



**PLEASE CHECK FOR CHANGE INFORMATION
AT THE REAR OF THIS MANUAL.**

SC 502 OSCILLOSCOPE

INSTRUCTION MANUAL

**Tektronix, Inc.
P.O. Box 500
Beaverton, Oregon 97077
070-1878-01
Product Group 75**

Serial Number _____

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INSTRUMENT SERIAL NUMBERS

Each instrument has a serial number on a panel insert, tag,
or stamped on the chassis. The first number or letter
designates the country of manufacture. The last five digits
of the serial number are assigned sequentially and are
unique to each instrument. Those manufactured in the
United States have six unique digits. The country of
manufacture is identified as follows:

B000000	Tektronix, Inc., Beaverton, Oregon, USA
100000	Tektronix Guernsey, Ltd., Channel Islands
200000	Tektronix United Kingdom, Ltd., London
300000	Sony/Tektronix, Japan
700000	Tektronix Holland, NV, Heerenveen, The Netherlands

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WARNING

THE FOLLOWING SERVICE INSTRUCTIONS ARE FOR USE BY QUALIFIED PERSONNEL ONLY. TO AVOID PERSONAL INJURY, DO NOT PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN OPERATING INSTRUCTIONS UNLESS YOU ARE QUALIFIED TO DO SO.

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OPERATORS SAFETY SUMMARY

The general safety information in this part of the summary is for both operating and servicing personnel. Specific warnings and cautions will be found throughout the manual where they apply, but may not appear in this summary.

Terms In This Manual

CAUTION statements identify conditions or practices that could result in damage to the equipment or other property.

WARNING statements identify conditions or practices that could result in personal injury or loss of life.

Terms As Marked on Equipment

CAUTION indicates a personal injury hazard not immediately accessible as one reads the marking, or a hazard to property including the equipment itself.

DANGER indicates a personal injury hazard immediately accessible as one reads the marking.

Symbols As Marked on Equipment



DANGER — High voltage.



Protective ground (earth) terminal.



ATTENTION — refer to manual.

Power Source

This product is intended to operate from a power source that will not apply more than 250 volts rms between the supply conductors or between either supply conductor and ground. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Grounding the Product

This product is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting to the product input or output terminals. A

protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Danger Arising From Loss of Ground

Upon loss of the protective-ground connection, all accessible conductive parts (including knobs and controls that may appear to be insulating) can render an electric shock.

Use the Proper Power Cord

Use only the power cord and connector specified for your product.

Use only a power cord that is in good condition.

Refer cord and connector changes to qualified service personnel.

Use the Proper Fuse

To avoid fire hazard, use only the fuse of correct type, voltage rating and current rating as specified in the parts list for your product.

Refer fuse replacement to qualified service personnel.

Do Not Operate in Explosive Atmospheres

To avoid explosion, do not operate this product in an explosive atmosphere unless it has been specifically certified for such operation.

Do Not Operate Without Covers

To avoid personal injury, do not operate this product without covers or panels installed. Do not apply power to the plug-in via a plug-in extender.

SERVICE SAFETY SUMMARY

FOR QUALIFIED SERVICE PERSONNEL ONLY

Refer also to the preceding Operators Safety Summary.

Do Not Service Alone

Do not perform internal service or adjustment of this product unless another person capable of rendering first aid and resuscitation is present.

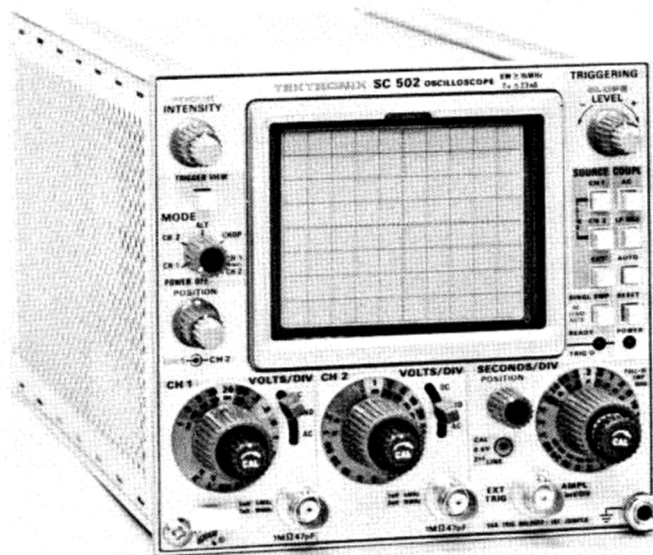
Use Care When Servicing With Power On

Dangerous voltages exist at several points in this product. To avoid personal injury, do not touch exposed connections and components while power is on.

Disconnect power before removing protective panels, soldering, or replacing components.

Power Source

This product is intended to operate from a power source that will not apply more than 250 volts rms between the supply conductors or between either supply conductor and ground. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.



The SC 502 Oscilloscope

SPECIFICATION

Performance Conditions

The electrical characteristics in this specification are valid with the following conditions:

1. The instrument must have been adjusted at an ambient temperature between +20°C and +30°C.
2. The instrument must be in a non-condensing environment whose limits are described under Environmental.
3. Allow twenty minutes warm-up time for operation to specified accuracy; sixty minutes after exposure to or storage in a high humidity (condensing) environment.

Any conditions that are unique to a particular characteristic are expressly stated as part of that characteristic.

The electrical and environmental performance limits together with their related validation procedures are a complete statement of the electrical and environmental performance of a calibrated instrument.

Table 1-1
VERTICAL DEFLECTION SYSTEM

Characteristics	Performance Requirements	Supplemental Information
Deflection Factor		
Calibrated Range	1 mV/div to 20 V/div in 14 steps in a 1-2-5 sequence.	
Variable Range	At least 2.5 to 1.	Continuously variable between calibrated steps and extends maximum uncalibrated deflection factor to at least 50 V/div.
DC Balance (+15°C to +35°C)	0.5 div + 1 mV.	
Accuracy		
+15°C to +35°C		
5 mV/div to 20 V/div	± 2%	
1 mV/div to 2 mV/div	± 5%	
0°C to +50°C	Derated accuracy by an additional 1%.	
Linearity	0.1 div or less of compression or expansion as a 2 div signal is positioned between the graticule limits.	
HF Bandwidth		
5 mV/div to 20 V/div	At least 15 MHz.	
Risetime (calculated)		23 ns or less.
Typical step response aberrations		± 2%, 3% peak-to-peak or less. Signal limited to 5 major divisions.
2 mV/div	At least 10 MHz.	
1 mV/div	At least 5 MHz.	

Table 1-1 (cont)

Characteristics	Performance Requirements	Supplemental Information
AC LF Response	10 Hz or less with ac coupling	1 Hz or less with X10 probe.
Common Mode Rejection Ratio (CH1-CH2 Display Mode)	At least 30 to 1 at 1 MHz or less with same deflection factor settings.	Common mode signal limited to ± 5 divisions, 10 div peak-to-peak. With X10 probes CMRR above 1 kHz is limited by probe compensation matching.
Channel Isolation	2% or less display related crosstalk to 15 MHz.	Input signal related crosstalk is typically less than 0.01%.
Displayed Noise	0.2 mV or less peak-to-peak at 1 mV.	
Typical Trace Drift (after 1 hour warm-up, constant line voltage)		
5 mV/div to 20 V/div		Less than 0.1 div/hr. and 0.03 div/°C.
1 mV/div to 2 mV/div		Less than 0.3 mV/hr. and 0.1 mV/°C.
CH1 or CH2 Input		
Impedance	1 M Ω \pm 1%.	Paralleled nominally by 47 pF.
Maximum Input Voltage		350 V (dc + peak ac), 700 V peak-to-peak ac at 1 kHz or less. Above 1 kHz recommended peak-to-peak ac limit is 250 V to 10 kHz derating to 25 V above 100 kHz.
Position Range	At least ± 6 divisions.	
Delay Line		Nominally 140 ns. Permits viewing the leading edge of the triggering waveform.
Display Modes		
CH1 or CH2	Selected input is displayed.	
ALT	Alternates display of CH1 and CH2 every other sweep.	
CHOP	Chops display of CH1 and CH2.	Chop rate at least 250 kHz.
CH1 minus CH2	Displays algebraic difference between CH1 and CH2.	
Trigger View	Triggering waveform is displayed instead of selected Display Mode when TRIG VIEW button is depressed.	Triggering point on the displayed waveform is nominally at CRT vertical center.

Table 1-2
HORIZONTAL DEFLECTION SYSTEM

Characteristics	Performance Requirements		Supplemental Information
Sweep Rates			
Calibrated Range	0.5 s/div to 0.2 μ s/div in 20 steps in a 1-2-5 sequence. X10 Horizontal Magnifier extends fastest calibrated rate to 20 ns/div.		
Variable Range	At least 2.5 to 1.		Continuously variable between calibrated sweep rates and extends slowest uncalibrated rate to at least 1.25 s/div. The variable control is internally selectable between the Variable Sweep Rate or Variable Holdoff functions.
Accuracy			
+15°C to +35°C	Unmagnified	Magnified X10	Measured over center 8 displayed divisions excluding the first 50 ns and magnified sweep beyond the 100th division.
0.5 s/div to 0.1 s/div	$\pm 3\%$	$\pm 4\%$	
50 ms/div to 1 μ s/div	$\pm 2\%$	$\pm 3\%$	
0.5 μ s/div to 0.2 μ s/div	$\pm 3\%$	$\pm 4\%$	
0°C to +50°C	Derate accuracy by an additional 1%.		
Linearity			Typically 5% (0.1 div) or less change in timing over any 2 div internal within the center 8 divisions.
MAG Registration	0.5 divisions or less.		
Sweep Length	At least 10.0 divisions.		
Position Range			
Fully CW	Start of 1 ms/div sweep positions to right of center graticule line.		
Fully CCW	10th division of 1 ms/div sweep positions to left of center graticule line.		
External Horizontal Input			
Bandwidth	At leasts 2 MHz.		Low frequency response determined by trigger coupling selection, 50 Hz or less with ac coupling.
Deflection Factor	50 mV/div $\pm 5\%$.		
Phase Difference	3° or less to 50 kHz.		
Input Impedance	1 M Ω $\pm 2\%$.		Paralleled nominally by 47 pF.
Maximum Input Voltage			350 V (dc + peak ac), 350 V peak-to-peak at 1 kHz or less.

Table 1-3
TRIGGERING SYSTEM

Characteristics	Performance Requirements		Supplemental Information
Trigger Sensitivity (Minimum peak-to-peak signal required)	CH1 or CH2	External	
	5 MHz or less	60 mV	
	5 MHz to 15 MHz	150 mV	
Coupling			
DC			Minimum signal requirements extend to dc.
AC			Minimum signal requirements increase below 50 Hz.
AC LF REJ			Minimum signal requirements increase below 5 kHz.
Trigger Level Range (Normal and Single Sweep modes only)	At least ± 8.0 divisions, CH1 or CH2, and at least ± 1.2 V external.		
External Trigger Input (Same as Ext. Horizontal input)			
Impedance	1 M Ω \pm 2%.		Paralleled nominally by 47 pF.
Maximum Input Voltage			350 V (dc + peak ac), 350 V peak-to-peak at 1 kHz or less.
Modes			
Auto	Sweep free-runs in the absence of a triggering signal.		TRIGGER LEVEL range automatically varies with the triggering signal peak-to-peak range. Not recommended for frequencies below 30 Hz. Below 100 Hz minimum signal requirements increase.
Normal (Auto button out)	Sweep will not run unless triggered.		
Single Sweep	Upon triggering, sweep runs once and will not run again unless reset by pushing Reset button.		
Holdoff Time			Measured at rear interface pins 20B-21B. Select Auto mode and free run sweep.
0.5 s/div to 1 ms/div			Nominally 10 ms.
0.5 ms/div to 10 μ s/div			Nominally 100 μ s.
5 μ s/div to 0.2 μ s/div			Nominally ≤ 2 μ s.
Variable Holdoff Range			At least 20 to 1 range. The Variable control is internally selectable between the Variable Sweep or Variable Holdoff functions.

**Table 1-4
CATHODE RAY TUBE**

Characteristics	Performance Requirements	Supplemental Information
CRT Type		T3350.
Graticule		8 X 10 divisions with 0.25 inch/division (0.64 cm/division).
Phosphor		P31.
Acceleration Potential		12 kV (–1.9 kV cathode).
Geometry and Orthogonality (exclude 4 corners)	Bowing or tilt is 0.1 division or less with respect to graticule lines.	
Intensity Control Function		When Intensity control is rotated fully clockwise and Single Sweep mode is selected, the sweep baseline spot is clearly visible.

**Table 1-5
CALIBRATOR**

Characteristics	Performance Requirements	Supplemental Information
Voltage	0.6 V peak-to-peak, $\pm 1\%$.	
Frequency	Twice the power line frequency.	
Rise and Falltimes		Less than 1 μ s.
Output Impedance		Approximately 120 Ω .

**Table 1-6
POWER SUPPLIES**

Characteristics	Performance Requirements	Supplemental Information
+20 V -		20.0 V ± 0.05 V.
–20 V		–20.0 V ± 0.05 V.
+5 V		+5.07 V ± 0.08 V.
–5 V		–5.00 V ± 0.20 V.
+70 V		+70 V –3 V, +4 V.
–70 V		–69 V +3 V, –4 V
Power Module Supply Currents		
+33.5 V		Typically 420 mA.
–33.5 V		Typically 400 mA.
+11.5 V		Typically 400 mA.
25 VAC		Typically 10 mA.
Fuse Data		
F800		0.3A, 3AG, slow blow.
F970		0.75A, 3AG, fast blow.

Table 1-6 (cont)

Characteristics	Performance Requirements	Supplemental Information
Mainframe Power Line Draw		Typically 29 watts or less operating, less than 1 watt with mode switch set to POWER OFF.
Recommended Adjustment Interval		1000 hours or 6 months.
Warmup Time		20 minutes, 60 minutes after exposure to or storage in high humidity (condensing) environment.

Table 1-7
REAR INTERFACE

Characteristics	Performance Requirements	Supplemental Information
External (Delayed) Gate Input		Pins 23B-22B. ECL balanced input operating between +5 V and ground. Nominally 100 Ω. Upon transition to logical high state sweep will free-run once and reset if GATE SELECT INPUT is grounded. A transition from logical high to low state will truncate sweep if it is running.
Gate Select Input		Pin 24B. Ground (1 kΩ or less) selects the external gate as the sweep controlling signal. Open circuit causes normal operation.
Intensify Input		Pin 19B. Single ended ECL input operating between +5 V and ground. A logical low state causes noticeable intensification. Open circuit defaults to logical high state.
CH1 Trigger Output		Pins 27B-28B. Analog output with source resistance of approximately 100 Ω. Sensitivity is typically 50 mV/div and bandwidth is typically 4 MHz.
Triggered Gate Output		Pins 25B-26B. ECL balanced output operating between +5 V and ground. A logical high state indicates a holdoff condition and sweep can not be triggered or gated.
Holdoff Output		Pins 20B-21B. ECL balanced output operating between +5 V and ground.
Ramp Output		Pin 18A. Analog output of positive going sweep ramp. Typically 0 V to at least +6.4 V. Output resistance is approximately 1 kΩ. Not recommended at sweep rates faster than 1 μs/div.

**Table 1-8
ENVIRONMENTAL^a**

Characteristics	Description
Temperature	Meets MIL-T-28800B, class 5.
Operating	0°C to +50°C.
Non-operating	-55°C to +75°C.
Humidity	Exceeds MIL-T-28800B, class 5.
	95% RH, 0°C to +30°C.
	75% RH, to +40°C.
	45% RH, to +50°C.
Altitude	Exceeds MIL-T-28800B, class 5.
Operating	4.6 km (15,000 ft).
Non-operating	15 km (50,000 ft).
Vibration	Exceeds MIL-T-28800B, class 5, when installed in qualified power modules ^b .
	0.38 mm (0.015") peak-to-peak, 5 Hz to 55 Hz, 75 minutes.
Shock	Meets MIL-T-28800B, class 5, when installed in qualified power modules ^b .
	30 g's (1/2 sine) 11 ms duration, 3 shocks in each direction along 3 major axes, 18 total shocks.
Transportation ^c	Qualified under National Safe Transit Association Preshipment Test Procedures 1A-B-1 and 1A-B-2.

^a With power module.

^b Refer to TM 500 power module specifications.

^c Without power module.

**Table 1-9
MECHANICAL**

Characteristics	Description
Finish	Anodized aluminum panel and chassis.
Net Weight	2.5 kg (5.56 lbs).
Nominal Dimensions	12.2 in. long (30.988 cm) X 5.30 in wide (13.46 cm) X 5.0 in. high (12.700 cm)

OPERATING INSTRUCTIONS

INTRODUCTION

The SC 502 Oscilloscope is a general purpose, 15 MHz, dual trace oscilloscope designed to operate in two compartments of a TM 500 Series Power Module. Recommended probes for use with the SC 502 are the P6105, P6062B, and P6060. The P6062B probe has a selectable 1X or 10X attenuation while the attenuation of P6105 is 10X.

Installation

The SC 502 is calibrated and ready to use as received. Referring to Fig. 2-1, install the Oscilloscope and turn the SC 502 MODE control to ALT to apply power. Check that the POWER indicator light on the front panel comes on.

CAUTION

Turn the Power Module off before inserting the plug-in; otherwise, damage may occur to the plug-in circuitry.

BASIC OPERATION

A brief description of the function of the front panel controls and connectors is given on the following pages.

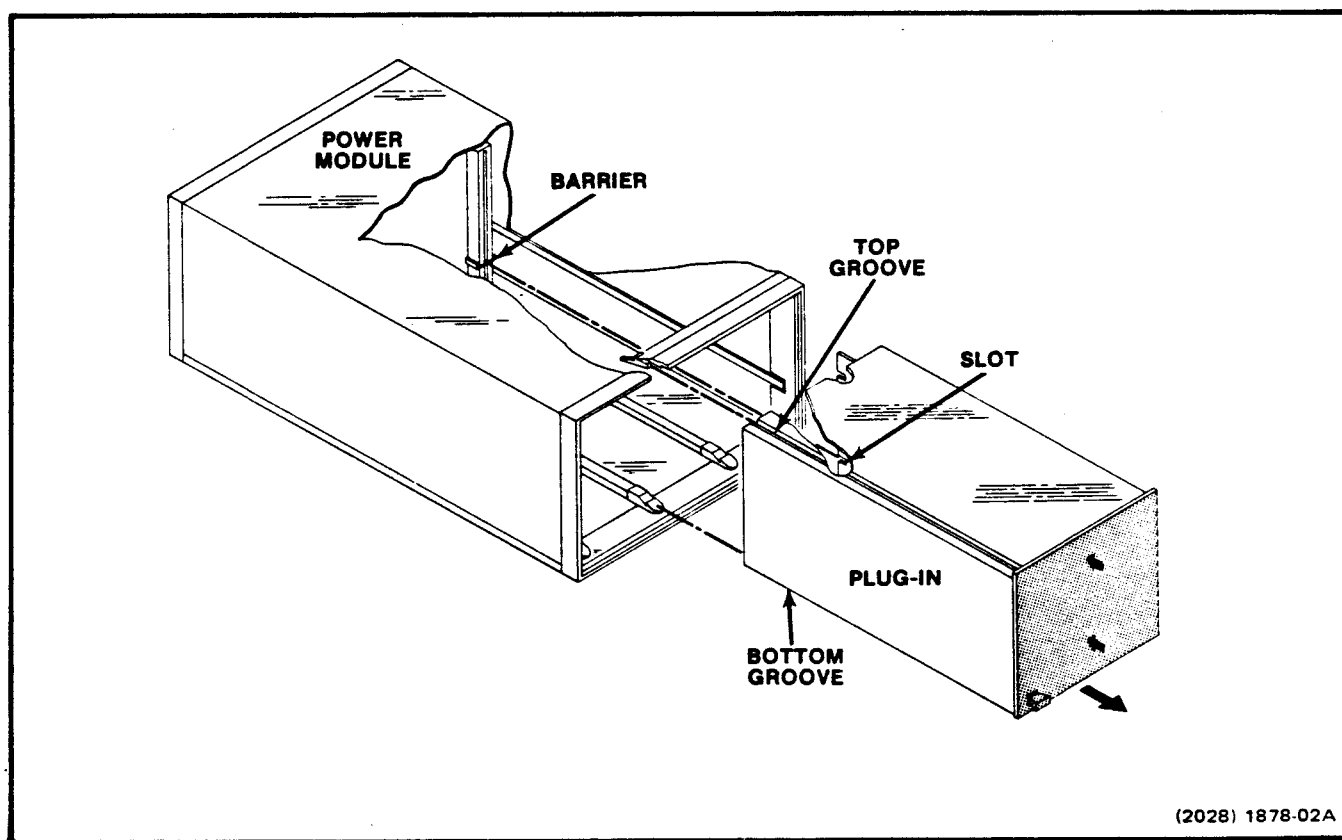


Fig. 2-1. Plug-in installation/removal.

NOTE

The vertical lightly shaded areas on the front panel behind the VOLTS/DIV and SECONDS/DIV knob skirts highlight the basic sensitivity and sweep rate selected. The darker gray shaded areas (located at 2 o'clock) behind the VOLTS/DIV knob skirts highlight the sensitivity when a 10X probe is used. The shaded colored area (located at 10 o'clock) behind the SECONDS/DIV knob indicates the sweep rate when the SWP MAG is activated. These shaded areas and additional values printed on the knob skirts are for operator convenience only. Do not force these knobs beyond their mechanical stops.

Setup Information

1. Set the SC 502 MODE switch to PWR OFF. Turn the TM 500 Series Power Module switch to off and install the SC 502 into a Power Module compartment. Make sure the Power Module is connected to a power source that meets the voltage and frequency requirement, then turn on the Power Module Power switch.

2. Set the SC 502 controls as follows:

INTENSITY	Fully ccw
FOCUS	As is
MODE	CH 1
POSITION	
CH 1	Midrange
CH 2	Midrange
CH 1 VOLTS/DIV	.2
Variable	Fully cw
CH 1 AC-GND-DC	DC
CH 2 VOLTS/DIV	.2
Variable	Fully cw
CH 2 AC-GND-DC	DC
POSITION (Horizontal)	Midrange
SECONDS/DIV	5 m
CAL/SWP MAG	Fully cw and pushed in
SINGL SWP	Off (Button out)
TRIGGERING	
SLOPE	+
LEVEL	Midrange
SOURCE	CH 1
COUPL	AUTO

3. Advance the INTENSITY control until the trace is at the desired viewing level. The trace should appear near the graticule center.

4. Connect a 1X probe or test lead from the CAL connector to the CH 1 input connector.

5. Adjust the channel and horizontal POSITION controls so that the display is centered vertically and starts at the left edge of the graticule.

6. Adjust the FOCUS control for a sharp, well-defined display over the entire trace length.

7. Disconnect the input signal and position the trace vertically so that it coincides with the center horizontal line of the graticule.

Calibration Check

8. Move the trace 1.5 divisions below graticule center and reconnect the calibrator signal to the CH 1 input connector.

9. The display should be 3 divisions in amplitude with six complete cycles (five complete cycles for 50 Hz line frequency) shown horizontally.

Trigger View

10. Press the TRIGGER VIEW button and observe the triggering waveform. The start of the waveform at the horizontal graticule centerline is the triggering point.

External Intensity Input

11. Connect a 5 V, 1 kHz sine-wave or square-wave signal to pin 24A (if it has been connected as the external Z-axis input) on the rear interface connector.

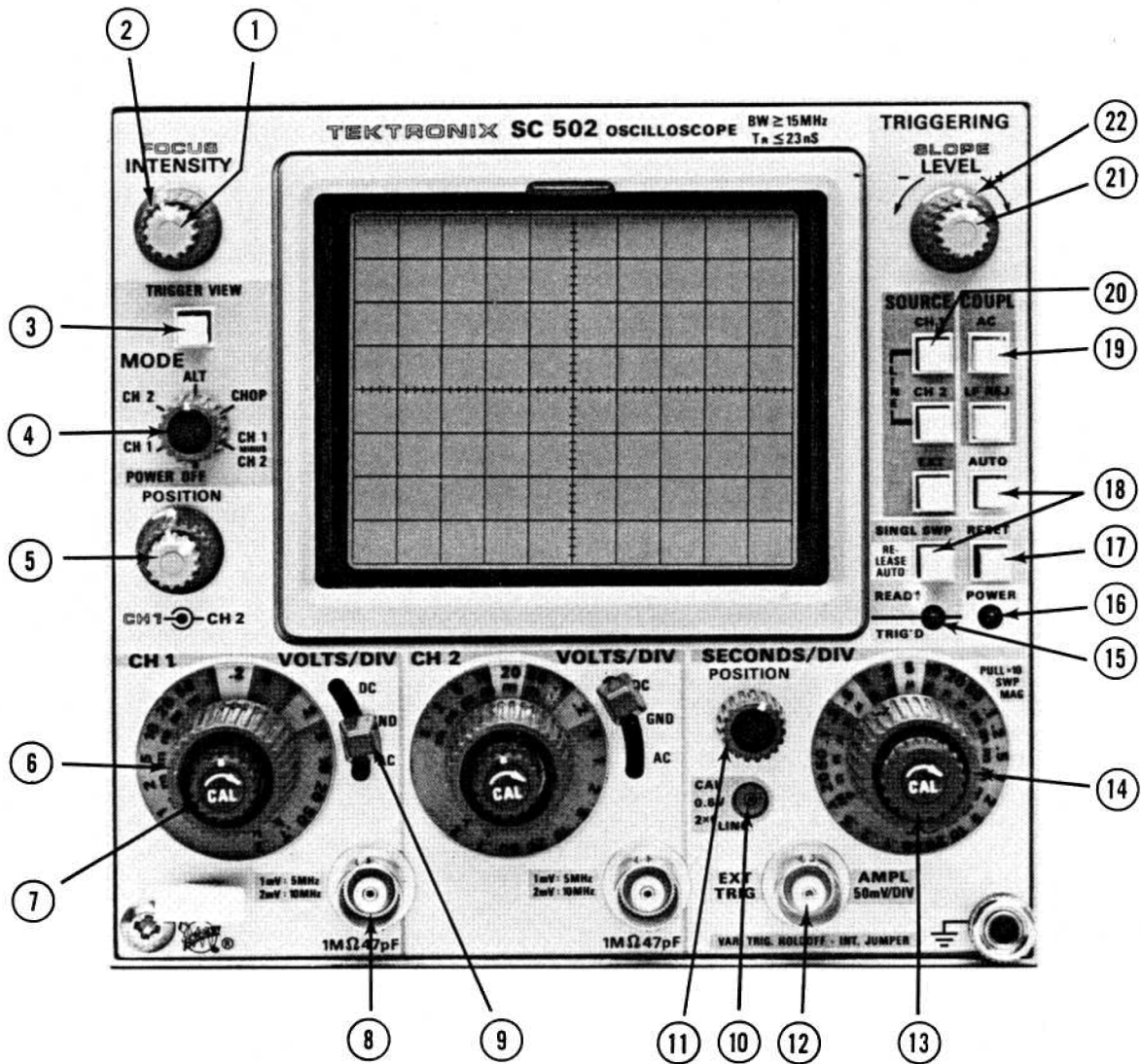
12. Slowly rotate the INTENSITY control counterclockwise until the trace appears to be a series of dimmed and brightened segments. The brightened segments correspond with the tops of the sinewaves or squarewaves.

This completes the description of the basic operating procedure for the SC 502. Instrument operations not explained here, or operations which need further explanation are discussed under General Operating Information.

CONTROLS AND CONNECTORS

① FOCUS Control. Provides adjustment for obtaining a well defined display.

② INTENSITY Control. Controls the display brightness.



1878-32

Fig. 2-2. Controls and connectors.

Operating Instructions—SC 502

- 3 TRIGGER VIEW Pushbutton. Causes the sweep triggering signal to be displayed on the crt.
- 4 MODE Switch. Selects the vertical amplifier mode of operation and turns the instrument on and off.
- PWR OFF. The internal instrument power is off.
- CH 1. Channel 1 is displayed.
- CH 2. Channel 2 is displayed.
- ALT. Dual trace display of both channels. Display is switched between channels at the end of each sweep. Generally used for sweep speeds above 1 ms/cm.
- CHOP. Dual trace display of both channels. Display is switched between the channels at ≥ 250 kHz. Generally used for sweep speeds below 1 ms/cm.
- CH 1 MINUS CH 2. The input of channel 2 is inverted and algebraically added to channel 1.
- 5 CH 1 and CH 2 POSITION. Controls the vertical position of the displayed signals.
- 6 VOLTS/DIV Switch. Selects the vertical deflection factor in a 1-2-5 sequence. The variable control (CAL) must be fully cw for the indicated deflection factor. Read the deflection factor over the lightly shaded area when using a 1X probe. Read the deflection factor over the grey area when using a 10X probe.
- 7 CAL Variable Control. Provides variable uncalibrated deflection factors between the calibrated settings of the VOLTS/DIV switch.
- 8 Input Connector. Bnc connector for applying vertical input signal.
- 9 AC-GND-DC Switch. Selects the vertical amplifier input coupling. In the AC position, signals are capacitively coupled to the vertical amplifier, blocking the dc component of the signal. In the GND position, the input of the vertical amplifier is disconnected from the input connector and grounded. This allows precharging of the input coupling capacitor. In the DC position, all components of the input signal are passed to the input amplifier.
- 10 Calibrator Jack. Provides a positive going 0.6 V square wave at twice the line frequency for calibration of gain and probe compensation.
- 11 POSITION control. Positions the display horizontally on the crt.
- 12 EXT TRIG/AMPL. External input connector for horizontal amplifier or for external trigger signal. The external amplifier ac-dc coupling is controlled by the trigger AC pushbutton.
- 13 CAL (Variable)/PULL X10 SWP MAG. The CAL control provides continuously variable sweep rates between the calibrated settings of the SECONDS/DIV switch or when selected by an internal jumper, provides a variable trigger holdoff time.
- When the CAL knob is pulled out, the displayed sweep rate/division is increased by a factor of ten.
- 14 SECONDS/DIV Switch. Selects the horizontal sweep rate or the AMPL mode for an external input to the horizontal amplifier. The VARIABLE control must be fully cw for calibrated sweep rates. The light shaded area under the knob skirt indicates the unmagnified sweep rate. The colored area at 10 o'clock shows the magnified sweep rate.
- 15 TRIG'D READY Indicator. The light indicates that the single sweep is armed or that the sweep is triggered.
- 16 POWER Indicator. The light indicates that the SC 502 power is turned on.
- 17 RESET Pushbutton. Push to arm the sweep in single sweep operation.
- 18 Trigger Mode Pushbuttons.
- AUTO Pushbutton In. The Sweep free runs and provides a reference trace when there is no adequate triggering signal.
- AUTO Pushbutton Out. The sweep is initiated by the applied trigger signal. When there is no adequate triggering signal, there is no trace.
- SINGLE SWP Pushbutton In. When this pushbutton is in and the AUTO pushbutton is

out, the sweep operates in the single sweep mode. After the sweep runs once, further sweeps cannot be displayed until the RESET button is pushed. The triggering LEVEL control adjustment for single sweep operation must be made with the AUTO pushbutton in the out position.

19 COUPLing Pushbuttons. Determine the coupling of the trigger signal to the trigger generator circuit.

AC Pushbutton In. Signals are capacitively coupled to the input of the trigger generator circuit. DC is rejected and signals below about 50 kHz are attenuated.

AC Pushbutton Out. (DC) All components of a trigger signal are coupled to the input of the trigger generator circuit.

LF REJ Pushbutton In. Signals are capacitively coupled to the input of the trigger circuit. DC is rejected and signals below about 5 kHz are attenuated.

20 SOURCE Pushbuttons. Determine the source of the signal coupled to the input of the trigger circuit.

CH 1 Pushbutton In. A sample of the Channel 1 signal is coupled to the triggering circuit.

CH 2 Pushbutton In. A sample of the Channel 2 signal is coupled to the triggering circuit.

LINE. (Both CH 1 and CH 2 pushbuttons depressed.) A sample of the power line signal is coupled to the triggering circuit.

EXT Pushbutton In. Signals connected to the EXT TRIG connector are coupled to the triggering circuit.

21 SLOPE Switch. Selects the rising or falling slope of the trigger signal to trigger the sweep.

22 LEVEL Control. Selects the amplitude point on the trigger signal at which the sweep is triggered.

GENERAL OPERATING INFORMATION

Graticule

The graticule of the SC 502 is internally marked on the faceplate of the crt to provide accurate, parallax-free

measurements. The graticule is marked with eight vertical and ten horizontal divisions. Each division is 0.25 inch by 0.25 inch. In addition, each major division is divided into five minor divisions. The vertical gain and horizontal timing are calibrated so that accurate measurements can be made from the graticule.

Intensity Control

The intensity of the display on the crt is controlled by the INTENSITY control. This control is normally adjusted so the display is easily visible but not overly bright. It will probably require readjustment for different displays or sweep rates. Be careful when only a spot is displayed. A high-intensity spot may burn the crt phosphor and cause permanent damage to the crt if allowed to remain too long.

Display Focus

If a well-defined display cannot be obtained with the FOCUS control, even at low intensity settings, adjustment of the internal astigmatism control may be required. This should only be done by qualified personnel.

To check for proper setting of the Astig control, slowly turn the FOCUS control through the optimum setting with a signal displayed on the crt screen. If the Astig control is correctly set, the vertical and horizontal portions of the trace will come into sharpest focus at the same position of the FOCUS control.

Trace Alignment Adjustment

This is an internal adjustment and should be done only by a person qualified to do so.

Intensity Modulation (Applies only if pin 24A of Interface Connector has been connected)

Intensity (Z-Axis) modulation can be used to relate a third item of electrical phenomena to the vertical (Y-Axis) and the horizontal (X-Axis) coordinates without affecting the waveshape of the displayed signal. The Z-Axis modulating signal, applied to pin 24A of the rear interface connector, changes the intensity of the displayed waveform to provide this type of display. The voltage amplitude required for visible trace modulation depends on the setting of the INTENSITY control. About +5 V will turn on the display to a normal brightness level from an off level, and about -5 V will turn the display off from a normal brightness level. "Gray scale" intensity modulation can be obtained by applying signals between these levels. Maximum safe input voltage is + or -10 V. Usable frequency range of the Z-Axis circuit is dc to 2 MHz.

Calibrator

The internal calibrator of the SC 502 provides a convenient signal source for checking basic vertical gain and sweep timing. The calibrator signal is also useful for adjusting probe compensation, as described in the probe instruction manual. The output square-wave voltage is 600 mV, within 1%. The frequency of the square-wave signal is twice the power-line frequency.

Vertical Displays

Single-Trace Displays. Either of the input channels can be used for single-trace displays. Apply the signal to the desired input connector and set the MODE switch to display the channel used. The trigger SOURCE switches can select either vertical channel as a trigger signal source.

Dual-Trace Operation (Alternate Mode). The ALT position of the MODE switch produces a display that alternates between Channel 1 and Channel 2 with each sweep of the crt. Although the ALT mode can be used at all sweep rates, the CHOP mode provides a more satisfactory display at sweep rates below about 50 μ s/div.

In the CH 1 or CH 2 positions of the trigger SOURCE switches, a stable display of two signals will be displayed, showing true time relationship. If the signals are not time related, one of the signals displayed will be unstable.

Dual-Trace Operation (Chopped Mode). The CHOP position of the MODE switch produces a display that is electronically switched between channels. In general, the CHOP mode provides the best display at sweep rates slower than about 50 ms/div, or whenever dual-trace, single-shot phenomena are to be displayed. At faster sweep rates, the chopped switching becomes apparent and may interfere with the display.

Proper external triggering for the chopped mode of operation is obtained by using external triggering from a signal that is time-related to either signal. This provides the same result as triggering internally from Channel 1 or Channel 2.

Two signals that are time-related can be displayed in the chopped mode, showing true time relationship. However, if the signals are not time-related, one signal displayed will appear unstable.

Algebraic Addition. The CH 1 MINUS CH 2 position of the MODE switch can be used to display the difference of two signals, for common-mode rejection to remove an undesired signal, or for dc offset (applying a DC voltage to

one channel to offset the dc component of a signal on the other channel).

The following general precautions should be observed:

1. Do not exceed the input voltage rating of the SC 502.
2. Do not apply signals that exceed an equivalent of about eight times the VOLTS/DIV switch setting. For example, with a VOLTS/DIV switch setting of 0.5, the voltage applied to that channel should not exceed about four volts. Larger voltages may distort the display.
3. Use CH 1 and CH 2 POSITION control settings that most nearly position the signal of each channel to midscreen when viewed in either the CH 1 or CH 2 positions of the MODE switch. This ensures the greatest dynamic range for CH 1 MINUS CH 2 mode operation.
4. For similar response from each channel, set the CH 1 and CH 2 AC-GND-DC switches to the same position.

Deflection Factor

The amount of vertical deflection produced by a signal is determined by the signal amplitude, the setting of the VOLTS/DIV switches, and the setting of the VOLTS/DIV variable controls. The calibrated deflection factors indicated by the VOLTS/DIV switches apply only when the VOLTS/DIV variable controls are set to the calibrated position (fully clockwise in detent).

The VOLTS/DIV variable controls provide continuously variable (uncalibrated) vertical deflection factors between the calibrated settings of the VOLTS/DIV switches. The VOLTS/DIV variable controls extend the maximum vertical deflection factor to at least 50 V per division.

Reliable signal measurements cannot be made unless both the oscilloscope and the unit under test are connected together by a common reference (ground) lead in addition to the signal lead or probe. The ground strap on the signal probe provides the best ground. Also, a ground lead can be connected to the post chassis ground to establish a common ground with the signal source.

Input Coupling

The AC-GND-DC switches allow a choice of coupling method for the applied signal. The type of display desired and the applied signal determines the coupling method to use.

In the AC coupling position, the dc component of the signal is blocked by a capacitor in the input circuit. The low-frequency -3 dB point in the AC position is about 10 Hz. Therefore, some low-frequency attenuation can be expected near this frequency limit. Attenuation in the form of waveform tilt will also appear in square waves that have low-frequency components. The AC coupling position provides the best display of signals with a dc component that is much larger than the ac component.

The DC coupling position can be used for most applications. This position allows measurement of the dc component of a signal and must be used to display signals below about 50 Hz to avoid the attenuation that would occur using ac coupling.

The GND position provides a ground reference at the input without the need to externally ground the probe. The signal applied to the probe is internally disconnected from the input circuit and connected to ground through a 1 M Ω resistor. The amplifier input circuit is held at ground potential.

In the GND position, connecting the input signal to ground through a 1 M Ω resistor forms a precharging network. This network allows the input coupling capacitor to charge to the average dc voltage level of the signal applied to the probe. Since this takes place in the GND position of the AC-GND-DC switch, any large voltage transients accidentally generated will not be applied to the amplifier input. The pre-charge network also provides a measure of protection to the external circuit by reducing the current levels that can be drawn from the external circuitry during capacitor charging. The following procedure should be used whenever the probe tip is connected to a signal source having a different dc level than that previously applied.

1. Before connecting the probe tip to a signal source, set the AC-GND-DC switch to GND.
2. Touch the probe tip to oscilloscope chassis ground. Wait several seconds for the input coupling capacitors to discharge.
3. Connect the probe tip to the signal source.
4. Wait several seconds for the input coupling capacitor to charge.
5. Set the AC-GND-DC switch to AC. The display will remain on screen so the ac component of the signal can be measured in the normal manner.

Trigger Source

Internal Triggering. For most applications the sweep can be triggered internally. In the CH 1 and CH 2 positions of the trigger SOURCE switches, the trigger signal is obtained from the vertical deflection system. For dual-trace displays, special considerations must be made to provide the correct display. Refer to the Dual-Trace Operation explanation in the Vertical Display portion of the Basic Operating instructions for dual-trace triggering information.

Line Triggering. LINE position of the SOURCE switch is achieved by simultaneously depressing the CH 1 and CH 2 buttons. The LINE position connects a sample of the power-line voltage to the input of the Trigger generator. Line triggering is useful when the input signal is time-related (multiple) to the line frequency. It is also useful for providing a stable display of a line-frequency component in a complex waveform.

External Triggering. An external signal connected to the EXT IN connector can be used to trigger the sweep in the EXT position of the SOURCE switch. The external signal must be time-related to the displayed signal for a stable display. An external trigger signal can be used to provide a triggered display when the internal signal is too low in amplitude for correct triggering, or contains undesirable signal components. It is also useful when signal tracing in amplifiers, phase-shift networks, wave-shaping circuits, etc. The signal from a single point in the circuit under test can be connected to the external trigger input connector through a cable or signal probe. The sweep is then triggered by the same signal at all times and allows amplitude, time relationship, or waveshape changes of signals at various points in the circuit to be examined without resetting the trigger controls.

Trigger Coupling

Two methods of coupling the trigger signal to the trigger circuits can be selected with the trigger COUPLING switches. Each method permits selection or rejection of certain frequency components of the trigger signal to obtain selective triggering.

AC Coupling. The AC position blocks the dc component of the trigger signal. Signals with low-frequency components below about 50 Hz are attenuated. In general, ac coupling can be used for most applications. However, if the trigger signal contains unwanted frequency components, the LF REJ COUPLING switch may provide a better display.

Low-Frequency Reject. The LF REJ position passes all high-frequency signals above about 5 kHz. Dc is rejected and signals below about 5 kHz are attenuated. When

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triggering from complex waveforms, this position is useful for providing a stable display of the high-frequency components.

Trigger Slope

The trigger SLOPE switch determines whether the trigger circuit responds on the positive-going or negative-going portion of the trigger signal. When the SLOPE switch is in the + (positive-going) position, the display starts with the positive-going portion of the waveform; in the - (negative-going) position, the display starts with the negative-going portion of the waveform. When several cycles of a signal appear in the display, the setting of the SLOPE switch is often unimportant. However, if only a certain portion of a cycle is to be displayed, correct setting of the SLOPE switch is important to provide a display that starts on the desired slope of the input signal.

Trigger Level

The trigger LEVEL control determines the voltage level on the triggering waveform at which the sweep is triggered. When the LEVEL control is set in the + region, the trigger circuit responds at a more positive point on the trigger signal. When the LEVEL control is set in the - region, the trigger circuit responds at a more negative point on the trigger signal. To set the LEVEL control, first select the trigger SOURCE, COUPLING, and SLOPE. Then set the LEVEL control fully clockwise and rotate it counterclockwise until the display starts at the desired point.

Trigger Mode

Automatic Triggering. The AUTO position (AUTO button pushed in) of the trigger mode switch provides a stable display when the LEVEL control is correctly set (see Trigger Level portion of General Operating Information) and an adequate trigger signal is present. The TRIG'D light indicates when the sweep generator is triggered.

When the trigger repetition rate is less than about 20 Hz, or in the absence of an adequate trigger signal, the sweep generator free-runs to produce a reference trace. When an adequate trigger signal is again applied, the free running condition ends and the sweep generator is triggered to produce a stable display (with the correct LEVEL control setting).

Normal Triggering. Operation in the normal position (AUTO button is out) of the trigger mode switch is the same as in the AUTO position when a trigger signal is applied. However, when a trigger signal is not present, the sweep generator remains off and there is no display. The TRIG'D light indicates when the sweep generator is triggered.

Use the normal mode to display signals with repetition rates below about 20 Hz. This mode provides an indication of an adequate trigger signal as well as the corrections of trigger control settings, since there is no display without proper trigger. Also, the TRIG'D light is off when the sweep is not correctly triggered.

Trigger Holdoff. By placing the internal HO-SWP jumper in the HO position, the variable sweep control (CAL) is connected as a Trigger Holdoff variable control. In this configuration, the control provides for stable triggering on aperiodic or irregular signals (such as complex digital words). (The internal jumper should only be changed by qualified personnel.)

To use the control, first obtain the most stable presentation possible by adjusting the triggering controls in the normal manner. Now, rotate the Trigger Holdoff variable control counterclockwise until any remaining instability is eliminated.

Single Sweep. When the signal to be displayed is not repetitive or varies in amplitude, shape, or time, a conventional display may produce an unstable presentation. To avoid this, use the single-sweep feature. The single-sweep mode can also be used to photograph a non-repetitive signal.

To use the single-sweep mode, first make sure the trigger circuit will respond to the event to be displayed. Set the AUTO and SINGLE SWP buttons to the out position and obtain the best possible display in the normal manner (for random signals set the trigger circuit to trigger on a signal which is approximately the same amplitude and frequency as the random signal). Then, depress the SINGL SWP button and press and release the RESET button. The next trigger pulse will initiate the sweep and a single trace will be presented on the screen. After this sweep is complete, the sweep generator is "locked out" until reset. The READY indicator lights when the sweep generator circuit has been reset and is ready to produce a sweep; it goes out after the sweep is complete. To prepare the circuit for another single-sweep display, press and release the RESET button again.

Horizontal Sweep Rates

The SECONDS/DIV switch selects calibrated sweep rates for the sweep generator. The variable control provides continuously variable sweep rates between the settings of the SECONDS/DIV switch. Only when the variable control is in its fully clockwise position are the sweep rates calibrated.

Sweep Magnification

The sweep magnifier expands the sweep by a factor of ten. The center division of the unmagnified display is the portion visible on the screen in magnified form. The equivalent length of the magnified sweep is more than 100 divisions. Any 10 division portion of the magnified sweep can be viewed by adjusting the horizontal POSITION control to bring the desired portion into the viewing area.

To use the magnified sweep, first move the portion of the display which is to be expanded to the center of the graticule. Then pull the SWP MAG switch to its out position. Use the horizontal POSITION control to move the magnified portion to the desired position.

When the SWP MAG switch is set to on, the sweep rate is determined by dividing the SECONDS/DIV switch setting by 10. For example, if the SECONDS/DIV switch is set to .5 μ , the magnified sweep rate is 0.05 μ s/div.

X-Y Operation

In some applications, it is desirable to display one signal versus another (X-Y) rather than against the internal time base. The AMP position (fully counterclockwise) of the SECONDS/DIV switch provides a means for applying an external signal to the horizontal amplifier for this type of display.

NOTE

The CHOP position of the MODE switch must be used for dual vertical displays. The ALT position of the MODE switch will not produce a correct display.

Do not exceed the horizontal scan area of the graticule in the X-Y mode of operation. This mode can be used to measure phase differences of signals up to about 50 kHz. Above this frequency, the phase shift in the system makes phase measurement difficult.

BASIC OSCILLOSCOPE APPLICATIONS

The following information describes the techniques for making basic measurements. These applications are not described in detail, since each application must be adapted to the requirements of the individual measurement. Contact your local Tektronix Field Office or representative for additional assistance.

Peak-to-Peak Voltage Measurements—AC

To make peak-to-peak voltage measurements, use the following procedure:

1. Set the desired channel AC-GND-DC switch to GND and connect the signal to the input connector.
2. Set the desired channel AC-GND-DC switch to AC and set the channel VOLTS/DIV switch to display about 5 or 6 vertical divisions of the waveform. Check that the variable VOLTS/DIV control for the channel is in the fully clockwise position.
3. Adjust the time-base triggering controls for a stable display and set the SECONDS/DIV switch to display several cycles of the waveform.
4. Turn the channel POSITION control so that the lower portion of the waveform coincides with one of the graticule lines below the center horizontal line, and the top of the waveform is in the viewing area. Move the display with the horizontal POSITION control so that one of the upper peaks is aligned with the center vertical reference line (see Fig. 2-3).

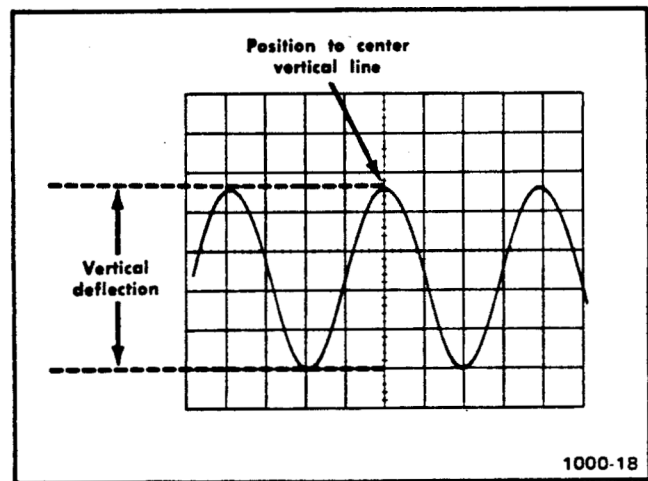


Fig. 2-3. Measuring peak-to-peak voltage of a waveform.

5. Measure the vertical deflection from peak to peak (divisions).

NOTE

This technique may also be used to make measurements between any two points on the waveform, rather than peak to peak.

6. Multiply the distance (in divisions) measured in step 5 by the channel VOLTS/DIV switch setting. Also include the attenuation factor of the probe, if one is used.

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EXAMPLE: Assume a peak-to-peak vertical deflection of 4.6 divisions and a channel VOLTS/DIV switch setting of 5 V.

$$\begin{array}{r} \text{Peak-to-} \\ \text{peak} \\ \text{volts} \end{array} = \begin{array}{r} 4.6 \\ \text{(divisions)} \end{array} \times \begin{array}{r} 5 \text{ (channel} \\ \text{VOLTS/DIV} \\ \text{setting)} \end{array} = \begin{array}{r} 23 \\ \text{volts} \end{array}$$

NOTE

If an attenuator probe is used, multiply the right side of the above equation by the attenuation factor.

Instantaneous Voltage Measurement—DC

To measure the dc level at a given point on a waveform, use the following procedure:

1. Set the desired channel AC-GND-DC switch to GND and position the trace to the bottom line of the graticule (or other selected reference line). If the voltage to be measured is negative with respect to ground, position the trace to the top line of the graticule. Do not move the channel POSITION control after this reference has been established.

NOTE

To measure a voltage level with respect to a voltage other than ground, make the following changes to step 1: Set the AC-GND-DC switch to DC and apply the reference voltage to the input connector, then position the trace to the reference line.

2. Connect the signal to the input connector. Set the desired channel AC-GND-DC switch to DC (the ground reference can be checked at any time by setting the input coupling to GND).

3. Set the channel VOLTS/DIV switch to display about 5 or 6 vertical divisions of the waveform. Check that the variable VOLTS/DIV control for the channel is in the fully clockwise position. Adjust the time-base triggering controls for a stable display.

4. Measure the distance in divisions between the reference line and the point on the waveform at which the dc level is to be measured. For example, in Fig. 2-4 the measurement is made between the reference line and point A.

5. Establish the polarity. The voltage is positive if the waveform is above the reference line.

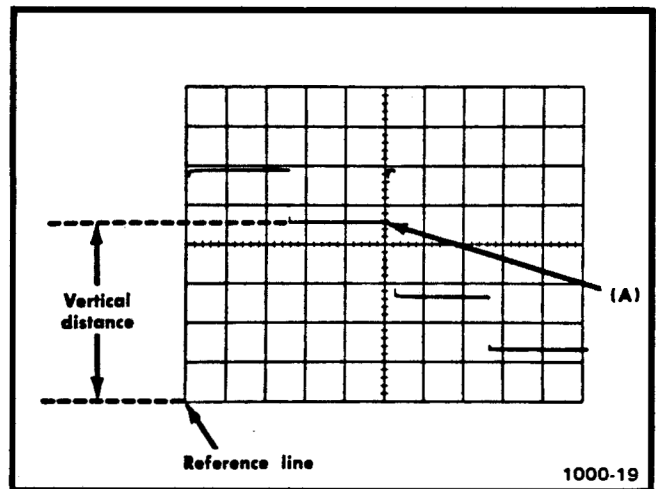


Fig. 2-4. Measuring instantaneous dc voltage with respect to a reference voltage.

6. Multiply the distance measured in step 4 by the channel VOLTS/DIV switch setting. Include the attenuation factor of the probe, if one is used (see the note following the Peak-to-Peak Voltage Measurement example).

EXAMPLE: Assume that the vertical distance measured is 4.6 divisions, the polarity is positive, the channel VOLTS/DIV switch setting is 2 V.

$$\begin{array}{r} \text{Instan-} \\ \text{taneous} \\ \text{Voltage} \end{array} = \begin{array}{r} 4.6 \\ \text{(division)} \end{array} \times \begin{array}{r} 2 \\ \text{(channel} \\ \text{VOLTS/DIV)} \end{array} = \begin{array}{r} +9.2 \\ \text{volts} \end{array}$$

Time Period Measurement

To measure the time (period) between two points on a waveform, use the following procedure:

1. Connect the signal to the vertical input connector, select either ac or dc input coupling, and set the channel VOLTS/DIV switch to display about four divisions of the waveform.

2. Set the time-base triggering controls to obtain a stable display. Set the SECONDS/DIV switch to the fastest sweep rate that will permit displaying one cycle of the waveform in less than eight divisions (some non-linearity may occur in the first and last graticule divisions of display). Refer to Fig. 2-5.

3. Adjust the desired channel POSITION control to move the points between which the time measurement is made to the center horizontal line. Adjust the horizontal

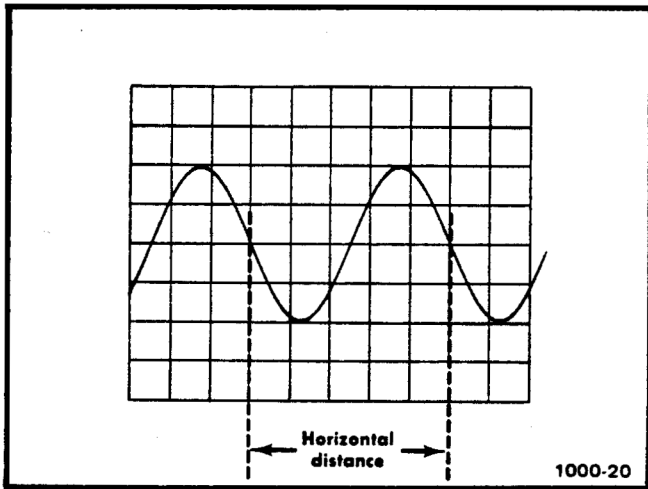


Fig. 2-5. Measuring time duration (period) between points on a waveform.

POSITION control to center the time-measurement points within the center eight divisions of the graticule.

4. Measure the horizontal distance between the time measurement points. Be sure the variable SECONDS/DIV control is fully clockwise.

5. Multiply the distance measured in step 4 by the setting of the SECONDS/DIV switch.

EXAMPLE: Assume that the horizontal distance between the time-measurement points is five divisions and the SECONDS/DIV switch is set to .1 ms. Using the formula:

$$\text{Period} = \text{horizontal distance (divisions)} \times \frac{\text{SECONDS/DIV switch setting}}{\text{DIV}} = (5) (0.1 \text{ ms}) = 0.5 \text{ ms}$$

The period is 0.5 ms.

Determining Frequency

The time measurement technique can also be used to determine the frequency of a signal. The frequency of a periodically recurrent signal is the reciprocal of the time duration (period) of one cycle. Use the following procedure:

1. Measure the period of one cycle of the waveform as described in the previous application.

2. Take the reciprocal of the period to determine the frequency.

EXAMPLE: The frequency of the signal shown in Fig. 2-5, which has a period of 0.5 ms is:

$$\text{Frequency} = \frac{1}{\text{period}} = \frac{1}{0.5 \text{ ms}} = 2 \text{ kHz}$$

Risetime Measurement

Risetime measurements employ basically the same techniques as the time-period measurements. The main difference is the points between which the measurement is made. The following procedure gives the basic method of measuring risetime between the 10% and 90% points of the waveform.

1. Connect the signal to the input connector.

2. Set the desired channel VOLTS/DIV switch and variable VOLTS/DIV control to produce a display exactly five divisions in amplitude.

3. Center the display about the center horizontal graticule line with the channel Position control.

4. Set the time-base triggering controls to obtain a stable display. Set the SECONDS/DIV switch to the fastest sweep rate that will display less than eight divisions between the 10% and 90% points on the waveform (see Fig. 2-6).

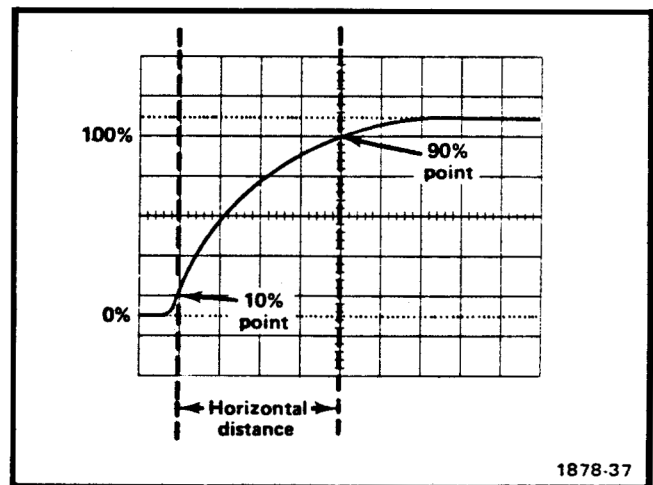


Fig. 2-6. Measuring risetime.

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5. Adjust the horizontal Position control to move the 10% point of the waveform to the second vertical line on the graticule.

6. Measure the horizontal distance between the 10% and 90% points. Be sure the variable SECONDS/DIV control is in the fully clockwise position.

7. Multiply the distance measured in step 6 by the setting of the SECONDS/DIV switch.

EXAMPLE: Assume that the horizontal distance between the 10% and 90% points is four divisions and the SECONDS/DIV switch is set to 1 μ s.

Using the period formula to find risetime:

$$\begin{array}{l} \text{Rise-} \\ \text{time} \\ \text{period} \end{array} = \begin{array}{l} \text{horizontal} \\ \text{distance} \\ \text{(divisions)} \end{array} \times \begin{array}{l} \text{SECONDS/} \\ \text{DIV} \\ \text{switch} \\ \text{setting} \end{array} = (4) (1 \mu\text{s}) = 4 \mu\text{s}$$

The risetime is 4 μ s.

Time Difference Measurements

The SC 502 Oscilloscope permits measurement of time difference between two or more separate events. To measure time difference, use the following procedure:

1. Set the AC-GND-DC switches of both channels to either AC or DC.

2. Set the MODE switch to either CHOP or ALT. In general, Chop is more suitable for low-frequency signals. More information on determining the mode is given under Vertical Displays in this section.

3. Set the triggering switches to trigger the display on channel 1 or channel 2, whichever channel provides the most stable and correct triggering for both channels.

4. Connect the reference signal to the channel 1 input connector and the comparison signal to the channel 2 input connector. The start of the reference signal should lead that of the comparison signal. Use coaxial cables or probes that have similar time-delay characteristics to connect the signal to the input connectors.

5. If the signals are opposite polarity, take this into account in the final calculation.

6. Set the channel VOLTS/DIV switches to produce about four divisions of display waveform.

7. Set the triggering controls for a stable display. Set the SECONDS/DIV switch for a sweep rate which shows three or more divisions between the measurement points, if possible.

8. Adjust the channel POSITION controls to bring the measurement points to the center horizontal reference line.

9. Adjust the horizontal POSITION control so the channel 1 waveform (reference) crosses the center horizontal line at a vertical graticule line.

10. Measure the horizontal distance between the two measurement points (see Fig. 2-7).

11. Multiply the measured distance by the setting of the SECONDS/DIV switch.

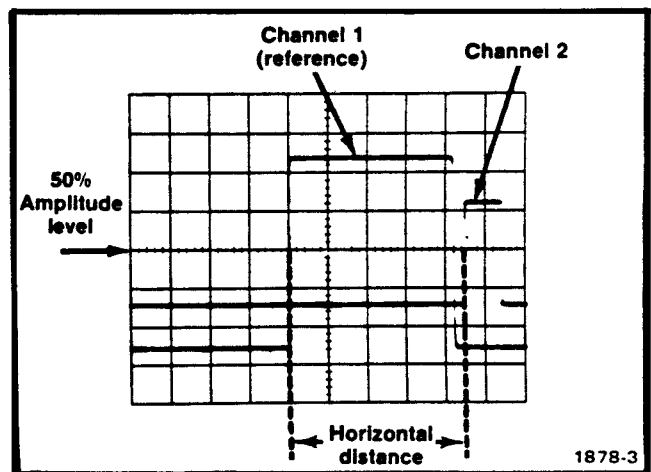


Fig. 2-7. Measuring time difference between two pulses.

EXAMPLE: Assume that the SECONDS/DIV switch is set to 50 μ s and the horizontal distance between measurement points is four divisions. Using the formula:

$$\begin{array}{l} \text{Time} \\ \text{Delay} \end{array} = \begin{array}{l} \text{SECONDS/} \\ \text{DIV} \\ \text{switch} \\ \text{setting} \end{array} \times \begin{array}{l} \text{horizontal} \\ \text{distance} \\ \text{(divisions)} \end{array} = (50 \mu\text{s}) (4) = 200 \mu\text{s}$$

The time delay is 200 μ s.

Multi-trace Phase Difference Measurement

Phase comparison between two or more signals of the same frequency can be made using both vertical input channels. This method of phase difference measurement can be used up to the frequency limit of the vertical system. To make the comparison, use the following procedure:

1. Set the AC-GND-DC switches of the amplifier channels to either AC or DC.

2. Set the MODE switch to either CHOP or ALT. In general, CHOP is more suitable for low-frequency signals and the ALT position is more suitable for high-frequency signals. More information on determining the mode is given under Vertical Displays in this section.

3. Set the triggering switches to trigger the display on channel 1 or channel 2, whichever channel provides the most stable and correct triggering for both channels.

4. Connect the reference signal to the channel 1 input connector and comparison signal to the channel 2 input connector. The reference signal should precede the comparison signal in time. Use coaxial cables or probes that have similar time-delay characteristics to connect the signals to the input connectors.

5. If the signals are of opposite polarity due to 180° phase difference, take this into account in the final calibration.

6. Set the channel VOLTS/DIV switches and the variable VOLTS/DIV controls so the displays are equal and about five divisions in amplitude.

7. Set the triggering controls to obtain a stable display. Set the SECONDS/DIV switch to a sweep rate that displays about one cycle of the waveform.

8. Move the waveforms to the center of the graticule with the channel POSITION controls.

9. Turn the variable SECONDS/DIV control until one cycle of the reference signal (channel 1) occupies exactly eight divisions between the second and tenth vertical lines of the graticule (see Fig. 2-8). Each division of the graticule represents 45° of the cycle ($360^\circ \div 8 \text{ divisions} = 45^\circ/\text{division}$). The sweep rate can be stated in terms of degrees as 45°/division.

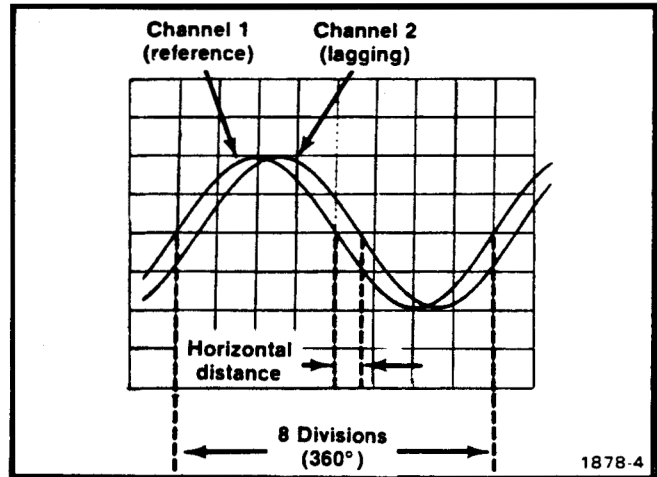


Fig. 2-8. Measuring phase difference.

10. Measure the horizontal difference between corresponding points on the waveforms.

11. Multiply the measured distance (in divisions) by 45°/division (sweep rate) to obtain the exact amount of phase difference.

EXAMPLE: Assume a horizontal difference of 0.6 division with a sweep rate of 45°/division as shown in Fig. 2-8. Use the formula:

Phase	horizontal	sweep	
Differ-	= difference	X (degrees/	= (0.6) (45°) = 27°
ence	(divisions)	divisions)	

The phase difference is 27°.

High Resolution Phase Measurement

More accurate dual-trace phase measurements can be made by increasing the sweep rate (without changing the variable SECONDS/DIV control setting). One of the easiest ways to increase the sweep rate is with the X10 sweep magnifier.

EXAMPLE: If the sweep rate were increased 10 times with the magnifier, the magnifier sweep rate should be $45^\circ/\text{division} \div 10 = 4.5^\circ/\text{division}$. Fig. 2-9 shows the same signals as used in Fig. 2-8, but with the X10 SWP MAG control pulled out. With a horizontal difference of six divisions, the phase difference is:

Phase	horizontal	magnified	
Differ-	= difference	X rate	= (6) (4.5°) = 27°
ence	(divisions)	(degrees/	division)

The phase difference is 27°.

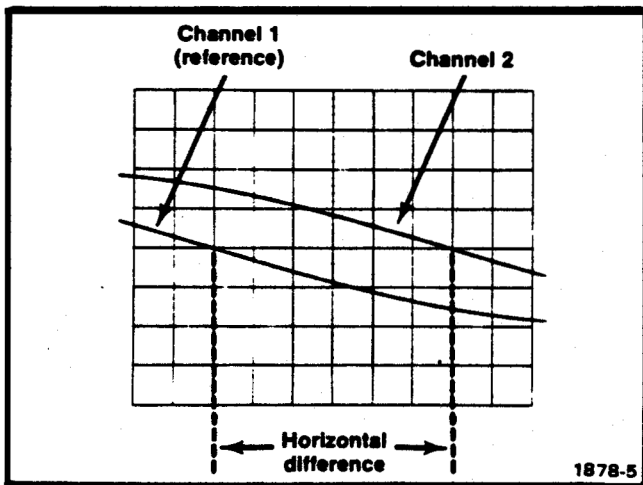


Fig. 2-9. High-resolution phase difference measurement with increased sweep rate.

REAR INTERFACE

Unassigned pins are available at the rear connector for routing signals to and from the SC 502 for specialized applications (see Rear Interface Connector Assignments in Section 5). One or more compartments of a multi-plug-in Power Module can be wired with barriers installed to provide specific functions between compartments. See Power Module instruction manual for additional information.

THEORY OF OPERATION

DIAGRAM 1 & 2 CIRCUIT DESCRIPTION

Vertical Amplifier

The vertical amplifier provides attenuation and amplification for the vertical signal before it is applied to the vertical deflection plates of the crt. The vertical amplifier circuitry includes the delay line and trigger view circuit, which allows the oscilloscope to display its triggering signal.

NOTE

Where both channels 1 and 2 are similar, only channel 1 will be described.

Input Coupling

Signals applied to the front-panel input connectors may be capacitively coupled (AC), directly coupled (DC), or internally disconnected (GND). Input coupling is selected by S100 at the input for channel 1.

Assuming that a signal is applied to the input, when S100 is set to DC, the applied signal is passed directly to the attenuators. When S100 is set to AC, C100 is placed in the circuit to couple signals of about 10 Hz (−3 dB point) and higher to the attenuator. This capacitor blocks any dc component of the signal. When S100 is set to GND, a ground reference is provided to the input of the amplifier without the need to remove the applied signal from the input connector.

NOTE

When dc levels (above 10 V) are to be blocked by ac coupling, the AC-GND-DC switch should be set to GND while input connections are made or broken, or when voltage levels are changed. This will allow the coupling capacitor to charge without overdriving the amplifier.

Input Attenuator

The input attenuator is a frequency-compensated voltage divider and provides 100X attenuation in positions 0.5 to 20 of the VOLTS/DIV switch. At dc and for low frequency signals, the divider is essentially resistive (attenuation ratio determined by the resistance ratio).

In addition to providing constant 100X attenuation at all frequencies within the bandwidth capabilities of the instrument, the input attenuator maintains a constant input rc characteristic (1 MΩ paralleled by about 47 pF).

Preampifier Stage

The preamplifier consists of two identical operational amplifiers, connected in a differential configuration. Fig. 3-1 shows a simplified block diagram of the preamplifier.

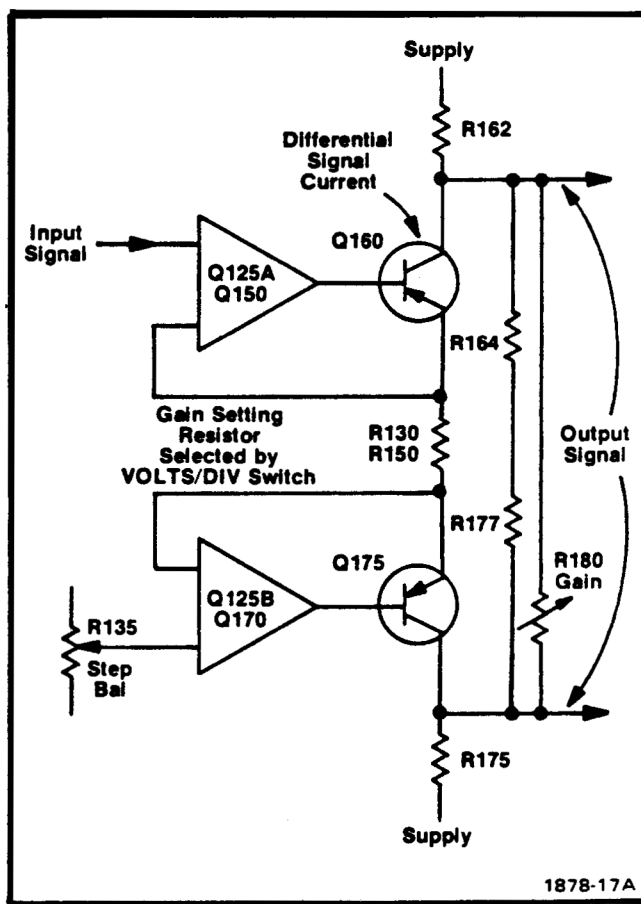


Fig. 3-1. Input preamplifier detailed block diagram showing signal current paths.

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The operational amplifiers are composed of Q125A, Q150 and Q160 on one side, and Q125B, Q170 and Q175 on the other side. Q125A and Q125B provide a voltage follower input to output transistors Q160 and Q175. Total gain of the stage is determined by the resistance between the two sides of the amplifier, and R162 and R175, paralleled by R164, R177, and R180 (the signal current path in Fig. 3-1).

Correct adjustment of the Step Bal control, R135 will quiescently balance the two sides of the amplifier so that there is no current through the gain-setting resistor(s). When a signal is applied to the gate of Q125A the signal current is developed through the gain-setting resistor

R130-R150. Conduction of Q160 and Q175 is changed by the amount of this current, developing the output voltage across R162 and R175. The output is a push-pull signal. The value of R130-R150 is selected by the VOLTS/DIV switch, S150, to determine the gain.

To minimize trace shift as different vertical deflection factors are selected, the Q125A and Q125B sources are dc balanced at equal potentials so that the voltage across the gain-setting resistors is near zero at all settings of the VOLTS/DIV switch. This dc balancing is achieved by adjusting Step Bal control R135 for no trace movement while rotating the VOLTS/DIV switch from 0.2 V to 1 mV.

DIAGRAM CIRCUIT DESCRIPTION

Vertical Amplifier

Gain Stage

The differential signal developed at the collectors of Q160 and Q175 is passed through emitter followers Q320 and Q325 to the output amplifier channel switch. Q320 and Q325 are also the lower half of a push-pull cascode amplifier. Q320 and Q325 provide current gain to drive the channel switch loads and trigger signal amplifier Q340 and Q345.

Channel Switch

The outputs of the channel 1 and channel 2 gain stages go to the channel switch where the signal that goes to the output amplifier is determined.

The MODE switch S300 controls the channel switch by forward biasing selected transistors. Table 3-1 shows in positive logic which transistor will be turned on by the lows (0). Since the different positions of the MODE switch operate in a similar manner, only the CH 1 position will be described in detail.

Channel 1 MODE switch operation. Setting the MODE switch to CH 1 places a low at pin 3 of U355 disabling the chop multivibrator and a low at pins 2, 3, 4 and 5 of J-K flip-flop U360. The low at the CLR input of U360 results in a low at pin 8 of U360, turning on Q330, Q335, Q415 and Q410. The remaining channel switch transistors are biased off. The signal from channel 1 is passed through Q330 and Q335 to the delay line. The channel 2 signal is passed through Q415 and Q410, the currents are summed then split equally by R427-R425 (Diagram 4) and applied to each side of the delay line. Summing the current of the unused channel and applying them equally to each side of

the delay line supplies the output amplifier with a constant input current, independent of either the MODE or TRIGGER VIEW switch positions.

Table 3-1

CHANNEL SWITCH LOGIC TABLE

MODE Switch	Output Level			
	U360 Pin 8	U360 Pin 6	U355 Pin 12	U355 Pin 13
CH 1	Low (0)	High (1)	High (1)	Low (0)
CH 2	High (1)	Low (0)	High (1)	High (1)
CH 1 minus CH 2	Low (0)	High (1)	Low (0)	High (1)

Chop multivibration operation. The chop multivibrator output is controlled by the MODE switch. In the CHOP position of the MODE switch pins 3 and 9 of U355 are disconnected from ground and the multivibrator (U355A-U355B) produces a 250 kHz square-wave signal. This signal is supplied via NAND gate U355C to the clock (pin 12) input of U360 and also to the blanking circuit. The chop output to the clock input of U360 is used to switch the channel switch output between channels 1 and 2. The chop output to the blanking circuit is used to blank the chop-switching transients.

Alternate mode operation. In the ALT position of the MODE switch, a pulse at the end of each sweep is supplied to the clock (pin 12) input of U360. The pulse to the clock input of U360 causes the channel switch to change the

input channel that is connected to the output amplifier at the end of each sweep.

Trigger Amplifier

Trigger amplifier Q340 and Q345 amplifies the output signal from the vertical preamplifier and supplies it to the

appropriate connections of the trigger pickoff circuit to be used as a triggering signal source for that vertical channel. The channel 1 trigger amplifier also supplies the signal to an auxiliary trigger amplifier.

DIAGRAM CIRCUIT DESCRIPTION

Vertical Amplifier & Trigger View

Delay Line

Delay Line DL400 provides approximately 140 ns delay for the vertical signal, which allows the sweep generator circuits time to initiate a sweep before the vertical signal reaches the vertical deflection plates of the crt. This lets the instrument display the leading edge of the signal that originated the trigger pulse when using internal triggering.

Output Amplifier

Q455 and Q450 are connected as a common-base amplifier to provide a low input impedance to properly terminate the delay line. It also provides isolation between the delay line and the following stages.

Q465 and Q460 compose an emitter-coupled push-pull amplifier that drives the output power amplifiers Q475 and

Q470. R461, R460 and R470 set the gain of the stage by controlling the signal degeneration between the emitters of Q465 and Q460. Variable capacitor C474 and the series rc networks provide high-frequency compensation to optimize amplifier frequency response. L470 and L475 are high-frequency peaking coils to provide additional amplifier speed.

Trigger View

Trigger view amplifier Q440 and Q435 amplify the output signal from the trigger comparator and supply it to the TRIGGER VIEW switch. When the TRIGGER VIEW switch is depressed, the vertical signal from each vertical channel is summed and split equally by R427-R425 and applied to each side of the delay line. At the same time the triggering signal is applied differentially to each side of the delay line. The trigger signal is now amplified and displayed as the vertical signal.

DIAGRAM 5 CIRCUIT DESCRIPTION

Trigger Pickoff and Generator

The trigger pickoff selects the internal trigger signal. It also selects and amplifies the external trigger signal to the level necessary to match the current level of the internal trigger signals. Input signal for the trigger pickoff is either a sample of the signal applied to Channel 1, or Channel 2, a sample of the power line voltage or an external signal.

The trigger generator produces trigger pulses to start the sweep generator. These trigger pulses are derived either from the internal trigger signal from the vertical deflection system, an external signal connected to the EXT TRIG input connector, or a sample of the power line voltage applied to the instrument. Controls are provided in this circuit to select trigger level, slope, and coupling.

Trigger Pickoff

The EXT TRIG signal from the front-panel connector is applied to the gate of field effect transistor source follower Q520A which provides a high input impedance for the signal and a low impedance to the base of Q525. Q520B provides isolation between the Ext Horiz Bal control, R535 and the base of Q525 as well as acting as a constant current source for Q520A. Q520B also provides temperature compensation for Q520A. Q525 forms a voltage-to-current converter whose output current will match that of the other triggering sources. The output from common base amplifier Q530 is supplied to the horizontal amplifier. R518 supplies current for Q525 when the front-panel EXT SOURCE pushbutton is not pushed in.

Trigger Generator

The output of the trigger pickoff, which is selected by the SOURCE pushbutton switches, is applied to the emitter of common base amplifier Q500 to provide a low input impedance. The output of Q500 passes through the COUPLING pushbutton switches to emitter follower Q510. The output of Q510 goes to the trigger level circuit (Q555, Q565, Q550 and Q560) and also to the trigger comparator (Q580 and Q575). The other input to the trigger comparator is from the triggering LEVEL control, R560. If the voltage at the trigger comparator base of Q575 is higher, current flows through Q575 and the collector of Q580 is high. The opposite is true if the base voltage of Q575 is lower (the collector of Q580 is low). Both outputs of the trigger comparator are supplied to gate generator U595 and to the trigger view amplifier Q440 and Q435.

Trigger Level Control. The triggering level, with the AUTO trigger mode pushbutton pushed in, is controlled

by the triggering signal, applied simultaneously to the bases of Q555 and Q565.

Assume a + input signal. This signal, coupled through emitter follower Q555, causes the emitter voltage to rise and charge C552 to the peak positive level of the input signal. C567 is charged in a similar manner to the peak negative level of the input signal. The peak-sensing capacitors, C552-C567, set the voltage levels applied to the triggering LEVEL control (R560) via emitter followers Q550 and Q560. This allows the triggering LEVEL control to be adjusted between the two voltage levels representing the most negative and most positive peaks of the trigger signal.

With the AUTO pushbutton out, the triggering LEVEL control limits are set by R556-R558 and R568-R569.

Gate generator, integrated circuit (IC), U595 converts the output signals from the trigger comparator to a gate waveform which is used for sweep generator control. With pin 1 connected to ground (+ SLOPE), a positive going waveform (3 to 4 V) on the IC input (pin 13) causes pin 3 (output) to rise to about 4.1 V and pin 4 (output) to drop to about 3.2 V. Pin 14 is negative going under the above conditions. The output gate occurs when pins 13 and 14 are within about 20 mV of each other. Floating pin 1 (– SLOPE) causes a gate output at pins 3 and 4 when pin 13 is negative going and pin 14 positive going. The holdoff signal from the sweep generator is supplied to U595 so that after completion of the sweep, pins 6 and 10 are high (about +4.2 V) during the holdoff time. This inhibits the gate generator until these pins drop to about 3.2 V after the holdoff time. The triggered gate and holdoff are available at the rear interface connector through line drivers U600B and U600C.

If it is desired to over-ride the gate output of U595, pin 24B of the rear interface connector is grounded. This enables line receiver U600A to supply the substitute Ext Gate and Ext Gate input signals from the rear interface connector. Q625 and Q630 control the diode switch used to select an internal or external gate as the input to the sweep generator.

Auxiliary Trigger Amplifier

A sample of the channel 1 preamplifier output signal is supplied to common base amplifier Q540 to provide a low input impedance and isolation. The output of Q540 is connected to pin 28B on the rear interface connector.

DIAGRAM CIRCUIT DESCRIPTION

Sweep Control and Generator

Sweep Control

U650, with additional external circuitry, controls the sweep generator. In the automatic triggering mode, pin 19 of U650 is grounded. If pin 1 of U650 receives no trigger gates from the trigger generator for a period of time determined by R664 and C662, circuitry in U650 outputs a negative-going square-wave. This negative-going square-wave from pin 3 drives the base of Q660 negative. When the sweep operates in the triggered mode a positive pulse from the trigger generator drives the base of Q670 positive. Either a positive signal at the base of Q670 or a negative signal at the base of Q660 will cause the entire collector current of the constant current source Q665 to flow through Q660, thus turning off Q670. Q660 turning on supplies current to unblank the crt, while turning Q670 off allows the sweep generator to run.

In the single sweep mode, pin 12 of U650 is connected to +5 V and pin 19 must be ungrounded by releasing the AUTO trigger mode pushbutton. When the sweep is armed, pins 7 and 11 of U650 are low, causing TRIG'D READY indicator to light. This action at pins 7 and 11 also occurs when the sweep is in the triggered mode. R643 limits the LED current.

When pin 18 is about +4 V, the sweep is disabled. When the voltage is about 0 V, the sweep is enabled. This occurs through action at the anode of CR649 from the horizontal amplifier SECOND/DIV switch or, through CR648 and the RESET button. The sweep is disabled when the RESET button is held in (closed) to prevent transients from falsely triggering the sweep in the single sweep mode.

A holdoff waveform is available at pin 17 which connects to the trigger generator preventing the generation of sweep gating waveforms during holdoff times after a single sweep has occurred. Holdoff time begins at the peak of the sweep ramp. It is necessary to allow the sweep circuits to return completely to quiescent conditions before the next sweep starts. The capacitors and resistors connected to pin 8 of U650 determine the holdoff time. They are determined by the sweep rate setting of the SECONDS/DIV switch. Holdoff time starts when pin 16 of U650 reaches about 2.4 V.

Q655 acts as an emitter follower and a regulator for a -5 V supply.

Sweep Generator

The sweep ramp is generated during the time Q670 is off. When Q670 is off, transistors Q685 and Q675 will be off. The current from the timing resistor now flows into the timing capacitor due to the action of the operational amplifier (Q690A, Q690B, and Q695) creating the sweep ramp. The positive going ramp now runs up at a rate determined by the timing resistor and capacitor combination, until it reaches approximately +6.9 V.

At the end of the sweep, Q670 is turned on forcing current through Q675 and Q685. When the Q685 current exceeds the timing resistor current, the sweep ramp is forced to retrace. As the sweep ramp drops below 0 V, Q680 and CR675 turn on. This causes the Q685 current to equal the timing resistor current, thus clamping the integrator output to 0 V until the start of the next sweep. The Swp Offset control, R681 adjusts the drain current of Q690B so the gate of Q690A is at 0 V.

The output of the sweep generator goes to: the input of the horizontal preamplifier, pin 18A of the rear interface connector through emitter followers Q310 and Q300 (Schematic 3), sweep control integrated circuit U650 pin 16 through comparator Q310 and Q315 to signal the start of the holdoff, and the channel switch alternate mode circuit through comparator Q310 and Q315 to cause the channel switch to change the input channel at the end of each sweep.

HORIZONTAL AMPLIFIER

Preamplifier

When the SECONDS/DIV switch is in a sweep rate position, the sweep ramp from the sweep generator is amplified by common base amplifier Q700, which provides low input impedance and isolation. It is then supplied to the input of the horizontal output amplifier. The gain of Q700 is determined by the position of the SWP MAG switch which controls the size of the collector resistor. The SECONDS/DIV switch in the sweep rate positions also forward biases Q715 and reverse biases Q720 to prevent the external horizontal signal from reaching the output amplifier.

In the AMP position of the SECONDS/DIV switch, the output of the external horizontal signal from the trigger

Theory of Operation—SC 502

pickoff is amplified by common base amplifier Q720. Q720 provides a low input impedance and isolation for the input signal. The gain of Q720 is determined by the size of the collector resistor, which includes the Ext Horiz Gain control R723 and R725. The SECONDS/DIV switch in the AMP position also causes Q710 to be forward biased and

Q700 to be reverse biased to prevent the sweep ramp from reaching the output amplifier.

The POSITION control is connected to the base of current source transistor Q730, whose output adjusts the current being fed to the input of the output amplifier.

DIAGRAM CIRCUIT DESCRIPTION

Horizontal Amplifier

Output Amplifier. The output of the horizontal preamplifier is applied to the base of Q745. Q745 and Q765 comprise an emitter coupled paraphase amplifier. Q755 is the current source for the paraphase amplifier. The Centering control, R760 provides a means of correcting for differential unbalance in the amplifier or crt, while the Sweep Gain control, R770 sets the overall gain of the horizontal amplifier. R750 and R764 provide thermal compensation for the paraphase amplifier stage.

Transistors Q775-Q780-Q785 and Q770-Q795-Q790 are connected as two separate current-driven feedback

amplifiers. Input transistor Q775 (in the left output amplifier) is an NPN transistor for better response to positive-going signals, while input transistor Q770 (in the right output amplifier) is a PNP transistor for better negative-going signal response.

Negative feedback is provided from the collectors of output transistors Q780-Q785-Q795-Q790 to the base of input transistors Q775 and Q770 through feedback networks C773-R773 and C785-R789. Capacitors C775, C776, and C791 are speed-up capacitors to improve the amplifier response to fast changes.

DIAGRAM CIRCUIT DESCRIPTION

Z-Axis Amplifier and Crt Circuit

The crt circuit produces the high voltage potentials and provides the control circuits necessary for operation of the cathode-ray tube (crt). The Z-Axis amplifier and Blanking amplifier circuits are included with the crt circuit discussion, since they set the intensity of the crt display.

Z-Axis Amplifier

The Z-Axis amplifier is a current driven, shunt-feedback operational amplifier with a voltage output. The amplifier consists of Q835, Q845, and Q840. The feedback path is from the Q845-Q840 collectors through C834-R834 to the summing point at the base of Q835. Q845 and Q840 are connected as a collector-coupled complementary amplifier that provides a fast linear output signal while consuming minimum quiescent power, Q845 acts as the pull-up transistor and Q840 acts as the pull-down transistor for the amplifier. The output voltage from the amplifier provides the drive signal to control the crt intensity level through the control-grid supply.

The output voltage level of the Z-Axis amplifier is determined by the voltage drop across R834 in reference to the voltage level at the summing point for the amplifier (base of Q835). The current through R834 is determined by the input current from a combination of two sources, INTENSITY control and sweep blanking. CR841 and current limiting resistor R841 act as a protection circuit for the Z-Axis amplifier in case of a high-voltage short. Q825 and Q830 form a comparator with the sweep blanking signal setting the reference level. To unblank the crt, the voltage level at Q830 base must be more positive than the level at the base of Q825.

Blanking Amplifier

A combination of four different input signals control the output current of the blanking amplifier. These signals are: sweep unblanking, horizontal amplifier mode, chop blanking and intensify from pin 19B of the rear interface. Q800 and Q805 form a comparator circuit with the base of Q805

set at about +3.7 V. The input intensify signal must go more negative than +3.7 V before it controls the blanking amplifier output.

All the controlling input signals pass through common base amplifier Q815, which provides a low input impedance and isolation from the impedance-matching and bias-setting transistor Q820. A current flow of approximately 5 mA through Q820 turns the crt beam off, while the front-panel set intensity causes a current of about 1 mA through the transistor. If the current through Q820 is about 0.3 mA, the crt beam will be intensified.

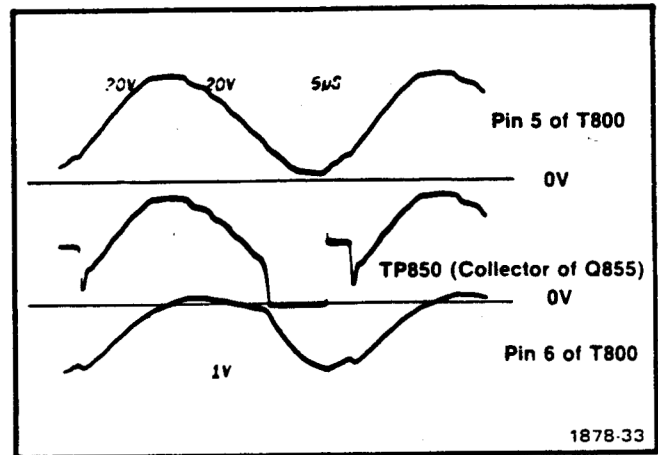


Fig. 3-2. Time relationship of waveforms at three points in the high-voltage regulator.

High-Voltage Regulator

High-Voltage Regulator. Q860, Q855, Q850 and U860 with their associated components provide the regulation and the drive to energize a resonant transformer T800. T850 allows T800 primary winding (pins 4 and 5) to move sinusoidally while allowing Q855 and Q850 to function as saturating switches.

High-Voltage Regulation. Refer to Fig. 3-2 during the following discussion. Regulation is accomplished by sampling the -2 kV across voltage divider R893C-R893D and comparing it to a $+20.0$ V reference supply. The junction of R893C-R893D as well as pin 3 of U860, is nominally 0 V. If the -2 kV supply should become less negative, the junction of R893C-R893D and hence pin 3 of U860 becomes more positive, causing the output (pin 6) of U860 to go positive. The output of U860 going positive results in increased charging current for C857, which will cause Q855 to conduct longer during each cycle, thereby increasing the average current to T800 and T850. As Q855 begins to conduct, T850 allows it to saturate while providing positive feedback from its one-turn winding to ensure that saturation will continue until pin 5 of T800 is at its most negative voltage. During the conduction of Q855, C854 is charging, then at the time pin 5 of T800 is at its most negative voltage, C854 starts discharging, cutting off CR855 and turning on CR853 to provide base current to Q860. Q860's conduction reduces the base current of Q855, thus causing its collector to go more positive. The turning off of Q855 is speeded up by the action of T850 with its one-turn winding. The current through T850 and the energy stored within the coil now flows through T800 via Q850 and CR850. Q850 remains turned on until T850 has been completely discharged. With 0 V across Q850 base-emitter, the primary of T800 may now swing more positive than the input supply voltage.

The high Q of T800 causes its voltages to vary sinusoidally, thus setting conditions for conduction again. During the time that Q855 was not conducting, U860 was charging C857 to a voltage level which when combined with voltage of the one-turn feedback winding of T850 will again cause Q855 to conduct. Initially at instrument turn on, the reference supply voltage is allowed to move positive slowly, depending upon the charging rate of C870 (which is controlled by R860). Once the voltage at pin F11 becomes more positive than $+20$ V, CR862 conducts and the reference supply is held as a constant $+20.6$ V. If a short should occur to the T800 secondary, the voltage at pin F11 will move toward zero, thereby reducing the reference voltage and consequently the transformer drive. If a T800 secondary winding short remains for a time, F800 will blow to protect Q855. If the R893C-R893D voltage divider or the regulator circuit should fail R855 and R857 will turn CR856 on to remove the base drive from Q855 via Q860.

High-Voltage Outputs

The secondary winding of T800 provides the negative and positive accelerating potential for the crt, the bias voltage for the control grid and heater voltage for the crt.

Positive accelerating voltage for the crt screen is supplied by voltage tripler U850. The applied voltage to the input of U850 from the T800 secondary winding is about 3.3 kV peak. The voltage for the crt directly heated cathode is also obtained from the T800 secondary winding. CR881 half-wave rectifies the transformer output and supplies the -2 kV to the crt cathode.

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Diodes CR885 and CR884 provide the rectified negative control voltage for the crt control grid. The output level of this supply is set by the Beam adjustment R873. Diodes CR879 and CR882 clip the crt grid bias voltage from the T800 secondary, to determine the operating level at the control grid. CR879 limits the negative excursion of the bias voltage, depending upon the output voltage of the Z-Axis amplifier. The positive clipping level at the cathode of CR882 is set by the Beam adjustment. CR885 acts as a dc restorer and CR884 as a rectifier. This results in a dc level across R888 equal to the peak-to-peak excursion at the anode of CR882.

CRT Control Circuits

In addition to the INTENSITY control discussed previously, front-panel FOCUS and internal astigmatism

controls have been incorporated for arriving at an optimum crt display. FOCUS control R894 provides the correct voltage for the second anode in the crt. Proper voltage for the third anode is obtained by adjusting Astig control R899. In order to obtain optimum spot size and shape, both the FOCUS and Astig controls are adjusted to provide the proper electrostatic lens configuration in the crt.

Geom adjustment R897 varies the positive level on the horizontal deflection plate shields to control the overall geometry of the display. The trace rotation control, R895, permits adjustment of the dc current through beam-rotation coil L895 to align the display with the horizontal graticule lines.

DIAGRAM CIRCUIT DESCRIPTION

Low Voltage Power Supplies and Calibrator

−20 V Supply

Power for the −20 V regulator is supplied from the TM 500 Series Power Module −33.5 V unregulated supply. The regulator for the −20 V supply consists of operational amplifier U950, and the series pass stage consisting of Q960 and the NPN transistor that is located in the power module. The gain of the amplifier is set by R949, R947 and R945. R949 is the input resistor, while R947 and R945 are the feedback resistors for the operational amplifier. The gain of the amplifier is set to about 2.9 times by R947 (−20 V Adjust). The supply voltage is established by comparing the voltage at the negative input (pin 2) of U950 with the voltage reference at the positive input (pin 3). Any differences between the negative and positive inputs to U950 cause a change in the conduction of Q960 and power module series pass transistor to correct for the output error. Q960 and the power module NPN series pass transistor are connected as an operational amplifier whose output is connected back to its negative input. Q955 protects the supply in the event of a current overload. The overload (increase in current through R943) will cause Q955 to turn on, which biases Q960 off, shutting the −20 V supply off.

+20 V Supply

The −20 V and +20 V supplies are similar in operation.

Power Off Circuit for −20 V and +20 V Supplies

Placing the MODE switch (S300) in the PWR OFF position applies +11.5 V to the negative input of U930 and

to the base of Q930. The +11.5 V applied to U930 reduces the output of the +20 V regulator, while the +11.5 V turns Q930 on, pulling the supply output down to ground.

At the same time +11.5 V is applied to Q930 and U930, +11.5 V is applied to the emitter of common base amplifier Q950 which in turn applies a slightly positive voltage to the positive input of U950. This reduces the output of the −20 V regulator to near 0 V.

+5 V Supply

Power for the +5 V regulator is supplied from the TM 500 Series Power Module +11.5 V unregulated supply. The regulator for the +5 V supply consists of operational amplifier U960 and series pass transistor Q970. The amplifier is connected for unity gain. R969 is the feedback resistor for the operational amplifier. The supply voltage is established by comparing the voltage at the negative input of U960 with the voltage reference at the positive input. Any differences between the negative and positive inputs of U960 causes a change in the conduction of Darlington transistor Q970 to correct for the output error. Q965 protects the supply in the event of a current overload. The overload (increase in current through R982) will cause Q965 to turn on, which biases Q970 off, shutting the +5 V supply off.

NOTE

If an over-voltage condition causes fuse F970 to open, an excessive amount of voltage will be applied to Zener diode VR969 which may damage the diode.

Line Trigger

A line-frequency signal is obtained from the secondary of TM 500 Series Power Module transformer and attenuated by R905, R907, and R909 to provide a line-trigger source for the time-base.

Calibrator

The Calibrator circuit composed of Q910, Q900, and their associated passive components produces a square-wave output with accurate amplitude and at a rate of twice the power-line frequency. This output is available at the

calibrator jack on the front panel as a 0.6 V (ground to peak) square-wave voltage.

The resistive-capacitive network at the base of Q900 receives a pulsating dc voltage from full-wave rectifier CR900-CR902 and produces a nearly symmetrical switching signal for Q910 and Q900. As Q910 is alternately switched on and off at twice the line frequency, current through R915 is alternately switched through the transistor or through CR915 and R917, producing the calibrator test signal.

CALIBRATION PROCEDURE

PERFORMANCE CHECK

Introduction

This procedure checks the electrical characteristics of the SC 502 that appear in the Specification portion of this section. If the instrument fails to meet the requirements given in this performance check, the adjustment procedure should be performed. This procedure can also be used by an incoming inspection facility to determine acceptability of performance.

The electrical characteristics in this section are valid only if the SC 502 is adjusted at an ambient temperature of

+20°C to +30°C and operated at an ambient temperature of 0°C to +50°C.

Tolerances that are specified in this performance check procedure apply to the instrument under test and do not include test equipment error.

Test Equipment Required

Below is a list of equipment required to verify operation as specified. Other equipment may be substituted when suitable.

Table 4-1

LIST OF TEST EQUIPMENT REQUIREMENTS

Description	Performance Requirements	Applications	Example
TM 500 power module		All steps.	TEKTRONIX TM 503, TM 504, TM 506.
Function generator	5 Hz to 5 kHz.	Frequency response.	TEKTRONIX FG 503 Function Generator [†] .
Time-mark generator	0.2 s to 5 ns in 1, 2, 5 sequence.	Sweep rate accuracy.	TEKTRONIX TG 501 Time Mark Generator [†] .
Calibration generator	Amplitude calibration, 5 mV to 100 V; accuracy, $\pm 0.25\%$ into 1 M Ω ; output, squarewave at approximately 1 kHz.	Vertical deflection accuracy.	TEKTRONIX PG 506 Calibration Generator [†] .
Leveled sine wave generator	50 kHz to 15 MHz.	Bandwidth, trigger sensitivity & range, & X-Y phasing.	TEKTRONIX SG 503 Leveled Sine-Wave Generator [†] .
Input normalizer	47 pF and 1 M Ω .	Vertical amplifier input.	Tektronix part no. 067-0541-00.
Termination	Impedance, 50 Ω ; accuracy, within 2%; connectors, bnc.	Output termination for signal generator.	Tektronix part no. 011-0049-01.
Coaxial cable	Impedance, 50 Ω ; length, 42 inch; connectors, bnc.	Provides signal interconnection.	Tektronix part no. 012-0482-00.
Dual input cable	Bnc female to 2 bnc male connectors.	X-Y phasing.	Tektronix part no. 067-0525-01.
Adapter	Bnc-to-pin jack.	Calibrator.	Tektronix part no. 013-0084-01.

Table 4-1 (cont)

Description	Performance Requirements	Applications	Example
Termination	Impedance, 600 Ω; accuracy, within 2%; connectors, bnc.	Low frequency response.	Tektronix part no. 011-0092-00.
DC voltmeter	0-200 V, accuracy, 0.1%.	Power supply checks.	TEKTRONIX DM 501A.
Plug-in extension		All steps.	Tektronix part no. 067-0645-02.
10X attenuator	50 Ω.	Vertical frequency response.	Tektronix part no. 011-0059-02.

*Requires TM 500-series power module.

Preliminary Control Settings

CH 1	
VOLTS/DIV	1
CAL	cw (detent)
DC-GND-AC	GND
CH 2	
VOLTS/DIV	1
CAL	cw (detent)
DC-GND-AC	GND
SECONDS/DIV	.2 m
PULL X10 HORIZ MAG-	pushed in-cw
CAL	(detent)
TRIGGERING	
AUTO	in
COUPL	DC (all buttons out)
SOURCE	CH 1
SLOPE	+
LEVEL	≈ midrange
MODE	CH 1
INTEN	normal brightness
FOCUS	sharp trace
POSITION (vertical)	
CH 1	≈ midrange
CH 2	≈ midrange
POSITION (horizontal)	≈ midrange
SINGLE SWP	out

b. Adjust the generator variable control until exactly five graticule divisions are displayed on the crt.

c. Check—that the readout error is less than 2.0%.

d. Check—readout error for the following settings listed in Table 4-2.

NOTE

When checking the deflection accuracy at an ambient temperature range of 0° C to +50° C, derate the accuracy by an additional 1.0%.

Table 4-2

VERTICAL DEFLECTION ACCURACY AND TOLERANCE

VOLTS/DIV	Generator Setting	Display	Tolerance
10	50 V	5	2.0%
5	20 V	4	2.0%
2	10 V	5	2.0%
1	5 V	5	2.0%
.5	2 V	4	2.0%
.2	1 V	5	2.0%
.1	.5 V	5	2.0%
50 m	.2 V	4	2.0%
20 m	.1 V	5	2.0%
10 m	50 mV	5	2.0%
5 m	20 mV	4	2.0%
2 m	10 mV	5	5.0%
1 m	5 mV	5	5.0%

1. Check the Vertical Deflection Accuracy (+15° C To +35° C)

DC-GND-AC	DC
VOLTS/DIV (CH 1 and CH 2)	20

a. Connect the calibration generator to the CH 1 input connector through a 50 Ω coaxial cable.

e. Repeat parts a through d for CH 2.

f. Disconnect all cables and return the front-panel controls to the preliminary settings.

2. Check the Vertical Deflection Variable Range

DC-GND-AC	DC
VOLTS/DIV (CH 1 and CH 2)	10 m
SECONDS/DIV	1 μ
SOURCE	EXT

a. Connect a 50 Ω coaxial cable from the calibration generator output connector to the SC 502 CH 1 input connector.

b. Adjust the generator output for five graticule divisions of display.

c. Rotate the CH 1 POSITION controls to center the displayed signal on the screen.

d. Turn the CH 1 CAL control to the fully counter-clockwise position.

e. Check—that the display is less than two graticule divisions in amplitude.

f. Connect the 50 Ω coaxial cable to the CH 2 input connector and repeat parts b through e of this procedure.

g. Disconnect all cables and return the front-panel controls to the preliminary settings.

3. Check the Vertical Bandwidth (5 mV/div to 20 V/div)

VOLTS/DIV (CH 1 and CH 2)	5 m
DC-GND-AC	DC
SECONDS/DIV	1 m

a. Connect a 50 kHz sine-wave signal from the output connector of the leveled sine-wave generator through a coaxial cable, X10 attenuator, and a 50 Ω termination to the SC 502 CH 1 input connector.

b. Adjust the generator for a crt display of exactly six graticule divisions.

c. Set the generator frequency to 15 MHz and adjust the frequency variable until the displayed signal is at least 4.2 major divisions in amplitude.

d. Check—that the frequency readout from the generator is equal to or greater than 15 MHz.

e. Change the MODE switch to CH 2.

f. Connect the sine-wave generator output to CH 2 input connector and return the generator frequency to 50 kHz and set the amplitude for six graticule divisions.

g. Repeat parts c and d to check the CH 2 bandwidth.

h. Leave all controls and connections for the next step.

4. Check the Vertical Bandwidth (2 mV/div)

VOLTS/DIV (CH 1 and CH 2)	2 m
---------------------------	-----

a. Return the generator to 50 kHz and adjust the leveled sine-wave generator for a crt display of exactly six graticule divisions.

b. Set the generator frequency to 10 MHz and adjust the frequency variable until the displayed signal is at least 4.2 divisions in amplitude.

c. Check—that the frequency readout from the generator is equal to or greater than 10 MHz.

d. Change the MODE switch to CH 1.

e. Connect the generator output to CH 1 input connector and return the generator frequency to 50 kHz and set the amplitude for six divisions.

f. Repeat parts b and c to check the CH 2 bandwidth.

g. Leave all controls and connections for the next step.

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5. Check the Vertical Bandwidth (1 mV/div)

VOLTS/DIV (CH 1 and
CH 2) 1 m

a. Return the generator to 50 kHz and adjust the leveled sine-wave generator for a crt display of exactly six divisions.

b. Set the generator frequency to 5 MHz and adjust the frequency variable until the displayed signal is at least 4.2 major divisions in amplitude.

c. Check—that the frequency readout from the generator is equal to or greater than 5.0 MHz.

d. Change the MODE switch to CH 2.

e. Connect the generator output to CH 2 input connector and return the generator frequency to 50 kHz and set the amplitude for six divisions.

f. Repeat parts b and c to check the CH 2 bandwidth.

g. Disconnect all cables and return front panel controls to the preliminary settings.

6. Check the AC LF Response

MODE CH 1
VOLTS/DIV (CH 1 and
CH 2) .5
DC-GND-AC DC
SECONDS/DIV AMPL

a. Adjust the INTEN and FOCUS controls for a well-defined line on the crt display.

b. Connect a 10 Hz sine-wave signal from the function generator through a 50 Ω coaxial cable, with a 50 Ω termination, to the CH 1 input connector.

c. Adjust the function generator output amplitude for six graticule divisions of display (one vertical line displayed).

d. Set the DC-GND-AC switch to AC.

e. Check—that the displayed amplitude is greater than 4.2 divisions.

f. Set the MODE switch to CH 2, reconnect the generator to the CH 2 input connector and repeat parts b through e.

g. Disconnect all cables and return the front-panel controls to the preliminary settings.

7. Check the Displayed Noise

VOLTS/DIV (CH 1 and
CH 2) 1 m
MODE CH 2
DC-GND-AC DC
SOURCE EXT
SECONDS/DIV 5.0 μ s

a. Connect a 0.2 mV standard amplitude signal from the calibration generator through a 50 Ω coaxial cable to the CH 2 input connector.

b. Adjust the INTEN and FOCUS controls for a well-defined display.

c. Check—to distinguish space between the two lines on the crt display.

d. Change the DISPLAY switch to CH 1 and reconnect the generator to the CH 1 input connector and repeat parts a through c.

e. Disconnect all cables and return the front-panel controls to the preliminary settings.

8. Check the Position Range

SECONDS/DIV .5 m
VOLTS/DIV (CH 1 and
CH 2) 10 m
DC-GND-AC AC

a. Connect a 0.12 V standard amplitude signal from the calibration generator through a 50 Ω coaxial cable to the CH 1 input connector.

b. Rotate the vertical POSITION control fully clockwise and counterclockwise and note the position of the peaks of the displayed waveform.

c. Check—that the positive and negative peaks of the waveform can be positioned to the center graticule line.

d. Rotate the vertical POSITION control to midrange.

e. Set the MODE switch to CH 2 and the source to CH 2. Reconnect the generator to the CH 2 input connector and repeat parts b through d.

f. Disconnect cable and return the front-panel controls to the preliminary settings.

9. Check CH 1 and CH 2 Operation

SECONDS/DIV 1 m

a. Adjust the TRIGGERING LEVEL control for a visible trace.

b. Check—for one trace affected by CH 1 front-panel controls.

c. Set the MODE switch to CH 2.

d. Check—for one trace affected by CH 2 front-panel controls.

e. Return the front-panel controls to the preliminary settings.

10. Check Alternate Operation

SECONDS/DIV 5 m
MODE ALT

a. Check—for two traces on the screen.

b. Adjust CH 1 and CH 2 vertical POSITION controls for approximately one major division separation between traces.

c. Check—that the sweep alternates between CH 1 and CH 2 traces for each SECONDS/DIV setting from 5 m through .5.

d. Return the front-panel controls to the preliminary settings.

11. Check Chopped Operation

SECONDS/DIV 5 m
MODE CHOP

a. Check—that two traces move across the screen simultaneously for each SECONDS/DIV setting from 5 m through .5.

b. Return the front-panel controls to the preliminary settings.

12. Check 1—2 Operation

DISPLAY 1—2

a. Check—that one trace is visible on the screen and that the CH 1 and CH 2 vertical POSITION controls move the trace equally in opposite directions.

b. Return the front-panel controls to the preliminary settings.

13. Check the Calibrated Sweep Range (+15°C to +35°C)

VOLTS/DIV (CH 1 and
CH 2) .5
DC-GND-AC DC
SECONDS/DIV .1 m

a. Connect .1 m time marks from the time-mark generator through a 50 Ω coaxial cable, with a 50 Ω termination, to the CH 1 input connector.

b. Rotate the TRIGGERING LEVEL control for a stable display. Vertically position the display to the center of the crt viewing area.

c. Check—that one time marker per graticule division is displayed on the crt within the accuracy tolerance listed in Table 4-3.

d. Disconnect all cables.

NOTE

When checking the sweep accuracy at an ambient temperature range of 0°C to +50°C, derate the accuracy by an additional 1%.

**Calibration Procedure—SC 502
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Table 4-3

HORIZONTAL DEFLECTION ACCURACY

SECONDS/DIV	Unmagnified	Magnified
0.5 s/div to 0.1 s/div	±3%	±4%
50 ms/div to 1 μs/div	±2%	±3%
0.5 μs/div to 0.2 μs/div	±3%	±2%

14. Check the Sweep Variable Range

SECONDS/DIV 0.5 m

- a. Connect 5 ms time marks from the time-mark generator through a 50 Ω coaxial cable, with a 50 Ω termination, to the CH 1 input connector.
- b. Rotate the TRIGGERING LEVEL control for a stable display. Vertically position the display to the center of the crt viewing area.
- c. Turn the SECONDS/DIV CAL control to the fully counterclockwise position.
- d. Check—that the third marker is to the left of the ninth graticule line.
- e. Disconnect the cable.

15. Check the Mag Register

PULL X10 HORIZ MAG out

- a. Horizontally position the sweep start (left end of sweep) on the graticule center line.
- b. Depress the PULL X10 HORIZ MAG switch.
- c. Check—that the beginning of the trace is within 0.5 division of the graticule center line.
- d. Return the front-panel controls to the preliminary settings.

16. Check the External Horizontal Deflection Factor

SECONDS/DIV AMP

- a. Connect the calibration generator to the EXT TRIG input connector through a 50 Ω coaxial cable and set its output amplitude for 0.2 V.
- b. Adjust the generator variable control until exactly four graticule divisions are displayed on the crt.
- c. Check—that the readout error is less than 5%.
- d. Disconnect all cables.

17. Check the External Horizontal Bandwidth

- a. Connect a 50 kHz sine-wave signal from the leveled sine-wave generator through a 50 Ω coaxial cable, to a 50 Ω termination, to the EXT TRIG input.
- b. Adjust the generator for a crt display of exactly five graticule divisions.
- c. Set the generator frequency to 2 MHz.
- d. Check—that the display is greater than 3.5 divisions measured horizontally.
- e. Disconnect the cable.

18. Check the XY Phasing

VOLTS/DIV (CH 1 and
CH 2) 50 m
DC-GND-AC GND
SECONDS/DIV AMP

- a. Connect a 50 kHz sine-wave signal from the leveled sine-wave generator through a 50 Ω coaxial cable, to the 50 Ω termination, to the dual input cable, to the CH 1 and EXT TRIG input connectors.
- b. Adjust the generator for a horizontal deflection of eight graticule divisions on the crt display.
- c. Set CH 1 DC-GND-AC to DC.
- d. Center the display on the crt screen with the POSITION controls.

e. Check—that the horizontal opening, at screen center, is less than 0.4 graticule division.

f. Disconnect all cables and return the front-panel controls to the preliminary settings.

19. Check the Trigger Sensitivity (below 5 MHz)

SECONDS/DIV	.5 μ
VOLTS/DIV (CH 1 and CH 2)	.5
DC-GND-AC	DC

a. Connect a 5 MHz signal from the leveled sine-wave generator through a 50 Ω coaxial cable, to a 50 Ω termination, to the CH 1 input connector.

b. Adjust the generator output amplitude for 0.4 graticule division on the crt screen.

c. Check—that a triggered positive-going display can be obtained at some setting of the TRIGGERING LEVEL control.

d. Set the SLOPE switch to – position.

e. Check—that a triggered negative-going display can be obtained at some setting of the TRIGGERING LEVEL control.

f. Release the AUTO button (Normal Mode).

g. Check—repeat parts c through e.

h. Depress the COUPL ac LF REJ switch.

i. Check—repeat parts c through e.

j. Release the ac LF REJ switch (out position) and press in the COUPL AC pushbutton.

k. Check—repeat parts c through e.

l. Release the AC pushbutton and press the AUTO button.

m. Connect a 5 MHz signal from the leveled sine-wave generator through a 50 Ω coaxial cable, to a 50 Ω termination, to the CH 2 input connector.

n. Set the front-panel controls as follows:

MODE	CH 2
SOURCE	CH 2
SLOPE	+

o. Repeat parts b through l of the above procedure to check the trigger sensitivity for CH 2.

20. Trigger Sensitivity (5 MHz to 15 MHz)

a. Change the generator frequency to 15 MHz and adjust the output frequency for 15 MHz.

b. Adjust the generator amplitude for one graticule division of display on the crt screen.

c. Set the SLOPE switch to + position.

d. Check—that a triggered positive-going display can be obtained at some setting of the TRIGGERING LEVEL control.

e. Reset the SLOPE switch to – position.

f. Check—that a triggered negative-going display can be obtained at some setting of the TRIGGERING LEVEL control.

g. Release the AUTO button (Normal Mode).

h. Check—repeat parts c through f.

i. Press the LF REJ button.

j. Check—repeat parts c through f.

k. Release the AC and LF REJ pushbuttons to the out position and press the COUPL AC switch.

l. Check—repeat parts c through f.

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m. Release the AC pushbutton and press the AUTO button.

n. Reconnect the generator to the CH 1 input connector.

o. Set the front-panel controls as follows:

MODE	CH 1
SOURCE	CH 1
SLOPE	+

p. Repeats parts b through l in the above procedure to check the trigger sensitivity for CH 1.

q. Disconnect the cable and return the front-panel controls to the preliminary settings.

21. Check Auto, Normal, and Single Sweep Modes

SECONDS/DIV	0.5 m
CH 1 DC-GND-AC	DC
CH 1 VOLTS/DIV	1

a. Connect the function generator to the CH 1 input connector through a 50 Ω coaxial cable and a 50 Ω termination.

b. Set the generator for a 1 kHz sine wave and adjust the amplitude for a display of six divisions. Adjust the TRIGGERING LEVEL control for a stable display.

c. Set the SOURCE switch to EXT.

d. Check—that the sweep free runs.

e. Set the SOURCE switch to CH 1.

f. Release the AUTO button (Normal Mode).

g. Check—for a visible trace.

h. Press the SOURCE EXT button.

i. Check—that the trace disappears.

j. Set the SOURCE switch to CH 1.

k. Press the SINGLE SWP button in.

l. Press and release the SGL SWP button.

m. Check—that the trace appears once each time the SINGLE SWP RESET button is pressed and released.

n. Disconnect the cable and return the front-panel controls to the preliminary settings.

22. Check the Calibrator

CH 1 VOLTS/DIV	.1
CH 1 DC-GND-AC	DC
SECONDS/DIV	1 m

a. Connect the output of the calibrator to the CH 1 input connector using the pin-jack-to-bnc adapter.

b. Check—that the display amplitude is six divisions within .06 divisions.

c. Disconnect the cable and return the front-panel controls to the preliminary settings.

23. Check the External Trigger Level Range

SECONDS/DIV	10 μ s
AUTO	OUT
SOURCE	EXT
COUPL	AC

a. Connect the leveled sine-wave generator through a 50 Ω coaxial cable and a 50 Ω termination to EXT TRIG.

b. Press and hold the TRIG VIEW pushbutton during the following steps.

c. Set the generator frequency range to 50 kHz and adjust the sine-wave generator amplitude for a display of six divisions.

d. Set the TRIGGERING LEVEL control to midrange.

e. Check—that the READY TRIG'D light is on.

f. Adjust the TRIGGERING LEVEL control fully clockwise.

g. Check—that the READY TRIG'D light is off and the trace stops running.

h. Set the TRIGGERING LEVEL control fully counterclockwise.

i. Check—that the READY TRIG'D light is off and the trace stops running.

j. Release the TRIG VIEW pushbutton.

k. Disconnect the cable and return the front-panel controls to the preliminary settings.

b. Set the generator frequency to 50 kHz and adjust the amplitude for a display of eight divisions.

c. Adjust the TRIGGERING LEVEL control to midrange.

d. Check—that the READY TRIG'D light is on.

e. Set the CH 1 VOLTS/DIV to 0.1.

f. Set the TRIGGERING LEVEL control fully clockwise.

g. Check—that the READY TRIG'D light is off and the sweep stops.

h. Set the TRIGGERING LEVEL control fully counterclockwise.

i. Check—that the READY TRIG'D light turns off and the sweep stops.

j. Change TRIGGERING SLOPE to — and repeat parts c through i.

k. Disconnect all cables and return the front-panel controls to the preliminary settings. This completes the Performance Check Procedure.

24. Check the Internal Trigger Level Range

SECONDS/DIV	10 μ s
CH 1 DC-GND-AC	DC
AUTO	OUT
CH 1 VOLTS/DIV	.2
COUPL	AC

a. Connect the leveled sine-wave generator output through a 50 Ω coaxial cable and a 50 Ω termination to the CH 1 input connector.

ADJUSTMENT PROCEDURE

Adjustment is generally required after a repair has been made, or after long time intervals in which normal aging of components may affect instrument accuracy.

To ensure instrument accuracy, check the calibration every 2000 hours of operation, or every six months if used infrequently.

Before complete calibration, thoroughly clean and inspect this instrument as outlined in the service section of the Power Module manual. The Power Module manual also contains information for general maintenance of this instrument, including preventive maintenance, component identification and replacement, etc.

NOTE

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.

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 by removing the SC 502 from the TM 500-Series Power Module before cleaning the instrument or replacing parts. The SC 502 MODE switch PWR OFF position does not remove all power from the oscilloscope.

Preliminary Procedure

NOTE

The performance of this instrument can be checked at any temperature within the 0° C to +50° C range. Make any adjustment at a temperature of +25° C, ±5° C.

1. Check that the power is OFF in both the SC 502 and TM 500 Series Power Module.

2. Connect the nominal line selector block of the Power Module to the correct line selector pins (120 V ac or 220 V ac). Also check that the regulating range selected

includes the input line voltage. See Installation Section of Power Module Manual.

a. Connect Power Module to the line voltage source.

3. Remove the SC 502 Oscilloscope side and top covers and connect the oscilloscope to the Power Module, using the plug-in extension.

a. Set the following controls:

FOCUS	As is
INTENSITY	Fully counterclockwise
TRIGGER VIEW	As is
MODE	PWR OFF
POSITION (Vertical)	
CH 1	midrange
CH 2	midrange
CH 1	
VOLTS/DIV	0.1
AC-GND-DC	AC
CH 2	
VOLTS/DIV	.02
AC-GND-DC	GND
POSITION (Horizontal)	Midrange
SECONDS/DIV	0.5 ms
CAL/SWP MAG	Fully clockwise and pushed in
Trigger Mode	
SINGLE SWP	Out position
AUTO	Pushed in
COUPLING	
AC	Pushed in
LF REJ	Out position
SOURCE	
CH 1	Pushed in
CH 2	Out position
EXT	Out position
SLOPE (Triggering)	+
LEVEL (Triggering)	As is

4. Turn the Power Module on by pulling the Power switch out.

a. Turn the SC 502 MODE switch to CH 1 to apply power.

CAUTION

If any work has been performed on the SC 502 power supplies, then the +20 V, -20 V and +5 V power supplies must be checked to be within 0.2 V of the correct voltage immediately after turn-on and before the warm-up period. See step 1 for power supply adjustments.

5. Allow 15 minutes for the SC 502 to warm-up and stabilize.

Adjustment Procedure

NOTE

The tabbed foldout page labeled "Adjustment Locations" contains illustrations showing the location of each adjustment in this procedure.

1. Adjust +20 V and -20 V Power Supplies R925 and R947 (Trigger Circuit Board)

NOTE

Adjusting the +20 V and -20 V power supplies with the 0.1% dc voltmeter is adequate for oscilloscope operation; however, if the supplies are adjusted this way the output CAL peak-to-peak square-wave voltage cannot be guaranteed to be within 1%. If a 1% or less calibrator output amplitude is required, then the +20 V and -20 V power supplies must be adjusted with a dc voltmeter having at least a 0.01% accuracy.

Connect the dc voltmeter between the +20 V test point and the ground test point. Adjust +20 V, R925 for a voltmeter reading of +20 V \pm 0.06 V.

Disconnect the voltmeter from the +20 V test point and connect it between the -20 V test point and the ground test point. Adjust -20 V, R947 for a voltmeter reading of -20 V \pm 0.1 V.

Disconnect the voltmeter.

2. Check +5 V Power Supply

Connect the dc voltmeter between the +5 V test point and the ground test point. Check for a voltmeter reading of +5.07 V \pm 0.08 V.

3. Adjust Beam Current R873 (F & I Circuit Board)

CAUTION

To avoid possible damage to the crt phosphor, do not allow a bright spot to remain stationary for an extended period of time within the viewing area.

Connect the positive lead of the dc voltmeter to the beam current test point (located on main circuit board) and the voltmeter negative lead to a chassis ground. Set the voltmeter to measure about 2 V full scale.

Set the SC 502 SECONDS/DIV switch to AMP, the horizontal POSITION control to position the spot off the crt viewing area, and the INTENSITY control fully clockwise.

Adjust Beam, R873 for a voltmeter reading of 0.40 V \pm 0.01 V. Disconnect the voltmeter and turn the INTENSITY control to its midrange position.

4. Adjust Astigmatism R899 (F & I Circuit Board)

Connect a test lead from CH 1 to the CAL connector. Trigger the oscilloscope and adjust FOCUS control R899 (Astigmatism) and the INTENSITY control for a clearly focused waveform. Remove the test lead.

5. Adjust Trace Rotation R895 (F & I Circuit Board)

Set the SC 502 SECONDS/DIV switch to .5 m. Position the SC 502 trace to the center horizontal graticule line.

Adjust Trace, R895 until the crt trace is parallel to the center horizontal graticule line.

6. Adjust Geometry R897, F & I Circuit Board (Below SN B039280)

NOTE

Geometry adjustment will cause some change in sweep timing.

Connect 0.5 ms time-markers from the properly terminated time mark generator to the CH 1 input connector. Trigger the display and adjust CH 1 POSITION fully ccw.

Adjust Geom R897 for minimum bow or tilt of the vertical lines, using the vertical graticule lines as the reference. The adjustment of R897 may have to be a compromise to bring all points within the 0.1 major division or less tolerance.

Disconnect the time-mark generator.

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7. Adjust Channel 1 & 2 Preamp Input Attenuator Balance R135 and R235 (Main Circuit Board)

Set the CH 1 AC-GND-DC switch to GND and the VOLTS/DIV switch to 0.2. Position the crt trace to the center horizontal graticule line using the CH 1 vertical POSITION control.

Rotate the CH 1 VOLTS/DIV switch to 1 m. Adjust CH 1 Step Bal R135 (CH 2 Step Bal R235) to bring the crt trace back to the center horizontal graticule line. Return the CH 1 VOLTS/DIV switch to 0.2 and return the crt trace to the center horizontal graticule line using the vertical position control, then repeat this step until all interaction is removed.

Change the SC 502 MODE switch to CH 2 and repeat the above step for channel 2.

8. Adjust Channel 1 & 2 Preamp Input Capacitance C105, C115, C119, C205, C215 and C219 (Main Circuit Board)

Set the CH 2 AC-GND-DC switch to DC, the VOLTS/DIV switch to 10 m and the triggering SOURCE to CH 2. Connect a 47 pF input normalizer to the CH 2 input connector. Connect a properly terminated high amplitude signal from the pulse generator through a 10X attenuator to the CH 2 input connector via the 47 pF input normalizer. Adjust the pulse generator for a 1 ms period and an output amplitude of approximately 50 mV (10 mV X 5 div). Adjust the triggering LEVEL control for a stable display.

Adjust C205 (C105) for a flat top. Remove the 10X attenuator from the cable. Change the VOLTS/DIV switch to .5 and increase the output amplitude of the pulse generator to obtain again a 5 major division signal. Adjust C215 (C115) for a flat top and C219, (C119) for a square front corner having 2% peak or 3% peak-to-peak or less of aberrations on the displayed waveform. (C333 is selected to balance Channel 1 aberrations with Channel 2.)

Change the SC 502 MODE switch to CH 1, along with the applicable CH 1 controls, and repeat the above step for Channel 1. Disconnect the pulse generator and the 47 pF normalizer.

9. Adjust Channel 1 & 2 Preamp Gain R180 and R280 (Main Circuit Board)

Set the CH 1 VOLTS/DIV switch to 10 m and rotate the triggering LEVEL fully clockwise. Connect a 50 mV standardized amplitude signal from the pulse generator to the

CH 1 input connector. Adjust CH 1 (CH 2) POSITION control to center display.

Adjust CH 1 Gain R180 (CH 2 Gain R280) for a waveform amplitude of exactly 5 major graticule divisions. Check that the remaining VOLTS/DIV switch positions are within the tolerance listed in Table 4-4.

Table 4-4

VOLTS/DIV ATTENUATOR CHECK

VOLTS/DIV Setting	Standardized Amplitude Applied to Input	Display Amplitude In Major Divisions	Tolerance
1 mV	5 mV	5	5%
2 mV	10 mV	5	5%
5 mV	20 mV	4	2%
10 mV	50 mV	5	Adjusted
20 mV	.1 mV	5	2%
50 mV	.2 V	4	2%
.1 V	.5 V	5	2%
.2 V	1V	5	2%
.5 V	2 V	4	2%
1 V	5V	5	2%
2 V	10 V	5	2%
5 V	20 V	4	2%
10 V	50 V	5	2%
20 V	100 V	5	2%

Change the SC 502 MODE switch to CH 2, along with the applicable CH 2 controls, and repeat the above step for channel 2. Disconnect the pulse generator.

10. Adjust Channel 1 & 2 Preamp Position Centering R335 and R394 (F & I Circuit Board)

Set the CH 2 AC-GND-DC to AC, the VOLTS/DIV switch to 10 m and the triggering SOURCE to CH 2. Connect a 200 mV pulse with a 1 ms period from the pulse generator to the CH 2 input connector. Adjust the triggering LEVEL control for a stable display. Rotate the CH 2 vertical POSITION control to each of its extremes and check that the bottom of the pulse display can be positioned at least one major division above (when positioning upward), and that the top of the pulse can be positioned at least one major division below, (when positioning downward) the graticule horizontal center line.

Adjust Vert Pos CH 2 R394 (CH 1 R335) so that the top and bottom of the pulse waveform are brought within an equal distance of the graticule center line at the two extremes of the vertical POSITION control.

Change the SC 502 MODE switch to CH 1, along with the applicable CH 1 controls, and repeat the above step for channel 2. Disconnect the pulse generator.

11. Adjust Vertical Output Amplifier R465, R473, C473, and C474 (F & I Circuit Board)

Set the SC 502 SECONDS/DIV switch to 2μ and the triggering SOURCE switch to CH 1. Connect a properly terminated, 60 mV positive-going, fast-rise, 10μ s period pulse from the pulse generator to the CH 1 input connector. Adjust the triggering LEVEL control for a stable display.

Adjust R465 for flat top without roll-off or overshoot on the crt displayed waveform.

Set the SC 502 SECONDS/DIV switch to $.2 \mu$ and the pulse generator for a 1μ s pulse period.

Adjust R473, C473 and C474 (using a low-capacitance alignment tool) for the squarest front corner without roll-off or overshoot.

Change the SC 502 MODE switch to CH 2, along with the applicable CH 2 controls, and check the results of the above adjustments using Channel 2. Adjust C387 for best match of aberrations to CH 1. If necessary, compromise the above adjustment so that the amplifier response is equal for both vertical channels. Disconnect the pulse generator.

12. Check Vertical Bandwidth

Set the SC 502 MODE switch to CH 2, the SECONDS/DIV switch to 5 m, the triggering SOURCE switch to CH 2, and the triggering LEVEL control fully clockwise. Connect a properly terminated leveled sine-wave generator to the CH 2 input connector. Set the output frequency of the sine-wave generator to 50 kHz and adjust its output amplitude to obtain 6 major divisions of SC 502 crt display.

Without disturbing the output amplitude control on the sine-wave generator, increase the generator frequency to 15 MHz. Check that the display amplitude is at least 4.2 major divisions; if it is not, repeat step 11 adjustments.

Change the SC 502 MODE switch to CH 1 along with the applicable CH 1 controls and check the bandwidth of channel 1. Disconnect the sine-wave generator.

13. Adjust Sweep Offset R681 (Main Circuit Board)

Set the SC 502 MODE switch to CH 1, the SECONDS/DIV switch to .2 m and the triggering SOURCE switch to CH 1. Connect the dc voltmeter positive lead to TP677 and the negative lead to a convenient ground. Set the voltmeter to read about 2 V full scale.

Adjust Offset R681 for a voltmeter reading of 0 V. Disconnect the dc voltmeter.

14. Adjust Horizontal Amplifier Centering R760 (Hor Defl Circuit Board)

Connect TP745 (TP test point) temporarily to ground with a jumper. Adjust Center R760 to position the crt spot to the vertical graticule center line. Remove the shorting jumper.

15. Adjust Sweep Gain R770 (Hor Defl Circuit Board)

Set the CH 1 VOLTS/DIV switch to .5, set SECONDS/DIV to .2 m. Connect 0.2 ms time-markers from a properly terminated time mark generator to the CH 1 input connector. Rotate the LEVEL control to obtain a stable display. Vertically position the display to the center of the viewing area of the crt.

Adjust Sweep Gain R770 until an SC 502 display of 1-time marker per major graticule division is obtained. The second and tenth time markers must line up exactly with their respective graticule lines.

16. Adjust X10 Magnifier Gain R708 (Main Circuit Board)

Change the time mark generator output so it will now supply 20μ s markers to the CH 1 input connector. Pull the SECONDS/DIV CAL/SWP MAG control out.

Adjust Mag Gain R708 until a display of 1-time marker per major graticule division is obtained. The second and tenth time markers must line up exactly with their respective graticule lines.

17. Adjust Fast Timing C1005 (Main Circuit Board)

Set the SC 502 SECONDS/DIV switch to 1μ and push the CAL/SWP MAG control in. Change the time-mark generator output so it will now supply 1μ s markers to the CH 1 input connector.

Calibration Procedure—SC 502 Adjustment Procedure

Adjust Time C1005 until a display of one-time marker per major graticule division is obtained. The second and tenth markers must line up exactly with their respective graticule lines.

Change the SECONDS/DIV switch and the marker output of the time-mark generator to 0.2 μ s. Check the SC 502 display for one-time marker per major graticule division (within 3%) in the center 8 graticule divisions. Check all sweep rates between 0.2 μ s and 5 μ s, using appropriate time markers, and check display again for one marker per major graticule division (within 3% for 0.5 μ s and 0.2 μ s and within 2% from 1 μ s to 5 μ s).

The final adjustment of C1005 may need to be a compromise so that the time markers in the center 8 graticule divisions for the above sweep rates are all within tolerance. Disconnect the time mark generator.

18. Adjust External Balance R535 (Trigger Circuit Board)



To avoid possible damage to the crt phosphor, do not allow a bright spot to remain stationary for an extended period of time within the viewing area.

Set the SC 502 SECONDS/DIV switch to 5 m and rotate the horizontal position control to align the start of the crt trace with the far left graticule line. Change the SECONDS/DIV switch to AMP. Set the INTENSITY level such that the crt phosphor will not be damaged.

Adjust EXT Bal R535 to position the crt spot to the vertical graticule center line.

19. Adjust External Horizontal Attenuator Compensation and Gain C516 (Trigger Circuit Board) and R723 (Main Circuit Board)

Set the SC 502 SECONDS/DIV switch to .2 m and the triggering SOURCE switch to EXT. Set the AUTO trigger mode pushbutton to its out position. Connect a properly terminated fast-rise signal of 1 ms period from the pulse generator to the EXT TRIG input connector. Push the TRIG VIEW pushbutton in and hold during the following adjustment. Adjust the TRIGGERING LEVEL as necessary to position the waveform at the center of the crt. Adjust pulse generator for a 5 div display.

Adjust ATT C, C516 for a flat top on the waveform without any overshoot or rolloff.

Release the TRIG VIEW pushbutton and set the SECONDS/DIV switch to AMP and the triggering SOURCE switch to CH 1. Disconnect the fast-rise pulse generator signal from the EXT TRIG input connector and connect a 0.5 V standardized amplitude signal from the pulse generator to the connector.

Adjust horizontal POSITION to center two dots on screen.

Adjust Ext Gain R723 for exactly 10 major graticule divisions between the two crt spots. Disconnect the pulse generator.

20. Adjust Trigger View Centering R433 (F & I Circuit Board)

Set the SC 502 SECONDS/DIV SWITCH to 5 μ and push the AUTO trigger mode pushbutton in. Connect a properly terminated sine-wave generator to the CH 1 input connector.

Set the output frequency of the sine-wave generator to 50 kHz and adjust its output amplitude to obtain 6 major divisions of SC 502 crt display. Adjust the triggering LEVEL to trigger the sine-wave signal at its 50% point; i.e., midway between peaks. Depress the TRIG VIEW pushbutton and hold it in during the following adjustment.

Adjust Trig View (TV) Center R433 so the start of the waveform trace on the SC 502 crt display is at the horizontal graticule center line. Change the triggering SLOPE switch to minus and recheck the starting position of the display (TRIG VIEW pushbutton still depressed). The final adjustment of R433 should be a compromise between the display starts for both the + and - SLOPE switch positions.

Release the TRIG VIEW pushbutton and change the position of the triggering LEVEL to select another triggering point on the waveform. Depress the TRIG VIEW pushbutton and check that the display corresponds to the previous setting. Repeat at various triggering LEVEL points. Disconnect the sine-wave generator.

This completes the adjustment procedure for the SC 502.

MAINTENANCE

General system maintenance procedures are provided in the Power Module instruction manual, i.e., preventive maintenance, troubleshooting aids, parts removal and replacement procedures, parts ordering information, etc.

CRT Replacement

The following procedure outlines the removal and replacement of the cathode-ray tube. Refer to Fig. 5-1.

WARNING

Use care when handling a crt. Protective clothing and safety glasses should be worn. Avoid striking crt on any object which might cause it to crack or implode. When storing a crt, place it in a protective carton or set it face down in a protected location on a smooth surface with a soft mat under the faceplate to protect it from scratches.

A. REMOVAL

1. Remove the instrument vented electrical shields (side covers), the top cover, and remove crt filter (16) with spring (15) from front of crt.

2. Disconnect the FOCUS extension shaft (1) from the focus potentiometer.

3. Loosen black thumb screw (2). Remove the "T" bracket (3) which is held with three screws (4).

4. Remove the two screws (5) holding the hor defl circuit board. (It's not necessary to remove board, just 8-pin ribbon connector and two horizontal deflection pin wires.) Lift the board slightly away from the SC 502 and disconnect the 8-pin ribbon wire connector and the two horizontal crt deflection pin leads.

5. Disconnect the coaxial cable 10-pin connector from the back of the F & I circuit board along with the trace rotation coil 2-pin connector. Also, disconnect the coaxial cable 4-pin connector and coaxial cable 2-pin connector from the back of the Trigger Circuit board. Don't remove (6) from (7). (6) would then be in the way of crt shield. Momentarily touch the crt end of the anode connector to chassis ground to discharge any voltage.

6. Remove the high-voltage shield (8), which is held by the two screws (9). Remove the 3-pin ribbon wire connector from Q970, which is mounted on the rear panel. Remove the eight screws (10) and remove the rear panel (11) being careful to not lose two board insulators. (See Fig. 5-1.)

7. Disconnect the crt socket (12) and the two crt vertical deflection pin leads, then lift out the crt shield with the crt inside.

B. REPLACEMENT

1. Install the (spacer) front crt support (13) into the bezel opening of the front subpanel (14).

2. Install the crt into the crt shield, then install the assembly into the appropriate area of the oscilloscope. Be careful not to bend any of the protruding connector pins. Place the crt shield (14) up against the (spacer) front crt support (13) and the crt into the front crt support (13), see Fig. 5-2. Install the crt socket (12), then hold the assembly in position and install the rear panel (11) with enough screws to hold the crt assembly in place.

3. Finish the installation procedure by reversing the removal procedure.

4. Install the (crt filter) spring (15) in the groove between the bottom front bezel portion of the front subpanel with the spring ends down. Install the implosion shield/filter (16) into the front bezel portion of the front subpanel by compressing the spring (15) and pushing in.

5. Replacing the crt will require partial instrument readjustment. Refer to the Adjustment section of this manual (section 4).

Circuit Board Removal

The following procedure outlines the removal and installation of the circuit boards.

A. REMOVAL

1. Remove the crt using the crt removal procedure.

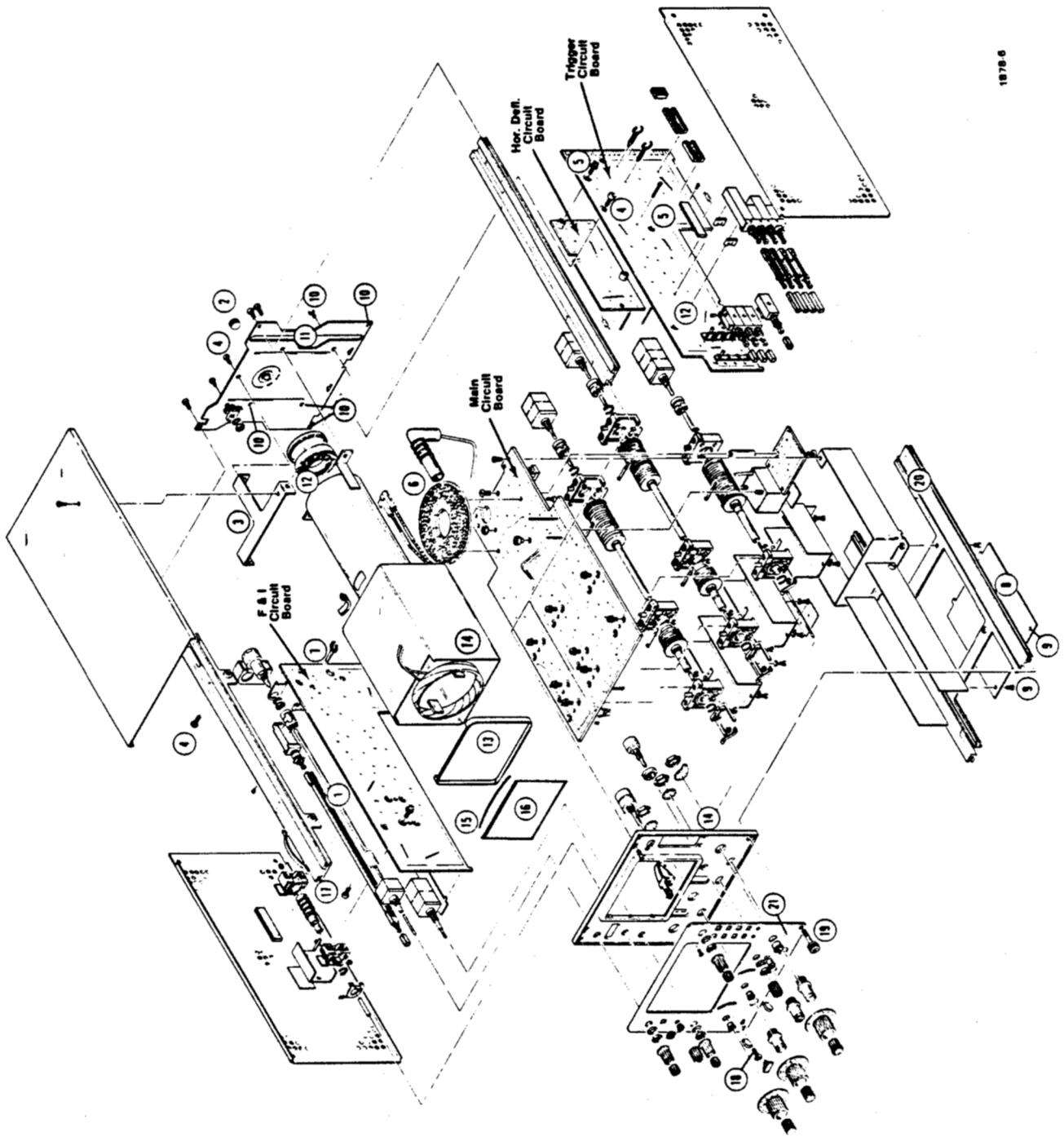


Fig. 5-1. Replacing the cathode-ray tube, and circuit board removal.

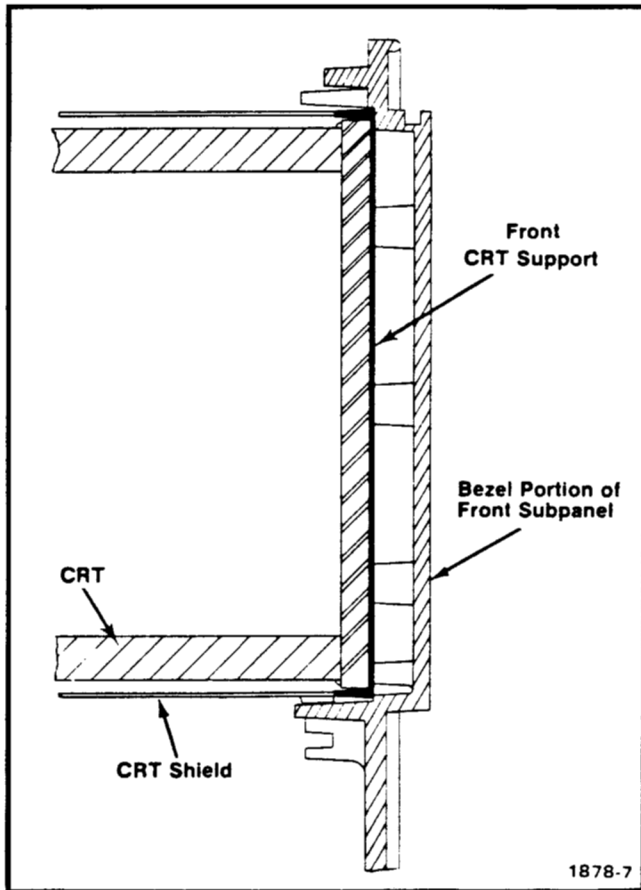


Fig. 5-2. Cross sectional view showing placement position of front crt support, crt shield and crt.

2. Remove all the knobs except the SLOPE, LEVEL and horizontal POSITION.

3. Remove the two screws (17) which hold the circuit board assembly to the top rails. Remove screw (18) and stud post with knurled nut (19) and remove bottom section frame (20).

4. Remove any nuts and washers holding the controls (from which the knobs have been removed) to the front subpanel (14) and front panel (21). Disconnect from the circuit boards those connectors whose leads go to the front-panel connectors or controls which still have knobs.

5. Slide the circuit board assembly away from the front subpanel until it is clear.

6. Disconnect the plugged-together circuit board assembly as required.

B. INSTALLATION

1. Reverse the Circuit Board Removal procedure, then follow the CRT Replacement procedure.

Variable Trigger Holdoff/Variable Sweep Time

The knob in the center of the Time-Div switch is normally used for varying the time per division settings of the sweep generator. Figure 5-3 shows the jumper change necessary for changing the function of this knob to a variable trigger hold-off adjustment. This is useful when triggering on irregular waveforms.

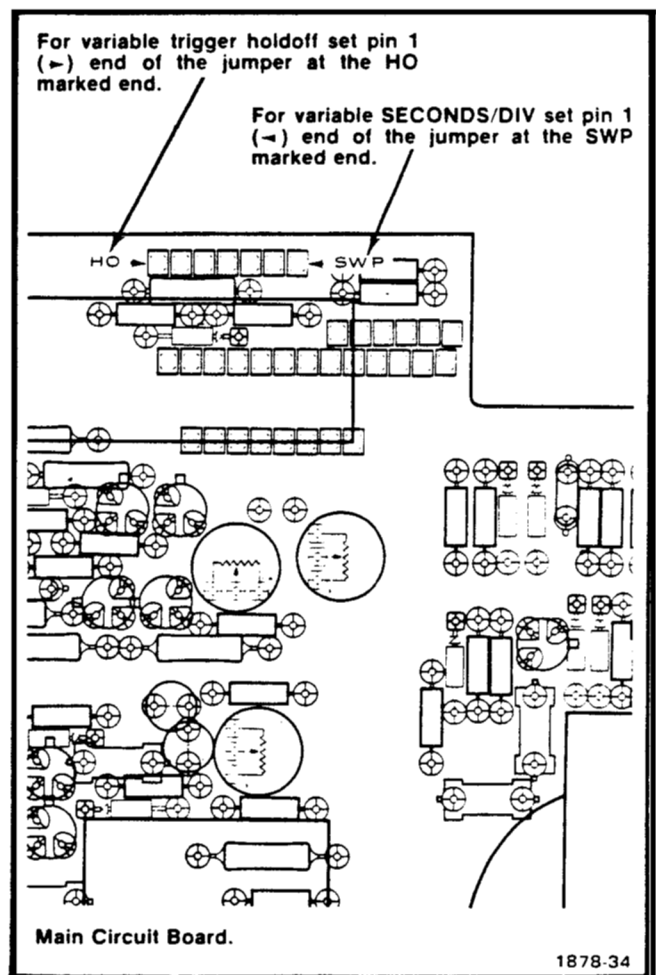


Fig. 5-3. Variable Trigger Hold Off—Variable Sweep Time jumper placement.

External Z-Axis In

An external Z-axis input signal can be used to turn the crt beam on or off. To do this, connect a coaxial cable from the auxiliary Z-axis amplifier solder pads (see Fig. 5-4) to contacts 24A (center conductor) and 23A (ground) of the rear interface. A +5 V signal turns the crt beam on from an off condition and -5 V turns the beam off from an on condition. The input resistance is about 1 k Ω .

(Above serial No. B021190 the Z-axis input connection is factory installed.)

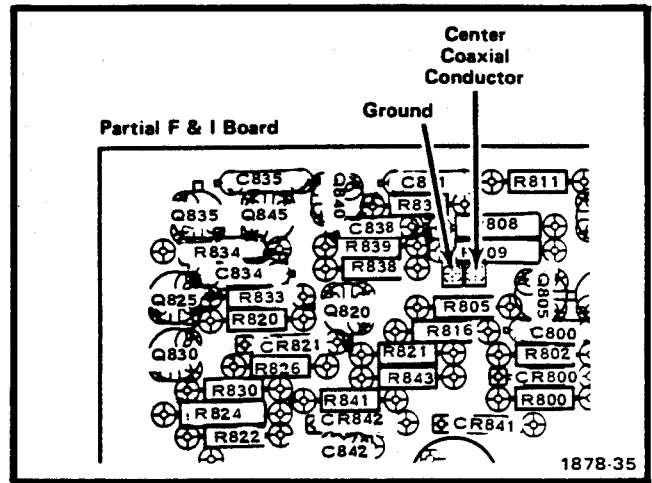


Fig. 5-4. Location of auxiliary Z-axis input solder pads.

Remarks	Maximum Recommended Loads	Active Level	Output or Input	Pin B		Pin A	Output or Input	Active Level	Maximum Recommended Loads	Remarks	
Linear Output	>10 kΩ	0 V dc 50 mV/div ≈100 Ω Output	Channel 1 Out	*28	Delaying System Barrier Slot	*28					
			Channel 1 Out Ground	*27		27					
Logic Output	See note ¹		Triggered Gate Out	*26		26					
Logic Output	See note ¹		Triggered Gate Out	*25		25					
Logic Input	Open Circuit or ground through ≤kΩ		Gate Select In	*24		*24	External Z-Axis In ²				Linear Input
Logic Input	See note ³		External Gate In	*23		*23	External Z-Axis In Ground ²				
Logic Input	See note ³		External Gate In	*22		22					
Logic Output	See note ¹		Holdoff Out	*21		21					
Logic Output	See note ¹		Holdoff Out	*20		20					
Logic Input	Input resistance ≈10 kΩ	ECL runs between +5 V and ground	Intensify In	*19		19					
				18		*18	Ramp Out	0 to +6.4 V	>100 kΩ		Linear Output
				17		*17	Channel 2 Vertical In Ground ²				
				16		*16	Channel 2 Vertical In ²				Linear Input
Linear Input			External Horizontal or Trigger In ²	*15		*15	Channel 1 Vertical In Ground ²				
			External Horizontal or Trigger In Ground ²	*14		*14	Channel 1 Vertical In ²				Linear Input
			25 VAC winding	*13		*13	25 VAC winding				Connected to ground
			+33.5 V filtered DC	*12		*12	+33.5 V filtered DC				
			Collector Lead of PNP Series-Pass	*11		*11	Base Lead of PNP Series-Pass				
Grounded			Transformer shield lead	*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	TM 500 Barrier Slot	*7	Emitter Lead of NPN Series-Pass				
			No connection	6	Rear View of Plug-In	*6	Base lead of NPN Series-Pass				
			17.5 VAC winding	5		5	17.5 VAC 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				
Connected to ground			25 VAC winding	*1		*1	25 VAC winding				
				B		A					

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 SC 502.

¹Designed to drive 100 Ω side-to-side terminated line with ECL line receiver. ECL integrated circuits are run between +5 V and ground and have their outputs protected by 47 Ω resistors.

²Customer optionally connected inputs.

³100 Ω side-to-side terminated line with ECL line receiver. ECL integrated circuits are run between +5 V and ground.

1878-36

Fig. 5-5. Input-Output Assignments for Plug-In Rear Interface Connector.

OPTIONS

There are no options available at this time.

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.

LIST OF ASSEMBLIES

A list of assemblies can be found at the beginning of the Electrical Parts List. The assemblies are listed in numerical order. When the complete component number of a part is known, this list will identify the assembly in which the part is located.

CROSS INDEX-MFR. CODE NUMBER TO MANUFACTURER

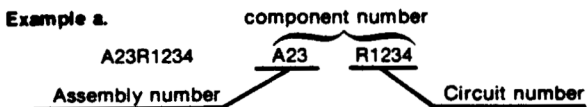
The Mfr. Code Number to Manufacturer index for the Electrical Parts List is located immediately after this page. The Cross Index provides codes, names and addresses of manufacturers of components listed in the Electrical Parts List.

ABBREVIATIONS

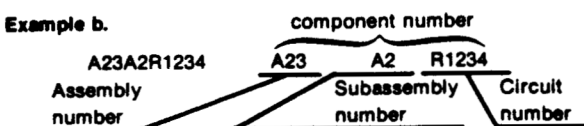
Abbreviations conform to American National Standard Y1.1.

COMPONENT NUMBER (column one of the Electrical Parts List)

A numbering method has been used to identify assemblies, subassemblies and parts. Examples of this numbering method and typical expansions are illustrated by the following:



Read: Resistor 1234 of Assembly 23



Read: Resistor 1234 of Subassembly 2 of Assembly 23

Only the circuit number will appear on the diagrams and circuit board illustrations. Each diagram and circuit board illustration is clearly marked with the assembly number. Assembly numbers are also marked on the mechanical exploded views located in the Mechanical Parts List. The component number is obtained by adding the assembly number prefix to the circuit number.

The Electrical Parts List is divided and arranged by assemblies in numerical sequence (e.g., assembly A1 with its subassemblies and parts, precedes assembly A2 with its subassemblies and parts).

Chassis-mounted parts have no assembly number prefix and are located at the end of the Electrical Parts List.

TEKTRONIX PART NO. (column two of the Electrical Parts List)

Indicates part number to be used when ordering replacement part from Tektronix.

SERIAL/MODEL NO. (columns three and four of the Electrical Parts List)

Column three (3) indicates the serial number at which the part was first used. Column four (4) indicates the serial number at which the part was removed. No serial number entered indicates part is good for all serial numbers.

NAME & DESCRIPTION (column five of the Electrical Parts List)

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.

MFR. CODE (column six of the Electrical Parts List)

Indicates the code number of the actual manufacturer of the part. (Code to name and address cross reference can be found immediately after this page.)

MFR. PART NUMBER (column seven of the Electrical Parts List)

Indicates actual manufacturers part number.

CROSS INDEX - MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip Code
00853	SANGAMO WESTON INC SANGAMO CAPACITOR DIV	SANGAMO RD P O BOX 128	PICKENS SC 29671
01121	ALLEN-BRADLEY CO	1201 SOUTH 2ND ST	MILWAUKEE WI 53204
01295	TEXAS INSTRUMENTS INC SEMICONDUCTOR GROUP	13500 N CENTRAL EXPRESSWAY P O BOX 225012 M/S 49	DALLAS TX 75265
02114	AMPEREX ELECTRONIC CORP FERROXCUBE DIV	5083 KINGS HWY	SAUGERTIES NY 12477
03508	GENERAL ELECTRIC CO SEMI-CONDUCTOR PRODUCTS DEPT	W GENESEE ST	AUBURN NY 13021
04222	AVX CERAMICS DIV OF AVX CORP	19TH AVE SOUTH P O BOX 867	MYRTLE BEACH SC 29577
04713	MOTOROLA INC SEMICONDUCTOR GROUP	5005 E MCDOWELL RD	PHOENIX AZ 85008
05397	UNION CARBIDE CORP MATERIALS SYSTEMS DIV	11901 MADISON AVE	CLEVELAND OH 44101
05828	GENERAL INSTRUMENT CORP GOVERNMENT SYSTEMS DIV	600 W JOHN ST	HICKSVILLE NY 11802
07263	FAIRCHILD CAMERA AND INSTRUMENT CORP SEMICONDUCTOR DIV	464 ELLIS ST	MOUNTAIN VIEW CA 94042
07716	TRW INC TRW ELECTRONICS COMPONENTS TRW IRC FIXED RESISTORS/BURLINGTON	2850 MT PLEASANT AVE	BURLINGTON IA 52601
12697	CLAROSTAT MFG CO INC	LOWER WASHINGTON ST	DOVER NH 03820
12969	UNITRODE CORP	580 PLEASANT ST	WATERTOWN MA 02172
13511	AMPHENOL CADRE DIV BUNKER RAMO CORP		LOS GATOS CA
14193	CAL-R INC	1601 OLYMPIC BLVD	SANTA MONICA CA 90404
14433	ITT SEMICONDUCTORS DIV		WEST PALM BEACH FL
14552	MICRO/SEMICONDUCTOR CORP	2830 S FAIRVIEW ST	SANTA ANA CA 92704
15238	ITT SEMICONDUCTORS A DIVISION OF INTERNATIONAL TELEPHONE AND TELEGRAPH CORP	500 BROADWAY P O BOX 168	LAWRENCE MA 01841
19701	MEPCO/ELECTRA INC A NORTH AMERICAN PHILIPS CO	P O BOX 760	MINERAL WELLS TX 76067
24546	CORNING GLASS WORKS	550 HIGH ST	BRADFORD PA 16701
25088	SIEMENS CORP	186 WOOD AVE S	ISELIN NJ 08830
30487	HUNTINGTON ELECTRIC INC	550 CONDIT ST P O BOX 366	HUNTINGTON IN 46750
31918	ITT SCHADOW INC	8081 WALLACE RD	EDEN PRAIRIE MN 55343
32997	BOURNS INC TRIMPOT DIV	1200 COLUMBIA AVE	RIVERSIDE CA 92507
51406	MURATA ERIE NORTH AMERICA INC GEORGIA OPERATIONS	1148 FRANKLIN RD SE	MARIETTA GA 30067
52763	STETTNER ELECTRONICS INC	6135 AIRWAYS BLVD PO BOX 21947	CHATTANOOGA TN 37421
52769	SPRAGUE-GOODMAN ELECTRONICS INC	134 FULTON AVE	GARDEN CITY PARK NY 11040
53944	GLOW LITE CORP	BOX 698	PAULS VALLEY OK 73075
54583	TDK ELECTRONICS CORP	755 EASTGATE BLVD	GARDEN CITY NY 11530
55680	NICHICON /AMERICA/ CORP	927 E STATE PKY	SCHAUMBURG IL 60195
56289	SPRAGUE ELECTRIC CO	87 MARSHALL ST	NORTH ADAMS MA 01247
57668	ROHM CORP	16931 MILLIKEN AVE	IRVINE CA 92713
58361	GENERAL INSTRUMENT CORP OPTOELECTRONICS DIV	3400 HILLVIEW AVE	PALO ALTO CA 94304
59660	TUSONIX INC	2155 N FORBES BLVD	TUCSON, ARIZONA 85705
59821	CENTRALAB INC SUB NORTH AMERICAN PHILIPS CORP	7158 MERCHANT AVE	EL PASO TX 79915
60211	VOLTAGE MULTIPLIERS INC	8711 WEST ROOSEVELT	VISALIA CA 93291
71400	BUSSMANN MFG CO MCGRAW EDISION CO	114 OLD STATE RD PO BOX 14460	ST LOUIS MO 63178
71590	GLOBE-UNION INC CENTRALAB ELECTRONICS DIV	HWY 20 W P O BOX 858	FORT DODGE IA 50501
75042	TRW INC TRW ELECTRONIC COMPONENTS IRC FIXED RESISTORS PHILADELPHIA DIV	401 N BROAD ST	PHILADELPHIA PA 19108
75915	LITTELFUSE INC	800 E NORTHWEST HWY	DES PLAINES IL 60016
76493	BELL INDUSTRIES INC MILLER J W DIV	19070 REYES AVE P O BOX 5825	COMPTON CA 90224

CROSS INDEX - MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip Code
80009	TEKTRONIX INC	4900 S W GRIFFITH DR P O BOX 500	BEAVERTON OR 97077
80031	MEPCO/ELECTRA INC	22 COLUMBIA RD	MORRISTOWN NJ 07960
83003	VARO INC	2203 WALNUT ST P O BOX 401426	GARLAND TX 75040
91637	DALE ELECTRONICS INC	P O BOX 609	COLUMBUS NE 68601
TK1727	PHILIPS NEDERLAND BV AFD ELONCO	POSTBUS 90050	5600 PB EINDHOVEN THE NETHERLANDS

Replaceable Electrical Parts - SC 502

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Discont	Name & Description	Mfr. Code	Mfr. Part No.
A1	670-3758-00	B010100	B023819	CIRCUIT BD ASSY:MAIN	80009	670-3758-00
A1	670-3758-01	B023820		CIRCUIT BD ASSY:MAIN	80009	670-3758-01
A2	670-3760-04	B010100	B041555	CIRCUIT BD ASSY:FOCUS & INTENSITY	80009	670-3760-04
A2	670-3760-06	B041556		CIRCUIT BD ASSY:FOCUS & INTENSITY	80009	670-3760-06
A3	670-3759-00	B010100	B022579	CIRCUIT BD ASSY:TRIGGER	80009	670-3759-00
A3	670-3759-01	B022580	B039279	CIRCUIT BD ASSY:TRIGGER	80009	670-3759-01
A3	670-3759-02	B039280	B039879	CIRCUIT BD ASSY:TRIGGER	80009	670-3759-02
A3	670-3759-03	B039880		CIRCUIT BD ASSY:TRIGGER	80009	670-3759-03
A4	670-3761-00			CIRCUIT BD ASSY:HORIZONTAL DEFLECTION	80009	670-3761-00
A5	670-3821-00	B010100	B039879	CIRCUIT BD ASSY:AUXILIARY HIGH VOLTAGE	80009	670-3821-00
A5	670-3821-01	B039880		CIRCUIT BD ASSY:HIGH VOLTAGE	80009	670-3821-01
A1	670-3758-00	B010100	B023819	CIRCUIT BD ASSY:MAIN	80009	670-3758-00
A1	670-3758-01	B023820		CIRCUIT BD ASSY:MAIN	80009	670-3758-01
A1C100	285-0816-01	B010100	B022509	CAP, FXD, PLASTIC:0.019UF, 10%, 600V	80009	285-0816-01
A1C100	285-0816-04	B022510		CAP, FXD, PLASTIC:0.019UF, 10%, 600V	80009	285-0816-04
A1C103	281-0504-00			CAP, FXD, CER DI:10PF, +/-1PF, 500V	54583	TCC20CH2H100FYA
A1C105	281-0182-00			CAP, VAR, PLASTIC:1.8-10PF, 500V	TK1727	2222-809-05002
A1C110	290-0534-00			CAP, FXD, ELCTLT:1UF, 20%, 35V	05397	T368A105M035AZ
A1C111	290-0534-00			CAP, FXD, ELCTLT:1UF, 20%, 35V	05397	T368A105M035AZ
A1C115	281-0182-00			CAP, VAR, PLASTIC:1.8-10PF, 500V	TK1727	2222-809-05002
A1C117	283-0669-00			CAP, FXD, MICA DI:360PF, 1%, 500V	00853	D155F361F0
A1C119	281-0178-00			CAP, VAR, PLASTIC:1-3.5PF, 500V	80031	2805D013R5BH02F0
A1C122	283-0001-00			CAP, FXD, CER DI:0.005UF, +100-0%, 500V	59821	2DDH61L502P
A1C126	290-0534-00			CAP, FXD, ELCTLT:1UF, 20%, 35V	05397	T368A105M035AZ
A1C143	281-0511-00	B020200		CAP, FXD, CER DI:22PF, +/-2.2PF, 500V	52763	2RDPLZ007 22POKC
A1C145	281-0511-00	B020200		CAP, FXD, CER DI:22PF, +/-2.2PF, 500V	52763	2RDPLZ007 22POKC
A1C150	281-0662-00			CAP, FXD, CER DI:10PF, +/-0.5PF, 500V	52763	2RDPLZ007 10PODE
A1C156	290-0517-00			CAP, FXD, ELCTLT:6.8UF, 20%, 35V	05397	T368B685M035AZ
A1C164	283-0643-00			CAP, FXD, MICA DI:22PF, 0.5%, 500V	00853	D105E22000
A1C170	281-0662-00			CAP, FXD, CER DI:10PF, +/-0.5PF, 500V	52763	2RDPLZ007 10PODE
A1C200	285-0816-01	B010100	B022509	CAP, FXD, PLASTIC:0.019UF, 10%, 600V	80009	285-0816-01
A1C200	285-0816-04	B022510		CAP, FXD, PLASTIC:0.019UF, 10%, 600V	80009	285-0816-04
A1C203	281-0504-00			CAP, FXD, CER DI:10PF, +/-1PF, 500V	54583	TCC20CH2H100FYA
A1C205	281-0182-00			CAP, VAR, PLASTIC:1.8-10PF, 500V	TK1727	2222-809-05002
A1C210	290-0534-00			CAP, FXD, ELCTLT:1UF, 20%, 35V	05397	T368A105M035AZ
A1C211	290-0534-00			CAP, FXD, ELCTLT:1UF, 20%, 35V	05397	T368A105M035AZ
A1C215	281-0182-00			CAP, VAR, PLASTIC:1.8-10PF, 500V	TK1727	2222-809-05002
A1C217	283-0669-00			CAP, FXD, MICA DI:360PF, 1%, 500V	00853	D155F361F0
A1C219	281-0178-00			CAP, VAR, PLASTIC:1-3.5PF, 500V	80031	2805D013R5BH02F0
A1C222	283-0001-00			CAP, FXD, CER DI:0.005UF, +100-0%, 500V	59821	2DDH61L502P
A1C226	290-0534-00			CAP, FXD, ELCTLT:1UF, 20%, 35V	05397	T368A105M035AZ
A1C243	281-0511-00	B020200		CAP, FXD, CER DI:22PF, +/-2.2PF, 500V	52763	2RDPLZ007 22POKC
A1C245	281-0511-00	B020200		CAP, FXD, CER DI:22PF, +/-2.2PF, 500V	52763	2RDPLZ007 22POKC
A1C250	281-0662-00			CAP, FXD, CER DI:10PF, +/-0.5PF, 500V	52763	2RDPLZ007 10PODE
A1C256	290-0517-00			CAP, FXD, ELCTLT:6.8UF, 20%, 35V	05397	T368B685M035AZ
A1C264	283-0643-00			CAP, FXD, MICA DI:22PF, 0.5%, 500V	00853	D105E22000
A1C270	281-0662-00			CAP, FXD, CER DI:10PF, +/-0.5PF, 500V	52763	2RDPLZ007 10PODE
A1C670	283-0239-00			CAP, FXD, CER DI:0.022UF, 10%, 50V	04222	3439-050C-223K
A1C672	290-0523-00			CAP, FXD, ELCTLT:2.2UF, 20%, 20V	05397	T368A225M020AS
A1C693	290-0534-00			CAP, FXD, ELCTLT:1UF, 20%, 35V	05397	T368A105M035AZ
A1C694	290-0517-00			CAP, FXD, ELCTLT:6.8UF, 20%, 35V	05397	T368B685M035AZ
A1C697	290-0534-00			CAP, FXD, ELCTLT:1UF, 20%, 35V	05397	T368A105M035AZ
A1C698	290-0522-00			CAP, FXD, ELCTLT:1UF, 20%, 50V	05397	T368A105M050AZ
A1C699	281-0508-00			CAP, FXD, CER DI:12PF, +/-0.6PF, 500V	52763	2RDPLZ007 12POJC
A1C725	283-0003-00			CAP, FXD, CER DI:0.01UF, +80-20%, 150V	59821	D103Z40Z5UJDC EX
A1C729	283-0003-00			CAP, FXD, CER DI:0.01UF, +80-20%, 150V	59821	D103Z40Z5UJDC EX
A1C733	290-0522-00			CAP, FXD, ELCTLT:1UF, 20%, 50V	05397	T368A105M050AZ

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A1C850	290-0272-00	B010100	B040399	CAP, FXD, ELCTLT: 47UF, 20%, 50V	56289	109D476X0050F2
A1C850	290-0986-00	B040400		CAP, FXD, ELCTLT: 47UF, 20%, 50V	55680	TLB1H470M
A1C851	290-0272-00	B010100	B040399	CAP, FXD, ELCTLT: 47UF, 20%, 50V	56289	109D476X0050F2
A1C851	290-0986-00	B040400		CAP, FXD, ELCTLT: 47UF, 20%, 50V	55680	TLB1H470M
A1C852	281-0525-00			CAP, FXD, CER DI: 470PF, +/-94PF, 500V	52763	2RDPLZ007 470PMO
A1C854	281-0549-00			CAP, FXD, CER DI: 68PF, 10%, 500V	52763	2RDPLZ007 68PMOU
A1C857	283-0167-00	B010100	B023819	CAP, FXD, CER DI: 0.1UF, 10%, 100V	04222	3430-100C-104K
A1C857	283-0341-00	B023820		CAP, FXD, CER DI: 0.047UF, 10%, 100V	04222	SR301C473KAA
A1C858	283-0341-00	B029000		CAP, FXD, CER DI: 0.047UF, 10%, 100V	04222	SR301C473KAA
A1C862	283-0220-00			CAP, FXD, CER DI: 0.01UF, 20%, 50V	04222	3429 050C 103M
A1C863	283-0111-00			CAP, FXD, CER DI: 0.1UF, 20%, 50V	05397	C330C104M5U1CA
A1C868	283-0167-00			CAP, FXD, CER DI: 0.1UF, 10%, 100V	04222	3430-100C-104K
A1C869	290-0517-00			CAP, FXD, ELCTLT: 6.8UF, 20%, 35V	05397	T368B685M035AZ
A1C870	290-0164-00			CAP, FXD, ELCTLT: 1UF, +50-10%, 150V	56289	500D105F150BA2R2
A1C872	290-0164-00			CAP, FXD, ELCTLT: 1UF, +50-10%, 150V	56289	500D105F150BA2R2
A1C873	281-0543-00			CAP, FXD, CER DI: 270PF, 10%, 500V	52763	2RDPLZ007 27PMO
A1C879	281-0523-00			CAP, FXD, CER DI: 100PF, 20%, 350V	52763	2RDPLZ007 100PMU
A1C911	283-0095-00			CAP, FXD, CER DI: 56PF, 10%, 200V	59660	855-536-COQ0560K
A1C913	283-0003-00			CAP, FXD, CER DI: 0.01UF, +80-20%, 150V	59821	D103Z40Z5UJDCX
A1C1005	281-0207-00			CAP, VAR, PLASTIC: 2-18PF, 100V	52769	GXA 18000
A1C1010	283-0674-00			CAP, FXD, MICA DI: 85PF, 1%, 500V	00853	D155F850F0
A1C1015	295-0138-00			CAP SET, MATCHED: 1UF, 0.01UF, MATCHED 1% QA	80009	295-0138-00
A1C1020	-----			(PART OF C1015)		
A1CR126	152-0323-00			SEMICON DVC, DI: SW, SI, 35V, 0.1A, DO-7	14433	WG1518
A1CR145	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A1CR150	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A1CR153	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A1CR170	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A1CR226	152-0323-00			SEMICON DVC, DI: SW, SI, 35V, 0.1A, DO-7	14433	WG1518
A1CR245	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A1CR250	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A1CR253	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A1CR270	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A1CR670	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A1CR675	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A1CR697	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A1CR850	152-0398-00			SEMICON DVC, DI: RECT, SI, 200V, 1A	04713	SR3609RL
A1CR851	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A1CR853	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A1CR855	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A1CR856	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A1CR862	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A1CR864	152-0333-00			SEMICON DVC, DI: SW, SI, 55V, 200MA, DO-35	07263	FDH-6012
A1CR865	152-0333-00			SEMICON DVC, DI: SW, SI, 55V, 200MA, DO-35	07263	FDH-6012
A1CR869	152-0061-00			SEMICON DVC, DI: SW, SI, 175V, 0.1A, DO-35	07263	FDH2161
A1CR870	152-0061-00			SEMICON DVC, DI: SW, SI, 175V, 0.1A, DO-35	07263	FDH2161
A1CR879	152-0061-00			SEMICON DVC, DI: SW, SI, 175V, 0.1A, DO-35	07263	FDH2161
A1CR882	152-0061-00			SEMICON DVC, DI: SW, SI, 175V, 0.1A, DO-35	07263	FDH2161
A1CR911	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A1CR915	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A1L140	276-0507-00			SHLD BEAD, ELEK: FERRITE	02114	56-590-65B/3B
A1L240	276-0507-00			SHLD BEAD, ELEK: FERRITE	02114	56-590-65B/3B
A1L850	108-0422-00			COIL, RF: FIXED, 80UH	80009	108-0422-00
A1LR698	108-0245-00			CHOKE, RF: FIXED, 3.9UH	76493	B6310-1
A1LR733	108-0245-00			CHOKE, RF: FIXED, 3.9UH	76493	B6310-1
A1Q125	151-1031-00			TRANSISTOR: FET, N-CHAN, SI	80009	151-1031-00
A1Q150	151-0325-00	B010100	B042044	TRANSISTOR: PNP, SI, TO-92, SEL	80009	151-0325-00
A1Q150	151-0220-00	B042045		TRANSISTOR: PNP, SI, TO-92	80009	151-0220-00

Replaceable Electrical Parts - SC 502

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Discont	Name & Description	Mfr. Code	Mfr. Part No.
A1Q160	151-0325-00			TRANSISTOR:PNP,SI,TO-92,SEL	80009	151-0325-00
A1Q170	151-0220-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0220-00
A1Q175	151-0325-00			TRANSISTOR:PNP,SI,TO-92,SEL	80009	151-0325-00
A1Q225	151-1031-00			TRANSISTOR:FET,N-CHAN,SI	80009	151-1031-00
A1Q250	151-0325-00	B010100	B042044	TRANSISTOR:PNP,SI,TO-92,SEL	80009	151-0325-00
A1Q250	151-0220-00	B042045		TRANSISTOR:PNP,SI,TO-92	80009	151-0220-00
A1Q260	151-0325-00			TRANSISTOR:PNP,SI,TO-92,SEL	80009	151-0325-00
A1Q270	151-0220-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0220-00
A1Q275	151-0325-00			TRANSISTOR:PNP,SI,TO-92,SEL	80009	151-0325-00
A1Q675	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A1Q680	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A1Q685	151-0259-00			TRANSISTOR:NPN,SI,TO-106	07263	S39288
A1Q690	151-1054-00			TRANSISTOR:FET,N-CHAN,SI,TO-71	80009	151-1054-00
A1Q695	151-0216-00			TRANSISTOR:PNP,SI,TO-92	04713	SPS8803
A1Q700	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A1Q710	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
A1Q720	151-0342-00			TRANSISTOR:PNP,SI,TO-92	07263	S035928
A1Q730	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
A1Q850	151-0364-00			TRANSISTOR:PNP,SI,X-51C	03508	X43CR181
A1Q855	151-0426-00			TRANSISTOR:NPN,SI,TO-220	03508	X44HR242
A1Q860	151-0437-00			TRANSISTOR:SELECTED	80009	151-0437-00
A1Q900	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
A1Q910	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
A1R100	315-0510-00			RES,FXD,FILM:51 OHM,5%,0.25W	19701	5043CX51R00J
A1R104	315-0105-00			RES,FXD,FILM:1M OHM,5%,0.25W	19701	5043CX1M000J
A1R110	315-0100-00			RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10R00J
A1R111	315-0100-00			RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10R00J
A1R115	322-0624-03			RES,FXD,FILM:990K OHM,0.25%,0.25W,TC=T2	91637	MFF1421D99002C
A1R117	315-0200-00			RES,FXD,FILM:20 OHM,5%,0.25W	19701	5043CX20R00J
A1R119	321-0289-03			RES,FXD,FILM:10.0K OHM,0.25%,0.125W,TC=T2	07716	CEAC10001C
A1R122	315-0474-00			RES,FXD,FILM:470K OHM,5%,0.25W	19701	5043CX470K0J92U
A1R125	315-0201-00			RES,FXD,FILM:200 OHM,5%,0.25W	57668	NTR25J-E200E
A1R126	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A1R129	321-0226-02			RES,FXD,FILM:2.21K OHM,0.5%,0.125W,TC=T2	91637	MFF1816D22100D
A1R130	321-0193-03			RES,FXD,FILM:1K OHM,0.25%,0.125W,TC=T2	07716	CEAC10000C
A1R135	311-1556-00			RES,VAR,NONWV:TRMR,50K OHM,0.5W	32997	3352T-DY7-503
A1R136	321-0364-00			RES,FXD,FILM:60.4K OHM,1%,0.125W,TC=TO	19701	5043ED60K40F
A1R138	321-0125-00			RES,FXD,FILM:196 OHM,1%,0.125W,TC=TO	07716	CEAD196ROF
A1R140	321-0226-02			RES,FXD,FILM:2.21K OHM,0.5%,0.125W,TC=T2	91637	MFF1816D22100D
A1R141	321-0193-03			RES,FXD,FILM:1K OHM,0.25%,0.125W,TC=T2	07716	CEAC10000C
A1R143	321-0097-03			RES,FXD,FILM:100 OHM,0.25%,0.125W,TC=TO	91637	CMF55116D100ROC
A1R145	321-0097-03			RES,FXD,FILM:100 OHM,0.25%,0.125W,TC=TO	91637	CMF55116D100ROC
A1R148	321-0030-03			RES,FXD,FILM:20.0 OHM,0.25%,0.125W,TC=T2	57668	CRB14 CYE 20 OHM
A1R150	321-0030-03			RES,FXD,FILM:20.0 OHM,0.25%,0.125W,TC=T2	57668	CRB14 CYE 20 OHM
A1R153	315-0330-00			RES,FXD,FILM:33 OHM,5%,0.25W	19701	5043CX33R00J
A1R155	315-0100-00			RES,FXD,FILM:10 OHM,5%,0.25W	19701	5043CX10R00J
A1R159	315-0681-00			RES,FXD,FILM:680 OHM,5%,0.25W	57668	NTR25J-E680E
A1R160	321-0251-00			RES,FXD,FILM:4.02K OHM,1%,0.125W,TC=TO	19701	5033ED4K020F
A1R162	321-0233-00			RES,FXD,FILM:2.61K OHM,1%,0.125W,TC=TO	07716	CEAD26100F
A1R164	321-0154-00			RES,FXD,FILM:392 OHM,1%,0.125W,TC=TO	07716	CEAD392ROF
A1R170	315-0330-00			RES,FXD,FILM:33 OHM,5%,0.25W	19701	5043CX33R00J
A1R172	321-0251-00			RES,FXD,FILM:4.02K OHM,1%,0.125W,TC=TO	19701	5033ED4K020F
A1R175	321-0233-00			RES,FXD,FILM:2.61K OHM,1%,0.125W,TC=TO	07716	CEAD26100F
A1R177	311-1599-00	B010100	B041865	RES,VAR,NONWV:PNL,2.5K OHM,1W,W/SW	01121	25M909
A1R177	311-1599-01	B041866		RES,VAR,NONWV:PNL,2.5K OHM,20%,0.5W	01121	25M909
A1R180	311-1239-00			RES,VAR,NONWV:TRMR,2.5K OHM,0.5W	32997	3386X-T07-252
A1R200	315-0510-00			RES,FXD,FILM:51 OHM,5%,0.25W	19701	5043CX51R00J
A1R204	315-0105-00			RES,FXD,FILM:1M OHM,5%,0.25W	19701	5043CX1M000J

Component No.	Tektronix Part No.	Serial/Assembly No.		Name & Description	Mfr. Code	Mfr. Part No.
		Effective	Dscont			
A1R210	315-0100-00			RES, FXD, FILM: 10 OHM, 5%, 0.25W	19701	5043CX10RR00J
A1R211	315-0100-00			RES, FXD, FILM: 10 OHM, 5%, 0.25W	19701	5043CX10RR00J
A1R215	322-0624-03			RES, FXD, FILM: 990K OHM, 0.25%, 0.25W, TC=T2	91637	MFF1421D99002C
A1R217	315-0200-00			RES, FXD, FILM: 20 OHM, 5%, 0.25W	19701	5043CX20R00J
A1R219	321-0289-03			RES, FXD, FILM: 10.0K OHM, 0.25%, 0.125W, TC=T2	07716	CEAC10001C
A1R222	315-0474-00			RES, FXD, FILM: 470K OHM, 5%, 0.25W	19701	5043CX470K0J92U
A1R225	315-0201-00			RES, FXD, FILM: 200 OHM, 5%, 0.25W	57668	NTR25J-E200E
A1R226	315-0102-00			RES, FXD, FILM: 1K OHM, 5%, 0.25W	57668	NTR25JE01K0
A1R229	321-0226-02			RES, FXD, FILM: 2.21K OHM, 0.5%, 0.125W, TC=T2	91637	MFF1816D22100D
A1R230	321-0193-03			RES, FXD, FILM: 1K OHM, 0.25%, 0.125W, TC=T2	07716	CEAC10000C
A1R235	311-1556-00			RES, VAR, NONWW: TRMR, 50K OHM, 0.5W	32997	3352T-DY7-503
A1R236	321-0364-00			RES, FXD, FILM: 60.4K OHM, 1%, 0.125W, TC=T0	19701	5043ED60K40F
A1R238	321-0125-00			RES, FXD, FILM: 196 OHM, 1%, 0.125W, TC=T0	07716	CEAD196R0F
A1R240	321-0226-02			RES, FXD, FILM: 2.21K OHM, 0.5%, 0.125W, TC=T2	91637	MFF1816D22100D
A1R241	321-0193-03			RES, FXD, FILM: 1K OHM, 0.25%, 0.125W, TC=T2	07716	CEAC10000C
A1R243	321-0097-03			RES, FXD, FILM: 100 OHM, 0.25%, 0.125W, TC=T0	91637	CMF55116D100ROC
A1R245	321-0097-03			RES, FXD, FILM: 100 OHM, 0.25%, 0.125W, TC=T0	91637	CMF55116D100ROC
A1R248	321-0030-03			RES, FXD, FILM: 20.0 OHM, 0.25%, 0.125W, TC=T2	57668	CRB14 CYE 20 OHM
A1R250	321-0030-03			RES, FXD, FILM: 20.0 OHM, 0.25%, 0.125W, TC=T2	57668	CRB14 CYE 20 OHM
A1R253	315-0330-00			RES, FXD, FILM: 33 OHM, 5%, 0.25W	19701	5043CX33R00J
A1R255	315-0100-00			RES, FXD, FILM: 10 OHM, 5%, 0.25W	19701	5043CX10RR00J
A1R259	315-0681-00			RES, FXD, FILM: 680 OHM, 5%, 0.25W	57668	NTR25J-E680E
A1R260	321-0251-00			RES, FXD, FILM: 4.02K OHM, 1%, 0.125W, TC=T0	19701	5033ED4K020F
A1R262	321-0233-00			RES, FXD, FILM: 2.61K OHM, 1%, 0.125W, TC=T0	07716	CEAD26100F
A1R264	321-0154-00			RES, FXD, FILM: 392 OHM, 1%, 0.125W, TC=T0	07716	CEAD392R0F
A1R270	315-0330-00			RES, FXD, FILM: 33 OHM, 5%, 0.25W	19701	5043CX33R00J
A1R272	321-0251-00			RES, FXD, FILM: 4.02K OHM, 1%, 0.125W, TC=T0	19701	5033ED4K020F
A1R275	321-0233-00			RES, FXD, FILM: 2.61K OHM, 1%, 0.125W, TC=T0	07716	CEAD26100F
A1R277	311-1599-00	B010100	B041865	RES, VAR, NONWW: PNL, 2.5K OHM, 1W, W/SW	01121	25M909
A1R277	311-1599-01	B041866		RES, VAR, NONWW: PNL, 2.5K OHM, 20%, 0.5W	01121	25M909
A1R280	311-1239-00			RES, VAR, NONWW: TRMR, 2.5K OHM, 0.5W	32997	3386X-T07-252
A1R670	315-0433-00			RES, FXD, FILM: 43K OHM, 5%, 0.25W	19701	5043CX43K00J
A1R672	315-0433-00			RES, FXD, FILM: 43K OHM, 5%, 0.25W	19701	5043CX43K00J
A1R675	321-0162-00			RES, FXD, FILM: 475 OHM, 1%, 0.125W, TC=T0	19701	5033ED475R0F
A1R677	315-0102-00			RES, FXD, FILM: 1K OHM, 5%, 0.25W	57668	NTR25JE01K0
A1R679	315-0303-00			RES, FXD, FILM: 30K OHM, 5%, 0.25W	19701	5043CX30K00J
A1R681	311-1560-00			RES, VAR, NONWW: TRMR, 5K OHM, 0.5W	32997	3352T-1-502
A1R683	315-0183-00			RES, FXD, FILM: 18K OHM, 5%, 0.25W	19701	5043CX18K00J
A1R685	315-0620-00			RES, FXD, FILM: 62 OHM, 5%, 0.25W	19701	5043CX63R00J
A1R686	315-0123-00			RES, FXD, FILM: 12K OHM, 5%, 0.25W	57668	NTR25J-E12K0
A1R688	301-0332-00			RES, FXD, FILM: 3.3K OHM, 5%, 0.5W	19701	5053CX3K300J
A1R693	315-0620-00			RES, FXD, FILM: 62 OHM, 5%, 0.25W	19701	5043CX63R00J
A1R694	315-0620-00			RES, FXD, FILM: 62 OHM, 5%, 0.25W	19701	5043CX63R00J
A1R697	315-0392-00			RES, FXD, FILM: 3.9K OHM, 5%, 0.25W	57668	NTR25J-E03K9
A1R698	315-0102-00			RES, FXD, FILM: 1K OHM, 5%, 0.25W	57668	NTR25JE01K0
A1R699	321-0220-00			RES, FXD, FILM: 1.91K OHM, 1%, 0.125W, TC=T0	19701	5033ED1K91F
A1R700	315-0102-00			RES, FXD, FILM: 1K OHM, 5%, 0.25W	57668	NTR25JE01K0
A1R702	321-0243-00			RES, FXD, FILM: 3.32K OHM, 1%, 0.125W, TC=T0	19701	5033ED3K32F
A1R704	315-0470-00			RES, FXD, FILM: 47 OHM, 5%, 0.25W	57668	NTR25J-E47E0
A1R705	321-0097-00			RES, FXD, FILM: 100 OHM, 1%, 0.125W, TC=T0	91637	CMF55116G100R0F
A1R706	321-0192-00			RES, FXD, FILM: 976 OHM, 1%, 0.125W, TC=T0	19701	5033ED976R0F
A1R708	311-1567-00			RES, VAR, NONWW: TRMR, 100 OHM, 0.5W	32997	3352T-1-101
A1R709	315-0622-00			RES, FXD, FILM: 6.2K OHM, 5%, 0.25W	19701	5043CX6K200J
A1R712	315-0622-00			RES, FXD, FILM: 6.2K OHM, 5%, 0.25W	19701	5043CX6K200J
A1R713	315-0152-00			RES, FXD, FILM: 1.5K OHM, 5%, 0.25W	57668	NTR25J-E01K5
A1R719	315-0622-00			RES, FXD, FILM: 6.2K OHM, 5%, 0.25W	19701	5043CX6K200J
A1R721	315-0470-00			RES, FXD, FILM: 47 OHM, 5%, 0.25W	57668	NTR25J-E47E0
A1R723	311-1568-00			RES, VAR, NONWW: TRMR, 50 OHM, 0.5W	32997	3352T-1-500

Replaceable Electrical Parts - SC 502

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A1R725	321-0125-00			RES, FXD, FILM: 196 OHM, 1%, 0.125W, TC=TO	07716	CEAD196R0F
A1R727	321-0344-00			RES, FXD, FILM: 37.4K OHM, 1%, 0.125W, TC=TO	19701	5033ED 37K40F
A1R729	321-0315-00			RES, FXD, FILM: 18.7K OHM, 1%, 0.125W, TC=TO	19701	5043ED18K70F
A1R730	321-0353-00			RES, FXD, FILM: 46.4K OHM, 1%, 0.125W, TC=TO	07716	CEAD46401F
A1R733	321-0232-00			RES, FXD, FILM: 2.55K OHM, 1%, 0.125W, TC=TO	19701	5043ED2K550F
A1R850	315-0511-00			RES, FXD, FILM: 510 OHM, 5%, 0.25W	19701	5043CX510R0J
A1R852	315-0200-00			RES, FXD, FILM: 20 OHM, 5%, 0.25W	19701	5043CX20R00J
A1R854	315-0681-00			RES, FXD, FILM: 680 OHM, 5%, 0.25W	57668	NTR25J-E680E
A1R855	315-0752-00			RES, FXD, FILM: 7.5K OHM, 5%, 0.25W	57668	NTR25J-E07K5
A1R857	315-0363-00			RES, FXD, FILM: 36K OHM, 5%, 0.25W	57668	NTR25J-E36K0
A1R859	315-0104-00			RES, FXD, FILM: 100K OHM, 5%, 0.25W	57668	NTR25J-E100K
A1R860	315-0394-00			RES, FXD, FILM: 390K OHM, 5%, 0.25W	57668	NTR25J-E390K
A1R862	315-0202-00	B010100	B023819	RES, FXD, FILM: 2K OHM, 5%, 0.25W	57668	NTR25J-E 2K
A1R862	315-0911-00	B023820		RES, FXD, FILM: 910 OHM, 5%, 0.25W	57668	NTR25J-E910E
A1R864	315-0203-00			RES, FXD, FILM: 20K OHM, 5%, 0.25W	57668	NTR25J-E 20K
A1R866	315-0361-00			RES, FXD, FILM: 360 OHM, 5%, 0.25W	19701	5043CX360R0J
A1R868	315-0123-00			RES, FXD, FILM: 12K OHM, 5%, 0.25W	57668	NTR25J-E12K0
A1R869	315-0102-00			RES, FXD, FILM: 1K OHM, 5%, 0.25W	57668	NTR25JE01K0
A1R879	315-0394-00			RES, FXD, FILM: 390K OHM, 5%, 0.25W	57668	NTR25J-E390K
A1R880	315-0102-00			RES, FXD, FILM: 1K OHM, 5%, 0.25W	57668	NTR25JE01K0
A1R883	315-0221-00			RES, FXD, FILM: 220 OHM, 5%, 0.25W	57668	NTR25J-E220E
A1R893	307-0490-00			RES NTWK, FXD, FI: HIGH VOLTAGE DIVIDER	80009	307-0490-00
A1R911	315-0102-00			RES, FXD, FILM: 1K OHM, 5%, 0.25W	57668	NTR25JE01K0
A1R913	315-0183-00			RES, FXD, FILM: 18K OHM, 5%, 0.25W	19701	5043CX18K00J
A1R915	321-0602-00			RES, FXD, FILM: 3.908K OHM, 0.25%, 0.125W, TC=T2	91637	MFF1816D39080C
A1R917	321-0927-07			RES, FXD, FILM: 125 OHM, 0.1%, 0.125W, TC=T9	19701	5033RE125R0B
A1R987	315-0181-00			RES, FXD, FILM: 180 OHM, 5%, 0.25W	57668	NTR25J-E180E
A1R1000	315-0124-00			RES, FXD, FILM: 120K OHM, 5%, 0.25W	19701	5043CX120K0J
A1R1003	321-0234-00			RES, FXD, FILM: 2.67K OHM, 1%, 0.125W, TC=TO	19701	5033ED2K67F
A1R1008	321-0917-03			RES, FXD, FILM: 2792K OHM, 0.25%, 0.125W, TC=T2	19701	5033RD27K20C
A1R1010	321-0268-03			RES, FXD, FILM: 6.04K OHM, 0.25%, 0.125W, T=T2	07716	CEAC60400C
A1R1015	321-0856-03			RES, FXD, FILM: 330K OHM, 0.25%, 0.125W, TC=T2	19701	5033C330K0C
A1R1018	321-0827-03			RES, FXD, FILM: 3.61K OHM, 0.25%, 0.125W, TC=T2	19701	5033RC3K610C
A1R1020	321-0830-03			RES, FXD, FILM: 2.41K OHM, 0.25%, 0.125W, TC=T2	07716	CEAC24100C
A1R1024	321-0200-00			RES, FXD, FILM: 1.18K OHM, 1%, 0.125W, TC=TO	19701	5033ED11K80F
A1R1028	321-0481-03			RES, FXD, FILM: 1M OHM, 0.25%, 0.125W, TC=T2	19701	5033RC1M000C
A1R1030	321-0510-07			RES, FXD, FILM: 2.00 MEG OHM, 0.1%, 0.125W, TC=TO	19701	5033RE2M00B
A1T800	120-1016-00			XFMR, PWR, SDN&SU: HIGH VOLTAGE	80009	120-1016-00
A1T850	108-0828-00			COIL, RF: FXD, 56.4UH	80009	108-0828-00
A1TP677	214-0579-00			TERM, TEST POINT: BRS CD PL	80009	214-0579-00
A1TP850	214-0579-00			TERM, TEST POINT: BRS CD PL	80009	214-0579-00
A1TP860	214-0579-00			TERM, TEST POINT: BRS CD PL	80009	214-0579-00
A1U850	152-0634-00			SEMICON DVC, DI: HV MULTR, SI, 6.7KV IN, 10KV	60211	VM169
A1U860	156-0067-00			MICROCKT, LINEAR: OPNL AMPL, SEL	04713	MC1741CP1
A1VR156	152-0149-00			SEMICON DVC, DI: ZEN, SI, 10V, 5%, 0.4W, DO-7	15238	Z5406
A1VR256	152-0149-00			SEMICON DVC, DI: ZEN, SI, 10V, 5%, 0.4W, DO-7	15238	Z5406
A1VR690	152-0227-00			SEMICON DVC, DI: ZEN, SI, 6.2V, 5%, 0.4W, DO-7	04713	SZ13903
A1VR855	152-0243-00			SEMICON DVC, DI: ZEN, SI, 15V, 5%, 0.4W, DO-7	04713	SZ13203 (1N965B)
A2	670-3760-04	B010100	B041555	CIRCUIT BD ASSY: FOCUS & INTENSITY	80009	670-3760-04
A2	670-3760-06	B041556		CIRCUIT BD ASSY: FOCUS & INTENSITY	80009	670-3760-06
A2C331	283-0636-00			CAP, FXD, MICA DI: 36PF, 1.4%, 100V	00853	D155E360G0
A2C333	283-0634-00			CAP, FXD, MICA DI: 65PF, 1%, 100V	00853	D155E650F0
A2C338	290-0534-00			CAP, FXD, ELCTLT: 1UF, 20%, 35V	05397	T368A105M035AZ
A2C353	281-0623-00			CAP, FXD, CER DI: 650PF, 5%, 500V	52763	2RDPLZ007 650PMO
A2C355	281-0546-00			CAP, FXD, CER DI: 330PF, 10%, 500V	52763	2RDPLZ007 330PMO
A2C360	290-0536-00			CAP, FXD, ELCTLT: 10UF, 20%, 25V TANTALUM	05397	T368B106M025AS
A2C387	281-0184-00	B022580		CAP, VAR, PLASTIC: 2-18PF, 500VDC	TK1727	2222-809-05003
A2C388	283-0636-00			CAP, FXD, MICA DI: 36PF, 1.4%, 100V	00853	D155E360G0

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A2C389	283-0677-00	B010100	B022579	CAP,FXD,MICA DI:82PF,1%,500V	00853	D155E820F0
A2C389	283-0647-00	B022580		CAP,FXD,MICA DI:70PF,1%,100V	00853	D155E700F0
A2C397	290-0534-00			CAP,FXD,ELCTLT:1UF,20%,35V	05397	T368A105M035AZ
A2C425	283-0003-00			CAP,FXD,CER DI:0.01UF,+80-20%,150V	59821	D103Z40Z5UJDCX
A2C435	283-0023-00			CAP,FXD,CER DI:0.1UF,+80-20%,12V	71590	2DDU66B104Z
A2C456	281-0662-00			CAP,FXD,CER DI:10PF,+/-0.5PF,500V	52763	2RDPLZ007 10PODE
A2C465	281-0543-00			CAP,FXD,CER DI:270PF,10%,500V	52763	2RDPLZ007 27POMO
A2C467	281-0662-00			CAP,FXD,CER DI:10PF,+/-0.5PF,500V	52763	2RDPLZ007 10PODE
A2C473	281-0205-00	B010100	B021841	CAP,VAR,PLASTIC:5.5-65 PF,100V	TK1727	2222-808-32659
A2C473	281-0208-00	B021842		CAP,VAR,PLASTIC:5.5-50PF,100V	52769	109-4931-060
A2C474	281-0205-00	B010100	B021841	CAP,VAR,PLASTIC:5.5-65 PF,100V	TK1727	2222-808-32659
A2C474	281-0208-00	B021842		CAP,VAR,PLASTIC:5.5-50PF,100V	52769	109-4931-060
A2C476	283-0677-00			CAP,FXD,MICA DI:82PF,1%,500V	00853	D155E820F0
A2C479	283-0000-00			CAP,FXD,CER DI:0.001UF,+100-0%,500V	59660	831-610-Y5U0102P
A2C480	283-0167-00			CAP,FXD,CER DI:0.1UF,10%,100V	04222	3430-100C-104K
A2C800	283-0023-00			CAP,FXD,CER DI:0.1UF,+80-20%,12V	71590	2DDU66B104Z
A2C830	283-0023-00			CAP,FXD,CER DI:0.1UF,+80-20%,12V	71590	2DDU66B104Z
A2C834	281-0661-00			CAP,FXD,CER DI:0.8PF,+/-0.1PF,500V	52763	2RDPLZ007 0P80BC
A2C835	283-0003-00			CAP,FXD,CER DI:0.01UF,+80-20%,150V	59821	D103Z40Z5UJDCX
A2C838	283-0003-00			CAP,FXD,CER DI:0.01UF,+80-20%,150V	59821	D103Z40Z5UJDCX
A2C841	283-0167-00			CAP,FXD,CER DI:0.1UF,10%,100V	04222	3430-100C-104K
A2C842	290-0534-00			CAP,FXD,ELCTLT:1UF,20%,35V	05397	T368A105M035AZ
A2C844	290-0534-00			CAP,FXD,ELCTLT:1UF,20%,35V	05397	T368A105M035AZ
A2C846	283-0167-00			CAP,FXD,CER DI:0.1UF,10%,100V	04222	3430-100C-104K
A2C875	290-0164-00			CAP,FXD,ELCTLT:1UF,+50-10%,150V	56289	500D105F150BA2R2
A2C876	290-0164-00			CAP,FXD,ELCTLT:1UF,+50-10%,150V	56289	500D105F150BA2R2
A2C877	290-0164-00			CAP,FXD,ELCTLT:1UF,+50-10%,150V	56289	500D105F150BA2R2
A2C890	283-0003-00	B010100	B039279	CAP,FXD,CER DI:0.01UF,+80-20%,150V	59821	D103Z40Z5UJDCX
A2C895	283-0003-00			CAP,FXD,CER DI:0.01UF,+80-20%,150V	59821	D103Z40Z5UJDCX
A2CR800	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A2CR802	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A2CR821	152-0141-02			SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A2CR841	152-0061-00			SEMICON DVC,DI:SW,SI,175V,0.1A,DO-35	07263	FDH2161
A2CR842	152-0061-00			SEMICON DVC,DI:SW,SI,175V,0.1A,DO-35	07263	FDH2161
A2L470	108-0054-00			COIL,RF:FIXED,6.9UF	80009	108-0054-00
A2L475	108-0054-00			COIL,RF:FIXED,6.9UF	80009	108-0054-00
A2L870	108-0240-00			COIL,RF:FIXED,820UH	76493	B5147
A2L875	108-0240-00			COIL,RF:FIXED,820UH	76493	B5147
A2LR360	108-0245-00			CHOKERF:FIXED,3.9UH	76493	B6310-1
A2LR840	108-0245-00			CHOKERF:FIXED,3.9UH	76493	B6310-1
A2Q320	151-0437-00			TRANSISTOR:SELECTED	80009	151-0437-00
A2Q325	151-0437-00			TRANSISTOR:SELECTED	80009	151-0437-00
A2Q330	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A2Q335	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A2Q340	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A2Q345	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A2Q350	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
A2Q355	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A2Q365	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A2Q375	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A2Q380	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A2Q385	151-0437-00			TRANSISTOR:SELECTED	80009	151-0437-00
A2Q390	151-0437-00			TRANSISTOR:SELECTED	80009	151-0437-00
A2Q400	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A2Q405	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A2Q410	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A2Q415	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A2Q417	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00

Replaceable Electrical Parts - SC 502

Component No.	Tektronix Part No.	Serial/Assembly No. Effective Dscnt	Name & Description	Mfr. Code	Mfr. Part No.
A2Q419	151-0188-00		TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A2Q425	151-0342-00		TRANSISTOR:PNP,SI,TO-92	07263	S035928
A2Q430	151-0342-00		TRANSISTOR:PNP,SI,TO-92	07263	S035928
A2Q450	151-0220-00		TRANSISTOR:PNP,SI,TO-92	80009	151-0220-00
A2Q455	151-0220-00		TRANSISTOR:PNP,SI,TO-92	80009	151-0220-00
A2Q460	151-0220-00		TRANSISTOR:PNP,SI,TO-92	80009	151-0220-00
A2Q465	151-0220-00		TRANSISTOR:PNP,SI,TO-92	80009	151-0220-00
A2Q470	151-0103-00		TRANSISTOR:NPN,SI,TO-5	04713	SM1307
A2Q475	151-0103-00		TRANSISTOR:NPN,SI,TO-5	04713	SM1307
A2Q800	151-0342-00		TRANSISTOR:PNP,SI,TO-92	07263	S035928
A2Q805	151-0342-00		TRANSISTOR:PNP,SI,TO-92	07263	S035928
A2Q815	151-0342-00		TRANSISTOR:PNP,SI,TO-92	07263	S035928
A2Q820	151-0341-00		TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
A2Q825	151-0342-00		TRANSISTOR:PNP,SI,TO-92	07263	S035928
A2Q830	151-0342-00		TRANSISTOR:PNP,SI,TO-92	07263	S035928
A2Q835	151-0190-00		TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A2Q840	151-0347-00		TRANSISTOR:NPN,SI,TO-92	04713	SPS7951
A2Q845	151-0350-00		TRANSISTOR:PNP,SI,TO-92	04713	SPS6700
A2R320	321-0131-00		RES,FXD,FILM:226 OHM,1%,0.125W,TC=TO	19701	5043ED226ROF
A2R322	322-0170-00		RES,FXD,FILM:576 OHM,1%,0.25W,TC=TO	75042	CEBT0-5760F
A2R324	311-1802-00		RES,VAR,NONW:PNL,2 X 500 OHM,10%,0.5W	32997	81C2DK29BA0023
A2R325	322-0170-00		RES,FXD,FILM:576 OHM,1%,0.25W,TC=TO	75042	CEBT0-5760F
A2R327	321-0131-00		RES,FXD,FILM:226 OHM,1%,0.125W,TC=TO	19701	5043ED226ROF
A2R329	321-0113-00		RES,FXD,FILM:147 OHM,1%,0.125W,TC=TO	07716	CEAD147ROF
A2R331	315-0242-00		RES,FXD,FILM:2.4K OHM,5%,0.25W	57668	NTR25J-E02K4
A2R333	321-0097-00		RES,FXD,FILM:100 OHM,1%,0.125W,TC=TO	91637	CMF551166100ROF
A2R335	311-1594-00		RES,VAR,NONW:TRMR,10 OHM,0.5W	32997	3352T-1-100
A2R336	321-0097-00		RES,FXD,FILM:100 OHM,1%,0.125W,TC=TO	91637	CMF551166100ROF
A2R338	315-0150-00		RES,FXD,FILM:15 OHM,5%,0.25W	19701	5043CX15R00J
A2R340	315-0201-00		RES,FXD,FILM:200 OHM,5%,0.25W	57668	NTR25J-E200E
A2R341	321-0229-00		RES,FXD,FILM:2.37K OHM,1%,0.125W,TC=TO	19701	5043ED2K37F
A2R343	321-0229-00		RES,FXD,FILM:2.37K OHM,1%,0.125W,TC=TO	19701	5043ED2K37F
A2R345	315-0201-00		RES,FXD,FILM:200 OHM,5%,0.25W	57668	NTR25J-E200E
A2R346	321-0116-00		RES,FXD,FILM:158 OHM,1%,0.125W,TC=TO	07716	CEAD158ROF
A2R350	315-0183-00		RES,FXD,FILM:18K OHM,5%,0.25W	19701	5043CX18K00J
A2R352	315-0682-00		RES,FXD,FILM:6.8K OHM,5%,0.25W	57668	NTR25J-E06K8
A2R353	315-0182-00		RES,FXD,FILM:1.8K OHM,5%,0.25W	57668	NTR25J-E1K8
A2R355	315-0682-00		RES,FXD,FILM:6.8K OHM,5%,0.25W	57668	NTR25J-E06K8
A2R356	315-0152-00		RES,FXD,FILM:1.5K OHM,5%,0.25W	57668	NTR25J-E01K5
A2R358	315-0102-00		RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A2R359	315-0102-00		RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A2R360	315-0392-00		RES,FXD,FILM:3.9K OHM,5%,0.25W	57668	NTR25J-E03K9
A2R362	315-0392-00		RES,FXD,FILM:3.9K OHM,5%,0.25W	57668	NTR25J-E03K9
A2R364	315-0392-00		RES,FXD,FILM:3.9K OHM,5%,0.25W	57668	NTR25J-E03K9
A2R365	315-0102-00		RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A2R367	315-0152-00		RES,FXD,FILM:1.5K OHM,5%,0.25W	57668	NTR25J-E01K5
A2R368	315-0152-00		RES,FXD,FILM:1.5K OHM,5%,0.25W	57668	NTR25J-E01K5
A2R370	315-0131-00		RES,FXD,FILM:130 OHM,5%,0.25W	19701	5043CX130R0J
A2R372	315-0102-00		RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A2R373	315-0152-00		RES,FXD,FILM:1.5K OHM,5%,0.25W	57668	NTR25J-E01K5
A2R375	315-0131-00		RES,FXD,FILM:130 OHM,5%,0.25W	19701	5043CX130R0J
A2R381	321-0131-00		RES,FXD,FILM:226 OHM,1%,0.125W,TC=TO	19701	5043ED226ROF
A2R383	322-0170-00		RES,FXD,FILM:576 OHM,1%,0.25W,TC=TO	75042	CEBT0-5760F
A2R386	321-0113-00		RES,FXD,FILM:147 OHM,1%,0.125W,TC=TO	07716	CEAD147ROF
A2R388	322-0170-00		RES,FXD,FILM:576 OHM,1%,0.25W,TC=TO	75042	CEBT0-5760F
A2R389	315-0242-00		RES,FXD,FILM:2.4K OHM,5%,0.25W	57668	NTR25J-E02K4
A2R390	321-0131-00		RES,FXD,FILM:226 OHM,1%,0.125W,TC=TO	19701	5043ED226ROF
A2R392	321-0097-00		RES,FXD,FILM:100 OHM,1%,0.125W,TC=TO	91637	CMF551166100ROF

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A2R394	311-1594-00			RES, VAR, NONWW: TRMR, 10 OHM, 0.5W	32997	3352T-1-100
A2R396	321-0097-00			RES, FXD, FILM: 100 OHM, 1%, 0.125W, TC=TO	91637	CMF551166100ROF
A2R397	315-0150-00			RES, FXD, FILM: 15 OHM, 5%, 0.25W	19701	5043CX15R00J
A2R399	315-0201-00			RES, FXD, FILM: 200 OHM, 5%, 0.25W	57668	NTR25J-E200E
A2R400	315-0201-00			RES, FXD, FILM: 200 OHM, 5%, 0.25W	57668	NTR25J-E200E
A2R401	321-0229-00			RES, FXD, FILM: 2.37K OHM, 1%, 0.125W, TC=TO	19701	5043ED2K37F
A2R404	321-0229-00			RES, FXD, FILM: 2.37K OHM, 1%, 0.125W, TC=TO	19701	5043ED2K37F
A2R405	321-0116-00			RES, FXD, FILM: 158 OHM, 1%, 0.125W, TC=TO	07716	CEAD158ROF
A2R409	315-0131-00			RES, FXD, FILM: 130 OHM, 5%, 0.25W	19701	5043CX130R0J
A2R411	315-0152-00			RES, FXD, FILM: 1.5K OHM, 5%, 0.25W	57668	NTR25J-E01K5
A2R413	315-0131-00			RES, FXD, FILM: 130 OHM, 5%, 0.25W	19701	5043CX130R0J
A2R425	321-0085-00			RES, FXD, FILM: 75 OHM, 1%, 0.125W, TC=TO	57668	CRB14FXE 75 OHM
A2R427	321-0085-00			RES, FXD, FILM: 75 OHM, 1%, 0.125W, TC=TO	57668	CRB14FXE 75 OHM
A2R429	315-0680-00			RES, FXD, FILM: 68 OHM, 5%, 0.25W	57668	NTR25J-E68E0
A2R431	321-0193-00			RES, FXD, FILM: 1K OHM, 1%, 0.125W, TC=TO	19701	5033ED1K00F
A2R433	311-1563-00			RES, VAR, NONWW: TRMR, 1K OHM, 0.5W	32997	3352T-DY7-102
A2R435	321-0193-00			RES, FXD, FILM: 1K OHM, 1%, 0.125W, TC=TO	19701	5033ED1K00F
A2R445	321-0083-00			RES, FXD, FILM: 71.5 OHM, 1%, 0.125W, TC=TO	07716	CEAD71R50F
A2R447	322-0178-00			RES, FXD, FILM: 698 OHM, 1%, 0.25W, TC=TO	75042	CEBTO-6980F
A2R449	321-0253-00			RES, FXD, FILM: 4.22K OHM, 1%, 0.125W, TC=TO	19701	5033ED 4K 220F
A2R450	321-0270-00			RES, FXD, FILM: 6.34K OHM, 1%, 0.125W, TC=TO	19701	5043ED6K340F
A2R453	321-0083-00			RES, FXD, FILM: 71.5 OHM, 1%, 0.125W, TC=TO	07716	CEAD71R50F
A2R454	322-0178-00			RES, FXD, FILM: 698 OHM, 1%, 0.25W, TC=TO	75042	CEBTO-6980F
A2R456	321-0151-00			RES, FXD, FILM: 365 OHM, 1%, 0.125W, TC=TO	07716	CEAD365R0F
A2R458	321-0085-00			RES, FXD, FILM: 75 OHM, 1%, 0.125W, TC=TO	57668	CRB14FXE 75 OHM
A2R460	322-0180-00			RES, FXD, FILM: 732 OHM, 1%, 0.25W, TC=TO	75042	CEBTO-7320F
A2R461	322-0180-00			RES, FXD, FILM: 732 OHM, 1%, 0.25W, TC=TO	75042	CEBTO-7320F
A2R465	311-1559-00			RES, VAR, NONWW: TRMR, 10K OHM, 0.5W	32997	3352T-1-103
A2R467	321-0151-00			RES, FXD, FILM: 365 OHM, 1%, 0.125W, TC=TO	07716	CEAD365R0F
A2R469	321-0085-00			RES, FXD, FILM: 75 OHM, 1%, 0.125W, TC=TO	57668	CRB14FXE 75 OHM
A2R470	321-0103-00			RES, FXD, FILM: 115 OHM, 1%, 0.125W, TC=TO	01121	RNK1150F
A2R473	311-1563-00			RES, VAR, NONWW: TRMR, 1K OHM, 0.5W	32997	3352T-DY7-102
A2R475	308-0783-00			RES, FXD, WW: 1K OHM, 1%, 3W, TC=30PPM	91637	NS2BA 10000F
A2R476	315-0680-00			RES, FXD, FILM: 68 OHM, 5%, 0.25W	57668	NTR25J-E68E0
A2R478	321-0286-00			RES, FXD, FILM: 9.31K OHM, 1%, 0.125W, TC=TO	19701	5043ED9K310F
A2R479	321-0221-00			RES, FXD, FILM: 1.96K OHM, 1%, 0.125W, TC=TO	19701	5043ED1K960F
A2R480	315-0680-00			RES, FXD, FILM: 68 OHM, 5%, 0.25W	57668	NTR25J-E68E0
A2R481	308-0783-00			RES, FXD, WW: 1K OHM, 1%, 3W, TC=30PPM	91637	NS2BA 10000F
A2R800	315-0471-00	B010100	B021189	RES, FXD, FILM: 470 OHM, 5%, 0.25W	57668	NTR25J-E470E
A2R800	315-0301-00	B021190		RES, FXD, FILM: 300 OHM, 5%, 0.25W	57668	NTR25J-E300E
A2R802	315-0183-00			RES, FXD, FILM: 18K OHM, 5%, 0.25W	19701	5043CX18K00J
A2R805	315-0333-00			RES, FXD, FILM: 33K OHM, 5%, 0.25W	57668	NTR25J-E33K0
A2R808	321-0204-00			RES, FXD, FILM: 1.30K OHM, 1%, 0.125W, TC=TO	19701	5033ED1K300F
A2R809	321-0248-00			RES, FXD, FILM: 3.74K OHM, 1%, 0.125W, TC=TO	19701	5043ED3K740F
A2R811	315-0392-00			RES, FXD, FILM: 3.9K OHM, 5%, 0.25W	57668	NTR25J-E03K9
A2R813	315-0751-00			RES, FXD, FILM: 750 OHM, 5%, 0.25W	57668	NTR25J-E750E
A2R815	315-0333-00			RES, FXD, FILM: 33K OHM, 5%, 0.25W	57668	NTR25J-E33K0
A2R816	315-0161-00	B010100	B021189	RES, FXD, FILM: 160 OHM, 5%, 0.25W	57668	NTR25J-E 160E
A2R816	315-0331-00	B021190		RES, FXD, FILM: 330 OHM, 5%, 0.25W	57668	NTR25J-E330E
A2R817	315-0242-00			RES, FXD, FILM: 2.4K OHM, 5%, 0.25W	57668	NTR25J-E02K4
A2R820	315-0510-00			RES, FXD, FILM: 51 OHM, 5%, 0.25W	19701	5043CX51R00J
A2R821	315-0122-00			RES, FXD, FILM: 1.2K OHM, 5%, 0.25W	57668	NTR25J-E01K2
A2R822	315-0564-00			RES, FXD, FILM: 560K OHM, 5%, 0.25W	19701	5043CX560K0J
A2R824	321-0278-00			RES, FXD, FILM: 7.68K OHM, 1%, 0.125W, TC=TO	07716	CEAD76800F
A2R826	315-0271-00			RES, FXD, FILM: 270 OHM, 5%, 0.25W	57668	NTR25J-E270E
A2R830	315-0242-00			RES, FXD, FILM: 2.4K OHM, 5%, 0.25W	57668	NTR25J-E02K4
A2R831	311-1801-00			RES, VAR, NONWW: PNL, 1K OHM, 20%, 1W	01121	13M499
A2R833	315-0101-00			RES, FXD, FILM: 100 OHM, 5%, 0.25W	57668	NTR25J-E 100E

Replaceable Electrical Parts - SC 502

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A2R834	321-0335-00			RES, FXD, FILM: 30.1K OHM, 1%, 0.125W, TC=TO	57668	RB14FXE30K1
A2R836	315-0622-00			RES, FXD, FILM: 6.2K OHM, 5%, 0.25W	19701	5043CX6K200J
A2R838	315-0332-00			RES, FXD, FILM: 3.3K OHM, 5%, 0.25W	57668	NTR25J-E03K3
A2R839	315-0753-00			RES, FXD, FILM: 75K OHM, 5%, 0.25W	57668	NTR25J-E75K0
A2R841	315-0201-00			RES, FXD, FILM: 200 OHM, 5%, 0.25W	57668	NTR25J-E200E
A2R843	315-0102-00			RES, FXD, FILM: 1K OHM, 5%, 0.25W	57668	NTR25JE01K0
A2R844	315-0620-00			RES, FXD, FILM: 62 OHM, 5%, 0.25W	19701	5043CX63R00J
A2R846	315-0470-00			RES, FXD, FILM: 47 OHM, 5%, 0.25W	57668	NTR25J-E47E0
A2R873	311-1556-00			RES, VAR, NONW: TRMR, 50K OHM, 0.5W	32997	3352T-DY7-503
A2R875	315-0203-00			RES, FXD, FILM: 20K OHM, 5%, 0.25W	57668	NTR25J-E 20K
A2R894	311-0349-00	B010100	B041555	RES, VAR, NONW: PNL, 2MEG OHM, 0.5W	12697	CM30940
A2R894	311-2282-00	B041556		RES, VAR, NONW: PNL, 2.5 MEGA OHM, 1.0W	12697	CM43482
A2R895	311-1559-00			RES, VAR, NONW: TRMR, 10K OHM, 0.5W	32997	3352T-1-103
A2R897	311-1555-00	B010100	B039279	RES, VAR, NONW: TRMR, 100K OHM, 0.5W	32997	3352T-1-104
A2R899	311-1555-00			RES, VAR, NONW: TRMR, 100K OHM, 0.5W	32997	3352T-1-104
A2S400	260-1310-01			SWITCH, PUSH: 4PDT MOMENTARY, NON-SHORTING	31918	ORDER BY DESCR
A2U355	156-0057-02			MICROCKT, DGLT: 2K OHM, 5%, 0.25W	01295	SN7401NP3
A2U360	156-0038-02			MICROCKT, DGLT: J-K MASTER SLAVE FF, SCRN	01295	SN7472NP3
A2W890	131-0566-00	B039280		BUS, CONDUCTOR: DUMMY RES, 0.094 X 0.225	24546	OMA 07
A3	670-3759-00	B010100	B022579	CIRCUIT BD ASSY: TRIGGER	80009	670-3759-00
A3	670-3759-01	B022580	B039279	CIRCUIT BD ASSY: TRIGGER	80009	670-3759-01
A3	670-3759-02	B039280	B039879	CIRCUIT BD ASSY: TRIGGER	80009	670-3759-02
A3	670-3759-03	B039880		CIRCUIT BD ASSY: TRIGGER	80009	670-3759-03
A3C316	281-0605-00			CAP, FXD, CER DI: 200PF, 10%, 500V	59660	301000Y50201K
A3C500	290-0522-00			CAP, FXD, ELCTLT: 1UF, 20%, 50V	05397	T368A105M050AZ
A3C501	283-0023-00			CAP, FXD, CER DI: 0.1UF, +80-20%, 12V	71590	2DDU66B104Z
A3C507	283-0003-00			CAP, FXD, CER DI: 0.01UF, +80-20%, 150V	59821	D103Z40Z5UJDC EX
A3C508	290-0522-00			CAP, FXD, ELCTLT: 1UF, 20%, 50V	05397	T368A105M050AZ
A3C510	283-0023-00			CAP, FXD, CER DI: 0.1UF, +80-20%, 12V	71590	2DDU66B104Z
A3C514	281-0519-00			CAP, FXD, CER DI: 47PF, +/-4.7PF, 500V	52763	2RDPLZ007 47POK
A3C515	283-0002-00			CAP, FXD, CER DI: 0.01UF, +80-20%, 500V	59821	D103Z40Z5ULADEG
A3C516	281-0207-00			CAP, VAR, PLASTIC: 2-18PF, 100V	52769	GXA 18000
A3C518	283-0023-00			CAP, FXD, CER DI: 0.1UF, +80-20%, 12V	71590	2DDU66B104Z
A3C520	281-0512-00			CAP, FXD, CER DI: 27PF, +/-2.7PF, 500V	52763	2RDPLZ007 27POK
A3C521	283-0003-00			CAP, FXD, CER DI: 0.01UF, +80-20%, 150V	59821	D103Z40Z5UJDC EX
A3C530	290-0522-00			CAP, FXD, ELCTLT: 1UF, 20%, 50V	05397	T368A105M050AZ
A3C535	283-0003-00			CAP, FXD, CER DI: 0.01UF, +80-20%, 150V	59821	D103Z40Z5UJDC EX
A3C539	290-0522-00			CAP, FXD, ELCTLT: 1UF, 20%, 50V	05397	T368A105M050AZ
A3C545	283-0023-00			CAP, FXD, CER DI: 0.1UF, +80-20%, 12V	71590	2DDU66B104Z
A3C548	290-0522-00			CAP, FXD, ELCTLT: 1UF, 20%, 50V	05397	T368A105M050AZ
A3C550	283-0023-00			CAP, FXD, CER DI: 0.1UF, +80-20%, 12V	71590	2DDU66B104Z
A3C552	290-0522-00			CAP, FXD, ELCTLT: 1UF, 20%, 50V	05397	T368A105M050AZ
A3C561	283-0023-00			CAP, FXD, CER DI: 0.1UF, +80-20%, 12V	71590	2DDU66B104Z
A3C567	290-0522-00			CAP, FXD, ELCTLT: 1UF, 20%, 50V	05397	T368A105M050AZ
A3C575	283-0003-00	B039280		CAP, FXD, CER DI: 0.01UF, +80-20%, 150V	59821	D103Z40Z5UJDC EX
A3C577	290-0534-00			CAP, FXD, ELCTLT: 1UF, 20%, 35V	05397	T368A105M035AZ
A3C590	290-0534-00			CAP, FXD, ELCTLT: 1UF, 20%, 35V	05397	T368A105M035AZ
A3C592	290-0522-00			CAP, FXD, ELCTLT: 1UF, 20%, 50V	05397	T368A105M050AZ
A3C595	290-0534-00			CAP, FXD, ELCTLT: 1UF, 20%, 35V	05397	T368A105M035AZ
A3C600	290-0534-00			CAP, FXD, ELCTLT: 1UF, 20%, 35V	05397	T368A105M035AZ
A3C603	281-0516-00			CAP, FXD, CER DI: 39PF, +/-3.9PF, 500V	52763	2RDPLZ007 39POKU
A3C622	283-0023-00			CAP, FXD, CER DI: 0.1UF, +80-20%, 12V	71590	2DDU66B104Z
A3C635	290-0534-00			CAP, FXD, ELCTLT: 1UF, 20%, 35V	05397	T368A105M035AZ
A3C643	283-0023-00			CAP, FXD, CER DI: 0.1UF, +80-20%, 12V	71590	2DDU66B104Z
A3C648	283-0023-00			CAP, FXD, CER DI: 0.1UF, +80-20%, 12V	71590	2DDU66B104Z
A3C649	290-0534-00			CAP, FXD, ELCTLT: 1UF, 20%, 35V	05397	T368A105M035AZ
A3C652	281-0605-00			CAP, FXD, CER DI: 200PF, 10%, 500V	59660	301000Y50201K
A3C655	290-0534-00			CAP, FXD, ELCTLT: 1UF, 20%, 35V	05397	T368A105M035AZ

Component No.	Tektronix Part No.	Serial/Assembly No. Effective Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A3C660	281-0543-00		CAP,FXD,CER DI:270PF,10%,500V	52763	2RDPLZ007 27POMO
A3C662	290-0523-00		CAP,FXD,ELCTLT:2.2UF,20%,20V	05397	T368A225M020AS
A3C667	290-0534-00		CAP,FXD,ELCTLT:1UF,20%,35V	05397	T368A105M035AZ
A3C900	290-0534-00		CAP,FXD,ELCTLT:1UF,20%,35V	05397	T368A105M035AZ
A3C902	290-0534-00		CAP,FXD,ELCTLT:1UF,20%,35V	05397	T368A105M035AZ
A3C905	283-0081-00		CAP,FXD,CER DI:0.1UF,+80-20%,25V	59821	2DDU69E104Z
A3C930	281-0525-00		CAP,FXD,CER DI:470PF,+/-94PF,500V	52763	2RDPLZ007 470POMO
A3C932	283-0003-00		CAP,FXD,CER DI:0.01UF,+80-20%,150V	59821	D103Z40Z5UJDCEX
A3C935	290-0522-00		CAP,FXD,ELCTLT:1UF,20%,50V	05397	T368A105M050AZ
A3C940	290-0525-00		CAP,FXD,ELCTLT:4.7UF,20%,50V	05397	T368B475M050AS
A3C943	290-0525-00		CAP,FXD,ELCTLT:4.7UF,20%,50V	05397	T368B475M050AS
A3C947	281-0536-00		CAP,FXD,CER DI:1000PF,10%,500V	52763	2RDPLZ007 1N0COMO
A3C950	290-0522-00		CAP,FXD,ELCTLT:1UF,20%,50V	05397	T368A105M050AZ
A3C967	290-0534-00		CAP,FXD,ELCTLT:1UF,20%,35V	05397	T368A105M035AZ
A3C980	290-0512-00		CAP,FXD,ELCTLT:22UF,20%,15V	05397	T368B226M015AS
A3CR310	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR500	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR515	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR516	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR518	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR519	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR617	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR620	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR622	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR625	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR627	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR648	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR649	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR657	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR662	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR900	152-0107-00		SEMICON DVC,DI:RECT,SI,400 V,400MA,A1	12969	"G727"
A3CR902	152-0107-00		SEMICON DVC,DI:RECT,SI,400 V,400MA,A1	12969	"G727"
A3CR927	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR929	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR930	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR932	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR940	152-0066-00		SEMICON DVC,DI:RECT,SI,400V,1A,DO-41	05828	GP10G-020
A3CR943	152-0066-00		SEMICON DVC,DI:RECT,SI,400V,1A,DO-41	05828	GP10G-020
A3CR945	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR950	152-0141-02		SEMICON DVC,DI:SW,SI,30V,150MA,30V,DO-35	03508	DA2527 (1N4152)
A3CR980	152-0066-00		SEMICON DVC,DI:RECT,SI,400V,1A,DO-41	05828	GP10G-020
A3F800	159-0029-00		FUSE,CARTRIDGE:3AG,0.3A,250V,20SEC	71400	MDL 3/10
A3F970	159-0042-00		FUSE,CARTRIDGE:3AG,0.75A,250V,0.15SEC	75915	312.750
A3LR500	108-0245-00		CHOKE,RF:FIXED,3.9UH	76493	B6310-1
A3LR530	108-0245-00		CHOKE,RF:FIXED,3.9UH	76493	B6310-1
A3LR535	108-0245-00		CHOKE,RF:FIXED,3.9UH	76493	B6310-1
A3LR548	108-0245-00		CHOKE,RF:FIXED,3.9UH	76493	B6310-1
A3LR592	108-0245-00		CHOKE,RF:FIXED,3.9UH	76493	B6310-1
A3LR600	108-0245-00		CHOKE,RF:FIXED,3.9UH	76493	B6310-1
A3LR635	108-0245-00		CHOKE,RF:FIXED,3.9UH	76493	B6310-1
A3LR667	108-0245-00		CHOKE,RF:FIXED,3.9UH	76493	B6310-1
A3Q300	151-0341-00		TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
A3Q310	151-0342-00		TRANSISTOR:PNP,SI,TO-92	07263	S035928
A3Q315	151-0342-00		TRANSISTOR:PNP,SI,TO-92	07263	S035928
A3Q435	151-0342-00		TRANSISTOR:PNP,SI,TO-92	07263	S035928
A3Q440	151-0342-00		TRANSISTOR:PNP,SI,TO-92	07263	S035928
A3Q500	151-0342-00		TRANSISTOR:PNP,SI,TO-92	07263	S035928
A3Q510	151-0341-00		TRANSISTOR:NPN,SI,TO-106	04713	SPS6919

Replaceable Electrical Parts - SC 502

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A3Q520	151-1042-00			SEMICON DVC SE:FET,SI,TO-92	04713	SPF627M2
A3Q525	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A3Q530	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A3Q540	151-0342-00			TRANSISTOR:PNP,SI,TO-92	07263	S035928
A3Q550	151-0216-00			TRANSISTOR:PNP,SI,TO-92	04713	SPS8803
A3Q555	151-0190-00			TRANSISTOR:NPN,SI,TO-92	80009	151-0190-00
A3Q560	151-0192-00			TRANSISTOR:SELECTED	04713	SPS8801
A3Q565	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A3Q575	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
A3Q580	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
A3Q625	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
A3Q630	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
A3Q655	151-0188-00			TRANSISTOR:PNP,SI,TO-92	80009	151-0188-00
A3Q660	151-0342-00			TRANSISTOR:PNP,SI,TO-92	07263	S035928
A3Q665	151-0342-00			TRANSISTOR:PNP,SI,TO-92	07263	S035928
A3Q670	151-0342-00			TRANSISTOR:PNP,SI,TO-92	07263	S035928
A3Q715	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
A3Q930	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
A3Q933	151-1005-00	B039880		TRANSISTOR:FET,N-CHAN,SI,TO-106	04713	SPF685
A3Q935	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
A3Q940	151-0347-00			TRANSISTOR:NPN,SI,TO-92	04713	SPS7951
A3Q950	151-0342-00			TRANSISTOR:PNP,SI,TO-92	07263	S035928
A3Q955	151-0342-00			TRANSISTOR:PNP,SI,TO-92	07263	S035928
A3Q958	151-1005-00	B039880		TRANSISTOR:FET,N-CHAN,SI,TO-106	04713	SPF685
A3Q960	151-0350-00			TRANSISTOR:PNP,SI,TO-92	04713	SPS6700
A3Q965	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
A3R300	315-0622-00			RES,FXD,FILM:6.2K OHM,5%,0.25W	19701	5043CX6K200J
A3R302	315-0183-00			RES,FXD,FILM:18K OHM,5%,0.25W	19701	5043CX18K00J
A3R304	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A3R310	315-0392-00			RES,FXD,FILM:3.9K OHM,5%,0.25W	57668	NTR25J-E03K9
A3R312	321-0302-00			RES,FXD,FILM:13.7K OHM,1%,0.125W,TC=TO	07716	CEAD 13701F
A3R315	321-0307-00			RES,FXD,FILM:15.4K OHM,1%,0.125W,TC=TO	19701	5043ED15K40F
A3R316	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25W	57668	NTR25JE01K0
A3R318	315-0751-00			RES,FXD,FILM:750 OHM,5%,0.25W	57668	NTR25J-E750E
A3R437	321-0240-00			RES,FXD,FILM:3.09K OHM,1%,0.125W,TC=TO	07716	CEAD30900F
A3R438	321-0126-00	B010100	B039279	RES,FXD,FILM:200 OHM,1%,0.125W,TC=TO	19701	5033ED200ROF
A3R438	315-0301-00	B039280		RES,FXD,FILM:300 OHM,5%,0.25W	57668	NTR25J-E300E
A3R440	321-0240-00			RES,FXD,FILM:3.09K OHM,1%,0.125W,TC=TO	07716	CEAD30900F
A3R500	315-0132-00			RES,FXD,FILM:1.3K OHM,5%,0.25W	57668	NTR25J-E01K3
A3R501	315-0101-00			RES,FXD,FILM:100 OHM,5%,0.25W	57668	NTR25J-E 100E
A3R503	315-0470-00			RES,FXD,FILM:47 OHM,5%,0.25W	57668	NTR25J-E47E0
A3R505	315-0431-00			RES,FXD,FILM:430 OHM,5%,0.25W	19701	5043CX430R0J
A3R507	315-0332-00			RES,FXD,FILM:3.3K OHM,5%,0.25W	57668	NTR25J-E03K3
A3R509	315-0622-00			RES,FXD,FILM:6.2K OHM,5%,0.25W	19701	5043CX6K200J
A3R510	315-0470-00			RES,FXD,FILM:47 OHM,5%,0.25W	57668	NTR25J-E47E0
A3R512	321-0452-00			RES,FXD,FILM:499K OHM,1%,0.125W,TC=TO	19701	5043ED499K0F
A3R514	315-0271-00			RES,FXD,FILM:270 OHM,5%,0.25W	57668	NTR25J-E270E
A3R516	321-0452-00			RES,FXD,FILM:499K OHM,1%,0.125W,TC=TO	19701	5043ED499K0F
A3R518	315-0470-00			RES,FXD,FILM:47 OHM,5%,0.25W	57668	NTR25J-E47E0
A3R520	315-0431-00			RES,FXD,FILM:430 OHM,5%,0.25W	19701	5043CX430R0J
A3R521	315-0240-00			RES,FXD,FILM:24 OHM,5%,0.25W	57668	NTR25J-E24E0
A3R523	315-0183-00			RES,FXD,FILM:18K OHM,5%,0.25W	19701	5043CX18K00J
A3R525	315-0183-00			RES,FXD,FILM:18K OHM,5%,0.25W	19701	5043CX18K00J
A3R527	321-0112-00			RES,FXD,FILM:143 OHM,1%,0.125W,TC=TO	07716	CEAD143ROF
A3R529	321-0249-00			RES,FXD,FILM:3.83K OHM,1%,0.125W,TC=TO	19701	5033ED3K83F
A3R530	321-0249-00			RES,FXD,FILM:3.83K OHM,1%,0.125W,TC=TO	19701	5033ED3K83F
A3R535	311-1568-00			RES,VAR,NONNW:TRMR,50 OHM,0.5W	32997	3352T-1-500
A3R537	315-0431-00			RES,FXD,FILM:430 OHM,5%,0.25W	19701	5043CX430R0J

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A3R540	315-0132-00			RES, FXD, FILM: 1.3K OHM, 5%, 0.25W	57668	NTR25J-E01K3
A3R543	315-0470-00			RES, FXD, FILM: 47 OHM, 5%, 0.25W	57668	NTR25J-E47E0
A3R545	315-0470-00			RES, FXD, FILM: 47 OHM, 5%, 0.25W	57668	NTR25J-E47E0
A3R546	315-0101-00	B010100	B021020	RES, FXD, FILM: 100 OHM, 5%, 0.25W	57668	NTR25J-E 100E
A3R546	315-0111-00	B021021		RES, FXD, FILM: 110 OHM, 5%, 0.25W	57668	NTR25J-E110E
A3R548	315-0332-00			RES, FXD, FILM: 3.3K OHM, 5%, 0.25W	57668	NTR25J-E03K3
A3R550	315-0183-00			RES, FXD, FILM: 18K OHM, 5%, 0.25W	19701	5043CX18K00J
A3R552	315-0100-00			RES, FXD, FILM: 10 OHM, 5%, 0.25W	19701	5043CX10RR00J
A3R555	315-0155-00			RES, FXD, FILM: 1.5M OHM, 5%, 0.25W	19701	5043CX1M500J
A3R556	315-0272-00			RES, FXD, FILM: 2.7K OHM, 5%, 0.25W	57668	NTR25J-E02K7
A3R557	315-0470-00			RES, FXD, FILM: 47 OHM, 5%, 0.25W	57668	NTR25J-E47E0
A3R558	315-0333-00			RES, FXD, FILM: 33K OHM, 5%, 0.25W	57668	NTR25J-E33K0
A3R562	315-0155-00			RES, FXD, FILM: 1.5M OHM, 5%, 0.25W	19701	5043CX1M500J
A3R564	315-0183-00			RES, FXD, FILM: 18K OHM, 5%, 0.25W	19701	5043CX18K00J
A3R567	315-0100-00			RES, FXD, FILM: 10 OHM, 5%, 0.25W	19701	5043CX10RR00J
A3R568	315-0562-00			RES, FXD, FILM: 5.6K OHM, 5%, 0.25W	57668	NTR25J-E05K6
A3R569	315-0333-00			RES, FXD, FILM: 33K OHM, 5%, 0.25W	57668	NTR25J-E33K0
A3R575	315-0470-00			RES, FXD, FILM: 47 OHM, 5%, 0.25W	57668	NTR25J-E47E0
A3R577	315-0361-00			RES, FXD, FILM: 360 OHM, 5%, 0.25W	19701	5043CX360R0J
A3R578	315-0150-00			RES, FXD, FILM: 15 OHM, 5%, 0.25W	19701	5043CX15R00J
A3R579	315-0301-00			RES, FXD, FILM: 300 OHM, 5%, 0.25W	57668	NTR25J-E300E
A3R580	315-0361-00			RES, FXD, FILM: 360 OHM, 5%, 0.25W	19701	5043CX360R0J
A3R581	315-0153-00			RES, FXD, FILM: 15K OHM, 5%, 0.25W	19701	5043CX15K00J
A3R583	315-0911-00	B010100	B039279	RES, FXD, FILM: 910 OHM, 5%, 0.25W	57668	NTR25J-E910E
A3R583	315-0621-00	B039280		RES, FXD, FILM: 620 OHM, 5%, 0.25W	57668	NTR25J-E620E
A3R585	315-0153-00			RES, FXD, FILM: 15K OHM, 5%, 0.25W	19701	5043CX15K00J
A3R587	315-0470-00			RES, FXD, FILM: 47 OHM, 5%, 0.25W	57668	NTR25J-E47E0
A3R588	315-0133-00			RES, FXD, FILM: 13K OHM, 5%, 0.25W	19701	5043CX13K00J
A3R590	315-0131-00			RES, FXD, FILM: 130 OHM, 5%, 0.25W	19701	5043CX130R0J
A3R595	315-0131-00			RES, FXD, FILM: 130 OHM, 5%, 0.25W	19701	5043CX130R0J
A3R596	315-0470-00			RES, FXD, FILM: 47 OHM, 5%, 0.25W	57668	NTR25J-E47E0
A3R598	315-0470-00			RES, FXD, FILM: 47 OHM, 5%, 0.25W	57668	NTR25J-E47E0
A3R600	315-0102-00			RES, FXD, FILM: 1K OHM, 5%, 0.25W	57668	NTR25JE01K0
A3R602	315-0102-00			RES, FXD, FILM: 1K OHM, 5%, 0.25W	57668	NTR25JE01K0
A3R603	315-0113-00			RES, FXD, FILM: 11K OHM, 5%, 0.25W	19701	5043CX11K00J
A3R605	315-0222-00			RES, FXD, FILM: 2.2K OHM, 5%, 0.25W	57668	NTR25J-E02K2
A3R607	315-0202-00			RES, FXD, FILM: 2K OHM, 5%, 0.25W	57668	NTR25J-E 2K
A3R608	315-0113-00			RES, FXD, FILM: 11K OHM, 5%, 0.25W	19701	5043CX11K00J
A3R610	315-0751-00			RES, FXD, FILM: 750 OHM, 5%, 0.25W	57668	NTR25J-E750E
A3R611	315-0751-00			RES, FXD, FILM: 750 OHM, 5%, 0.25W	57668	NTR25J-E750E
A3R613	315-0470-00			RES, FXD, FILM: 47 OHM, 5%, 0.25W	57668	NTR25J-E47E0
A3R614	315-0470-00			RES, FXD, FILM: 47 OHM, 5%, 0.25W	57668	NTR25J-E47E0
A3R615	315-0183-00			RES, FXD, FILM: 18K OHM, 5%, 0.25W	19701	5043CX18K00J
A3R617	315-0101-00			RES, FXD, FILM: 100 OHM, 5%, 0.25W	57668	NTR25J-E 100E
A3R619	315-0102-00			RES, FXD, FILM: 1K OHM, 5%, 0.25W	57668	NTR25JE01K0
A3R620	315-0392-00			RES, FXD, FILM: 3.9K OHM, 5%, 0.25W	57668	NTR25J-E03K9
A3R622	315-0183-00			RES, FXD, FILM: 18K OHM, 5%, 0.25W	19701	5043CX18K00J
A3R625	315-0333-00			RES, FXD, FILM: 33K OHM, 5%, 0.25W	57668	NTR25J-E33K0
A3R630	315-0392-00			RES, FXD, FILM: 3.9K OHM, 5%, 0.25W	57668	NTR25J-E03K9
A3R631	315-0751-00			RES, FXD, FILM: 750 OHM, 5%, 0.25W	57668	NTR25J-E750E
A3R633	315-0751-00			RES, FXD, FILM: 750 OHM, 5%, 0.25W	57668	NTR25J-E750E
A3R635	315-0470-00			RES, FXD, FILM: 47 OHM, 5%, 0.25W	57668	NTR25J-E47E0
A3R637	315-0470-00			RES, FXD, FILM: 47 OHM, 5%, 0.25W	57668	NTR25J-E47E0
A3R640	321-0220-00			RES, FXD, FILM: 1.91K OHM, 1%, 0.125W, TC=T0	19701	5033ED1K91F
A3R641	321-0289-00			RES, FXD, FILM: 10.0K OHM, 1%, 0.125W, TC=T0	19701	5033ED10K0F
A3R643	315-0181-00			RES, FXD, FILM: 180 OHM, 5%, 0.25W	57668	NTR25J-E180E
A3R645	315-0181-00			RES, FXD, FILM: 180 OHM, 5%, 0.25W	57668	NTR25J-E180E
A3R648	315-0470-00			RES, FXD, FILM: 47 OHM, 5%, 0.25W	57668	NTR25J-E47E0

Replaceable Electrical Parts - SC 502

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscort	Name & Description	Mfr. Code	Mfr. Part No.
A3R649	315-0333-00			RES, FXD, FILM: 33K OHM, 5%, 0.25W	57668	NTR25J-E33K0
A3R651	315-0124-00			RES, FXD, FILM: 120K OHM, 5%, 0.25W	19701	5043CX120K0J
A3R653	315-0622-00			RES, FXD, FILM: 6.2K OHM, 5%, 0.25W	19701	5043CX6K200J
A3R655	315-0392-00			RES, FXD, FILM: 3.9K OHM, 5%, 0.25W	57668	NTR25J-E03K9
A3R657	301-0471-00			RES, FXD, FILM: 470 OHM, 5%, 0.5W	19701	5053CX 470R0J
A3R659	321-0227-00			RES, FXD, FILM: 2.26K OHM, 1%, 0.125W, TC=T0	01121	RNK2261F
A3R660	321-0269-00			RES, FXD, FILM: 6.19K OHM, 1%, 0.125W, TC=T0	07716	CEAD61900F
A3R662	315-0824-00			RES, FXD, FILM: 820K OHM, 5%, 0.25W	19701	5043CX820K0J
A3R664	315-0434-00			RES, FXD, FILM: 430K OHM, 5%, 0.25W	57668	NTR25J-E430K
A3R665	315-0361-00			RES, FXD, FILM: 360 OHM, 5%, 0.25W	19701	5043CX360R0J
A3R667	315-0332-00			RES, FXD, FILM: 3.3K OHM, 5%, 0.25W	57668	NTR25J-E03K3
A3R715	321-0216-00			RES, FXD, FILM: 1.74K OHM, 1%, 0.125W, TC=T0	07716	CEAD17400F
A3R716	315-0622-00			RES, FXD, FILM: 6.2K OHM, 5%, 0.25W	19701	5043CX6K200J
A3R900	315-0242-00			RES, FXD, FILM: 2.4K OHM, 5%, 0.25W	57668	NTR25J-E02K4
A3R902	315-0562-00			RES, FXD, FILM: 5.6K OHM, 5%, 0.25W	57668	NTR25J-E05K6
A3R905	315-0472-00			RES, FXD, FILM: 4.7K OHM, 5%, 0.25W	57668	NTR25J-E04K7
A3R907	315-0472-00			RES, FXD, FILM: 4.7K OHM, 5%, 0.25W	57668	NTR25J-E04K7
A3R909	315-0132-00			RES, FXD, FILM: 1.3K OHM, 5%, 0.25W	57668	NTR25J-E01K3
A3R922	321-0236-00			RES, FXD, FILM: 2.80K OHM, 1%, 0.125W, TC=T0	07716	CEAD28000F
A3R925	311-1571-00			RES, VAR, NONW: TRMR, 500 OHM, 0.5W	32997	3352W-1-501
A3R927	321-0263-00			RES, FXD, FILM: 5.36K OHM, 1%, 0.125W, TC=T0	07716	CEAD53600F
A3R929	315-0202-00			RES, FXD, FILM: 2K OHM, 5%, 0.25W	57668	NTR25J-E 2K
A3R930	315-0242-00			RES, FXD, FILM: 2.4K OHM, 5%, 0.25W	57668	NTR25J-E02K4
A3R932	315-0392-00			RES, FXD, FILM: 3.9K OHM, 5%, 0.25W	57668	NTR25J-E03K9
A3R934	315-0133-00			RES, FXD, FILM: 13K OHM, 5%, 0.25W	19701	5043CX13K00J
A3R935	315-0131-00			RES, FXD, FILM: 130 OHM, 5%, 0.25W	19701	5043CX130R0J
A3R937	315-0361-00			RES, FXD, FILM: 360 OHM, 5%, 0.25W	19701	5043CX360R0J
A3R939	315-0131-00	B010100	B039879	RES, FXD, FILM: 130 OHM, 5%, 0.25W	19701	5043CX130R0J
A3R940	308-0685-00			RES, FXD, WW: 1.5 OHM, 5%, 1W	75042	BW-20-1R500J
A3R943	308-0767-00			RES, FXD, WW: 1.1 OHM, 5%, 1W	75042	BW-20-1R100J
A3R945	321-0263-00			RES, FXD, FILM: 5.36K OHM, 1%, 0.125W, TC=T0	07716	CEAD53600F
A3R947	311-1571-00			RES, VAR, NONW: TRMR, 500 OHM, 0.5W	32997	3352W-1-501
A3R949	321-0236-00			RES, FXD, FILM: 2.80K OHM, 1%, 0.125W, TC=T0	07716	CEAD28000F
A3R951	315-0821-00			RES, FXD, FILM: 820 OHM, 5%, 0.25W	19701	5043CX820R0J
A3R953	315-0242-00			RES, FXD, FILM: 2.4K OHM, 5%, 0.25W	57668	NTR25J-E02K4
A3R955	315-0202-00			RES, FXD, FILM: 2K OHM, 5%, 0.25W	57668	NTR25J-E 2K
A3R956	315-0113-00			RES, FXD, FILM: 11K OHM, 5%, 0.25W	19701	5043CX11K00J
A3R957	315-0131-00			RES, FXD, FILM: 130 OHM, 5%, 0.25W	19701	5043CX130R0J
A3R959	315-0333-00			RES, FXD, FILM: 33K OHM, 5%, 0.25W	57668	NTR25J-E33K0
A3R960	315-0101-00			RES, FXD, FILM: 100 OHM, 5%, 0.25W	57668	NTR25J-E 100E
A3R961	315-0361-00			RES, FXD, FILM: 360 OHM, 5%, 0.25W	19701	5043CX360R0J
A3R963	315-0131-00	B010100	B039879	RES, FXD, FILM: 130 OHM, 5%, 0.25W	19701	5043CX130R0J
A3R965	321-0306-01			RES, FXD, FILM: 15.0K OHM, 0.5%, 0.125W, TC=T0	07716	CEAD15001D
A3R967	321-0764-01			RES, FXD, FILM: 5.09K OHM, 0.5%, 0.125W, TC=T0	19701	5033RD5K090D
A3R969	315-0392-00			RES, FXD, FILM: 3.9K OHM, 5%, 0.25W	57668	NTR25J-E03K9
A3R973	315-0361-00			RES, FXD, FILM: 360 OHM, 5%, 0.25W	19701	5043CX360R0J
A3R975	315-0102-00			RES, FXD, FILM: 1K OHM, 5%, 0.25W	57668	NTR25JE01K0
A3R979	315-0181-00			RES, FXD, FILM: 180 OHM, 5%, 0.25W	57668	NTR25J-E180E
A3R982	308-0441-00			RES, FXD, WW: 3 OHM, 5%, 3W	14193	SA31-3R00J
A3S500	263-0013-04			SWITCH PB ASSY: 3 LATCHING, 10 MM, 7 CONTACT	80009	263-0013-04
A3S550	260-1778-00			SWITCH, PUSH: 4 BUTTON, 2/4 POLE, COUPLING	31918	ORDER BY DESC
A3S600	263-0011-04			SWITCH PB ASSY: 1 PUSH, 10MM	80009	263-0011-04
A3TP940	214-0579-00			TERM, TEST POINT: BRS CD PL	80009	214-0579-00
A3TP941	214-0579-00			TERM, TEST POINT: BRS CD PL	80009	214-0579-00
A3TP942	214-0579-00			TERM, TEST POINT: BRS CD PL	80009	214-0579-00
A3TP980	214-0579-00			TERM, TEST POINT: BRS CD PL	80009	214-0579-00
A3U595	155-0109-00	B010100	B021539	MICROCKT, LINEAR: TRIGGER	80009	155-0109-00
A3U595	155-0109-01	B021540		MICROCKT, LINEAR: MONOLITHIC TRIG	80009	155-0109-01

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A3U600	156-0369-00			MICROCKT, DGTL: ECL, TRIPLE LINE RECEIVER	04713	MC10216 P OR L
A3U650	155-0049-01	B010100	B022749	MICROCKT, DGTL: W/LOCKOUT DSBL FCTN	80009	155-0049-01
A3U650	155-0049-02	B022750		MICROCKT, DGTL: SWEEP CNTRL, W/LOCKOUT DISABLE	80009	155-0049-02
A3U930	156-0067-00			MICROCKT, LINEAR: OPNL AMPL, SEL	04713	MC1741CP1
A3U950	156-0067-00			MICROCKT, LINEAR: OPNL AMPL, SEL	04713	MC1741CP1
A3U960	156-0067-00			MICROCKT, LINEAR: OPNL AMPL, SEL	04713	MC1741CP1
A3VR930	152-0227-00			SEMICON DVC, DI: ZEN, SI, 6.2V, 5%, 0.4W, DO-7	04713	SZ13903
A3VR950	152-0227-00			SEMICON DVC, DI: ZEN, SI, 6.2V, 5%, 0.4W, DO-7	04713	SZ13903
A3VR969	152-0175-00			SEMICON DVC, DI: ZEN, SI, 5.6V, 5%, 0.4W, DO-7	14552	TD3810976
A4	670-3761-00			CIRCUIT BD ASSY: HORIZONTAL DEFLECTION	80009	670-3761-00
A4C740	283-0178-00			CAP, FXD, CER DI: 0.1UF, 20%, 100V	05397	C330C104Z1U1CA
A4C742	290-0534-00			CAP, FXD, ELCTLT: 1UF, 20%, 35V	05397	T368A105M035AZ
A4C744	290-0534-00			CAP, FXD, ELCTLT: 1UF, 20%, 35V	05397	T368A105M035AZ
A4C746	290-0534-00			CAP, FXD, ELCTLT: 1UF, 20%, 35V	05397	T368A105M035AZ
A4C748	283-0178-00			CAP, FXD, CER DI: 0.1UF, 20%, 100V	05397	C330C104Z1U1CA
A4C766	281-0605-00			CAP, FXD, CER DI: 200PF, 10%, 500V	59660	301000Y5D201K
A4C771	283-0003-00			CAP, FXD, CER DI: 0.01UF, +80-20%, 150V	59821	D103Z40Z5UJDCX
A4C773	281-0619-00			CAP, FXD, CER DI: 1.2PF, +/-0.1PF, 500V	52763	2RDPLZ007 1P20BC
A4C775	283-0023-00			CAP, FXD, CER DI: 0.1UF, +80-20%, 12V	71590	2DDU66B104Z
A4C776	283-0003-00			CAP, FXD, CER DI: 0.01UF, +80-20%, 150V	59821	D103Z40Z5UJDCX
A4C781	283-0003-00			CAP, FXD, CER DI: 0.01UF, +80-20%, 150V	59821	D103Z40Z5UJDCX
A4C783	283-0003-00			CAP, FXD, CER DI: 0.01UF, +80-20%, 150V	59821	D103Z40Z5UJDCX
A4C785	281-0619-00			CAP, FXD, CER DI: 1.2PF, +/-0.1PF, 500V	52763	2RDPLZ007 1P20BC
A4C790	283-0003-00			CAP, FXD, CER DI: 0.01UF, +80-20%, 150V	59821	D103Z40Z5UJDCX
A4C791	283-0003-00			CAP, FXD, CER DI: 0.01UF, +80-20%, 150V	59821	D103Z40Z5UJDCX
A4C793	283-0003-00			CAP, FXD, CER DI: 0.01UF, +80-20%, 150V	59821	D103Z40Z5UJDCX
A4C797	283-0003-00			CAP, FXD, CER DI: 0.01UF, +80-20%, 150V	59821	D103Z40Z5UJDCX
A4CR768	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A4CR770	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A4CR772	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A4CR785	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A4CR786	152-0141-02			SEMICON DVC, DI: SW, SI, 30V, 150MA, 30V, DO-35	03508	DA2527 (1N4152)
A4Q745	151-0190-00			TRANSISTOR: NPN, SI, TO-92	80009	151-0190-00
A4Q755	151-0341-00			TRANSISTOR: NPN, SI, TO-106	04713	SPS6919
A4Q765	151-0190-00			TRANSISTOR: NPN, SI, TO-92	80009	151-0190-00
A4Q770	151-0350-00			TRANSISTOR: PNP, SI, TO-92	04713	SPS6700
A4Q775	151-0347-00			TRANSISTOR: NPN, SI, TO-92	04713	SPS7951
A4Q780	151-0350-00			TRANSISTOR: PNP, SI, TO-92	04713	SPS6700
A4Q785	151-0347-00			TRANSISTOR: NPN, SI, TO-92	04713	SPS7951
A4Q790	151-0350-00			TRANSISTOR: PNP, SI, TO-92	04713	SPS6700
A4Q795	151-0347-00			TRANSISTOR: NPN, SI, TO-92	04713	SPS7951
A4R740	315-0470-00			RES, FXD, FILM: 47 OHM, 5%, 0.25W	57668	NTR25J-E47E0
A4R742	315-0620-00			RES, FXD, FILM: 62 OHM, 5%, 0.25W	19701	5043CX63R00J
A4R744	315-0150-00			RES, FXD, FILM: 15 OHM, 5%, 0.25W	19701	5043CX15R00J
A4R746	315-0620-00			RES, FXD, FILM: 62 OHM, 5%, 0.25W	19701	5043CX63R00J
A4R748	315-0470-00			RES, FXD, FILM: 47 OHM, 5%, 0.25W	57668	NTR25J-E47E0
A4R749	321-0293-00			RES, FXD, FILM: 11.0K OHM, 1%, 0.125W, TC=TO	07716	CEAD11001F
A4R750	315-0131-00			RES, FXD, FILM: 130 OHM, 5%, 0.25W	19701	5043CX130R0J
A4R753	321-0231-00			RES, FXD, FILM: 2.49K OHM, 1%, 0.125W, TC=TO	19701	5033ED2K49F
A4R755	321-0288-00			RES, FXD, FILM: 9.76K OHM, 1%, 0.125W, TC=TO	19701	5033ED9K760F
A4R757	321-0261-00			RES, FXD, FILM: 5.11K OHM, 1%, 0.125W, TC=TO	19701	5033ED5K110F
A4R759	321-0136-00			RES, FXD, FILM: 255 OHM, 1%, 0.125W, TC=TO	07716	CEAD255R0F
A4R760	311-1567-00			RES, VAR, NONWM: TRMR, 100 OHM, 0.5W	32997	3352T-1-101
A4R762	321-0136-00			RES, FXD, FILM: 255 OHM, 1%, 0.125W, TC=TO	07716	CEAD255R0F
A4R764	315-0131-00			RES, FXD, FILM: 130 OHM, 5%, 0.25W	19701	5043CX130R0J
A4R765	321-0292-00			RES, FXD, FILM: 10.7K OHM, 1%, 0.125W, TC=TO	07716	CEAD10701F
A4R766	315-0470-00			RES, FXD, FILM: 47 OHM, 5%, 0.25W	57668	NTR25J-E47E0
A4R768	321-0125-00			RES, FXD, FILM: 196 OHM, 1%, 0.125W, TC=TO	07716	CEAD196R0F

Replaceable Electrical Parts - SC 502

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A4R770	311-1565-00			RES, VAR, NONMW: TRMR, 250 OHM, 0.5W	32997	3352T-1-251
A4R771	315-0512-00			RES, FXD, FILM: 5.1K OHM, 5%, 0.25W	57668	NTR25J-E05K1
A4R773	321-0339-00			RES, FXD, FILM: 33.2K OHM, 1%, 0.125W, TC=TO	07716	CEAD33201F
A4R775	315-0511-00			RES, FXD, FILM: 510 OHM, 5%, 0.25W	19701	5043CX510R0J
A4R777	315-0821-00			RES, FXD, FILM: 820 OHM, 5%, 0.25W	19701	5043CX820R0J
A4R779	315-0752-00			RES, FXD, FILM: 7.5K OHM, 5%, 0.25W	57668	NTR25J-E07K5
A4R781	315-0620-00			RES, FXD, FILM: 62 OHM, 5%, 0.25W	19701	5043CX63R00J
A4R783	315-0100-00			RES, FXD, FILM: 10 OHM, 5%, 0.25W	19701	5043CX10RR00J
A4R785	315-0620-00			RES, FXD, FILM: 62 OHM, 5%, 0.25W	19701	5043CX63R00J
A4R786	315-0433-00			RES, FXD, FILM: 43K OHM, 5%, 0.25W	19701	5043CX43K00J
A4R788	315-0202-00			RES, FXD, FILM: 2K OHM, 5%, 0.25W	57668	NTR25J-E 2K
A4R789	321-0339-00			RES, FXD, FILM: 33.2K OHM, 1%, 0.125W, TC=TO	07716	CEAD33201F
A4R790	315-0392-00			RES, FXD, FILM: 3.9K OHM, 5%, 0.25W	57668	NTR25J-E03K9
A4R792	315-0242-00			RES, FXD, FILM: 2.4K OHM, 5%, 0.25W	57668	NTR25J-E02K4
A4R793	315-0272-00			RES, FXD, FILM: 2.7K OHM, 5%, 0.25W	57668	NTR25J-E02K7
A4R795	315-0620-00			RES, FXD, FILM: 62 OHM, 5%, 0.25W	19701	5043CX63R00J
A4R797	315-0100-00			RES, FXD, FILM: 10 OHM, 5%, 0.25W	19701	5043CX10RR00J
A4R798	315-0620-00			RES, FXD, FILM: 62 OHM, 5%, 0.25W	19701	5043CX63R00J
A4R799	315-0243-00			RES, FXD, FILM: 24K OHM, 5%, 0.25W	57668	NTR25J-E24K0
A4TP745	214-0579-00			TERM, TEST POINT: BRS CD PL	80009	214-0579-00
A4VR781	152-0227-00			SEMICON DVC, DI: ZEN, SI, 6.2V, 5%, 0.4W, DO-7	04713	SZ13903
A4VR795	152-0590-00			SEMICON DVC, DI: ZEN, SI, 18V, 5%, 0.4W, DO-7	04713	SZG35014K2
A5	670-3821-00	B010100	B039879	CIRCUIT BD ASSY: AUXILIARY HIGH VOLTAGE	80009	670-3821-00
A5	670-3821-01	B039880		CIRCUIT BD ASSY: HIGH VOLTAGE	80009	670-3821-01
A5C881	283-0044-00			CAP, FXD, CER DI: 1000PF, 20%, 3000V	51406	DHA12Y5S102M3KV
A5C882	283-0044-00			CAP, FXD, CER DI: 1000PF, 20%, 3000V	51406	DHA12Y5S102M3KV
A5C883	283-0043-00			CAP, FXD, CER DI: 6800PF, 100-0%, 3000V	51406	DHA23Z5U682P3KV
A5C885	283-0263-00			CAP, FXD, CER DI: 2200PF, 20%, 3000V	59660	828556Y5R0222M
A5C887	283-0044-00			CAP, FXD, CER DI: 1000PF, 20%, 3000V	51406	DHA12Y5S102M3KV
A5CR881	152-0429-00			SEMICON DVC, DI: RECT, SI, 5000V, 10MA, A298J	83003	VG5X-1
A5CR884	152-0242-00			SEMICON DVC, DI: SIG, SI, 225V, 0.2A, DO-7	07263	FDH5004
A5CR885	152-0242-00			SEMICON DVC, DI: SIG, SI, 225V, 0.2A, DO-7	07263	FDH5004
A5DS880	119-0181-00	B039880		ARSR, ELEC SURGE: 230, GAS FILLED	25088	B1-A230
A5R882	315-0103-00			RES, FXD, FILM: 10K OHM, 5%, 0.25W	19701	5043CX10K00J
A5R885	315-0102-00			RES, FXD, FILM: 1K OHM, 5%, 0.25W	57668	NTR25JE01K0
A5R886	315-0101-00			RES, FXD, FILM: 100 OHM, 5%, 0.25W	57668	NTR25J-E 100E
A5R888	315-0226-00			RES, FXD, FILM: 22M OHM, 5%, 0.25W	80009	315-0226-00
A5R889	308-0710-00	B010100	B021109	RES, FXD, WW: 0.27 OHM, 10%, 1W	75042	BW-20-R2700J
A5R889	308-0760-00	B021110		RES, FXD, WW: 0.2 OHM, 10%, 2W	30487	ALSR-2-0.2-10%
A5R891	315-0101-00			RES, FXD, FILM: 100 OHM, 5%, 0.25W	57668	NTR25J-E 100E
A5VR880	150-0111-00	B010100	B039879	LAMP, GLOW: 125V MAX, 1.5MA, 2AC-AT, WIRE	53944	A1B-9
A5VR890	150-0111-00	B010100	B039879	LAMP, GLOW: 125V MAX, 1.5MA, 2AC-AT, WIRE	53944	A1B-9
	-----			CHASSIS PARTS		
DL400	119-0690-00	B010100	B022529	DELAY LINE, ELEC: 140NS	80009	119-0690-00
DL400	119-0690-01	B022530		DELAY LINE, ELEC: 140NS	80009	119-0690-01
DS640	150-1029-00			LT EMITTING DIO: GREEN, 565NM, 35MA	58361	Q6480/MV5274C
DS980	150-1029-00			LT EMITTING DIO: GREEN, 565NM, 35MA	58361	Q6480/MV5274C
J100	131-1315-01	B010100	B025519	CONN, RCPT, ELEC: BNC, FEMALE	80009	131-1315-01
J100	131-1315-01	B025520		CONN, RCPT, ELEC: BNC, FEMALE	80009	131-1315-01
J200	131-1315-01	B010100	B025519	CONN, RCPT, ELEC: BNC, FEMALE	80009	131-1315-01
J200	131-1315-01	B025520		CONN, RCPT, ELEC: BNC, FEMALE	80009	131-1315-01
J500	131-0955-00			CONN, RCPT, ELEC: BNC, FEMALE	13511	31-279
L895	108-0829-00			COIL, TUBE DEF: FIXED, TRACE ROTATOR	80009	108-0829-00
Q970	151-0405-00			TRANSISTOR: SELECTED	04713	SJE943
R560	311-1192-00			RES, VAR, NONMW: PNL, 10K OHM, 1W, W/SW (PART OF S560)	12697	381-CM39695

Component No.	Tektronix Part No.	Serial/Assembly No.		Name & Description	Mfr. Code	Mfr. Part No.
		Effective	Dscont			
R674	311-1803-00			RES, VAR, NONWV:PNL, 20K OHM, 10%, 1W, RTRY DPST (PART OF S700)	01121	25M910
R714	311-0642-00			RES, VAR, NONWV:PNL, 20K OHM, 0.5W	01121	W-7707
S100	263-1128-00			SW CAM ACTR AS:VOLTS/DIV/AC-GND-DC (PART OF S100)	80009	263-1128-00
S150	-----					
S200	263-1128-00			SW CAM ACTR AS:VOLTS/DIV/AC-GND-DC (PART OF S200)	80009	263-1128-00
S250	-----					
S300	263-1129-00			SW CAM ACTR AS:DISPLAY MODE (PART OF R560)	80009	263-1129-00
S560	-----					
S700	-----					
S1000	263-1130-00			SW CAM ACTR AS:SECONDS/DIV	80009	263-1130-00
V800	154-0730-05	B010100	8039279	ELECTRON TUBE:CRT, P31, INT SCALE	80009	154-0730-05
V800	154-0859-00	B039280	8040669	ELECTRON TUBE:CRT, P31, INTERNAL SCALE	80009	154-0859-00
V800	154-0859-01	B040670		ELECTRON TUBE:CRT, P31, INT SCALE	80009	154-0859-01

DIAGRAMS AND CIRCUIT BOARD ILLUSTRATIONS

Symbols

Graphic symbols and class designation letters are based on ANSI Standard Y32.2-1975.

Logic symbology is based on ANSI Y32.14-1973 in terms of positive logic. Logic symbols depict the logic function performed and may differ from the manufacturer's data.

The overline on a signal name indicates that the signal performs its intended function when it is in the low state.

Abbreviations are based on ANSI Y1.1-1972.

Other ANSI standards that are used in the preparation of diagrams by Tektronix, Inc. are:

- Y14.15, 1966 Drafting Practices.
- Y14.2, 1973 Line Conventions and Lettering.
- Y10.5, 1968 Letter Symbols for Quantities Used in Electrical Science and Electrical Engineering.

American National Standard Institute
1430 Broadway
New York, New York 10018

Component Values

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

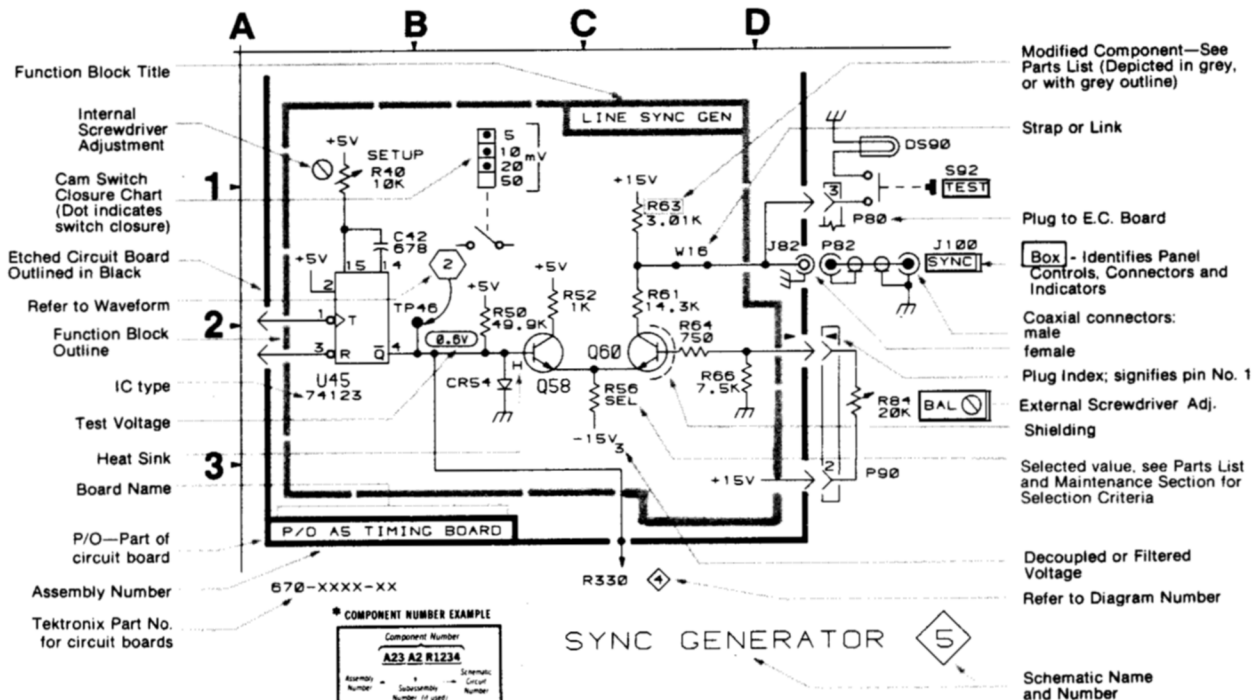
- Capacitors = Values one or greater are in picofarads (pF).
Values less than one are in microfarads (μ F).
- Resistors = Ohms (Ω).

———— The information and special symbols below may appear in this manual. ————

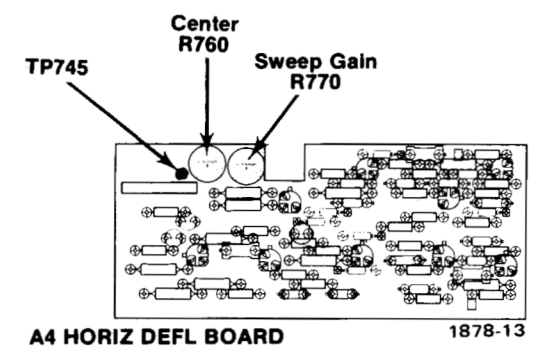
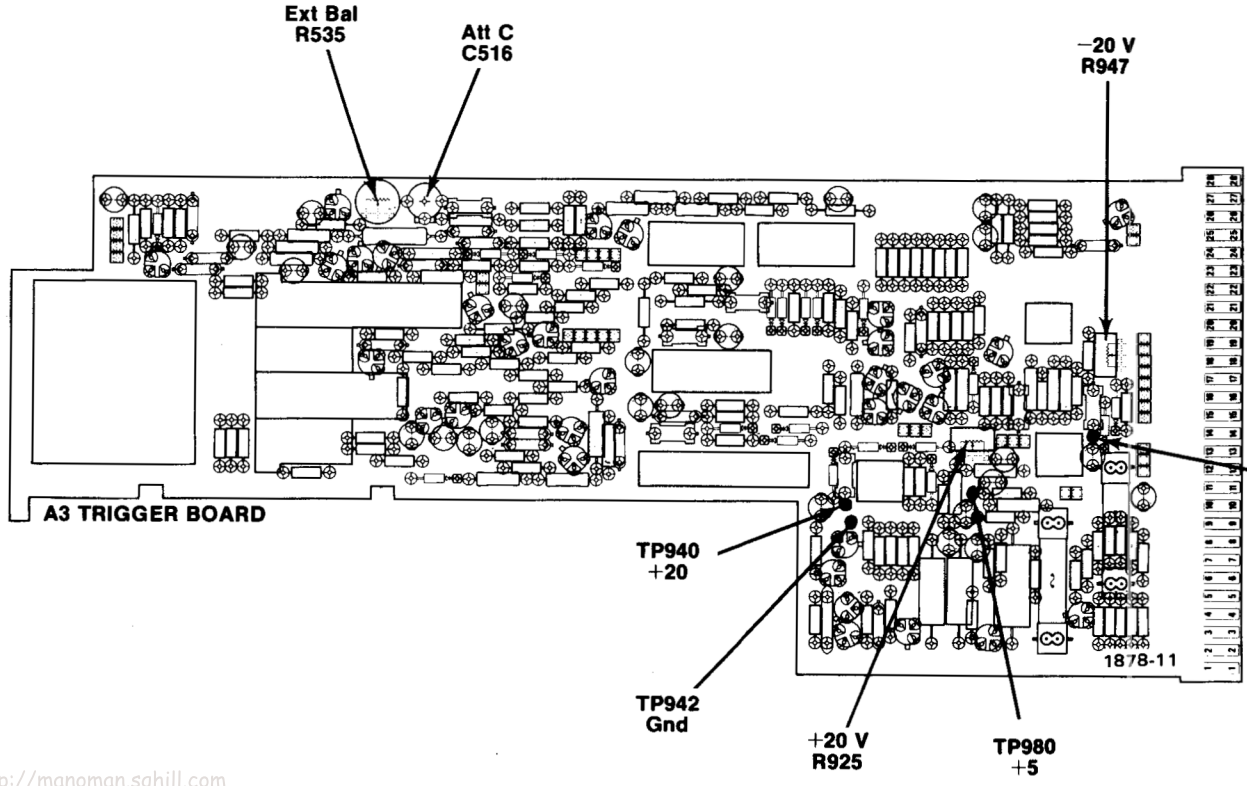
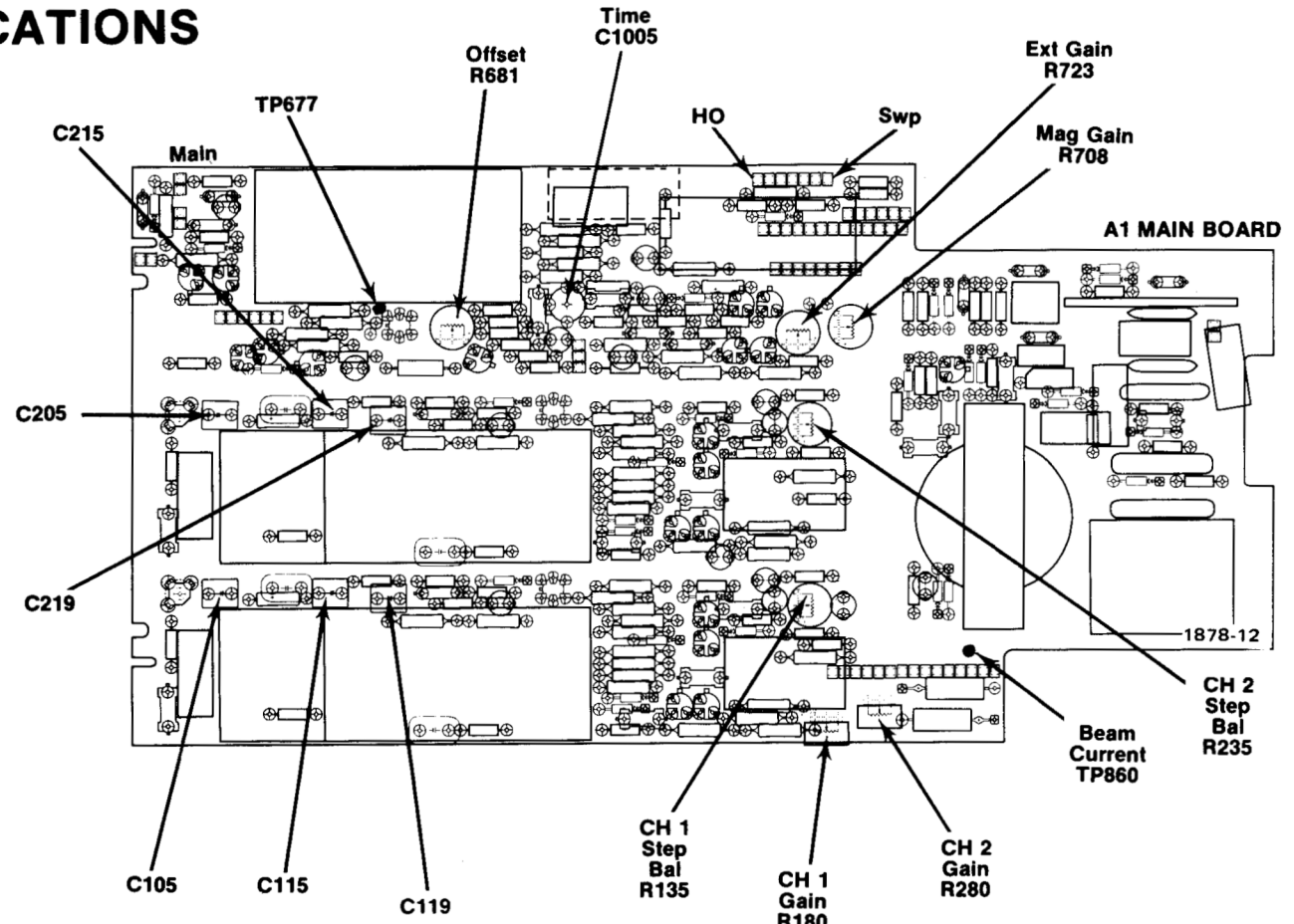
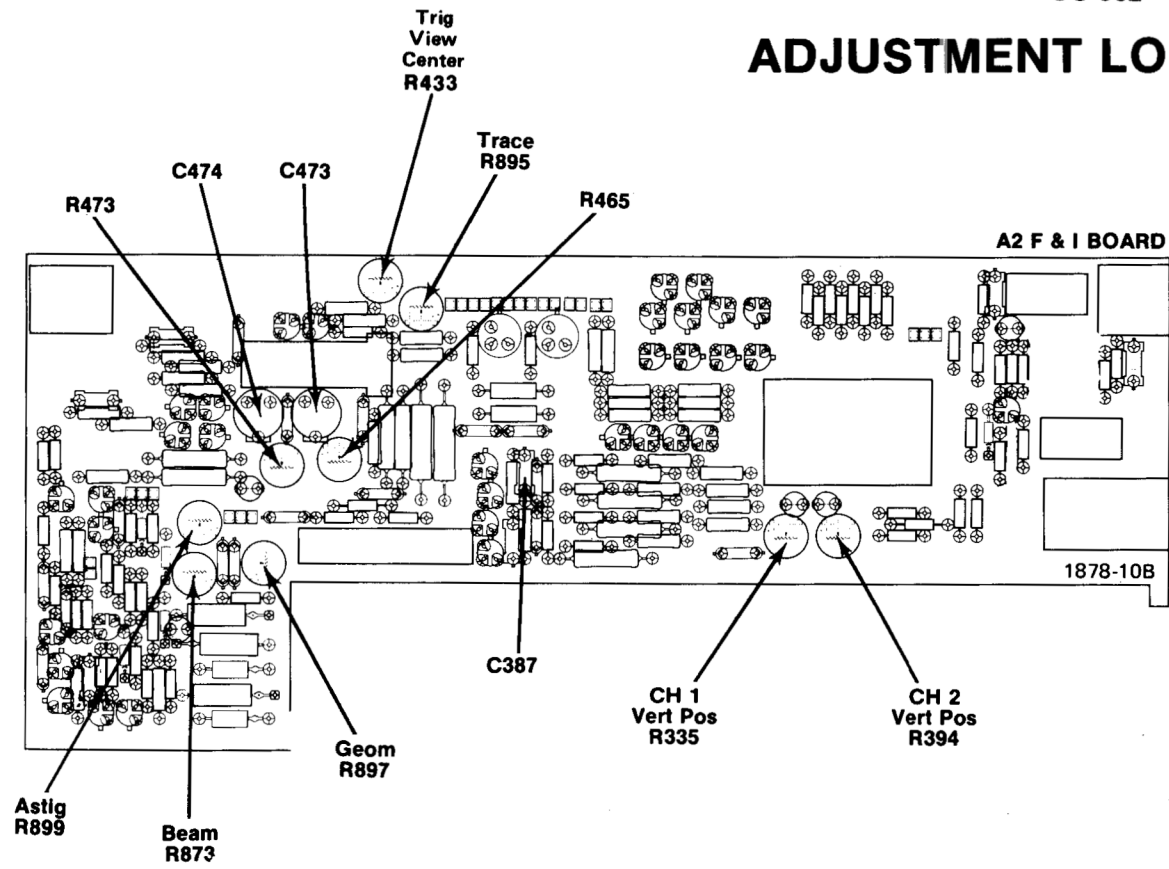
Assembly Numbers and Grid Coordinates

Each assembly in the instrument is assigned an assembly number (e.g., A20). The assembly number appears on the circuit board outline on the diagram, in the title for the circuit board component location illustration, and in the lookup table for the schematic diagram and corresponding component locator illustration. The Replaceable Electrical Parts list is arranged by assemblies in numerical sequence; the components are listed by component number *(see following illustration for constructing a component number).

The schematic diagram and circuit board component location illustration have grids. A lookup table with the grid coordinates is provided for ease of locating the component. Only the components illustrated on the facing diagram are listed in the lookup table. When more than one schematic diagram is used to illustrate the circuitry on a circuit board, the circuit board illustration may only appear opposite the first diagram on which it was illustrated; the lookup table will list the diagram number of other diagrams that the circuitry of the circuit board appears on.



ADJUSTMENT LOCATIONS



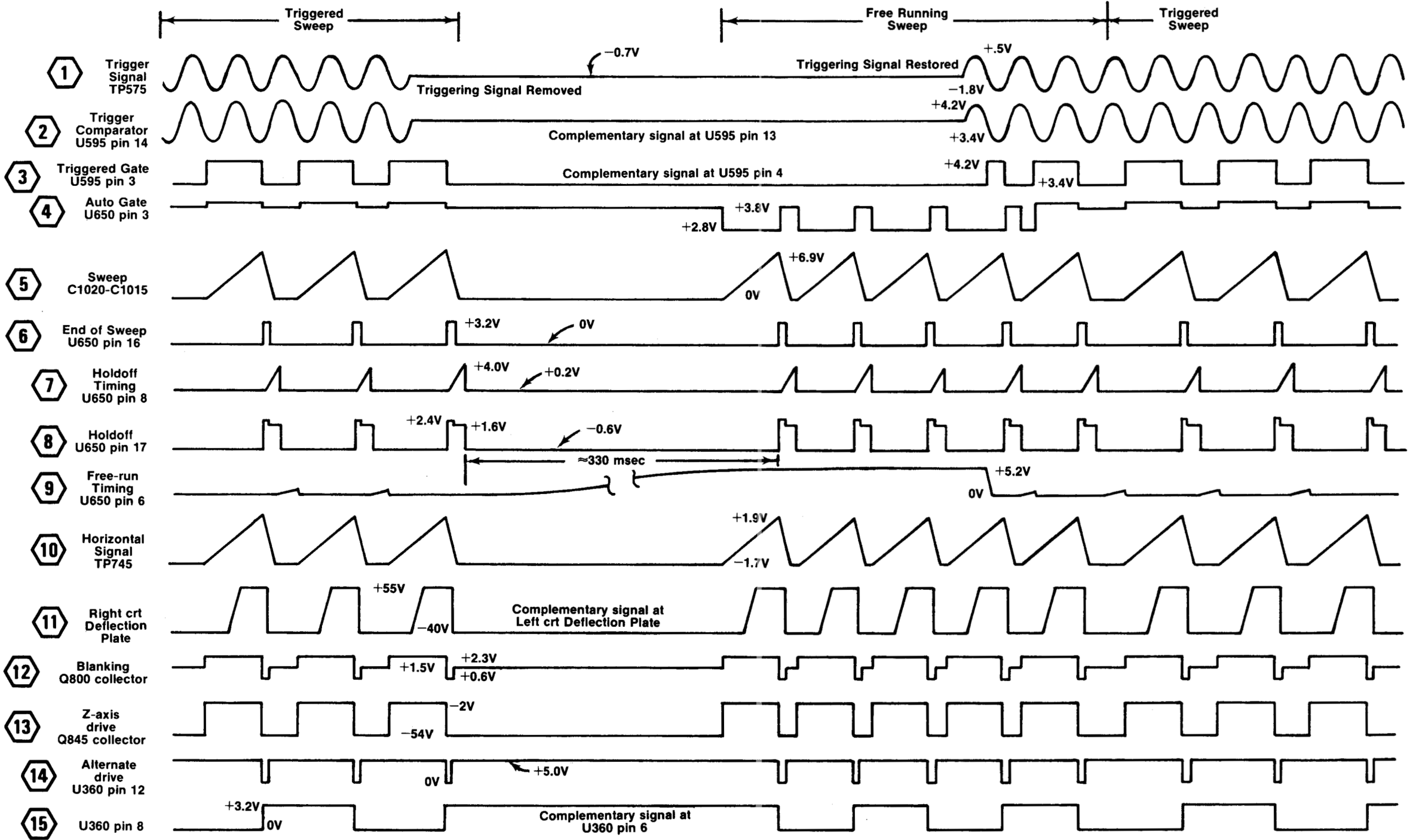
REV D APR 1980

WAVEFORMS

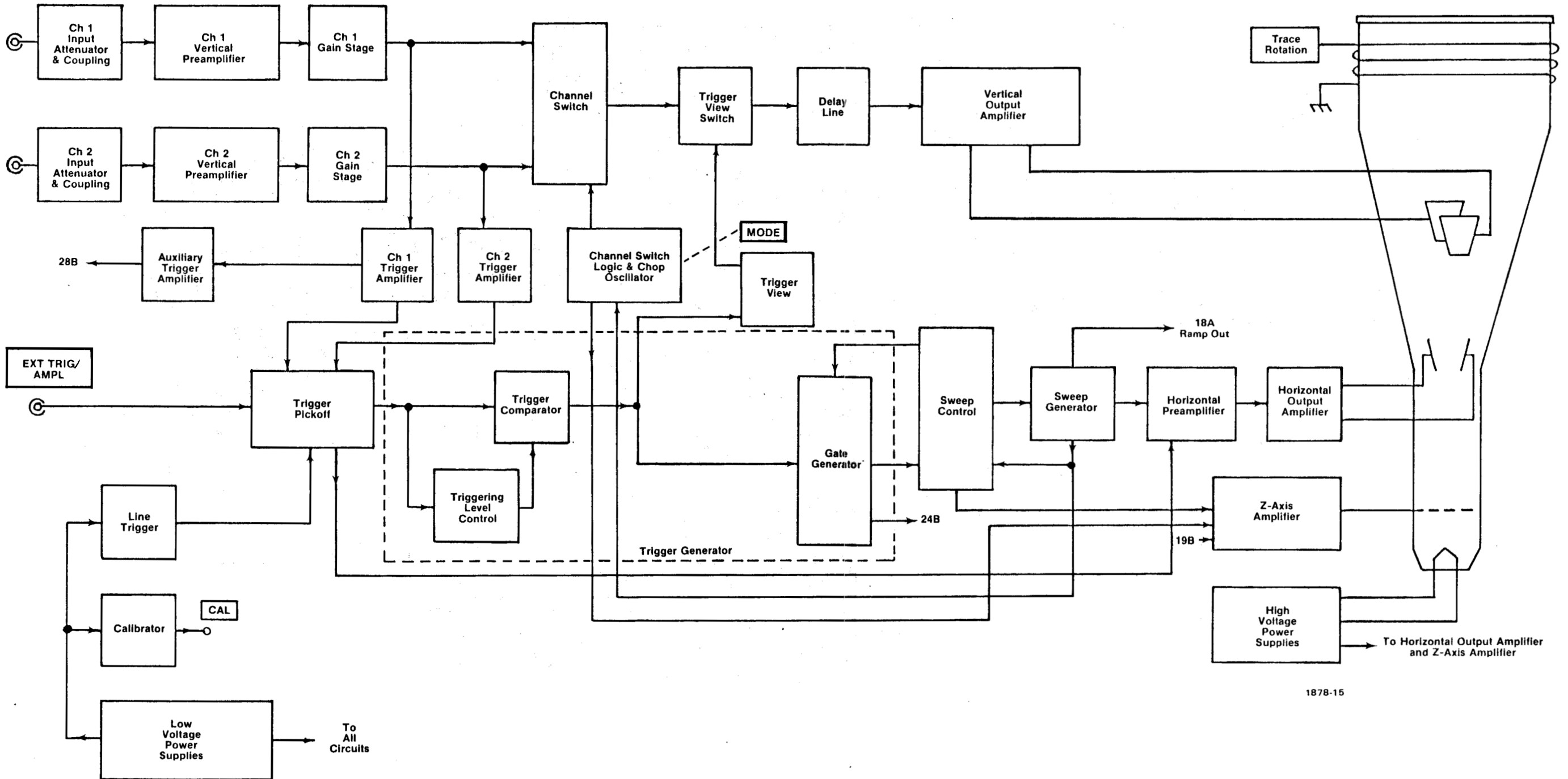
WAVEFORM CONDITIONS

INTENSITY Midrange
 MODE ALT
 POSITION (Horizontal) Midrange
 SECONDS/DIV 2 m
 CAL/SWP MAG Fully clockwise and pulled out
 Trigger Mode AUTO
 COUPLING AC
 SOURCE LINE
 SLOPE +
 LEVEL (Triggering) Midrange

REV B APR 1980



SC 502 **BLOCK DIAGRAM**



A1 MAIN BOARD PARTS LOCATION GRID

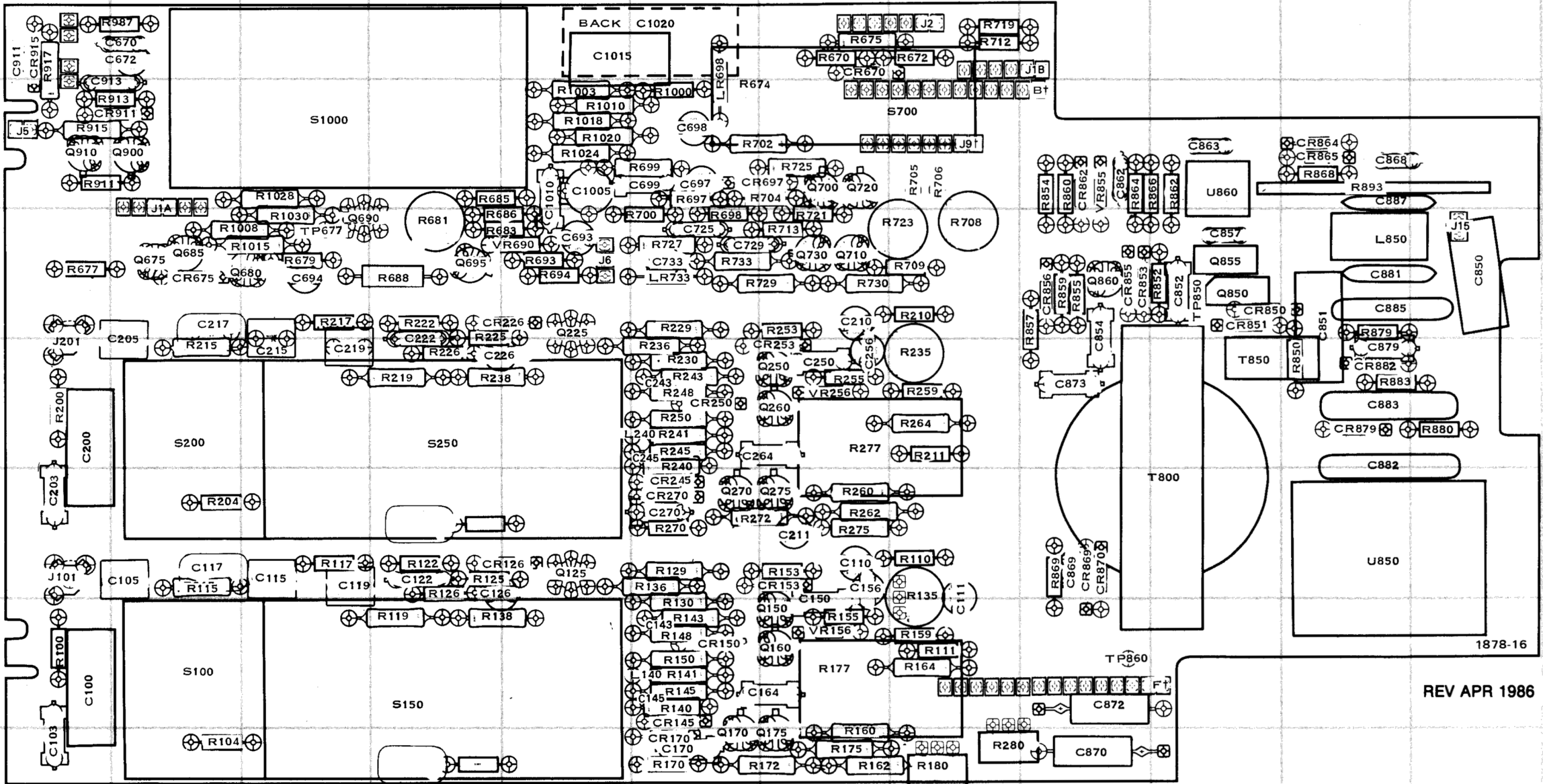


Table 8-1

CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
B†	H2	CR126	D5	Q720	G2	R259	H4	R917	A1
C100	A6	CR145	F6	Q730	G3	R260	G5	R987	B1
C103	A7	CR150	F6	Q850	J3	R262	G5	R1000	F2
C105	B5	CR153	G5	Q855	J3	R264	H4	R1003	E2
C110	G5	CR170	F7	Q860	I3	R270	F5	R1008	B2
C111	H5	CR226	D3	Q900	B2	R272	F5	R1010	E2
C115	C5	CR245	F5	Q910	A2	R275	G5	R1015	C3
C117	B5	CR250	F4			R277*	G4	R1018	E2
C119	C5	CR253	G4			R280	H7	R1020	E2
C122	D5	CR270	F5	R100	A6	R670	G1	R1024	E2
C126	D5	CR670	G1	R104	B7	R672	H1	R1028	C2
C143	F6	CR675	B3	R110	H5	R674	F2	R1030	C3
C145	F6	CR697	G2	R111	H6	R675	G1		
C150	G6	CR850	J3	R115	B5	R677	A3		
C156	G5	CR851	J3	R117	C5	R679	C3	S100	B6
C164	G6	CR853	I3	R119	D6	R681	D3	S150	D6
C170	F7	CR855	I3	R122	D5	R683	D3	S200	B4
C200	A4	CR856	I3	R125	D5	R685	D2	S250	D4
C203	A5	CR862	I2	R126	D5	R686	D3	S700	H2
C205	B4	CR864	K2	R129	F5	R688	D3	S1000	C2
C210	G3	CR865	K2	R130	F6	R693	E3		
C211	G5	CR869	I5	R135	H5	R694	E3	T800	J5
C215	C4	CR870	I5	R136	F5	R697	F2	T850	J4
C217	B3	CR879	K4	R138	D6	R698	F3		
C219	C4	CR882	K4	R140	F6	R699	F2	TP677	C3
C222	D4	CR911	B2	R141	F6	R700	F3	TP850	J3
C226	D4	CR915	A1	R143	F6	R702	F2	TP860	I6
C243	F4			R145	F6	R704	G2		
C245	F4	F†	I6	R148	F6	R705	H2	U850	K5
C250	G4	J101	A5	R150	F6	R706	H2	U860	J2
C256	G4	J201	A4	R153	G5	R708	H3		
C264	G4			R155	G6	R709	H3	VR156	G6
C270	F5	L140	F6	R159	H6	R712	H1	VR256	G4
C670	B1	L240	F4	R160	G7	R713	G3	VR690	E3
C672	B1	L850	K3	R162	G7	R719	H1	VR855	I2
C693	E3			R164	H6	R721	G3		
C694	C3	LR698	F1	R170	F7	R723	H3	J1A(W)**	B2
C697	F2	LR733	F3	R172	F7	R725	G2	J1B(W)**	H1
C698	F2			R175	G7	R727	F3	J2(W)**	G1
C699	F2	J5	A2	R177*	G6	R729	F3		
C725	F3	J6(N)**	E3	R180	H7	R730	G3		
C729	F3	J9(D)†**	H2	R200	A4	R733	F3		
C733	F3	J15	L3	R204	B5	R850	K4		
C850	L3	Q125A	E5	R210	H3	R852	J3		
C851	K3	Q125B	E5	R211	H4	R854	I2		
C852	J3	Q150 *	G6	R215	B4	R855	I3		
C854	I3	Q160	G6	R217	C3	R857	I2		
C857	J3	Q170	F7	R219	D4	R859	I3		
C862	I2	Q175	G7	R222	D3	R860	I2		
C863	J2	Q225A	E3	R225	D3	R862	J2		
C868	K2	Q225B	E3	R226	D4	R864	I2		
C869	I5	Q250 *	G4	R229	F3	R866	I2		
C870	I7	Q260	G4	R230	F4	R868	K2		
C872	I6	Q270	F5	R235	H4	R869	I5		
C873	I4	Q275	G5	R236	F4	R879	K3		
C879	K4	Q675	B3	R238	D4	R880	L4		
C881§	K3	Q680	C3	R240	F4	R883	K4		
C882§	K4	Q685	B3	R241	F4	R893A	K2		
C883§	K4	Q690	C3	R243	F4	R893B	K2		
C885§	K3	Q695	D3	R245	F4	R893C	K2		
C887§	K2	Q700	G2	R248	F4	R893D	K2		
C911	A1	Q710	G3	R250	F4	R911	A2		
C913	A2			R253	G3	R913	B2		
C1005	E2			R255	G4	R915	A2		
C1010	E2								
C1015	E1								
C1020	F1								

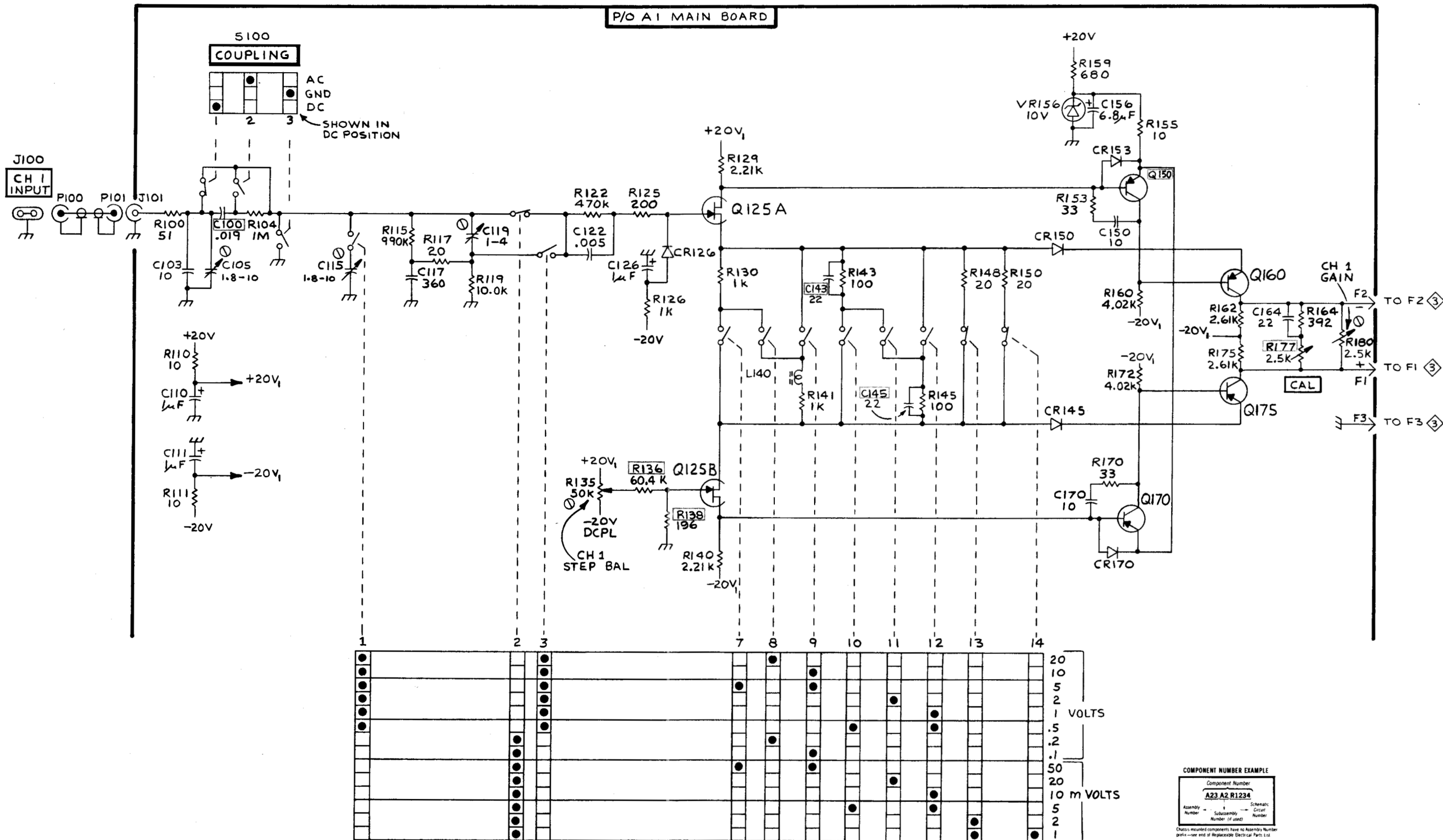
† Located on back of board.

§ Connected between Aux board and Main board.

**Numbers or letters inside parenthesis indicate board designation.

*See Parts List for serial number ranges.

P/O A1 MAIN BOARD

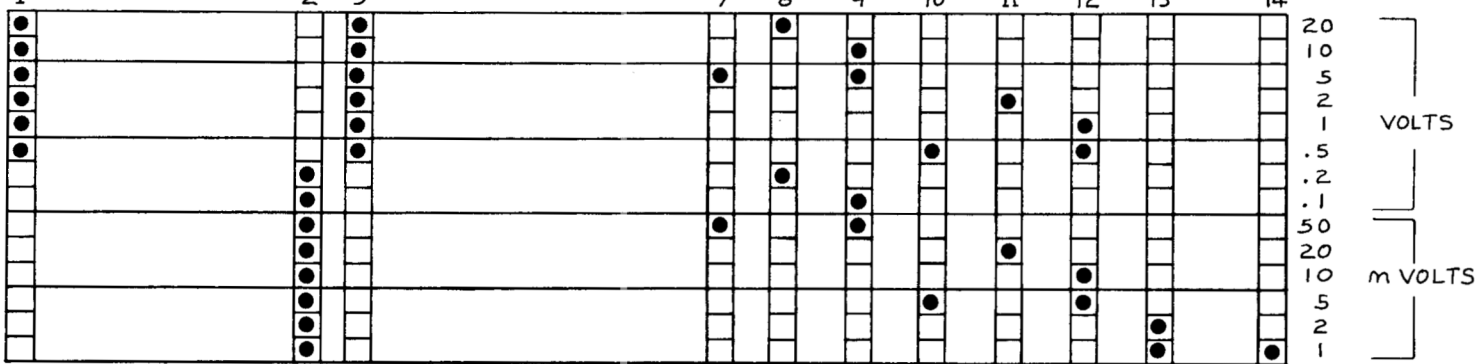
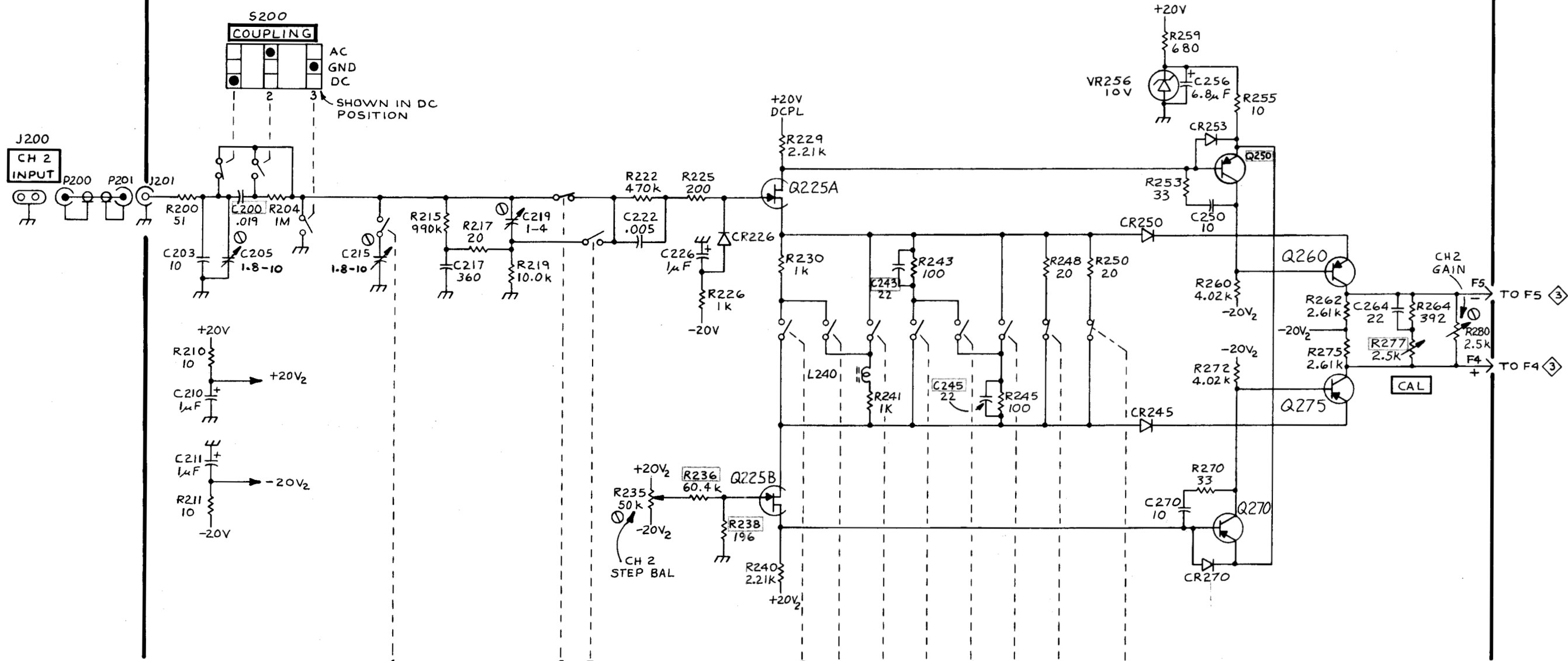


CH 1 VOLTS 1 DIV
S150
SHOWN IN 1mV/DIV POSITION

COMPONENT NUMBER EXAMPLE
 Component Number
A23 A2 R1234
 Assembly Number Subassembly Number (if used) Schematic Circuit Number
Chassis mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List

SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.

P/O AI MAIN BOARD

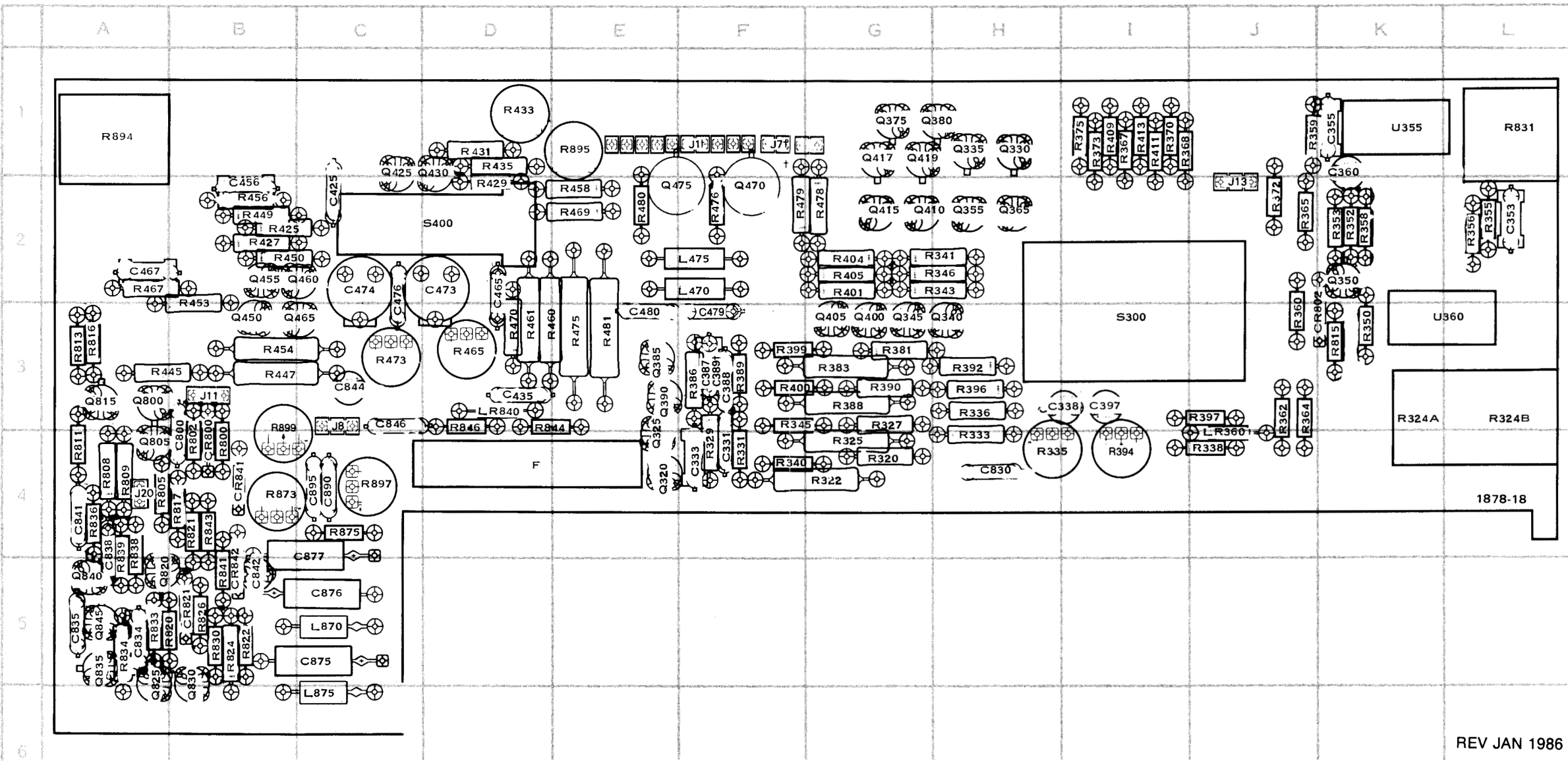


CH 2 VOLTS/DIV
S250
SHOWN IN 1mV/DIV POSITION

COMPONENT NUMBER EXAMPLE
Component Number
A23 A2 R1234
Assembly Number - Subassembly Number (if used) - Schematic Circuit Number

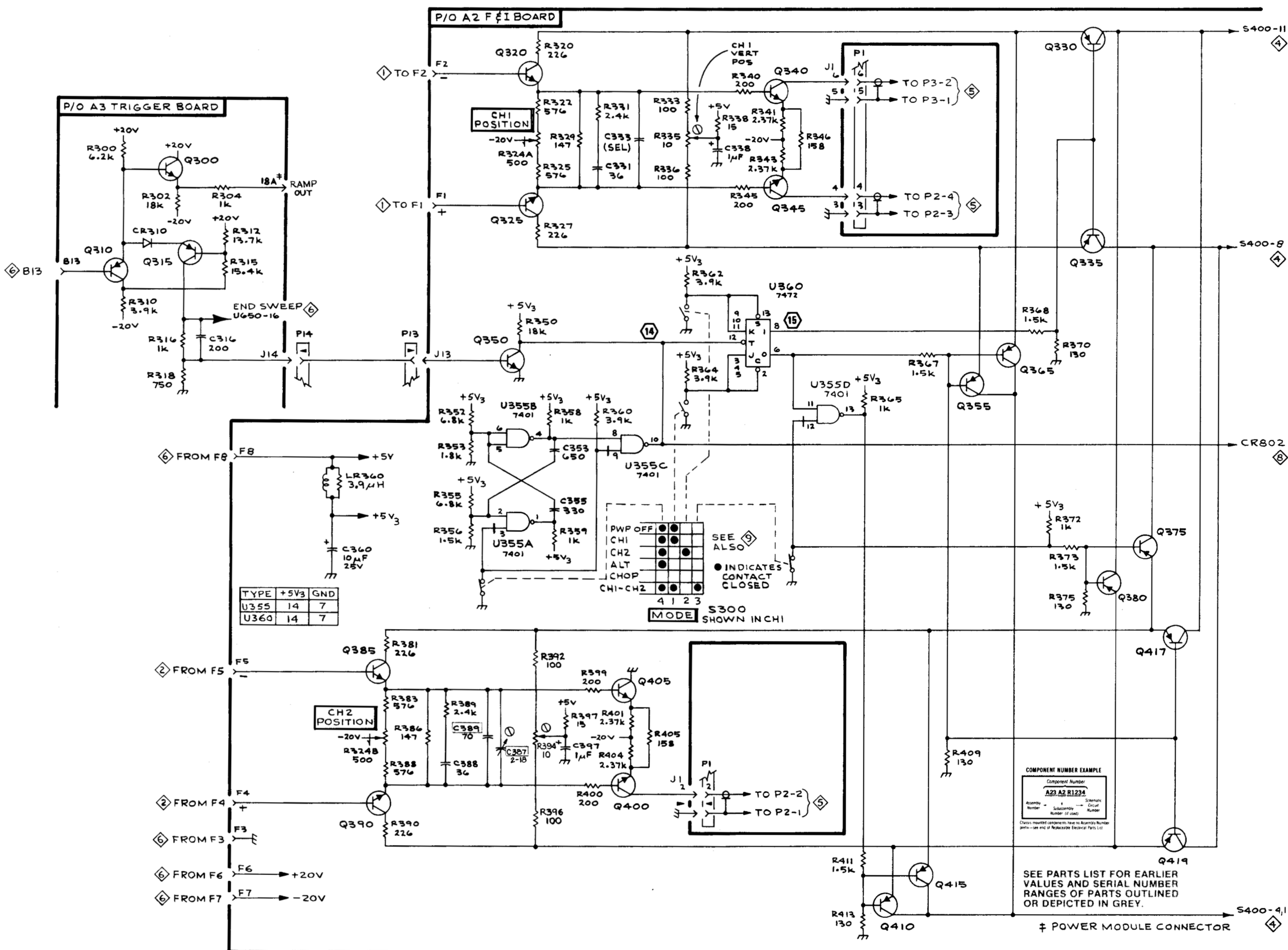
SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.

SC 502 A2 F & I BOARD PARTS LOCATION GRID



REV JAN 1986

CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC		
C331	F4	C476	C2	C895	C4	L470	F2	Q320	E4	Q415	G2	Q830	B5	R336	H3	R364	J3	R396	H3	R447	B3	R478	G2	R822	B5	R894 *	A1
C333	F4	C479	F3			L475	F2	Q325	E4	Q417	G1	Q835	A5	R338	J4	R365	J2	R397	J3	R449	B2	R479	F2	R824	B5	R895	E1
C338	I3	C480	E3	CR800	B4	L870	C5	Q330	H1	Q419	G1	Q840	A5	R340	F4	R367	I1	R399	F3	R450	B2	R480	E2	R826	B5	R897	C4
C353	L2	C800	B4	CR802	K3	L875	C6	Q335	H1	Q425	C1	Q845	A5	R341	H2	R368	I1	R400	F3	R453	B2	R481	E3	R830	B5	R899	B3
C355	K1	C830	H4	CR821	B5			Q340	H3	Q430	D1			R343	H2	R370	I1	R401	G2	R454	B3	R800	B4	R831	L1		
C360	K1	C834	A5	CR841	B4	LR360	J3	Q345	G3	Q450	B3			R345	F3	R372	J2	R404	G2	R456	B2	R802	B4	R833	A5		
C387*	F3	C835	A5	CR842	B5	LR840	D3	Q350	K2	Q455	B2	R320	G4	R346	H2	R373	I1	R405	G2	R458	E2	R805	A4	R834	A5		
C388	F3	C838	A4					Q355	H2	Q460	C2	R322	G4	R350	K3	R375	I1	R409	I1	R460	D3	R808	A4	R836	A4		
C389†	F3	C841	A4	F	D4			Q365	H2	Q465	C3	R324A	K3	R352	K2	R381	G3	R411	I1	R461	D3	R809	A4	R838	A4	S300	I3
C397	I3	C842	B5					Q375	G1	Q470	F2	R324B	L3	R353	K2	R383	G3	R413	I1	R465	D3	R811	A4	R839	A4	S400	D2
C425	C2	C844	C3	J1(G)**	E1			Q380	H1	Q475	E2	R325	G4	R355	L2	R386	F3	R425	B2	R467	A2	R813	A3	R841	B5		
C435	D3	C846	C3	J7(L)**	F1			Q385	E3	Q800	A3	R327	G3	R356	L2	R388	G3	R427	B2	R469	E2	R815	K3	R843	B4	U355A	K1
C456	B2	C875	C5	J8	C3			Q390	E3	Q805	A4	R329	F4	R358	K2	R389	F3	R429	D2	R470	D3	R816	A3	R844	D3	U355B	K1
C465	D2	C876	C5	J11(C)**	B3			Q400	G3	Q815	A3	R331	F4	R359	J1	R390	G3	R431	D1	R473	C3	R817	B4	R846	D3	U355C	K1
C467	A2	C877	C4	J13(E)**	J2			Q405	G3	Q820	A5	R333	H4	R360	J3	R392	H3	R433	D1	R475	E3	R820	A5	R873	B4	U355D	K1
C473*	D2	C890	C4					Q410	G2	Q825	A5	R335	H4	R362	J3	R394	I4	R435	D1	R476	F2	R821	B4	R875	C4	U360	L3
C474*	C2																										

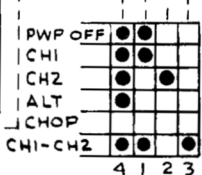


P/O A3 TRIGGER BOARD

P/O A2 F&I BOARD

CH1 POSITION

CH2 POSITION



TYPE	+5V3	GND
U355	14	7
U360	14	7

COMPONENT NUMBER EXAMPLE

Component Number
A23 A2 R1234

Assembly Number Subassembly Number Schematic Number Circuit Number

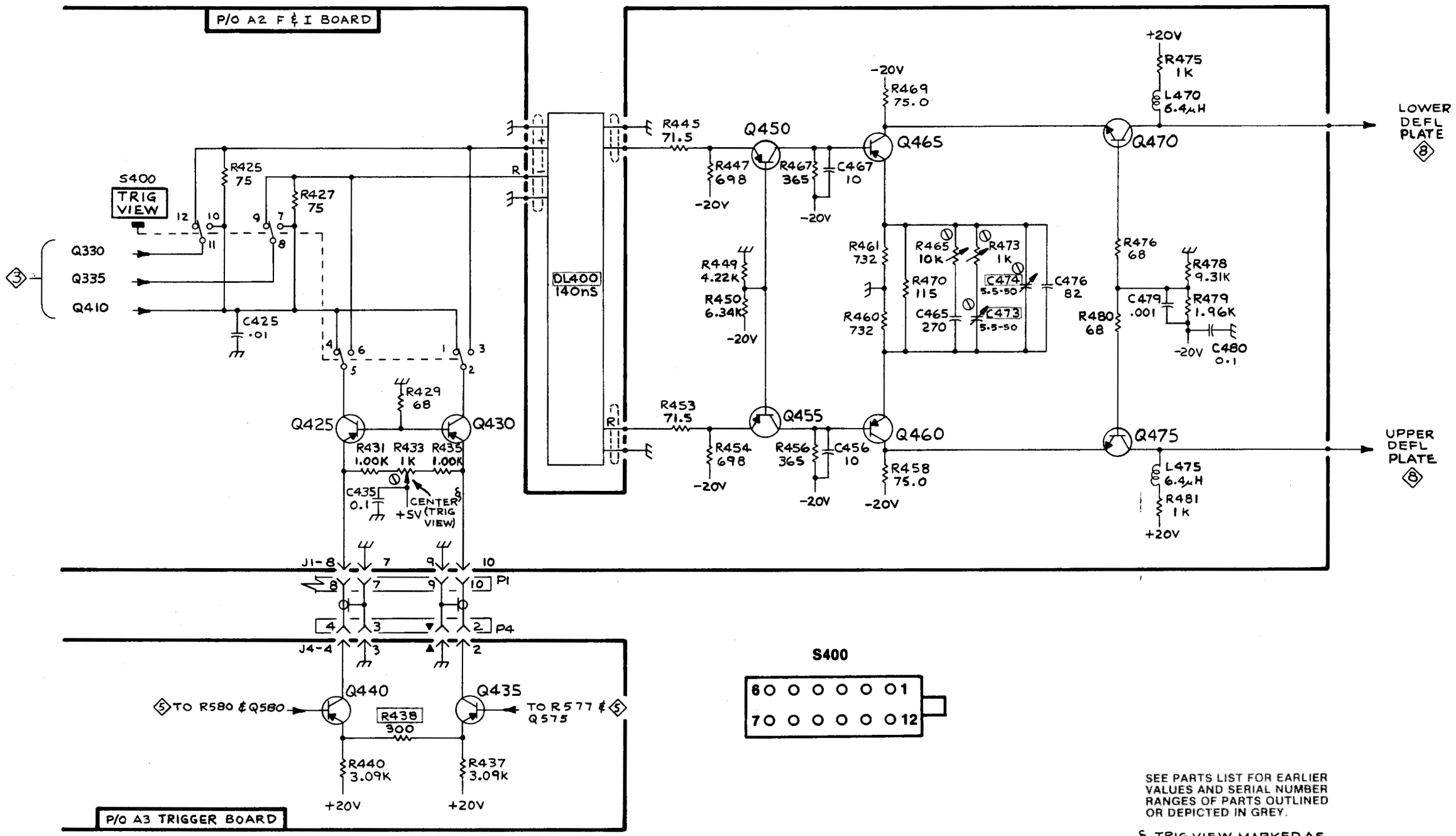
Circle mounted components show no quantity number prefix—see end of Replaceable Electrical Parts List

SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.

‡ POWER MODULE CONNECTOR

REV FEB 1983
1878-24

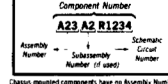
POSITION CONTROL / CHANNEL SWITCHING / TRIGGER PICKOFF



SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.

§ TRIG VIEW MARKED AS TV ON CIRCUIT BOARD.

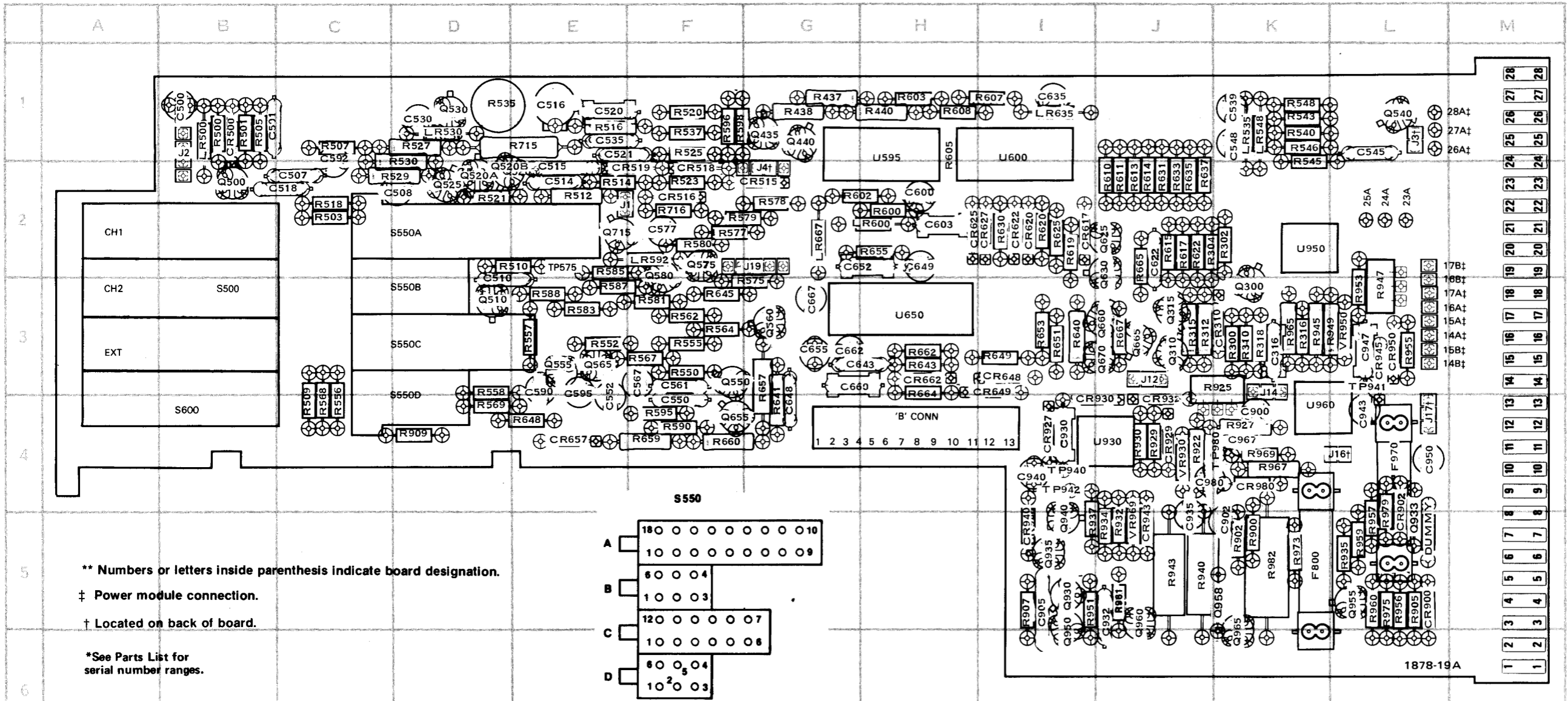
COMPONENT NUMBER EXAMPLE



Classroom mounted components have no Assembly Number prefix—see end of Reproducible Electrical Parts List

SC 502 A3 TRIGGER BOARD PARTS LOCATION GRID

REV APR 1984



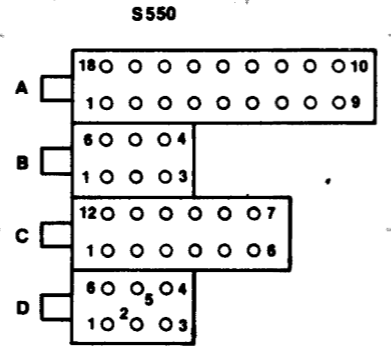
CKT NO	GRID LOC
R947	L3
R949	L3
R951	I5
R953	L3
R955	L3
R956	L5
R957	L5
R959	L5
R960	L5
R961	J5
R963*	K5
R965	K3
R967	K4
R969	K4
R973	K5
R975	L5
R979	L5
R982	K5
S500A	B3
S500B	B3
TP940	I4
TP941	L3
TP942	I4
TP980	K4
U595	H1
U600A	I1
U600B	I1
U600C	I1
U650	H3
U930	J4
U950	K2
U960	K4
VR930	J4
VR950	L3
VR969	J5

** Numbers or letters inside parenthesis indicate board designation.

‡ Power module connection.

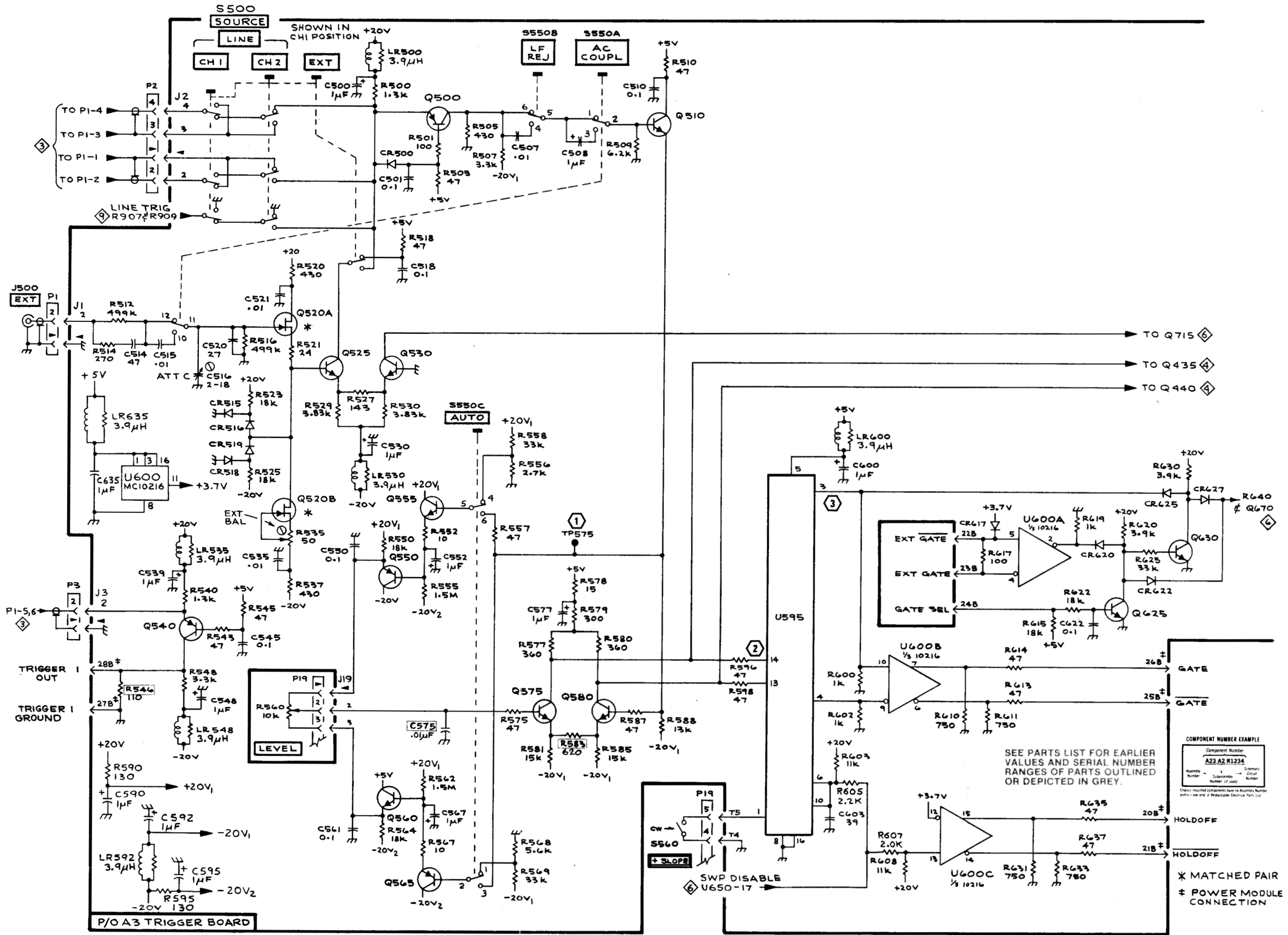
† Located on back of board.

*See Parts List for serial number ranges.



CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC				
B	H4	C539	K1	C648	G4	C950	L4	CR649	I3	F800	K5	LR530	D1	Q525	D2	Q930	I5	R316	K3	R520	F1	R555	F3	R585	E2	R614	J2	R648	E4	R905	L5
C316	K3	C545	L1	C649	H2	C967	K4	CR657	E4	F970	L4	LR535	K1	Q530	D1	Q933*	L5	R318	K3	R521	D2	R556	C4	R587	E3	R615	J2	R649	I3	R907	I5
C500	B1	C550	F4	C655	G3	C980	J4	CR662	H3			LR548	K1	Q540	L1	Q935	I5	R437	G1	R523	F2	R557	E3	R588	E3	R617	J2	R651	I3	R909	D4
C501	B1	C552	E3	C660	G3			CR900	L5			LR592	F2	Q550	F3	Q940	I5	R438	G1	R525	F1	R558	D3	R590	F4	R619	I2	R653	I3	R922	J4
C507	C2	C561	F3	C662	G3	CR310	K3	CR902	L5	J1(H)**	E2	LR600	H2	Q555	E3	Q950	I5	R440	H1	R527	D1	R562	F3	R595	F4	R620	I2	R655	H2	R925	J3
C508	D2	C567	F3	C667	G3	CR500	B1	CR927	I4	J2(G1)**	B1	LR635	I1	Q560	G3	Q955	L5	R500	B1	R529	D2	R564	F3	R596	F1	R622	J2	R657	G3	R927	K4
C510	D3	C577	F2	C900	K4	CR515	G2	CR929	J4	J3(G5)**	L1	LR667	G2	Q565	E3	Q958*	K5	R501	B1	R530	D2	R567	F3	R598	F1	R625	I2	R659	F4	R929	J4
C514	E2	C590	E3	C902	K5	CR516	F2	CR930	J4	J4(G7)**	G2	Q300	K3	Q575	F2	Q960	J5	R503	C2	R535	D1	R568	C4	R600	H2	R630	I2	R660	F4	R930	J4
C515	E2	C592	C1	C905	I5	CR518	F2	CR932	J4	J4(G7)**	G2	Q310	J3	Q580	F2	Q965	K5	R505	B1	R537	F1	R569	D4	R602	G2	R631	J2	R662	H3	R932	J5
C516	E1	C595	E3	C930	I4	CR519	F2	CR940	I5	J12(C)**	J3	Q315	J3	Q625	J2			R507	C1	R540	K1	R575	G3	R603	H1	R633	J2	R664	H3	R934	J5
C518	C2	C600	H2	C932	J5	CR617	I2	CR943	J5	J14(E)**	K3	Q435	G1	Q630	J2	R300	K3	R509	C4	R543	K1	R577	F2	R605	H1	R635	J2	R665	J2	R935	L5
C520	E1	C603	H2	C935	J5	CR620	I2	CR945	L3	J16(A)**	L4	Q440	G1	Q655	F4	R302	K2	R510	E2	R545	K1	R578	G2	R607	I1	R637	J2	R667	J3	R937	I5
C521	E1	C622	J2	C940	I4	CR625	H2	CR950	L3	J17(U)**	L4	Q500	B2	Q660	J3	R304	J2	R512	E2	R546	K1	R579	F2	R608	H1	R640	I3	R715	E1	R939*	L5
C530	D1	C635	I1	C943	L4	CR627	I2	CR980	K4	J19(T)**	G2	Q510	D3	Q665	J3	R310	K3	R514	E2	R548	K1	R580	F2	R610	J2	R641	G4	R716	F2	R940	J5
C535	E1	C643	H3	C947	L3	CR648	I3					Q520A	D2	Q670	J3	R312	J3	R516	E1	R550	F3	R581	F3	R611	J2	R643	H3	R900	K5	R943	J5
												Q520B	D2	Q715	E2	R315	J3	R518	C2	R552	E3	R583	E3	R613	J2	R645	F3	R902	K5	R945	K3

1878-19A



P/O A3 TRIGGER BOARD

REV MAY 1982
1878-26

TRIGGERING & GATE SELECT

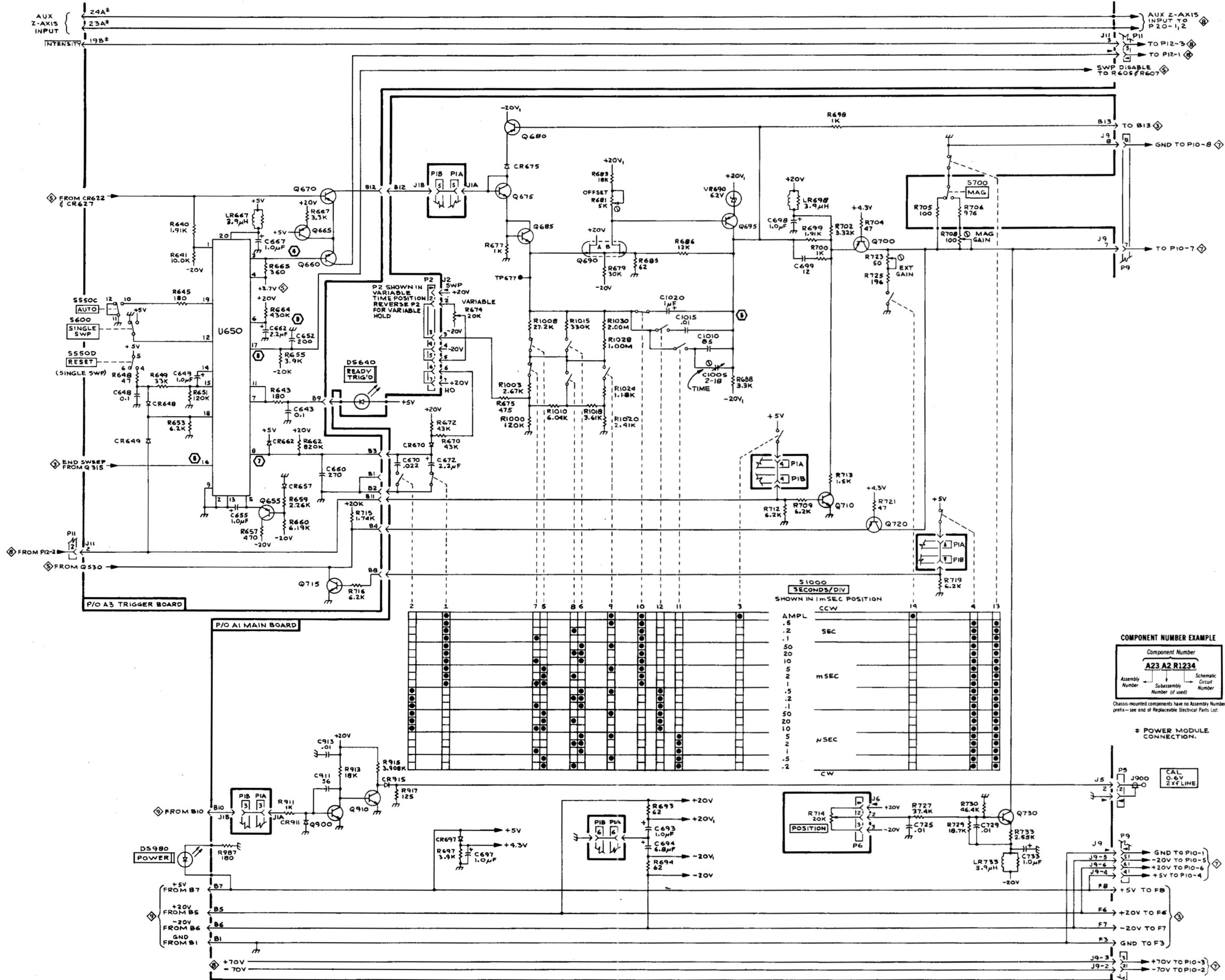
COMPONENT NUMBER EXAMPLE

Component Number	A23 A2 R1234
Assembly Number	1
Subassembly Number	1
Serial Number	12345
Number of Uses	1

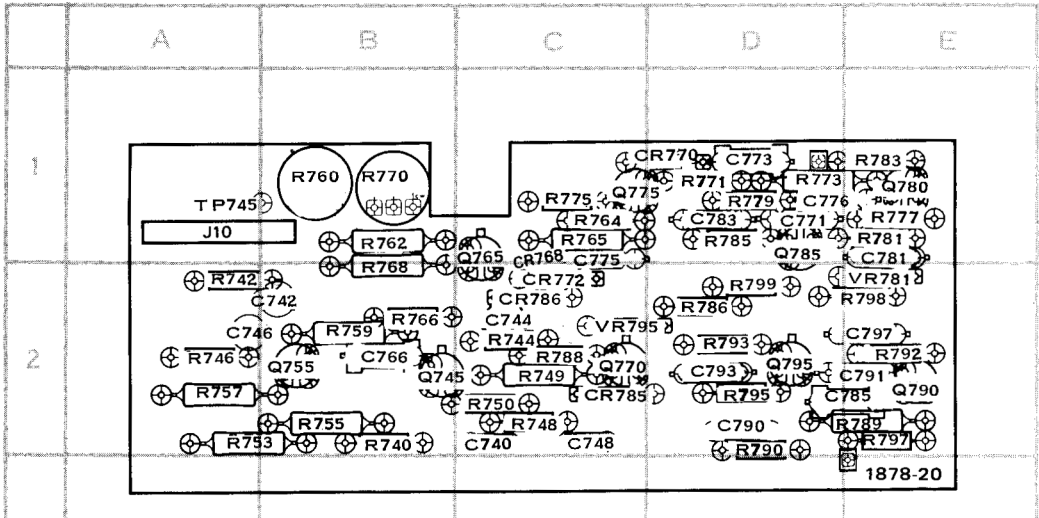
SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.

Capacitors mounted components have no Assembly Number prefix—see end of Aerospace Electrical Parts List

* MATCHED PAIR
‡ POWER MODULE CONNECTION



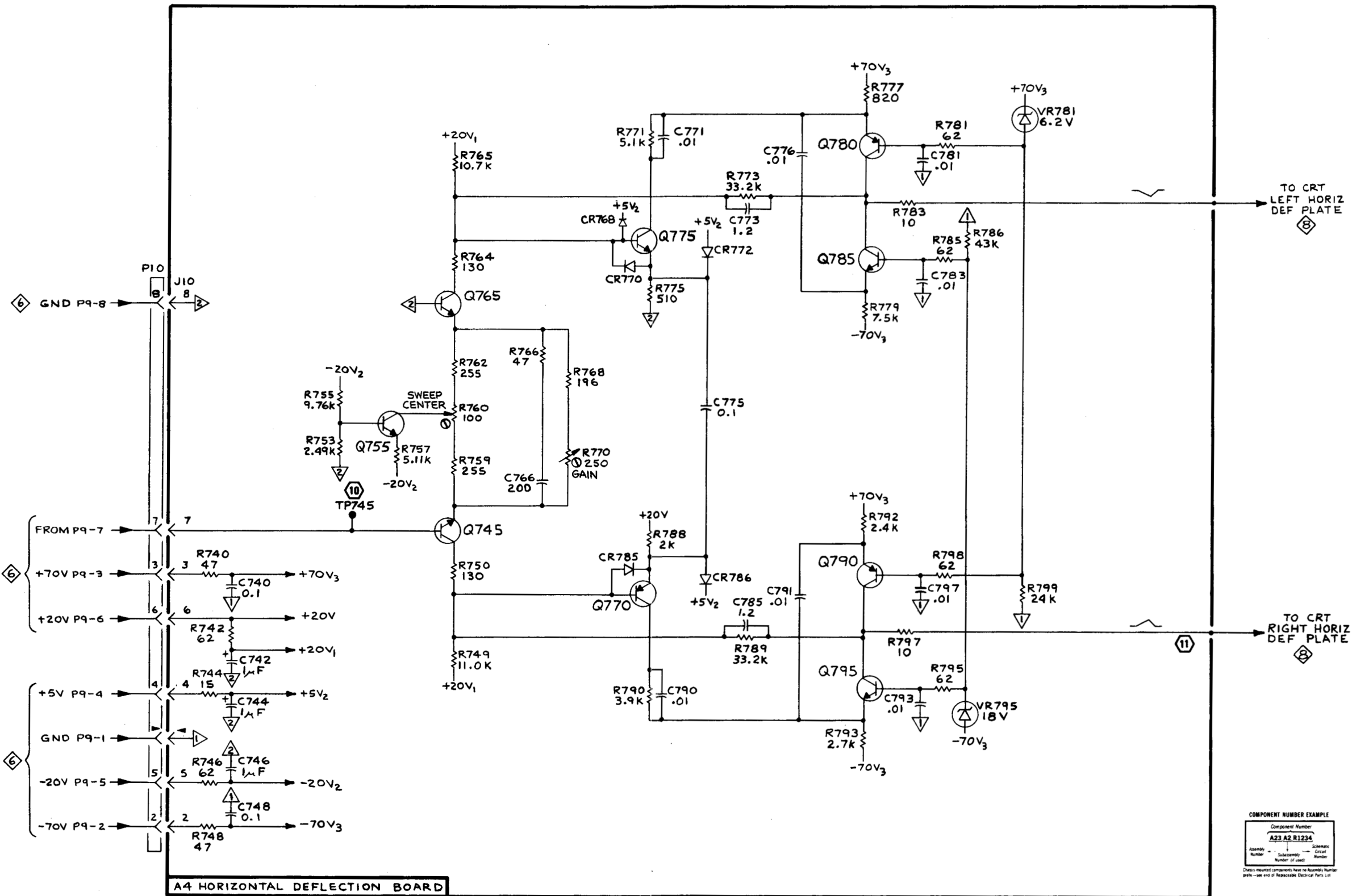
A4 HORIZ DEFL BOARD PARTS LOCATION GRID



REV B APR 1980

CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
C740	C2	Q780	E1	R781	E1
C742	B2	Q785	D1	R783	E1
C744	C2	Q790	E2	R785	D1
C746	A2	Q795	D2	R786	D2
C748	C2			R788	C2
C766	B2	R740	B2	R789	E2
C771	D1	R742	A2	R790	D2
C773	D1	R744	C2	R792	E2
C775	C1	R746	A2	R793	D2
C776	D1	R748	C2	R795	D2
C781	E1	R749	C2	R797	E2
C783	D1	R750	C2	R798	E2
C785	E2	R753	A2	R799	D2
C790	D2	R755	B2		
C791	E2	R757	A2		
C793	D2	R759	B2	TP745	A1
C797	E2	R760	B1		
		R762	B1		
CR768	C1	R764	C1	VR781	E2
CR770	D1	R765	C1	VR795	C2
CR772	C2	R766	B2		
CR785	C2	R768	B2		
CR786	C2	R770	B1		
J10(D)**	A1	R771	D1		
		R773	D1		
Q745	B2	R775	C1		
Q755	B2	R777	E1		
Q765	C1	R779	D1		
Q770	C2				
Q775	C1				

** Numbers or letters inside parenthesis indicate board designation.



A4 HORIZONTAL DEFLECTION BOARD

REV C APR 1980
1878-28

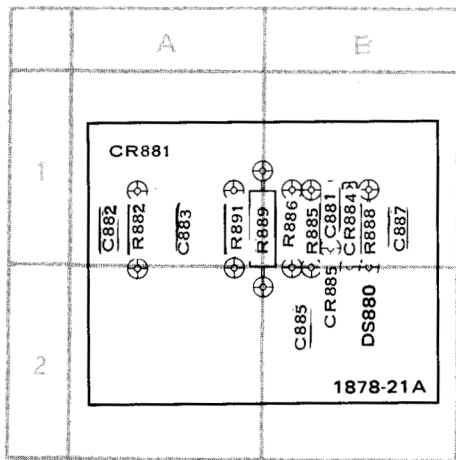
HORIZONTAL DEFLECTION AMPLIFIER 7

COMPONENT NUMBER EXAMPLE

Component Number			
A23 A2 R1234			
Assembly Number	Schematic Number	Circuit Number	Number of Units
A23	A2	R1234	

Chassis mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List

A5 AUX BOARD PARTS LOCATION GRID



REV APR 1984

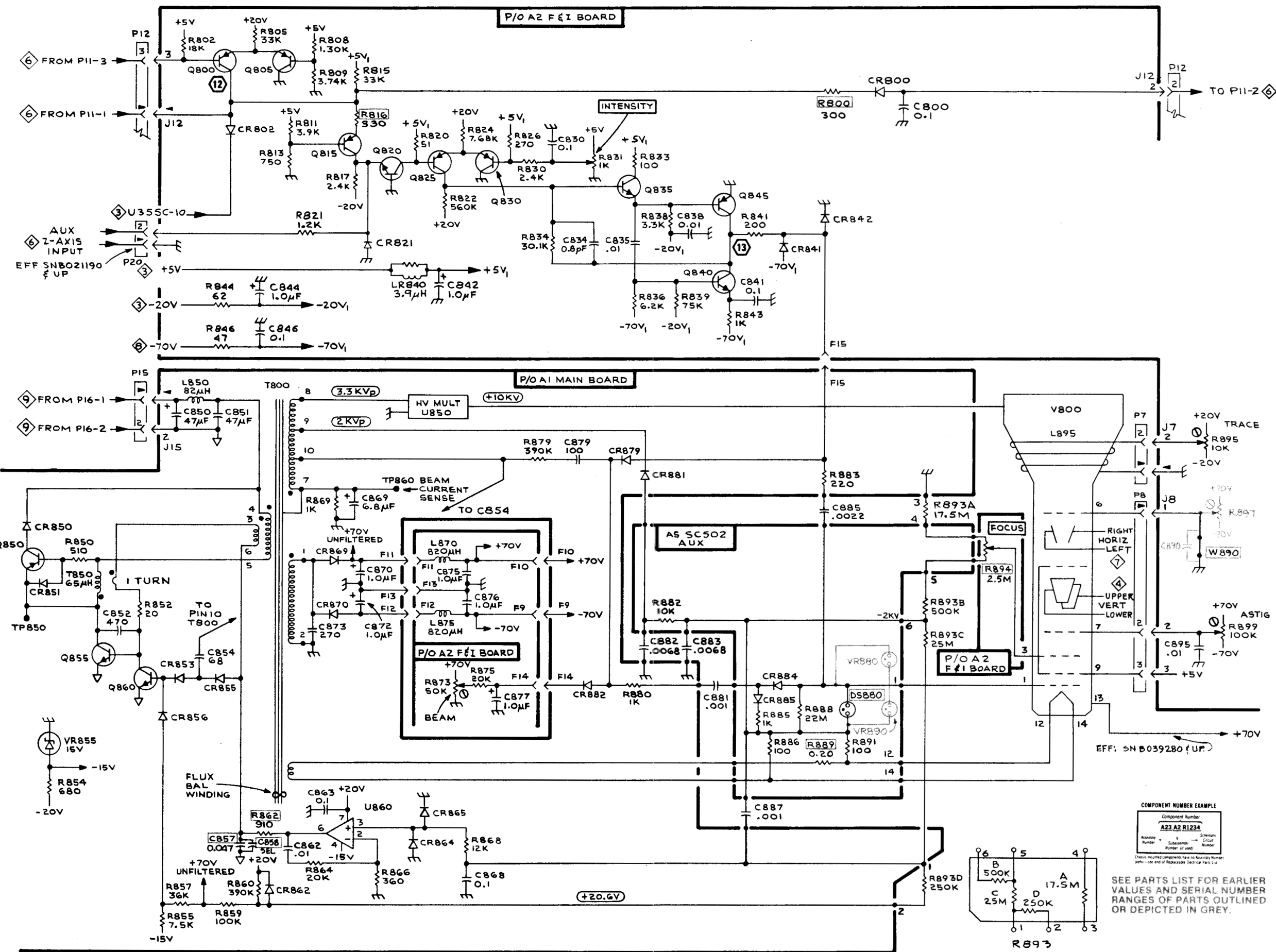
CKT NO	GRID LOC
C881§	B1
C882	A1
C883	A1
C885	B2
C887	B1
CR884	B1
CR885	B2
CR881§§	A1
DS880*	B2
R882	A1
R885	B1
R886	B1
R888	B1
R889	A1
R891	A1
VR890 *	B2
VR880 *	B2

} Mounted on
} backside

§ Connected between Aux board and Main board.

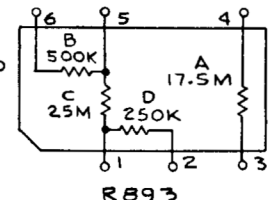
§§ Connected between Aux and T800.

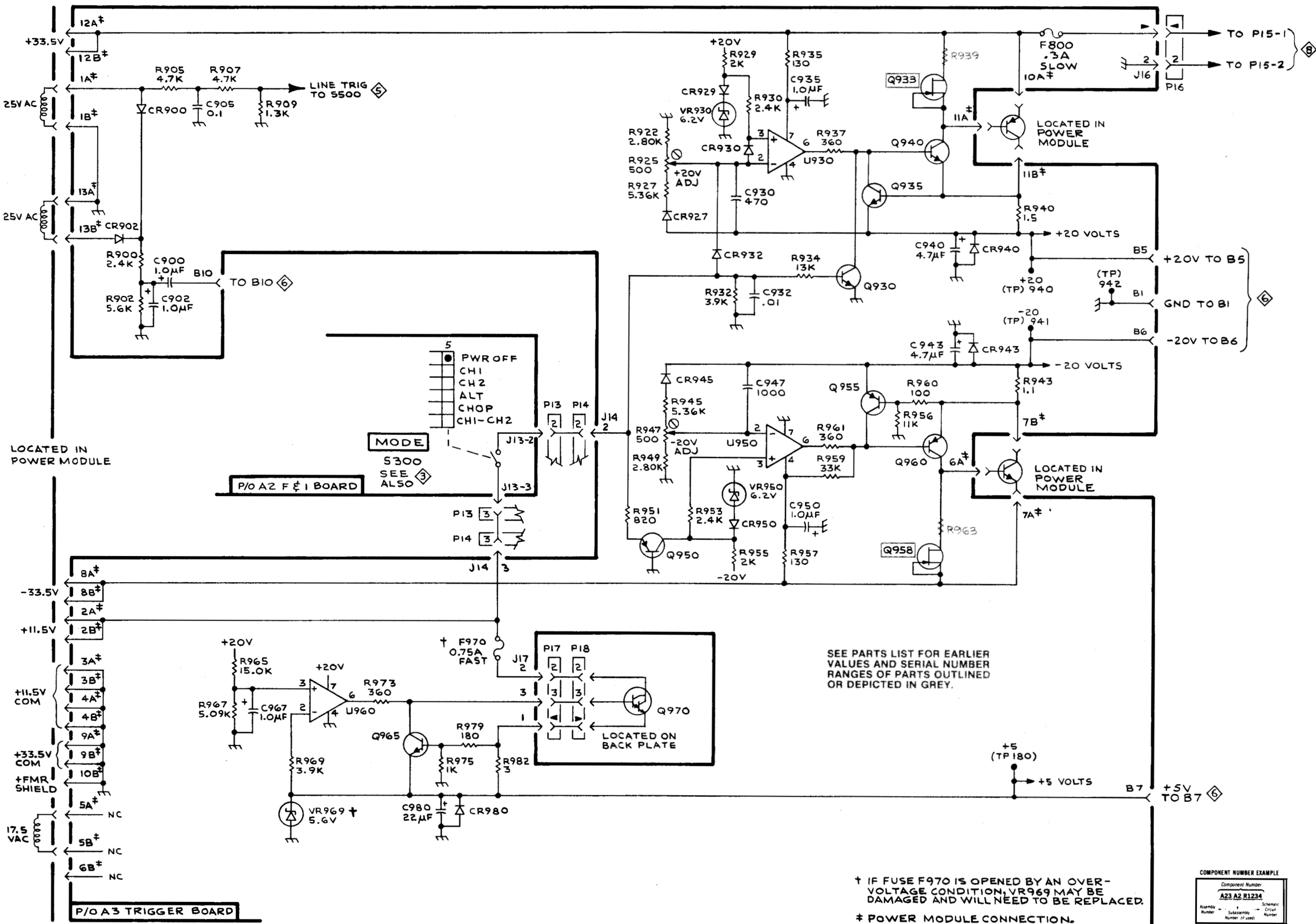
*See Parts List for
serial number ranges.



COMPONENT NUMBER EXAMPLE
 Component Number
A23 A2 R1234
 Assembly Number Subassembly Number Circuit Number
 Number of wires

SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.





SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.

† IF FUSE F970 IS OPENED BY AN OVER-VOLTAGE CONDITION, VR969 MAY BE DAMAGED AND WILL NEED TO BE REPLACED.

‡ POWER MODULE CONNECTION.

COMPONENT NUMBER EXAMPLE

Component Number	
A23 A2 R1234	
Assembly Number	Schematic Number
Subassembly Number (if used)	Circuit Number

Class required components have no Assembly Number prefix -- see end of Replaceable Parts List

REPLACEABLE MECHANICAL PARTS

PARTS ORDERING INFORMATION

Replacement parts are available from or through your local Tektronix, Inc. Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc. Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

SPECIAL NOTES AND SYMBOLS

- X000 Part first added at this serial number
- 00X Part removed after this serial number

FIGURE AND INDEX NUMBERS

Items in this section are referenced by figure and index numbers to the illustrations.

INDENTATION SYSTEM

This mechanical parts list is indented to indicate item relationships. Following is an example of the indentation system used in the description column.

```

1 2 3 4 5           Name & Description
Assembly and/or Component
Attaching parts for Assembly and/or Component
    --- * ---
Detail Part of Assembly and/or Component
Attaching parts for Detail Part
    --- * ---
Parts of Detail Part
Attaching parts for Parts of Detail Part
    --- * ---
    
```

Attaching Parts always appear in the same indentation as the item it mounts, while the detail parts are indented to the right. Indented items are part of, and included with, the next higher indentation. The separation symbol --- * --- indicates the end of attaching parts.

Attaching parts must be purchased separately, unless otherwise specified.

ITEM NAME

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

ABBREVIATIONS

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

CROSS INDEX - MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip Code
06229	ELECTROVERT INC	86 HARTFORD AVE	MOUNT VERNON NY 10553
07707	USM CORP SUB OF EMMART INDUSTRIES INC USM FASTENER DIV	510 RIVER RD	SHELTON CT 06484
08261	SPECTRA-STRIP AN ELTRA CO	7100 LAMPSON AVE	GARDEN GROVE CA 92642
09922	BURNDY CORP	RICHARDS AVE	NORWALK CT 06852
11897	PLASTIGLIDE MFG CORP	2701 W EL SEGUNDO BLVD	HAWTHORNE CA 90250
12327	FREWAY CORP	9301 ALLEN DR	CLEVELAND OH 44125
12697	CLAROSTAT MFG CO INC	LOWER WASHINGTON ST	DOVER NH 03820
22526	DU PONT E I DE NEMOURS AND CO INC DU PONT CONNECTOR SYSTEMS	30 HUNTER LANE	CAMP HILL PA 17011
22670	G M NAMEPLATE INC	2040 15TH AVE WEST	SEATTLE WA 98119
24546	CORNING GLASS WORKS	550 HIGH ST	BRADFORD PA 16701
45722	USM CORP., PARKER-KALON FASTENER DIV		CAMPBELLSVILLE, KY 42718
71159	BRISTOL SOCKET SCREW CO		WATERBURY CT
71279	MIDLAND-ROSS CORP CAMBION DIV	ONE ALEWIFE PLACE	CAMBRIDGE MA 02138
73743	FISCHER SPECIAL MFG CO	446 MORGAN ST	CINCINNATI OH 45206
74445	HOLO-KROME CO	31 BROOK ST	WEST HARTFORD CT 06110
77900	SHAKEPROOF DIV OF ILLINOIS TOOL WORKS	SAINT CHARLES RD	ELGIN IL 60120
78189	ILLINOIS TOOL WORKS INC SHAKEPROOF DIVISION	ST CHARLES ROAD	ELGIN IL 60120
78553	EATON CORP ENGINEERED FASTENERS OPERATIONS CLEVELAND DIV	8700 BROOKPARK RD P O BOX 6688	CLEVELAND OH 44101
79136	WALDES KOHINOOR INC	47-16 AUSTEL PLACE	LONG ISLAND CITY NY 11101
80009	TEKTRONIX INC	4900 S W GRIFFITH DR P O BOX 500	BEAVERTON OR 97077
83385	MICRODOT MANUFACTURING INC GREER-CENTRAL DIV	3221 W BIG BEAVER RD	TROY MI 48098
85471	BOYD INDUSTRIAL RUBBER DIV OF A B BOYD CO	2527 GRANT AVE	SAN LEANDRO CA 94579
86928	SEASTROM MFG CO INC	701 SONORA AVE	GLENDALE CA 91201
87308	N L INDUSTRIES INC N L FASTENERS	BARKLEY RD P O BOX 1360	STATESVILLE NC 28677
91500	ASHEVILLE-SCHOONMAKER MICA CO	910 JEFFERSON AVE P O BOX 318	NEWPORT NEWS VA 23607
93907	TEXTRON INC CAMCAR DIV	600 18TH AVE	ROCKFORD IL 61101
TK0392	NORTHWEST FASTENER SALES INC	7923 SW CIRRUS DRIVE	BEAVERTON OR 97005
TK0435	LEWIS SCREW CO	4114 S PEORIA	CHICAGO IL 60609
TK0507	O HARA METAL PRODUCTS CO	542 BRANNAN ST	SAN FRANCISCO CA 94107
TK0588	UNIVERSAL PRECISION PRODUCTS	1775 NW 216TH	HILLSBORO OR 97123
TK1543	CAMCAR/TEXTRON	516 18TH AVE	ROCKFORD IL 61101
TK1617	CRAFT FACTORY PLASTICS	17145 SW ALEXANDER	ALOHA OR 97007

Fig. & Index No.	Tektronix Part No.	Serial/Assembly No.		Qty	12345 Name & Description	Mfr.	
		Effective	Dscont			Code	Mfr. Part No.
1-1	337-1399-04			2	SHIELD,ELEC:SIDE	80009	337-1399-04
-2	200-1837-00	B010100	B023129	2	COVER,PLUG-IN:TOP & BOTTOM	80009	200-1837-00
	200-1837-01	B023130	B026599	2	COVER,PLUG-IN:TOP & BOTTOM	80009	200-1837-01
	200-1837-02	B026600		1	COVER,PLUG-IN:TOP & BOTTOM (ATTACHING PARTS)	80009	200-1837-02
-3	211-0214-00			2	SCREW,MACHINE:4-40 X 0.25,TRH,STL (END ATTACHING PARTS)	TK1543	ORDER BY DESC
-4	366-1031-03	B010100	B023469	2	KNOB:RED,CAL,0.127 ID X 0.392 OD X 0.466 H	80009	366-1031-03
	366-1031-08	B023470		2	KNOB:GY,CAL,0.127 ID X 0.392 OD X 0.466 H	80009	366-1031-08
	213-0153-00			2	.SETSCREW:5-40 X 0.125,STL	TK0392	ORDER BY DESC
-5	366-1405-00	B010100	B023469	1	KNOB:RED,CAL,0.08 ID X 0.45 OD X 0.466 H	80009	366-1405-00
	366-1405-04	B023470		1	KNOB:WHT,CAL,0.082 ID X 0.45 OD X 0.466 H	80009	366-1405-04
	213-0048-00			1	.SETSCREW:4-40 X 0.125,STL	TK0392	ORDER BY DESC
-6	366-1567-03	B010100	B023469	2	KNOB:GY,VOLTS/DIV,0.192 ID X 1.125 OD X 0.8 4 H	80009	366-1567-03
	366-1567-05	B023470		2	KNOB:GY,VOLTS/DIV,0.189 ID X 1.125 OD .SETSCREW:5-40 X 0.125,STL	80009	366-1567-05
	213-0153-00			2	.SETSCREW:5-40 X 0.125,STL	TK0392	ORDER BY DESC
-7	366-1567-02	B010100	B023469	1	KNOB:GY,SEC/DIV,0.192 ID X 1.125 OD X 0.84	80009	366-1567-02
	366-1567-04	B023470		1	KNOB:GY,SEC/DIV,0.192 ID X 1.125 OD X 0.84 H	80009	366-1567-04
	213-0153-00			2	.SETSCREW:5-40 X 0.125,STL	TK0392	ORDER BY DESC
-8	366-0215-02	B010100	B023469	2	KNOB:LEVER SWITCH	80009	366-0215-02
	366-0215-05	B023470		2	KNOB:GY,FOR LEVER,0.375 H,W/RTNR SPR	80009	366-0215-05
-9	366-1520-01	B010100	B022399	1	KNOB:GY,0.594 X 0.25 X 0.47	80009	366-1520-01
	366-1690-00	B022400		1	KNOB,LATCH:SIL GY,0.53 X 0.23 X 1.059 (ATTACHING PARTS)	80009	366-1690-00
-10	214-1840-00	B010100	B022399	1	PIN,KNOB SECRG:0.12 L X 0.094-0.1 OD,ACETAL (END ATTACHING PARTS)	80009	214-1840-00
-11	366-1023-01	B010100	B023469	2	KNOB:GY,0.127 ID X 0.392 OD X 0.531 H	80009	366-1023-01
	366-1023-07	B023470		2	KNOB:GY,0.127 ID X 0.392 OD X 0.466 H	80009	366-1023-07
	213-0246-00			2	.SETSCREW:5-40 X 0.094,STL	71159	ORDER BY DESC
-12	366-1391-00	B010100	B023469	3	KNOB:GY,0.081 ID X 0.28 OD X 0.32 H	80009	366-1391-00
	366-1391-01	B023470		3	KNOB:GY,0.081 ID X 0.28 OD X 0.32 H	80009	366-1391-01
	213-0239-00			3	.SETSCREW:3-48 X 0.062,STL	80009	213-0239-00
-13	366-1077-00	B010100	B023469	3	KNOB:GRAY W/SETSCREW	80009	366-1077-00
	366-1077-01	B023470		3	KNOB:GY,0.127 ID X 0.5 OD X 0.531 H	80009	366-1077-01
	213-0153-00			3	.SETSCREW:5-40 X 0.125,STL	TK0392	ORDER BY DESC
-14	366-1512-00			5	PUSH BUTTON:SIL GY,0.18 SQ X 0.83	80009	366-1512-00
-15	366-1559-00			4	PUSH BUTTON:SIL GY,0.18 SQ X 0.43	80009	366-1559-00
-16	-----			1	CONNECTOR,RCPT,:(SEE J500 REPL) (ATTACHING PARTS)		
-17	210-0255-00			1	TERMINAL,LUG:0.391 ID,LOCKING,BRS CD PL (END ATTACHING PARTS)	12327	ORDER BY DESC
-18	-----			2	CONN,RCPT,ELEC:(SEE J100,J200 REPL)		
	210-0207-00			2	TERMINAL,LUG:0.385 OD,PLAIN,BRS CD PL	12697	01136902
-19	-----			1	RESISTOR,VAR:(SEE R714 REPL) (ATTACHING PARTS)		
-20	210-0583-00			1	NUT,PLAIN,HEX:0.25-32 X 0.312,BRS CD PL	73743	2X-20319-402
-21	210-0940-00			1	WASHER,FLAT:0.25 ID X 0.375 OD X 0.02,STL (END ATTACHING PARTS)	12327	ORDER BY DESC
-22	361-0143-00			1	SPACER,RING:0.125 L X 0.281 ID,AL	80009	361-0143-00
-23	-----			1	RESISTOR,VAR:(SEE R560 REPL) (ATTACHING PARTS)		
-24	210-0583-00			1	NUT,PLAIN,HEX:0.25-32 X 0.312,BRS CD PL	73743	2X-20319-402
-25	210-0940-00			1	WASHER,FLAT:0.25 ID X 0.375 OD X 0.02,STL (END ATTACHING PARTS)	12327	ORDER BY DESC
-26	348-0067-00			1	GROMMET,PLASTIC:GRAY,ROUND,0.252 ID	80009	348-0067-00
-27	358-0378-00			1	BUSHING,SLEEVE:0.131 ID X 0.18 OD X 0.125 L	80009	358-0378-00
-28	426-1072-00			9	FRAME,PUSH BTN:SILVER GRAY PLSTC	80009	426-1072-00
-29	220-0633-00			1	NUT,PLAIN,KNURL:0.25-28 X 0.375 OD,BRS NP	80009	220-0633-00
-30	333-1998-00	B010100	B023469	1	PANEL,FRONT:	80009	333-1998-00
	333-1998-01	B023470		1	PANEL,FRONT: (ATTACHING PARTS)	80009	333-1998-01
-31	210-0583-00			2	NUT,PLAIN,HEX:0.25-32 X 0.312,BRS CD PL	73743	2X-20319-402
-32	210-0940-00			2	WASHER,FLAT:0.25 ID X 0.375 OD X 0.02,STL	12327	ORDER BY DESC
-33	355-0170-00			1	STUD,SHLDR&STEP:BINDING POST	80009	355-0170-00

Replaceable Mechanical Parts - SC 502

Fig. & Index No.	Tektronix Part No.	Serial/Assembly No.		Qty	12345 Name & Description	Mfr.	
		Effective	Dscont			Code	Mfr. Part No.
1-34	211-0537-00			1	SCREW,MACHINE:6-32 X 0.375,TRH,STL (END ATTACHING PARTS)	TK0435	ORDER BY DESC
-35	214-1513-01	B010100	B022399	1	LCH,PL-IN RTNG:PLASTIC	80009	214-1513-01
	105-0719-00	B022400		1	LATCH,RETAINING:PLUG-IN (ATTACHING PARTS)	80009	105-0719-00
-36	213-0254-00			1	SCREW,TPG,TF:2-32 X 0.25,TYPE B,FLH,100 DEG (END ATTACHING PARTS)	45722	ORDER BY DESC
	105-0718-00	B022400	B024739	1	BAR,LATCH RLSE:	80009	105-0718-00
	105-0718-01	B024740		1	BAR,LATCH RLSE:	80009	105-0718-01
-37	348-0055-00			2	GROMMET,PLASTIC:GRAY,ROUND,0.207 ID	80009	348-0055-00
-38	136-0387-00			1	.JACK,TIP:U/W 0.04 DIA PIN,GRAY	71279	4504352010318
-39	386-3134-01	B010100	B023139	1	SUBPANEL,FRONT:	80009	386-3134-01
	386-3134-03	B023140		1	SUBPANEL,FRONT:PAINTED GRAY (ATTACHING PARTS)	80009	386-3134-03
-40	213-0229-00	B010100	B025259	4	SCR,TPG,TF:6-20 X 0.375,TYPE B,FLH,100 DEG	93907	ORDER BY DESC
	213-0123-00	B025260		4	SCREW,TPG,TF:6-32 X 0.375,SPCL TYPE,FLH (END ATTACHING PARTS)	93907	234-21940-026
-41	384-1099-00			4	EXTENSION SHAFT:1.58 L X 0.187 SQ,PLSTC	80009	384-1099-00
-42	384-1100-00			1	EXTENSION SHAFT:6.215 L X 0.187 SQ,PLASTIC	80009	384-1100-00
-43	384-0289-00			1	EXTENSION SHAFT:2.813 L X 0.125 STEP OD,STL	TK0588	ORDER BY DESC
-44	376-0165-00			1	CPLG,SHAFT,RGD:0.127 & 0.07,BLACK NYLON	80009	376-0165-00
	213-0075-00			2	.SETSCREW:4-40 X 0.094,STL	74445	ORDER BY DESC
-45	384-1056-00			1	EXTENSION SHAFT:6.58 L X 0.123 OD,EPOX GL	80009	384-1056-00
-46	376-0051-01			1	CPLG,SHAFT,FLEX:0.127 ID X 0.375 OD,DEL RIN	80009	376-0051-01
	213-0048-00			1	.SETSCREW:4-40 X 0.125,STL	TK0392	ORDER BY DESC
-47	200-1809-00			1	COVER,VAR RES:MKD CAUTION HIGH VOLTAGE	TK1617	N/A
-48	213-0282-00	B010100	B021604	1	THUMBSCREW:0.375 X 10.7MM,9.525 OD,PLSTC	83385	ORDER BY DESC
	213-0753-00	B021605	B021639	1	THUMBSCREW:0.375-32 X 0.36,0.75 OD HD,PLSTC	80009	213-0753-00
	213-0282-00	B021640		1	THUMBSCREW:0.375 X 10.7MM,9.525 OD,PLSTC	83385	ORDER BY DESC
-49	407-1623-00			1	BRACKET,PANEL:REAR (ATTACHING PARTS)	80009	407-1623-00
-50	211-0507-00			3	SCREW,MACHINE:6-32 X 0.312,PNH,STL (END ATTACHING PARTS)	83385	ORDER BY DESC
-51	-----			1	TRANSISTOR:(SEE Q970 REPL) (ATTACHING PARTS)		
-52	211-0097-00			1	SCREW,MACHINE:4-40 X 0.312,PNH,STL	TK0435	ORDER BY DESC
-53	210-0406-00			1	NUT,PLAIN,HEX:4-40 X 0.188,BRS CD PL	73743	12161-50
-54	210-0994-00			1	WASHER,FLAT:0.125ID X 0.250D X 0.022 (END ATTACHING PARTS)	86928	A371-283-20
-55	342-0202-00			1	INSULATOR,PLATE:TRANSISTOR,MICA	91500	10-21-023-106
-56	214-1061-00			1	CONTACT,ELEC:GROUNDING,CU BE	80009	214-1061-00
-57	426-1245-00	B010100	B023009	1	FR SECT,PLUG-IN:LEFT, TOP AND BOTTOM	80009	426-1245-00
	426-1245-01	B023010		1	FR SECT,PLUG-IN:TOP LEFT (ATTACHING PARTS)	80009	426-1245-01
-58	213-0192-00			1	SCREW,TPG,TF:6-32 X 0.5,SPCL TYPE,FILH,STL	87308	ORDER BY DESC
	212-0109-00			1	SCREW,MACHINE:8-32 X 0.188,FILH,STL (END ATTACHING PARTS)	83385	ORDER BY DESC
-59	426-1246-00			1	FR SECT,PLUG-IN:RIGHT SIDE (ATTACHING PARTS)	80009	426-1246-00
-60	213-0192-00			1	SCREW,TPG,TF:6-32 X 0.5,SPCL TYPE,FILH,STL	87308	ORDER BY DESC
	212-0109-00			1	SCREW,MACHINE:8-32 X 0.188,FILH,STL (END ATTACHING PARTS)	83385	ORDER BY DESC
-61	255-0334-00			AR	PLASTIC CHANNEL:12.75 X 0.175 X 0.155	11897	122-37-2500
-62	386-3135-00	B010100	B023009	1	PANEL,REAR:	80009	386-3135-00
	386-3135-01	B022010		1	PANEL,REAR: (ATTACHING PARTS)	80009	386-3135-01
-63	211-0504-00	B010100	B028799	2	SCREW,MACHINE:6-32 X 0.250,PNH,STL	TK0435	ORDER BY DESC
	211-0507-00	B028800		2	SCREW,MACHINE:6-32 X 0.312,PNH,STL	83385	ORDER BY DESC
-64	211-0097-00			2	SCREW,MACHINE:4-40 X 0.312,PNH,STL	TK0435	ORDER BY DESC
	213-0192-00			2	SCREW,TPG,TF:6-32 X 0.5,SPCL TYPE,FILH,STL (END ATTACHING PARTS)	87308	ORDER BY DESC
-65	220-0625-00			2	NUT,SHEET SPR:6-32,STL CD PL,CLIP-ON TYPE	78553	C8090-632-24
-66	386-1316-00			1	.SUPPORT,CRT:REAR	80009	386-1316-00
-67	136-0643-00	B010100	B039279	1	.SKT,PL-IN ELEK:ELCTRN TUBE,12 CONT W/LEADS	80009	136-0643-00
	136-0643-01	B039280		1	.SKT,PL-IN ELEK:ELCTRN TUBE,12 CONT W/LEADS	80009	136-0643-01
	131-0707-00			3	.CONTACT,ELEC:22-26 AWG,BRS,CU BE GLD PL	22526	47439-000

Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
1-	210-0966-00	B021604	B021641	1	WASHER,FLAT:0.312 ID X 0.875 OD X 0.09	86928	ORDER BY DESCR
-68	214-1700-00			1	SPRING,FLAT:73MM X 3.2MM,PH BRZ	80009	214-1700-00
-69	337-2203-00			1	SHLD,IMPLOSION:BLUE POLYCARBONATE	80009	337-2203-00
-70	386-3160-00			1	SUPPORT,CRT:FRONT	80009	386-3160-00
-71	-----			1	FORM,COIL:(SEE L895 REPL)		
-72	252-0562-00			AR 1	PLASTIC EXTR:0.1 X 0.12,POLYETHYLENE	06229	GS2
-73	334-2363-00			1	MARKER,IDENT:MKD DANGER,HIGH VOLTAGE	80009	334-2363-00
	334-1379-00			1	MARKER,IDENT:MKD HI VACUUM	22670	ORDER BY DESCR
	348-0090-00	B028700		1	PAD,CUSHIONING:2.03 X 0.69 X 0.312 SI RBR	85471	R-10470MED/PSA
-74	337-2140-00			1	SHIELD,CRT:	80009	337-2140-00
-75	200-1780-00			1	COVER,HV:BOTTOM (ATTACHING PARTS)	80009	200-1780-00
-76	211-0097-00			2	SCREW,MACHINE:4-40 X 0.312,PNH,STL	TK0435	ORDER BY DESCR
-77	210-0851-00			2	WASHER,FLAT:0.119 X 0.375 X 0.025,STL (END ATTACHING PARTS)	12327	ORDER BY DESCR
-78	426-1199-00	B010100	B023139	1	FR SECT,PLUG-IN:BOTTOM	80009	426-1199-00
	426-1199-01	B023140		1	FR SECT,PLUG-IN:BOTTOM	80009	426-1199-01
	386-3657-00	B022430	B025769	2	SUPPORT,PLUG-IN:	80009	386-3657-00
	386-3657-01	B025770		2	SUPPORT,PLUG-IN:	93907	ORDER BY DESCR
-79	-----			1	DELAY LINE,ELEC:(SEE DL400 REPL) (ATTACHING PARTS)		
-80	211-0097-00			2	SCREW,MACHINE:4-40 X 0.312,PNH,STL (END ATTACHING PARTS) DELAY LINE ASSY INCLUDES:	TK0435	ORDER BY DESCR
-81	131-1721-00			2	.CONTACT,ELEC:DELAY LINE,0.035 DIA MALE	80009	131-1721-00
-82	361-0008-00			1	SPACER,SLEEVE:0.28 L X 0.111 ID,PP	80009	361-0008-00
-83	334-2361-00			3	MARKER,IDENT:MKD DANGER	80009	334-2361-00
-84	-----			1	CKT BOARD ASSY:HORIZ DEFL(SEE A4 REPL) (ATTACHING PARTS)		
-85	211-0116-00	B010100	B028339	2	SCR,ASSEM WSHR:4-40 X 0.312,PNH,BRS,POZ	77900	ORDER BY DESCR
	211-0292-00	B028340		2	SCR,ASSEM WSHR:4-40 X 0.29,PNH,BRS NI PL (END ATTACHING PARTS) CKT BOARD ASSY INCLUDES:	78189	51-040445-01
-86	131-0608-00			8	.TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL	22526	48283-036
-87	129-0455-00			2	.SPACER,POST:0.305 L,4-40 THRU,BRS,CU SN ZN .PL,0.25 OD	80009	129-0455-00
-88	-----			1	CKT BOARD ASSY:TRIGGER(SEE A3 REPL) (ATTACHING PARTS)		
	211-0116-00	B010100	B028339	2	SCR,ASSEM WSHR:4-40 X 0.312,PNH,BRS,POZ	77900	ORDER BY DESCR
	211-0292-00	B028340		2	SCR,ASSEM WSHR:4-40 X 0.29,PNH,BRS NI PL (END ATTACHING PARTS) CKT BOARD ASSY INCLUDES:	78189	51-040445-01
-89	343-0496-04			1	.CLIP,SWITCH:FRONT,10MM X 4 UNIT	80009	343-0496-04
-90	343-0497-04			1	.CLIP,SWITCH:REAR,10MM X 4 UNIT	80009	343-0497-04
-91	210-3033-00			8	.EYELET,METALLIC:0.059 OD X 0.156 L,BRS	07707	SE-25
-92	-----			1	.ACTR ASSY,PB:(SEE A3S500 REPL)		
-93	-----			1	.ACTR ASSY,PB:(SEE A3S600 REPL)		
-94	-----			1	.SWITCH,PUSH:(SEE A3S550 REPL)		
-95	361-0385-00			6	.SPACER,PB SW:0.164 L,GREEN POLYCARBONATE	80009	361-0385-00
	361-0384-00			6	.SPACER,PB SW:0.133 L,RED POLYCARBONATE	80009	361-0384-00
-96	131-0608-00			28	.TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL	22526	48283-036
-97	136-0634-00	B010100	B039999	1	.SKT,PL-IN ELEK:MICROCIRCUIT,20 DIP	09922	DILB20P-108
	136-0752-00	B040000		1	.SKT,PL-IN ELEK:MICROCIRCUIT,20 DIP	09922	DILB20P-108
-98	131-0566-00			1	.BUS,CONDUCTOR:DUMMY RES,0.094 X 0.225	24546	OMA 07
-99	136-0252-04			2	.SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS	22526	75060-007
-100	136-0577-00			1	.CONN,RCPT,ELEC:CKT BOARD,15 CONTACT	22526	65001-015
-101	136-0260-02	B010100	B039999	2	.SKT,PL-IN ELEK:MICROCKT,16 DIP,PCB MT	09922	DILB16P-108T
	136-0729-00	B040000		2	.SKT,PL-IN ELEK:MICROCKT,16 CONTACT	09922	DILB16P-108T
-102	136-0514-00	B010100	B039999	3	.SKT,PL-IN ELEK:MICROCIRCUIT,8 DIP	09922	DILB8P-108
	136-0727-00	B040000		3	.SKT,PL-IN ELEK:MICROCKT,8 CONTACT	09922	DILB8P-108
-103	-----			4	.TERM,TEST POINT:(SEE A3TP940,TP941,TP942, .TP980 REPL)		
-104	344-0154-00			4	.CLIP,ELECTRICAL:FUSE,CKT BD MT	80009	344-0154-00
-105	352-0222-00			3	.HOLDER,CABLE:HORIZ CKT BD MT,DELTRIN	80009	352-0222-00
	198-3788-00	B022580		1	.WIRE SET,ELEC:	80009	198-3788-00
-106	-----			1	CKT BOARD ASSY:F & I (SEE A2 REPL)		

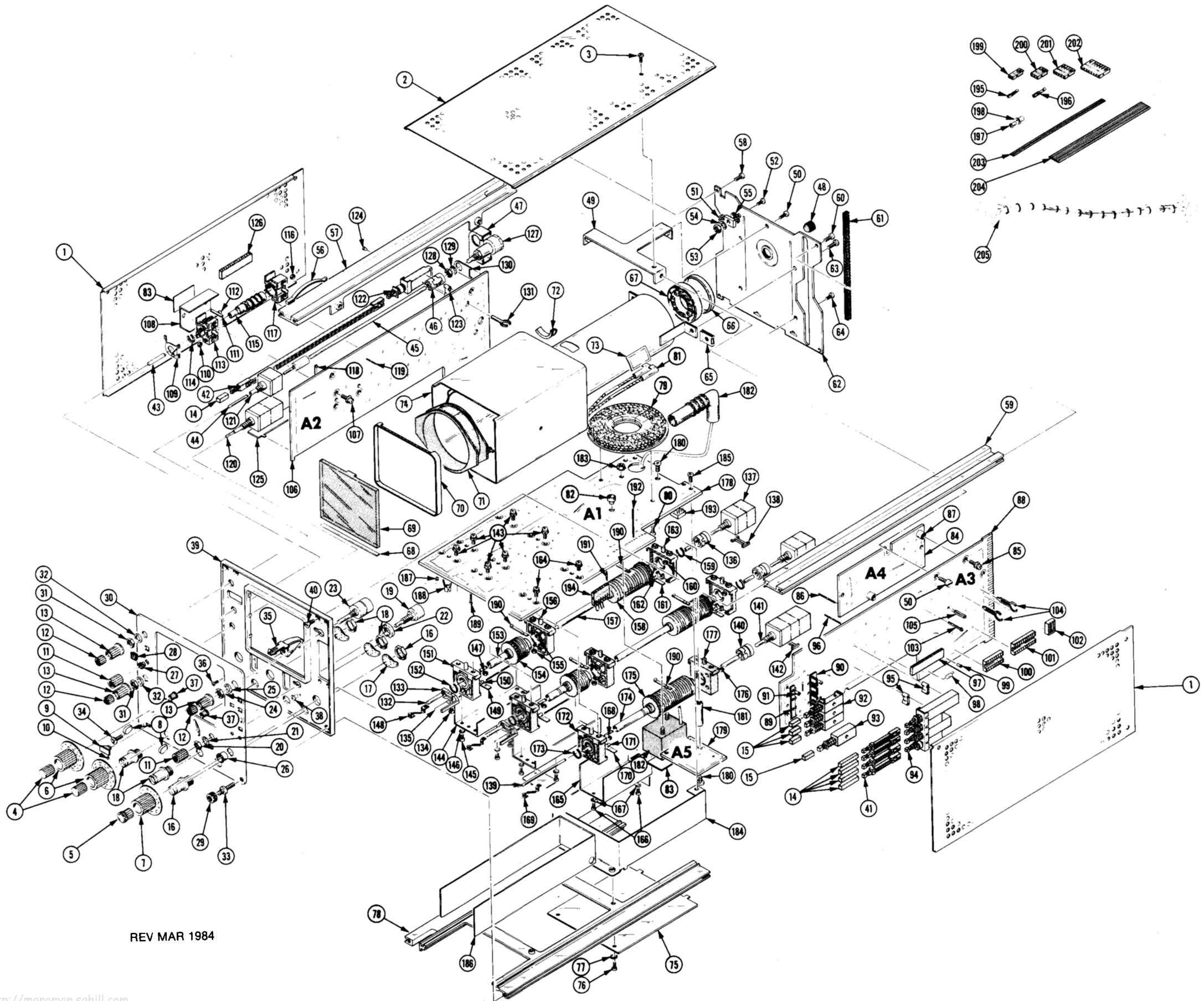
Replaceable Mechanical Parts - SC 502

Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective Dscnt		Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
1-					.ACTR ASSY,CAM S:DISPLAY(SEE S300 REPL) (ATTACHING PARTS)		
-107	211-0116-00	B010100	B028339	4	.SCR,ASSEM WSHR:4-40 X 0.312,PNH,BRS,POZ	77900	ORDER BY DESC
	211-0292-00	B028340		4	.SCR,ASSEM WSHR:4-40 X 0.29,PNH,BRS NI PL (END ATTACHING PARTS)	78189	51-040445-01
					ACTUATOR INCLUDES:		
-108	200-1660-00			1	..COVER,CAM SW:5 ELEMENTS	80009	200-1660-00
-109	131-1248-00			1	..CONTACT,ELEC:SHAFT GND,NI BE	80009	131-1248-00
-110	210-0406-00			2	..NUT,PLAIN,HEX:4-40 X 0.188,BRS CD PL	73743	12161-50
-111	214-1704-01			1	..SPRING,FLAT:0.52 X 0.125 X 0.008,CU BE	80009	214-1704-01
-112	214-1127-00			1	..ROLLER,DETENT:0.125 DIA X 0.125,SST	80009	214-1127-00
-113	401-0155-00			1	..BEARING,CAM SW:FRONT,0.454 DIA CAM (ATTACHING PARTS)	80009	401-0155-00
-114	354-0219-00			1	..RING,RETAINING:EXT,CRESCENT,U/O 0.25 DIA (END ATTACHING PARTS)	79136	5103-25-S-ZD-R
-115	105-0674-00			1	..ACTUATOR,CAM SW:DISPLAY MODE	80009	105-0674-00
-116	210-0406-00			2	..NUT,PLAIN,HEX:4-40 X 0.188,BRS CD PL	73743	12161-50
-117	401-0156-00			1	..BEARING,CAM SW:REAR,0.454 DIA CAM	80009	401-0156-00
-118	131-0604-00			5	..CONTACT,ELEC:CKT BD SW,SPR,CU BE	80009	131-0604-00
-119	131-0608-00			21	..TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL	22526	48283-036
-120	-----			1	..RES.,VARIABLE:(SEE A2R324 REPL)		
-121	-----			1	..RES.,VARIABLE:(SEE A2R831 REPL)		
-122	-----			1	..SWITCH,PUSH:(SEE A2S400 REPL)		
-123	361-0382-00			2	..SPACER,PB SW:0.275 L,BROWN POLYCARBONATE	80009	361-0382-00
-124	136-0252-04			28	..SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS	22526	75060-007
-125	337-2228-00			1	..SHIELD,ELEC:CIRCUIT BOARD	80009	337-2228-00
-126	136-0577-00			1	..CONN,RCPT,ELEC:CKT BOARD,15 CONTACT	22526	65001-015
-127	-----			1	..RES.,VARIABLE:(SEE A2R894 REPL) (ATTACHING PARTS)		
-128	210-0583-00			1	..NUT,PLAIN,HEX:0.25-32 X 0.312,BRS CD PL	73743	2X-20319-402
-129	210-0046-00			1	..WASHER,LOCK:0.261 ID,INTL,0.018 THK,STL (END ATTACHING PARTS)	77900	1214-05-00-0541C
-130	386-3263-00			1	..PL,VAR RES MTG:	80009	386-3263-00
-131	352-0086-00			1	..HOLDER,TOROID:0.5 DIA,DELIN	80009	352-0086-00
	672-0512-00	B010100	B041865	1	CIRCUIT BD ASSY:MAIN	80009	672-0512-00
	672-0512-01	B041866	B042044	1	CIRCUIT BD ASSY:MAIN 670-3758-00 W/CAM SW	80009	672-0512-01
	672-0512-02	B042045		1	CIRCUIT BD ASSY:MAIN	80009	672-0512-02
-132	384-1175-00			2	..EXTENSION SHAFT:5.7 L X 0.123 OD,EPOXY GL	80009	384-1175-00
-133	214-2321-01			2	..LEVER,SWITCH:0.25 ID X 0.715 L,W/4-40 THD (ATTACHING PARTS)	80009	214-2321-01
-134	211-0225-00			2	.SCREW,CAP:4-40 X 0.312,SCH,STL,CD PL,HEX RE .C (END ATTACHING PARTS)	TK0428	ORDER BY DESC
-135	131-1314-00			2	..CONTACT,ELEC:GROUNDING,MONEL	80009	131-1314-00
-136	376-0051-01			2	..CPLG,SHAFT,FLEX:0.127 ID X 0.375 OD,DELIN	80009	376-0051-01
	213-0048-00			8	..SETSCREW:4-40 X 0.125,STL	TK0392	ORDER BY DESC
-137	-----			2	..RES.,VARIABLE:(SEE R177 AND R277 REPL)		
-138	361-0515-00			2	..SPACER,SWITCH:0.176 L,ACETAL	80009	361-0515-00
-139	384-1380-00			1	..EXTENSION SHAFT:5.2 L X 0.081 OD,SST,PSVT	80009	384-1380-00
-140	376-0050-00			1	..CPLG,SHAFT,FLEX:0.081 & 0.127 ID,PP	80009	376-0050-00
	213-0022-00			4	..SETSCREW:4-40 X 0.188,STL	74445	ORDER BY DESC
-141	-----			1	..RES.,VARIABLE:(SEE R674 REPL)		
-142	361-0515-00			1	..SPACER,SWITCH:0.176 L,ACETAL .ACTR ASSY,CAM S:(SEE S100/S150, S200/S250 REPL) (ATTACHING PARTS)	80009	361-0515-00
-143	211-0116-00	B010100	B028339	12	.SCR,ASSEM WSHR:4-40 X 0.312,PNH,BRS,POZ	77900	ORDER BY DESC
	211-0292-00	B028340		12	.SCR,ASSEM WSHR:4-40 X 0.29,PNH,BRS NI PL (END ATTACHING PARTS)	78189	51-040445-01
					EACH ACTUATOR INCLUDES:		
-144	200-1816-00			1	..COVER,CAM SW:14 & 3 ELEMENTS (ATTACHING PARTS)	80009	200-1816-00
-145	211-0008-00			6	..SCREW,MACHINE:4-40 X 0.25,PNH,STL	93907	ORDER BY DESC
-146	210-0004-00			6	..WASHER,LOCK:#4 INTL,0.015 THK,STL (END ATTACHING PARTS)	77900	1204-00-00-0541C
-147	210-0406-00			2	..NUT,PLAIN,HEX:4-40 X 0.188,BRS CD PL	73743	12161-50

Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective Dscnt	Qty	12345	Name & Description	Mfr. Code	Mfr. Part No.
1-148	131-0963-00		2		..CONTACT, ELEC:GROUNDING, PH BRZ, W/BRACKET	TK0507	ORDER BY DESCR
-149	214-1139-03		2		..SPRING, FLAT:0.885 X 0.156 CU BE RED CLR	80009	214-1139-03
-150	214-1752-00		2		..ROLLER, DETENT:0.125 OD X 0.16, SST	80009	214-1752-00
-151	401-0178-00		1		..BEARING, CAM SW:CENTER/REAR ..(ATTACHING PARTS)	80009	401-0178-00
-152	354-0390-00		1		..RING, RETAINING: BASIC EXT, U/O 0.375 DIA ..(END ATTACHING PARTS)	79136	5100-37-ZD
-153	384-0878-06		1		..SHAFT, CAM SW:1.414 L X 0.248 OD OUTER CONCE ..NTRIC W/DRIVER ..(ATTACHING PARTS)	80009	384-0878-06
	354-0443-00		1		..RING, RETAINING: EXT CRESCENT, U/O 0.375 DIA ..(END ATTACHING PARTS)	79136	5103-37-MD
-154	105-0672-00		1		..ACTUATOR, CAM SW:AC, GND, DC	80009	105-0672-00
-155	210-0406-00		4		..NUT, PLAIN, HEX:4-40 X 0.188, BRS CD PL	73743	12161-50
-156	401-0180-00		1		..BEARING, CAM SW:FRONT & REAR, 0.80 & 0.83 DI ..A CAM DOUBLE BOARD	80009	401-0180-00
-157	384-0880-03		1		..SHAFT, CAM SW:3.121 L X 0.188 OD INTMD CONCE ..NTRIC W/DRIVER	80009	384-0880-03
-158	105-0671-00		1		..ACTUATOR, CAM SW:VOLTS/DIV ..(ATTACHING PARTS)	80009	105-0671-00
-159	354-0390-00		1		..RING, RETAINING: BASIC EXT, U/O 0.375 DIA ..(END ATTACHING PARTS)	79136	5100-37-ZD
-160	210-0406-00		4		..NUT, PLAIN, HEX:4-40 X 0.188, BRS CD PL	73743	12161-50
-161	214-1139-03		1		..SPRING, FLAT:0.885 X 0.156 CU BE RED CLR	80009	214-1139-03
	214-1139-02		1		..SPRING, FLAT:0.885 X 0.156 CU BE GRN CLR	80009	214-1139-02
-162	214-1752-00		2		..ROLLER, DETENT:0.125 OD X 0.16, SST	80009	214-1752-00
-163	401-0180-00		1		..BEARING, CAM SW:FRONT & REAR, 0.80 & 0.83 DI ..A CAM DOUBLE BOARD ..ACTR ASSY, CAM S:HORIZONTAL(SEE S1000 REPL) ..(ATTACHING PARTS)	80009	401-0180-00
-164	211-0116-00	B010100	4	B028339	..SCR, ASSEM WSHR:4-40 X 0.312, PNH, BRS, POZ	77900	ORDER BY DESCR
	211-0292-00	B028340	4		..SCR, ASSEM WSHR:4-40 X 0.29, PNH, BRS NI PL ..(END ATTACHING PARTS) ..ACTUATOR INCLUDES:	78189	51-040445-01
-165	200-1817-00		1		..COVER, CAM SW:14 ELEMENTS ..(ATTACHING PARTS)	80009	200-1817-00
-166	211-0008-00		4		..SCREW, MACHINE:4-40 X 0.25, PNH, STL	93907	ORDER BY DESCR
-167	210-0004-00		4		..WASHER, LOCK:#4 INTL, 0.015 THK, STL ..(END ATTACHING PARTS)	77900	1204-00-00-0541C
-168	210-0406-00		2		..NUT, PLAIN, HEX:4-40 X 0.188, BRS CD PL	73743	12161-50
-169	131-0963-00		2		..CONTACT, ELEC:GROUNDING, PH BRZ, W/BRACKET	TK0507	ORDER BY DESCR
-170	214-1139-02		2		..SPRING, FLAT:0.885 X 0.156 CU BE GRN CLR	80009	214-1139-02
-171	214-1752-00		2		..ROLLER, DETENT:0.125 OD X 0.16, SST	80009	214-1752-00
-172	401-0180-00		1		..BEARING, CAM SW:FRONT & REAR, 0.80 & 0.83 DI ..A CAM DOUBLE BOARD ..(ATTACHING PARTS)	80009	401-0180-00
-173	354-0390-00		1		..RING, RETAINING: BASIC EXT, U/O 0.375 DIA ..(END ATTACHING PARTS)	79136	5100-37-ZD
-174	384-0878-07		1		..SHAFT, CAM SW:2.519 L X 0.248 OD OUTER CONCE ..NTRIC W/DRIVER	80009	384-0878-07
-175	105-0673-00		1		..ACTUATOR, CAM SW:HORIZONTAL	80009	105-0673-00
-176	210-0406-00		4		..NUT, PLAIN, HEX:4-40 X 0.188, BRS CD PL	73743	12161-50
-177	401-0178-00		1		..BEARING, CAM SW:CENTER/REAR	80009	401-0178-00
-178	-----		1		..CKT BOARD ASSY:MAIN(SEE A1 REPL)		
-179	-----		1		..CKT BOARD ASSY:(SEE A5 REPL) ..(ATTACHING PARTS)		
-180	211-0507-00		2		..SCREW, MACHINE:6-32 X 0.312, PNH, STL ..(END ATTACHING PARTS)	83385	ORDER BY DESCR
-181	385-0016-00		1		..SPACER, POST:1.0 L W/6-32 THD THRU, NYLON	80009	385-0016-00
-182	-----		1		..SEMICON DVC, DI:HV MULTR(SEE U850 REPL) ..(ATTACHING PARTS)		
-183	210-0407-00		2		..NUT, PLAIN, HEX:6-32 X 0.25, BRS CD PL ..(END ATTACHING PARTS)	73743	3038-402
-184	337-2168-00		1		..SHIELD, ELEC:FRONT ..(ATTACHING PARTS)	80009	337-2168-00
-185	211-0116-00	B010100	2	B028339	..SCR, ASSEM WSHR:4-40 X 0.312, PNH, BRS, POZ	77900	ORDER BY DESCR

Replaceable Mechanical Parts - SC 502

Fig. & Index No.	Tektronix Part No.	Serial/Assembly No.		Qty	12345 Name & Description	Mfr.	
		Effective	Dscont			Code	Mfr. Part No.
1-	211-0292-00	B028340		2	..SCR,ASSEM WSHR:4-40 X 0.29,PNH,BRS NI PL ..(END ATTACHING PARTS)	78189	51-040445-01
-186	337-2166-00			1	..SHIELD,ELEC:RIGHT,CKT BD MTG	80009	337-2166-00
-187	136-0252-04			77	..SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS	22526	75060-007
-188	131-1003-00			2	..CONN,RCP,T,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
-189	-----			3	..TERM,TEST POINT:(SEE A1TP677,TP850, ..TP860 REPL)		
-190	131-0604-00			42	..CONTACT,ELEC:CKT BD SW,SPR,CU BE	80009	131-0604-00
-191	131-0608-00			38	..TERMINAL,PIN:0.365 L X 0.025 BRZ GLD PL	22526	48283-036
-192	131-0787-00			28	..TERMINAL,PIN:0.64 L X 0.025 SQ PH BRZ	22526	47359-000
-193	136-0514-00	B010100	B039999	1	..SKT,PL-IN ELEK:MICROCIRCUIT,8 DIP	09922	D1LB8P-108
	136-0727-00	B040000		1	..SKT,PL-IN ELEK:MICROCKT,8 CONTACT	09922	D1LB8P-108
-194	131-1838-00			1	..BUS,CONDUCTOR:7,26 AWG,0.313 L	80009	131-1838-00
	198-2303-00			1	WIRE SET,ELEC:	80009	198-2303-00
-195	131-1538-00			4	.CONNECTOR,TERM:22-26 AWG U/O 0.04 SQ PIN	22526	75369-002
-196	131-0707-00	B010100	B021189	35	.CONTACT,ELEC:22-26 AWG,BRS,CU BE GLD PL	22526	47439-000
	131-0707-00	B021190		37	.CONTACT,ELEC:22-26 AWG,BRS,CU BE GLD PL	22526	47439-000
	131-0708-00			1	.CONTACT,ELEC:28-32 AWG,BRS,CU BE GLD PL	22526	47437-000
-197	210-0774-00			8	.EYELET,METALLIC:0.152 OD X 0.218 L	80009	210-0774-00
-198	210-0775-00			8	.EYELET,METALLIC:0.126 OD X 0.205 L	80009	210-0775-00
-199	352-0169-01			2	.HLDR,TERM CONN:2 WIRE,BROWN	80009	352-0169-01
	352-0169-06			1	.HLDR,TERM CONN:2 WIRE,BLUE	80009	352-0169-06
	352-0169-07			1	.HLDR,TERM CONN:2 WIRE,VIOLET	80009	352-0169-07
	352-0169-00	B021189		1	.HLDR,TERM CONN:2 WIRE,BLACK	80009	352-0169-00
-200	352-0161-03			1	.HLDR,TERM CONN:3 WIRE,ORANGE	80009	352-0161-03
	352-0161-04			2	.HLDR,TERM CONN:3 WIRE,YELLOW	80009	352-0161-04
-201	352-0163-05			1	.HLDR,TERM CONN:5 WIRE,GREEN	80009	352-0163-05
-202	352-0166-08			1	.HLDR,TERM CONN:8 WIRE,GRAY	80009	352-0166-08
-203	175-0862-00			AR	.CABLE,SP,ELEC:3,22 AWG,STRD,PVC JKT,RBN	TK0846	03CF22M19-BBT
	175-0826-00			AR	.CABLE,SP,ELEC:3,26 AWG,STRD,PVC JKT,RBN	80009	175-0826-00
	175-0828-00			AR	.CABLE,SP,ELEC:5,26 AWG,STRD,PVC JKT,RBN	08261	111-2699-955
-204	175-0831-00			AR	.CABLE,SP,ELEC:8,26 AWG,STRD,PVC INSUL,RBN	08261	111-2699-971
-205	179-2198-00			1	WIRING HARNESS:COAX CABLE	80009	179-2198-00
	179-2199-00			1	WIRING HARNESS:CIRCUIT BOARD	80009	179-2199-00
					STANDARD ACCESSORIES		
	070-1878-01			1	MANUAL,TECH:INSTR	80009	070-1878-01



REV MAR 1984

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

070-1878-01

1 MANUAL, TECH: INSTRUCTION

80009 070-1878-01