Microdot Co., Inc., Connector and Cable Division	220 Pasadena Ave.	South Pasadena, CA 91030

Mechanical Parts List—PG 506

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Discont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-1	337-1399-04			2		SHLD,ELECTRICAL:SIDE	80009	337-1399-04
-2	366-1168-00			1		KNOB,BLACK CAP AND RED BODY W/SETSCREW	80009	366-1168-00
	213-0153-00			1		. SETSCREW:5-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-3	366-1346-02			1		KNOB:RED	80009	366-1346-00
	213-0153-00			1		. SETSCREW:5-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-4	366-1567-00			1		KNOB:GRAY W/SETSCREW	80009	366-1567-00
	213-0153-00			2		. SETSCREW:5-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-5	366-1521-00			1		KNOB:W/SKIRT	80009	366-1521-00
	213-0153-00			2		. SETSCREW:5-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-6	366-0494-00			1		KNOB:GRAY WITH SETSCREW	80009	366-0494-00
	213-0153-00			1		. SETSCREW:5-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-7	366-0215-02			1		KNOB:LEVER SWITCH	80009	366-0215-02
-8	366-1422-01			1		KNOB:LATCH	80009	366-1422-01
						(ATTACHING PARTS)		
-9	214-1840-00			1		PIN,KNOB SECRG:	80009	214-1840-00
						- - - - *		
-10	131-1315-00			2		CONNECTOR,RCPT,:BNC,FEMALE	80009	131-1315-00
-11	342-0117-00			2		INSULATOR,BSHG:	80009	342-0117-00
-12	119-0238-00			1		COIL,CAL:	80009	119-0238-00
						(ATTACHING PARTS)		
-13	210-0593-00			2		NUT,FINISHING:0.25 HEX X 0.312" LONG,BRS	80009	210-0593-00
-14	210-0004-00			2		WASHER,LOCK:INTL,0.12 ID X 0.26"OD,STL	78189	1204-00-00-0541C
-15	210-0994-00			2		WASHER,FLAT:0.125 ID X 0.25" OD,STL	83385	OBD
-16	210-0849-00			2		WSHR,SHOULDERED:0.11 ID X 0.188"OD,FIBER	83330	2151
-17	210-0406-00			2		NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
						- - - - *		
-18	361-0059-01			1		SPACER,CUR LOOP:1.094 X 0.344X 0.125 INCH	80009	361-0059-01
-19	358-0414-00			2		BUSHING,SLEEVE:0.25 OD X 0.21 INCH LONG	80009	358-0414-00
-20	358-0378-00			2		BUSHING,SLEEVE:PRESS MOUNT	80009	358-0378-00
-21	-----			1		RES.,VARIABLE:(SEE R785A,B EPL)		
						(ATTACHING PARTS)		
-22	210-0583-00			1		NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS	73743	2X20319-402
-23	210-0940-00			1		WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL	79807	OBD
						- - - - *		
-24	-----			1		CKT BOARD ASSY:FAST RISE(SEE A3 EPL)		
						(ATTACHING PARTS)		
-25	220-0695-00			2		NUT,PLAIN,DODEC:	80009	220-0695-00
-26	210-0406-00			1		NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
-27	211-0109-00			1		SCREW,MACHINE:4-40 X 0.875"100 DEG,FLH STL	83385	OBD
						- - - - *		
-28	361-0682-00			1		SPACER,SLEEVE:0.648 X 0.189 BRS	80009	361-0682-00
	-----			-		. CKT BOARD INCLUDES:		
-29	131-1727-00			2		. CONNECTOR,RCPT,:BNC,FEMALE,CKT CARD MT	24931	28JR262-1
-30	131-0608-00			9		. CONTACT,ELEC:0.365 INCH LONG	22526	47357
-31	333-1863-00			1		PANEL,FRONT:	80009	333-1863-00
						(ATTACHING PARTS)		
-32	210-0405-00			2		NUT,PLAIN,HEX.:2-56 X 0.188 INCH,BRS	73743	2X12157-402
-33	210-0001-00			2		WASHER,LOCK:INTL,0.092 ID X 0.18" OD STL	78189	OBD
-34	211-0034-00			2		SCREW,MACHINE:2-56 X 0.5,PNH STL,CD PL	83385	OBD
						- - - - *		
-35	352-0157-00			1		LAMPHOLDER:WHITE PLASTIC	80009	352-0157-00
-36	200-0935-00			1		BASE,LAMPHOLDER:0.29 OD X 0.19" L,BK PLSTC	80009	200-0935-00
-37	378-0602-03			1		LENS,IND LIGHT:BLUE	80009	378-0602-03
-38	386-2843-00			1		SUBPANEL,FRONT:	80009	386-2843-00
						(ATTACHING PARTS)		
-39	213-0229-00			4		SCR,TPG,THD FOR:6-20X0.375 100 DEG,FLH STL	83385	OBD
						- - - - *		
-40	214-1513-01			1		LCH,PLUG-IN RET:	80009	214-1513-01
						(ATTACHING PARTS)		
-41	213-0254-00			1		SCR,TPG,THD CTG:2-56X0.25"100 DEG,FLH STL	45722	OBD
						- - - - *		
-42	378-0742-00			1		LENS,LIGHT:CLEAR	80009	378-0742-00
-43	337-1955-00			1		SHIELD,ELEC:	80009	337-1955-00

Mechanical Parts List—PG 506

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Qty Dscnt	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
1-44	-----	-----	1						CKT BOARD ASSY:DISPLAY(SEE A4 EPL)		
	-----	-----	-						. CKT BOARD ASSY INCLUDES:		
-45	-----	-----	2						. LAMP,INCAND:(SEE DS480 & DS482 EPL)		
-46	136-0252-04		4						. CONTACT,ELEC:0.178 INCH LONG	00779	1-332095-2
-47	131-0608-00		19						. CONTACT,ELEC:0.365 INCH LONG	22526	47357
-48	-----	-----	1						CKT BOARD ASSY:(SEE D.V.M-PERIOD A2 EPL) (ATTACHING PARTS)		
-49	211-0116-00		10						SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	OBD
	-----	-----	-						. CKT BOARD ASSY INCLUDES:		
-50	136-0252-04		13						. CONTACT,ELEC:0.188 INCH LONG	22526	75060
-51	260-0723-00		1						. SWITCH,SLIDE:DPDT,0.5A,125VAC	80009	260-0723-00
-52	131-1003-00		1						. CONNECTOR BODY,:CKT BD MT,3 PRONG	80009	131-1003-00
-53	131-0608-00		46						. CONTACT,ELEC:0.365 INCH LONG	22526	47357
-54	136-0514-00		3						. SOCKET,PLUG-IN:MICROCIRCUIT,8 CONTACT	82647	C930802
-55	136-0269-02		7						. SOCKET,PLUG-IN:14 CONTACT,LOW CLEARANCE	01295	C931402
-56	136-0260-02		4						. SOCKET,PLUG-IN:16 CONTACT,LOW CLEARANCE	01295	C931602
-57	131-0604-00		14						. CONTACT,ELEC:0.025 SQ X 0.365 INCH LONG	80009	131-0604-00
	672-0455-00		1						CKT BOARD ASSY:CAM SW(MODE/AMPLITUDE) (ATTACHING PARTS)	80009	672-0455-00
-58	213-0146-00		4						SCR,TPG,THD FOR:6-20 X 0.313 INCH,PNH STL	83385	OBD
	210-0921-00		1						WASHER,MICA:0.50 X 0.141 X 0.005 INCH THK	80009	210-0921-00
	-----	-----	-						. CKT BOARD ASSY INCLUDES:		
-59	384-1105-00		1						. EXTENSION SHAFT:0.8241 L X 0.081 OD SST	80009	384-1105-00
-60	376-0039-00		1						. ADPT,SHAFT,CPLG:0.128 AND 0.082"DIA SHAFT	80009	376-0039-00
	-----	-----	-						. COUPLER INCLUDES:		
	213-0075-00		4						. SETSCREW:4-40 X 0.094 INCHES,HEX SOC STL	74445	OBD
-61	-----	-----	1						. RES.,VARIABLE:(SEE R590 EPL) (ATTACHING PARTS)		
-62	210-0583-00		1						. NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS	73743	2X20319-402
-63	210-0046-00		1						. WASHER,LOCK:INTL,0.26 ID X 0.40" OD,STL	78189	1214-05-00-0541C
	-----	-----	-						. BRKT,CMPNT MTG:RESISTOR	80009	407-1393-00
-64	407-1393-00		1						. ACTUATOR ASSY:CAM SWITCH(PERIOD) (ATTACHING PARTS)	80009	263-1101-00
	263-1101-00		4						. SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	OBD
-65	211-0116-00		-						. ACTUATOR ASSY INCLUDES:		
-66	210-0406-00		4						. NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
-67	401-0115-00		1						. BEARING,CAM SW:CENTER	80009	401-0115-00
-68	105-0631-00		1						. ACTUATOR,CAM SW:(PERIOD) (ATTACHING PARTS)	80009	105-0631-00
-69	354-0391-00		1						. RING,RETAINING:0.395"FREE ID X 0.025" STL	97464	3100-43-CD
-70	210-0406-00		4						. NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
-71	214-1139-02		2						. SPRING,FLAT:GREEN COLORED	80009	214-1139-02
-72	214-1127-00		1						. ROLLER,DETENT:0.125 DIA X 0.125 INCH L	80009	214-1127-00
-73	401-0081-02		1						. BEARING,CAM SW:FRONT	80009	401-0081-02
-74	384-1323-00		1						. EXTENSION SHAFT:0.018 DIA X 6.40 INCH L,SST	80009	384-1323-00
-75	214-1190-02		1						. EXTENDER-RETRAC:	80009	214-1190-02
-76	-----	-----	-						. RES.,VARIABLE::SEE R225A,B EPL) (ATTACHING PARTS)		
-77	210-0583-00		1						. NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS	73743	2X20319-402
-78	210-0046-00		1						. WASHER,LOCK:INTL,0.26 ID X 0.40" OD,STL	78189	1214-05-00-0541C
-79	407-1393-00		1						. BRKT,CMPNT MTG:RESISTOR	80009	407-1393-00
-80	214-1136-00		1						. ACTUATOR,SL SW:	80009	214-1136-00
	263-1098-00		1						. ACTUATOR ASSY:CAM SWITCH (ATTACHING PARTS)	80009	263-1098-00
-81	211-0116-00		6						. SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	OBD
-82	105-0243-00		1						. ACTUATOR,SWITCH: (ATTACHING PARTS)	80009	105-0243-00
-83	213-0214-00		1						. SCREW,CAP SCH:2-56 X 0.375"HEX HD STL	70278	OBD

Mechanical Parts List—PG 506

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Discont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
-84	131-1314-00			1	.	CONTACT,ELEC:GND	80009	131-1314-00
-85	210-0406-00			3	.	NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
-86	131-0963-00			1	.	CONTACT,ELEC:GROUNDING	80009	131-0963-00
-87	214-1139-02			1	.	SPRING,FLAT:GREEN COLORED	80009	214-1139-02
	214-1139-03			1	.	SPRING,FLAT:RED COLORED	80009	214-1139-03
-88	214-1127-00			2	.	ROLLER,DETENT:0.125 DIA X 0.125 INCH L	80009	214-1127-00
-89	401-0081-02			1	.	BEARING,CAM SW:FRONT (ATTACHING PARTS)	80009	401-0081-02
-90	354-0391-00			1	.	RING,RETAINING:0.395"FREE ID X 0.025" STL - - - * - - -	97464	3100-43-CD
-91	105-0632-00			1	.	ACTUATOR,CAM SW:(MODE)	80009	105-0632-00
-92	210-0406-00			4	.	NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
-93	401-0115-00			1	.	BEARING,CAM SW:CENTER	80009	401-0115-00
-94	105-0634-00			1	.	ACTUATOR,CAM SW:AMPL,REAR (ATTACHING PARTS)	80009	105-0634-00
-95	354-0391-00			1	.	RING,RETAINING:0.395"FREE ID X 0.025" STL - - - * - - -	97464	3100-43-CD
-96	105-0482-00			1	.	STOP,DETENT:	80009	105-0482-00
-97	210-0406-00			4	.	NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
-98	214-1139-02			1	.	SPRING,FLAT:GREEN COLORED	80009	214-1139-02
	214-1139-03			1	.	SPRING,FLAT:RED COLORED	80009	214-1139-03
-99	214-1127-00			2	.	ROLLER,DETENT:0.125 DIA X 0.125 INCH L	80009	214-1127-00
-100	401-0081-02			1	.	BEARING,CAM SW:	80009	401-0081-02
-101	-----			1	.	CKT BOARD:MAIN(SEE A1 EPL)	.	.
	-----			.	.	CKT BOARD INCLUDES:	.	.
-102	131-0608-00			33	.	CONTACT,ELEC:0.365 INCH LONG	22526	47357
-103	136-0252-04			24	.	CONTACT,ELEC:0.188 INCH LONG	22526	75060
-104	214-1254-00			2	.	HEATSINK,XSTR:	05820	209-AB
-105	136-0514-00			2	.	SOCKET,PLUG-IN:MICROCIRCUIT,8 CONTACT	82647	C930802
-106	136-0269-02			1	.	SOCKET,PLUG-IN:14 CONTACT,LOW CLEARANCE	01295	C931402
-107	136-0260-02			2	.	SOCKET,PLUG-IN:16 CONTACT,LOW CLEARANCE	01295	C931602
-108	131-1003-00			3	.	CONNECTOR BODY,CKT BD MT,3 PRONG	80009	131-1003-00
-109	131-1031-00			16	.	CONTACT ASSY,EL:CAM SWITCH,TOP (ATTACHING PARTS)	80009	131-1031-00
-110	210-0779-00			16	.	RIVET,TUBULAR:0.051 OD X 0.115 INCH LONG - - - * - - -	42838	RA-29952715
-111	131-1030-00			2	.	CONTACT ASSY,EL:CAM SWITCH,BOTTOM	80009	131-1030-00
-112	131-0604-00			13	.	CONTACT,ELEC:0.025 SQ X 0.365 INCH LONG	80009	131-0604-00
-113	214-0579-00			3	.	TERM.,TEST PT:0.40 INCH LONG	80009	214-0579-00
-114	344-0154-00			4	.	CLIP,ELECTRICAL:FOR 0.25 INCH DIA FUSE	80009	344-0154-00
-115	351-0180-00			1	.	SLIDE,GUIDE:SWITCH ACTUATOR	80009	351-0180-00
-116	214-1061-00			1	.	SPRING,GROUND:FLAT	80009	214-1061-00
-117	426-0725-05			1	.	FR SECT,PLUG-IN:TOP	80009	426-0725-05
-118	426-0724-06			1	.	FR SECT,PLUG-IN:BOTTOM	80009	426-0724-06
-119	352-0169-01			1	.	HOLDER,TERM.CON:2 WIRE BROWN	80009	352-0169-01
	352-0169-02			3	.	HOLDER,TERM.CON:2 WIRE RED	80009	352-0169-00
-120	352-0161-03			2	.	HOLDER,TERM.CON:3 WIRE ORANGE	80009	352-0161-03
-121	352-0164-06			4	.	HOLDER,TERM.CON:6 WIRE BLUE	80009	352-0164-06
-122	352-0165-07			4	.	HOLDER,TERM.CON:7 WIRE VIOLET	80009	352-0165-07
-123	352-0167-09			2	.	HOLDER,TERM.CON:9 WIRE WHITE	80009	352-0167-09
-124	352-0168-00			2	.	HOLDER,TERM.CON:10 WIRE BLACK	80009	352-0168-00
-125	131-0883-00			2	.	CONNECTOR,TERM:	98278	12021-15
-126	131-0707-00			100	.	CONTACT,ELEC:0.48"L,22-26 AWG WIRE	22526	47439
-127	131-0708-00			6	.	CONTACT,ELEC:0.48"L,28-32 AWG WIRE	22526	47437
-128	210-0774-00			6	.	EYELET,METALLIC:0.152 OD X 0.245 INCH L,BRS	80009	210-0774-00
-129	210-0775-00			6	.	EYELET,METALLIC:0.126 OD X 0.23 INCH L,BRS	80009	210-0775-00
-130	175-0825-00			FT	.	WIRE,ELECTRICAL:2 WIRE RIBBON 1.538 FT	23499	TEK-175-0825-00
-131	175-0826-00			FT	.	WIRE,ELECTRICAL:3 WIRE RIBBON 0.375 FT	08261	TEK-175-0826-00
-132	175-0829-00			FT	.	WIRE,ELECTRICAL:6 WIRE RIBBON 0.500 FT.	83501	TEK-175-0829-00
-133	175-0830-00			FT	.	WIRE,ELECTRICAL:7 WIRE RIBBON 0.875 FT.	08261	TEK-175-0830-00
-134	175-0832-00			FT	.	WIRE,ELECTRICAL:9 WIRE RIBBON 0.334 FT.	23499	TEK-175-0832-00
-135	175-0833-00			FT	.	WIRE,ELECTRICAL:10 WIRE RIBBON, 0.313 FT.	23499	TEK-175-0833-00

Mechanical Parts List--PG 506

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	No. Dscont	Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
------------------------	-----------------------	-------------------------	---------------	-----	---	---	---	---	---	--------------------	-------------	-----------------

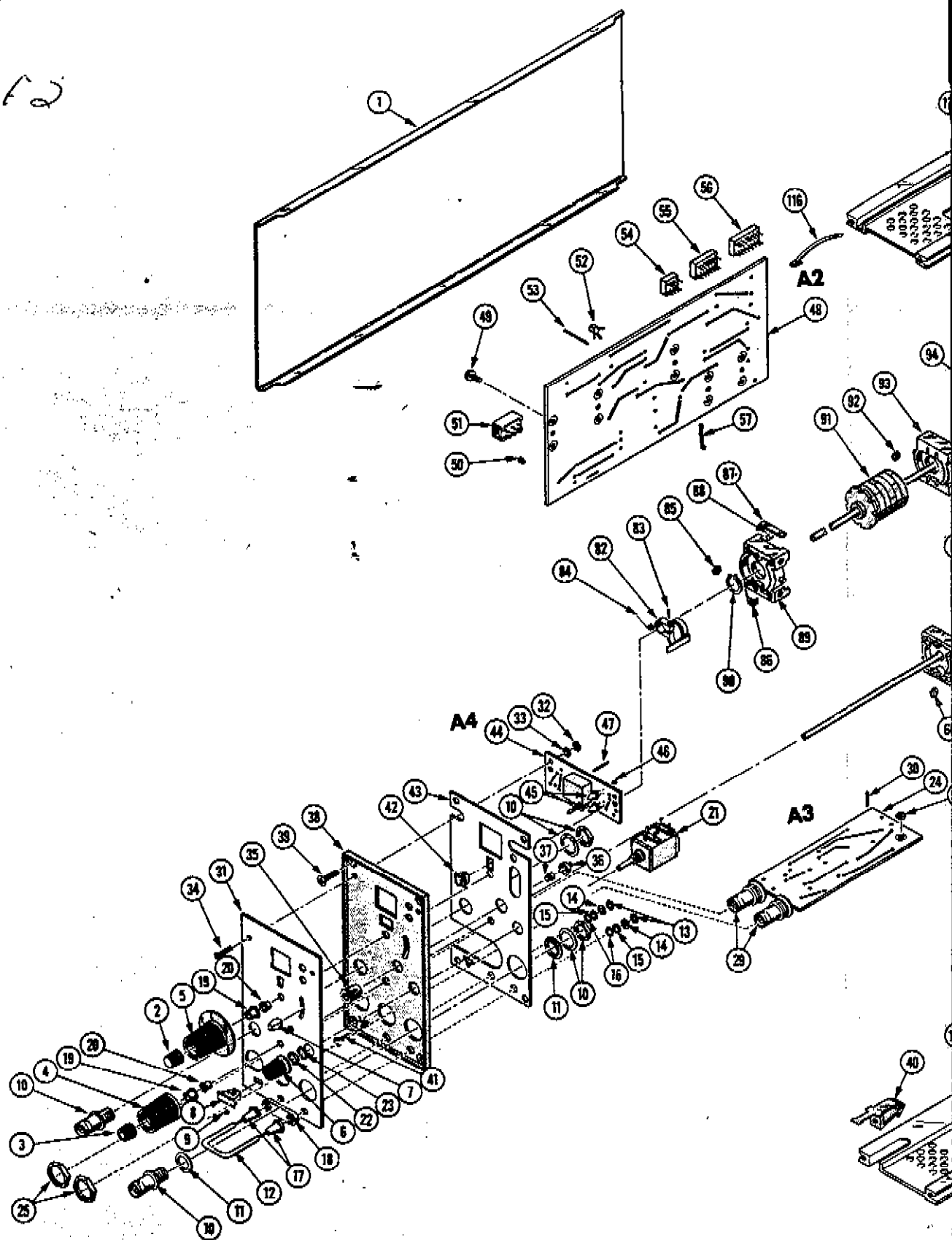
ACCESSORIES

070-1740-00				1						MANUAL, TECH: INSTRUMENT (NOT SHOWN)	80009	070-1740-00
012-0482-00				1						CABLE ASSY, RF: 50 OHM, 36" LONG (NOT SHOWN)	80009	012-0482-00

REPACKAGING

065-0151-00				1						CARTON ASSEMBLY: (NOT SHOWN)	80009	065-0151-00
-------------	--	--	--	---	--	--	--	--	--	------------------------------	-------	-------------

FIG. 1
SHT. 1062

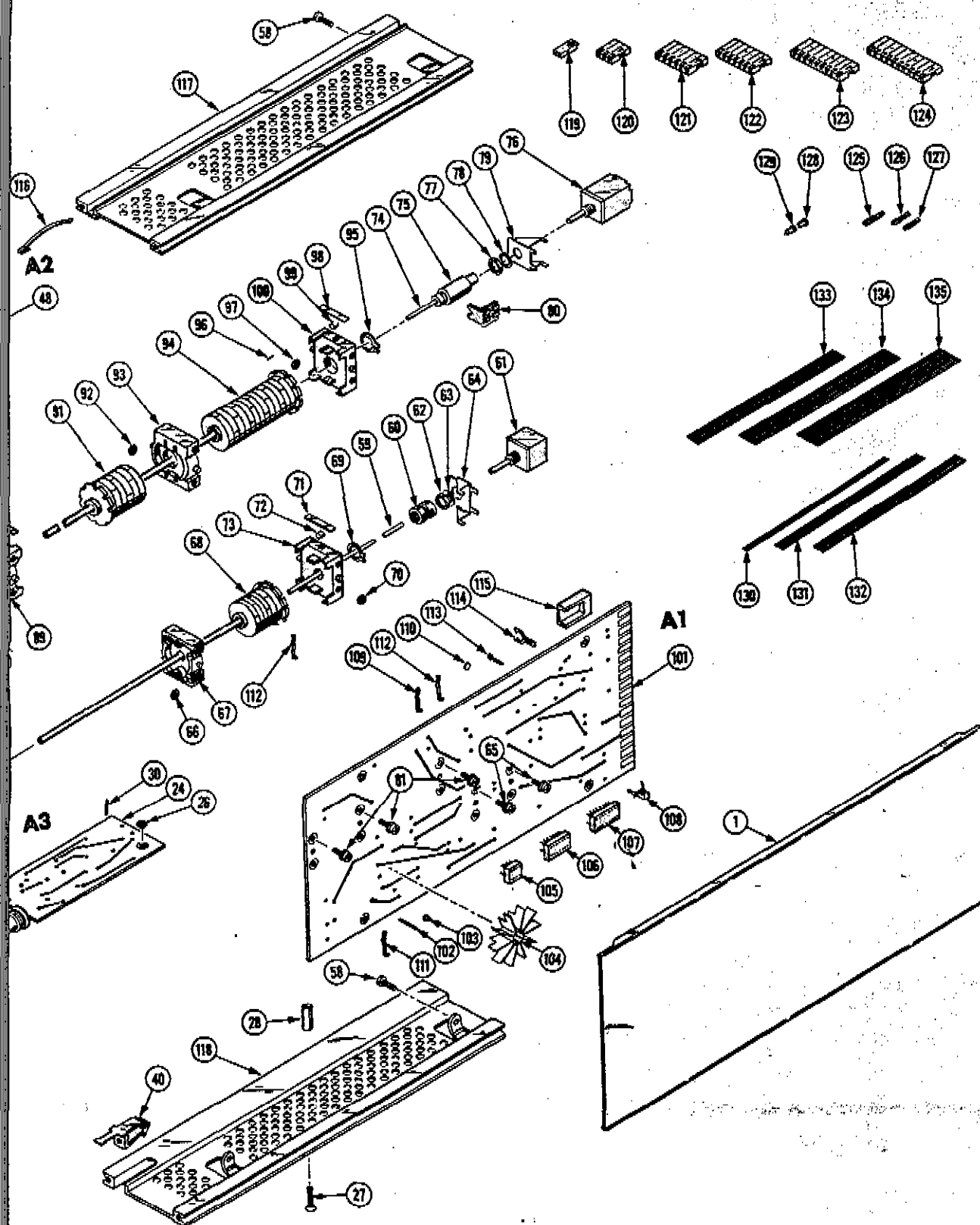


+

FIG. 1
SHT. 2 of 2

+

FIG. 1 EXPLODED



MANUAL CHANGE INFORMATION

At Tektronix, we continually strive to keep up with latest electronic developments by adding circuit and component improvements to our instruments as soon as they are developed and tested.

Sometimes, due to printing and shipping requirements, we can't get these changes immediately into printed manuals. Hence, your manual may contain new change information on following pages.

A single change may affect several sections. Sections of the manual are often printed at different times, so some of the information on the change pages may already be in your manual. Since the change information sheets are carried in the manual until ALL changes are permanently entered, some duplication may occur. If no such change pages appear in this section, your manual is correct as printed.



MANUAL CHANGE INFORMATION

PRODUCT PG 506
EFF SN B010100-up

CHANGE REFERENCE C1/1074
DATE 10-17-74

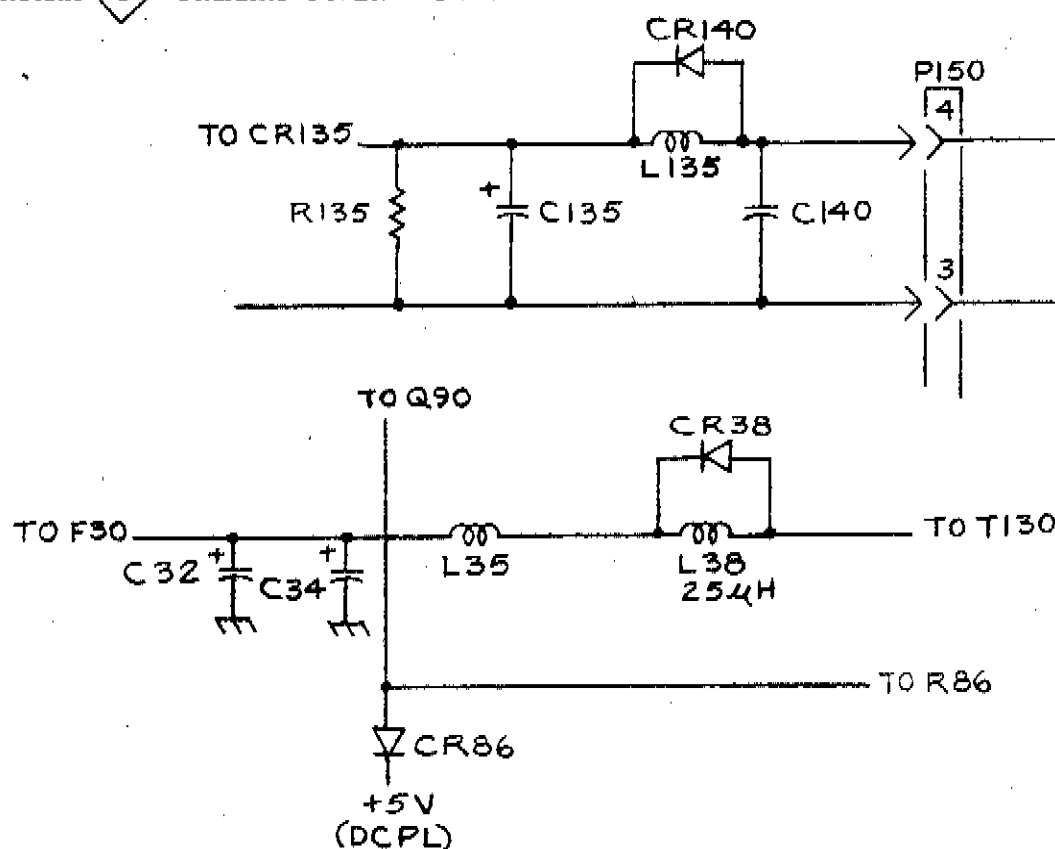
CHANGE:	DESCRIPTION	
TEXT CORRECTION		
Page 1-8	ELECTRICAL CHARACTERISTICS	
ADD:	The ELECTRICAL CHARACTERISTICS are valid for the following environmental conditions.	
	Temperature	
	Operating: 0°C to +50°C. Forced air circulation is required for ambient temperatures above +40°C.	
	Storage: -40°C to +75°C.	
	Altitude	
	Operating: To 15,000 feet.	
	Storage: To 50,000 feet.	
ELECTRICAL PARTS LIST AND SCHEMATIC CHANGES		
CHANGE TO:		
C140	283-0057-00	CAP.,FXD,CER DI:0.1μF, +80%-20%, 200V
R423	321-0229-00	RES.,FXD,FILM:2.37K OHM, 1%, 0.125W
R430	321-0261-00	RES.,FXD,FILM:5.11K OHM, 1%, 0.125W
R540	131-0566-00	LINK, TERMINAL, CONNECTING
R558	131-0566-00	LINK, TERMINAL, CONNECTING
R916	323-0150-00	RES.,FXD,FILM:357 OHM, 1%, 0.50W
R928	323-0097-00	RES.,FXD,FILM:100 OHM, 1%, 0.50W
R930	323-0097-00	RES.,FXD,FILM:100 OHM, 1%, 0.50W
R944	317-0180-00	RES.,FXD,COMP:18 OHM, 5%, 0.125W
R1004	317-0180-00	RES.,FXD,COMP:18 OHM, 5%, 0.125W
REMOVE:		
C85	283-0065-01	CAP.,FXD,CER DI:0.001 μF, 5%, 100V
C108	283-0065-01	CAP.,FXD,CER DI:0.001 μF, 5%, 100V
C545	283-0204-00	CAP.,FXD,CER DI:0.01 μF, 20%, 50V
Q540	151-0223-00	TRANSISTOR:SILICON, NPN
Q550	151-0221-00	TRANSISTOR:SILICON, PNP S24849
R537	315-0751-00	RES.,FXD,COMP:750 OHM, 5%, 0.25W
PAGE 1 OF 4		

CHANGE:	DESCRIPTION	
REMOVE:		
R543	315-0911-00	RES.,FXD,COMP:910 OHM, 5%, 0.25W
R545	315-0162-00	RES.,FXD,COMP:1.6K OHM, 5%, 0.25W
R550	315-0202-00	RES.,FXD,COMP:2K OHM, 5%, 0.25W
R554	315-0472-00	RES.,FXD,COMP:4.7K OHM, 5%, 0.25W
R556	315-0273-00	RES.,FXD,COMP:27K OHM, 5%, 0.25W
U535	156-0399-00	MICROCIRCUIT, DI:OPTOELECTRONIC ISOLATOR
ADD:		
C294	290-0405-00	CAP.,FXD,ELCTLT:10 μ F, +50-10%, 150V
C745	281-0543-00	CAP.,FXD,CER:270 PF, 500 V, +10%
C748	281-0543-00	CAP.,FXD,CER:270 PF, 500 V, +10%
CR38	152-0333-00	SEMICONV DEVICE:SILICON, 55V, 200 MA
CR140	152-0586-00	SEMICONV DEVICE:SILICON, 600V, 500MA
CR535	152-0141-02	SEMICONV DEVICE:SILICON, 30V, 150MA
L38	108-0337-00	COIL, RF: 25 μ H
R1042	315-0221-00	RES.,FXD,COMP:220 OHM, 5%, 0.25W
T532	120-0952-00	TRANSFORMER,RF:TOROID 2 WINDINGS TD-301

DIAGRAM 1 PRIMARY POWER - Partial

PAGE 2 OF 4

DIAGRAM 1 PRIMARY POWER - Partial



CHANGE:

DESCRIPTION

DIAGRAM 2 STANDARD AMPLITUDE - Partial

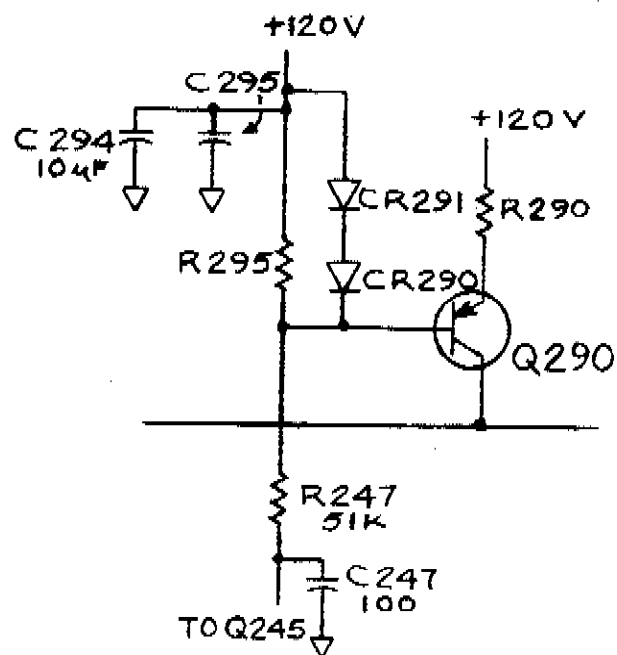
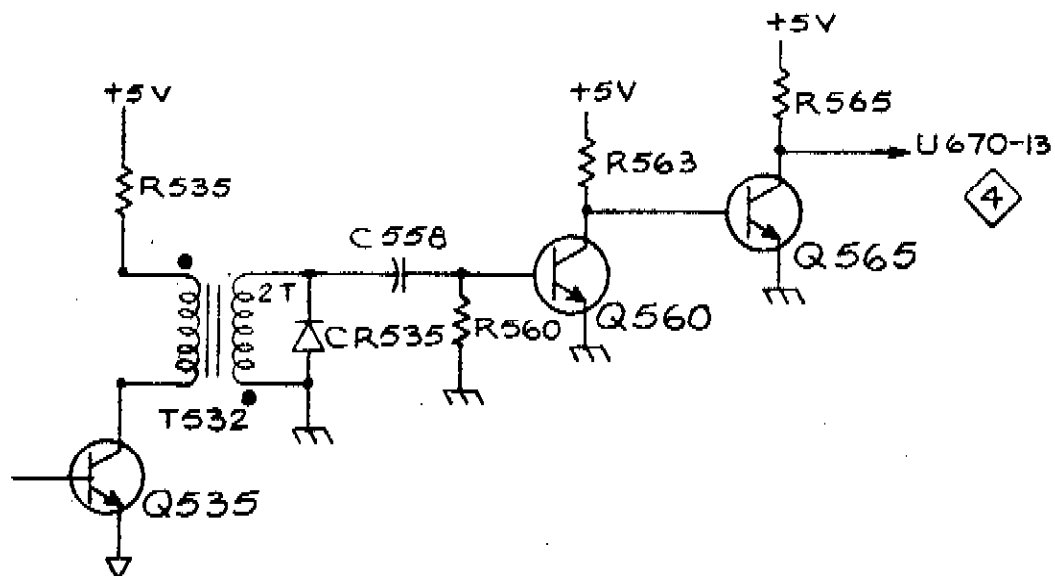


DIAGRAM 3 DIGITAL VOLTMETER - Partial



CHANGE:

DESCRIPTION

DIAGRAM 5 HIGH AMPLITUDE - Partial

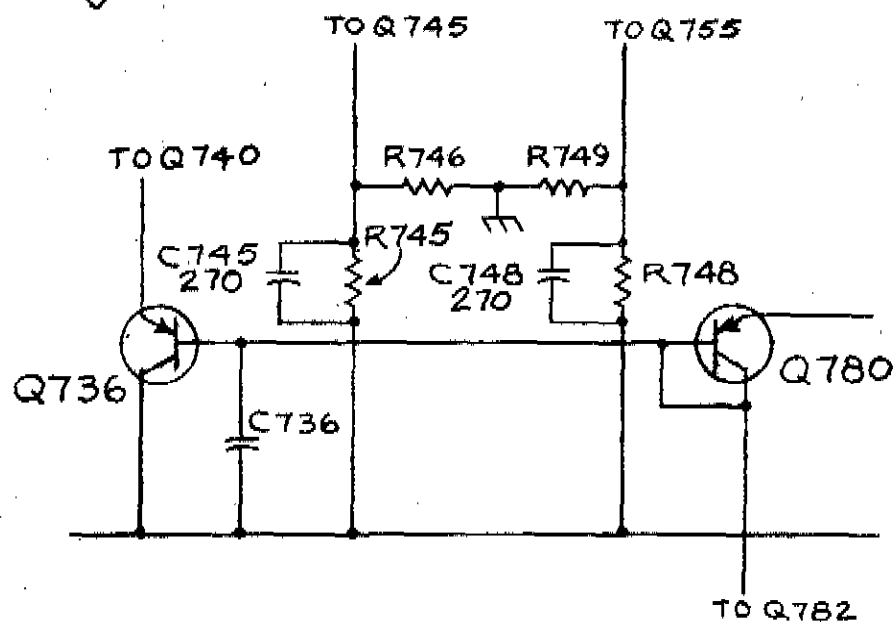
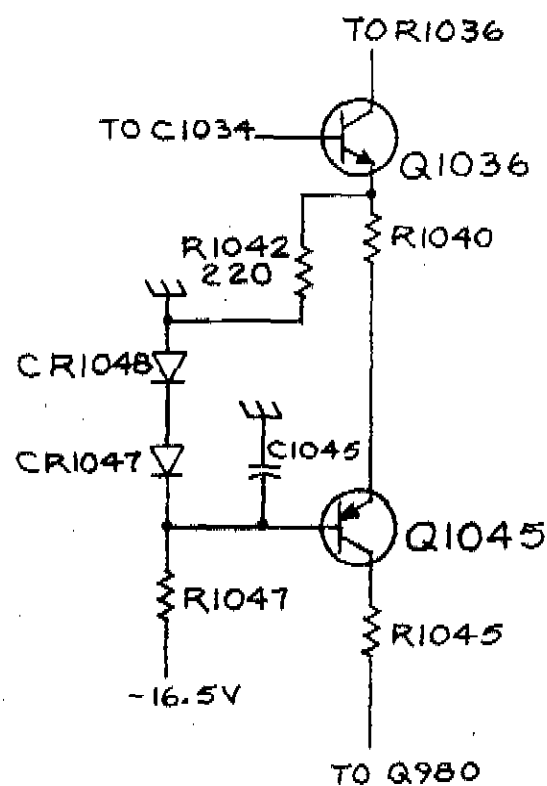


DIAGRAM 6 FAST RISE - Partial



STEP 8
MAX AMPL SET
R790

STEP 1
+16.5V
TEST POINT

STEP 1
-16.5V
TEST POINT

STEP 1
+5.2V
TEST POINT

MAIN BOARD (RIGHT SIDE)

STEP 4a
R308

STEP 4c
R304

STEP 4
FLOATING
GROUND

STEP 3
10 V
REGULATOR
R340

STEP 2
100 V
REGULATOR
R205

STEP 1
PRIMARY
POWER
R30

