

Tektronix®

**SC 503
10 MHz STORAGE
OSCILLOSCOPE**

(SN B039999 & BELOW)

INSTRUCTION MANUAL



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

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10 MHz STORAGE
OSCILLOSCOPE**

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INSTRUCTION MANUAL

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


070-2636-02
Product Group 75

Serial Number _____

First Printing JUN 1978
Revised MAR 1983

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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
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200000	Tektronix United Kingdom, Ltd., London
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WARNING

THE FOLLOWING SERVICING 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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SAFETY INFORMATION


The following general safety information applies to all operators and service personnel. Specific warnings appear throughout the manual where they apply and should be followed in each instance.

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

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


The word **DANGER** on the equipment identifies areas of immediate hazard which could result in personal injury or loss of life.

The following safety symbols may appear on the equipment:

 — Refer to the manual

 — High voltage

Protective ground terminal

 — A terminal which must be connected to earth ground prior to making any other connections to the equipment.

Ground the Power Module

To avoid electric shock, the power module must be properly grounded. Refer to the power module manual for grounding instructions.

Do not use the power module power cord grounding conductor as the sole signal-return current conductor.

Use the Proper Power Cord

To avoid electric shock and fire, use only the power cord and plug specified for your power module. Use only a power cord that is in good condition.

For detailed information on power plugs see the power module manual.

Use the Proper Fuse

To avoid electric shock and fire, use only the fuses specified in your power module and plug-in manuals and which are identical in the following aspects:

- a. Physical Size—3AG, etc.
- b. Type—Slow Blow, Fast Blow, etc.
- c. Voltage Rating
- d. Current Rating

Do Not Operate in an Explosive Atmosphere

To avoid explosion, do not operate this instrument in an area where flammable gas or fumes are present. Such operation could cause an explosion.

Exercise Care When Handling the Crt

Breaking the crt may cause an implosion. Wear protective clothing and safety glasses when handling the crt. When storing the crt, put 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.

Avoid Excessive Moisture

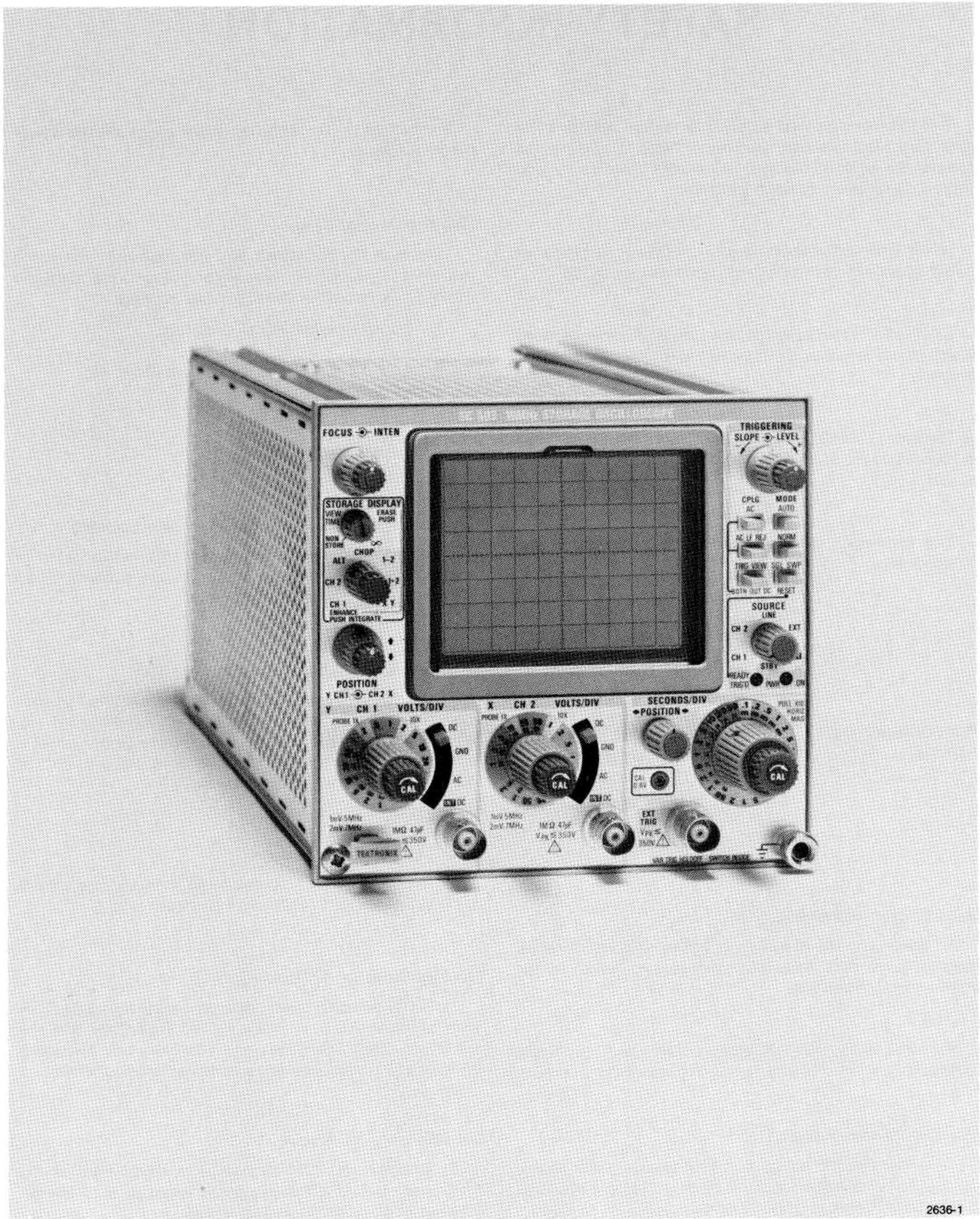
Circuit boards and components must be dry before applying power to prevent damage from arcing.

Do Not Operate Without Covers

To avoid personal injury, do not operate the instrument without the panels or covers installed. Do not perform any servicing other than that described in the operating instructions unless you are a qualified serviceperson.

Do Not Service Alone

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



2636-1

SC 503 STORAGE OSCILLOSCOPE.

OPERATING INSTRUCTIONS

Introduction

The SC 503 Oscilloscope is a dual-trace, bi-stable storage oscilloscope designed to operate in two compartments of a TM 500 series power module. It features variable enhance and integrate display modes to increase the writing speed. The SC 503 has bi-stable storage, including auto-erase, a wide range of deflection factors, and versatile triggering including auto triggering and trigger view.

Recommended probes for use with the SC 503 are the P6062B, P6105, and P6060. The P6062B probe has a selectable 1X or 10X attenuation while the attenuation of the P6105 is 10X.

Installation

CAUTION

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

The SC 503 is calibrated and ready to use when received. Referring to Fig. 1-1, install the SC 503 in the power module and turn the TRIGGERING SOURCE control to CH 1 to apply power. Check that the PWR ON indicator on the front panel illuminates.

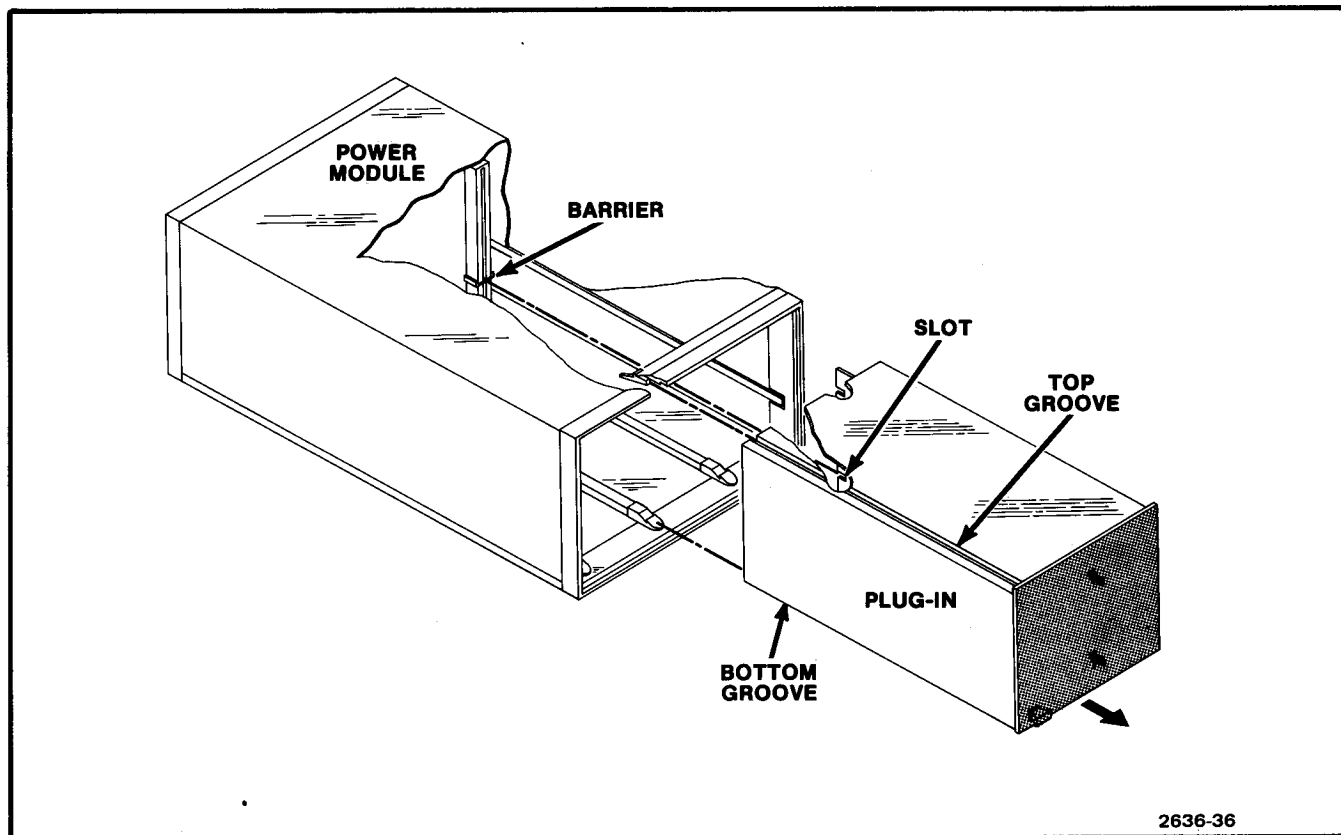


Fig. 1-1. Plug-in installation and removal.

CONTROLS AND CONNECTORS

The SC 503 is fully calibrated and ready for use when received. Review the functions of the controls and connectors before use.

Refer to Fig. 1-2.

1. **TRIGGERING SLOPE:** This switch selects the polarity of the triggering signal that starts the sweep.

2. **TRIGGERING LEVEL:** This control selects the amplitude point on the triggering signal at which the sweep is triggered.

3. **MODE AUTO:** When depressed, the sweep is started by the applied trigger signal. In the absence of an adequate triggering signal, the sweep free runs and provides a bright reference trace.

4. **MODE NORM:** When this pushbutton is depressed, the sweep is initiated by the applied triggering signal. In the absence of an adequate triggering signal, there is no trace.

5. **MODE SGL SWP—RESET:** Pressing this pushbutton (momentary contact switch) re-arms the sweep. The sweep triggers only once in the single sweep mode. After the sweep is displayed, further sweeps cannot be presented until the button is pressed again to re-arm the sweep.

6. **CPLG AC:** Triggering signals are capacitively coupled to the input of the trigger generator circuit when this button is depressed. The dc component is rejected and the signals below approximately 50 Hz are attenuated.

7. **CPLG AC LF REJ:** When depressed, this pushbutton capacitively couples the signals to the input of the trigger circuit. The dc component is rejected and the signals below approximately 10 kHz are attenuated.

8. **TRIG VIEW:** This switch, when depressed, displays the triggering signal on the crt.

9. **SOURCE:** This switch selects the source of the trigger signal, coupled to the input of the trigger circuit.

STBY—This position turns off the internal regulated power supply voltages.

CH 1—In this position a sample of the channel 1 signal is used as a trigger signal.

CH 2—This position samples and uses the channel 2 signal for a trigger signal.

LINE—In this position, a sample of the power line frequency is used as a trigger signal.

EXT—This position selects the signal connected to the EXT TRIG connector for triggering.

INT—In this position, the signal connected through the rear interface connector and the power module is used as the triggering signal.

10. **PWR ON:** This light indicates when the SC 503 regulated power supplies are on.

11. **READY TRIG'D:** This light indicates the single sweep is armed or that the sweep is properly triggered.

12. **PULL X10 HORIZ MAG:** When the seconds/div CAL knob is pulled out (blue band exposed), the displayed sweep rate increases by a factor of 10. This magnification is also present in the XY mode.

CAL: This control, through an internal switch, controls the variable sweep rate or the variable trigger holdoff.

Variable sweep rate—The control provides for continuously variable sweep rates between the calibrated settings of the SECONDS/DIV switch.

Variable trigger holdoff—The control provides continuously variable trigger holdoff.

13. **SECONDS/DIV:** This switch selects the sweep rate. The CAL control must be turned fully clockwise for calibrated sweep rates.

14. **Ground connection.**

15. **POSITION:** This control positions the display horizontally on the crt, except in the XY mode.

Operating Instructions—SC 503

16. CAL 0.6V: This jack provides a positive-going 0.6 V square wave at approximately 1 kHz for calibration and probe compensation.

17. EXT TRIG: This bnc connector is the input for external triggering signals.

18. Input connectors: These bnc connectors accept the vertical signal input.

19. DC-GND-AC-INT DC: This switch selects the type of input coupling and applies the signal to the vertical amplifier.

DC—In this position, the front panel input connector to the input amplifier is dc coupled.

GND—This position disconnects and grounds the input of the vertical amplifier.

AC—In this position, signals from the front-panel bnc connector are capacitively coupled to the vertical amplifier, blocking the dc component of the input signal.

INT DC—This position applies a dc-coupled signal to the input amplifier through the rear interface connector and the power module.

20. CAL: This control provides continuously variable deflection factors between the calibrated settings of the VOLTS/DIV switch.

21. VOLTS/DIV: This switch selects the vertical deflection factor in a 1-2-5 sequence (CAL control must be rotated fully clockwise for the indicated deflection factor).

When using a 1X probe or no probe, read the deflection factor through the knob skirt window labeled 1X; however, when a 10X probe is used on the input, read the knob skirt window labeled 10X.

22. CH 2 POSITION: This control positions the display vertically. In the XY mode of operation this control positions the display horizontally.

23. CH 1 POSITION: This control positions the display vertically.

24. ENHANCE: When this switch is rotated clockwise, the writing speed is increased.

INTEGRATE: This is a momentary contact button. On repetitive signals too fast to store normally, depressing the button permits a charge to build up on the crt screen (target) before the signal is stored.

25. STORAGE DISPLAY: This switch selects the mode of operation for the vertical amplifier system.

CH 1—Displays channel 1 only.

CH 2—Displays channel 2 only.

ALT—This position produces a display that alternates between channel 1 and channel 2 and is switched after each trace passes across the crt.

CHOP—This position produces a display that is switched between channels at a 250 kHz rate. This position provides the best display at sweep rates slower than approximately 0.5 ms/division.

1-2 —In this position, the input to channel 2 is inverted and algebraically added to channel 1.

1+2 —In this position, the channel 2 signal is algebraically added to channel 1.

XY—In this position, the channel 1 signal is displayed vertically and the channel 2 signal is displayed horizontally.

26. VIEW TIME: This control adjusts the viewing time through a range from about 0.5 second to 5 seconds after the end of the sweep.

NON STORE: When the VIEW TIME control is in the detent position (fully counterclockwise).

STORE: When the VIEW TIME control is out of the detent position.

ERASE PUSH: When pressed, this momentary contact switch erases the stored display.

27. INTEN: This control varies the display brightness.

28. FOCUS: This control adjusts for a well-defined crt display.

GENERAL OPERATING INFORMATION

Graticule

The graticule of the SC 503 is internally marked on the faceplate of the crt to provide accurate, parallax-free measurement. The graticule is divided into eight vertical and ten horizontal divisions. Each division is 0.25 inch. In addition, each major division is divided into five minor divisions. The vertical gain and horizontal timing are calibrated to the graticule, so accurate measurements can be made from the graticule.

Intensity Control

The INTEN control is normally adjusted so the display is easily visible but not overly bright. Readjustment may be required for different displays or sweep rates. The SC 503 automatically reduces the display intensity level when sweep speeds of 10 ms and slower are selected. This reduces the possibility of accidentally burning the sensitive storage crt phosphor at slower sweep speeds.

CAUTION

Particular care should be exercised when a bright spot is displayed. A high-intensity spot may burn the crt phosphor and cause permanent damage to the crt.

Display Focus

The FOCUS control works in conjunction with the astigmatism adjustment to give a fine trace or well-focused spot.

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

Calibrator

The internal calibrator of the SC 503 provides a convenient signal source for checking vertical gain. The output square-wave voltage is 0.6 V, within $\pm 1\%$ at approximately 1 kHz. This signal is very useful as a probe calibrator signal as described in the probe instruction manual.

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 STORAGE DISPLAY switch to display the channel used. The TRIGGERING SOURCE switch selects either vertical channel as a trigger signal source.

Dual-Trace Operation (Alternate Mode). The ALT position of the STORAGE DISPLAY switch produces a display that alternates between channel 1 and channel 2 after each trace across the crt. Although the ALT mode can be used at all sweep rates, the CHOP mode may provide a more satisfactory display at sweep rates slower than 0.5 ms/div. At these slower sweep rates, alternate mode switching becomes visually perceptible.

Dual-Trace Operation (Chopped Mode). The CHOP position of the STORAGE DISPLAY switch produces a display that is electronically switched between channels. Generally, the CHOP mode provides the best display at sweep rates slower than approximately 0.5 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 when 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 to shift its horizontal position with consecutive sweeps.

Two single-shot, transient, or random signals that occur within the time interval determined by the SECONDS/DIV switch (ten times the displayed rate) can be compared using the chopped mode. To obtain a usable display, the sweep must be triggered from the vertical channel, displaying the event that occurs first. Since the signals show true time relationship, time difference measurements can be used.

Operating Instructions—SC 503

Algebraic Addition. The 1–2 position of the STORAGE DISPLAY switch can be used to display the difference between two signals or for common-mode rejection to remove an undesired signal. The 1+2 position of the STORAGE DISPLAY switch can be used to display the sum of two signals.

The following should be observed:

1. Do not exceed the input voltage rating of the SC 503.
2. Do not apply signals that exceed an equivalent of approximately six 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 approximately 3 V. Signals larger than six divisions 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 STORAGE DISPLAY switch. This ensures the greatest dynamic range in the 1–2 and 1+2 mode of operation.
4. For similar response from each channel, set the CH 1 and CH 2 DC-GND-AC-INT 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 (detent fully clockwise).

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 uncalibrated vertical deflection factor to at least 50 V/div.

Grounding

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 front panel ground post to establish a common ground with the signal source.

Input Coupling

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

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 approximately 10 Hz. Therefore, some low frequency attenuation can be expected near this frequency limit. Attenuation in the form of waveform tilt appears 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 approximately 50 Hz to avoid the attenuation that occurs using ac coupling.

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

In the GND position, the input signal connected to ground through a 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 DC-GND-AC-INT DC switch, any large voltage transients accidentally generated will not be applied to the amplifier input.

The precharge network 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 when the probe tip is connected to a signal source having a different dc level than previously applied when using AC coupling.

1. Set the DC-GND-AC-INT DC switch to GND before connecting the probe tip to a signal source.
2. Touch the probe tip to the oscilloscope chassis ground. Wait several seconds for the input coupling capacitor 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 DC-GND-AC-INT DC switch to AC. The display will remain on screen so that the ac component of the signal can be measured in the normal manner.

The INT DC position of the DC-GND-AC-INT DC switch selects the signal connected at the rear interface input.

Trigger Source

CH 1 and CH 2 Triggering. For most applications, the sweep can be triggered internally. In the CH 1 and CH 2 positions of the TRIGGERING 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. See discussion under Dual-Trace Operation.

Line Triggering. The LINE position of the TRIGGERING SOURCE switch 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 TRIG connector can be used to trigger the sweep in the EXT position of the TRIGGERING 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 signal components on which it is not desired to trigger. 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. This allows examination of amplitude, time relationship, or waveshape changes of signals at various points in the circuit without resetting the trigger controls.

The rear interface INT DC triggering is similar to the external triggering except the signal sources are at the rear interface connector.

Trigger Coupling

Three methods of coupling the trigger signal to the trigger circuits can be selected with the TRIGGERING CPLG 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 approximately 50 Hz are attenuated. In general, ac coupling can be used for most applications.

AC Low-Frequency Reject. The AC LF REJ position passes all high-frequency signals above approximately 10 kHz. Dc is rejected and signals below approximately 10 kHz are attenuated. When triggering from complex waveforms, this position is useful for providing a stable display of the high-frequency components.

DC Coupling. The dc coupling method passes all trigger signals between dc and 10 MHz.

Triggering Slope

The TRIGGERING 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 TRIGGERING 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 TRIGGERING 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 as the triggering waveform shifts in a positive-going direction. When the LEVEL control is set in the – region, the trigger circuit responds as the triggering signal changes level in a negative-going direction. To set the LEVEL control, first select the trigger SOURCE, CPLG, 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 TRIGGERING MODE switch provides a stable display when the LEVEL control is correctly set and an adequate trigger signal is present. When the trigger repetition rate is less than approximately 20 Hz, or in the absence of an adequate trigger signal, the sweep generator free runs to produce a reference trace. The READY TRIG'D light indicates when the sweep generator is triggered.

When an adequate trigger signal is applied, the free-running condition ends and the sweep generator is triggered to produce a stable display (with the correct LEVEL control setting). The TRIGGERING LEVEL range is reduced to approximately the peak-to-peak range of the triggering signal. Internal and external trigger sensitivity is reduced below approximately 100 Hz.

Normal Triggering. Operation in the normal position (NORM button pushed in) of the TRIGGERING 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 READY TRIG'D indicator light illuminates when the sweep generator is triggered and is off when the sweep is not correctly triggered.

Single Sweep. When the signal to be displayed is not repetitive, use the single-sweep feature. To use this mode, first make sure the trigger circuit will respond to the event to be displayed. Depress the NORM button 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, press and release the SGL SWP 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 TRIG'D indicator lights when the sweep generator circuit has been reset and is ready to produce a sweep. The light goes out after the sweep is completed. To prepare the circuit for another single-sweep display, press and release the SGL SWP button.

Trigger Holdoff. By placing the internal Swp-Var-HO switch (see the bottom right corner of the front panel for switch location) in the HO position, the variable sweep control (CAL) is connected as a variable trigger holdoff control. In this configuration, the control provides for stable triggering on aperiodic or irregular signals such as complex digital words.

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.

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 to be expanded to the center of the graticule. Then switch the PULL X10 HORIZ MAG control to the out position. Use the horizontal POSITION control to move the magnified portion to the desired position.

When the PULL X10 HORIZ MAG control is on, the sweep rate is determined by reading the number shown against the blue background.

XY Operation

In some applications, it is desirable to display one signal versus another (XY) rather than against the internal time base. The XY position of the DISPLAY switch provides a means for applying an external signal to the amplifier. By connecting different signal sources to the CH 1 and CH 2 input connectors simultaneously, the vertical POSITION control positions the vertical display with the CH 1-Y and the horizontal display with the CH 2-X.

NOTE

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

Storage

VIEW TIME. When the VIEW TIME control is rotated fully counterclockwise (detent position), the instrument is in the non-store mode. When this control is rotated out of this detent position, the viewing time of the stored display adjusts from about 0.5 to 5 seconds. In the fully clockwise position, the display is stored until erased or the instrument is turned off. When the VIEW TIME control is positioned within the range from about 0.5 to 5 seconds, an erase occurs automatically after each sweep.

NOTE

It is recommended that the view time be limited to four hours or less to prevent residual image formation.

ERASE PUSH. Pushing this momentary contact button erases the stored display.

ENHANCE. This control adjusts the stored writing speed. Rotating this control in the clockwise direction increases the writing speed. In the fully counterclockwise position, the writing speed is not increased.

PUSH INTEGRATE. Pushing the ENHANCE button in (a momentary pushbutton) permits a very fast repetitive signal to build up a charge on the target before the signal is stored.

SPECIFICATION AND PERFORMANCE CHECK

SPECIFICATION

Performance Conditions

The electrical characteristics are valid only if the SC 503 has been calibrated at an ambient temperature between +20°C and +30°C and is operating at an ambient temperature between 0°C and +50°C unless otherwise noted.

Items listed in the Performance Requirements column of the Electrical Characteristics are verified by completing the Performance Check in this manual. Items listed in the Supplemental Information column are not verified in this manual; they are either explanatory notes or performance characteristics for which no limits are specified.

ELECTRICAL CHARACTERISTICS

Table 2-1

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	±3%.	
1 mV/div to 2 mV/div	±5%.	
0°C to +50°C	Derate 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 10 MHz.	
Risetime (calculated)		Less than 35 ns.
Typical step response aberrations		±2%, 3% peak-to-peak or less Signal limited to 5 major divisions.
2 mV/div	At least 7 MHz.	
1 mV/div	At least 5 MHz.	

Table 2-1 (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 (CH 1 – CH 2 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 10 MHz.	Input signal related crosstalk is typically less than 0.01%.
Displayed Noise	0.2 mV or less peak-to-peak at 1 mV/div.	
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.
CH 1 or CH 2 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		
CH 1 or CH 2	Selected input is displayed.	
ALT	Alternates display of Ch 1 and Ch 2 every other sweep.	
CHOP	Chops display of CH 1 and CH 2	Chop rate at least 250 kHz.
1–2	Displays algebraic difference between CH 1 and CH 2.	
1+2	Displays algebraic sum of CH 1 and CH 2.	
XY	Displays CH 1 on Y axis and CH 2 on X axis.	X10 Horizontal Magnifier is functional. X axis positioning is controlled by CH 2 position.
Trigger View	Triggering waveform is displayed instead of selected Display Mode when TRIG VIEW switch is depressed.	Triggering point on the displayed waveform is nominally at CRT vertical center.

**Table 2-2
HORIZONTAL DEFLECTION SYSTEM**

Characteristics	Performance Requirements		Supplemental Information
Sweep Rates Calibrated Range	2 s/div to 0.5 μ s/div in 21 steps in a 1-2-5 sequence. X10 Horizontal Magnifier extends fastest calibrated rate to 50 ns/div.		
Variable Range	At least 2.5 to 1.		Continuously variable between calibrated sweep rates and extends slowest uncalibrated rate to at least 5 s/div. The Variable control is internally selectable between the Variable Sweep Rate or Variable Holdoff functions.
Accuracy + 15°C to +35°C 2 s/div to 0.5 s/div 0.2 s/div to 5 μ s/div 2 μ s/div to 0.5 μ s/div	Unmagnified $\pm 4\%$ $\pm 3\%$ $\pm 4\%$	Magnified X10 $\pm 5\%$ $\pm 4\%$ $\pm 5\%$	Measured over center 8 displayed divisions excluding the first 50 ns and magnified sweep beyond the 100th division.
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 interval within the center 8 divisions.
MAG Registration	0.5 division 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 the left of center graticule line.		
XY Mode Horizontal Bandwidth	At least 500 kHz.		Low frequency response is determined by CH 2 coupling selection.
Deflection Factor	Selected by CH 2 Volts/Div and X10 Horizontal Magnifier controls.		Accuracy is typically $\pm 5\%$.
Phase Difference	3° or less to 50 kHz.		

**Table 2-3
TRIGGERING**

Characteristics	Performance Requirements		Supplemental Information
Trigger Sensitivity (Minimum peak-to-peak signal required.)			REAR INTERFACE Typically 35 mV Typically 80 mV
Below 5 MHz 5 MHz to 10 MHz	CH 1 or CH 2 0.4 div 1.0 div	EXTERNAL 60 mV 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 10 kHz.
Modes			
Auto	Sweep free-runs in the absence of a triggering signal.		Level control range automatically varies with the triggering signal amplitude for frequencies above 100 Hz. Not recommended for frequencies below 30 Hz. Below 100 Hz minimum signal requirements increase.
Normal	Sweep will not run unless triggered.		
Single Sweep	Upon triggering, sweep runs once and will not run again unless reset by pushing Reset switch.		Single Sweep is the default mode when all switches are out.
Trigger Level Range (Normal and Single Sweep modes only)	At least ± 6.0 divisions, CH 1 or CH 2, and at least ± 1.2 V external.		Typically ± 0.6 V or greater, rear interface.
External Trigger Input			
Impedance	1 M Ω \pm 10%.		Paralleled nominally by 47 pF.
Maximum Input Voltage			350 V (dc + peak ac), 350 V peak-to-peak ac at 1 kHz or less. Above 1 kHz recommended peak-to-peak ac limit is 100 V to 10 kHz derating to 10 V above 100 kHz.
Holdoff Time			Measured at rear interface pins 20B-21B. Select Auto mode and remove any trigger source so that sweep free-runs. Nominally 100 ms \pm 25%. 50 ms \pm 25%. 1.2 ms \pm 25%. 600 μ s \pm 25%. 24 μ s \pm 25%. 12 μ s \pm 25%.
2 s/div to 0.2 s/div 0.1 s/div to 5 ms/div 2 ms/div to 0.5 ms/div 0.2 ms/div to 50 μ s/div 20 μ s/div to 5 μ s/div 2 μ s/div to 0.5 μ s/div			

Table 2-3 (cont)

Characteristics	Performance Requirements	Supplemental Information
Variable Holdoff Range		At least 20 to 1 range. The Variable control is internally selectable between the Variable Sweep Rate or Variable Holdoff functions.

Table 2-4
STORAGE SYSTEM

Characteristics	Performance Requirements	Supplemental Information
Stored Writing Speed (center 6 X 8 divisions)		
Normal	At least 80 div/ms (50 cm/ms)	Stored writing speed decreases at lower intensity levels.
Enhanced	At least 400 div/ms (250 cm/ms)	
View Time		
Range (auto erase)		Typically less than 0.5 sec to greater than 5 sec.
Control Fully CW		Up to 4 hours. It is recommended that view time be limited to 4 hours or less to prevent residual image formation.
Erase Time		400 to 600 ms.
INTEGRATE Function		Improves storage of very fast repetitive signals. The writing gun beam accumulates a charge on the target as long as INTEGRATE pushbutton is depressed.

Table 2-5
CATHODE RAY TUBE

Characteristics	Performance Requirements	Supplemental Information
CRT Type		T3140.
Graticule		8 X 10 divisions with 0.25 inch/division (0.64 cm/division).
Phosphor		P44.
Acceleration Potential		2 kV (–1.9 kV cathode). Beam current returns through backplate connection.
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 2-6
CALIBRATOR OUTPUT AND POWER SUPPLIES**

Characteristics	Performance Requirements	Supplemental Information
Voltage	0.6 V peak-to-peak, $\pm 1\%$.	Calibrator voltage is set by adjusting +12 V supply.
Frequency		Approximately 1 kHz.
Rise and Fall times		Less than 1 μ s.
Output Impedance		Approximately 120 Ω .
+12 V		± 0.3 V, 5 mV peak-to-peak or less ripple.
-12 V		± 0.4 V, 5 mV peak-to-peak or less ripple.
+5 V		± 0.2 V, 5 mV peak-to-peak or less ripple.
+180 V		+180 V ± 10 V. 0.7 V typical peak-to-peak ripple.
+100 V		+110 V ± 5 V. 0.4 V typical peak-to-peak ripple.
-100 V		-135 V ± 20 V. 1.5 V typical peak-to-peak ripple.
-1.9 kV		-1.9 kV ± 70 V.
Power Module Supply Currents		
+33.5 V Supply		Typically 450 mA.
-33.5 V Supply		Typically 290 mA.
+11.5 V Supply		Typically 260 mA.
25 V AC Supply		Less than 1 mA.
Fuse Data		
F8051		0.75A, 3AG, fast-blow.
F9051		0.5A, 3AG, slow-blow.
Mainframe Power Line Draw		Typically 30 watts or less operating, less than 1 watt in standby.
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 2-7
REAR INTERFACE INPUT AND OUTPUT SIGNALS**

Characteristics	Performance Requirements	Supplemental Information
Z-Axis Input		Pins 24A-23A. Analog input summed with front panel INTENSITY control setting. Nominally 1.5 k Ω $\pm 5\%$. +5 V will turn beam on with INTEN fully CCW. -5 V will turn beam off with INTEN fully CW.

Table 2-7 (cont)

Characteristics	Performance Requirements	Supplemental Information
CH 1 and CH2 Inputs		Pins 14A-15A and 16A-17A respectively. Selected by CH1 and CH 2 coupling switches in INT (interface) position. Nominally $50\ \Omega \pm 2\%$. Customer modifiable to $1\ \text{M}\Omega$. Parallel C is typically $100\ \text{pF}$. Maximum input voltage is $5\ \text{V rms}$ $40\ \text{V peak ac}$. Displayed noise may exceed $1\ \text{mV peak-to-peak}$.
Trigger Input		Pins 14B-15B, selected by SOURCE switch in INT (interface) position. Nominally $50\ \Omega$ when INT selected and $25\ \Omega$ when other source selected. Customer modifiable to $1\ \text{M}\Omega$. parallel C is typically $60\ \text{pF}$. Maximum input voltage is $2.5\ \text{V rms}$, $40\ \text{V peak ac}$. Maximum input power: $1/4\ \text{W}$.
External Gate Input		Pins 22B-23B. ECL balanced input operating between $+5\ \text{V}$ and ground. Nominally $100\ \Omega$. 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 ($1\ \text{k}\Omega$ 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 $+5\ \text{V}$ and ground. A low logical state causes a noticeable intensification. Open circuit defaults to logical high state.
Reset Input		Pin 21A. Ground ($1\ \text{k}\Omega$ or less) causes single sweep reset.
CH 1 Trigger Output		Pins 27B-28B. Analog output with source resistance of less than $50\ \Omega$. Sensitivity is typically $50\ \text{mV/div}$ and bandwidth is typically $4\ \text{MHz}$.
Triggered Gate Output		Pins 25B-26B. ECL balanced output operating between $+5\ \text{V}$ and ground. A logical high state indicates a holdoff condition and sweep can not be triggered or gated on.
Ramp Output		Pin 18A. Analog output of positive going sweep ramp. Typically $0\ \text{V}$ to at least $+10\ \text{V}$. Output resistance is approximately $500\ \Omega$. Not recommended at sweep rates faster than $1\ \mu\text{s/div}$.
Sweep Gate Output		Pin 26A. Approximately $+5\ \text{V}$ during sweep; approximately $0\ \text{V}$ otherwise. Source impedance through $1\ \text{k}\Omega$.

Table 2-7 (cont)

Characteristics	Performance Requirements	Supplemental Information
Light Output		Pin 20A. Less than +1.0 V through 1 k Ω when READY/TRIG light is on; typically +5 V through high impedance otherwise. Loading by more than 1 mA when output is in the high voltage state may cause erroneous READY/TRIG light indication.
Holdoff Out		Pins 20B-21B. ECL balanced output operating between +5 V and ground.
Erase		Pin 22A. Erase function, when connected to ground.

ENVIRONMENTAL CHARACTERISTICS

Table 2-8

ENVIRONMENTAL CHARACTERISTICS^a

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

PHYSICAL CHARACTERISTICS

Table 2-9

PHYSICAL

Characteristics	Description
Finish	Anodized aluminum front panel etch and chromate chassis.
Net Weight	5.7 lbs; (2.5 kg).
Overall Nominal Dimensions	5.29 in (134.4 mm) W X 11.85 in (300.9 mm) D X 4.96 in (126.0 mm).

^a With power module.

^b Refer to TM 500 power module specifications.

^c +45°C in TM 503 and TM 504.

^d Without power module.

PERFORMANCE CHECK

Introduction

This procedure checks the electrical characteristics of the SC 503 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 503 is calibrated 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.

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 ^a .
Time-mark generator	0.2 s to 5 ns in 1, 2, 5 sequence.	Sweep rate accuracy.	TEKTRONIX TG 501 Time Mark Generator ^a .
Calibration generator	Amplitude calibration, 50 mV to 5 V; accuracy, $\pm 0.25\%$ into 1 M Ω ; output, squarewave at approximately 1 kHz.	Vertical deflection accuracy.	TEKTRONIX PG 506 Calibration Generator ^a .
Leveled sine wave generator	50 kHz to 10 MHz.	Bandwidth, trigger sensitivity & range, & X-Y phasing.	TEKTRONIX SG 503 Leveled Sine-Wave Generator ^a .
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. 012-0057-01.
Dual input cable	Bnc female to Z bnc male connectors.	X-Y phasing.	Tektronix part no. 067-0525-01.
Adapter	Bnc-to-pin jack.	Calibrator.	Tektronix part no. 013-0084-01.
Termination	Impedance, 600 Ω ; accuracy, within 2%; connectors, bnc.	Low frequency response.	Tektronix part no. 011-0092-00.

^a Requires TM 500-series power module.

Preliminary Control Settings

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

Table 2-10

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-INT DC	GND
VOLTS/DIV (CH1 and CH 2)	20
PG 506	100 V

- Connect the calibration generator to the CH 1 input connector through a 50 Ω coaxial cable.
- Adjust the generator variable control until exactly five graticule divisions are displayed on the crt.
- Check—that the readout error is less than 2.0%.
- Check—readout error for the following settings listed in Table 2-10.

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%.

- Repeat parts a through d for CH 2.
- Disconnect all cables and return the front-panel controls to the preliminary settings.

2. Check the Vertical Deflection Variable Range Accuracy

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

- Connect a 50 Ω coaxial cable from the calibration generator output connector to the SC 503 CH 1 input connector.
- Adjust the generator output for five graticule divisions of display.
- Rotate the CH 1 POSITION controls to center the displayed signal on the screen.
- Turn the CH 1 CAL control to the fully counterclockwise position.
- 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)	5m
DC-GND-AC-INT DC	DC
SECONDS/DIV	1m

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 503 CH 1 input connector.

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

c. Set the generator frequency to 10 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 10 MHz.

e. Change the DISPLAY switch to CH 2.

f. Connect the 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)	2m
---------------------------	----

a. Adjust the leveled sine-wave generator for a crt display of exactly six graticule divisions.

b. Set the generator frequency to 7 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 7.0 MHz.

d. Change the DISPLAY switch to CH 1.

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 1 bandwidth.

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

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

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

a. 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 DISPLAY 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 the generator and signal setup.

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6. Check the AC LF Response

DISPLAY	XY
VOLTS/DIV (CH 1 and CH 2)	.5
DC-GND-AC-INT DC	DC

a. Connect a 10 Hz sine-wave signal from the function generator through a 50 Ω coaxial cable, with a 600 Ω termination, to the CH 1 input connector.

b. Adjust the INTEN and FOCUS controls for two well-defined dots on the crt display.

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

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

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

f. 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)	1m
DISPLAY	CH 2
DC-GND-AC-INT DC	DC
SOURCE	EXT

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 Step Attenuator Balance

a. Position the trace with the horizontal and vertical POSITION controls to the center graticule line.

b. Rotate the VOLTS/DIV switch to the 1m position (fully clockwise).

c. Check—that the trace shifts less than one graticule division away from the graticule center.

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

9. Check the Position Range

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

a. Connect a 0.2 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 displayed waveform.

c. Check—that the positive and negative sections of the waveform can be positioned on the crt screen.

d. Rotate the vertical POSITION control to midrange.

e. Set the DISPLAY switch to CH 2 and reconnect the generator to the CH 2 input connector and repeat parts b through d.

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

10. Check CH 1 and CH 2 Operation

SECONDS/DIV	1m
-------------	----

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 DISPLAY 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.

11. Check Alternate Operation

SECONDS/DIV	5m
DISPLAY	ALT

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

b. Check—for two traces on the screen.

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

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

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

12. Check Chopped Operation

SECONDS/DIV	5m
DISPLAY	CHOP

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

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

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

13. Check 1–2 Operation

DISPLAY	1 – 2
---------	-------

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

b. 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.

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

14. Check 1 + 2 Operation

DISPLAY	1 + 2
---------	-------

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

b. 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 the same direction.

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

15. Check XY Operation

DISPLAY	XY
---------	----

a. Adjust the CH 1 vertical POSITION control from fully clockwise to fully counterclockwise.

b. Check—that the dot moves vertically off the screen in both directions.

c. Adjust the CH 2 vertical POSITION control from fully clockwise to fully counterclockwise.

d. Check—that the dot moves horizontally off the screen in both directions.

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

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16. Check the Calibrated Sweep Range

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

a. Connect .5 μ s 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 2-11.

d. Disconnect all cables.

Table 2-11

HORIZONTAL DEFLECTION ACCURACY

SECONDS/DIV	+15°C to +35°C		0°C to +50°C	
	Unmagnified	Magnified	Unmagnified	Magnified
2 s/div to 0.5 s/div	$\pm 4\%$	$\pm 5\%$	$\pm 5\%$	$\pm 6\%$
0.2 s/div to 5 μ s/div	$\pm 3\%$	$\pm 4\%$	$\pm 4\%$	$\pm 5\%$
2 μ s/div to 0.5 μ s/div	$\pm 4\%$	$\pm 5\%$	$\pm 5\%$	$\pm 6\%$

17. 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.

b. Adjust the generator for a vertical deflection of eight graticule divisions on the crt display.

c. Center the display on the crt screen with the POSITION controls.

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

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

18. Check the XY Phasing

VOLTS/DIV (CH 1 and CH 2) 5m
 SOURCE EXT

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 CH 2 input connectors.

19A. Check the Trigger Sensitivity (below 5 MHz)

SECONDS/DIV .5 μ
 VOLTS/DIV (CH 1 and CH 2) .5
 DC-GND-AC-INT DC 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. Depress the MODE NORM switch.

g. Check—repeat parts c through e.

h. Depress the CPLG AC LF REJ switch.

i. Check—repeat parts c through e.

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

k. Check—repeat parts c through e.

l. Release the AC pushbutton and press the MODE 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:

DISPLAY	CH 2
SOURCE	CH 2
SLOPE	+

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

19B. Trigger Sensitivity (5 MHz to 10 MHz)

a. Change the generator frequency to 10 MHz and adjust the output frequency for 10 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. Press the MODE NORM switch.

h. Check—repeat parts c through f.

i. Press the CPLG AC LF REJ button.

j. Check—repeat parts c through f.

k. Release the AC LF REJ pushbutton to the out position and press the CPLG AC switch.

l. Check—repeat parts c through f.

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

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

o. Set the front-panel controls as follows:

DISPLAY	CH 1
SOURCE	CH 1
SLOPE	+

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

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

Specification and Performance Check—SC 503

20. Check Auto, Normal, and Single Sweep Modes

SECONDS/DIV	1 m
CH 1 DC-GND-AC-INT DC	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. Press the NORM button.

g. Check—for a visible trace.

h. Set the SOURCE switch to EXT.

i. Check—that the trace disappears.

j. Set the SOURCE switch to CH 1.

k. Release the NORM button (out position).

l. Check—for a visible trace.

m. Momentarily press and release the SGL SWP RESET button.

n. Check—that the trace appears once each time the SGL SWP RESET button is pressed.

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

21. Check Stored Writing Speed

SECONDS/DIV	10 μ s
CH 1 VOLTS/DIV	.5 V
CH 1 DC-GND-AC-INT DC	DC
CPLG	AC
MODE	NORM

a. Connect 10 μ s markers from the time-mark generator through a 50 Ω coaxial cable and a 50 Ω termination to the CH 1 input connector.

b. Set the TRIGGERING LEVEL control for a stable display.

c. Adjust the TIME/DIV variable for five markers in four horizontal divisions.

d. Change the CH 1 input coupling to GND, TRIGGERING SOURCE to LINE, and TRIGGERING MODE to SGL SWP.

e. Set the INTEN control to a point just below the unblanking level.

f. Set the VIEW TIME to ∞ and press ERASE PUSH after the crt background is fully lighted.

g. Adjust the TRIGGERING LEVEL control, if necessary, to write one horizontal trace each time the SGL SWP RESET button is pressed.

h. Repeatedly push and release the SGL SWP RESET button while slowly positioning the trace vertically.

i. Check—that the stored lines over the innermost six vertical by eight horizontal graticule divisions show no breaks greater than 0.025 inch.

j. Leave the INTEN control setting for the next step.

22. Check Enhanced Writing Speed

Use the INTEN control setting determined in the previous step.

VIEW TIME	NON-STORE
SOURCE	CH 1
MODE	NORM
CH 1 DC-GND-AC-INT DC DC	

a. Using the SECONDS/DIV and the sweep variable (CAL) control, set the sweep speed for one 10 μ s marker every four graticule divisions.

b. Reset the TRIGGERING SOURCE to LINE, MODE to SGL SWP, and CH 1 DC-GND-AC-INT DC to GND.

c. Adjust the CH 1 vertical POSITION control to position the trace one division above the bottom graticule line.

d. Set the VIEW TIME to ∞ . After the crt background is fully illuminated, press the ERASE pushbutton.

e. Turn the ENHANCE control slightly clockwise, and press the SGL SWP RESET and ERASE pushbuttons sequentially until the stored trace becomes easily visible. The crt background should have minimum brightness and should contain no spots of illumination greater than 0.025 inch.

f. Press the ERASE pushbutton, adjust the CH 1 vertical POSITION control to position the trace slightly above the previously stored trace, and press the SGL SWP RESET button.

g. Check—that the stored trace has no breaks greater than 0.025 inch over the innermost eight horizontal graticule divisions.

h. Repeat parts f and g to check the screen area contained within the innermost six vertical by eight horizontal graticule divisions.

23. Check the Calibrator

CH 1 VOLTS/DIV	.1
CH 1 DC-GND-AC-INT DC DC	

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 division.

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

24. Check the External Trigger Level Range

SECONDS/DIV	10 μ s
MODE	NORM
SOURCE	EXT

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

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25. Check the Internal Trigger Level Range

SECONDS/DIV	10 μ s
CH 1 DC-GND-AC-INT DC DC	
MODE	NORM
CH 1 VOLTS/DIV	.2

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.

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

c. Adjust the TRIGGERING LEVEL control to midrange.

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

e. Set the TRIGGERING LEVEL control fully clockwise.

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

g. Set the TRIGGERING LEVEL control fully counterclockwise.

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

i. Change TRIGGERING SCOPE to — and repeat parts c through h.

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

WARNING

THE FOLLOWING SERVICING 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. REFER TO OPERATORS SAFETY SUMMARY AND SERVICE SAFETY SUMMARY PRIOR TO PERFORMING ANY SERVICE.

THEORY OF OPERATION

VERTICAL CIRCUITRY

The vertical input circuitry 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 trigger signal.

NOTE

Where both channels 1 and 2 exist and both channels 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), internally disconnected (GND) or dc coupled through the rear interface connector (INT DC). Input coupling is selected by S1021A at the input for channel 1.

Assuming that a signal is applied to the input, when S1021A is set to DC, the applied signal is passed directly to the attenuators. When S1021A is set to AC, C1012 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 S1021A 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.

When S1021A is in the INT DC position, the rear interface signals are internally coupled to the channel 1 or channel 2 attenuators. In channel 1, the vertical signal from pins 14A and 15A of the rear interface connector is fed into the CH 1 attenuator. When Q7021 conducts, K8041 is energized closing S8041. The operation of channel 2 input circuitry is identical to that of channel 1.

NOTE

When dc levels (above 10 volts) are to be blocked by ac coupling, the DC-GND-AC-INT DC switch should be set to GND while input connections are made or broken, or when voltage levels are changed. This allows 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. For dc and low frequency signals the divider is essentially resistive.

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).

Gain Switching Stage

The preamplifier consists of two identical operational amplifiers, connected in a differential configuration.

The operational amplifiers are composed of Q2011B and Q1012 driving Q1014 and Q2011A and Q1011 driving Q1013. Transistor Q2011B and Q2011A provide a voltage follower input to output transistors Q1014 and Q1013. Total gain of the stage is determined by the resistance between the two sides of the amplifier and R4061, R4063 and R4064 (see Fig. 3-1). The Channel 2 gain is set by R4031, R4049 and R4041. Variable resistor R4031, CH 2 Gain, matches the gain of both preamplifiers to the channel switching circuitry.

Correct adjustment of the Step Bal 1 control, R4065, quiescently balances the two sides of the amplifier so that there is no current through the gain-setting resistor(s). This dc balancing is achieved by adjusting Step Bal 1 control R4065 for no trace movement while rotating the VOLTS/DIV switch from 0.2 V to 1 mV. When a signal is applied to the gate of Q2011B, the signal current is developed through gain-setting resistors located between the sources of Q2011A and Q2011B. Transistors Q1013 and Q1014 output the differential current. The value of the gain resistors is selected by the VOLTS/DIV switch, S1021A to determine the gain.

Vertical Preamplifier and Trigger Pickoff

The channel 1 preamplifier and trigger pickoff circuitry is composed of Q4055, Q5051, Q4056, Q4053, Q4054, Q5052, Q4052, Q4051 and associated circuitry.

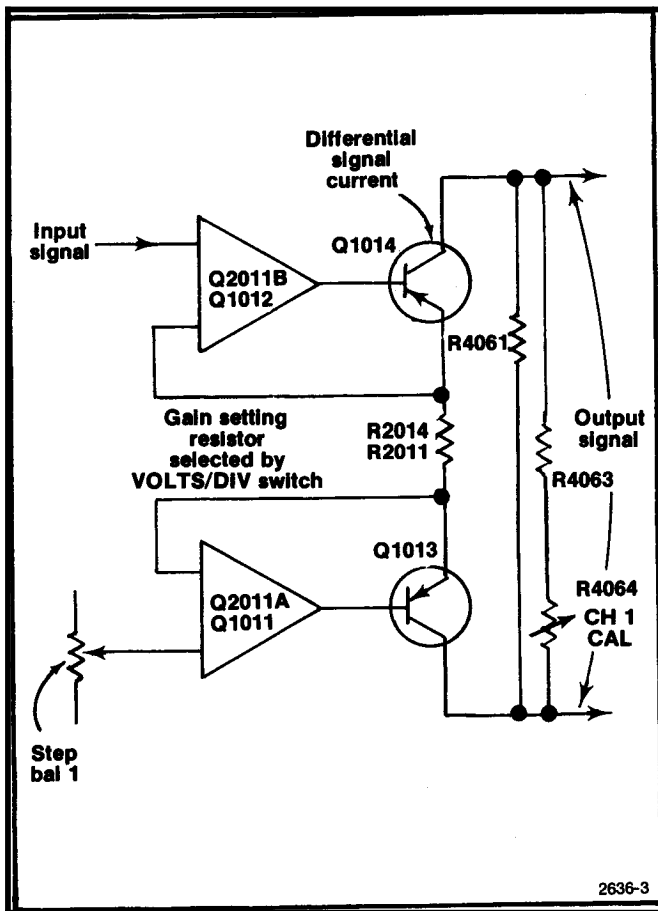


Fig. 3-1. Input channel 1 preamplifier detailed block diagram showing signal current paths.

The signals from the channel 1 input amplifier enter the bases of the common emitter preamplifiers, Q4053 and Q4054. The components located between these emitters are for circuit peaking and gain. High frequency compensation is attained by peaking components, C4051, R4052 and C4052. The circuit gain is set by R4054-L. The CH 1 trigger pick-off and CH 1 events out signals are outputs from the common emitter amplifier composed of Q4052 and Q4051 with associated circuitry.

The common base amplifiers composed of Q4056 and Q5052 drive the channel switch. The channel 1 position amplifier consisting of Q4055, Q5051 and associated circuitry sums the differential current from transistors Q1013 and Q1014 into the collectors of Q4056 and Q5052.

Both channel 1 and channel 2 preamplifiers use resistive thick film networks, R4054 and R4033. Channel 2 operation is similar to channel 1 with exception of the X signal which outputs to the horizontal deflection amplifier via transistors Q5031 and Q3031.

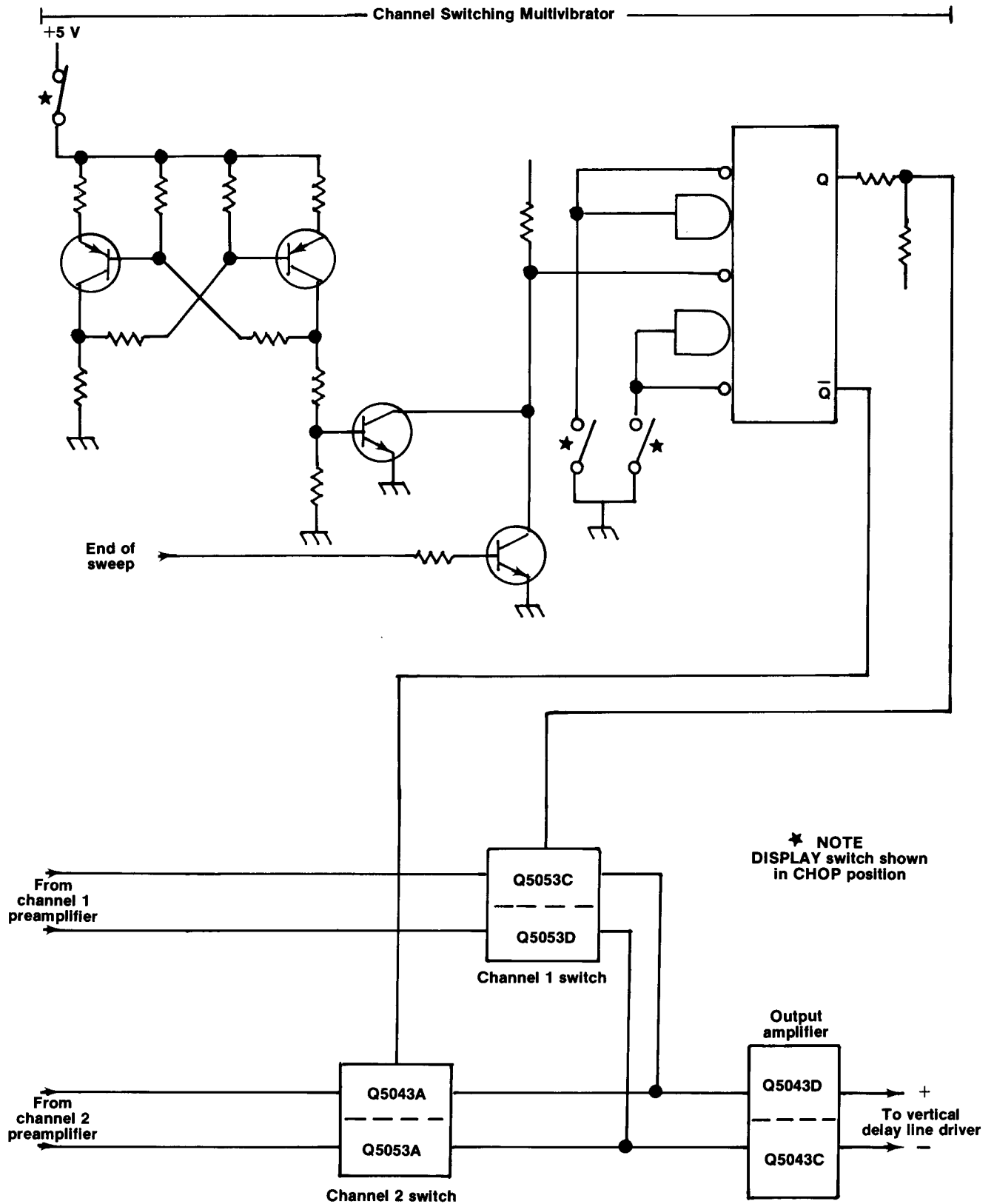
Channel Switching

The channel switch is composed of three circuits, the chop oscillator, logic and the switching matrix.

The chop oscillator composed of Q6011 and Q6012 is an astable multivibrator. This oscillator when switched on from the +5 V by the DISPLAY switch S6021, drives the switch logic flip-flop, U5011 (see Fig. 3-2). In conjunction with the oscillator output is the end of sweep signal which turns on transistor Q5012 driving U5011 that controls the display switching between channels when ALT mode is selected by the DISPLAY switch.

In the switching matrix, the emitters of Q5043A and Q5053A are switched against diodes CR4031 and CR4042. The bases of Q5043 and Q5053 are switch between +300 mV and -600 mV. The amplifier currents are directed into the summing resistors, R5054 and R5055. The DISPLAY switch, S6021 drives the channel switch logic flip-flop, U5011 to select the proper currents for all modes of operation including CH 1, CH 2, 1-2 and 1+2.

When the TRIG VIEW switch is pressed, the CH 1 and CH 2 inputs are disabled by Q5053E to the switch matrix.



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Fig. 3-2. Channel switching.

VERTICAL AMPLIFIER

The vertical Amplifier circuit provides the final amplification for the vertical deflection signal. This circuit includes the Delay Line Driver, Delay Line, and Output Amplifier.

Delay Line Driver

This circuitry consists of an input amplifier, limiter and an impedance matching circuit.

The input amplifier is composed of Q5042 and Q5033. The limiter consists of Q5035, Q5034, CR5031 and CR5032. The impedance matching is accomplished with the precision resistors R5021 and R5022 which are the collector load resistors for Q5034 and Q5035. The input amplifier has a high common mode rejection, storage gain correction and thermal compensation.

Transistor Q4042, the active current source, provides the high common mode rejection. This current source provides accurate limiting and common mode level on the delay line.

The storegain switching signal through Q5043E turns on FET Q5041, providing storage gain correction through R5037.

The thermal compensation for the vertical system consists of RT5041 and R5043.

The limiter is composed of Q5035, Q5034, CR5032, CR5031, R5047 and R5034. The outputs from the collectors of Q5042 and Q5033 are the input currents for the

limiter circuitry. When Q5035 turns off, the voltage on its emitter drops until diode CR5032 forward biases which takes current from transistor Q5034 limiting the output current swing. This action repeats itself for signal currents flowing in the opposite direction.

Delay Line

The delay line impedance is 75 Ω and provides a nominal 140 ns delay for the vertical signal. This delay allows the sweep generator circuits time to initiate a sweep before the vertical signal reaches the crt deflection plates.

Output Amplifier

The signals from the delay line feed the output amplifier composed of Q2021, Q2012, Q2022, Q2011, Q3031, Q3011, Q3034, Q3021, Q3014, Q3012, and associated circuitry.

Transistors Q2021 and Q2012 comprise a voltage amplifier with peaking. The peaking components are composed of R2014 and C2011 for the 200 ns peak and C2022 and R2018 for the 75 ns peak. The vertical output centering adjustment, R1012, and the vertical gain adjustment, R1011, are also included in the voltage amplifier stage.

Transistors Q2022, Q3031, Q3034, Q3021, and associated circuitry comprise a shunt-feedback amplifier connected to the upper vertical deflection plate. Transistors Q2011, Q3011, Q3012, Q3014, and associated circuitry are the shunt feedback amplifier output to the lower deflection plate. Components R3023 and C3018 in the feedback stage of the output amplifier control the 20 to 40 ns peaking.

TRIGGERING AND SWEEP CIRCUITRY

Trigger Pickoff

This circuit, through the setting of the TRIGGERING SOURCE switch, inputs one of several triggering signals to the trigger generator circuit. Triggering signals available are the external (EXT), interface (INT), channel one only (CH 1) channel two only (CH 2), and the power line (LINE).

In the EXT position of the TRIGGERING SOURCE switch, the sweep is triggered by the external signal connected to the EXT TRIG connector. The CH 1 or CH 2 input signal triggers the sweep when the TRIGGERING SOURCE switch is in the CH 1 or CH 2 position. In the INT position of the TRIGGERING SOURCE switch, the sweep is triggered by the signal connected to the rear interface trigger input connector.

Trigger Coupling

The TRIGGERING CPLG pushbuttons select either ac or dc coupling. When the AC pushbutton is pressed, coupling capacitor C1011 blocks the dc component of the trigger signal and attenuates signal components below approximately 50 Hz. This capacitor discharges through the TRIGGERING SOURCE switch and R1033 when switched out of the EXT position. When the AC LF REJ pushbutton is pressed, coupling capacitor C1012 blocks the dc components of the trigger signal below about 10 kHz. The trigger signal is direct coupled when both the AC and AC LF REJ pushbuttons are released.

Input Source Follower

Field effect transistor (FET) Q2014 operates as a source follower providing a high-impedance input for the triggering signals. It also provides isolation between the trigger generator circuit and the trigger signal source. Diode CR2011 protects Q2014. FET Q2016 is a high-impedance, relatively constant, current source providing temperature compensation for Q2014.

Trigger Generator

The triggering signal from source follower Q2014 feeds a differential pair composed of Q2012 and Q2011. Transistor Q2016 is a current source for Q2012. Transistor Q2012 forms a voltage to a current converter. Transistors Q2012 and Q2011 are cascoded and protected by diodes CR2012 and CR2013. The output signal at the collector of Q4011 drives the peak detector circuitry and the trigger comparator circuitry composed of Q4021, Q4022, and their associated components.

When the MODE AUTO switch is pressed, the triggering signal enters the amplifier circuit, composed of Q4002 for the + peak circuitry and Q4001 for the – peak circuitry. The peak detector circuits sample the + and – peak signal levels, and are adjusted by dc level shift potentiometers R1002 and R1001. Peak sensing capacitors C4012 and C4011 hold peak voltage levels that are applied to the TRIGGERING LEVEL control via buffer level shifters U3001 and U2001. The LEVEL control is adjusted between the two voltage levels, equal to the most negative and most positive peaks of the triggering signal. With the MODE AUTO pushbutton out, the triggering LEVEL control limits are set by R3011, R3014, R2016, and R2015.

The trigger level is set by the TRIGGERING LEVEL control and sent to the base of trigger comparator Q4022. If the voltage at the base of Q4022 is higher than the base of Q4021, current flows through Q4022 and the collector of Q4021 goes high. If the base of Q4022 is lower than the base of Q4021, the collector of Q4021 is lowered. Both outputs of the trigger comparator are supplied to and

switched internally by the gate generator U4021. These signals are taken from U4021 via Q4031 and Q4032 and fed to the Trigger View Circuit.

Trigger View

When the TRIG VIEW pushbutton is pressed, the triggering signal is displayed on the crt.

When the TRIG VIEW switch is in the off position (button out), Q5053B and Q5043A conduct for normal channel 1 and channel 2 preamplifier operation.

When the TRIG VIEW switch is pressed, Q5053E conducts cutting off (via diode paths) Q5053B and Q5043A, thus turning off the channel 1 and channel 2 preamplifiers.

Gate Generator

Integrated circuit U4021 converts the output signals from the trigger comparator to a gate waveform, which is used for sweep generator control. With the + slope select, pin 1, of U4021 connected to ground, a high signal on pin 13 of U4021 causes pin 3 (gate output) to go more positive and pin 4 to go more negative. Pin 14 goes negative. The output gate occurs when pins 13 and 14 are within about 20 mV of each other. Ungrounding pin 1 causes gate outputs from pins 3 and 4 when pin 13 is negative going and pin 14 is positive going.

The reset (holdoff) signal from pin 9 of U6011 causes pins 7 and 10 of U7011 to go high during the holdoff time after the completion of the sweep. This inhibits the gate generator until after holdoff time, when pins 7 and 10 are driven low by pin 9 of U6011.

The triggered gate (25B and 26B) and holdoff outputs (20B and 21B) are available on the rear interface connector.

Sweep Control Operation

The sweep control circuit recognizes initiating gates from the trigger circuitry and uses these gates to start and stop the sweep, as well as reset the trigger gating generator. The control circuitry also provides blanking pulses for the crt.

The sweep control circuit is composed of two OR gates. Transistors Q6026, Q7033 and Q6023 output the sweep and logic gates to U6011. Transistors Q6031, Q6021, Q6022 and Q6024 cause a current flow which initiates the sweep (see Fig. 3-3).

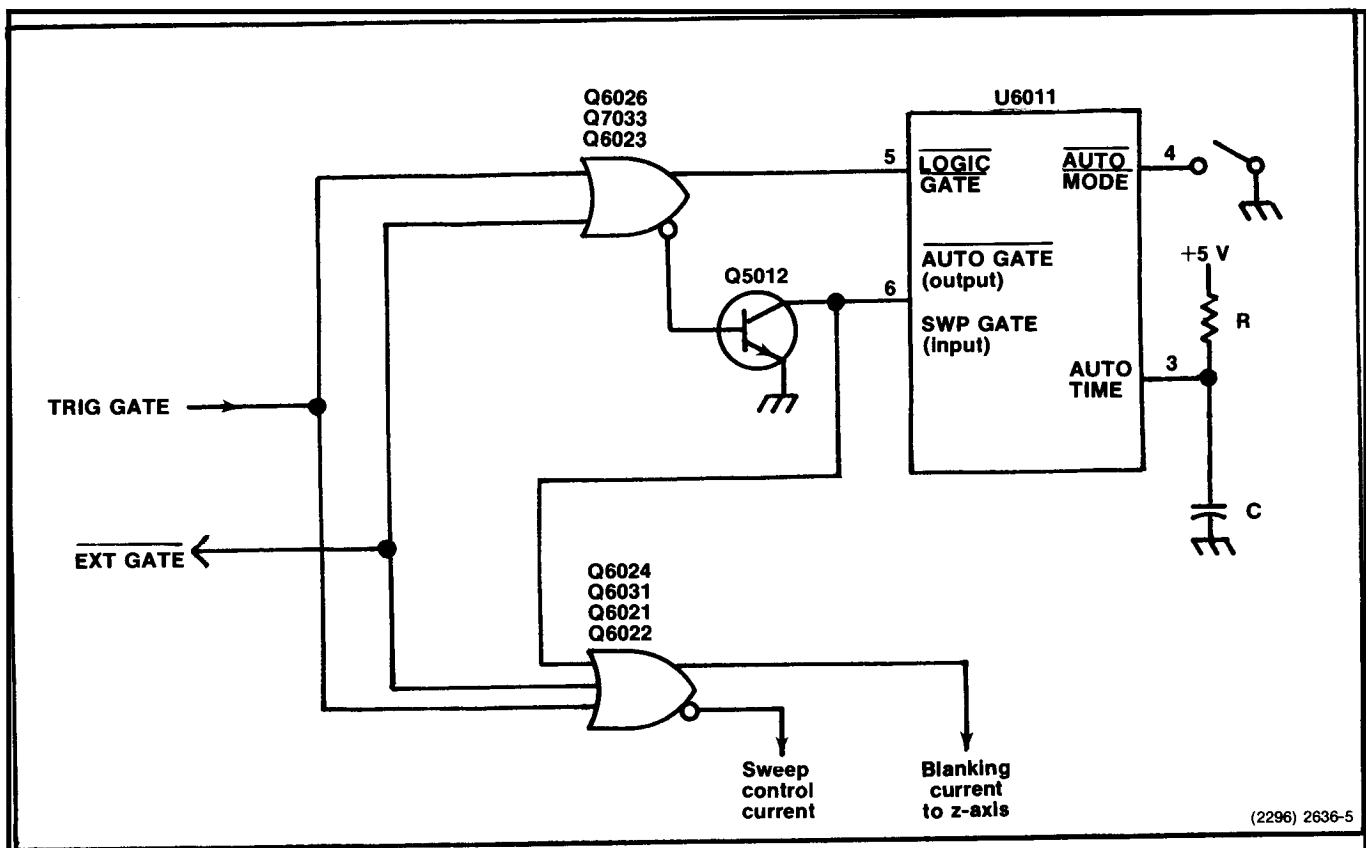


Fig. 3-3. Simplified sweep control circuit.

Sweep Gates

The trigger gate is a low-level signal developed from U4021, pin 4 (Diagram 5). This signal turns on Q6023 causing Q5001 to initiate the sweep gate to pin 6 of U6011. The logic gate feeds pin 5 of U6011 when Q5011 conducts.

The auto gate is a low-level signal from U6011 developed at pin 6. Pressing the TRIGGERING AUTO MODE switch grounds pin 4 of U6011. If no logic gate is received at pin 5 of U6011, for a period of time determined by R6014 and C6011, the circuitry in U6011 outputs, from pin 6, a negative-going square wave. This square wave turns Q6021 on, when the bases of Q6022 and Q6024 are at a higher level than the threshold voltage on the base of Q6031. A blanking signal is developed from Q6031 that is positive going and outputs to the Z-axis circuitry.

The external gate must be an ECL input signal at the rear interface connector, and inputs to the gate enable circuit. This circuit consists of Q6027 and Q6011. The gate select signal from pin 24B on the rear interface connector causes Q6027 to conduct. Transistor Q6011 turns off, thus enabling the external gate. This gate turns Q6024 on causing current flow through CR4021, thus developing a sweep.

Holdoff

The holdoff signal is available at pin 9 of U6011, which connects to the gate generator (U4021) at pin 10 (Diagram 5). This positive-going signal prevents the generation of sweep gates during holdoff times or after a single sweep has occurred. Holdoff begins when pin 12 of U6011 goes high. The resistor capacitor network, connected to pins 10 and 11 of U6011, determines the holdoff time. The setting of the SECONDS/DIV switch determines the duration of the holdoff.

Single Sweep

In the SGL SWP mode, pin 1 of U6011 is grounded and pin 4 of U6011 is ungrounded. When the sweep is armed, pins 13 and 15 of U6011 are low, causing the READY TRIG'D indicator to light. This action, at pins 13 and 15, also occurs when the sweep is in a triggered mode. Resistor R6011 limits the LED current to a specified value. Pressing the SGL SWP switch (momentary pushbutton) grounds pin 2 of U6011 through R5006, causing the gate generator (U6011) to reset. This turns on the READY TRIG'D light and arms the circuit for another triggered ramp.

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Ramp Generator

The sweep ramp is generated during the time that Q3021 is off. A constant current, determined by the timing resistor, flows into the timing capacitor, due to the action of the operational amplifier composed of Q3022A, Q3023, and Q4021. This generates the sweep ramp. The negative-going ramp voltage decreases at a rate determined by the timing resistor and timing capacitor combination, until reaching approximately -10.5 V.

At the end of the sweep, the sweep current through diode CR4021 turns Q3021 on. If the ramp voltage attempts to go above 0 V, CR4022 conducts. This causes the current through Q3021 to equal the current through the timing resistor plus the timing capacitor discharge current. This action clamps the integrator output to 0 V until the next sweep turns Q3021 off.

The negative-going ramp is inverted through Q7044, and then emitter coupled to pin 18A of the rear interface connector. When the ramp turns Q7034 off, current through Q7032 creates a negative-going signal at the base of Q7031. Transistor Q7031 outputs a positive-going, end-of-sweep (eos) signal to pin 12 of U6011. This output signal also feeds the Z-axis circuitry (Diagram 9) to initiate blanking of the crt.

In the XY mode, Q4022 turns on, disabling the ramp; CR7031 conducts, disabling the end-of-sweep comparator; and Q5012 turns on, disabling the sweep gates.

Horizontal Preamp and Output Amplifier

The horizontal preamplifier circuit is contained within U3037. A negative-going sweep ramp is fed to pin 9 of U3037 from the sweep generator.

The X1 gain control, R5013, is connected from pin 6 to pin 3 of U3037. In the HORIZ MAG position, the X10 gain control, R6011, is connected in parallel with R5013. The magnifier registration voltage on pins 1 and 8 of U3037 is provided by R5014. Horizontal positioning is controlled by the front-panel horizontal POSITION control.

The output sweep signals, from pins 7 and 2 of U3037, drive two separate current-driven, feedback amplifiers composed of Q3021, Q2011, and Q2012 for the positive-going sweep and Q3022, Q3011, and Q3012 for the negative-going sweep. Transistor Q2021 is the current source.

STORAGE CIRCUITRY

General

The storage circuit (see block diagram in Section 8) provides the voltage levels necessary to operate the crt flood guns, collimation electrodes, and storage target backplate.

The circuitry includes an erase monostable circuit, a storage target backplate amplifier, an enhance generator, and an integrate circuit. The enhance circuit permits storage of very fast single-sweep signals. Integrate permits storage of a number of repetitive sweeps, each of which would be too fast to store as a single-sweep event. The auto-erase generator circuit automatically initiates an erase pulse following the end of each sweep. The VIEW TIME control determines the length of time the stored information is held before erasure.

Storage Tube

The crt used in the SC 503 is a direct-view, bistable storage cathode-ray tube. Storage, which is the retention on the crt of a displayed event, is based on a secondary emission principle. A stream of primary electrons strikes an insulated target surface with sufficient energy to

dislodge electrons. As the potential increases, each primary electron dislodges more than one secondary electron, resulting in the written target material charging positive. The written portion of the target approaches the storage target backplate potential, yielding higher-energy flood electrons, resulting in light output.

In addition to the conventional crt writing gun elements the storage cathode-ray tube contains flood guns, collimation electrodes, and a storage target backplate. The operating mode of the tube depends primarily on the voltage applied to the storage target backplate. With one condition of applied potential, the storage target backplate operates in the ready-to-write state. When the storage target backplate is bombarded with high-energy writing-beam current, the bombarded portion shifts to the stored mode to store the written display. With a lower applied voltage, the storage target backplate operates in the conventional mode, similar to a conventional refreshed crt.

Flood Guns and Collimation Electrodes

Two low-energy electron guns (flood guns) are used in the SC 503 crt. The cathodes of these guns are biased to approximately -80 V by an operational amplifier con-

Theory of Operation—SC 503

sisting of Q2024 and Q2031. The flood guns provide a continuous flood of low-energy electrons that cover the entire target area.

The collimation electrodes serve as an electrostatic lens to distribute the flood gun electrons uniformly over the storage target. Resistor R1038 determines the voltage level of the collimation electrodes, through R1037 and Q1024. During erase, approximately one-fifth of the erase waveform is coupled through C1022 and Q1024 to the collimation electrodes. This compensates for interaction between the storage target backplate and the collimation electrodes during the erase cycle.

Storage Target Backplate Amplifier

This amplifier biases the storage target backplate into the store or the nonstore mode. It consists of Q1026, Q1022, and Q1021. When the VIEW TIME control, S7013B is in the nonstore position, a dc potential supplied through R4034 and R5031 is inverted and amplified by the storage target backplate amplifier to about 130 V below the store operating level. In this condition, the crt operates as a conventional crt.

With the VIEW TIME control, S7013B, in the store mode, less current is available to the storage target backplate operational amplifier through R4034 and R5031, raising the storage target backplate to a more positive potential. At this potential, the crt is in a ready-to-write state.

The input to the storage target backplate amplifier is a summing junction for the erase signal. Transistor Q1031 provides a bootstrap feedback for the erase-positive signal, through the zener action of VR1022. The store operating level of the storage target backplate is adjusted by R1039.

Auto Erase Generator

In the auto-erase circuit, the positive-going end-of-sweep pulse from the sweep generator is inverted and buffered through Q7012 into a discrete set-reset latch composed of Q7011 and Q7014. A positive ramp with a two-second time constant is developed by R6037 and C6032. When this positive ramp reaches the switching level of comparator U6031A, the comparator steps negative. This comparison level is adjusted by R7013 and determines the view time of the stored display. An erase-negative step can also be entered into the circuit at this point either from the rear interface External Erase connection or by pushing the manual ERASE PUSH button.

Erase Generator

To erase the stored display, a positive pulse is first applied to the storage target backplate. This pulse increases the potential difference between the flood-gun cathodes and the target backplate, raising the operating level above the upper writing limit and writing the entire target area with flood gun electrons. Next, the voltage is pulled negative, well below the retention threshold. Then, as the backplate potential is gradually returned, the target is charged to the storage target backplate potential and returned to a ready-to-write state.

The erase generator consists of an erase-positive monostable (Q5031, Q5032), an erase-negative ramp generator (Q6033), and associated circuitry. The erase-positive monostable generates the positive pulse portion of the erase waveform (see waveforms 13 and 14 in Section 8). The negative transition from U6031A, rear interface External Erase, or ERASE PUSH, turns off Q5031 allowing one side of C5032 to charge positive through R5038. This positive level is inverted through Q5032 and coupled to the summing junction of the storage target backplate operational amplifier. The erase-negative generator creates the positive-going ramp of the erase waveform (see waveform 15 in Section 8). When Q5031 turns on, the positive side of C5032 is pulled negative and gradually charged positive by Q6033. This ramp is coupled through Q6032 to the storage target backplate operational amplifier.

When Q6033 is saturated (collector at 5.6 V), comparator U6031B, pin 6 is more positive than its positive input pin 5, causing a low comparator output. During the erase-negative ramp (diagram 14 in Section 8) U6031B has a high output that holds Q7013 reset. The output of comparator U6031B is also coupled into the single sweep reset circuitry through Q7031.

Enhanced Operation

Writing speed is primarily a function of the writing gun beam current density and the physical properties of the storage tube. At very fast sweep speeds, the writing beam does not charge the scanned portion of the target sufficiently to shift the target to the stored state. The flood gun electrons discharge the small deposited charge down to the bias potential before the next sweep occurs. Writing beyond the normal writing speed of the crt is accomplished through the process of enhancement or integration.

The enhance generator produces a 5-15 ms negative-going current pulse to the backplate amplifier summing junction resulting in a positive-going pulse to the target backplate. This pulse conditions the target so that less writing gun current is required to shift the scanned section to the stored state.

Transistors Q6031, Q5033, driven by Q7012, and associated circuitry form the enhance monostable to produce the enhance pulse. The amplitude of this pulse is set by R4023.

Integrate Operation

In the integrate mode, the flood gun emission is interrupted by pressing the INTEGRATE button momentarily, permitting the writing gun beam to sum the charge on the backplate for successive sweeps. These areas of accumulated charge shift to the stored state when the flood electrons are turned on (INTEGRATE button released).

Pressing the INTEGRATE button grounds the input bias to the flood gun operational amplifier, consisting of Q2024 and Q2031, and turns off the flood-guns. This grounding also turns on Q3032 and Q2032, generating a compensating voltage into the HV adjust input. This compensating voltage shift corrects for deflection sensitivity changes that occur when the flood guns are turned off. This circuitry also turns on the FET switch Q5041, in the vertical delay line driver with Transistor Q5043E.

CRT AND POWER SUPPLY CIRCUITRY

Crt Circuit

This circuitry produces the high voltage potentials and provides the control circuits necessary for operation of the cathode ray tube. The Z-axis amplifier circuit sets the intensity of the display and controls the crt blanking.

Z-Axis Amplifier

The Z-axis amplifier is a current-driven, shunt-feedback operational amplifier with a voltage output. The amplifier consists of Q7021, Q7022, and Q7023. The feedback path is from the collectors of Q7022 and Q7023, through C7023 and R7024 to a summing point at the base of Q7021. Collector-coupled complementary amplifiers Q7022 and Q7023 provide a fast linear output signal and consume minimum quiescent power. Transistor Q7023 acts as the pullup transistor and Q7022 acts as the pulldown 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 R7024 with reference to the voltage level at the summing point for the amplifier (base of Q7021). The current through R7024 is determined by the input current from a combination of the INTEN control setting and the sweep blanking.

During blanking Q5021 turns on biasing Q5031 off, so that the Z-axis amplifier's output is at a low level. Removing the blanking current source from the base of Q5021 permits the operating point of the differential amplifier to be set by the intensity control potentiometer, R530. The output current raises the output level of the Z-axis amplifier.

Diodes CR8021 and CR8022 act as protective clamps for the Z-axis amplifier. Transistors Q5031 and Q5021 form a comparator, with the sweep blanking signal setting the reference level. To unblank the crt, the voltage level at the base of Q5021 must be more positive than the level at the base of Q5031. The operating level at the control grid of V500, is determined by diodes CR7041 and CR8041. Diode CR8041 limits the negative excursion of the bias voltage, depending upon the Z-axis amplifier output voltage. The positive clipping level at the cathode of CR7041 is set by the Beam Current adjust. Diodes CR2012 and CR2011 act, with coupling capacitor C7035, as dc restorers driven by C7034. This results in a dc level across R2012 equal to the peak-to-peak excursion at the anode of CR7041.

High Voltage Regulation

The regulator circuitry composed of Q7031, Q7032, Q6031, U6021, and associated circuitry provides the driving current to energize transformer T7041. Regulation is accomplished by sampling the -1.9 kV, via the voltage divider composed of R7027C and R7027D, and comparing it to $+12.5$ V reference. The junction of R7027C and R7027D, as well as pin 2 of U6021, is normally 0 V. When the -1.9 kV supply becomes less negative, the junction of R7027C, R7027D and pin 2 of U6021 becomes more positive. The negative-going output at pin 6 of U6021 is inverted by transistor Q6031. This signal results in increased charging current for C6032, which causes Q7031 to conduct longer during each cycle increasing the average current to T7041 and T6041.

Transformer T6041 operates as a high Q tuned circuit producing nearly sinusoidal waveforms. Transistor Q7031 conducts and saturates, Pin 5 of T6041 goes negative. During the conduction of Q7031, C6032 discharges through the base of Q7031 until Q7031 no longer saturates. As Q7031 turns off, Q7032 starts to conduct and finally saturates through the action of the one-turn

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winding of T7041 connected to the base of Q7032. The one-turn winding connected to the base of Q7031 aids in turn on.

The current through T7041 and the energy stored within the coil now flow through T6041 via Q7032 and CR7032. Transistor Q7032 remains on until T7041 completely discharges. With 0 V across the base-emitter of Q7032, the primary of T6041 now swings more positive than the input supply voltage. During the time that Q7032 is off, Q7031 charges C6032 to a voltage level that, when combined with voltage from the one-turn feedback winding of T7041, again causes Q7032 to conduct.

Initially, at instrument turn on, the reference supply voltage is allowed to go positive slowly. Once the voltage at the cathode of CR6051 becomes more positive than +12 V, CR 6021 conducts and the reference supply is held at a constant +12.5 V. If a short occurs to the T6041 secondary, the voltage at the cathode of CR6051 will move toward zero, thereby reducing the reference voltage and consequently the transformer drive. If a T6041 secondary winding short remains for a time, F9051, located on the Trigger board, opens to protect Q7032.

High-Voltage Outputs

The secondary windings of T6041 with associated circuitry provide the accelerating voltages and bias potentials for the crt, the floodgun and cathode heaters and power for the deflection amplifier and storage circuit.

Crt Control Circuits

The FOCUS and Astig controls are adjusted for optimum spot size and shape. The Geom control, R8062, buffered by Q8061, varies the positive level on the horizontal deflection plate shields to control the overall geometry of the display. The Trace Rotation control, R7062, adjusts the dc current through the beam rotation coil, L500, to align the display with the horizontal graticule lines.

Low-Voltage Power Supplies

The low-voltage power supply circuit (Diagram 11) provides the voltages for the oscilloscope. Electronic regulation is used, where necessary, to provide stable, low-ripple output voltages.

Power is applied to the supply by means of the TRIGGERING SOURCE switch, after the instrument has been inserted into the power module. The instrument is on in all positions of this switch, except in the STBY position. However, in the STBY position, unregulated voltages are still present in the instrument.

+12 V Supply

The +12 V supply, besides providing power to circuitry throughout the instrument, is a reference voltage source to establish operating levels for the feedback regulators in the -12 V and +5 V supplies.

The +12 V supply consists of VR6062, Q7063, Q7062, Q8062, Q8061, Q7053, and Q8053 and uses a series pass transistor in the power module. Current to the load is delivered by the series pass transistors.

The +12 V is established by the drop across CR6061, R6062, and R6061, which is compared to the voltage drop across VR6062 and the emitter-base junction of Q7063. The feedback path is through Q8062 to the base of Q7053. Any variation in output voltage due to ripple, change of current through the load, etc. is immediately transmitted to the base of Q7053, which in turn drives the base of the series pass transistor in the power module. The change in conduction of Q7053 nullifies this voltage variation, thus maintaining a steady output. The output of the supply is set to exactly +12 V by the +12 Volts adjust, R6053.

-12 V Supply

The -12 V supply consists of Q6041, Q7054, Q8051, Q7042, Q8052, Q7043, Q7051, and a series pass power module transistor. The operation of this supply is very similar to the +12 V supply. The supply voltage is established by comparing the voltage at the power module transistor output to the voltage drop across R6054 and the emitter-base junction of Q6041. The feedback path is through Q8051 to the base of Q7042, which drives the base of the series pass transistor located in the power module. Any variation in output voltage is sensed at the base of Q7042 and nullified, thus maintaining a steady output voltage.

When the TRIGGERING SOURCE switch is in the STBY position, the bases of Q7052 and Q7051 are at ground. This turns off the +12 V, -12 V and 5 V supplies in the SC 503. However, voltages from unregulated supplies are present.

+5 V Supply

Power for the +5 V regulator is supplied from the power module +11.5 V unregulated supply. The regulator for the +5 V supply is composed of operational amplifier U4011 and the series pass transistor in the power module. The series pass transistor is driven by emitter follower Q4012. Feedback for the amplifier is through C4012 and R4016.

The supply voltage is established by comparing the voltage at the negative input, pin 2 of U4011, with the +12 V reference at the positive input, pin 3. Any difference between the negative and positive inputs of U4011 causes a change in the conduction of the series pass transistor correcting the output error.

For example, if the +5 V momentarily goes more positive, pin 2 of U4011 goes more positive causing pin 6 of U4011 to go more negative. This reduces conduction in Q4012, which in turn reduces conduction in the series pass transistor located in the power module, causing the output voltage to drop back to +5 V.



An overvoltage on the +5 V line can damage VR4021 and open F8051.

Calibrator Circuit

This circuitry produces a square-wave output with accurate amplitude at a 1 kHz frequency. The output is available at the front panel as a 0.6 V (ground to peak) square-wave voltage.

This circuit is composed of Q1022 and Q1021 with associated components and is a free running emitter-coupled multivibrator.

ADJUSTMENTS

INTERNAL 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, 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 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 503 from the TM 500-series power module before cleaning the instrument or replacing parts. The SC 503 TRIGGERING SOURCE switch STBY position does not remove all power from the oscilloscope.

Equipment Required

1. TM 500-series power module having at least three compartments.
2. Dc voltmeter with accuracy within 0.1% and measurement range of at least 20 V. A TEKTRONIX DM 501 Digital Multimeter (operates in a TM 500 series power module), or equivalent, may be used.
3. Time-mark generator with marker output periods of 0.5 ms, 0.2 ms, 20 μ s, 5 μ s, 2 μ s, 1 μ s, 0.5 μ s, and 0.2 μ s (all within $\pm 0.1\%$). A TEKTRONIX TG 501 Time Mark Generator (operates in a TM 500 series power module), or equivalent time mark generator, may be used.
4. Calibration generator with the following characteristics: Standardized amplitudes of 20 mV to 50 V in a 1-2-5 sequence, with an accuracy of $\pm 0.25\%$ into 1 M Ω . Fast-rise pulse with a positive-going risetime of 1 ns or less and selectable periods of 10 ms, 10 μ s, and 1 μ s, with an amplitude adjustable from 60 mV to 500 mV. High-amplitude pulse with a positive-going risetime of 10 ns or less with a 1 ms period, and an amplitude adjustable from 100 mV to 5 V. A TEKTRONIX PG 506 Calibration Generator (operates in a TM 500 series power module), or equivalent, may be used.
5. Leveled sine-wave generator with output frequencies of 50 kHz and 10 MHz with leveled amplitudes of 60 mV and 3 V. A TEKTRONIX SG 503 Leveled Sine Wave Generator (operates in a TM 500 series power module), or equivalent, may be used.
6. 47 pF Input Normalizer with 2X attenuation, and bnc connectors. Use Tektronix Calibration Fixture 067-0541-00 or equivalent.
7. 50 ohm termination, bnc connectors, and 2% accuracy. Use Tektronix Part No. 011-0049-01 or equivalent.
8. 50 ohm coaxial cable, 42 inches long with bnc connectors. Use Tektronix Part No. 012-0057-01 or equivalent.
9. Plug-in extension, Tektronix Calibration Fixture 067-0645-02 (two required).
10. 10X attenuator, 50 Ω with bnc connectors and 2% accuracy. Use Tektronix Part No. 011-0059-02 or equivalent.
11. Low-capacitance screwdriver, approximately four inches long with a bit size of 3/32 inch. Use J.F.D. Electronics adjustment tool No. 5284.

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12. Extender board (Troubleshooting only) Tektronix Part No. 067-0819-00.

Preliminary Procedure

NOTE

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

1. Check that the power is off to the 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 the Installation section of the power module manual.

3. Remove the SC 503 Oscilloscope side, top, and bottom covers and connect the oscilloscope to the power module, using the plug-in extensions. Observe the caution signs on the plug-ins when making the connections. Align the plug-in correctly when making the connection to the short board.

4. Turn on the power module by pulling the power switch out.

CAUTION

If any work has been performed on the SC 503 power supplies, check the +12 V, -12 V, and +5 V power supplies. These supplies must be within 0.2 V of the correct voltage immediately after turn on.

5. Allow fifteen minutes for the SC 503 to warm up and stabilize.

NOTE

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

Preliminary Settings

Set the following controls during warm-up time:

FOCUS	Midrange
INTEN	Fully counterclockwise
STORAGE DISPLAY	CH 1
VIEWTIME	NON STORE
POSITION (vertical)	
CH 1	Midrange
CH 2	Midrange
CH 1	
VOLTS/DIV	.1
DC-GND-AC-INT DC	AC
CH 2	
VOLTS/DIV	.2
DC-GND-AC-INT DC	GND
POSITION (horizontal)	Midrange
SECONDS/DIV	.5m
PULL X10 HORIZ	Fully clockwise
MAG/CAL	and pushed in
TRIGGERING	
MODE	AUTO
CPLG	AC
SOURCE	CH 1
SLOPE	+
LEVEL	Midrange

ADJUSTMENT PROCEDURE

1. Adjust Calibrator Output

- Set the voltmeter to the 2 V range.
- Connect the voltmeter positive lead to the front-panel CAL jack and the negative lead to the ground jack.
- Short test points TP1011 and TP1012 on the Main circuit board.
- Check—that the voltage measured is 0.600 V.
- Adjust—R6053, Cal (on the Trigger board), for a voltmeter reading of 0.600 V.
- Disconnect the voltmeter.
- Disconnect the short between TP1011 and TP1012.

2. Check Power Supplies and Test Points

- Set the voltmeter to the 20 V range.

b. Connect the voltmeter positive lead to test point TP4011 located on the F & I board and the negative lead to chassis ground.

c. Check—that the voltage readout is between +5.20 V and +4.80 V.

d. Reconnect the voltmeter positive lead to test point TP6051 located on the Trigger board.

e. Check—that the voltage readout is between +12.30 V and +11.70 V.

f. Reconnect the voltmeter positive lead to test point TP6041 located on the Trigger board.

g. Check—that the voltage readout is between -12.40 V and -11.60 V.

h. Set the voltmeter to the 200 V range.

i. Reconnect the voltmeter positive lead to the junction of L1021 and C1011 on the Horizontal Deflection Board.

j. Check—that the voltage readout is between +170.0 V and +190.0 V.


k. Reconnect the voltmeter positive lead to the + side of C2031 on the F & I board.

l. Check—that the voltage readout is between +105.0 V and +115.0 V.

m. Reconnect the voltmeter positive lead to the negative side of C2021 on the F & I board.

n. Check—that the voltage readout is between -115.0 V and -155.0 V.

NOTE

If the supply is less negative than -115.0 V a .047 μ F (283-0341-00) or .1 μ F (288-0178-00) 50 volt capacitor may be added across the existing value of C6032 on the Main board. (Shown on schematic  as C6031 SEL), use the .047 μ F value when possible. The above selection procedure should only be necessary if parts were changed in the HV oscillator circuitry.

3. Adjust Triggering Dc Balance

The front-panel control settings are the same as the preliminary settings with the following exception:

TRIGGERING SOURCE INT

a. Set the voltmeter to measure 2 V full scale.

b. Connect the positive lead of the voltmeter to test point TP2011 and the negative lead to test point TP2012 on the Trigger Switch board.

c. Check—that the voltmeter reads 0 V, ± 10 mV.

d. Adjust—R2015, Dc Bal (on the Trigger Switch board), for a reading on the voltmeter of 0 V, ± 10 mV.

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

4. Adjust Crt Beam Current

The front-panel control settings are the same as the preliminary settings with the following exceptions:

TRIGGERING SOURCE EXT
SECONDS/DIV 2m

a. Connect the positive lead of the voltmeter to the beam current test point, TP6061 (on the Main circuit board), and the negative lead to chassis ground.

b. Set the voltmeter to the 2 V range.

c. Position the beam off the crt viewing area.

d. Turn the INTEN control fully clockwise.

e. Check—that the voltmeter reads 1.35 V ± 0.01 V.

f. Adjust—R8064, Beam (on the Main circuit board), for a voltmeter reading of 1.35 V, ± 0.01 V.

g. Turn the INTEN control to midrange.

h. Disconnect the voltmeter and return the front-panel controls to the preliminary settings.

5. Adjust Crt Astigmatism

The front-panel control settings are the same as the preliminary settings with the following exception:

DISPLAY XY



Damage to the crt phosphor can occur under adverse conditions. Avoid any condition where an extremely bright, sharply focused spot exists on the crt.

a. Reduce the spot intensity to prevent crt phosphor damage.

b. Position the crt spot to the center of the viewing area.

c. Turn the FOCUS control fully counterclockwise.

d. Check—the crt spot for maximum roundness.

e. Adjust—R7064, Astig (on the Main circuit board), for the roundest crt spot.

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- f. Set the FOCUS control for the best focused spot.
- g. Return the front-panel controls to the preliminary settings.

6. Adjust Crt Balance

The front-panel control settings are the same as the preliminary settings with the following exception:

DISPLAY XY



Damage to the crt phosphor can occur under adverse conditions. Avoid any condition where an extremely bright, sharply focused spot exists on the crt.

- a. Reduce the spot intensity to prevent crt phosphor damage.
- b. Position the crt spot to the center of the viewing area.
- c. Turn the FOCUS control fully counterclockwise.
- d. Rotate the INTEN control for maximum illumination.
- e. Check—the crt spot for maximum illumination.
- f. Adjust—R7061, Crt Bal (located on the Main circuit board), for maximum spot illumination.
- g. Reduce the spot intensity and adjust the FOCUS control for the best focused spot.
- h. Return the front-panel controls to the preliminary settings.

7. Adjust Crt Trace Rotation

The front-panel control settings are the same as the preliminary settings with the following exception:

DISPLAY CH 2

- a. Use the vertical POSITION control to move the trace to the center horizontal graticule line.

b. Check—that the horizontal trace is parallel to the center horizontal graticule line.

c. Adjust—R7062, Rotn (on the Main circuit board), until the crt trace is parallel to the center horizontal graticule line.

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

8. Adjust Crt Geometry

The front-panel control settings are the same as the preliminary settings with the following exceptions:

CH 2 VOLTS/DIV .1
CH 2 DC-GND-AC-INT DC DC

a. Connect 0.2 ms time markers from the time-mark generator through a coaxial cable and 50 Ω termination to the CH 2 input connector. Trigger the display and position the baseline of the time-mark below the bottom graticule line.

b. Check—the vertical lines for minimum bow or tilt.

c. Adjust—R8062, Geom (on the Main circuit board), for minimum bow or tilt of the vertical lines. If necessary, compromise the adjustment of R8062 to obtain less than 0.1 division bowing and tilt everywhere within the graticule area.

d. Interaction—between geometry and vertical, horizontal gain adjustments. If any change in geometry level is significant, vertical and horizontal gain should be checked for accuracy. The vertical and horizontal adjustments follow later in this procedure.

e. Disconnect the time-mark generator and return the front-panel controls to the preliminary settings.

9. Adjust Preamplifier Attenuator Balance

The front-panel control settings are the same as the preliminary settings with the following exceptions:

CH 1 VOLTS/DIV .2
CH 1 DC-GND-AC-INT DC GND

a. Position the crt trace to the center horizontal graticule line using the CH 1 vertical POSITION control.

- b. Set the CH 1 VOLTS/DIV switch to 1m.
- c. Check—that the trace is on the center horizontal graticule line.
- d. Adjust—R4065, Step Bal 1 for CH 1 (R3031, Step Bal 2 for CH 2), on the Main circuit board, to bring the crt trace back to the center horizontal graticule line.
- e. Return the CH 1 VOLTS/DIV switch to its .2 position.
- f. Repeat parts a through e until trace shift is eliminated when turning the VOLTS/DIV switch from .2 to 1m.
- g. Change the DISPLAY switch to CH 2 and repeat parts a through e for channel 2.
- h. Return the front-panel controls to the preliminary settings.

10. Adjust Preamplifier Input Capacitance

The front-panel control settings are the same as the preliminary settings with the following exceptions:

DISPLAY	CH 2
CH 2 VOLTS/DIV	10m
CH 2 DC-GND-AC-INT DC	DC
TRIGGERING SOURCE	CH 1

- a. Connect a coaxial cable from the high-amplitude output of the calibration generator through a 10X attenuator, to a 50 Ω termination, to a 47 pF input normalizer, to the CH 2 input of the SC 503.
- b. Adjust the calibration generator for a 1 millisecond period and a display amplitude of five divisions.
- c. Adjust the TRIGGERING LEVEL control for a stable display.
- d. Check—the front corner of the displayed waveform for squareness.
- e. Adjust—C2011 on the Attenuator board for a square front corner on the displayed waveform.

- f. Remove the 10X attenuator from the signal setup and set the CH 2 VOLTS/DIV switch to the .5 position.
- g. Increase the output amplitude of the calibration generator to obtain a five-division display.
- h. Check—the front corner of the displayed waveform for squareness.
- i. Adjust—C2012 for a flat top and C2014 for a square front corner (adjustments on the Attenuator board).
- j. Interaction—may occur between the settings of C2011 and C2012-C2014. Repeat parts a through i and readjust if necessary.

Change the following front-panel control settings:

DISPLAY	CH 1
CH 1 VOLTS/DIV	10m
CH 1 DC-GND-AC-INT DC	DC
TRIGGERING SOURCE	CH 1

- k. Repeat parts a through j for channel 1.
- l. Disconnect the signal setup.
- m. Return the front-panel controls to the preliminary settings.

11. Adjust Deflection Plate Dc Level

The front-panel control settings are the same as the preliminary settings with the following exception:

DISPLAY	CH 2
---------	------

- a. Set the digital voltmeter to the 20 V scale and connect the test leads between the collectors of Q3014 and Q3034 on the F & I circuit board.
- b. Set the CH 2 vertical POSITION control until the voltmeter indicates 0 V, ± 50 mV.
- c. Disconnect the voltmeter leads.
- d. Set the voltmeter to the 200 V scale, and reconnect the positive lead of the voltmeter to either connection listed in part a. Connect the negative lead to chassis ground.

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e. Check—the voltmeter for a reading between +49.75 V and +50.25 V.

f. Adjust—R2021, Dc Level (on the F & I board), for a voltmeter reading of +50.00 V.

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

12. Adjust Vertical Centering

The front-panel control settings are the same as the preliminary settings.

- a. Rotate the CH 1 POSITION control fully clockwise.
- b. Set the digital voltmeter to the 200 V scale and measure the voltage between the collectors of Q3014 and Q3034 (on the F & I board). Note this reading.
- c. Rotate the CH 1 POSITION control fully counterclockwise.
- d. Measure the voltage between the collectors of Q3014 and Q3034. Note this reading.
- e. Check—for less than 1 V difference between the measurements found in parts b and d.
- f. Adjust—R1012, Centering (on the F & I board), for less than 1 V difference between the two measurements found in parts b and d.
- g. Disconnect the voltmeter and return the front-panel controls to the preliminary settings.

13. Adjust Preamplifier Gain

The front-panel control settings are the same as the preliminary settings with the following exceptions:

CH 1 VOLTS/DIV	10m
TRIGGERING SOURCE	EXT

- a. Turn the TRIGGERING LEVEL control fully clockwise.
- b. Connect 50 mV of standardized amplitude signal from the calibration generator, through a coaxial cable to the SC 503 CH 1 input connector.

c. Check—for five divisions of deflection.

d. Adjust—R1011, Gain (on the F & I circuit board), for exactly five divisions of deflection.

e. Check—the remaining CH 1 VOLTS/DIV switch positions for deflection accuracy within the tolerances listed in Table 4-1.

Table 4-1

VERTICAL DEFLECTION ACCURACY

VOLTS/DIV Setting	Standardized Amplitude Applied to Input	Display Amplitude In Divisions	Tolerance
1 mV	5 mV	5	5%
2 mV	10 mV	5	5%
5 mV	20 mV	4	3%
10 mV	50 mV	5	Adjusted
20 mV	.1 V	5	3%
50 mV	.2 V	4	3%
.1 V	.5 V	5	3%
.2 V	1 V	5	3%
.5 V	2 V	4	3%
1 V	5 V	5	3%
2 V	10 V	5	3%
5 V	20 V	4	3%
10 V	50 V	5	3%
20 V	100 V	5	3%

f. Set the DISPLAY switch to CH 2 and the CH 2 VOLTS/DIV switch to 10m. Change the calibration generator output to 50 mV and move the coaxial cable to the CH 2 input connector.

g. Change the TRIGGERING SOURCE switch to CH 2.

h. Check—for a displayed waveform amplitude of five divisions.

i. Adjust—R4031, CH 2 Gain (on the Main circuit board), for a displayed waveform amplitude of exactly five divisions.

j. Check—the remaining CH 2 VOLTS/DIV switch positions for accuracy within the tolerances listed in Table 4-1.

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

14. Adjust Vertical Amplifier Frequency Compensation

The front-panel control settings are the same as the preliminary settings with the following exceptions:

DISPLAY	CH 2
TRIGGERING SOURCE	CH 2
CH 1 DC-GND-AC-INT DC	AC
CH 2 DC-GND-AC-INT DC	AC
CH 1 VOLTS/DIV	.2
SECONDS/DIV	5 μ

a. Connect the positive-going, fast-rise output of the calibration generator through a coaxial cable with a 50 Ω termination to the CH 2 input connector.

b. Adjust the calibration generator output for a 10 μ s period and a display amplitude of five divisions.

c. Set the TRIGGERING LEVEL control for a stable display.

d. Check—the displayed waveform for a flat top without rolloff or overshoot.

e. Adjust—R2014 (on the F & I board), for a flat top (without rolloff or overshoot) on the displayed waveform.

f. Adjust the calibration generator output for a 1 μ s period.

g. Set the PULL X10 HORIZ MAG switch to the out position (resultant sweep rate is 0.5 μ s/division).

h. Check—the displayed waveform for a flat top without rolloff or overshoot.

i. Adjust—R2018 and C2022 (on the F & I board), using a low-capacitance screwdriver, for a square front corner (without rolloff or overshoot) on the displayed waveform.

j. Set the SECONDS/DIV switch to 2 μ .

k. Check—the displayed waveform for a flat top without rolloff or overshoot.

l. Change the DISPLAY and SOURCE switches to CH 1.

m. Adjust—R3023 and C3018 (on the F & I board), using a low-capacitance screwdriver, for a square front corner (without rolloff or overshoot) on the displayed waveform.

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

o. Interaction—between CH 1 and CH 2 frequency compensation. Change the TRIGGERING SOURCE switch to CH 2 and repeat parts b through i for channel 2. If necessary, compromise the above adjustments so that the amplifier response is equal for both vertical channels.

p. Disconnect the calibration generator and return the front-panel controls to the preliminary settings.

15. Adjust Mag Registration

The front-panel control settings are the same as the preliminary settings with the following exceptions:

CH 1 VOLTS/DIV	.5
SECONDS/DIV	.1m

a. Connect .1 ms time markers from the time-mark generator through a coaxial cable and 50 Ω termination to the CH 1 input connector. Note one time mark/div on the crt screen.

b. Turn the TRIGGERING LEVEL control to obtain a stable display.

c. Pull the SECONDS/DIV CAL control out.

d. Horizontally position the first time mark to the center graticule line.

e. Push the SECONDS/DIV CAL control in.

f. Check—the display for coincidence of the first time mark and the vertical graticule center line.

Adjustments—SC 503

g. Adjust—R5014, Mag Reg (on the Main circuit board), to set the first time mark at the center graticule line.

h. Interaction—between setting of R5014, Mag Reg adjustment and magnified sweep. Repeat parts c through g until there is no interaction between the X1 and X10 positions.

16. Adjust X1 Gain

- a. Set the SECONDS/DIV control to the .5m position.
- b. Set the time-mark generator to supply 0.5 ms time markers.
- c. Check—the display for one time mark per division with the second and tenth time marks coincident with the second and tenth vertical graticule lines.
- d. Adjust—R5013, X1 Gain (on the Main circuit board), until a display of one time marker per division is obtained. The second and tenth time markers must line up exactly with their respective graticule lines.

17. Adjust X10 Gain

- a. Set the time-mark generator to supply 50 μ s markers.
- b. Pull the SECONDS/DIV CAL/HORIZ MAG control out.
- c. Check—the display for one time mark per division with the second and tenth time marks coincident with the second and tenth vertical graticule lines.
- d. Adjust—R6011, X10 Gain (on the Main circuit board), until one time marker per division is obtained. The second and tenth time markers must line up exactly with their respective graticule lines.
- e. Disconnect the time-mark generator and return the front-panel controls to the preliminary settings.

18. Adjust X Gain

The front-panel control settings are the same as the preliminary settings with the following exceptions:

DISPLAY	XY
CH 2 DC-GND-AC-INT DC	DC
CH 2 VOLTS/DIV	10m

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

b. Center the two-dot display on the center horizontal graticule line with the positioning controls.

c. Check—the display for five divisions between the dots.

d. Adjust—R5012, X Gain (on the Main circuit board), for a two-dot display with dot centers five divisions apart.

e. Disconnect the calibration generator and return the front-panel controls to the preliminary settings.

19. Adjust Trigger View Centering

The front-panel control settings are the same as the preliminary settings with the following exceptions:

SECONDS/DIV	2m
TRIGGERING SOURCE	LINE

- a. Depress and hold in the TRIG VIEW switch during the following steps.
- b. Check—the display for trace start at the center horizontal graticule line.
- c. Adjust—R4031, Trig View Bal (on the Trigger board), so that the start of the trace is at the center horizontal graticule line.
- d. Set the TRIGGERING SLOPE switch to – and recheck the starting position of the display.
- e. Compromise the final adjustment of R4031 between the trace starts for both the + and – SLOPE switch positions.
- f. Release the TRIG VIEW switch and return the front-panel controls to the preliminary settings.

20. Adjust Triggering + Peak and – Peak Offset

The front-panel control settings are the same as the preliminary settings with the following exceptions:

TRIGGERING SOURCE	LINE
TRIGGERING LEVEL	fully counterclockwise
SLOPE	—

a. Depress and hold in the TRIG VIEW switch during the following steps.

b. Check—the bottom of the displayed waveform for a position one-half division below the point where the waveform just loses triggering.

c. Adjust—R1001, – Peak (on the Trigger board), to position the bottom of the displayed waveform to one-half division below the point where the waveform just loses triggering.

d. Rotate the TRIGGERING LEVEL control to the + side and set the SLOPE switch to the + position.

e. Check—the top of the displayed waveform for a position one-half division above the point where the waveform just loses triggering.

f. Adjust—R1002, + Peak (on the Trigger board) to position the top of the displayed waveform to one-half division above the point where the waveform just loses triggering.

g. Release the TRIG VIEW switch and return the front-panel controls to the preliminary settings.

21. Adjust Storage Operating Level

The front-panel control settings are the same as the preliminary settings with the following exceptions:

CH 1 DC-GND-AC-INT DC	GND
SECONDS/DIV	1m
VIEW TIME	∞

a. Set R1039, Store (on the F & I board), fully counterclockwise. Set the ENHANCE control to minimum.

b. Set the INTEN control for a normal viewing level.

c. Turn the vertical POSITION control to produce a series of horizontal lines in the viewing area. Note that the lines fade out rapidly.

d. Erase and rewrite the lines while adjusting R1039 in small increments. Continue until there is no deterioration of the stored lines for approximately one minute after erasure.

e. Set the voltmeter to the 200 V dc scale and measure the voltage on pin 1 of J1021. Note the voltage reading.

f. Turn R1039 fully clockwise.

g. Turn the vertical POSITION control to produce a series of lines in the viewing area. Note that the background light level is high.

h. Erase and rewrite the lines, as in part d, while adjusting R1039 counterclockwise in small increments until there is no fadeup.

i. Reconnect the voltmeter to pin 1 of J1021 and measure the voltage.

j. Check—that the voltage reading is about half way between the voltage measured in part e and part i.

k. Adjust—R1039 for a voltage reading half way between the voltages measured in part e and part i.

l. Disconnect the voltmeter and return the front-panel controls to the preliminary settings.

22. Adjust Collimation Level

The front-panel control settings are the same as the preliminary settings with the following exception:

VIEW TIME	midrange
-----------	----------

a. Check—the display for a uniformly illuminated background.

b. Adjust—R1038, CE Level (located on the F & I board), to produce a uniformly illuminated background display.

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

NOTE

Uniform background display depends upon the proper floodgun heater current, which is affected by the efficiency of the high voltage power supply. If components have been replaced in the high voltage supply circuitry, particularly transistor Q7031 or transformer T6041, make the following check:

Temporarily remove, if present, the selected capacitor, C6031 in parallel with capacitor C6032. Check the –135 V supply. If less than –115 V, select capacitor C6031 with values of 0.047 μ F or 0.1 μ F, to bring the –135 V supply within ± 20 V.

23. Adjust High Voltage Compensation

The front-panel control settings are the same as the preliminary settings with the following exception:

CH 1 DC-GND-AC-INT DC DC

a. Connect 100 mV of 1 kHz square-wave signal from the calibration generator, through a coaxial cable, to the CH 1 input connector.

b. Set the CH 1 VOLTS/DIV switch to 10m and adjust the variable VOLTS/DIV control for exactly five divisions of vertical display.

c. Set the VIEW TIME control to ∞ . When the background fully lights, push the ERASE button.

d. Check—the crt for five divisions of vertical display while pressing the INTEGRATE pushbutton.

e. Adjust—R2034, HV Adjust (on the F & I board), for five divisions of vertical display while pressing the INTEGRATE pushbutton.

f. Disconnect the calibration generator and return the front-panel controls to the preliminary settings. This completes the Adjustments procedure.

MAINTENANCE AND INTERFACING INFORMATION

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.

Numbers in parentheses, in the following discussion, refer to mechanical parts referenced in Fig. 5-1.

Instrument Covers and Bottom Frame Removal

The following procedure outlines removal of the instrument covers and bottom frame.

- a. Using a blade-type screwdriver, pry up the rear corner of each side cover and carefully pull the covers away from the guides.
- b. Remove the two pan-head screws that secure the bottom cover and pull the cover forward.
- c. Remove the two pan-head screws that attach the high voltage cover. Pull up and remove the cover.
- d. Remove the ground stud located at the bottom right corner of the front panel and the truss-head screw at the bottom left corner of the front panel. Remove the rear hexagonal-head screws with a hexagonal nut driver and pull the bottom frame away.

Crt Removal and Replacement

The following procedure outlines removal and replacement of the cathode-ray tube.

WARNING

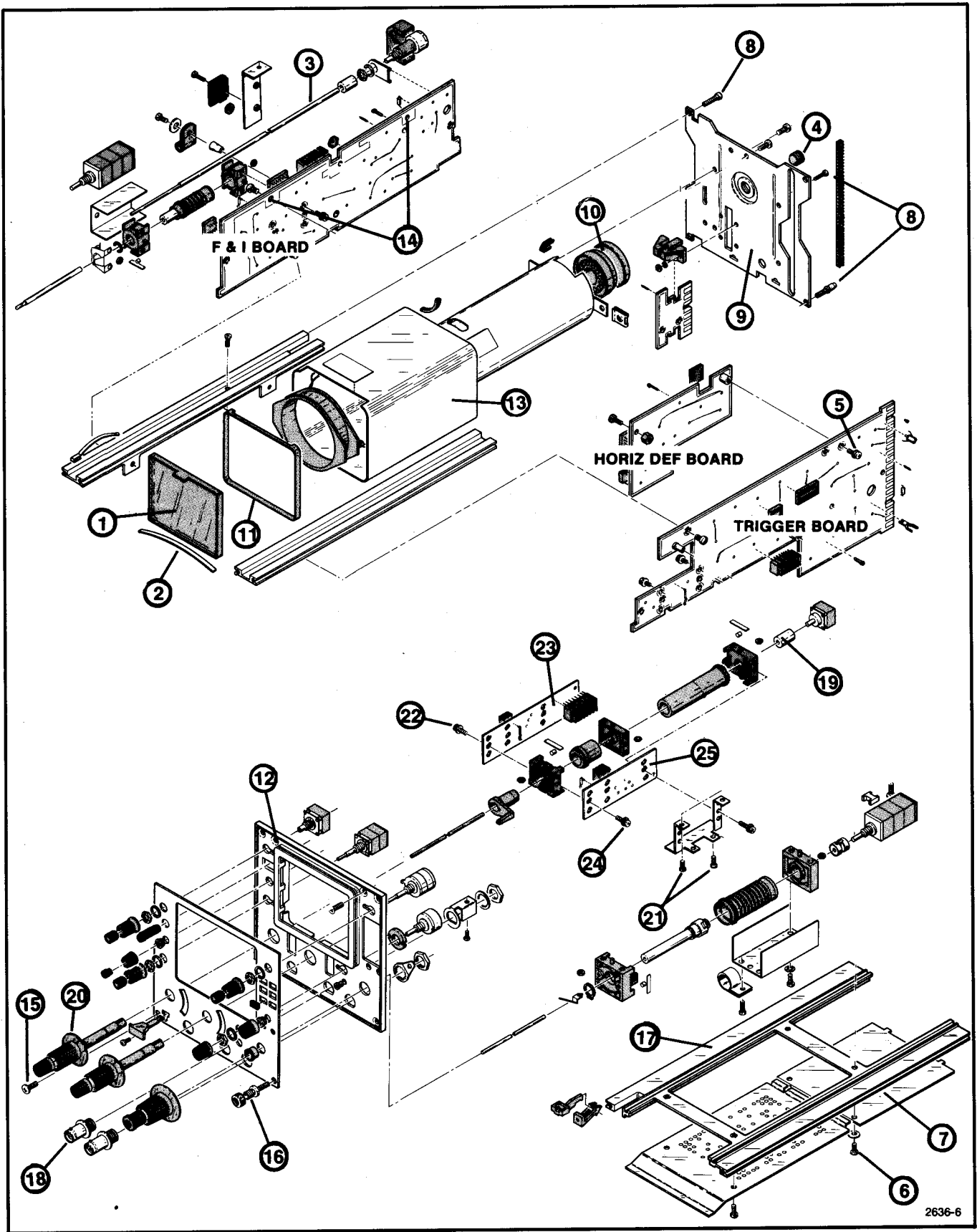
Use care when handling the crt. Protective clothing and safety glasses should be worn. Avoid striking the crt on any object which might cause it to crack or implode. When storing a crt, place it in a protective carton. Set the crt face down in a protected location on a smooth surface, with a soft mat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

1. CRT REMOVAL

- a. Remove the instrument side and top covers.
- b. Remove the implosion shield filter (1) and the implosion shield spring (2).
- c. Disconnect the FOCUS extension shaft (3) from the focus potentiometer.
- d. Loosen the black screw (4). Remove the three screws holding the rear panel bracket and remove the rear panel bracket.
- e. Remove the screw (5) holding the horizontal deflection circuit board. Disconnect the two horizontal crt deflection pin leads. Lift the board straight up, disconnecting the square pins at the bottom.
- f. Disconnect the trace rotation coil from the F and I circuit board by removing the two-pin connector. Remove the two crt vertical deflection pin leads.
- g. Remove the two screws (6) that secure the high voltage cover and remove the cover (7). Remove the eight screws (8) holding the rear panel (9) and remove the panel.
- h. Disconnect the crt socket (10); then remove the crt shield with the crt inside.

2. CRT REPLACEMENT

- a. Install the front crt support spacer (11) into the rear bezel opening of the front subpanel (12).
- b. Install the crt in the crt shield; then install the assembly in the oscilloscope. During installation, be careful not to bend the protruding connector pins. Place the crt shield (13) against the front crt support spacer. Push the crt into the front crt support. See Fig. 5-2. Connect the crt socket to the crt. Hold the crt assembly in position and install the rear panel with enough screws to hold the crt assembly in place.



2636-6

Fig. 5-1. Cathode-ray tube, circuit board, and cam switch parts details.

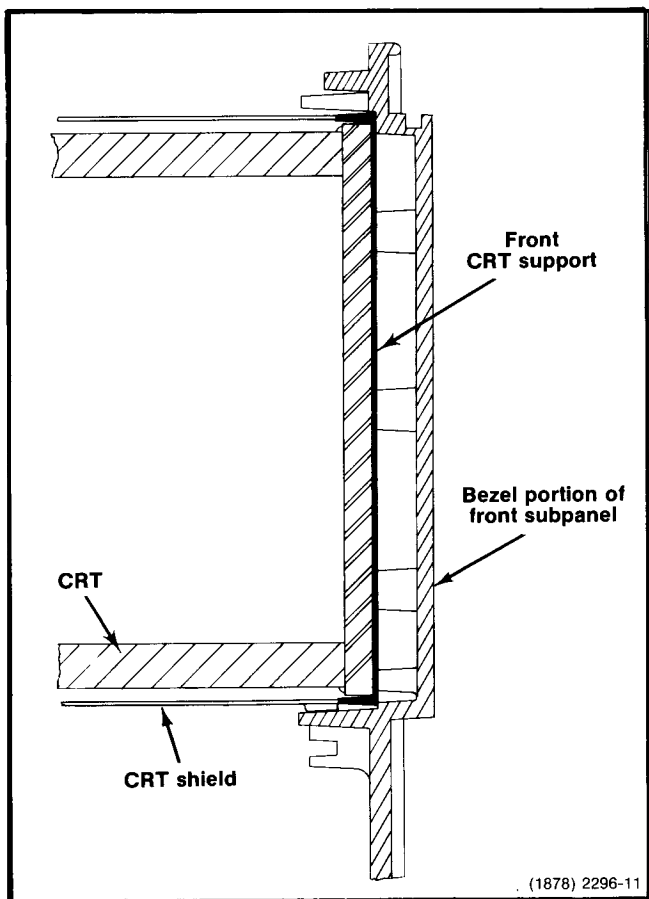


Fig. 5-2. Cross sectional view showing placement position of front crt support, crt shield, and crt.

c. Insert two screws (6) to secure the high voltage cover and replace the remaining screws (8) to secure the rear panel.

d. Connect the two crt vertical deflection pin leads to the F and I circuit board.

e. Reconnect the two-pin connector from the trace rotation coil to the F and I circuit board.

f. Reinstall the horizontal deflection board. Reconnect the two horizontal crt deflection pin leads. Replace the screw that holds the board.

g. Position the rear-panel bracket and insert the three screws securing the bracket. Tighten the black screw.

h. Reconnect the FOCUS extension shaft to the focus potentiometer.

i. Install the implosion shield spring, with the spring ends down, in the bottom groove of the front bezel portion of the front subpanel. Install the filter into the front bezel portion of the front subpanel by compressing the spring and pushing into the groove.

j. Reinstall the instrument side and top covers.

k. Replacing the crt requires partial instrument readjustment. Refer to the Adjustments section of this manual.

Circuit Board Removal and Installation

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

1. CIRCUIT BOARD REMOVAL

a. Remove the crt using the crt removal procedure.

b. Remove all of the front-panel knobs except SLOPE, LEVEL, horizontal POSITION, vertical POSITION and INTEN.

c. Remove the two screws (14) holding the circuit board assembly to the top rails. Remove the screw (15) and the stud post with knurled nut (16) and remove the bottom section frame (17).

d. Disconnect from the circuit boards those connectors with leads to the front-panel connectors and controls with knobs. Unsolder the leads at the three bnc connectors. Remove the screw at the vertical bnc connector ground lugs.

e. Slide the circuit board assembly away from the front panel until clear of the subpanel.

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

2. CIRCUIT BOARD INSTALLATION

a. Reverse the circuit board removal procedure; then follow the crt replacement procedure.

Cam Switch Removal and Installation

The following procedure outlines removal and installation of the cam switches. See the instrument covers and bottom frame removal procedure.

Maintenance and Interfacing Information—SC 503

1. CAM SWITCH REMOVAL

a. Unsolder the resistor (R510-channel one, R520-channel two) from the front-panel bnc connector (18).

b. Loosen the front set screw (19) from the shaft coupling and pull the CAL extension shaft through the front panel.

c. Pull out the skirted knob (20).

d. Remove the four screws (21) securing the cam switch assembly and carefully lift the assembly straight out.

2. CAM SWITCH INSTALLATION

a. Reverse the cam switch removal procedure.

NOTE

Carefully align the cam switch sockets to the board pins before installing the cam switch assembly.

Gain Board Removal and Installation

See cam switch removal and installation procedure.

1. GAIN BOARD REMOVAL

a. Unsolder the connecting wire between the gain board and the attenuator board.

b. Remove the three truss-head screws (22) and lift out the gain board (23).

2. GAIN BOARD INSTALLATION

a. Reverse the gain board removal procedure.

Attenuator Board Removal and Installation

See cam switch removal and installation procedure.

1. ATTENUATOR BOARD REMOVAL

a. Unsolder the connecting wire between the gain board and the attenuator board.

b. Remove the three truss-head screws (24) and lift out the attenuator board (25).

2. ATTENUATOR BOARD INSTALLATION

a. Reverse the attenuator board removal procedure.

Using the Rear Interface

The tabbed foldout pages labeled Waveforms and Rear Board Connections, refer to the following information:

CH 1 Trigger Out (contact 28B) and Ground (27B). The analog output is on contact 28B. The source resistance is less than 50 Ω . The sensitivity is typically 50 mV/div and bandwidth is typically 4 MHz.

Triggered Gate Out (contacts 26B and 25B). These contacts provide an ECL-balanced output operating between +5 V and ground. A high logical state on contact 26B indicates a holdoff condition, and the sweep cannot be triggered or gated on. This output is designed to drive a 100 Ω side-to-side terminated line with an ECL line receiver. The outputs are protected with two 47 Ω resistors.

Gate Select In (contact 24B). Grounding 24B through 1 k Ω (or less) selects the external gate as the sweep controlling signal. An open circuit causes normal operation.

External Gate In (contacts 23B and 22B). These contacts accept an ECL-balanced input operating between +5 V and ground. Input resistance is 100 Ω (side-to-side). A transition to a high logical state on contact 23B causes the sweep to start, run once, and reset if contact 24B (gate select) is grounded. A transition from a high to a low state will stop the sweep, if it is running. The ECL input is protected with a diode clamp.

Holdoff Out (contacts 21B and 20B). This is an ECL-balanced output operating between +5 V and ground designed to drive a 100 Ω side-to-side line terminated with an ECL receiver. The outputs are protected with 47 Ω resistors. A high logical state on 20B (low level on 21B) indicates a sweep holdoff period.

Intensify In (contact 19B). The input signal to contact 19B must be equivalent to a single output from an ECL driver operating between +5 V and ground. Input resistance is approximately 1 k Ω . A low logical state intensifies the trace. An open circuit defaults to a high logical state.

Trigger In (contact 15B) and Ground (14B). Contact 15B is selected when the SOURCE switch on the front panel is in the INT (interface) position. Input resistance is nominally 50 Ω when INT is selected and 25 Ω when another source is selected. Input resistance (when selected) can be modified by changing the value of R3041 to 1 M Ω . Parallel capacitance is approximately 60 pF. Maximum input voltage is 2.5 V rms, 40 V peak ac. The maximum input power is 1/4 W or less.

Sweep Gate Out (contact 26A) and Ground (25A). The level is +5 V during sweep time and approximately 0 V otherwise from a source impedance of 1 k Ω .

Z-Axis In (contact 24A) and Ground (23A). This is an analog input summed with voltage from the front panel INTEN control. When the INTEN control is fully counterclockwise (ccw), +5 V at this contact will turn the crt beam on. When the INTEN control is fully clockwise (cw), -5 V turns the crt beam off. The nominal input resistance is 1.5 k Ω .

Erase Function (contact 22A). A remote switch closure to ground performs the same function as the ERASE PUSH function on the front panel. The voltage is +5 V when the contact is not grounded.

Reset In (contact 21A). Grounding contact 21A through a 1 k Ω (or less) causes single sweep reset.

Light Out (contact 20A). This output is less than +1 V through 1 k Ω when the READY TRIG'D light is on, +5 V through a high impedance otherwise. A loading greater than 1 mA when output is in the high voltage state may cause erroneous READY TRIG'D light operation.

+5 V Out (contact 19A). This is a power supply output. The maximum current capability is 15 mA.

Ramp Out (contact 18A). This is a positive-going sweep (ramp), typically 0 V to +10 V. The output resistance is approximately 500 Ω . Not recommended for use at sweep rates faster than 1 microsecond/division.

CH 2 Vertical In (contact 16A) and Ground (17A). Contact 16A is selected as the source for the CH 2 vertical signal when the front panel CH 2 coupling switch is in the INT DC position. The input resistance is nominally 50 Ω . This can be modified by changing the value of R2051 to 1 M Ω . The parallel capacitance is approximately 100 pF. The maximum input voltage is 5 V rms, 40 V peak ac. Displayed noise may exceed 1 mV, peak to peak.

CH 1 Vertical In (contact 14A) and Ground (15A). Contact 14A is selected as the source for the CH 1 vertical signal when the front panel CH 1 coupling switch is in the INT DC position. The input resistance is nominally 50 Ω . This can be modified by changing the value of R2031 to 1 M Ω . The parallel capacitance is approximately 100 pF. The maximum input voltage is 5 V rms, 40 V peak ac. Displayed noise may exceed 1 mV, peak to peak.

Repackaging Information

If the Tektronix instrument is to be shipped to a Tektronix Service Center for service or repair, attach a tag showing: owner (with address) and the name of an individual at your firm that can be contacted. Include complete instrument serial number and a description of the service required.

Save and re-use the package in which your instrument was shipped. If the original packaging is unfit for use or not available, repackage the instrument as follows:

Surround the instrument with polyethylene sheeting to protect the finish of the instrument. Obtain a carton of corrugated cardboard of the correct carton strength and having inside dimensions of no less than six inches more than the instrument dimensions. Cushion the instrument by tightly packing three inches of dunnage or urethane foam between carton and instrument, on all sides. Seal carton with shipping tape or industrial stapler.

The carton test strength for your instrument is 200 pounds.

OPTIONS

None 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.

SPECIAL NOTES AND SYMBOLS

X000 Part first added at this serial number

00X Part removed after this serial number

ITEM NAME

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

ABBREVIATIONS

ACTR	ACTUATOR	PLSTC	PLASTIC
ASSY	ASSEMBLY	QTZ	QUARTZ
CAP	CAPACITOR	RECP	RECEPTACLE
CER	CERAMIC	RES	RESISTOR
CKT	CIRCUIT	RF	RADIO FREQUENCY
COMP	COMPOSITION	SEL	SELECTED
CONN	CONNECTOR	SEMICOND	SEMICONDUCTOR
ELCTLT	ELECTROLYTIC	SENS	SENSITIVE
ELEC	ELECTRICAL	VAR	VARIABLE
INCAND	INCANDESCENT	WW	WIREWOUND
LED	LIGHT EMITTING DIODE	XFMR	TRANSFORMER
NONWIR	NON WIREWOUND	XTAL	CRYSTAL

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
00853	SANGAMO ELECTRIC CO., S. CAROLINA DIV.	P O BOX 128	PICKENS, SC 29671
01121	ALLEN-BRADLEY COMPANY	1201 2ND STREET SOUTH	MILWAUKEE, WI 53204
01295	TEXAS INSTRUMENTS, INC., SEMICONDUCTOR GROUP	P O BOX 5012, 13500 N CENTRAL EXPRESSWAY	DALLAS, TX 75222
02111	SPECTROL ELECTRONICS CORPORATION	17070 EAST GALE AVENUE	CITY OF INDUSTRY, CA 91745
02735	RCA CORPORATION, SOLID STATE DIVISION	ROUTE 202	SOMERVILLE, NY 08876
03508	GENERAL ELECTRIC COMPANY, SEMI-CONDUCTOR PRODUCTS DEPARTMENT	ELECTRONICS PARK	SYRACUSE, NY 13201
04222	AVX CERAMICS, DIVISION OF AVX CORP.	P O BOX 867, 19TH AVE. SOUTH	MYRTLE BEACH, SC 29577
04713	MOTOROLA, INC., SEMICONDUCTOR PROD. DIV.	5005 E MCDOWELL RD, PO BOX 20923	PHOENIX, AZ 85036
07263	FAIRCHILD SEMICONDUCTOR, A DIV. OF FAIRCHILD CAMERA AND INSTRUMENT CORP.	464 ELLIS STREET	MOUNTAIN VIEW, CA 94042
12697	CLAROSTAT MFG. CO., INC.	LOWER WASHINGTON STREET	DOVER, NH 03820
12954	SIEMENS CORPORATION, COMPONENTS GROUP	8700 E THOMAS RD, P O BOX 1390	SCOTTSDALE, AZ 85252
13511	AMPHENOL CARDRE DIV., BUNKER RAMO CORP.		LOS GATOS, CA 95030
14099	SEMTECH CORP.	652 MITCHELL RD.	NEWBURY PARK, CA 91320
14433	ITT SEMICONDUCTORS	3301 ELECTRONICS WAY P O BOX 3049	WEST PALM BEACH, FL 33402
14936	GENERAL INSTRUMENT CORP., SEMICONDUCTOR PRODUCTS GROUP		
15238	ITT SEMICONDUCTORS, A DIVISION OF INTERNATIONAL TELEPHONE AND TELEGRAPH CORP.	P.O. BOX 600, 600 W. JOHN ST.	HICKSVILLE, NY 11802
17856	SILICONIX, INC.	P.O. BOX 168, 500 BROADWAY	LAWRENCE, MA 01841
19396	ILLINOIS TOOL WORKS, INC. PAKTRON DIV.	2201 LAURELWOOD DRIVE	SANTA CLARA, CA 95054
27014	NATIONAL SEMICONDUCTOR CORP.	900 FOLLIN LANE, SE	VIENNA, VA 22180
32997	BOURNS, INC., TRIMPOT PRODUCTS DIV.	2900 SEMICONDUCTOR DR.	SANTA CLARA, CA 95051
50157	MIDWEST COMPONENTS INC.	1200 COLUMBIA AVE. P. O. BOX 787	RIVERSIDE, CA 92507
50434	HEWLETT-PACKARD COMPANY	1981 PORT CITY BLVD.	MUSKEGON, MI 49443
51642	CENTRE ENGINEERING INC.	640 PAGE MILL ROAD	PALO ALTO, CA 94304
53184	XCITON CORPORATION	2820 E COLLEGE AVENUE	STATE COLLEGE, PA 16801
53944	ELT INC., GLOW LITE DIVISION	5 HEMLOCK STREET	LATHAM, NY 12110
54473	MATSUSHITA ELECTRIC, CORP. OF AMERICA	BOX 698	PAULS VALLEY, OK 73075
56289	SPRAGUE ELECTRIC CO.	1 PANASONIC WAY	SECAUCUS, NJ 07094
57668	R-OHM CORP.	87 MARSHALL ST.	NORTH ADAMS, MA 01247
59660	TUSONIX INC.	16931 MILLIKEN AVE.	IRVINE, CA 92713
71400	BUSSMAN MFG., DIVISION OF MCGRAW-EDISON CO.	2155 N FORBES BLVD	TUCSON, AZ 85705
71590	CENTRALAB ELECTRONICS, DIV. OF GLOBE-UNION, INC.	2536 W. UNIVERSITY ST.	ST. LOUIS, MO 63107
72982	ERIE TECHNOLOGICAL PRODUCTS, INC.	P O BOX 858	FORT DODGE, IA 50501
73138	BECKMAN INSTRUMENTS, INC., HELIPOT DIV.	644 W. 12TH ST.	ERIE, PA 16512
75042	TRW ELECTRONIC COMPONENTS, IRC FIXED RESISTORS, PHILADELPHIA DIVISION	2500 HARBOR BLVD.	FULLERTON, CA 92634
76493	BELL INDUSTRIES, INC., MILLER, J. W., DIV.	401 N. BROAD ST.	PHILADELPHIA, PA 19108
80009	TEKTRONIX, INC.	19070 REYES AVE., P O BOX 5825	COMPTON, CA 90224
80031	ELECTRA-MIDLAND CORP., MEPCO DIV.	P O BOX 500	BEAVERTON, OR 97077
82389	SWITCHCRAFT, INC.	22 COLUMBIA ROAD	MORRISTOWN, NJ 07960
90201	MALLORY CAPACITOR CO., DIV. OF P. R. MALLORY AND CO., INC.	5555 N. ELSTON AVE. 3029 E. WASHINGTON STREET P. O. BOX 372	CHICAGO, IL 60630 INDIANAPOLIS, IN 46206
91418	RADIO MATERIALS COMPANY, DIV. OF P.R. MALLORY AND COMPANY, INC.	4242 W BRYN MAWR	CHICAGO, IL 60646
91637	DALE ELECTRONICS, INC.	P. O. BOX 609	COLUMBUS, NE 68601
95348	GORDOS CORPORATION	250 GLENWOOD AVENUE	BLOOMFIELD, NJ 07003

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A10	670-5368-00	B010100	B019999	CKT BOARD ASSY:MAIN	80009	670-5368-00
A10	670-5368-01	B020000	B032219	CKT BOARD ASSY:MAIN	80009	670-5368-01
A10	670-5368-02	B032220		CKT BOARD ASSY:MAIN	80009	670-5368-02
A20	670-5369-00	B010100	B011599	CKT BOARD ASSY:FOCUS & INTENSITY	80009	670-5369-00
A20	670-5369-01	B011600	B019999	CKT BOARD ASSY:FOCUS & INTENSITY	80009	670-5369-01
A20	670-5369-02	B020000	B032219	CKT BOARD ASSY:FOCUS & INTENSITY	80009	670-5369-02
A20	670-5369-03	B032220		CKT BOARD ASSY:FOCUS & INTENSITY	80009	670 5369-03
A30	670-5370-00	B010100	B011599	CKT BOARD ASSY:TRIGGER	80009	670-5370-00
A30	670-5370-01	B011600	B032219	CKT BOARD ASSY:TRIGGER	80009	670-5370-01
A30	670-5370-02	B032220		CKT BOARD ASSY:TRIGGER	80009	670-5370-02
A40	670-5371-00	B010100	B011189	CKT BOARD ASSY:HORIZONTAL DEFLECTION	80009	670-5371 00
A40	670-5371-01	B011190	B019999	CKT BOARD ASSY:HORIZONTAL DEFLECTION	80009	670-5371-00
A40	670 5371-02	B020000		CKT BOARD ASSY:HORIZONTAL DEFLECTION	80009	670 5371-02
A50	670-5372 00			CKT BOARD ASSY:TRIGGER SWITCH	80009	670-5372-00
A60	670-5373-00	B010100	B011599	CKT BOARD ASSY:GAIN,LEFT	80009	670 5373-00
A60	670-5373-01	B011600	B019999	CKT BOARD ASSY:GAIN,LEFT	80009	670-5373-01
A60	670-5373-02	B020000	B032219	CKT BOARD ASSY:GAIN,LEFT	80009	670-5373-01
A60	670-5373-03	B032220		CKT BOARD ASSY:GAIN,LEFT	80009	670-5373-03
A61	670 5373-00	B010100	B011599	CKT BOARD ASSY:GAIN,RIGHT	80009	670-5373-00
A61	670-5373-01	B011600	B019999	CKT BOARD ASSY:GAIN,RIGHT	80009	670-5373-01
A61	670-5373 02	B020000	B032219	CKT BOARD ASSY:GAIN,RIGHT	80009	670-5373-02
A61	670-5373-03	B032220		CKT BOARD ASSY:GAIN,RIGHT	80009	670 5373-03
A70	670-5374-00			CKT BOARD ASSY:ATTENUATOR	80009	670-5374-00
A71	670-5374-00			CKT BOARD ASSY:ATTENUATOR	80009	670-5374-00
A80	670-5631-00			CKT BOARD ASSY:HIGH VOLTAGE	80009	670-5631-00
A90	670 5114-00			CKT BOARD ASSY:INTERFACE (NO ELECTRICAL PARTS)	80009	670-5114-00

A10	670 5368-00	B010100	B019999	CKT BOARD ASSY:MAIN	80009	670-5368-00
A10	670-5368-01	B020000	B032219	CKT BOARD ASSY:MAIN	80009	670-5368-01
A10	670-5368-02	B032220		CKT BOARD ASSY:MAIN	80009	670-5368-02
C1021	281-0788-00			CAP.,FXD,CER DI:470PF,10%,100V	72982	8005H9AADW5R471K
C1022	290-0580-00			CAP.,FXD,ELCTLT:0.27UF,20%,50V	56289	196D274X0050HA1
C2021	290-0526-00			CAP.,FXD,ELCTLT:6.8UF,20%,6V	90201	TDC685M00NLE
C2022	283-0353-00			CAP.,FXD,CER DI:0.1UF,10%,50V	04222	1210SC104K A2075
C2023	295-0143-00			CAP.,SET,MTCHD:10UF,0.1UF,0.001UF	80009	295-0143-00
C2031	290-0523-00			CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0020HA1
C2032	290-0523-00			CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0020HA1
C2041	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	04222	SA205E104MAA
C2051	290-0523-00			CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0020HA1
C2052	290-0523-00			CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0020HA1
C2061	281 0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	04222	SA205E104MAA
C3021	290 0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C3042	281-0775-00	XB020000		CAP.,FXD,CER DI 0.1UF,20%,50V	04222	SA205E104MAA
C3061	283-0181-00	B010100	B032219X	CAP.,FXD,CER DI:1.8PF,10%,100V	59660	8101B121COKO189B
C3062	281-0775-00	XB020000		CAP.,FXD,CER DI:0.1UF,20%,50V	04222	SA205E104MAA
C4011	295-0143-00			CAP.,SET,MTCHD:10UF,0.1UF,0.001UF	80009	295-0143-00
C4012	295-0143-00			CAP.,SET,MTCHD:10UF,0.1UF,0.001UF	80009	295-0143-00
C4021	290-0534-00			CAP.,FXD,ELCTLT:1UF 20%,35V	56289	196D105X0035HA1
C4022	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C4024	281-0759-00			CAP.,FXD,CER DI:22PF,10%,100V	72982	8035D9AADC1G220K
C4053	281-0813-00			CAP.,FXD CER DI:0.047UF,20%,50V	04222	GC705-E-473M
C4054	283 0156-00			CAP.,FXD,CER DI:1000PF,+100-0%,200V	72982	8111A208Z5U0102Z
C4055	283-0181-00	XB032220		CAP.,FXD,CER DI:1.8PF,10%,100V	59660	8101B121COKO189B
C5031	281-0773-00			CAP.,FXD,CER DI:0.01UF 10%,100V	04222	SA201C103KAA

Replaceable Electrical Parts—SC 503

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
C5041	281-0773-00			CAP., FXD, CER DI: 0.01UF, 10%, 100V	04222	SA201C103KAA
C5045	281-0819-00	B010100	B019999X	CAP., FXD, CER DI: 33PF, 5%, 50V	72982	8035BCOG330
C5061	281-0773-00			CAP., FXD, CER DI: 0.01UF, 10%, 100V	04222	SA201C103KAA
C6022	281-0809-00			CAP., FXD, CER DI: 200PF 5%, 100V	72982	8013T2ADDC1G201J
C6023	290-0534-00			CAP., FXD, ELCTLT: 1UF, 20%, 35V	56289	196D105X0035HA1
C6031	283-0178-00			CAP., FXD, CER DI: 0.1UF, +80-20%, 100V	72982	8131N145651 104Z
C6032	283-0326-00			CAP., FXD, CER DI: 0.082UF, 10%, 50V	72982	8121N075X7R0823K
C6033	283-0167-00	B010100	B019999	CAP., FXD, CER DI: 0.1UF, 10%, 100V	72982	8131N145X5R0104K
C6033	283-0198-00	B020000		CAP., FXD, CER DI: 0.22UF, 20%, 50V	56289	1C10Z5U223M050B
C6034	281-0811-00	B010100	B019999X	CAP., FXD, CER DI: 10PF, 10%, 100V	72982	8035D2AADC1G100K
C6035	283-0198-00	XB020000		CAP., FXD, CER DI: 0.22UF, 20%, 50V	56289	1C10Z5U223M050B
C6041	290-0766-00			CAP., FXD, ELCTLT: 2.2UF, +50-10%, 160V	54473	ECEA2CS2R2
C6051	290-0766-00			CAP., FXD, ELCTLT: 2.2UF, +50-10%, 160V	54473	ECEA2CS2R2
C6052	283-0084-00			CAP., FXD, CER DI: 270PF, 5%, 1000V	59660	838 533X5F0 2715
C6061	290-0526-00			CAP., FXD, ELCTLT: 6.8UF, 20%, 6V	90201	TDC685MOONLE
C7021	290-0534-00			CAP., FXD, ELCTLT: 1UF, 20%, 35V	56289	196D105X0035HA1
C7022	283-0178-00			CAP., FXD, CER DI: 0.1UF, +80-20%, 100V	72982	8131N145651 104Z
C7023	281-0661-00			CAP., FXD, CER DI: 0.8PF, +/-0.1PF, 500V	04222	7001-1268
C7024	281-0773-00			CAP., FXD, CER DI: 0.01UF, 10%, 100V	04222	SA201C103KAA
C7025	281-0773-00			CAP., FXD, CER DI: 0.01UF, 10%, 100V	04222	SA201C103KAA
C7026	283-0167-00			CAP., FXD, CER DI: 0.1UF, 10%, 100V	72982	8131N145X5R0104K
C7031	281-0788-00			CAP., FXD, CER DI: 470PF, 10%, 100V	72982	8005H9AADW5R471K
C7032	290-0722-00	B010100	B032219	CAP., FXD, ELCTLT: 100UF, 20%, 10V	56289	196D107X0010PE3
C7032	290-0986-00	B032220		CAP., FXD, ELCTLT: 47UF, 20%, 50V		
C7034	283-0044-00			CAP., FXD, CER DI: 0.001UF, 3000V	72982	3903BW002Y5S102M
C7035	283-0263-00			CAP., FXD, CER DI: 0.0022UF, 20%, 3000V	56289	33C319
C7041	283-0128-00			CAP., FXD, CER DI: 100PF, 5%, 500V	72982	871-536T2H101J
C7042	283-0043-00			CAP., FXD, CER DI: 0.0068UF, 3000V	59660	3903BW416Z5U682P
C7043	283-0043-00			CAP., FXD, CER DI: 0.0068UF, 3000V	59660	3903BW416Z5U682P
C7051	290-0766-00			CAP., FXD, ELCTLT: 2.2UF, +50-10%, 160V	54473	ECEA2CS2R2
C8021	283-0167-00			CAP., FXD, CER DI: 0.1UF, 10%, 100V	72982	8131N145X5R0104K
C8022	283-0044-00			CAP., FXD, CER DI: 0.001UF, 3000V	72982	3903BW002Y5S102M
C8031	290-0272-00	B010100	B032219	CAP., FXD, ELCTLT: 47UF, 20%, 50V	56289	109D476X0050F2
C8031	290-0986-00	B032220		CAP., FXD, ELCTLT: 47UF, 20%, 50V		
C8041	281-0773-00			CAP., FXD, CER DI: 0.01UF, 10%, 100V	04222	SA201C103KAA
C8052	283-0178-00			CAP., FXD, CER DI: 0.1UF, +80-20%, 100V	72982	8131N145651 104Z
C8053	290-0723-00			CAP., FXD, ELCTLT: 150UF, 20%, 6V	56289	196D157X0006PE3
C8061	281-0773-00			CAP., FXD, CER DI: 0.01UF, 10%, 100V	04222	SA201C103KAA
CR1011	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR2021	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR3041	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR4011	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR4021	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR4022	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR4023	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR4031	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR4041	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR4042	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR4043	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR4044	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR4053	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR5031	152-0322-00			SEMICONV DEVICE: SILICON, 15V, HOT CARRIER	50434	5082-2672
CR5032	152-0322-00			SEMICONV DEVICE: SILICON, 15V, HOT CARRIER	50434	5082-2672
CR5051	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR5052	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR5053	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
CR5061	152-0141-02			SEMICON D DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR5062	152-0141-02			SEMICON D DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR6021	152-0141-02			SEMICON D DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR6034	152-0141-02			SEMICON D DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR6035	152-0586-00			SEMICON D DEVICE: SILICON, 600V, 500MA	14936	RGP10J-011
CR6036	152-0141-02			SEMICON D DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR6037	152-0141-02			SEMICON D DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR6051	152-0586-00			SEMICON D DEVICE: SILICON, 600V, 500MA	14936	RGP10J-011
CR6052	152-0586-00			SEMICON D DEVICE: SILICON, 600V, 500MA	14936	RGP10J-011
CR7031	152-0141-02			SEMICON D DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR7032	152-0398-00			SEMICON D DEVICE: SILICON, 200V, 1A	04713	SR3609RL
CR7041	152-0061-00			SEMICON D DEVICE: SILICON, 175V, 100MA	07263	FDH2161
CR7051	152-0333-00			SEMICON D DEVICE: SILICON, 55V, 200MA	07263	FDH-6012
CR7052	152-0333-00			SEMICON D DEVICE: SILICON, 55V, 200MA	07263	FDH-6012
CR7053	152-0333-00			SEMICON D DEVICE: SILICON, 55V, 200MA	07263	FDH-6012
CR7054	152-0333-00			SEMICON D DEVICE: SILICON, 55V, 200MA	07263	FDH-6012
CR8021	152-0061-00			SEMICON D DEVICE: SILICON, 175V, 100MA	07263	FDH2161
CR8022	152-0061-00			SEMICON D DEVICE: SILICON, 175V, 100MA	07263	FDH2161
CR8041	152-0061-00			SEMICON D DEVICE: SILICON, 175V, 100MA	07263	FDH2161
J2031	131-1003-00			CONN, RCPT, ELEC: CKT BD MT, 3 PRONG	80009	131-1003-00
J2051	131-1003-00			CONN, RCPT, ELEC: CKT BD MT, 3 PRONG	80009	131-1003-00
J3032	131-1003-00			CONN, RCPT, ELEC: CKT BD MT, 3 PRONG	80009	131-1003-00
J3052	131-1003-00			CONN, RCPT, ELEC: CKT BD MT, 3 PRONG	80009	131-1003-00
J3053	131-1003-00			CONN, RCPT, ELEC: CKT BD MT, 3 PRONG	80009	131-1003-00
L4011	108-0245-00			COIL, RF: 3.9UH	76493	B6310-1
L4012	108-0245-00			COIL, RF: 3.9UH	76493	B6310-1
L4013	108-0245-00			COIL, RF: 3.9UH	76493	B6310-1
L4021	108-0245-00			COIL, RF: 3.9UH	76493	B6310-1
L6031	108-0240-00			COIL, RF: FIXED, 820UH	76493	B5147
L7021	108-0245-00			COIL, RF: 3.9UH	76493	B6310-1
L7033	108-0422-00			COIL, RF: FIXED, 82UH	80009	108-0422-00
L8051	108-0240-00			COIL, RF: FIXED, 820UH	76493	B5147
L8052	108-0422-00			COIL, RF: FIXED, 82UH	80009	108-0422-00
LR2031	108-0520-00			COIL, RF: 2.2UH (WOUND ON A 10 OHM RES)	80009	108-0520-00
LR2032	108-0520-00			COIL, RF: 2.2UH (WOUND ON A 10 OHM RES)	80009	108-0520-00
LR2051	108-0520-00			COIL, RF: 2.2UH (WOUND ON A 10 OHM RES)	80009	108-0520-00
LR2052	108-0520-00			COIL, RF: 2.2UH (WOUND ON A 10 OHM RES)	80009	108-0520-00
Q1021	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q1022	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q1023	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q2021	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q3021	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q3022A, B	151-1054-00			TRANSISTOR: SILICON, JFE, N-CHANNEL, DUAL	80009	151-1054-00
Q3023	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q4021	151-0190-00			TRANSISTOR: SILICON, NPN	07263	S032677
Q4022	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q4031	151-0190-00			TRANSISTOR: SILICON, NPN	07263	S032677
Q4032	151-0192-00			TRANSISTOR: SILICON, NPN, SEL FROM MPS6521	04713	SPS8801
Q4033	151-0192-00			TRANSISTOR: SILICON, NPN, SEL FROM MPS6521	04713	SPS8801
Q4034	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q4035	151-0341-00	B010100	B019999	TRANSISTOR: SILICON, NPN	07263	S040065
Q4035	151-0192-00	B020000		TRANSISTOR: SILICON, NPN, SEL FROM MPS6521	04713	SPS8801
Q4041	151-0341-00	B010100	B019999	TRANSISTOR: SILICON, NPN	07263	S040065
Q4041	151-0192-00	B020000		TRANSISTOR: SILICON, NPN, SEL FROM MPS6521	04713	SPS8801
Q4042	151-0254-00			TRANSISTOR: SILICON, NPN	03508	X38L3118

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Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
Q4051	151-0190-00			TRANSISTOR: SILICON, NPN	07263	S032677
Q4052	151-0190-00			TRANSISTOR: SILICON, NPN	07263	S032677
Q4053	151-0192-00			TRANSISTOR: SILICON, NPN, SEL FROM MPS6521	04713	SPS8801
Q4054	151-0192-00			TRANSISTOR: SILICON, NPN, SEL FROM MPS6521	04713	SPS8801
Q4055	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q4056	151-0341-00	B010100	B019999	TRANSISTOR: SILICON, NPN	07263	S040065
Q4056	151-0192-00	B020000		TRANSISTOR: SILICON, NPN, SEL FROM MPS6521	04713	SPS8801
Q5031	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q5032	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q5033	151-0190-00			TRANSISTOR: SILICON, NPN	07263	S032677
Q5034	151-0188-00			TRANSISTOR: SILICON, PNP	04713	SPS6868K
Q5035	151-0188-00			TRANSISTOR: SILICON, PNP	04713	SPS6868K
Q5041	151-1025-00			TRANSISTOR: SILICON, JFE, N-CHANNEL	01295	SFB8129
Q5042	151-0190-00			TRANSISTOR: SILICON, NPN	07263	S032677
Q5051	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q5052	151-0341-00	*B010100	B019999	TRANSISTOR: SILICON, NPN	07263	S040065
Q5052	151-0192-00	B020000		TRANSISTOR: SILICON, NPN, SEL FROM MPS6521	04713	SPS8801
Q6031	151-0188-00			TRANSISTOR: SILICON, PNP	04713	SPS6868K
Q7021	151-0188-00			TRANSISTOR: SILICON, PNP	04713	SPS6868K
Q7022	151-0347-00			TRANSISTOR: SILICON, NPN	56289	2N5551
Q7023	151-0350-00			TRANSISTOR: SILICON, PNP	04713	SPS6700
Q7031	151-0426-00			TRANSISTOR: SILICON, NPN	03508	X44H242
Q7032	151-0364-00			TRANSISTOR: SILICON, PNP	80009	151-0364-00
Q8061	151-0347-00			TRANSISTOR: SILICON, NPN	56289	2N5551
R1011	315-0181-00			RES., FXD, CMPSN: 180 OHM, 5%, 0.25W	01121	CB1815
R1012	321-0913-03			RES., FXD, FILM: 2.22K OHM, 0.25%, 0.125W	91637	MFF1816D22200C
R1013	321-0927-07			RES., FXD, FILM: 125 OHM, 0.1%, 0.125W	91637	CMF55-116C125R0B
R1021	315-0132-00			RES., FXD, CMPSN: 1.3K OHM, 5%, 0.25W	01121	CB1325
R1022	315-0302-00			RES., FXD, CMPSN: 3K OHM, 5%, 0.25W	01121	CB3025
R1023	315-0302-00			RES., FXD, CMPSN: 3K OHM, 5%, 0.25W	01121	CB3025
R1024	315-0682-00			RES., FXD, CMPSN: 6.8K OHM, 5%, 0.25W	01121	CB6825
R1025	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R1026	315-0163-00			RES., FXD, CMPSN: 16K OHM, 5%, 0.25W	01121	CB1635
R1028	315-0363-00			RES., FXD, CMPSN: 36K OHM, 5%, 0.25W	01121	CB3635
R2021	315-0363-00			RES., FXD, CMPSN: 36K OHM, 5%, 0.25W	01121	CB3635
R2022	315-0244-00			RES., FXD, CMPSN: 240K OHM, 5%, 0.25W	01121	CB2445
R2023	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R2024	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R2025	321-1715-03			RES., FXD, FILM: 1.2M OHM, 0.25%, 0.125W	91637	CMF110216D12003C
R2026	321-1714-03			RES., FXD, FILM: 120 OHM, 0.25%, 0.125W	91637	MFF1816D12002C
R2027	321-1296-07			RES., FXD, FILM: 12K OHM, 0.1%, 0.125W	91637	MFF1816C12001B
R2028	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R2031	323-0068-00			RES., FXD, FILM: 49.9 OHM, 1%, 0.50W	75042	CECT0-49R90F
R2051	323-0068-00			RES., FXD, FILM: 49.9 OHM, 1%, 0.50W	75042	CECT0-49R90F
R3021	321-1296-07			RES., FXD, FILM: 12K OHM, 0.1%, 0.125W	91637	MFF1816C12001B
R3022	321-1714-03			RES., FXD, FILM: 120 OHM, 0.25%, 0.125W	91637	MFF1816D12002C
R3023	321-1715-03			RES., FXD, FILM: 1.2M OHM, 0.25%, 0.125W	91637	CMF110216D12003C
R3024	315-0113-00			RES., FXD, CMPSN: 11K OHM, 5%, 0.25W	01121	CB1135
R3025	315-0123-00			RES., FXD, CMPSN: 12K OHM, 5%, 0.25W	01121	CB1235
R3026	315-0123-00			RES., FXD, CMPSN: 12K OHM, 5%, 0.25W	01121	CB1235
R3031	311-1228-00			RES., VAR, NONWIR: 10K OHM, 20%, 0.50W	32997	3386F-T04-103
R3041	315-0113-00			RES., FXD, CMPSN: 11K OHM, 5%, 0.25W	01121	CB1135
R3051	315-0123-00			RES., FXD, CMPSN: 12K OHM, 5%, 0.25W	01121	CB1235
R4011	315-0133-00			RES., FXD, CMPSN: 13K OHM, 5%, 0.25W	01121	CB1335
R4012	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R4013	321-0210-00			RES., FXD, FILM: 1.5K OHM, 1%, 0.125W	91637	MFF1816G15000F
R4021	315-0101-00			RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
R4022	315-0393-00		RES., FXD, CMPSN: 39K OHM, 5%, 0.25W	01121	CB3935
R4023	321-0273-00		RES., FXD, FILM: 6.81K OHM, 1%, 0.125W	91637	MFF1816G68100F
R4024	315-0620-00		RES., FXD, CMPSN: 62 OHM, 5%, 0.25W	01121	CB6205
R4025	315-0103-00		RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R4031	311-1226-00		RES., VAR, NONWIR: 2.5K OHM, 20%, 0.50W	32997	3386F-T04-252
R4033	307-0607-00		RES NTWK, FXD FI: VERTICAL AMP BIAS	80009	307-0607-00
R4041	315-0301-00		RES., FXD, CMPSN: 300 OHM, 5%, 0.25W	01121	CB3015
R4042	315-0621-00		RES., FXD, CMPSN: 620 OHM, 5%, 0.25W	01121	CB6215
R4043	315-0123-00		RES., FXD, CMPSN: 12K OHM, 5%, 0.25W	01121	CB1235
R4044	321-0287-00		RES., FXD, FILM: 9.53K OHM, 1%, 0.125W	91637	MFF1816G95300F
R4045	315-0103-00		RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R4046	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R4047	315-0302-00		RES., FXD, CMPSN: 3K OHM, 5%, 0.25W	01121	CB3025
R4048	321-0084-00		RES., FXD, FILM: 73.2 OHM, 1%, 0.125W	91637	MFF1816G73R20F
R4049	311-1976-00		RES., VAR, NONWIR: 2K OHM, 20%, 0.50W	12697	CM41732
R4051	321-0231-00		RES., FXD, FILM: 2.49K OHM, 1%, 0.125W	91637	MFF1816G24900F
R4053	315-0113-00		RES., FXD, CMPSN: 11K OHM, 5%, 0.25W	01121	CB1135
R4054	307-0607-00		RES NTWK, FXD FI: VERTICAL AMP BIAS	80009	307-0607-00
R4061	321-0202-00		RES., FXD, FILM: 1.24K OHM, 1%, 0.125W	91637	MFF1816G12400F
R4062	315-0621-00		RES., FXD, CMPSN: 620 OHM, 5%, 0.25W	01121	CB6215
R4063	315-0301-00		RES., FXD, CMPSN: 300 OHM, 5%, 0.25W	01121	CB3015
R4064	311-1976-00		RES., VAR, NONWIR: 2K OHM, 20%, 0.50W	12697	CM41732
R4065	311-1245-00		RES., VAR, NONWIR: 10K OHM, 10%, 0.50W	73138	72-28-0
R5011	311-1803-00		RES., VAR, NONWIR: 20K OHM, 10%, 1W	01121	13M501
R5012	311-1237-00		RES., VAR, NONWIR: 1K OHM, 10%, 0.50W	32997	3386X-T07-102
R5013	311-1918-00		RES., VAR, NONWIR: 2K OHM, 10%, 0.50W	73138	72-199-0
R5014	311-1239-00		RES., VAR, NONWIR: 2.5K OHM, 10%, 0.50W	73138	72-26-0
R5021	321-0085-00		RES., FXD, FILM: 75 OHM, 1%, 0.125W	91637	MFF1816G75R00F
R5022	321-0085-00		RES., FXD, FILM: 75 OHM, 1%, 0.125W	91637	MFF1816G75R00F
R5031	315-0103-00		RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R5032	315-0681-00		RES., FXD, CMPSN: 680 OHM, 5%, 0.25W	01121	CB6815
R5034	321-0166-00		RES., FXD, FILM: 523 OHM, 1%, 0.125W	91637	MFF1816G523R0F
R5036	321-0319-00		RES., FXD, FILM: 20.5K OHM, 1%, 0.125W	91637	MFF1816G20501F
R5037	315-0472-00		RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R5038	315-0363-00		RES., FXD, CMPSN: 36K OHM, 5%, 0.25W	01121	CB3635
R5039	315-0151-00		RES., FXD, CMPSN: 150 OHM, 5%, 0.25W	01121	CB1515
R5041	322-0172-00		RES., FXD, FILM: 604 OHM, 1%, 0.25W	75042	CEBT0-6040F
R5042	321-0084-00		RES., FXD, FILM: 73.2 OHM, 1%, 0.125W	91637	MFF1816G73R20F
R5043	315-0152-00		RES., FXD, CMPSN: 1.5K OHM, 5%, 0.25W	01121	CB1525
R5044	315-0201-00		RES., FXD, CMPSN: 200 OHM, 5%, 0.25W	01121	CB2015
R5045	315-0202-00		RES., FXD, CMPSN: 2K OHM, 5%, 0.25W	01121	CB2025
R5046	315-0105-00		RES., FXD, CMPSN: 1M OHM, 5%, 0.25W	01121	CB1055
R5047	321-0166-00		RES., FXD, FILM: 523 OHM, 1%, 0.125W	91637	MFF1816G523R0F
R5048	315-0203-00		RES., FXD, CMPSN: 20K OHM, 5%, 0.25W	01121	CB2035
R5049	315-0202-00		RES., FXD, CMPSN: 2K OHM, 5%, 0.25W	01121	CB2025
R5051	315-0113-00		RES., FXD, CMPSN: 11K OHM, 5%, 0.25W	01121	CB1135
R5052	315-0512-00		RES., FXD, CMPSN: 5.1K OHM, 5%, 0.25W	01121	CB5125
R5053	315-0512-00		RES., FXD, CMPSN: 5.1K OHM, 5%, 0.25W	01121	CB5125
R5054	321-0128-00		RES., FXD, FILM: 210 OHM, 1%, 0.125W	91637	MFF1816G210R0F
R5055	321-0128-00		RES., FXD, FILM: 210 OHM, 1%, 0.125W	91637	MFF1816G210R0F
R5061	315-0202-00		RES., FXD, CMPSN: 2K OHM, 5%, 0.25W	01121	CB2025
R5062	321-0319-00		RES., FXD, FILM: 20.5K OHM, 1%, 0.125W	91637	MFF1816G20501F
R5063	315-0512-00		RES., FXD, CMPSN: 5.1K OHM, 5%, 0.25W	01121	CB5125
R5064	315-0912-00		RES., FXD, CMPSN: 9.1K OHM, 5%, 0.25W	01121	CB9125
R5065	315-0912-00		RES., FXD, CMPSN: 9.1K OHM, 5%, 0.25W	01121	CB9125
R5066	315-0912-00		RES., FXD, CMPSN: 9.1K OHM, 5%, 0.25W	01121	CB9125
R5067	315-0751-00		RES., FXD, CMPSN: 750 OHM, 5%, 0.25W	01121	CB7515

Replaceable Electrical Parts—SC 503

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R5068	315-0751-00			RES., FXD, CMPSN: 750 OHM, 5%, 0.25W	01121	CB7515
R6011	311-1236-00			RES., VAR, NONWIR: 250 OHM, 10%, 0.50W	73138	72-22-0
R6012	321-0251-00			RES., FXD, FILM: 4.02K OHM, 1%, 0.125W	91637	MFF1816G40200F
R6021	315-0244-00			RES., FXD, CMPSN: 240K OHM, 5%, 0.25W	01121	CB2445
R6022	315-0244-00			RES., FXD, CMPSN: 240K OHM, 5%, 0.25W	01121	CB2445
R6023	315-0474-00	B010100	B019999	RES., FXD, CMPSN: 470K OHM, 5%, 0.25W	01121	CB4745
R6023	315-0125-00	B020000		RES., FXD, CMPSN: 1.2M OHM, 5%, 0.25W	01121	CB1255
R6024	315-0123-00			RES., FXD, CMPSN: 12K OHM, 5%, 0.25W	01121	CB1235
R6025	301-0361-00			RES., FXD, CMPSN: 360 OHM, 5%, 0.50W	01121	EB3615
R6027	315-0153-00			RES., FXD, CMPSN: 15K OHM, 5%, 0.25W	01121	CB1535
R6029	315-0472-00			RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R6031	315-0392-00			RES., FXD, CMPSN: 3.9K OHM, 5%, 0.25W	01121	CB3925
R6032	315-0622-00			RES., FXD, CMPSN: 6.2K OHM, 5%, 0.25W	01121	CB6225
R6061	315-0392-00			RES., FXD, CMPSN: 3.9K OHM, 5%, 0.25W	01121	CB3925
R7021	315-0620-00			RES., FXD, CMPSN: 62 OHM, 5%, 0.25W	01121	CB6205
R7022	315-0622-00			RES., FXD, CMPSN: 6.2K OHM, 5%, 0.25W	01121	CB6225
R7023	321-0318-00			RES., FXD, FILM: 20K OHM, 1%, 0.125W	91637	MFF1816G20001F
R7024	321-0335-00			RES., FXD, FILM: 30.1K OHM, 1%, 0.125W	91637	MFF1816G30101F
R7025	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R7026	315-0395-00			RES., FXD, CMPSN: 3.9M OHM, 5%, 0.25W	01121	CB3955
R7027	307-0490-01			RES., NTWK, FXD, FI: HIGH VOLTAGE DIVIDER	80009	307-0490-01
R7031	315-0123-00			RES., FXD, CMPSN: 12K OHM, 5%, 0.25W	01121	CB1235
R7041	315-0100-00			RES., FXD, CMPSN: 10 OHM, 5%, 0.25W	01121	CB1005
R7043	315-0394-00			RES., FXD, CMPSN: 390K OHM, 5%, 0.25W	01121	CB3945
R7044	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R7051	315-0125-00			RES., FXD, CMPSN: 1.2M OHM, 5%, 0.25W	01121	CB1255
R7052	315-0184-00			RES., FXD, CMPSN: 180K OHM, 5%, 0.25W	01121	CB1845
R7061	311-1399-00			RES., VAR, NONWIR: 5M OHM, 20%, 0.50W	73138	72-90-0
R7062	311-1245-00			RES., VAR, NONWIR: 10K OHM, 10%, 0.50W	73138	72-28-0
R7064	311-1242-00			RES., VAR, NONWIR: 200K OHM, 10%, 0.50W	02111	63X-204-T602
R8021	315-0622-00			RES., FXD, CMPSN: 6.2K OHM, 5%, 0.25W	01121	CB6225
R8022	315-0221-00			RES., FXD, CMPSN: 220 OHM, 5%, 0.25W	01121	CB2215
R8024	315-0114-00			RES., FXD, CMPSN: 110K OHM, 5%, 0.25W	01121	CB1145
R8025	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R8031	315-0221-00			RES., FXD, CMPSN: 220 OHM, 5%, 0.25W	01121	CB2215
R8032	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R8041	315-0184-00			RES., FXD, CMPSN: 180K OHM, 5%, 0.25W	01121	CB1845
R8051	315-0104-00			RES., FXD, CMPSN: 100K OHM, 5%, 0.25W	01121	CB1045
R8052	315-0823-00			RES., FXD, CMPSN: 82K OHM, 5%, 0.25W	01121	CB8235
R8053	315-0223-00			RES., FXD, CMPSN: 22K OHM, 5%, 0.25W	01121	CB2235
R8054	308-0755-00			RES., FXD, WW: 0.75 OHM, 5%, 2W	75042	BWH-R7500J
R8061	315-0104-00			RES., FXD, CMPSN: 100K OHM, 5%, 0.25W	01121	CB1045
R8062	311-1242-00			RES., VAR, NONWIR: 200K OHM, 10%, 0.50W	02111	63X-204-T602
R8064	311-1246-00			RES., VAR, NONWIR: 50K OHM, 10%, 0.50W	02111	63X-503-T602
FT5041	307-0124-00			RES., THERMAL: 5K OHM, 10%	50157	1D1618
S1011	260-1811-00			SWITCH, SLIDE: DPDT, 0.5 A, 125VAC-DC	82389	C5B206L2
S2011	263-1164-00			ACTR ASSY, CAM S: TIME/DIV	80009	263-1164-00
S5011						
T6041	120-1191-00			XFMR, PWR, SDN&SU: HIGH VOLTAGE	80009	120-1191-00
T7041	108-0925-00			COIL, RF: 21 UH	80009	108-0925-00
T7061	120-0743-00			XFMR, TOROID: 13 TURNS, BIFILAR	80009	120-0743-00
U3051	156-0853-00			MICROCIRCUIT, LI: OPERATIONAL AMPLIFIER, DUAL	27014	LM358N
U5043	156-0048-00			MICROCIRCUIT, LI: FIVE NPN TRANSISTOR ARRAY	02735	CA3046
U5053	156-0048-00			MICROCIRCUIT, LI: FIVE NPN TRANSISTOR ARRAY	02735	CA3046
U6021	156-1149-00			MICROCIRCUIT, LI: OPERATIONAL AMP, JFET INPUT	27014	LF351N
VR6021	152-0288-00			SEMICONV DEVICE: ZENER, 0.4W, 140V, 5%	12954	DZ720717C
VR8041	152-0285-00			SEMICONV DEVICE: ZENER, 0.4W, 62V, 5%	80009	152-0285-00

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A20	670-5369-00	B010100	B011599	CKT BOARD ASSY: FOCUS & INTENSITY	80009	670-5369-00
A20	670-5369-01	B011600	B019999	CKT BOARD ASSY: FOCUS & INTENSITY	80009	670-5369-01
A20	670-5369-02	B020000	B032219	CKT BOARD ASSY: FOCUS & INTENSITY	80009	670-5369-02
A20	670-5369-03	B032220		CKT BOARD ASSY: FOCUS & INTENSITY	80009	670-5369-03
C1021	290-0271-00			CAP., FXD, ELCTLT: 9UF, +20-15%, 125V	56289	109D905C2125F2
C1022	283-0004-00	B010100	B019999X	CAP., FXD, CER DI: 0.02UF, +80-20%, 150V	91418	SP203Z151-4R9
C1025	290-0164-00	XB020000		CAP., FXD, ELCTLT: 1UF, +50-10%, 150V	56289	500D105F150BA7
C1036	283-0004-00	XB020000		CAP., FXD, CER DI: 0.02UF, +80-20%, 150V	91418	SP203Z151-4R9
C2011	281-0809-00			CAP., FXD, CER DI: 200PF, 5%, 100V	72982	8013T2ADDC1G201J
C2021	290-0164-00			CAP., FXD, ELCTLT: 1UF, +50-10%, 150V	56289	500D105F150BA7
C2022	281-0208-00			CAP., VAR PLSTC: 5.5-50PF, 100V	80031	2810C5R5506H02F0
C2023	281-0543-00	XB032220		CAP., FXD, CER DI: 270PF, 10%, 500V	72982	301055X5P271K
C2024	283-0003-00			CAP., FXD, CER DI: 0.01UF, +80-20%, 150V	91418	SP103Z151-4R9
C2026	290-0534-00			CAP., FXD, ELCTLT: 1UF, 20%, 35V	56289	196D105X0035HA1
C2031	290-0744-00			CAP., FXD, ELCTLT: 3.3UF, +50-10%, 160V	90201	TT3R3U160B013P
C3011	281-0593-00	B010100	B032219	CAP., FXD, CER DI: 3.9PF, 10%, 500V	04222	7001-1113
C3011	283-0348-00	B032220		CAP., FXD, CER DI: 0.5PF, +/-0.1PF, 100V	51642	100-100-NP0-508B
C3014	281-0773-00	B010100	B032219	CAP., FXD, CER DI: 0.01UF, 10%, 100V	04222	SA201C103KAA
C3014	283-0005-00	B032220		CAP., FXD, CER DI: 0.01UF, +100-0%, 250V	72982	8131N300Z5U0103P
C3016	281-0627-00	B010100	B019999	CAP., FXD, CER DI: 1PF, +/-0.25PF, 500V	04222	7001-1340
C3016	281-0661-00	B020000	B032219	CAP., FXD, CER DI: 0.8PF, +/-0.1PF, 500V	04222	7001-1268
C3016	281-0593-00	B032220		CAP., FXD, CER DI: 3.9PF, 10%, 500V	04222	7001-1113
C3018	281-0161-00	B010100	B019999	CAP., VAR, CER DI: 5-15PF, 350V	59660	518-000A5-15
C3018	281-0123-00	B020000	B032219	CAP., VAR, CER DI: 5-25PF, 100V	59660	518-000A5-25
C3018	281-0161-00	B032220		CAP., VAR, CER DI: 5-15PF, 350V	59660	518-000A5-15
C3021	281-0593-00	B010100	B032219	CAP., FXD, CER DI: 3.9PF, 10%, 500V	04222	7001-1113
C3021	283-0348-00	B032220		CAP., FXD, CER DI: 0.5PF, +/-0.1PF, 100V	51642	100-100-NP0-508B
C3026	281-0627-00	B010100	B019999	CAP., FXD, CER DI: 1PF, +/-0.25PF, 500V	04222	7001-1340
C3026	281-0661-00	B020000	B032219	CAP., FXD, CER DI: 0.8PF, +/-0.1PF, 500V	04222	7001-1268
C3026	281-0593-00	B032220		CAP., FXD, CER DI: 3.9PF, 10%, 500V	04222	7001-1113
C3031	281-0773-00	B010100	B032219	CAP., FXD, CER DI: 0.01UF, 10%, 100V	04222	SA201C103KAA
C3031	283-0005-00	B032220		CAP., FXD, CER DI: 0.01UF, +100-0%, 250V	72982	8131N300Z5U0103P
C4011	281-0773-00			CAP., FXD, CER DI: 0.01UF, 10%, 100V	04222	SA201C103KAA
C4012	281-0792-00			CAP., FXD, CER DI: 82PF, 10%, 100V	72982	8035D2AADCOG820K
C4013	283-0079-00	B010100	B032219	CAP., FXD, CER DI: 0.01UF, 20%, 250V	59660	8151B202Y5S0103M
C4013	281-0783-00	B032220		CAP., FXD, CER DI: 0.1UF, 20%, 100V	72982	8045-D-Z5U104M
C4014	283-0003-00	B010100	B032219	CAP., FXD, CER DI: 0.01UF, +80-20%, 150V	91418	SP103Z151-4R9
C4014	283-0187-00	B032220		CAP., FXD, CER DI: 0.047UF, 10%, 400V	72982	8131N401X5R0473K
C4021	281-0775-00			CAP., FXD, CER DI: 0.1UF, 20%, 50V	04222	SA205E104MAA
C4022	283-0079-00	B010100	B032219	CAP., FXD, CER DI: 0.01UF, 20%, 250V	59660	8151B202Y5S0103M
C4022	281-0783-00	B032220		CAP., FXD, CER DI: 0.1UF, 20%, 100V	72982	8045-D-Z5U104M
C4031	281-0775-00			CAP., FXD, CER DI: 0.1UF, 20%, 50V	04222	SA205E104MAA
C4032	290-0134-00			CAP., FXD, ELCTLT: 22UF, 20%, 15V	56289	150D226X0015B2
C5011	281-0773-00			CAP., FXD, CER DI: 0.01UF, 10%, 100V	04222	SA201C103KAA
C5012	290-0580-00			CAP., FXD, ELCTLT: 0.27UF, 20%, 50V	56289	196D274X0050HA1
C5022	281-0773-00			CAP., FXD, CER DI: 0.01UF, 10%, 100V	04222	SA201C103KAA
C5024	281-0773-00			CAP., FXD, CER DI: 0.01UF, 10%, 100V	04222	SA201C103KAA
C5031	281-0775-00			CAP., FXD, CER DI: 0.1UF, 20%, 50V	04222	SA205E104MAA
C5032	290-0136-00			CAP., FXD, ELCTLT: 2.2UF, 20%, 20V	56289	162D225X0020CD2
C6015	281-0788-00			CAP., FXD, CER DI: 470PF, 10%, 100V	72982	8005H9AADW5R471K
C6031	281-0773-00			CAP., FXD, CER DI: 0.01UF, 10%, 100V	04222	SA201C103KAA
C6032	290-0534-00			CAP., FXD, ELCTLT: 1UF, 20%, 35V	56289	196D105X0035HA1
CR1021	152-0066-00			SEMICONV DEVICE: SILICON, 400V, 750MA	14433	LG4016
CR1022	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	IN4152R
CR1031	152-0066-00			SEMICONV DEVICE: SILICON, 400V, 750MA	14433	LG4016
CR1033	152-0066-00			SEMICONV DEVICE: SILICON, 400V, 750MA	14433	LG4016
CR1034	152-0066-00			SEMICONV DEVICE: SILICON, 400V, 750MA	14433	LG4016

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Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
CR2021	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR2022	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR3031	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR3032	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR4011	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR5021	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR5031	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR5032	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR5034	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR6021	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR6031	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR6032	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR7031	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
LR2021	108-0520-00			COIL, RF: 2.2UH (WOUND ON A 10 OHM RES)	80009	108-0520-00
LR5011	108-0520-00			COIL, RF: 2.2UH (WOUND ON A 10 OHM RES)	80009	108-0520-00
Q1021	151-0444-02			TRANSISTOR: SILICON, NPN	80009	151-0444-02
Q1022	151-0444-02			TRANSISTOR: SILICON, NPN	80009	151-0444-02
Q1024	151-0347-00			TRANSISTOR: SILICON, NPN	56289	2N5551
Q1026	151-0350-00			TRANSISTOR: SILICON, PNP	04713	SPS6700
Q1031	151-0347-00			TRANSISTOR: SILICON, NPN	56289	2N5551
Q2011	151-0441-00	B010100	B032219	TRANSISTOR: SILICON, NPN	04713	SRF501
Q2011	151-0190-00	B032220		TRANSISTOR: SILICON, NPN	07263	S032677
Q2012	151-0188-00			TRANSISTOR: SILICON, PNP	04713	SPS6868K
Q2021	151-0188-00			TRANSISTOR: SILICON, PNP	04713	SPS6868K
Q2022	151-0441-00	B010100	B032219	TRANSISTOR: SILICON, NPN	04713	SRF501
Q2022	151-0190-00	B032220		TRANSISTOR: SILICON, NPN	07263	S032677
Q2024	151-0350-00			TRANSISTOR: SILICON, PNP	04713	SPS6700
Q2031	151-0444-02			TRANSISTOR: SILICON, NPN	80009	151-0444-02
Q2032	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q3011	151-0347-00			TRANSISTOR: SILICON, NPN	56289	2N5551
Q3012	151-0612-00	B010100	B032219	TRANSISTOR: SILICON, PNP	80009	151-0612-00
Q3012	151-0406-00	B032220		TRANSISTOR: SILICON, PNP	04713	0BD
Q3014	151-0615-00	B010100	B032219	TRANSISTOR: SILICON, NPN	04713	SDS358K
Q3014	151-0407-00	B032220		TRANSISTOR: SILICON, NPN	04713	SS2456
Q3021	151-0615-00	B010100	B032219	TRANSISTOR: SILICON, NPN	04713	SDS358K
Q3021	151-0407-00	B032220		TRANSISTOR: SILICON, NPN	04713	SS2456
Q3031	151-0347-00			TRANSISTOR: SILICON, NPN	56289	2N5551
Q3032	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q3034	151-0612-00	B010100	B032219	TRANSISTOR: SILICON, PNP	80009	151-0612-00
Q3034	151-0406-00	B032220		TRANSISTOR: SILICON, PNP	04713	0BD
Q4011	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q4012	151-0103-00			TRANSISTOR: SILICON, NPN	80009	151-0103-00
Q5011	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q5012	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q5013	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q5031	151-0254-00			TRANSISTOR: SILICON, NPN	03508	X38L3118
Q5032	151-0254-00			TRANSISTOR: SILICON, NPN	03508	X38L3118
Q5033	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q6011	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q6012	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q6031	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q6032	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q6033	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q7011	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q7012	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q7013	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065

Replaceable Electrical Parts—SC 503

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
Q7014	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q7031	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
R1011	311-1222-00			RES.,VAR, NONWIR: 100 OHM, 20%, 0.50W	32997	3386F-T04-101
R1012	311-1223-00	B010100	B032219	RES.,VAR, NONWIR: TRMR, 250 OHM, 0.5W	02111	63M251T602
R1012	311-1224-00	B032220		RES.,VAR, NONWIR: 500 OHM, 20%, 0.50W	32997	3386F-T04-501
R1013	311-0349-00			RES.,VAR, NONWIR: PNL, 2M OHM, 0.5W	12697	CM30940
				RES.,VAR, NONWIR: 2.2K OHM, 1%, 0.125W	75062	CRCTO-2433F

R1023	315-0511-00	XB011600		RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R1024	315-0753-00			RES.,FXD,CMPSN:75K OHM,5%,0.25W	01121	CB7535
R1025	315-0225-00	XB020000		RES.,FXD,CMPSN:2.2M OHM,5%,0.25W	01121	CB2255
R1026	315-0753-00			RES.,FXD,CMPSN:75K OHM,5%,0.25W	01121	CB7535
R1028	315-0204-00			RES.,FXD,CMPSN:200K OHM,5%,0.25W	01121	CB2045
R1031	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R1032	315-0222-00			RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	01121	CB2225
R1034	315-0823-00			RES.,FXD,CMPSN:82K OHM,5%,0.25W	01121	CB8235
R1036	315-0105-00			RES.,FXD,CMPSN:1M OHM,5%,0.25W	01121	CB1055
R1037	315-0204-00			RES.,FXD,CMPSN:200K OHM,5%,0.25W	01121	CB2045
R1038	311-1235-00			RES.,VAR, NONWIR: 100K OHM, 20%, 0.50W	32997	3386F-T04-104
R1039	311-1232-00			RES.,VAR, NONWIR: 50K OHM, 20%, 0.50W	32997	3386F-T04-503
R2011	321-0226-00	B010100	B032219	RES.,FXD,FILM:2.21K OHM,1%,0.125W	91637	MFF1816G22100F
R2011	321-0253-00	B032220		RES.,FXD,FILM:4.22K OHM,1%,0.125W	91637	MFF1816G42200F
R2012	321-0126-00	B010100	B032219	RES.,FXD,FILM:200 OHM,1%,0.125W	91637	MFF1816G200R0F
R2012	321-0121-00	B032220		RES.,FXD,FILM:178 OHM,1%,0.125W	91637	MFF1816G178R0F
R2014	311-1232-00			RES.,VAR, NONWIR: 50K OHM, 20%, 0.50W	32997	3386F-T04-503
R2016	321-0226-00	B010100	B032219	RES.,FXD,FILM:2.21K OHM,1%,0.125W	91637	MFF1816G22100F
R2016	321-0253-00	B032220		RES.,FXD,FILM:4.22K OHM,1%,0.125W	91637	MFF1816G42200F
R2018	311-1227-00			RES.,VAR, NONWIR: 5K OHM, 20%, 0.50W	32997	3386F-T04-502
R2019	321-0085-00			RES.,FXD,FILM:75 OHM,1%,0.125W	91637	MFF1816G75R00F

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Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R3022	321-0219-00	B032220		RES., FXD, FILM: 1.87K OHM, 1%, 0.125W	91637	MFF1816G18700F
R3023	311-0633-00	B010100	B019999	RES., VAR, NONWIR: 5K OHM, 10%, 0.50W	73138	82-30-1
R3023	311-0609-00	B020000		RES., VAR, NONWIR: 2K OHM, 10%, 0.50W	73138	82-26-1
R3024	315-0302-00	B010100	B032219	RES., FXD, CMPSN: 3K OHM, 5%, 0.25W	01121	CB3025
R3024	321-0381-00	B032220		RES., FXD, FILM: 90.9K OHM, 1%, 0.125W	91637	MFF1816G90901F
R3025	321-0123-00	B010100	B032219X	RES., FXD, FILM: 187 OHM, 1%, 0.125W	91637	MFF1816G187ROF
R3026	321-0113-00	B010100	B032219	RES., FXD, FILM: 147 OHM, 1%, 0.125W	91637	MFF1816G147ROF
R3026	315-0561-00	B032220		RES., FXD, CMPSN: 560 OHM, 5%, 0.25W	01121	CB5615
R3027	315-0470-00	XB011190	B021746	RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R3027	321-0113-00	B021747	B032219	RES., FXD, FILM: 147 OHM, 1%, 0.125W	91637	MFF1816G147ROF
R3027	315-0561-00	B032220		RES., FXD, CMPSN: 560 OHM, 5%, 0.25W	01121	CB5615
R3028	322-0349-00	B010100	B022219	RES., FXD, FILM: 42.2K OHM, 1%, 0.25W	75042	CEBTO-4222F
R3028	321-0381-00	B032220		RES., FXD, FILM: 90.9K OHM, 1%, 0.125W	91637	MFF1816G90901F
R3029	315-0621-00	B010100	B022219	RES., FXD, CMPSN: 620 OHM, 5%, 0.25W	01121	CB6215
R3029	315-0101-00	B032220		RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R3031	315-0243-00			RES., FXD, CMPSN: 24K OHM, 5%, 0.25W	01121	CB2435
R3032	315-0203-00			RES., FXD, CMPSN: 20K OHM, 5%, 0.25W	01121	CB2035
R3033	315-0300-00	XB011600		RES., FXD, CMPSN: 30 OHM, 5%, 0.25W	01121	CB3005
R3034	315-0562-00			RES., FXD, CMPSN: 5.6K OHM, 5%, 0.25W	01121	CB5625
R3035	315-0562-00			RES., FXD, CMPSN: 5.6K OHM, 5%, 0.25W	01121	CB5625
R3036	315-0562-00			RES., FXD, CMPSN: 5.6K OHM, 5%, 0.25W	01121	CB5625
R3037	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R3039	315-0470-00			RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R4011	321-0259-00			RES., FXD, FILM: 4.87K OHM, 1%, 0.125W	91637	MFF1816G48700F
R4012	321-0289-00			RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R4013	315-0151-00			RES., FXD, CMPSN: 150 OHM, 5%, 0.25W	01121	CB1515
R4014	315-0101-00			RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R4015	321-0302-00			RES., FXD, FILM: 13.7K OHM, 1%, 0.125W	91637	MFF1816G13701F
R4016	315-0333-00			RES., FXD, CMPSN: 33K OHM, 5%, 0.25W	01121	CB3335
R4017	315-0562-00			RES., FXD, CMPSN: 5.6K OHM, 5%, 0.25W	01121	CB5625
R4018	308-0767-00			RES., FXD, WW: 1.1 OHM, 5%, 1W	75042	BW20-1R100J
R4019	315-0431-00			RES., FXD, CMPSN: 430 OHM, 5%, 0.25W	01121	CB4315
R4021	315-0101-00			RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R4022	315-0202-00			RES., FXD, CMPSN: 2K OHM, 5%, 0.25W	01121	CB2025
R4023	311-1977-00			RES., VAR, NONWIR: PNL, 10K OHM, 20%, 0.50W	12697	CM41733
	-----			(FURNISHED AS A UNIT WITH S4021)		
R4024	315-0151-00			RES., FXD, CMPSN: 150 OHM, 5%, 0.25W	01121	CB1515
R4025	315-0241-00			RES., FXD, CMPSN: 240 OHM, 5%, 0.25W	01121	CB2415
R4026	315-0224-00			RES., FXD, CMPSN: 220K OHM, 5%, 0.25W	01121	CB2245
R4028	315-0203-00			RES., FXD, CMPSN: 20K OHM, 5%, 0.25W	01121	CB2035
R4029	315-0164-00			RES., FXD, CMPSN: 160K OHM, 5%, 0.25W	01121	CB1645
R4031	315-0751-00			RES., FXD, CMPSN: 750 OHM, 5%, 0.25W	01121	CB7515
R4032	321-0351-00			RES., FXD, FILM: 44.2K OHM, 1%, 0.125W	91637	MFF1816G44201F
R4034	321-0304-00			RES., FXD, FILM: 14.3K OHM, 1%, 0.125W	91637	MFF1816G14301F
R4036	321-0333-00			RES., FXD, FILM: 28.7K OHM, 1%, 0.125W	91637	MFF1816G28701F
R5011	315-0362-00			RES., FXD, CMPSN: 3.6K OHM, 5%, 0.25W	01121	CB3625
R5012	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R5013	315-0162-00	B010100	B032219	RES., FXD, CMPSN: 1.6K OHM, 5%, 0.25W	01121	CB1625
R5013	315-0132-00	B032220		RES., FXD, CMPSN: 1.3K OHM, 5%, 0.25W	01121	CB1325
R5014	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R5015	315-0162-00	B010100	B032219	RES., FXD, CMPSN: 1.6K OHM, 5%, 0.25W	01121	CB1625
R5015	315-0132-00	B032220		RES., FXD, CMPSN: 1.3K OHM, 5%, 0.25W	01121	CB1325
R5016	315-0821-00			RES., FXD, CMPSN: 820 OHM, 5%, 0.25W	01121	CB8215
R5017	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R5018	315-0821-00			RES., FXD, CMPSN: 820 OHM, 5%, 0.25W	01121	CB8215
R5019	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R5021	315-0162-00			RES., FXD, CMPSN: 1.6K OHM, 5%, 0.25W	01121	CB1625

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R5022	315-0203-00			RES., FXD, CMPSN: 20K OHM, 5%, 0.25W	01121	CB2035
R5031	321-0304-00			RES., FXD, FILM: 14.3K OHM, 1%, 0.125W	91637	MPF1816G14301F
R5032	315-0134-00			RES., FXD, CMPSN: 130K OHM, 5%, 0.25W	01121	CB1345
R5034	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R5036	315-0513-00			RES., FXD, CMPSN: 51K OHM, 5%, 0.25W	01121	CB5135
R5038	315-0392-00			RES., FXD, CMPSN: 3.9K OHM, 5%, 0.25W	01121	CB3925
R6011	315-0431-00			RES., FXD, CMPSN: 430 OHM, 5%, 0.25W	01121	CB4315
R6012	315-0472-00			RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R6013	315-0472-00			RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R6014	315-0472-00			RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R6016	315-0621-00			RES., FXD, CMPSN: 620 OHM, 5%, 0.25W	01121	CB6215
R6017	315-0132-00			RES., FXD, CMPSN: 1.3K OHM, 5%, 0.25W	01121	CB1325
R6018	315-0472-00			RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R6019	315-0472-00			RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R6021	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R6022	315-0912-00			RES., FXD, CMPSN: 9.1K OHM, 5%, 0.25W	01121	CB9125
R6031	315-0203-00			RES., FXD, CMPSN: 20K OHM, 5%, 0.25W	01121	CB2035
R6032	321-0323-00			RES., FXD, FILM: 22.6K OHM, 1%, 0.125W	91637	MPF1816G22601F
R6033	315-0203-00			RES., FXD, CMPSN: 20K OHM, 5%, 0.25W	01121	CB2035
R6034	315-0303-00			RES., FXD, CMPSN: 30K OHM, 5%, 0.25W	01121	CB3035
R6035	315-0514-00			RES., FXD, CMPSN: 510K OHM, 5%, 0.25W	01121	CB5145
R6036	315-0244-00	B010100	B019999	RES., FXD, CMPSN: 240K OHM, 5%, 0.25W	01121	CB2445
R6036	315-0184-00	B020000		RES., FXD, CMPSN: 180K OHM, 5%, 0.25W	01121	CB1845
R6037	315-0205-00			RES., FXD, CMPSN: 2M OHM, 5%, 0.25W	01121	CB2055
R6038	315-0134-00			RES., FXD, CMPSN: 130K OHM, 5%, 0.25W	01121	CB1345
R6039	315-0104-00			RES., FXD, CMPSN: 100K OHM, 5%, 0.25W	01121	CB1045
R7011	315-0391-00			RES., FXD, CMPSN: 390 OHM, 5%, 0.25W	01121	CB3915
R7012	315-0202-00			RES., FXD, CMPSN: 2K OHM, 5%, 0.25W	01121	CB2025
R7013	311-2017-00			RES., VAR, NONWIR: 20K OHM, 20%, 0.50W (FURNISHED AS A UNIT WITH S6021)	12697	CM41742
R7021	315-0153-00			RES., FXD, CMPSN: 15K OHM, 5%, 0.25W	01121	CB1535
R7022	315-0203-00			RES., FXD, CMPSN: 20K OHM, 5%, 0.25W	01121	CB2035
R7023	315-0222-00			RES., FXD, CMPSN: 2.2K OHM, 5%, 0.25W	01121	CB2225
R7024	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R7025	315-0182-00			RES., FXD, CMPSN: 1.8K OHM, 5%, 0.25W	01121	CB1825
R7026	315-0392-00			RES., FXD, CMPSN: 3.9K OHM, 5%, 0.25W	01121	CB3925
R7027	315-0752-00			RES., FXD, CMPSN: 7.5K OHM, 5%, 0.25W	01121	CB7525
R7028	315-0242-00			RES., FXD, CMPSN: 2.4K OHM, 5%, 0.25W	01121	CB2425
R7029	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R7031	315-0203-00			RES., FXD, CMPSN: 20K OHM, 5%, 0.25W	01121	CB2035
R7032	315-0104-00			RES., FXD, CMPSN: 100K OHM, 5%, 0.25W	01121	CB1045
R7034	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R7036	315-0392-00			RES., FXD, CMPSN: 3.9K OHM, 5%, 0.25W	01121	CB3925
S4021	-----			(PART OF R4023)		
S6021	263-1171-00			SW CAM ACTR AS: VERTICAL MODE	80009	263-1171-00
S7013	-----			(PART OF R7013)		
U4011	156-0067-00			MICROCIRCUIT, LI: OPERATIONAL AMPLIFIER	01295	MICROA741CP
U5011	156-0731-00			MICROCIRCUIT, DI: DUAL J-K FF W/PRESET & CLR	01295	SN74LS76A
U6031	156-0853-00			MICROCIRCUIT, LI: OPERATIONAL AMPLIFIER, DUAL	27014	LM358N
VR1022	152-0255-00	B010100	B019999X	SEMICONV DEVICE: ZENER, 0.4W, 51V, 5%	80009	152-0255-00
VR4021	152-0309-00			SEMICONV DEVICE: ZENER, 1W, 6.2V, 5%	04713	SZ14310
W1022	131-0566-00	XB020000		BUS CONDUCTOR: DUMMY RES, 2.375, 22 AWG	57668	JWW-0200E0
W3025	131-0566-00	XB032220		BUS CONDUCTOR: DUMMY RES, 2.375, 22 AWG	57668	JWW-0200E0

Replaceable Electrical Parts—SC 503

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A30	670-5370-00	B010100	B011599	CKT BOARD ASSY:TRIGGER	80009	670-5370-00
A30	670-5370-01	B011600	B032219	CKT BOARD ASSY:TRIGGER	80009	670-5370-01
A30	670-5370-02	B032220		CKT BOARD ASSY:TRIGGER	80009	670-5370-02
C1031	283-0182-00			CAP.,FXD,CER DI:51PF,5%,400V	72982	8121N400A510J
C1035	281-0814-00			CAP.,FXD,CER DI:100PF,10%,100V	04222	GC70-1-A101K
C3001	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C3021	281-0773-00			CAP.,FXD,CER DI:0.01UF,10%,100V	04222	SA201C103KAA
C3031	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C3041	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C4001	281-0773-00			CAP.,FXD,CER DI:0.01UF,10%,100V	04222	SA201C103KAA
C4002	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C4003	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C4011	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C4012	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C4021	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C4031	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C4041	281-0773-00			CAP.,FXD,CER DI:0.01UF,10%,100V	04222	SA201C103KAA
C5001	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C5011	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C5012	281-0763-00			CAP.,FXD,CER DI:47PF,10%,100V	04222	GC101A470K
C6001	281-0812-00			CAP.,FXD,CER DI:1000PF,10%,100V	72982	8035D9AADX7R102K
C6002	281-0812-00			CAP.,FXD,CER DI:1000PF,10%,100V	72982	8035D9AADX7R102K
C6003	281-0773-00			CAP.,FXD,CER DI:0.01UF,10%,100V	04222	SA201C103KAA
C6011	290-0523-00			CAP.,FXD,ELCTLT:2.2UF,20%,20V	56289	196D225X0020HA1
C6012	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	04222	SA205E104MAA
C6041	290-0525-00			CAP.,FXD,ELCTLT:4.7UF,20%,50V	56289	196D475X0050KA1
C6051	290-0525-00			CAP.,FXD,ELCTLT:4.7UF,20%,50V	56289	196D475X0050KA1
C6052	281-0791-00			CAP.,FXD,CER DI:270PF,10%,100V	72982	8035D2AADX5R271K
C7011	281-0773-00			CAP.,FXD,CER DI:0.01UF,10%,100V	04222	SA201C103KAA
C7021	290-0512-00			CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C7051	281-0791-00			CAP.,FXD,CER DI:270PF,10%,100V	72982	8035D2AADX5R271K
C7052	281-0786-00			CAP.,FXD,CER DI:150PF,10%,100V	72982	8035D2AADX5P151K
C7053	281-0786-00			CAP.,FXD,CER DI:150PF,10%,100V	72982	8035D2AADX5P151K
C7055	281-0792-00			CAP.,FXD,CER DI:82PF,10%,100V	72982	8035D2AADCOG820K
C8001	290-0534-00			CAP.,FXD,ELCTLT:1UF,20%,35V	56289	196D105X0035HA1
C8002	281-0773-00			CAP.,FXD,CER DI:0.01UF,10%,100V	04222	SA201C103KAA
C8061	281-0792-00			CAP.,FXD,CER DI:82PF,10%,100V	72982	8035D2AADCOG820K
CR2001	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
CR2011	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
CR3001	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
CR3011	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
CR4031	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
CR5011	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
CR5012	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
CR5021	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
CR5031	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
CR6031	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
CR6032	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
CR6041	152-0066-00			SEMICONV DEVICE:SILICON,400V,750MA	14433	LG4016
CR6042	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
CR6051	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
CR6061	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
CR7011	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
CR7031	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
CR7032	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
CR7041	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R

Ckt No.	Tektronix Part No.	Serial/Model No.		Name & Description	Mfr	
		Eff	Dscont		Code	Mfr Part Number
CR7051	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR8011	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR8021	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR8022	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR8041	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR8061	152-0066-00			SEMICONV DEVICE: SILICON, 400V, 750MA	14433	LG4016
CR9001	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
F8051	159-0042-00			FUSE, CARTRIDGE: 3AG, 0.75A, 250V, FAST-BLOW	71400	AGC 3/4
F9051	159-0032-00			FUSE, CARTRIDGE: 3AG, 0.5A, 250V, SLOW-BLOW	71400	MDL 1/2
J3031	131-1003-00			CONN, RCPT, ELEC: CKT BD MT, 3 PRONG	80009	131-1003-00
J3032	131-1003-00			CONN, RCPT, ELEC: CKT BD MT, 3 PRONG	80009	131-1003-00
J3033	131-1003-00			CONN, RCPT, ELEC: CKT BD MT, 3 PRONG	80009	131-1003-00
J7031	131-1003-00			CONN, RCPT, ELEC: CKT BD MT, 3 PRONG	80009	131-1003-00
J8041	131-1003-00			CONN, RCPT, ELEC: CKT BD MT, 3 PRONG	80009	131-1003-00
J9031	131-1003-00			CONN, RCPT, ELEC: CKT BD MT, 3 PRONG	80009	131-1003-00
K8031	148-0064-00			RELAY, REED: SPST	95348	F81-1441
K8041	148-0064-00			RELAY, REED: SPST	95348	F81-1441
L4021	108-0245-00			COIL, RF: 3.9UH	76493	B6310-1
L7021	108-0245-00			COIL, RF: 3.9UH	76493	B6310-1
L8001	108-0245-00			COIL, RF: 3.9UH	76493	B6310-1
Q2031	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q3031	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q4001	151-0188-00			TRANSISTOR: SILICON, PNP	04713	SPS6868K
Q4002	151-0190-00			TRANSISTOR: SILICON, NPN	07263	S032677
Q4011	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q4021	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q4022	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q4031	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q4032	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q5001	151-0190-00			TRANSISTOR: SILICON, NPN	07263	S032677
Q5011	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q5012	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q5021	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q5031	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q5032	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q6011	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q6021	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q6022	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q6023	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q6024	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q6025	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q6026	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q6027	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q6031	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q6041	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q7021	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q7031	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q7032	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q7033	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q7034	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q7035	151-0302-00			TRANSISTOR: SILICON, NPN	07263	S038487
Q7036	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q7041	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q7042	151-0103-00			TRANSISTOR: SILICON, NPN	80009	151-0103-00
Q7043	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065

Replaceable Electrical Parts—SC 503

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
Q7044	151-0192-00			TRANSISTOR:SILICON,NPN,SEL FROM MPS6521	04713	SPS8801
Q7051	151-0342-00			TRANSISTOR:SILICON,PNP	07263	S035928
Q7052	151-0342-00			TRANSISTOR:SILICON,PNP	07263	S035928
Q7053	151-0134-00			TRANSISTOR:SILICON,PNP	80009	151-0134-00
Q7054	151-0342-00			TRANSISTOR:SILICON,PNP	07263	S035928
Q7061	151-0347-00			TRANSISTOR:SILICON,NPN	56289	2N5551
Q7062	151-0347-00			TRANSISTOR:SILICON,NPN	56289	2N5551
Q7063	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q8001	151-0342-00			TRANSISTOR:SILICON,PNP	07263	S035928
Q8002	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q8051	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q8052	151-0341-00			TRANSISTOR:SILICON,NPN	07263	S040065
Q8053	151-0342-00			TRANSISTOR:SILICON,PNP	07263	S035928
Q8061	151-0342-00			TRANSISTOR:SILICON,PNP	07263	S035928
Q8062	151-0342-00			TRANSISTOR:SILICON,PNP	07263	S035928
R1001	311-1228-00			RES.,VAR,NONWIR:10K OHM,20%,0.50W	32997	3386F-T04-103
R1002	311-1228-00			RES.,VAR,NONWIR:10K OHM,20%,0.50W	32997	3386F-T04-103
R1003	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R1011	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R1031	315-0754-00			RES.,FXD,CMPSN:750K OHM,5%,0.25W	01121	CB7545
R1032	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R1033	315-0104-00			RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
R1034	315-0334-00			RES.,FXD,CMPSN:330K OHM,5%,0.25W	01121	CB3345
R2011	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R2012	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R2013	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R2014	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R2015	315-0363-00			RES.,FXD,CMPSN:36K OHM,5%,0.25W	01121	CB3635
R2016	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R2021	321-0126-00			RES.,FXD,FILM:200 OHM,1%,0.125W	91637	MFF1816G200R0F
R2022	321-0226-00			RES.,FXD,FILM:2.21K OHM,1%,0.125W	91637	MFF1816G22100F
R2023	321-0226-00			RES.,FXD,FILM:2.21K OHM,1%,0.125W	91637	MFF1816G22100F
R2024	321-0126-00			RES.,FXD,FILM:200 OHM,1%,0.125W	91637	MFF1816G200R0F
R3001	315-0105-00			RES.,FXD,CMPSN:1M OHM,5%,0.25W	01121	CB1055
R3002	315-0105-00			RES.,FXD,CMPSN:1M OHM,5%,0.25W	01121	CB1055
R3011	315-0183-00			RES.,FXD,CMPSN:18K OHM,5%,0.25W	01121	CB1835
R3012	315-0243-00			RES.,FXD,CMPSN:24K OHM,5%,0.25W	01121	CB2435
R3013	315-0303-00			RES.,FXD,CMPSN:30K OHM,5%,0.25W	01121	CB3035
R3014	315-0122-00			RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
R3021	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R3022	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R3023	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R3024	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R3025	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R3031	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R3041	315-0240-00			RES.,FXD,CMPSN:24 OHM,5%,0.25W	01121	CB2405
R3042	315-0240-00			RES.,FXD,CMPSN:24 OHM,5%,0.25W	01121	CB2405
R4001	321-0193-00			RES.,FXD,FILM:1K OHM,1%,0.125W	91637	MFF1816G10000F
R4002	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R4003	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R4004	321-0147-00			RES.,FXD,FILM:332 OHM,1%,0.125W	91637	MFF1816G332R0F
R4005	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
R4010	315-0151-00	XB011600		RES.,FXD,CMPSN:150 OHM,5%,0.25W	01121	CB1515
R4011	321-0186-00			RES.,FXD,FILM:845 OHM,1%,0.125W	91637	MFF1816G845R0F
R4012	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R4013	315-0910-00			RES.,FXD,CMPSN:91 OHM,5%,0.25W	01121	CB9105
R4014	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R4015	315-0752-00			RES., FXD, CMPSN: 7.5K OHM, 5%, 0.25W	01121	CB7525
R4016	321-0271-00			RES., FXD, FILM: 6.49K OHM, 1%, 0.125W	91637	MFF1816G64900F
R4017	315-0752-00			RES., FXD, CMPSN: 7.5K OHM, 5%, 0.25W	01121	CB7525
R4021	315-0301-00			RES., FXD, CMPSN: 300 OHM, 5%, 0.25W	01121	CB3015
R4022	315-0391-00			RES., FXD, CMPSN: 390 OHM, 5%, 0.25W	01121	CB3915
R4023	315-0391-00			RES., FXD, CMPSN: 390 OHM, 5%, 0.25W	01121	CB3915
R4031	311-1223-00	B010100	B032219	RES., VAR, NONWIR: TRMR, 250 OHM, 0.5W	02111	63M251T602
R4031	311-1225-00	B032220		RES., VAR, NONWIR: 1K OHM, 20%, 0.50W	32997	3386F-T04-102
R4041	315-0562-00			RES., FXD, CMPSN: 5.6K OHM, 5%, 0.25W	01121	CB5625
R4042	315-0470-00			RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R4043	315-0622-00			RES., FXD, CMPSN: 6.2K OHM, 5%, 0.25W	01121	CB6225
R4044	315-0153-00			RES., FXD, CMPSN: 15K OHM, 5%, 0.25W	01121	CB1535
R4045	315-0622-00			RES., FXD, CMPSN: 6.2K OHM, 5%, 0.25W	01121	CB6225
R5001	315-0100-00			RES., FXD, CMPSN: 10 OHM, 5%, 0.25W	01121	CB1005
R5002	315-0470-00			RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R5003	315-0242-00			RES., FXD, CMPSN: 2.4K OHM, 5%, 0.25W	01121	CB2425
R5004	315-0681-00			RES., FXD, CMPSN: 680 OHM, 5%, 0.25W	01121	CB6815
R5005	315-0153-00			RES., FXD, CMPSN: 15K OHM, 5%, 0.25W	01121	CB1535
R5006	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R5011	315-0470-00			RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R5013	315-0202-00			RES., FXD, CMPSN: 2K OHM, 5%, 0.25W	01121	CB2025
R5021	321-0239-00			RES., FXD, FILM: 3.01K OHM, 1%, 0.125W	91637	MFF1816G30100F
R5022	315-0821-00			RES., FXD, CMPSN: 820 OHM, 5%, 0.25W	01121	CB8215
R5023	315-0241-00			RES., FXD, CMPSN: 240 OHM, 5%, 0.25W	01121	CB2415
R5024	315-0432-00			RES., FXD, CMPSN: 4.3K OHM, 5%, 0.25W	01121	CB4325
R5025	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R5026	315-0182-00			RES., FXD, CMPSN: 1.8K OHM, 5%, 0.25W	01121	CB1825
R5027	321-0279-00			RES., FXD, FILM: 7.87K OHM, 1%, 0.125W	91637	MFF1816G78700F
R5028	315-0201-00			RES., FXD, CMPSN: 200 OHM, 5%, 0.25W	01121	CB2015
R5029	315-0752-00			RES., FXD, CMPSN: 7.5K OHM, 5%, 0.25W	01121	CB7525
R5030	315-0361-00			RES., FXD, CMPSN: 360 OHM, 5%, 0.25W	01121	CB3615
R5031	315-0470-00			RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R5032	315-0202-00			RES., FXD, CMPSN: 2K OHM, 5%, 0.25W	01121	CB2025
R5033	315-0152-00			RES., FXD, CMPSN: 1.5K OHM, 5%, 0.25W	01121	CB1525
R5034	315-0203-00			RES., FXD, CMPSN: 20K OHM, 5%, 0.25W	01121	CB2035
R5035	315-0333-00			RES., FXD, CMPSN: 33K OHM, 5%, 0.25W	01121	CB3335
R5036	315-0152-00			RES., FXD, CMPSN: 1.5K OHM, 5%, 0.25W	01121	CB1525
R6001	315-0202-00			RES., FXD, CMPSN: 2K OHM, 5%, 0.25W	01121	CB2025
R6002	315-0392-00			RES., FXD, CMPSN: 3.9K OHM, 5%, 0.25W	01121	CB3925
R6011	315-0181-00			RES., FXD, CMPSN: 180 OHM, 5%, 0.25W	01121	CB1815
R6012	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R6013	315-0474-00			RES., FXD, CMPSN: 470K OHM, 5%, 0.25W	01121	CB4745
R6014	315-0473-00			RES., FXD, CMPSN: 47K OHM, 5%, 0.25W	01121	CB4735
R6015	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R6016	315-0622-00			RES., FXD, CMPSN: 6.2K OHM, 5%, 0.25W	01121	CB6225
R6021	315-0681-00			RES., FXD, CMPSN: 680 OHM, 5%, 0.25W	01121	CB6815
R6022	315-0241-00			RES., FXD, CMPSN: 240 OHM, 5%, 0.25W	01121	CB2415
R6023	315-0511-00			RES., FXD, CMPSN: 510 OHM, 5%, 0.25W	01121	CB5115
R6031	315-0201-00			RES., FXD, CMPSN: 200 OHM, 5%, 0.25W	01121	CB2015
R6032	315-0152-00			RES., FXD, CMPSN: 1.5K OHM, 5%, 0.25W	01121	CB1525
R6033	315-0751-00			RES., FXD, CMPSN: 750 OHM, 5%, 0.25W	01121	CB7515
R6041	321-0306-01			RES., FXD, FILM: 15K OHM, 0.5%, 0.125W	91637	MFF1816G15001D
R6042	321-0306-01			RES., FXD, FILM: 15K OHM, 0.5%, 0.125W	91637	MFF1816G15001D
R6051	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R6053	311-1224-00			RES., VAR, NONWIR: 500 OHM, 20%, 0.50W	32997	3386F-T04-501
R6054	315-0332-00			RES., FXD, CMPSN: 3.3K OHM, 5%, 0.25W	01121	CB3325
R6061	321-0236-00			RES., FXD, FILM: 2.8K OHM, 1%, 0.125W	91637	MFF1816G28000F

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Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R6062	321-0215-00			RES., FXD, FILM: 1.69K OHM, 1%, 0.125W	91637	MFF1816G16900F
R7001	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R7002	315-0202-00			RES., FXD, CMPSN: 2K OHM, 5%, 0.25W	01121	CB2025
R7011	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R7021	315-0432-00			RES., FXD, CMPSN: 4.3K OHM, 5%, 0.25W	01121	CB4325
R7022	315-0151-00			RES., FXD, CMPSN: 150 OHM, 5%, 0.25W	01121	CB1515
R7023	315-0362-00			RES., FXD, CMPSN: 3.6K OHM, 5%, 0.25W	01121	CB3625
R7031	315-0393-00			RES., FXD, CMPSN: 39K OHM, 5%, 0.25W	01121	CB3935
R7041	315-0183-00			RES., FXD, CMPSN: 18K OHM, 5%, 0.25W	01121	CB1835
R7042	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R7043	321-0289-00			RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R7044	315-0114-00			RES., FXD, CMPSN: 110K OHM, 5%, 0.25W	01121	CB1145
R7045	321-0291-00			RES., FXD, FILM: 10.5K OHM, 1%, 0.125W	91637	MFF1816G10501F
R7046	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R7051	315-0100-00			RES., FXD, CMPSN: 10 OHM, 5%, 0.25W	01121	CB1005
R7052	315-0362-00			RES., FXD, CMPSN: 3.6K OHM, 5%, 0.25W	01121	CB3625
R7053	315-0511-00			RES., FXD, CMPSN: 510 OHM, 5%, 0.25W	01121	CB5115
R7054	315-0100-00			RES., FXD, CMPSN: 10 OHM, 5%, 0.25W	01121	CB1005
R7056	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R7057	315-0562-00			RES., FXD, CMPSN: 5.6K OHM, 5%, 0.25W	01121	CB5625
R7061	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R7062	315-0182-00			RES., FXD, CMPSN: 1.8K OHM, 5%, 0.25W	01121	CB1825
R8001	315-0680-00			RES., FXD, CMPSN: 68 OHM, 5%, 0.25W	01121	CB6805
R8002	315-0271-00			RES., FXD, CMPSN: 270 OHM, 5%, 0.25W	01121	CB2715
R8003	315-0222-00			RES., FXD, CMPSN: 2.2K OHM, 5%, 0.25W	01121	CB2225
R8011	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R8012	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R8013	315-0333-00			RES., FXD, CMPSN: 33K OHM, 5%, 0.25W	01121	CB3335
R8014	315-0751-00			RES., FXD, CMPSN: 750 OHM, 5%, 0.25W	01121	CB7515
R8015	315-0751-00			RES., FXD, CMPSN: 750 OHM, 5%, 0.25W	01121	CB7515
R8016	315-0751-00			RES., FXD, CMPSN: 750 OHM, 5%, 0.25W	01121	CB7515
R8017	315-0751-00			RES., FXD, CMPSN: 750 OHM, 5%, 0.25W	01121	CB7515
R8018	315-0101-00			RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R8019	315-0470-00			RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R8021	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R8022	315-0152-00			RES., FXD, CMPSN: 1.5K OHM, 5%, 0.25W	01121	CB1525
R8023	315-0123-00			RES., FXD, CMPSN: 12K OHM, 5%, 0.25W	01121	CB1235
R8024	315-0392-00			RES., FXD, CMPSN: 3.9K OHM, 5%, 0.25W	01121	CB3925
R8025	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R8026	315-0471-00			RES., FXD, CMPSN: 470 OHM, 5%, 0.25W	01121	CB4715
R8027	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R8041	315-0181-00			RES., FXD, CMPSN: 180 OHM, 5%, 0.25W	01121	CB1815
R8042	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R8051	315-0222-00			RES., FXD, CMPSN: 2.2K OHM, 5%, 0.25W	01121	CB2225
R8052	315-0270-00			RES., FXD, CMPSN: 27 OHM, 5%, 0.25W	01121	CB2705
R8053	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R8054	315-0621-00			RES., FXD, CMPSN: 620 OHM, 5%, 0.25W	01121	CB6215
R8055	315-0270-00			RES., FXD, CMPSN: 27 OHM, 5%, 0.25W	01121	CB2705
R8062	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R9001	315-0201-00			RES., FXD, CMPSN: 200 OHM, 5%, 0.25W	01121	CB2015
R9002	315-0102-00			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R9011	315-0470-00			RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R9012	315-0470-00			RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R9013	315-0470-00			RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R9014	315-0183-00			RES., FXD, CMPSN: 18K OHM, 5%, 0.25W	01121	CB1835
R9021	315-0392-00			RES., FXD, CMPSN: 3.9K OHM, 5%, 0.25W	01121	CB3925
R9041	315-0241-00			RES., FXD, CMPSN: 240 OHM, 5%, 0.25W	01121	CB2415

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Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R9051	308-0767-00			RES., FXD, WW: 1.1 OHM, 5%, 1W	75042	BW20-1R100J
R9052	308-0685-00			RES., FXD, WW: 1.5 OHM, 5%, 1W	75042	BW20-1R500J
R9053	315-0241-00			RES., FXD, CMPSN: 240 OHM, 5%, 0.25W	01121	CB2415
R9054	315-0621-00			RES., FXD, CMPSN: 620 OHM, 5%, 0.25W	01121	CB6215
R9055	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R9061	315-0105-00			RES., FXD, CMPSN: 1M OHM, 5%, 0.25W	01121	CB1055
S2031	263-1165-00			ACTR ASSY, CAM S: TRIGGER SOURCE	80009	263-1165-00
U2001	156-0067-00			MICROCIRCUIT, LI: OPERATIONAL AMPLIFIER	01295	MICROA741CP
U3001	156-0067-00			MICROCIRCUIT, LI: OPERATIONAL AMPLIFIER	01295	MICROA741CP
U4021	155-0109-01			MICROCIRCUIT, LI: MONOLITHIC TRIGGER	80009	155-0109-01
U6011	155-0122-00			MICROCIRCUIT, DI: A & B LOGIC	80009	155-0122-00
U7011	156-0860-00			MICROCIRCUIT, DI: TRIPLE LINE RECEIVER	80009	156-0860-00
VR6062	152-0227-00			SEMICONV DEVICE: ZENER, 0.4W, 6.2V, 5%	04713	SZ13903
VR7052	152-0217-00			SEMICONV DEVICE: ZENER, 0.4W, 8.2V, 5%	04713	SZG20
VR7061	152-0149-00			SEMICONV DEVICE: ZENER, 0.4W, 10V, 5%	04713	SZG35009K3

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Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A40	670-5371-00	B010100	B011189	CKT BOARD ASSY:HORIZONTAL DEFLECTION	80009	670-5371-00
A40	670-5371-01	B011190	B019999	CKT BOARD ASSY:HORIZONTAL DEFLECTION	80009	670-5371-00
A40	670-5371-02	B020000		CKT BOARD ASSY:HORIZONTAL DEFLECTION	80009	670-5371-02
C1011	290-0763-00			CAP., FXD, ELCTLT: 1UF, +50-20%, 250V	56289	500D151
C1021	290-0534-00			CAP., FXD, ELCTLT: 1UF, 20%, 35V	56289	196D105X0035HA1
C1031	290-0534-00			CAP., FXD, ELCTLT: 1UF, 20%, 35V	56289	196D105X0035HA1
C2011	283-0083-00			CAP., FXD, CER DI: 0.0047UF, 20%, 500V	72982	811-565C471J
C2012	283-0083-00			CAP., FXD, CER DI: 0.0047UF, 20%, 500V	72982	811-565C471J
C2014	281-0609-00			CAP., FXD, CER DI: 1PF, +/-0.1PF, 500V	59660	374-018COK0109B
C2016	290-0572-00			CAP., FXD, ELCTLT: 0.1UF, 20%, 50V	56289	196D104X0050HA1
C2031	290-0534-00			CAP., FXD, ELCTLT: 1UF, 20%, 35V	56289	196D105X0035HA1
C2032	290-0534-00			CAP., FXD, ELCTLT: 1UF, 20%, 35V	56289	196D105X0035HA1
C2033	281-0773-00			CAP., FXD, CER DI: 0.01UF, 10%, 100V	04222	SA201C103KAA
C3011	283-0083-00			CAP., FXD, CER DI: 0.0047UF, 20%, 500V	72982	811-565C471J
C3012	283-0083-00			CAP., FXD, CER DI: 0.0047UF, 20%, 500V	72982	811-565C471J
C3021	290-0572-00			CAP., FXD, ELCTLT: 0.1UF, 20%, 50V	56289	196D104X0050HA1
C3022	281-0791-00			CAP., FXD, CER DI: 270PF, 10%, 100V	72982	8035D2AADX5R271K
C3023	281-0773-00			CAP., FXD, CER DI: 0.01UF, 10%, 100V	04222	SA201C103KAA
C3024	281-0773-00			CAP., FXD, CER DI: 0.01UF, 10%, 100V	04222	SA201C103KAA
C3025	281-0773-00			CAP., FXD, CER DI: 0.01UF, 10%, 100V	04222	SA201C103KAA
C3026	281-0773-00			CAP., FXD, CER DI: 0.01UF, 10%, 100V	04222	SA201C103KAA
C3031	283-0186-00			CAP., FXD, CER DI: 27PF, 5%, 50V	59660	811A058C0G0270J
CR1021	152-0586-00			SEMICONV DEVICE:SILICON, 600V, 500MA	14936	RGP10J-011
CR2021	152-0141-02			SEMICONV DEVICE:SILICON, 30V, 150MA	01295	1N4152R
CR2022	152-0141-02			SEMICONV DEVICE:SILICON, 30V, 150MA	01295	1N4152R
CR2031	152-0141-02			SEMICONV DEVICE:SILICON, 30V, 150MA	01295	1N4152R
CR2032	152-0141-02			SEMICONV DEVICE:SILICON, 30V, 150MA	01295	1N4152R
CR3021	152-0141-02			SEMICONV DEVICE:SILICON, 30V, 150MA	01295	1N4152R
L1021	108-0240-00			COIL, RF: FIXED, 820UH	76493	B5147
L1031	108-0245-00			COIL, RF: 3.9UH	76493	B6310-1
L1032	108-0245-00			COIL, RF: 3.9UH	76493	B6310-1
L2031	108-0245-00			COIL, RF: 3.9UH	76493	B6310-1
L2032	108-0245-00			COIL, RF: 3.9UH	76493	B6310-1
Q1021	151-0342-00			TRANSISTOR: SILICON, PNP	07263	S035928
Q2011	151-0444-00			TRANSISTOR: SILICON, NPN	04713	SPS797
Q2012	151-0443-00			TRANSISTOR: SILICON, PNP	04713	SPS7950
Q2021	151-0341-00			TRANSISTOR: SILICON, NPN	07263	S040065
Q3011	151-0443-00			TRANSISTOR: SILICON, PNP	04713	SPS7950
Q3012	151-0444-00			TRANSISTOR: SILICON, NPN	04713	SPS797
Q3021	151-0190-00			TRANSISTOR: SILICON, NPN	07263	S032677
Q3022	151-0188-00			TRANSISTOR: SILICON, PNP	04713	SPS6868K
R1021	315-0154-00			RES., FXD, CMPSN: 150K OHM, 5%, 0.25W	01121	CB1545
R1031	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R1032	321-0341-00			RES., FXD, FILM: 34.8K OHM, 1%, 0.125W	91637	MFF1816G34801F
R1034	321-0327-00			RES., FXD, FILM: 24.9K OHM, 1%, 0.125W	91637	MFF1816G24901F
R1036	315-0472-00			RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R2011	301-0134-00			RES., FXD, CMPSN: 130K OHM, 5%, 0.50W	01121	EB1345
R2012	315-0101-00			RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R2014	321-0371-00			RES., FXD, FILM: 71.5K OHM, 1%, 0.125W	91637	MFF1816G71501F
R2016	321-0371-00			RES., FXD, FILM: 71.5K OHM, 1%, 0.125W	91637	MFF1816G71501F
R2018	315-0620-00			RES., FXD, CMPSN: 62 OHM, 5%, 0.25W	01121	CB6205
R2021	315-0620-00			RES., FXD, CMPSN: 62 OHM, 5%, 0.25W	01121	CB6205
R2022	315-0332-00			RES., FXD, CMPSN: 3.3K OHM, 5%, 0.25W	01121	CB3325
R2023	315-0332-00			RES., FXD, CMPSN: 3.3K OHM, 5%, 0.25W	01121	CB3325
R2024	315-0911-00			RES., FXD, CMPSN: 910 OHM, 5%, 0.25W	01121	CB9115

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R2025	321-0254-00			RES., FXD, FILM: 4.32K OHM, 1%, 0.125W	91637	MFF1816G43200F
R2026	321-0196-00			RES., FXD, FILM: 1.07K OHM, 1%, 0.125W	91637	MFF1816G10700F
R2027	315-0821-00			RES., FXD, CMPSN: 820 OHM, 5%, 0.25W	01121	CB8215
R2028	315-0122-00			RES., FXD, CMPSN: 1.2K OHM, 5%, 0.25W	01121	CB1225
R2031	321-0334-00	B010100	B019999	RES., FXD, FILM: 29.4K OHM, 1%, 0.125W	91637	MFF1816G29401F
R2031	321-0677-07	B020000		RES., FXD, FILM: 30.4K OHM, 0.1%, 0.125W	91637	MFF1816G30401B
R3011	315-0332-00			RES., FXD, CMPSN: 3.3K OHM, 5%, 0.25W	01121	CB3325
R3012	301-0134-00			RES., FXD, CMPSN: 130K OHM, 5%, 0.50W	01121	EB1345
R3014	315-0332-00			RES., FXD, CMPSN: 3.3K OHM, 5%, 0.25W	01121	CB3325
R3016	315-0101-00			RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R3018	321-0371-00			RES., FXD, FILM: 71.5K OHM, 1%, 0.125W	91637	MFF1816G71501F
R3019	321-0371-00			RES., FXD, FILM: 71.5K OHM, 1%, 0.125W	91637	MFF1816G71501F
R3020	315-0470-00	XB011190	B019999X	RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R3021	315-0470-00			RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R3022	321-0385-00			RES., FXD, FILM: 100K OHM, 1%, 0.125W	91637	MFF1816G10002F
R3023	321-0385-00			RES., FXD, FILM: 100K OHM, 1%, 0.125W	91637	MFF1816G10002F
R3024	321-0231-00			RES., FXD, FILM: 2.49K OHM, 1%, 0.125W	91637	MFF1816G24900F
R3025	315-0472-00			RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R3026	315-0183-00			RES., FXD, CMPSN: 18K OHM, 5%, 0.25W	01121	CB1835
R3027	315-0470-00	XB011190	B019999X	RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R3031	321-0304-00			RES., FXD, FILM: 14.3K OHM, 1%, 0.125W	91637	MFF1816G14301F
R3032	321-0304-00			RES., FXD, FILM: 14.3K OHM, 1%, 0.125W	91637	MFF1816G14301F
R3033	315-0470-00			RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R3034	321-0155-00			RES., FXD, FILM: 402 OHM, 1%, 0.125W	91637	MFF1816G402R0F
R3036	321-0201-00			RES., FXD, FILM: 1.21K OHM, 1%, 0.125W	91637	MFF1816G12100F
R3037	321-0230-00			RES., FXD, FILM: 2.43K OHM, 1%, 0.125W	91637	MFF1816G24300F
R3038	321-0201-00			RES., FXD, FILM: 1.21K OHM, 1%, 0.125W	91637	MFF1816G12100F
U2021	156-0067-00			MICROCIRCUIT, LI: OPERATIONAL AMPLIFIER	01295	MICROA741CP
U3037	155-0124-00			MICROCIRCUIT, LI: HORIZONTAL PREAMPL	80009	155-0124-00
VR1021	152-0306-00			SEMICONV DEVICE: ZENER, 0.4W, 9.1V, 5%	15238	Z5409
VR2017	152-0306-00			SEMICONV DEVICE: ZENER, 0.4W, 9.1V, 5%	15238	Z5409

Replaceable Electrical Parts—SC 503

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A50	670-5372-00			CKT BOARD ASSY:TRIGGER SWITCH	80009	670-5372-00
C1011	283-0002-00			CAP., FXD, CER DI:0.01UF, +80-20%, 500V	91418	SM103Z5014R9
C1012	283-0103-00			CAP., FXD, CER DI:180PF, 5%, 500V	59660	831-518-Z5D0181J
C2011	290-0534-00			CAP., FXD, ELCTLT:1UF, 20%, 35V	56289	196D105X0035HA1
C2012	290-0534-00			CAP., FXD, ELCTLT:1UF, 20%, 35V	56289	196D105X0035HA1
CR2011	152-0141-02			SEMICONV DEVICE:SILICON, 30V, 150MA	01295	1N4152R
CR2012	152-0141-02			SEMICONV DEVICE:SILICON, 30V, 150MA	01295	1N4152R
CR2013	152-0141-02			SEMICONV DEVICE:SILICON, 30V, 150MA	01295	1N4152R
Q2011	151-0341-00			TRANSISTOR:SILICON, NPN	07263	S040065
Q2012	151-0341-00			TRANSISTOR:SILICON, NPN	07263	S040065
Q2014	151-1042-00			SEMICONV DVC SE:MATCHED PAIR FET	01295	SKA5390
Q2016	151-1042-00			SEMICONV DVC SE:MATCHED PAIR FET	01295	SKA5390
R1011	315-0104-00			RES., FXD, CMPSN:100K OHM, 5%, 0.25W	01121	CB1045
R1012	315-0105-00			RES., FXD, CMPSN:1M OHM, 5%, 0.25W	01121	CB1055
R2011	315-0470-00			RES., FXD, CMPSN:47 OHM, 5%, 0.25W	01121	CB4705
R2012	315-0240-00			RES., FXD, CMPSN:24 OHM, 5%, 0.25W	01121	CB2405
R2014	321-0269-00			RES., FXD, FILM:6.19K OHM, 1%, 0.125W	91637	MFF1816G61900F
R2015	311-1221-00			RES., VAR, NONWIR:50 OHM, 20%, 0.50W	32997	3386F-T04-500
R2016	321-0120-00			RES., FXD, FILM:174 OHM, 1%, 0.125W	91637	MFF1816G174R0F
R2018	321-0269-00			RES., FXD, FILM:6.19K OHM, 1%, 0.125W	91637	MFF1816G61900F
S1011	263-0010-00			SWITCH PB ASSY:1 PUSH, 7.5MM, W/2 CONTACTS	80009	263-0010-00
S1012	263-0010-00			SWITCH PB ASSY:1 PUSH, 7.5MM, W/2 CONTACTS	80009	263-0010-00
S1013	263-0033-00			SWITCH, PB ASSY:1 MOMENTARY, 7.5MM, 2 CONTACT	80009	263-0033-00
S1014A-C	263-0015-06			ACTR ASSY, PB:2 LATCH, 1 CANCEL, 7.5MM	80009	263-0015-06

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A60	670-5373-00	B010100	B011599	CKT BOARD ASSY:GAIN,LEFT	80009	670-5373-00
A60	670-5373-01	B011600	B019999	CKT BOARD ASSY:GAIN,LEFT	80009	670-5373-01
A60	670-5373-02	B020000	B032219	CKT BOARD ASSY:GAIN,LEFT	80009	670-5373-02
A60	670-5373-03	B032220		CKT BOARD ASSY:GAIN,LEFT	80009	670-5373-03
A61	670-5373-00	B010100	B011599	CKT BOARD ASSY:GAIN,RIGHT	80009	670-5373-00
A61	670-5373-01	B011600	B019999	CKT BOARD ASSY:GAIN,RIGHT	80009	670-5373-01
A61	670-5373-02	B020000	B032219	CKT BOARD ASSY:GAIN,RIGHT	80009	670-5373-02
A61	670-5373-03	B032220		CKT BOARD ASSY:GAIN,RIGHT	80009	670-5373-03
C1011	281-0811-00			CAP.,FXD,CER DI:10PF,10%,100V	72982	8035D2AADG1G100K
C1021	281-0808-00	B010100	B011599	CAP.,FXD,CER DI:7PF,20%,100V	72982	8035D9AADCOG709G
C1021	281-0541-00	B011600	B032219	CAP.,FXD,CER DI:6.8PF,10%,500V	59660	301-000C0H0689D
C1021	281-0810-00	B032220		CAP.,FXD,CER DI:5.6PF,0.5%,100V	04222	GC10-1A5R6D
C1022	281-0775-00			CAP.,FXD,CER DI:0.1UF,20%,50V	04222	SA205E104MAA
C2011	281-0819-00			CAP.,FXD,CER DI:33PF,5%,50V	72982	8035BCOG330
C3011	281-0798-00			CAP.,FXD,CER DI:51PF,1%,100V	04222	MC101A510G
CR1011	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
CR1021	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
CR2011	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
CR2012	152-0141-02			SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
Q1011	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q1012	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q1013	151-0220-00			TRANSISTOR:SILICON,PNP	07263	S036228
Q1014	151-0220-00			TRANSISTOR:SILICON,PNP	07263	S036228
Q2011A-B	151-1031-00			TRANSISTOR:SILICON,FE,N-CHANNEL,DUAL	17856	DN870
R1012	321-0231-00			RES.,FXD,FILM:2.49K OHM,1%,0.125W	91637	MFF1816G24900F
R1014	321-0231-00			RES.,FXD,FILM:2.49K OHM,1%,0.125W	91637	MFF1816G24900F
R1016	321-0181-00			RES.,FXD,FILM:750 OHM,1%,0.125W	91637	MFF1816G750R0F
R1021	315-0100-00			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
R1022	315-0220-00	XB020000		RES.,FXD,CMPSN:22 OHM,5%,0.25W	01121	CB2205
R1024	321-0181-00			RES.,FXD,FILM:750 OHM,1%,0.125W	91637	MFF1816G750R0F
R2011	321-0030-03			RES.,FXD,FILM:20.0 OHM,0.25%,0.125W	91637	MFF1816D20R00C
R2012	321-0097-03			RES.,FXD,FILM:100 OHM,0.25%,0.125W	91637	MFF1816D100R0C
R2014	321-0193-03			RES.,FXD,FILM:1K OHM,0.25%,0.125W	91637	MFF1816D10000C
R3011	321-0097-03			RES.,FXD,FILM:100 OHM,0.25%,0.125W	91637	MFF1816D100R0C
R3012	321-0028-00			RES.,FXD,FILM:19.1 OHM,1%,0.125W	91637	MFF1816G19R10F
R3014	321-0193-03			RES.,FXD,FILM:1K OHM,0.25%,0.125W	91637	MFF1816D10000C
S1021A,B	263-1172-00			SW CAM ACTR AS:ATTENUATOR	80009	263-1172-00
W1022	131-0566-00			BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	57668	JWW-0200E0

Replaceable Electrical Parts—SC 503

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
A70	670-5374-00		CKT BOARD ASSY:ATTENUATOR	80009	670-5374-00
A71	670-5374-00		CKT BOARD ASSY:ATTENUATOR	80009	670-5374-00
C1011	281-0634-00		CAP., FXD, CER DI: 10PF, +/-0.25PF, 500V	59660	374 011 COG0100C
C1012	285-1124-00		CAP., FXD, PLSTC: 0.022UF, 20%, 400V	19396	PP721E223M
C2011	281-0184-00		CAP., VAR, PLSTC: 2-18PF, 500VDC	80031	2805D00218BN02F0
C2012	281-0184-00		CAP., VAR, PLSTC: 2-18PF, 500VDC	80031	2805D00218BN02F0
C2014	281-0178-00		CAP., VAR, PLSTC: 1-3.5PF, 500V	80031	2805D013R5BH02F0
C2021	283-0001-00		CAP., FXD, CER DI: 0.005UF, +100-0%, 500V	72982	831-559E502P
C3011	290-0534-00		CAP., FXD, ELCTLT: 1UF, 20%, 35V	56289	196D105X0035HA1
C3021	283-0669-00		CAP., FXD, MICA D: 360PF, 1%, 500V	00853	D155F361F0
CR3011	152-0323-00		SEMICONV DEVICE: SILICON, 35V, 0.1A	80009	152-0323-00
R1021	315-0105-00		RES., FXD, CMPSN: 1M OHM, 5%, 0.25W	01121	CB1055
R2011	322-0624-03		RES., FXD, FILM: 990K OHM, 0.25%, 0.25W	91637	MFF1421D99002C
R2012	315-0220-00		RES., FXD, CMPSN: 22 OHM, 5%, 0.25W	01121	CB2205
R2021	321-0289-03		RES., FXD, FILM: 10K OHM, 0.25%, 0.125W	91637	MFF1816D10001C
R2022	315-0201-00		RES., FXD, CMPSN: 200 OHM, 5%, 0.25W	01121	CB2015
R2024	315-0474-00		RES., FXD, CMPSN: 470K OHM, 5%, 0.25W	01121	CB4745
R3011	321-0097-00		RES., FXD, FILM: 100 OHM, 1%, 0.125W	91637	MFF1816G100ROF
R3012	315-0243-00		RES., FXD, CMPSN: 24K OHM, 5%, 0.25W	01121	CB2435
R3014	321-0327-02		RES., FXD, FILM: 24.9K OHM, 0.5%, 0.125W	91637	MFF1816D24901D
S2021A,B	263-1172-00		SW CAM ACTR AS: ATTENUATOR	80009	263-1172-00

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A80	670-5631-00			CKT BOARD ASSY:HIGH VOLTAGE	80009	670-5631-00
CR1011	152-0429-00			SEMICONV DEVICE:SILICON,5000V,10MA	14099	SA3282
CR2011	152-0242-00			SEMICONV DEVICE:SILICON,225V,200MA	07263	FDH5004
CR2012	152-0242-00			SEMICONV DEVICE:SILICON,225V,200MA	07263	FDH5004
DS2011	150-0111-00			LAMP,GLOW:NEON,1.2MA	53944	A1B-3
DS2012	150-0111-00			LAMP,GLOW:NEON,1.2MA	53944	A1B-3
R1011	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R1012	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R1014	308-0463-00			RES.,FXD,WW:0.3 OHM,1%,3W	91637	RS2B-KR3000F
R1016	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R2011	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R2012	315-0226-00			RES.,FXD,CMPSN:22M OHM,5%,0.25W	01121	CB2265

Replaceable Electrical Parts—SC 503

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
CHASSIS PARTS						
DL6041	119-0975-00			DELAY LINE,ELEC:140NS,150 OHMS	80009	119-0975-00
DS500	150-1029-00			LT EMITTING DIO:GREEN,565NM,35MA	53184	XC209G
DS510	150-1029-00			LT EMITTING DIO:GREEN,565NM,35MA	53184	XC209G
J500	131-0955-00			CONN,RCPT,ELEC:BNC,FEMALE	13511	31-279
J510	131-0955-00			CONN,RCPT,ELEC:BNC,FEMALE	13511	31-279
J520	131-0955-00			CONN,RCPT,ELEC:BNC,FEMALE	13511	31-279
L500	108-0829-00			COIL,TUBE DEFL:FXD,TRACE ROTATOR	80009	108-0829-00
L510	108-0271-00	XB020000		COIL,RF:FIXED,235NH	80009	108-0271-00
L520	108-0271-00	XB020000		COIL,RF:FIXED,235NH	80009	108-0271-00
R510	315-0101-03	B010100	B019999X	RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R520	315-0101-03	B010100	B019999X	RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R530	311-1948-00			RES.,VAR,NONWIR:PNL,1K OHM,20%,0.50W	12697	CM41723
R532A,B	311-1946-00			RES.,VAR,NONWIR:PNL,10K OHM,20%,0.50W	12697	CM41721
R540	311-0546-00			RES.,VAR,NONWIR:10K OHM,20%,0.75W	80009	311-0546-00
R550	311-1192-00			RES.,VAR,NONWIR:10K OHM,20%,1W,W/SW (FURNISHED AS A UNIT WITH S550)	71590	BA-232-001
S550	-----			(PART OF R550)		
V500	154-0812-00			ELECTRON TUBE:CRT,P44,INT SCALE	80009	154-0812-00

DIAGRAMS AND CIRCUIT BOARD ILLUSTRATIONS

Symbols and Reference Designators

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

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

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 goes to the low state.

Abbreviations are based on ANSI Y1.1-1972.

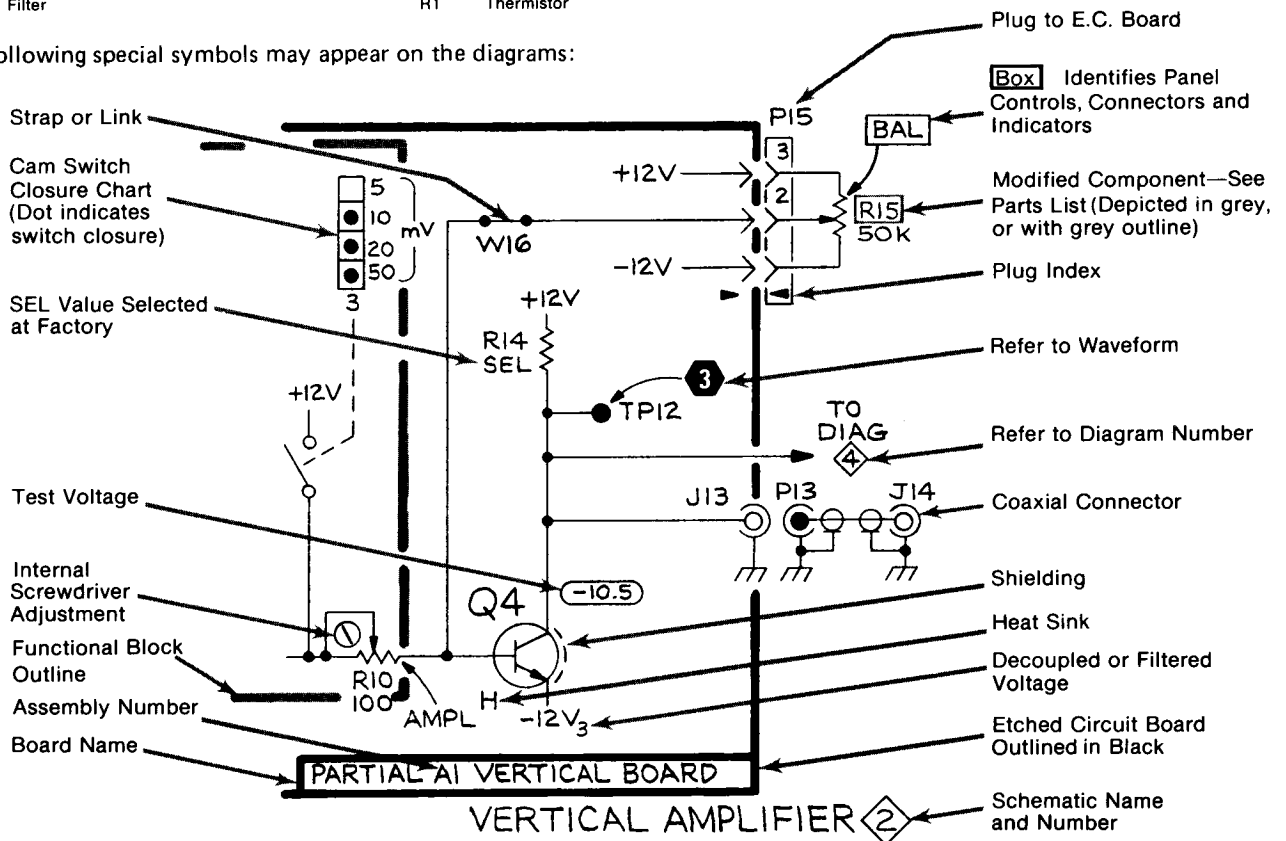
Other ANSI standards that are used in the preparation of diagrams by Tektronix, Inc. are:

- 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.

The following prefix letters are used as reference designators to identify components or assemblies on the diagrams.

A	Assembly, separable or repairable (circuit board, etc)	H	Heat dissipating device (heat sink, heat radiator, etc)	S	Switch or contactor
AT	Attenuator, fixed or variable	HR	Heater	T	Transformer
B	Motor	HY	Hybrid circuit	TC	Thermocouple
BT	Battery	J	Connector, stationary portion	TP	Test point
C	Capacitor, fixed or variable	K	Relay	U	Assembly, inseparable or non-repairable (integrated circuit, etc.)
CB	Circuit breaker	L	Inductor, fixed or variable	V	Electron tube
CR	Diode, signal or rectifier	M	Meter	VR	Voltage regulator (zener diode, etc.)
DL	Delay line	P	Connector, movable portion	W	Wirestrap or cable
DS	Indicating device (lamp)	Q	Transistor or silicon-controlled rectifier	Y	Crystal
E	Spark Gap, Ferrite bead	R	Resistor, fixed or variable	Z	Phase shifter
F	Fuse	RT	Thermistor		
FL	Filter				

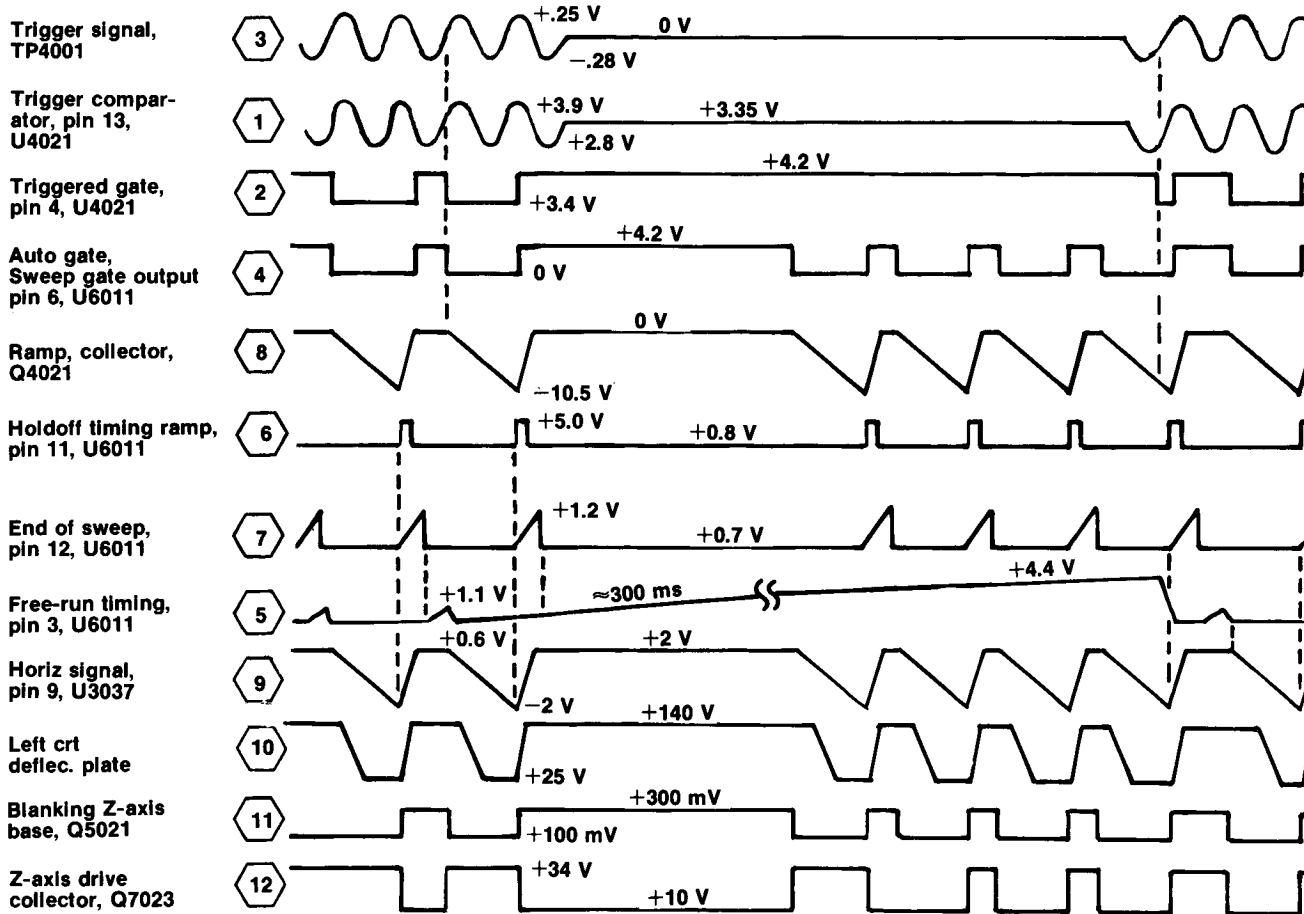
The following special symbols may appear on the diagrams:



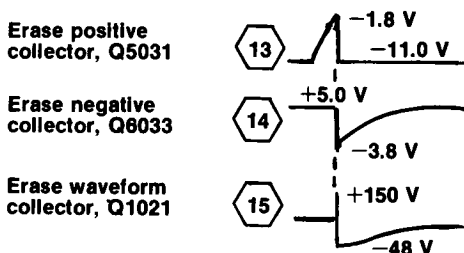
WAVEFORM DIAGRAMS

TRIGGERING SOURCE
 TRIGGERING MODE
 TRIGGERING CPLG
 TRIGGERING SLOPE
 TRIGGERING LEVEL
 INTEN
 DISPLAY
 HORIZ Position
 SECONDS/DIV
 CAL/HORIZ DIV
 VIEW TIME
 ENHANCE

LINE
 Auto
 AC
 +
 Midrange
 Midrange
 ALT
 Midrange
 2 m
 cw and in
 ccw
 ccw



For waveforms 13 to 15, the control settings are the same as above with exception of VIEW TIME which is set to midrange.

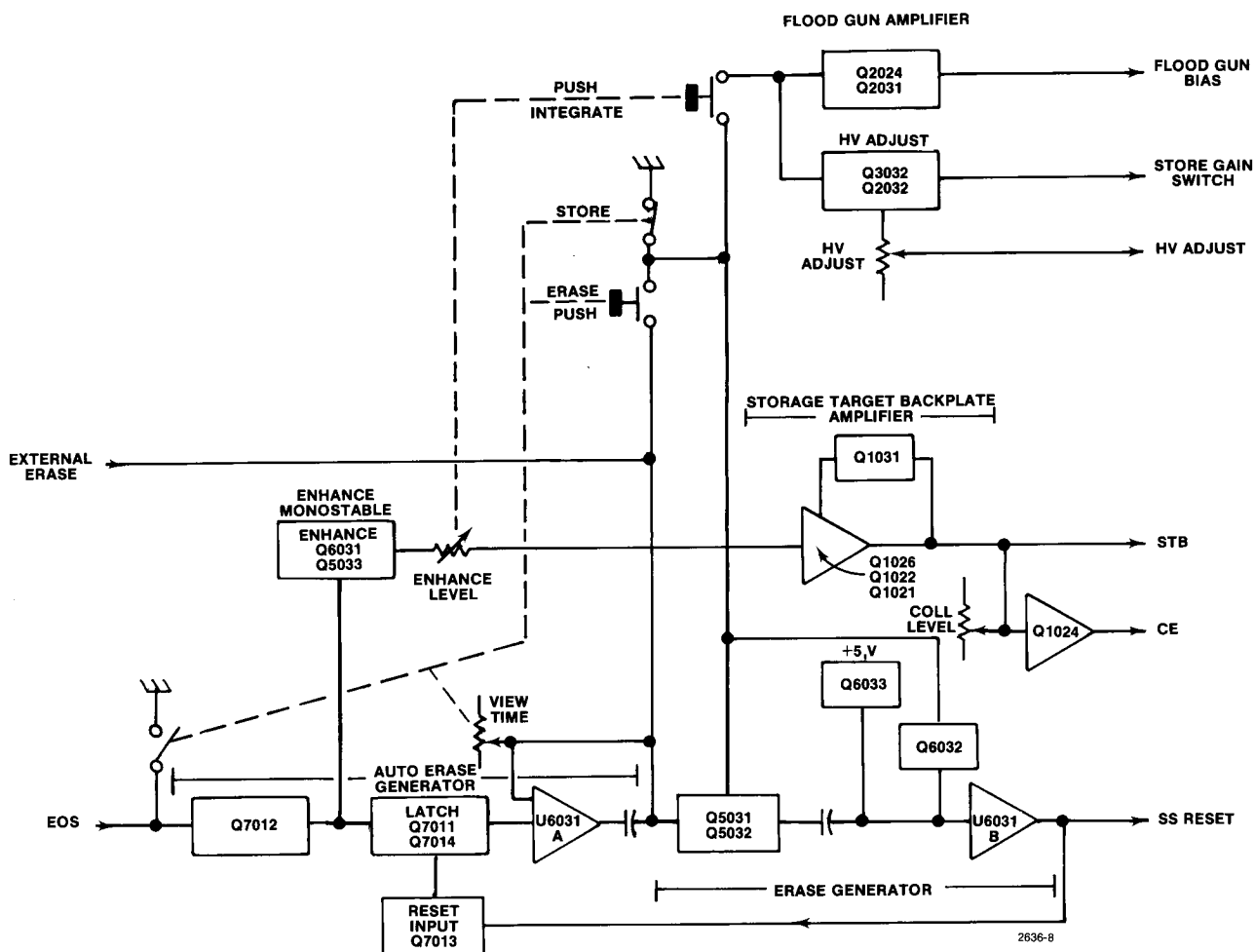


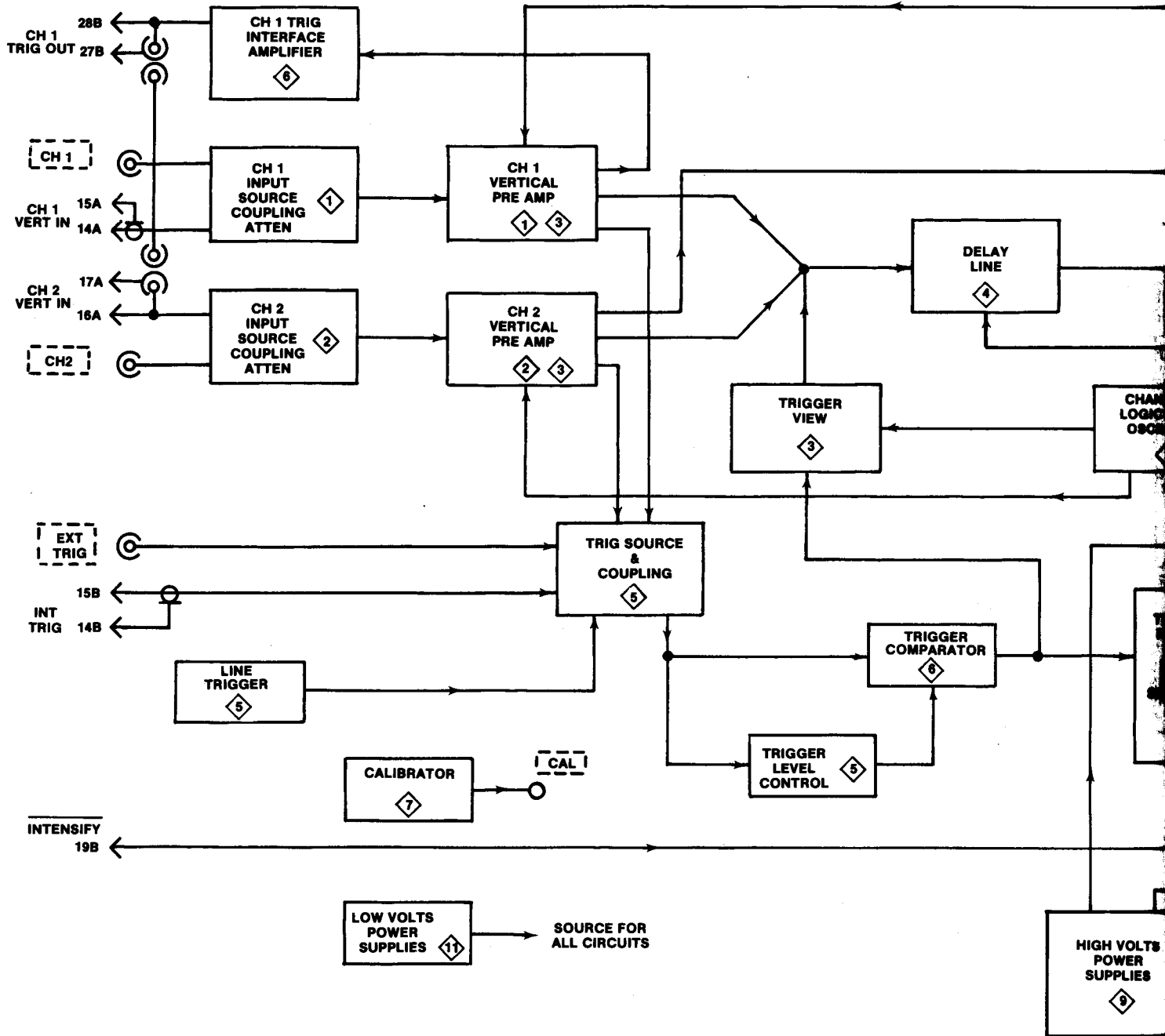
WARNING

Potential on collector of Q1021 may exceed 200 V peak-to-peak.

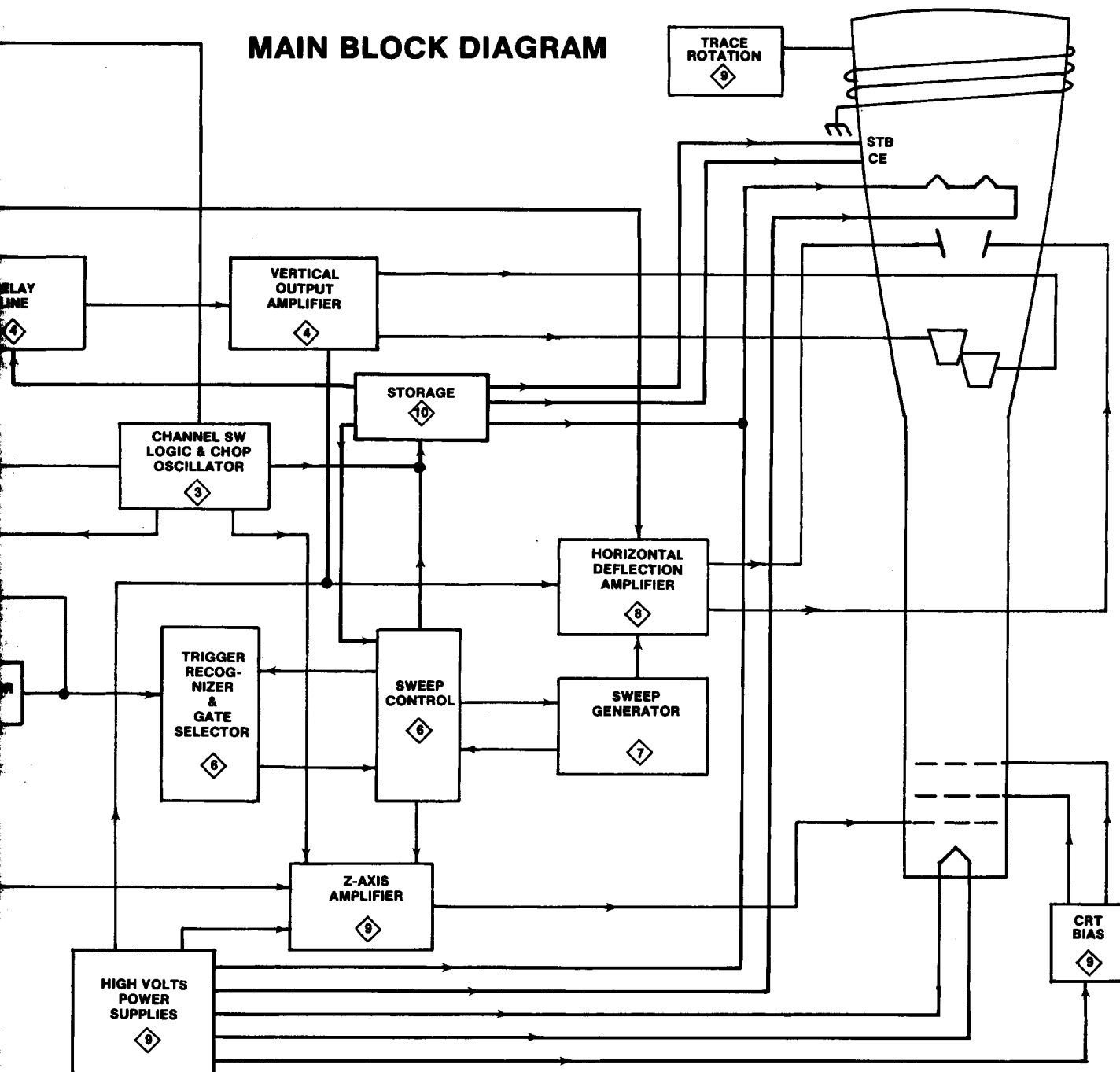
STORAGE BLOCK DIAGRAM

BLOCK DIAGRAMS

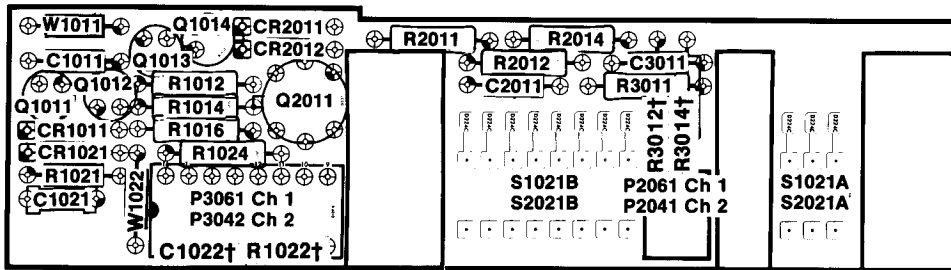




MAIN BLOCK DIAGRAM

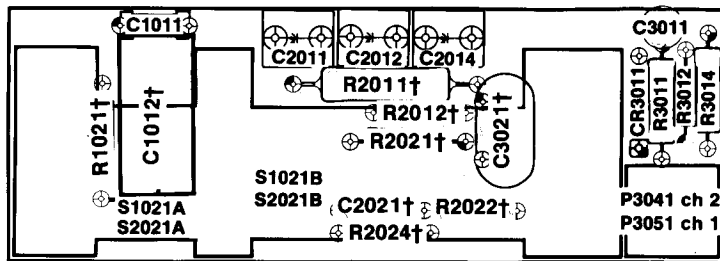


BLOCK DIAGRAMS



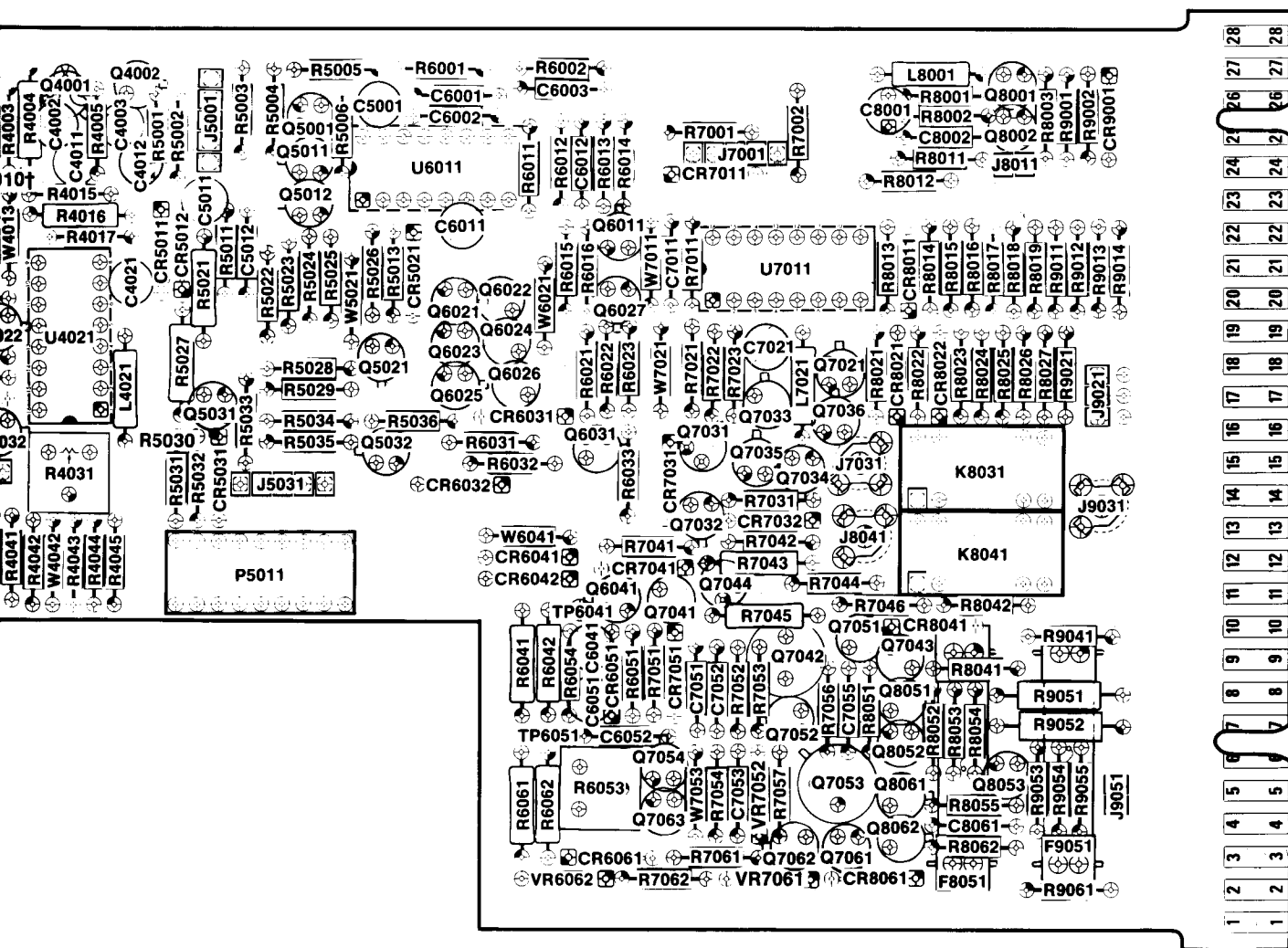
2636-10A

Fig. 8-3. A60 & A61-Gain circuit board assemblies.



2636-11A

Fig. 8-4. A70 & A71-Attenuator circuit board assemblies.



2636-14A

2. A30-Trigger circuit board assembly.

*See Parts list for serial number ranges.

†Located on back of board.

A30, A60, A61, A70 & A71
COMPONENT LOCATIONS

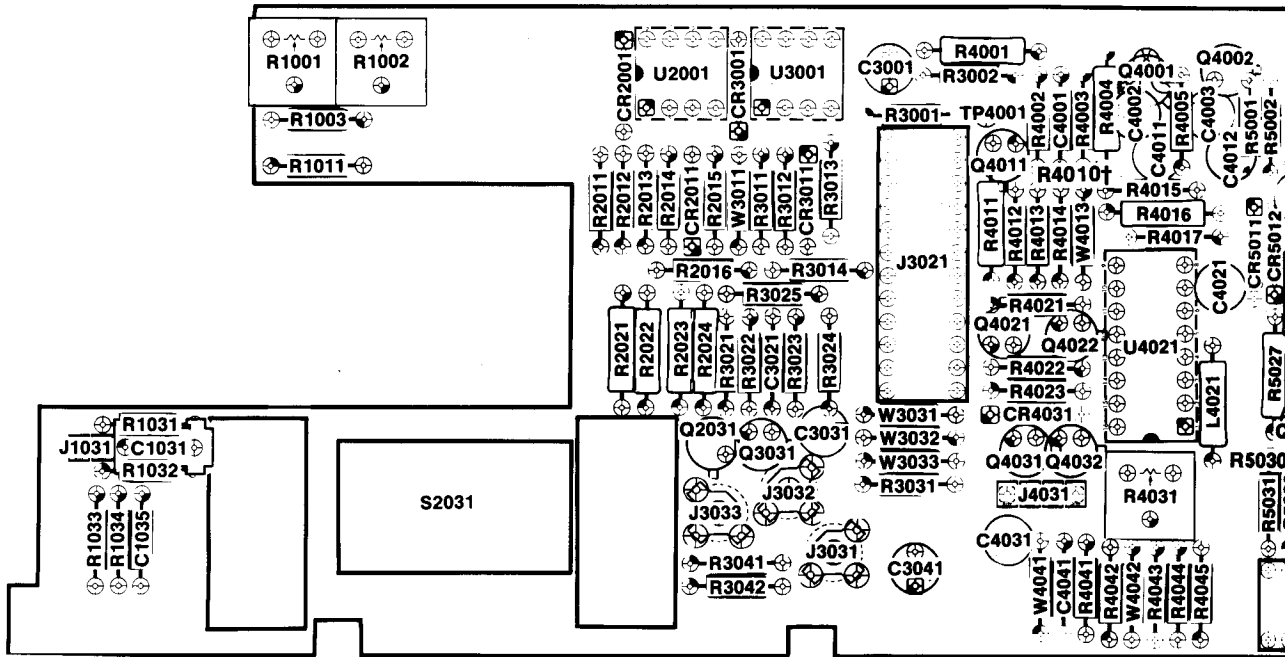


Fig. 8-2. A30-Trigger circuit

Table 8-1 COMPONENTS SCHEMATIC LOCATIONS

CHASSIS PARTS LOCATED ON 1				A70 PARTS LOCATED ON 1			
CKT NO	GRID LOC			CKT NO	GRID LOC		
L510	C3			C1011	C3		
R510	C3			C1012	D3		
A10 PARTS LOCATED ON 1				C2011	D3		
				C2012	E3		
CKT NO	GRID LOC			C2014	E3		
C2051	H2			C2021	F3		
C2052	H2			C3011	F3		
C2061	C6			C3021	E3		
C3062	F6			CR3011	F3		
C4053	J1			R1021	D3		
LR2031	H1			R2011	E3		
LR2032	H1			R2012	E3		
R2051	C5			R2021	E4		
R3051	K2			R2022	F3		
R4044	J2			R2024	F3		
R4051	J1			R3011	F5		
R4062	K1			R3012	F3		
R4065	F5			R3014	F5		
U3051A	K1						
A30 PARTS LOCATED ON 1							
CKT NO	GRID LOC						
CR8022	A6						
K8041	A6						
Q7021	B6						
R8024	B6						
R8025	B6						
S8041	A5						
A60 PARTS LOCATED ON 1							
CKT NO	GRID LOC	CKT NO	GRID LOC				
C1011	K3	R1012	K5				
C1021	K5	R1014	K3				
C1022	K2	R1016	H2				
C2011	J4	R1021	K2				
C3011	J5	R1022	K2				
CR1011	K2	R1024	H6				
CR1021	K6	R2011	K4				
CR2011	K3	R2012	J4				
CR2012	K5	R2014	H4				
Q1011	K5	R3011	J5				
Q1012	K3	R3012	K5				
Q1013	L5	R3014	J5				
Q1014	L3						
Q2011A	H5						
Q2011B	H3						

CHANNEL 1 HEADAMP 1

A | B | C | D | E | F

1

2

3

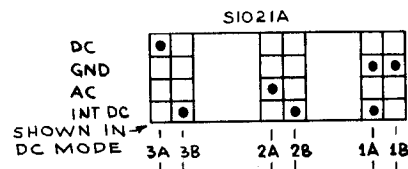
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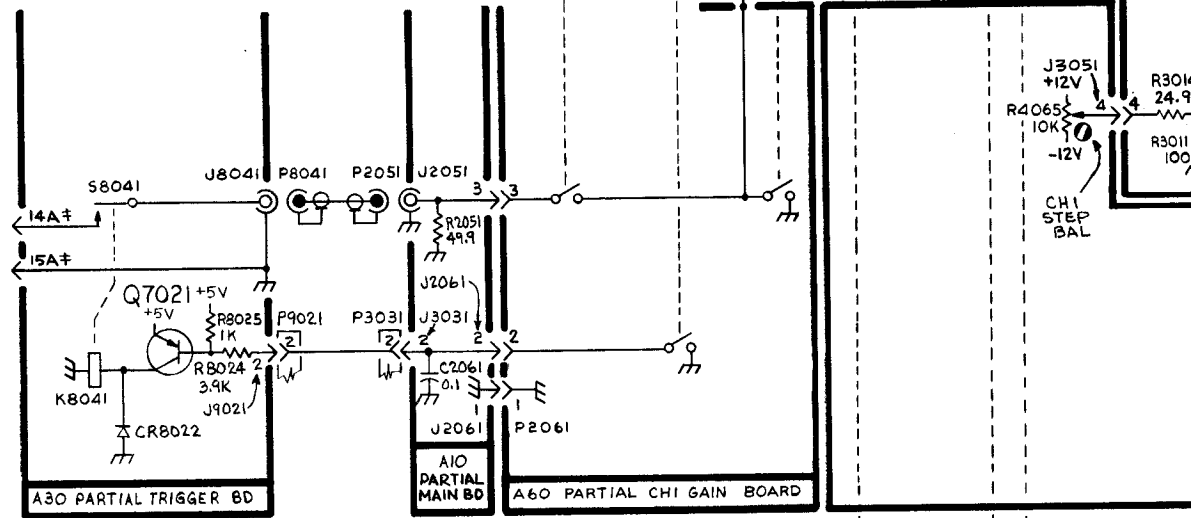
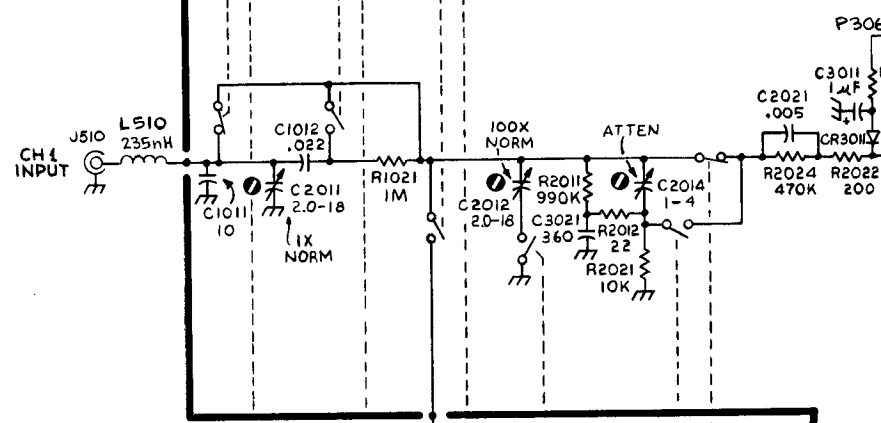
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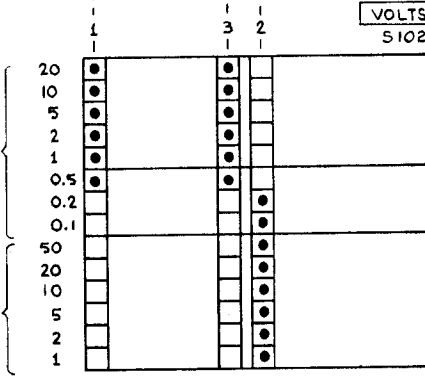


A70 PARTIAL CHI ATTENUATOR

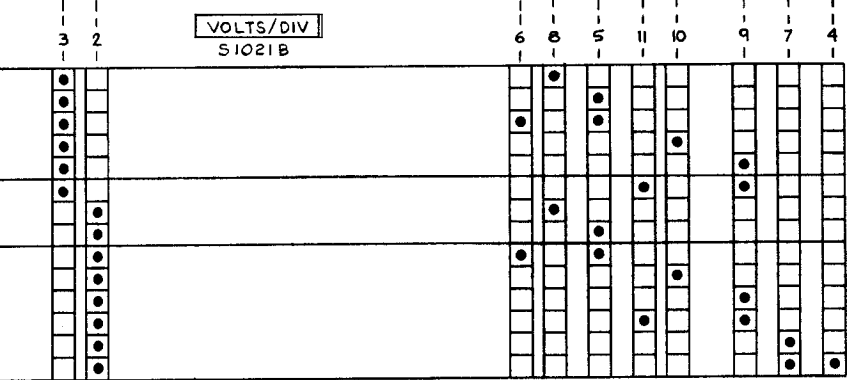
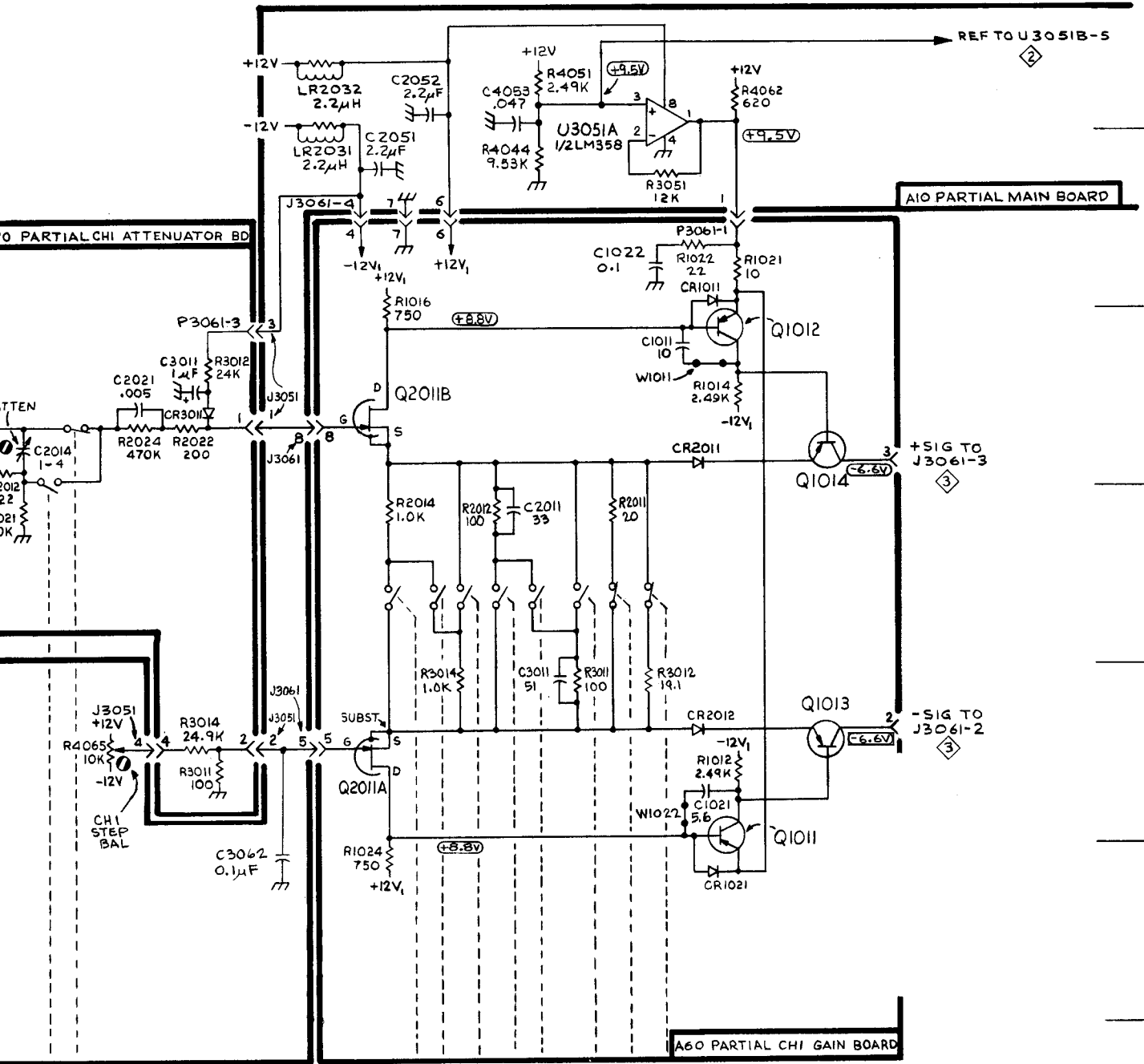


POWER MODULE CONNECTION

SHOWN IN 1mV POSITION



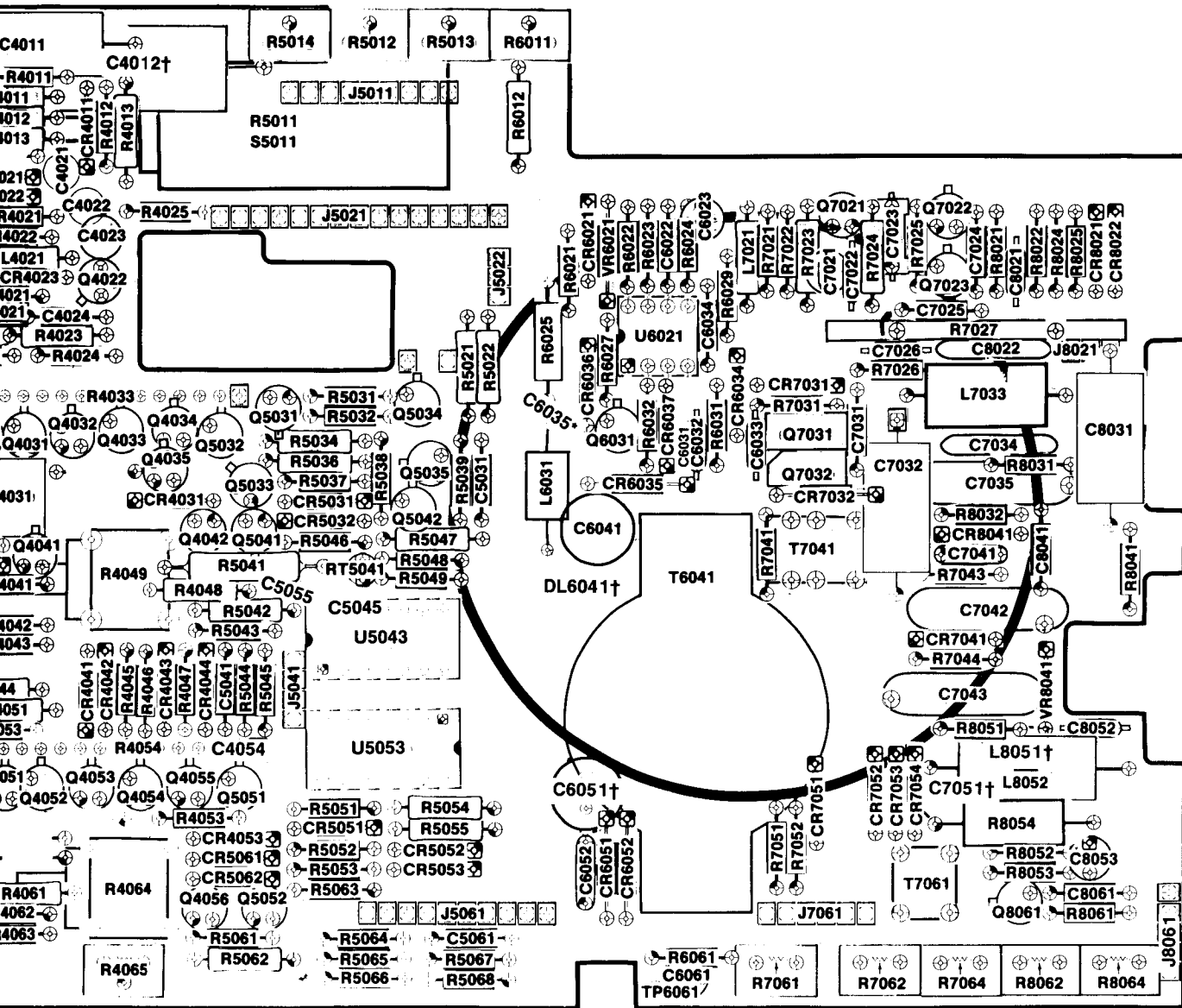
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REV JUN 1982

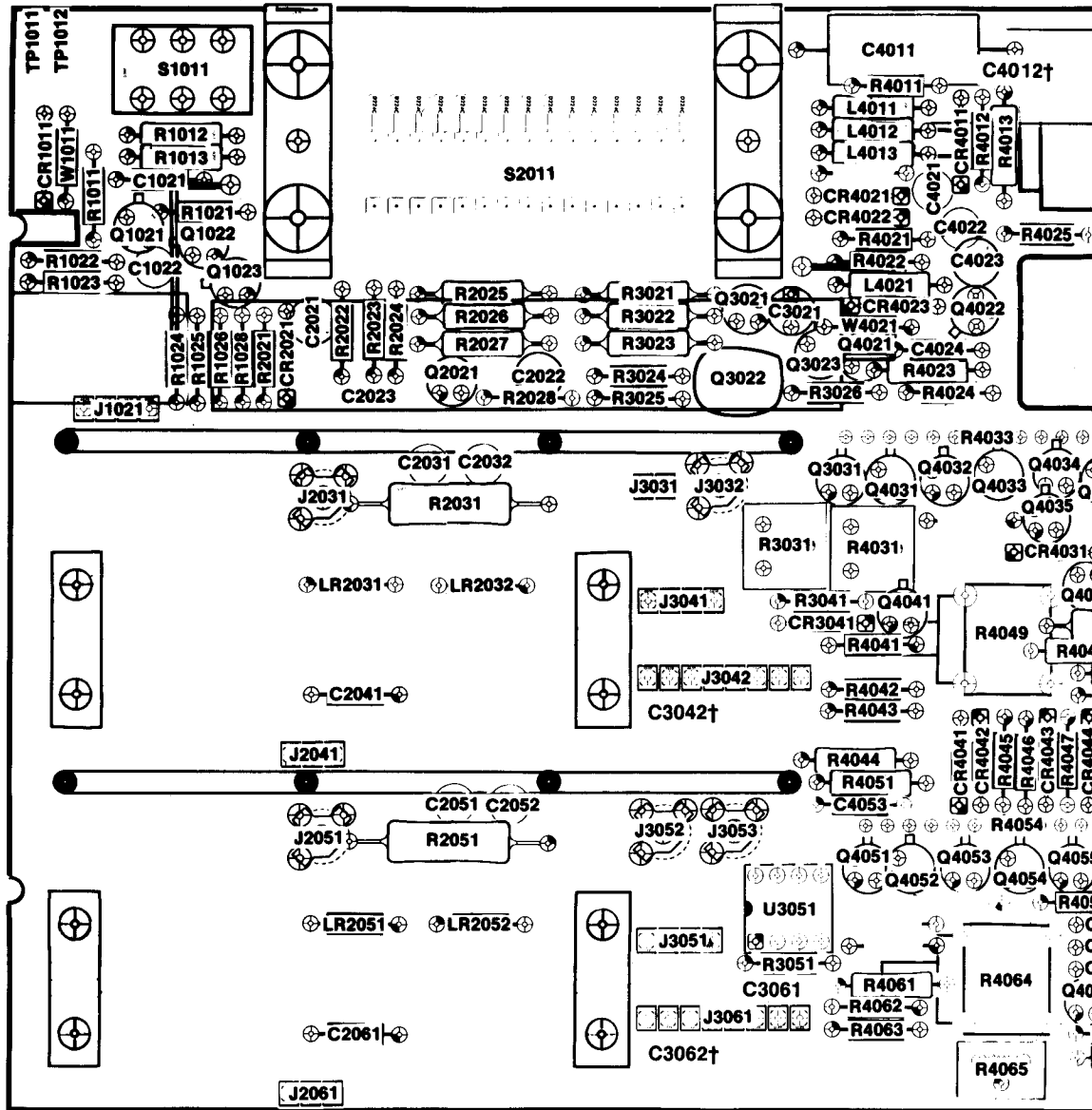
CHANNEL 1 PREAMP 1

CHANNEL 1 PREAMP 1



2636-12A

8-5. A10-Main circuit board assembly.



*See Parts List for serial number ranges.

†Located on back of board.

Fig. 8-5. A10-Main circuit board

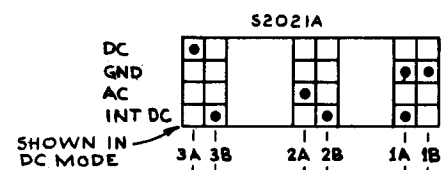
Table 8-2 COMPONENTS SCHEMATIC LOCATIONS

CHASSIS PARTS LOCATED ON 2			A71 PARTS LOCATED ON 2			
CKT NO	GRID LOC		CKT NO	GRID LOC		
R520	C3		C1011	C4		
A10 PARTS LOCATED ON 2			C1012	D3		
CKT NO	GRID LOC		C2011	D3		
C2031	H2		C2012	E3		
C2032	H2		C2014	E4		
C2041	C6		C2021	F3		
LR2031	H2		C3011	F3		
LR2032	H1		C3021	E4		
R2031	C6		CR3011	F3		
R3031	F5		R1021	D3		
R4042	K2		R2011	E3		
R4043	K2		R2012	E4		
U3051B	K2		R2021	E4		
A30 PARTS LOCATED ON 2			R2022	F3		
CKT NO	GRID LOC		R2024	F3		
CR8021	A6		R3011	F5		
K8031	A6		R3012	F3		
Q7036	B6		R3014	F5		
R8027	B6		A61 PARTS LOCATED ON 2			
R9021	B6		CKT NO	GRID LOC		
S8031	A5		C1011	K3	R2011	J4
A61 PARTS LOCATED ON 2			C1021	K6	R2012	J4
CKT NO	GRID LOC	CKT NO	GRID LOC		R2014	H4
C1022	K2	R2011	J4		R3011	J5
C2011	J4	R2012	J4		R3012	K5
C3011	J5	R3011	J5		R3012	K5
		R3012	K5		R3014	J5
CR1011	K3					
CR1021	K6					
CR2011	K4					
CR2012	K5					
Q1011	K6					
Q1012	K3					
Q1013	L5					
Q1014	L4					
Q2011A	H6					
Q2011B	H3					
R1012	K5					
R1014	K3					
R1016	H3					
R1021	K3					
R1024	H6					

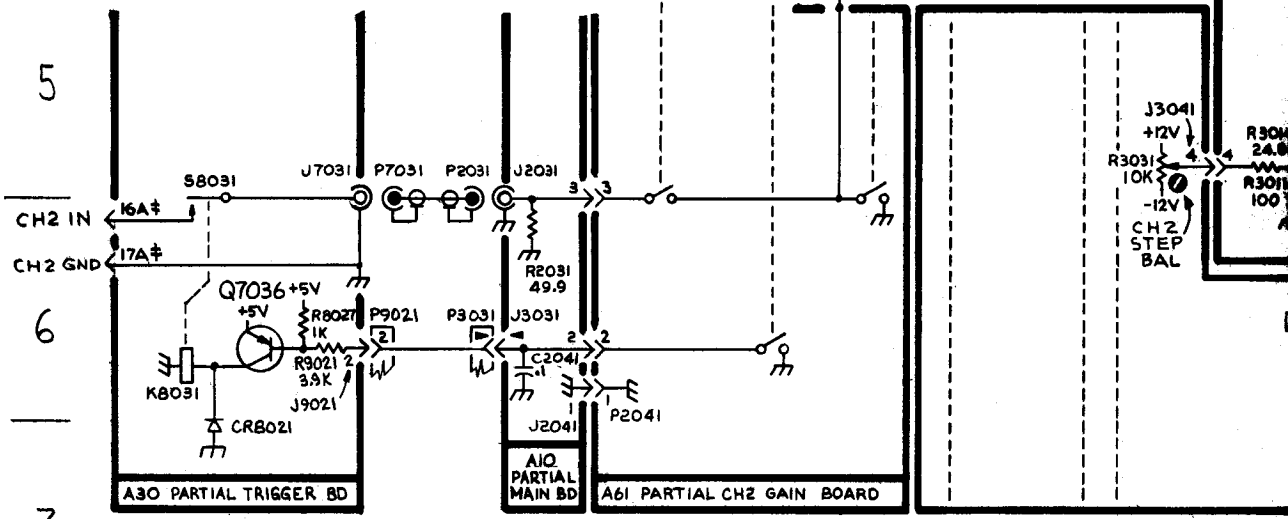
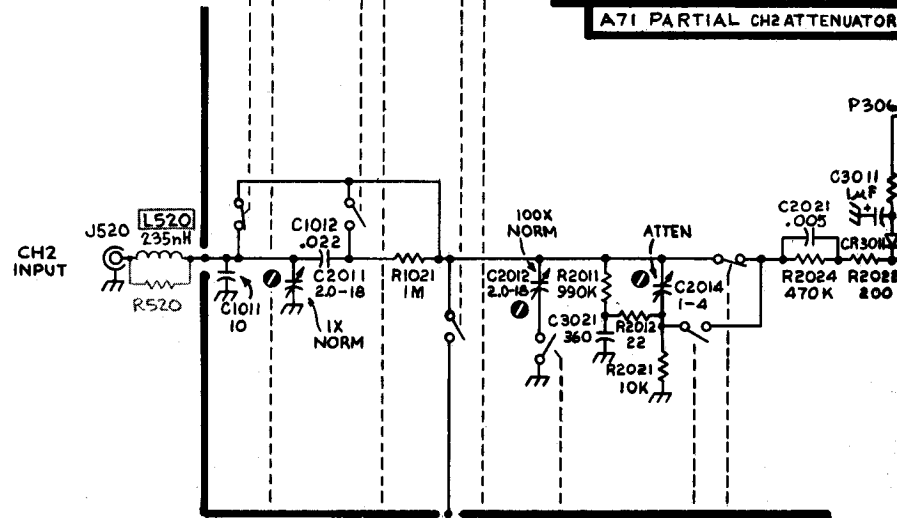
A | B | C | D | E | F

REF FROM U3051A

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8



A71 PARTIAL CH2 ATTENUATOR

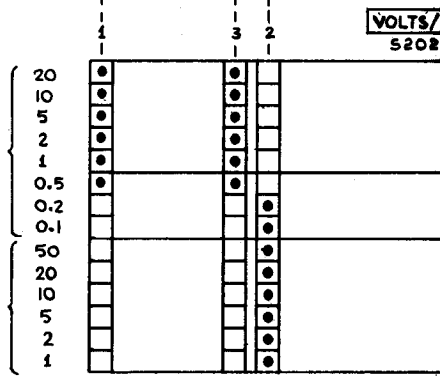


* POWER MODULE CONNECTION

SHOWN IN 1mV POSITION

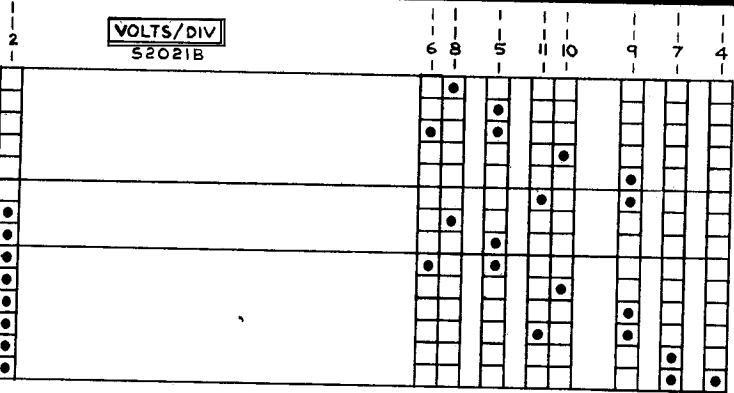
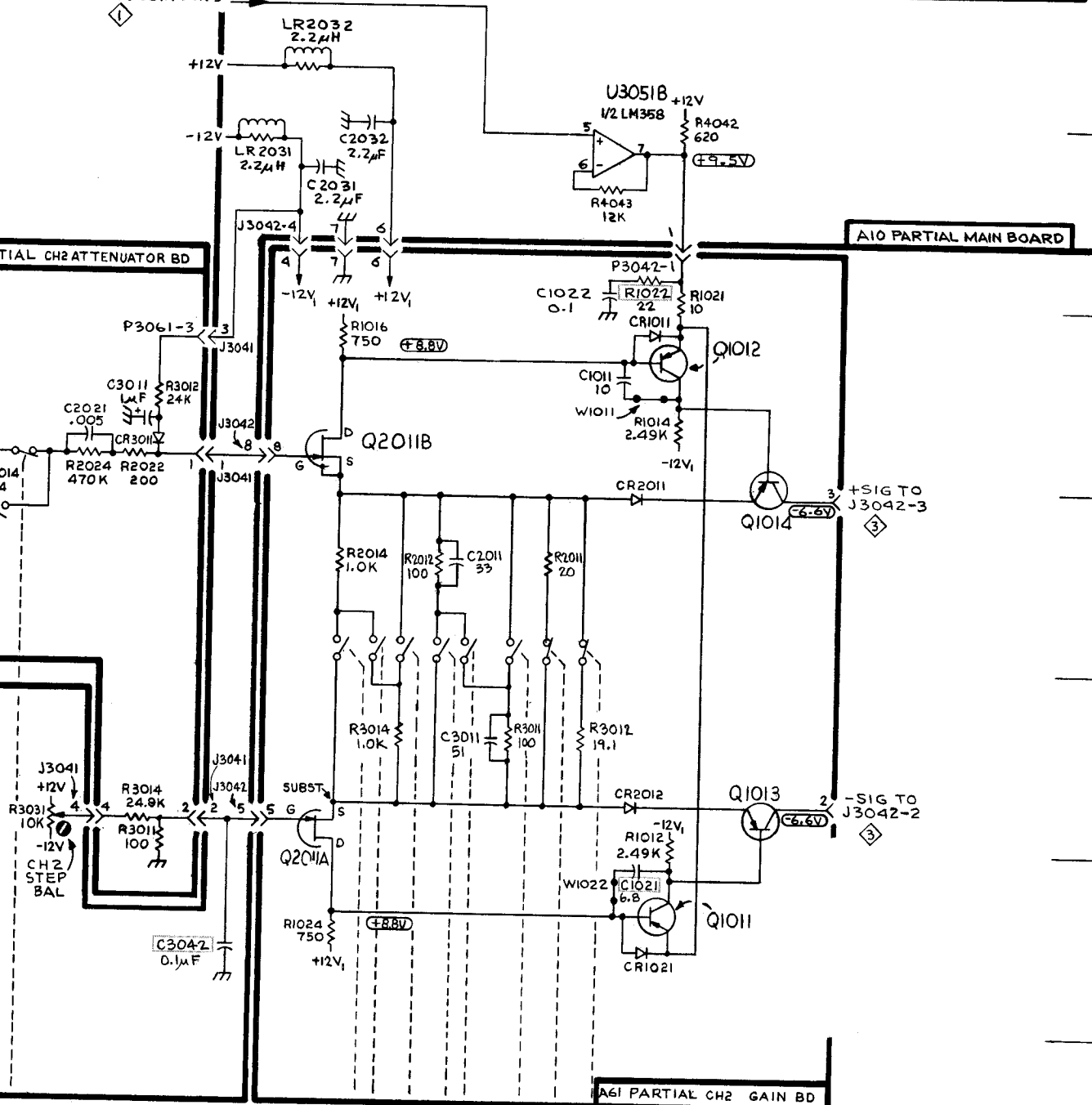
VOLTS

mV

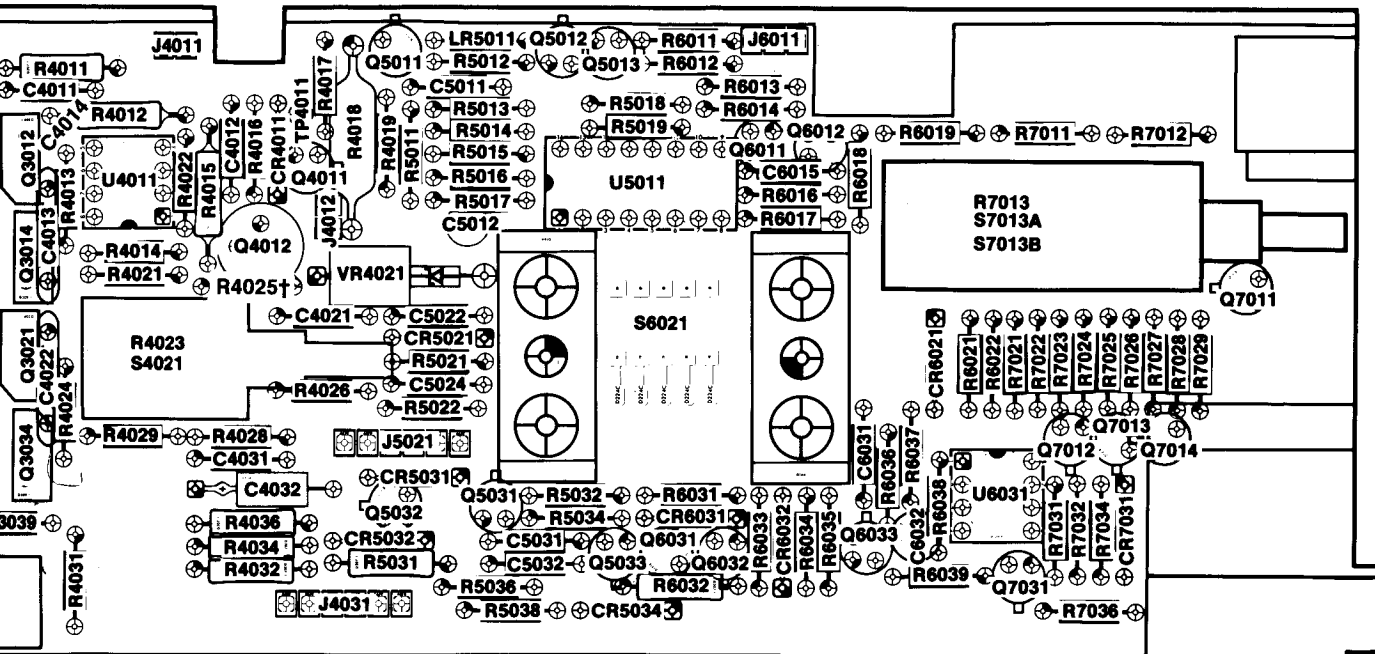


F | H | J | K | L | M

REF FROM U3051A PIN 3

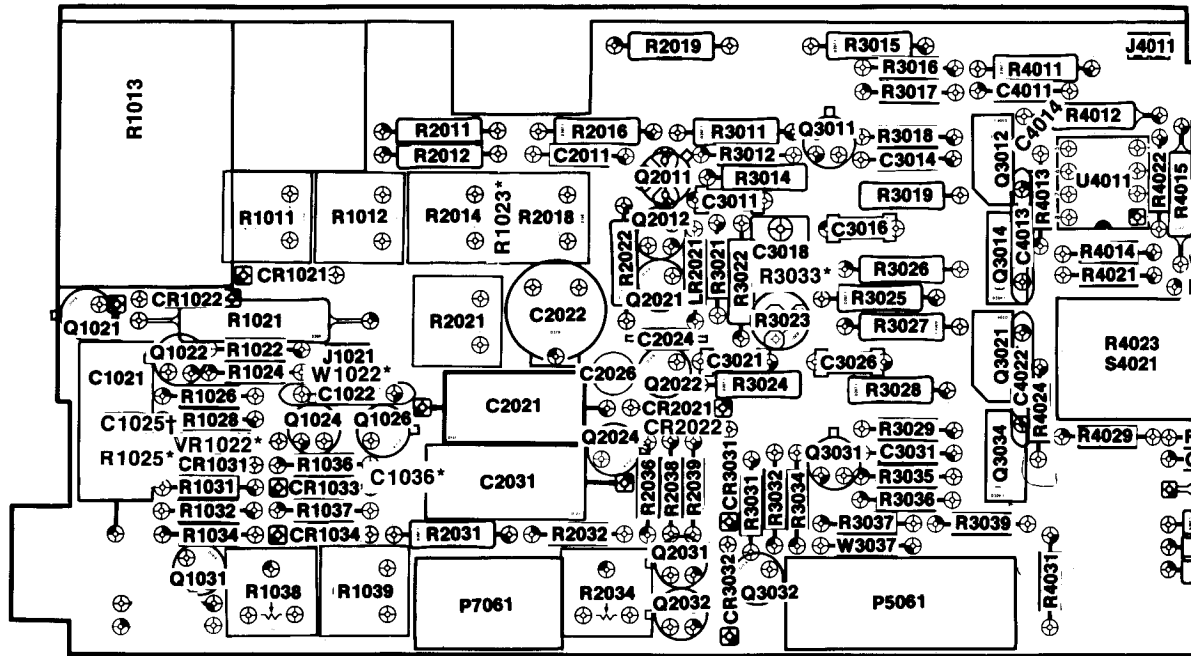


SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.



2636-17A

20-Focus & Intensity circuit board assembly.



*See Parts List for serial number ranges.

†Located on back of board.

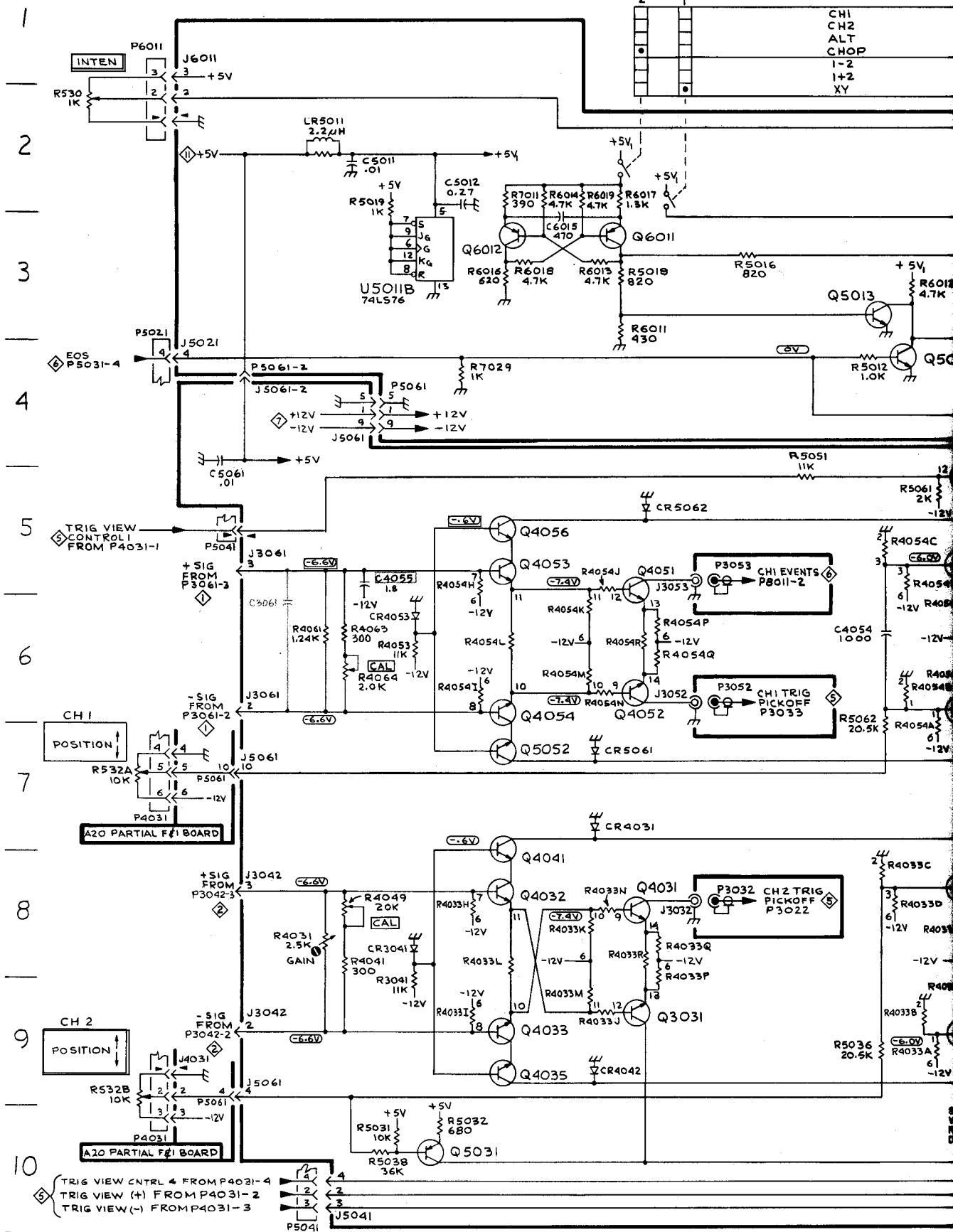
Fig. 8-6. A20-Focus & Intensity c

Table 8-3 COMPONENTS SCHEMATIC LOCATIONS

VERTICAL PREAMPLIFIER & CHANNEL SWITCHING 3

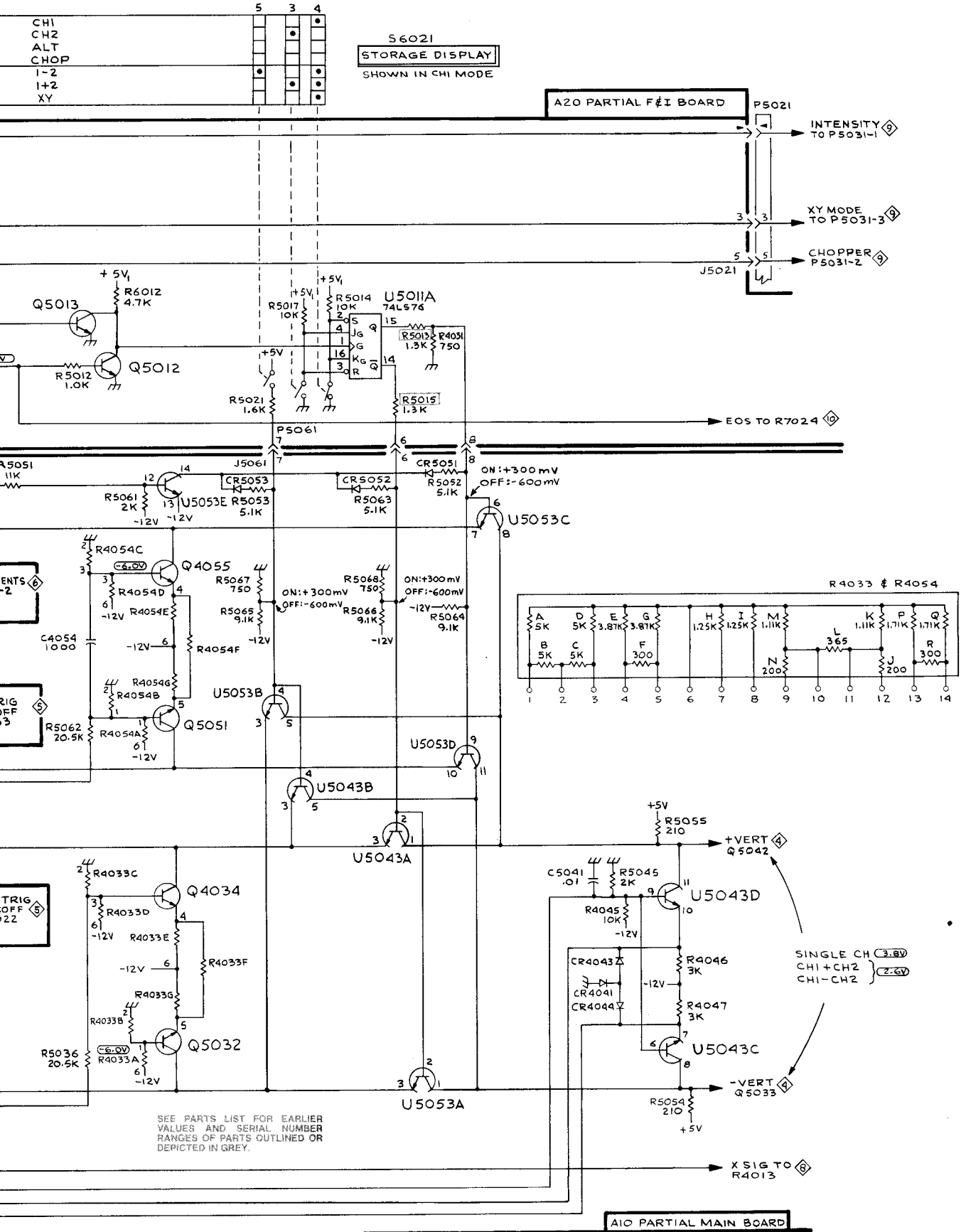
CHASSIS PARTS LOCATED ON 3				A20 PARTS LOCATED ON 3			
CKT NO	GRID LOC			CKT NO	GRID LOC		
R530	A2			C5011	C2	R5021	H4
R532A	A7			C5012	D2	R6011	E3
R532B	A9			C6015	E3	R6012	G3
A10 PARTS LOCATED ON 3							
CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC		
C3061*	B6	R3041	C9	R4054K	E6		
C4054	G6	R4031	C8	R4054L	D6		
C4055*	C5	R4033A	G9	R4054M	E6		
C5041	L8	R4033B	G9	R4054N	E6		
C5061	B4	R4033C	G8	R4054P	E6		
		R4033D	G8	R4054Q	E6		
CR3041	C8	R4033E	H8	R4054R	E6	R4031	K3
CR4031	E7	R4033F	H8	R4061	C6	R5012	G4
CR4041	L9	R4033G	H9	R4063	C5	R5013	K3
CR4042	E9	R4033H	D8	R4064	C6	R5014	J3
CR4043	L8	R4033I	D9	R5031	C10	R5015	K4
CR4044	L9	R4033J	E9	R5032	D10	R5016	F3
CR4053	C6	R4033K	E8	R5036	G9	R5017	J3
CR5051	K5	R4033L	D8	R5038	C10	R5018	E3
CR5052	J5	R4033M	E9	R5045	L8	R5019	C2
CR5053	H5	R4033N	E8	R5051	F5	U5011A	J3
CR5061	E7	R4033P	E9	R5052	K5	U5011B	C3
CR5062	E5	R4033Q	E8	R5053	H5		
		R4033R	E8	R5054	M9		
Q3031	E9	R4041	C8	R5055	M7		
Q4031	E8	R4045	L8	R5061	G5		
Q4032	D8	R4046	M8	R5062	G6		
Q4033	D9	R4047	M9	R5063	J5		
Q4034	H8	R4049	C8	R5064	K6		
Q4035	D9	R4053	C6	R5065	H6		
Q4041	D8	R4054A	G7	R5066	J6		
Q4051	E5	R4054B	G6	R5067	H5		
Q4052	E6	R4054C	G5	R5068	J5		
A4053	D5	R4054D	G5			U5043A	J7
Q4054	D6	R4054E	H6			U5043B	J7
Q4055	H5	R4054F	H6			U5043C	M9
Q4056	D5	R4054G	H6			U5043D	M8
Q5031	D10	R4054H	D5			U5053A	K9
Q5032	H9	R4054I	D6			U5053B	H6
Q5051	H6	R4054J	E5			U5053C	K5
Q5052	D7					U5053D	K7
						U5053E	H5

A | B | C | D | E | F | G



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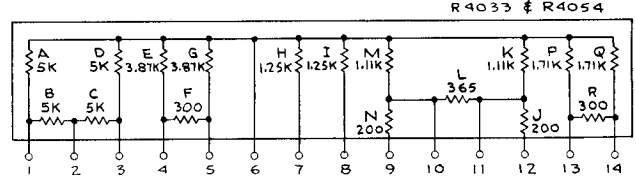
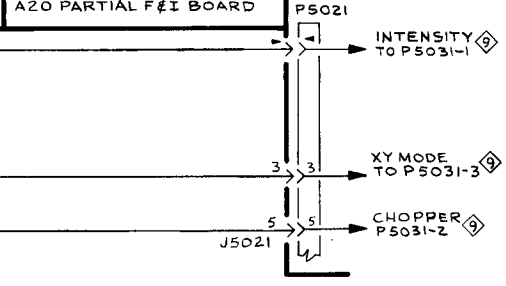
VERTICAL PREAMPLIFIER AND CHANNEL SWITCH 3

A20 PARTIAL F#I BOARD

A10 PARTIAL MAIN BOARD

56021
STORAGE DISPLAY
SHOWN IN CHI MODE

CHI	5	3	4
CH2			
ALT			
CHOP			
1-2			
1+2			
XY			



SINGLE CH 3.6V
CHI + CH2 2.6V
CHI - CH2

Table 8-4 COMPONENTS SCHEMATIC LOCATIONS

CHASSIS PARTS LOCATED ON 4		A20 PARTS LOCATED ON 4			
CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
DL6041	E5	C2011	H5	R1011	H5
A10 PARTS LOCATED ON 4		C2022	J4	R1012	H5
		C2024	M2	R1023	H4
A10 PARTS LOCATED ON 4		C2026	H7	R2011	H5
		C3011	J6	R2012	H4
A10 PARTS LOCATED ON 4		C3014	L6	R2014	H4
		C3016	J7	R2016	H4
A10 PARTS LOCATED ON 4		C3018	J5	R2018	J5
		C3021	J3	R2019	F4
A10 PARTS LOCATED ON 4		C3026	J3	R2021	K5
		C3031	L3	R2022	J6
A10 PARTS LOCATED ON 4		C4011	L5	R3011	L5
		C4013	M5	R3012	K5
A10 PARTS LOCATED ON 4		C4014	L7	R3014	K6
		C4022	M4	R3015	F6
A10 PARTS LOCATED ON 4				R3016	K5
		LR2021	F7	R3017	L7
A10 PARTS LOCATED ON 4				R3018	L6
		Q2011	K6	R3019	K7
A10 PARTS LOCATED ON 4		Q2012	H6	R3021	K4
		Q2021	H4	R3022	J4
A10 PARTS LOCATED ON 4		Q2022	K4	R3023	J4
		Q3011	L6	R3024	K3
A10 PARTS LOCATED ON 4		Q3012	L7	R3025*	M5
		Q3014	M6	R3026	L5
A10 PARTS LOCATED ON 4		Q3021	L4	R3027	L4
		Q3031	L3	R3028	K3
A10 PARTS LOCATED ON 4		Q3034	L2	R3029	L3
				R3033	J5
A10 PARTS LOCATED ON 4				R3035	L2
				R3039	K4
A10 PARTS LOCATED ON 4				R4011	L5
				R4013	M6
A10 PARTS LOCATED ON 4				R4024	M3
				W3025*	M5
C5031	D5				
C5045	C5				
CR5031	D5				
CR5032	C5				
Q4042	C5				
Q5033	C6				
Q5034	D6				
Q5035	D3				
Q5041	C4				
Q5042	C3				
R4048	C5				
R5021	D6				
R5022	D4				
R5034	D6				
R5037	C4				
R5039	D5				
R5041	B5				
R5042	C4				
R5043	C5				
R5046	B4				
R5047	D3				
R5048	B4				
R5049	B4				
RT5041	C4				
U5043E	B4				

VERTICAL DEFL AMPL 4

A | B | C | D | E | F |

1

2

3

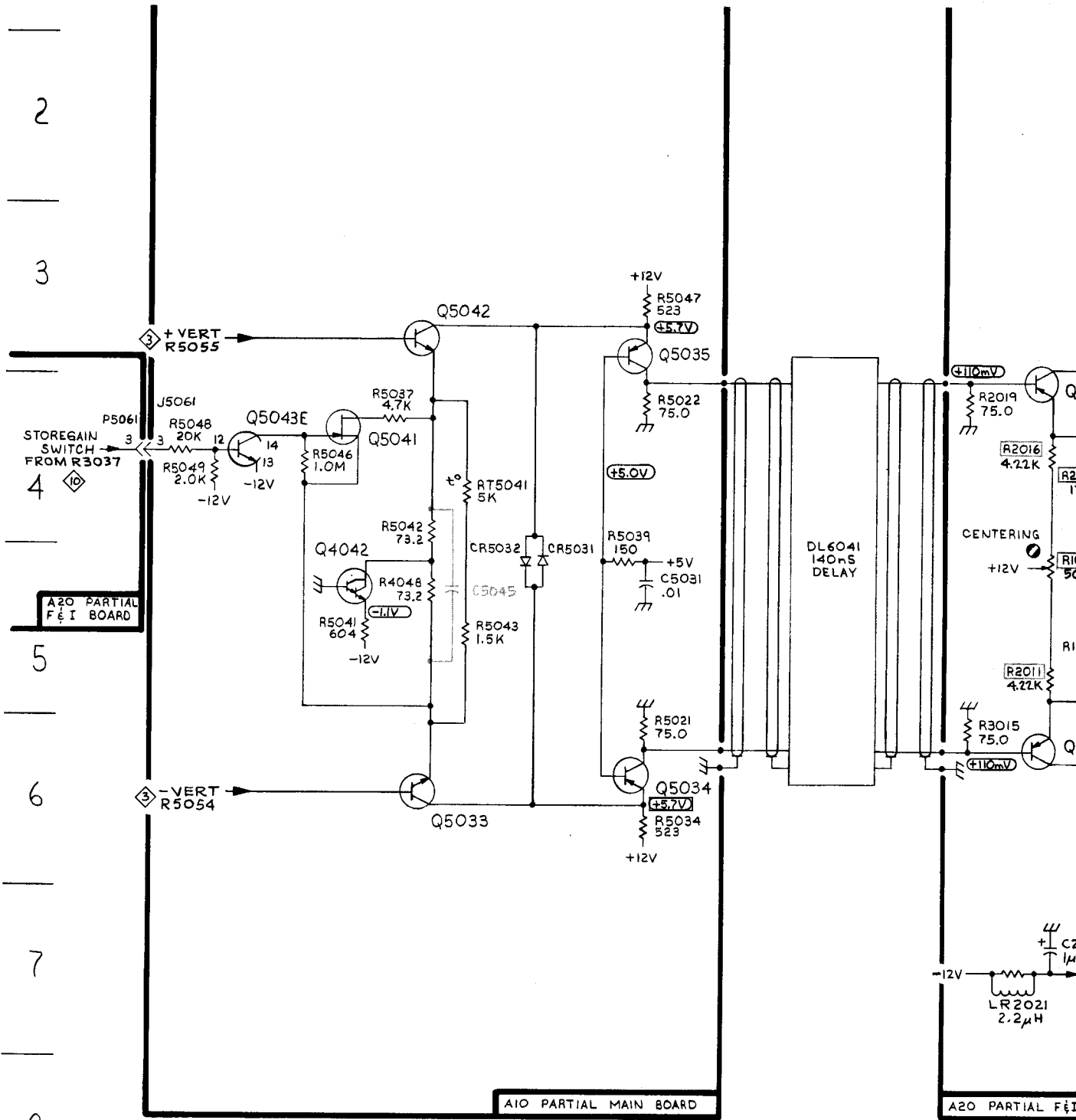
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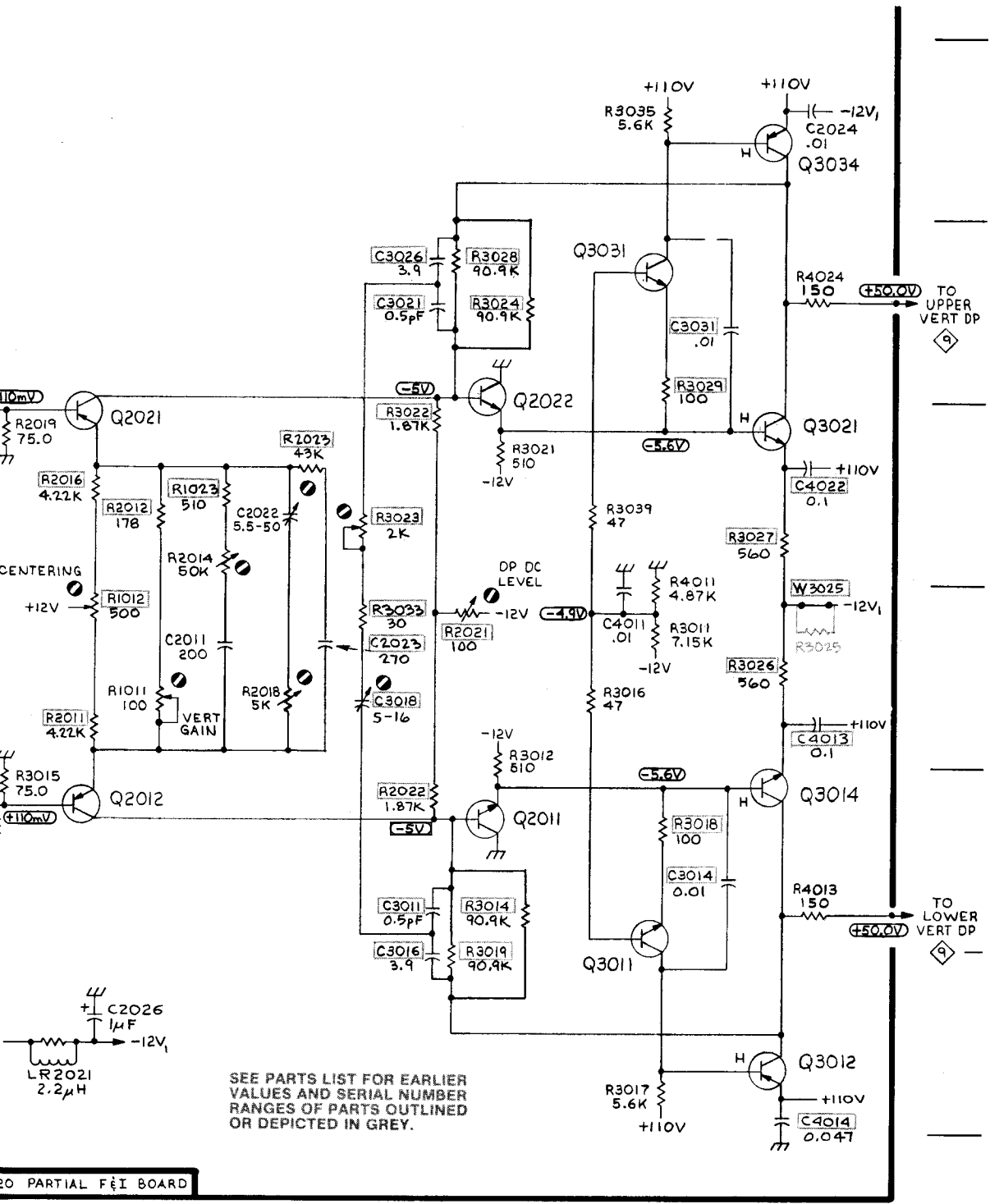
8



SC503

2636-28
REV NOV 1982

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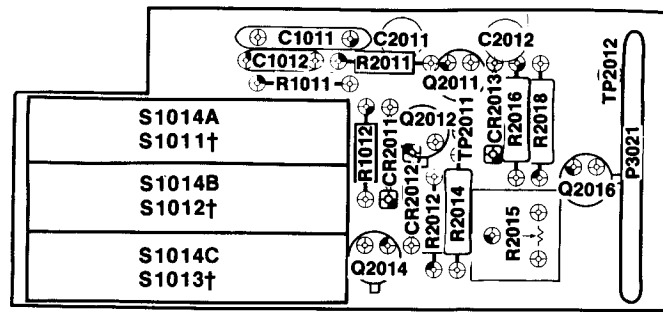


20 PARTIAL FEI BOARD

2636-28
REV NOV 1982

VERTICAL DEFL AMPL 4

VERTICAL DEFL AMPL 4



2636-13A

†Located on back of board.

Fig. 8-7. A50-Trigger Switch circuit board assembly.

Table 8-5 COMPONENTS SCHEMATIC LOCATIONS

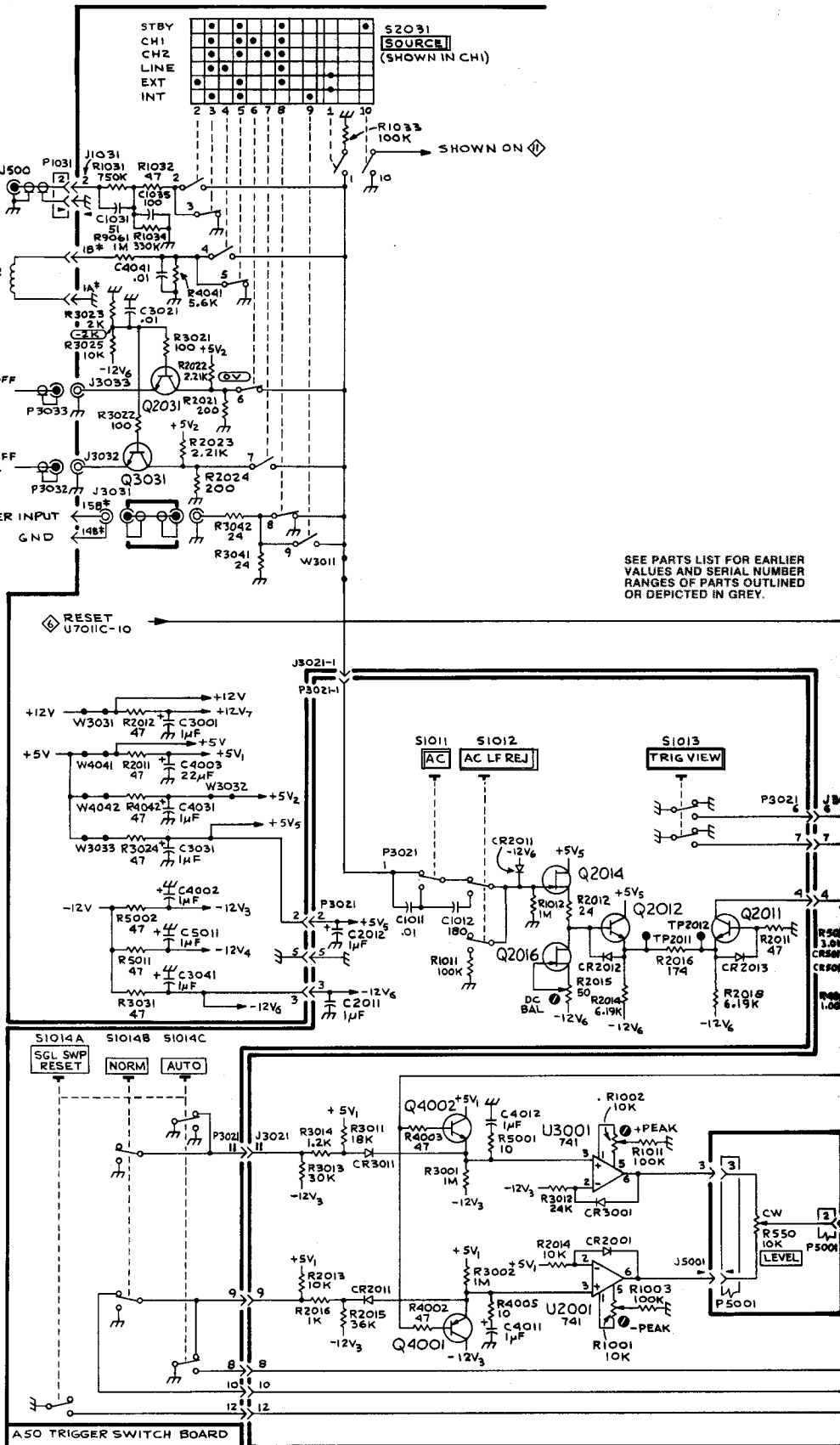
CHASSIS PARTS LOCATED ON 5						A50 PARTS LOCATED ON 5					
CKT NO	GRID LOC					CKT NO	GRID LOC				
R550	H9					C1011	D7				
S550	J4					C1012	E7				
						C2011	D8				
						C2012	D7				
A30 PARTS LOCATED ON 5						CR2011	E7				
CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CR2012	F8				
C1031	B2	Q4001	E10	R3025	B3	CR2013	H8				
C1035	C2	Q4002	E9	R3031	B8	Q2011	H7				
C3001	C6	Q4011	J8	R3041	C5	Q2012	F8				
C3021	B3	Q4021	K8	R3042	C5	Q2014	F7				
C3031	C7	Q4022	K9	R4001	H8	Q2016	E8				
C3041	C8	Q4031	L8	R4002	E10	R1011	E8				
C4001	J10	Q4032	L10	R4003	D9	R1012	E7				
C4002	C7			R4004	J8	R2011	H7				
C4003	C6	R1001	F10	R4005	E10	R2012	F7				
C4011	E10	R1002	F9	R4010	J10	R2014	F8				
C4012	E9	R1003	F10	R4011	J7	R2015	F8				
C4021	L4	R1011	F9	R4012	J9	R2016	F8				
C4031	C7	R1031	B2	R4013	K9	R2018	H8				
C4041	C3	R1032	C2	R4014	J9						
C5011	C7	R1033	D2	R4015	K9						
C5012	K5	R1034	C2	R4016	J9						
CR2001	F10	R2011	B6	R4017	K9						
CR2011	D10	R2012	B6	R4021	K9						
CR3001	F9	R2013	D10	R4022	K10						
CR3011	D9	R2014	E10	R4023	K8						
CR4031	J9	R2015	D10	R4031	L9						
CR5011	H8	R2016	D10	R4041	C3						
CR5012	H8	R2021	C4	R4042	B7						
L4031	K4	R2022	C3	R4043	K9						
Q2031	C4	R2023	C4	R4044	L9						
Q3031	B4	R2024	C4	R4045	K9						
		R3001	E9	R5001	E9						
		R3002	E10	R5002	B7						
		R3011	D9	R5003	K5						
		R3012	E9	R5011	B8						
		R3013	D9	R5021	H7						
		R3014	D9	R9061	B3						
		R3021	C3	U2001	F10						
		R3022	B4	U3001	F9						
		R3023	B3	U4021	L6						
		R3024	B7								

TRIGGER INPUT & SWITCHING

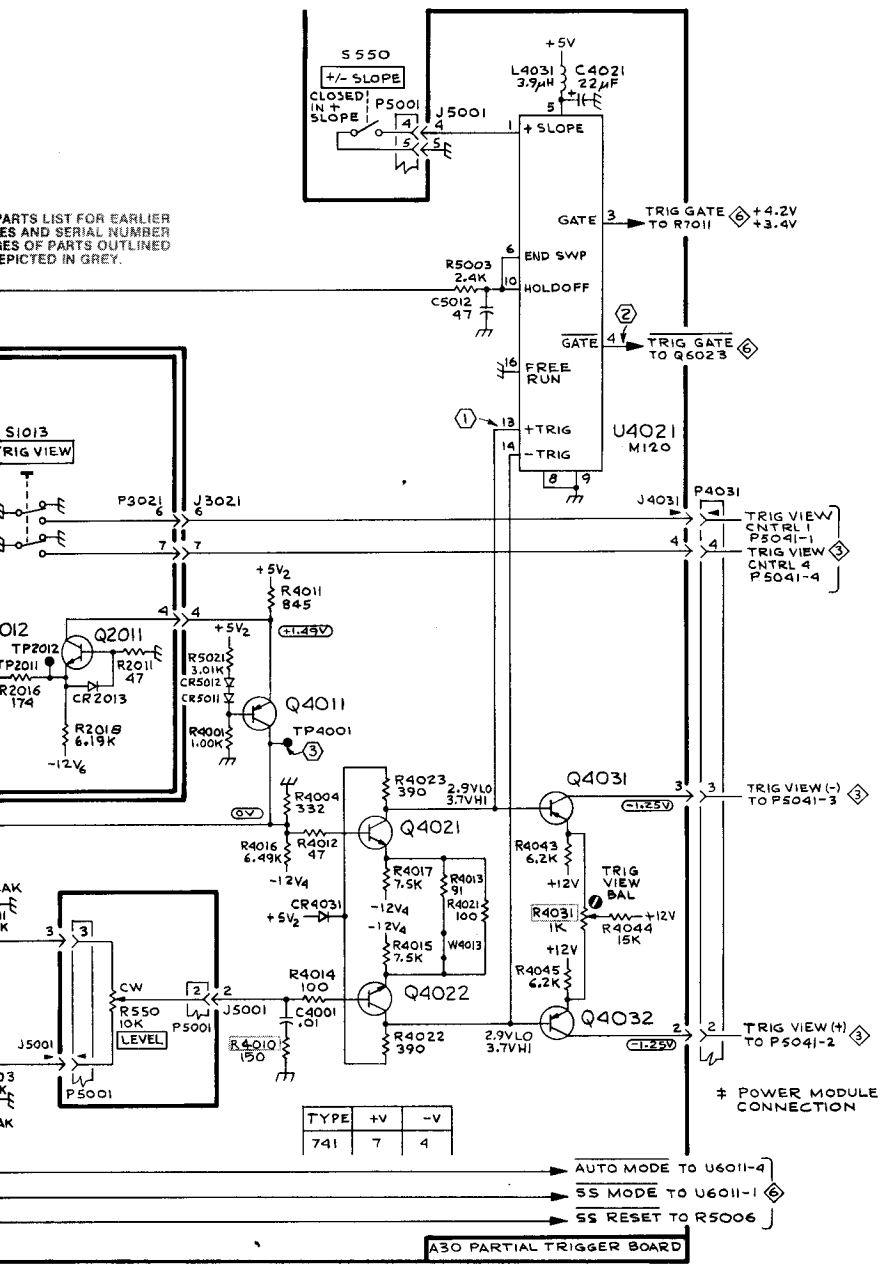
5

A | B | C | D | E | F | H

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11




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

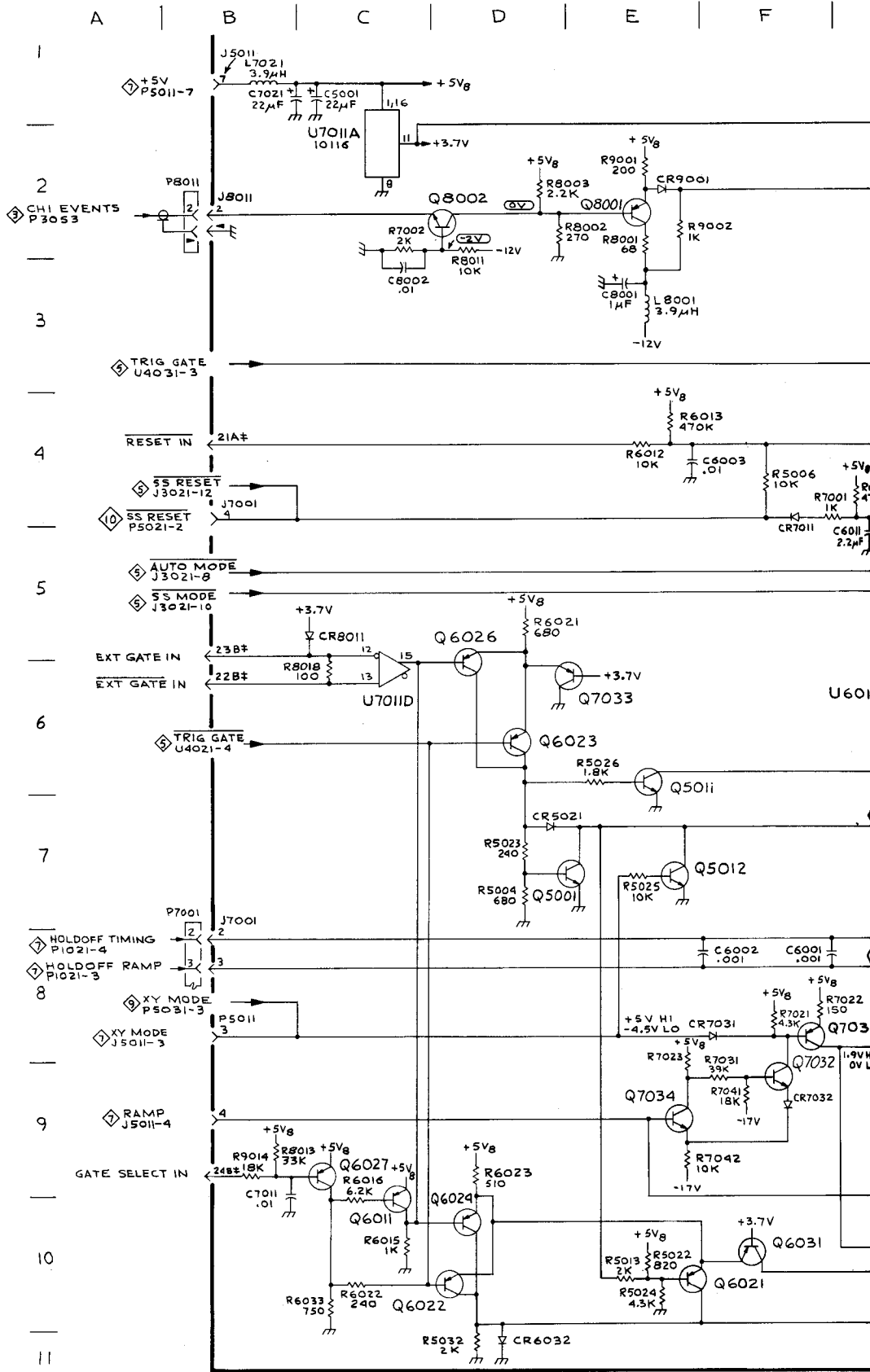


TRIGGER INPUT & SWITCHING

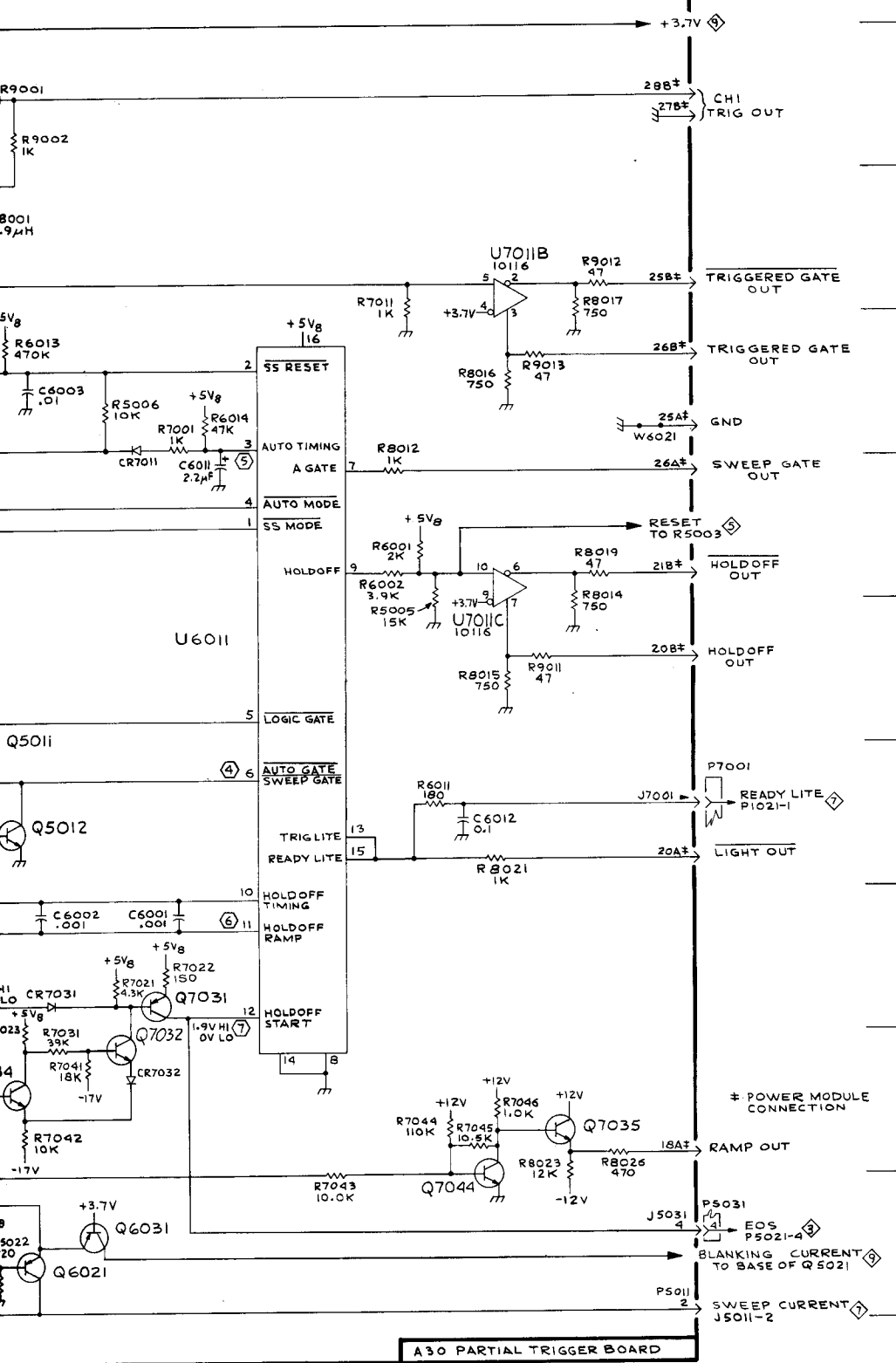
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Table 8-6 COMPONENTS SCHEMATIC LOCATIONS

A30 PARTS LOCATED ON 					
CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
C5001	C1	Q6031	F10	R7011	H3
C6001	F8	Q7031	F8	R7021	F8
C6002	F8	Q7032	F9	R7022	F8
C6003	E4	Q7033	E6	R7023	E8
C6011	G5	Q7034	E9	R7031	F9
C6012	J7	Q7035	J9	R7041	F9
C7011	B9	Q7044	H10	R7042	E9
C7021	B1	Q8001	E2	R7043	H10
C8001	E3	Q8002	D2	R7044	H9
C8002	C3			R7045	J9
		R5004	D7	R7046	J9
CR5021	D7	R5005	H6	R8001	E2
CR6032	D11	R5006	F4	R8002	D3
CR7011	F4	R5013	E10	R8003	D2
CR7031	F8	R5022	E10	R8011	D3
CR7032	F9	R5023	D7	R8012	H5
CR8011	C5	R5024	E10	R8013	B9
CR9001	E2	R5025	E7	R8014	J6
		R5026	E6	R8015	J6
L7021	B1	R5032	D11	R8016	J4
L8001	E3	R6001	H5	R8017	J3
		R6002	H5	R8018	C6
Q5001	D7	R6011	H7	R8019	J5
Q5011	E6	R6012	E4	R8021	J7
Q5012	E7	R6013	E4	R8023	J9
Q6011	C10	R6014	G4	R8026	J9
Q6021	E10	R6015	C10	R9001	E2
Q6022	D10	R6016	C9	R9002	E2
Q6023	D6	R6021	D5	R9011	J6
Q6024	D10	R6022	C10	R9012	J3
Q6026	D5	R6023	D9	R9013	J4
Q6027	C9	R6033	C10	R9014	B9
		R7001	F4		
		R7002	C2	U6011	G6
				U7011A	C2
				U7011B	J3
				U7011C	J5
				U7011D	C6



F | G | H | J | K



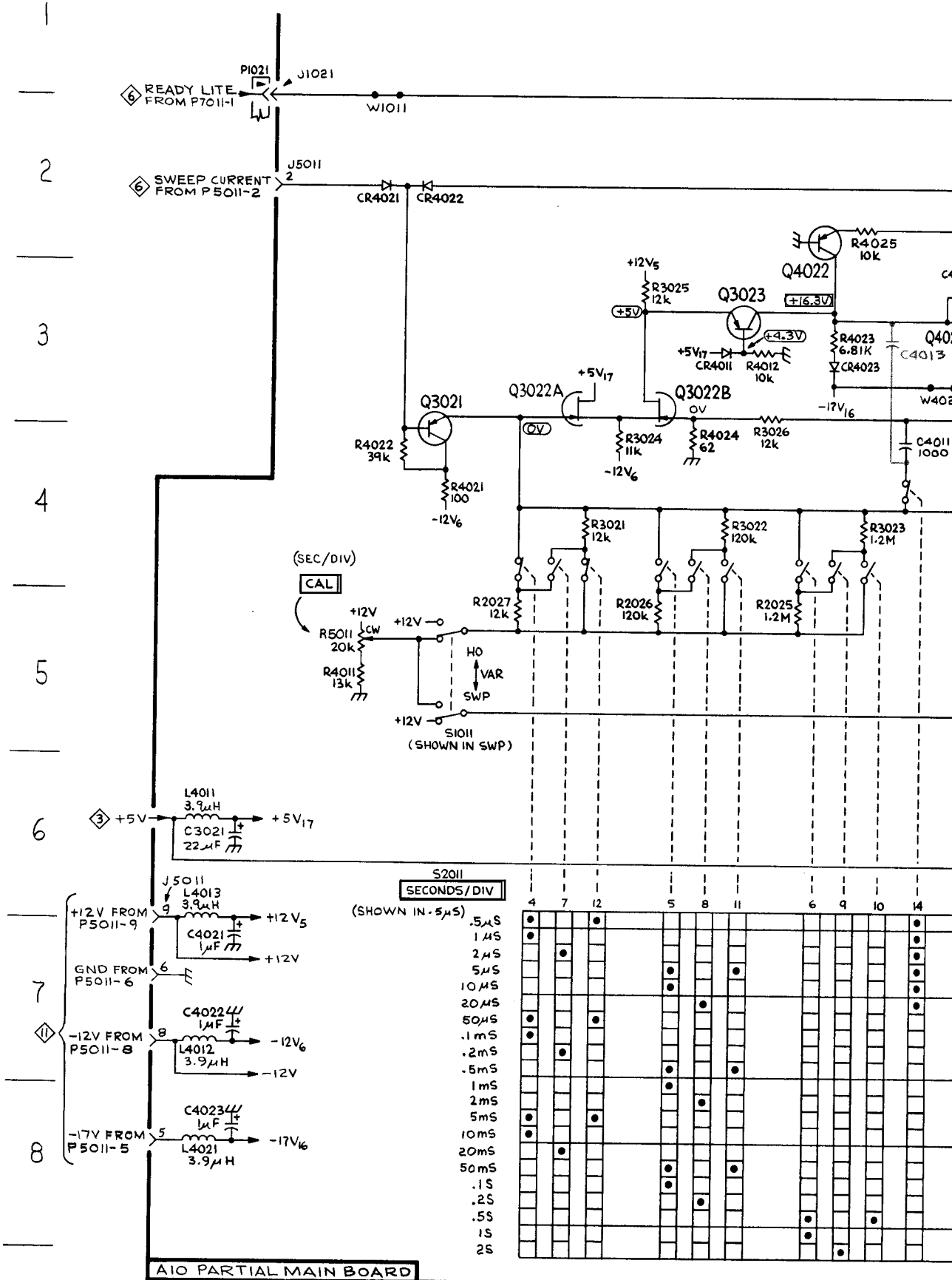
A30 PARTIAL TRIGGER BOARD

Table 8-7 COMPONENTS SCHEMATIC LOCATIONS

CALIBRATOR, SWEEP GENERATOR

CHASSIS PARTS LOCATED ON 7					
CKT NO	GRID LOC				
DS500	L1				
DS510	L2				
A10 PARTS LOCATED ON 7					
CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
C1021	K4	Q3023	E3	R4022	C4
C1022	J4	Q4021	F3	R4023	F3
C2021	K5	Q4022	E3	R4024	E4
C2022	K6			R4025	F2
C2023	H4	R1011	K2	R5011	C5
C3021	B6	R1012	J4		
C4011	F4	R1013	K4	S1011	C5
C4012	F4	R1021	J4		
C4021	B7	R1022	J5		
C4022	B7	R1023	J5		
C4023	B8	R1024	J4		
C4024	F3	R1025	J5		
		R1026	H6		
CR1011	K4	R1028	J5		
CR2021	H5	R2021	J5		
CR4011	E3	R2022	K5		
CR4021	C2	R2023	J5		
CR4022	C2	R2024	J6		
CR4023	F3	R2025	E4		
		R2026	D5		
L4011	B6	R2027	D5		
L4012	B7	R2028	K6		
L4013	B6	R3021	D4		
L4021	B8	R3022	E4		
		R3023	F4		
Q1021	J4	R3024	D4		
Q1022	J5	R3025	D3		
Q1023	H5	R3026	E4		
Q2021	J5	R4011	C5		
Q3021	C3	R4012	E3		
Q3022A	D3	R4021	C4		
Q3022B	E3				

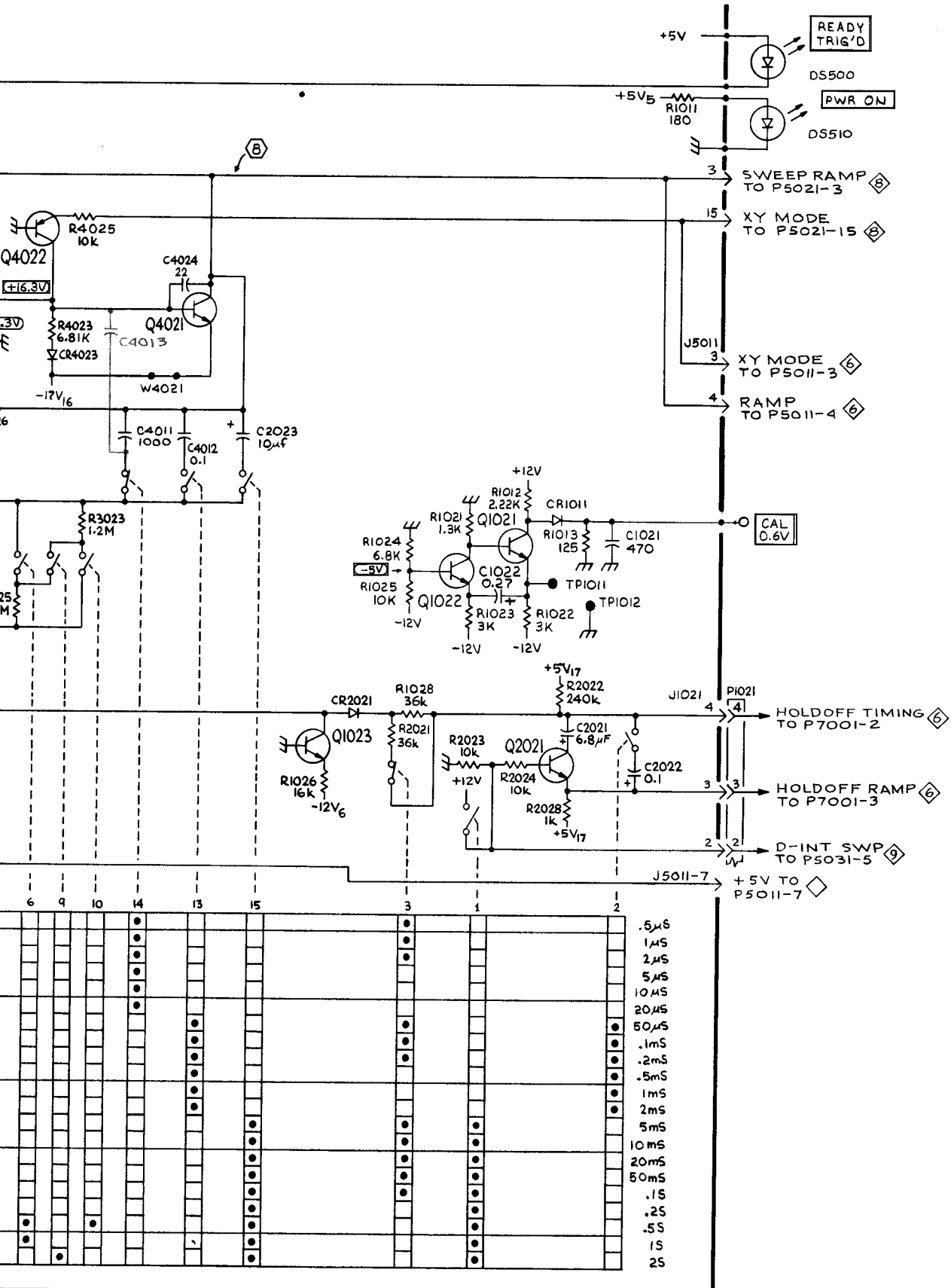
A | B | C | D | E | F



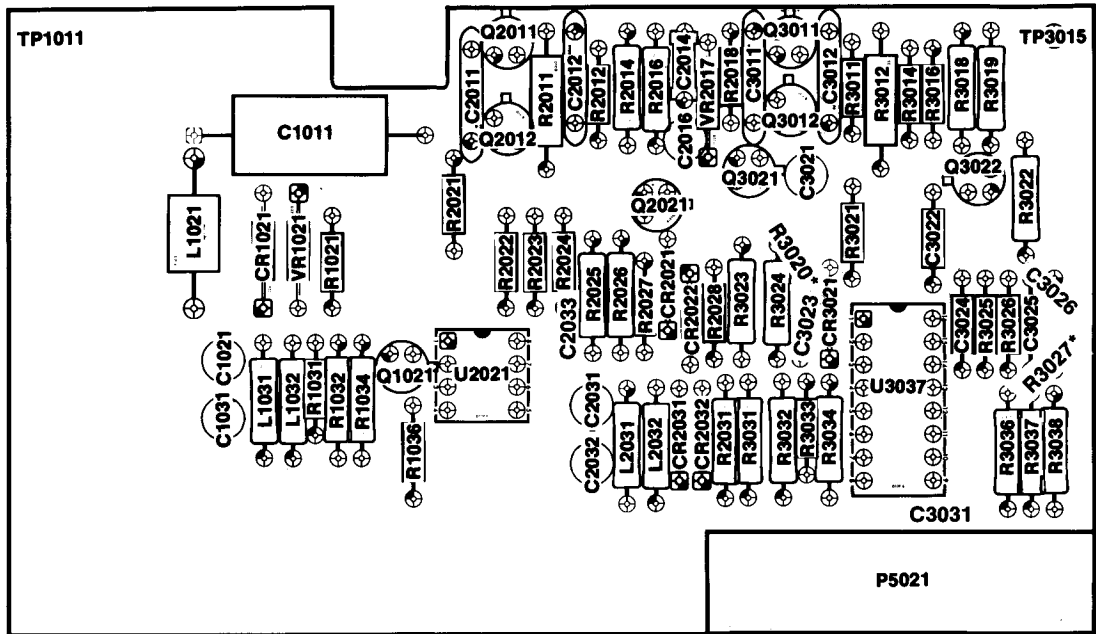
SC503

REV B FEB 1980
 2636-31

F | H | J | K | L | M



REV B FEB 1980
2636-31



*See Parts List for
serial number ranges.

2636-15A

Fig. 8-8. A40-Horizontal Deflection circuit board assembly.

Table 8-8 COMPONENTS SCHEMATIC LOCATIONS

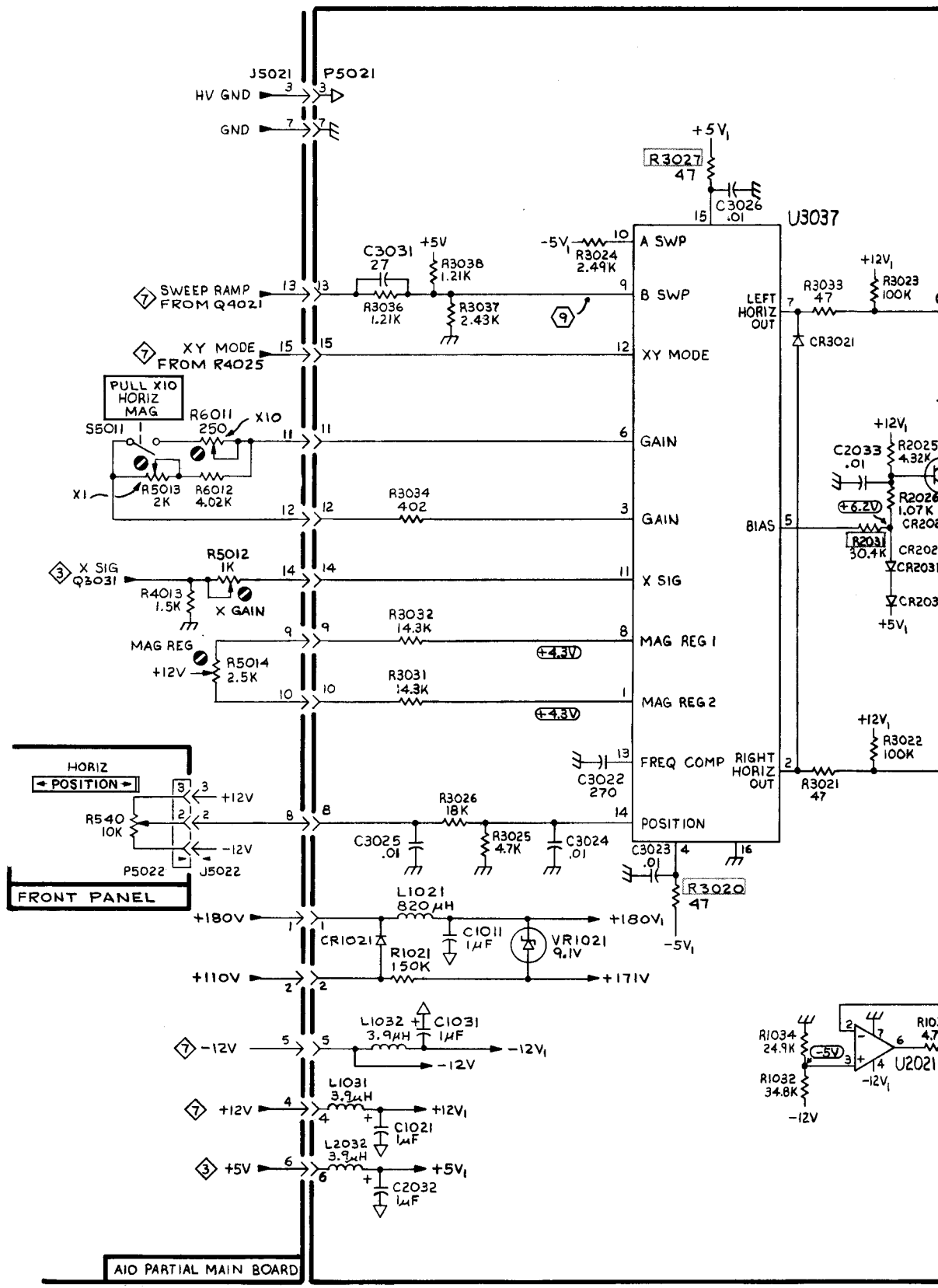
CHASSIS PARTS LOCATED ON		8	
CKT NO	GRID LOC		
R540	B6		
A10 PARTS LOCATED ON		8	
CKT NO	GRID LOC		
R4013	B4		
R5012	C4		
R5013	B4		
R5014	C5		
R6011	B3		
R6012	B4		
S5011	B3		
A40 PARTS LOCATED ON		8	
CKT NO	GRID LOC	CKT NO	GRID LOC
C1011	D6	R1032	F7
C1021	C7	R1034	F7
C1031	D7	R1036	H7
C2011	J2	R2011	J2
C2012	J2	R2012	K2
C2014	H2	R2014	J2
C2016	J2	R2016	H2
C2031	H7	R2018	J5
C2032	C8	R2021	J2
C2033	F4	R2022	K3
C3011	J5	R2023	K1
C3012	J5	R2024	H2
C3021	H4	R2025	F4
C3022	E5	R2026	F4
C3023	E6	R2027	H3
C3024	E6	R2028	H4
C3025	D6	R2031	F4
C3026	E2	R3011	K4
C3031	C3	R3012	J5
		R3014	K6
		R3016	K5
CR1021	C6	R3018	J5
CR2021	H4	R3019	H5
CR2022	H4	R3020	E6
CR2031	F4	R3021	F5
CR2032	F4	R3022	F5
CR3021	F3	R3023	F3
		R3024	E2
L1021	D6	R3025	D6
L1031	C7	R3026	D6
L1032	C7	R3027	E2
L2031	H7	R3031	D5
L2032	C8	R3032	D5
		R3033	F3
Q1021	H7	R3034	D4
Q2011	K2	R3036	C3
Q2012	K2	R3037	D3
Q2021	H4	R3038	D3
Q3011	K5		
Q3012	K5	VR1021	D6
Q3021	H3	VR2017	J3
Q3022	H5		
R1021	D7	U2021	F7
R1031	H7	U3037	F2

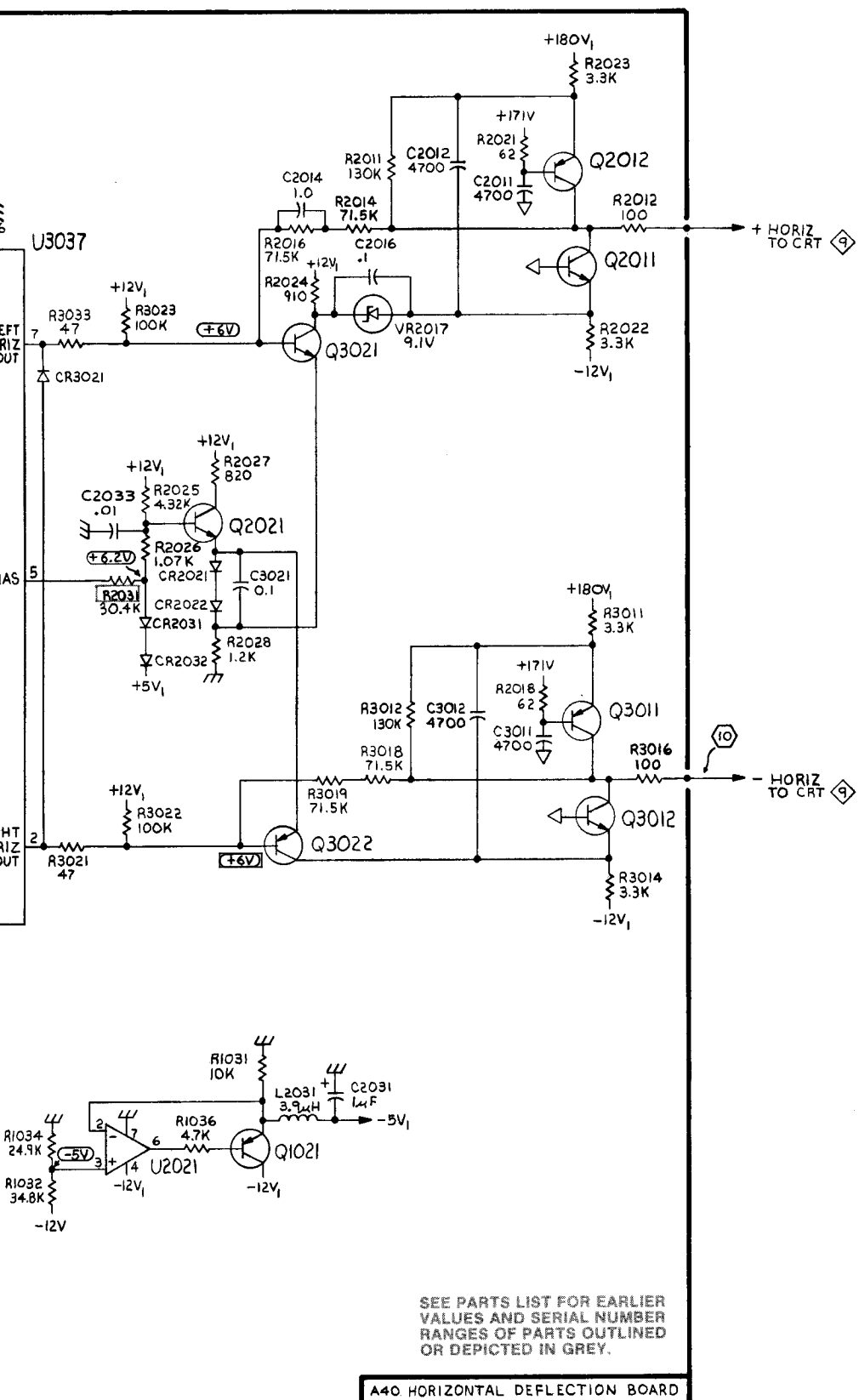
HORIZONTAL PREAMP & OUTPUT

8

A | B | C | D | E | F |

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A40 HORIZONTAL DEFLECTION BOARD

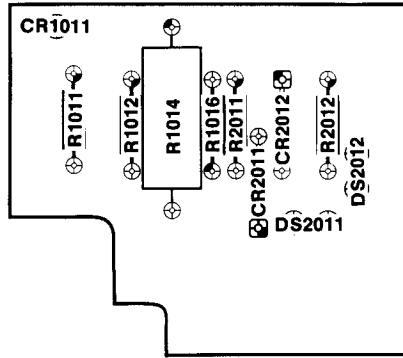
HORIZONTAL PREAMP & OUTPUT

636-32
OCT 1981

HORIZ PREAMP & OUTPUT

8

JS



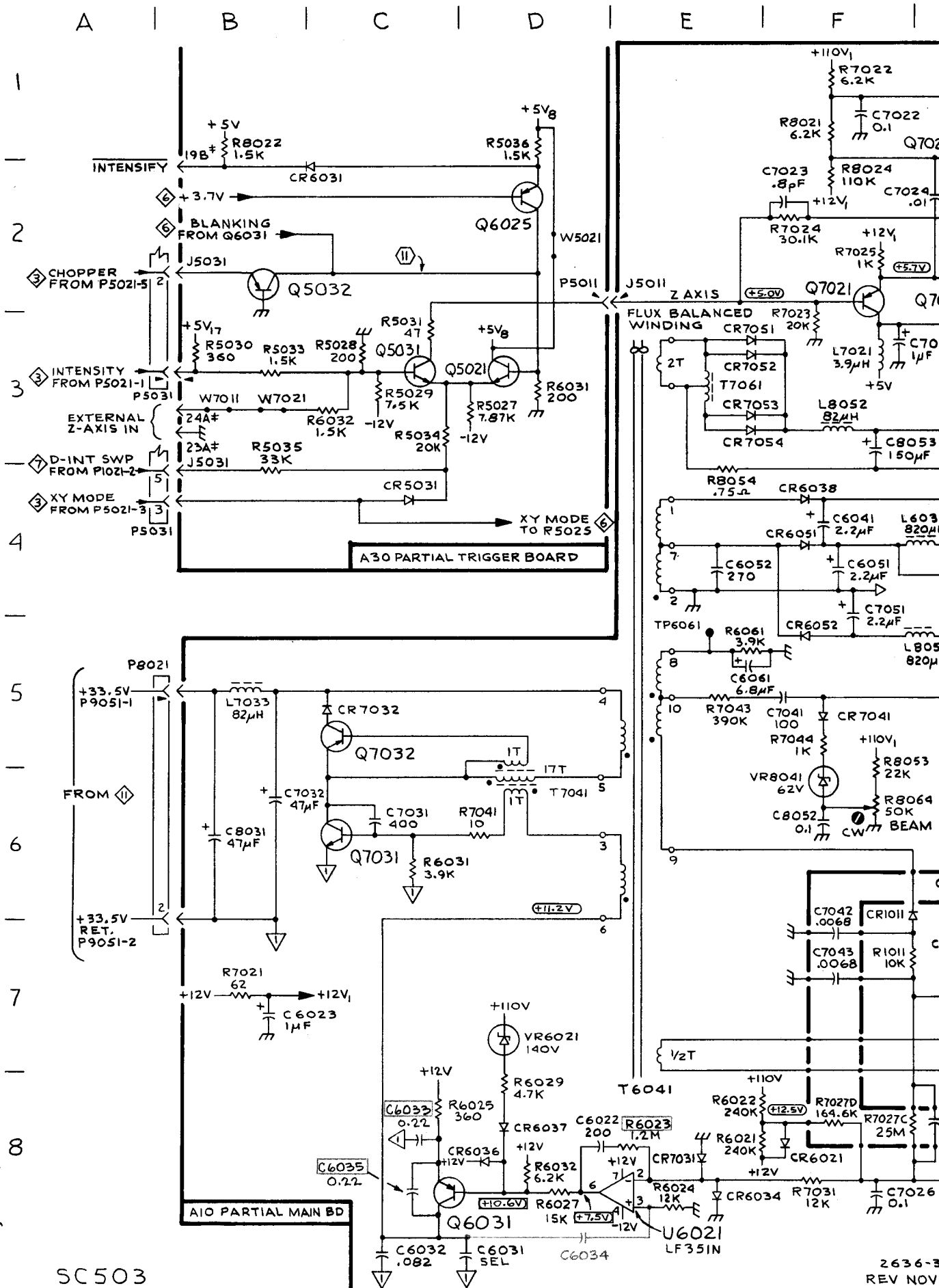
2636-16A

Fig. 8-9. A80-High Voltage circuit board assembly.

Table 8-9 COMPONENTS SCHEMATIC LOCATIONS

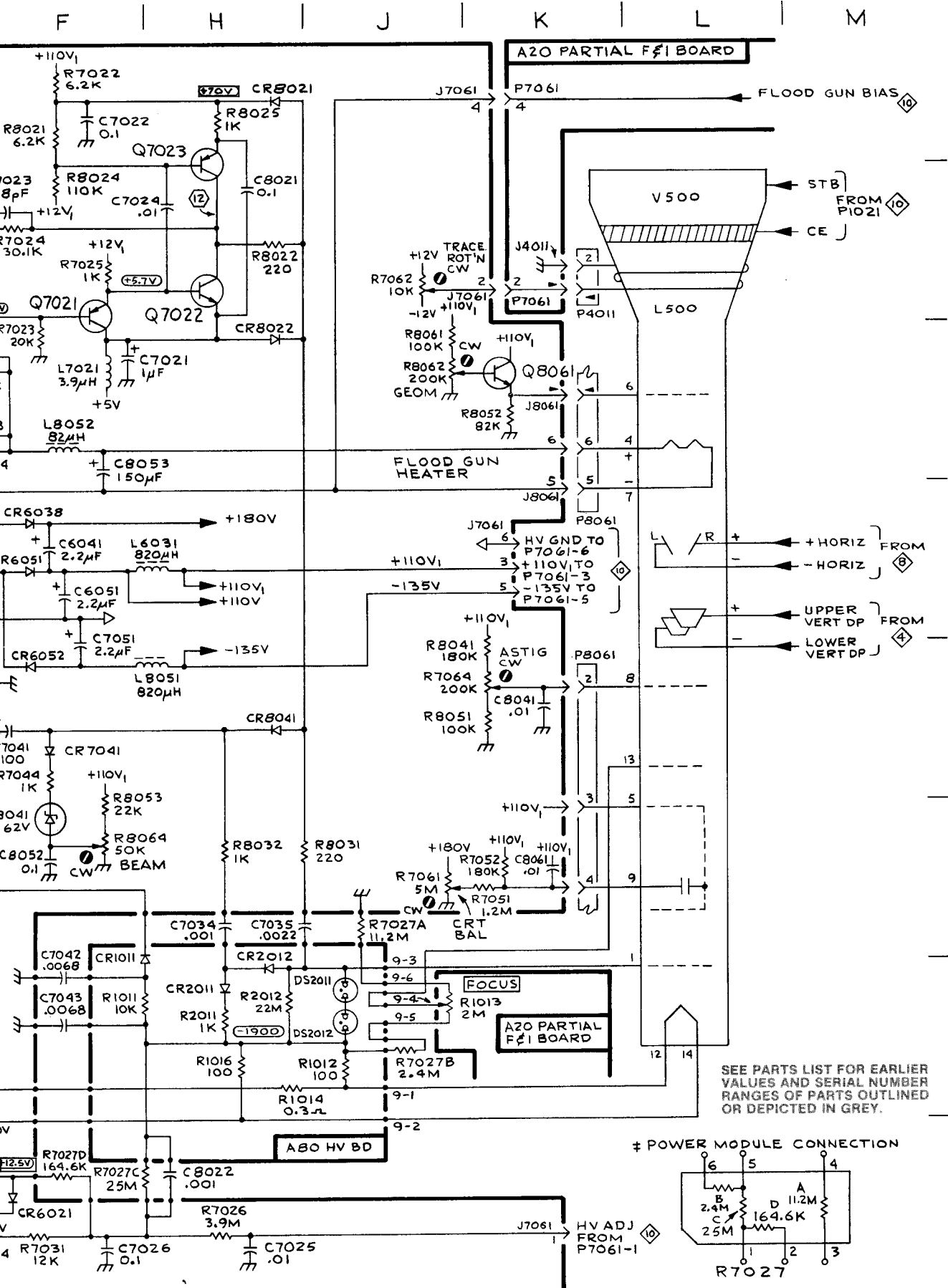
CHASSIS PARTS LOCATED ON 9				A30 PARTS LOCATED ON 9			
CKT NO	GRID LOC			CKT NO	GRID LOC		
L500	L2			CR5031	C4		
V500	L2			CR6031	C2		
A10 PARTS LOCATED ON 9				A80 PARTS LOCATED ON 9			
CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
C6022	D8	L6031	H4	R8022	H2	CR1011	F6
C6023	B7	L7021	F3	R8024	F2	CR2011	H7
C6031	D8	L7033	B5	R8025	H1	CR2012	H7
C6032	C8	L8051	H5	R8031	J6	DS2011	J7
C6033	B8	L8052	F3	R8032	H6	DS2012	J7
C6034	D8			R8041	J5	R1011	F7
C6035	C8	Q6031	C8	R8051	J5	R1012	J7
C6041	F4	Q7021	F2	R8052	K3	R1014	J7
C6051	F4	Q7022	H2	R8053	F6	R1016	H7
C6052	E4	Q7023	H1	R8054	E4	R2011	H7
C6061	E5	Q7031	C6	R8061	H3	R2012	H7
C7021	H3	Q7032	C5	R8062	H3		
C7022	F1	Q8061	K3	R8064	F6		
C7023	F2						
C7024	H2	R6021	E8	T6041	E8		
C7025	H8	R6022	E8	T7041	D6		
C7026	F8	R6023	E8				
C7031	C6	R6024	E8	U6021	E8		
C7032	B6	R6025	C8				
C7034	H6	R6027	D8	VR6021	D7		
C7035	H6	R6029	D8	VR8041	F6		
C7041	F5	R6031	C6				
C7042	F7	R6032	D8				
C7043	F7	R6061	E5				
C7051	F4	R7021	B7				
C8021	H2	R7022	F1				
C8022	H8	R7023	F3				
C8031	B6	R7024	F2				
C8041	K5	R7025	F2				
C8052	F6	R7026	H8				
C8053	F3	R7027A	J6				
C8061	K6	R7027B	J7				
		R7027C	F8				
CR6021	F8	R7027D	F8				
CR6034	E8	R7031	F8				
CR6036	D8	R7041	D6				
CR6037	D8	R7043	E5				
CR6038	F4	R7044	F5				
CR6051	F4	R7051	K6				
CR6052	F5	R7052	K6				
CR7031	E8	R7061	J6				
CR7032	C5	R7062	J2				
CR7041	F5	R7064	J5				
CR7051	E3	R8021	F1				
CR7052	E3						
CR7053	E3						
CR7054	E3						
CR8021	H1						
CR8022	H3						
CR8041	H5						
A20 PARTS LOCATED ON 9							
CKT NO	GRID LOC						
R1013	K7						

CONT. HIGH VOLTAGE & Z-AXIS



SC503

2636-3
REV NOV

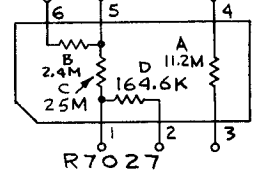


CRT, HIGH VOLTAGE & Z-AXIS

9

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

POWER MODULE CONNECTION

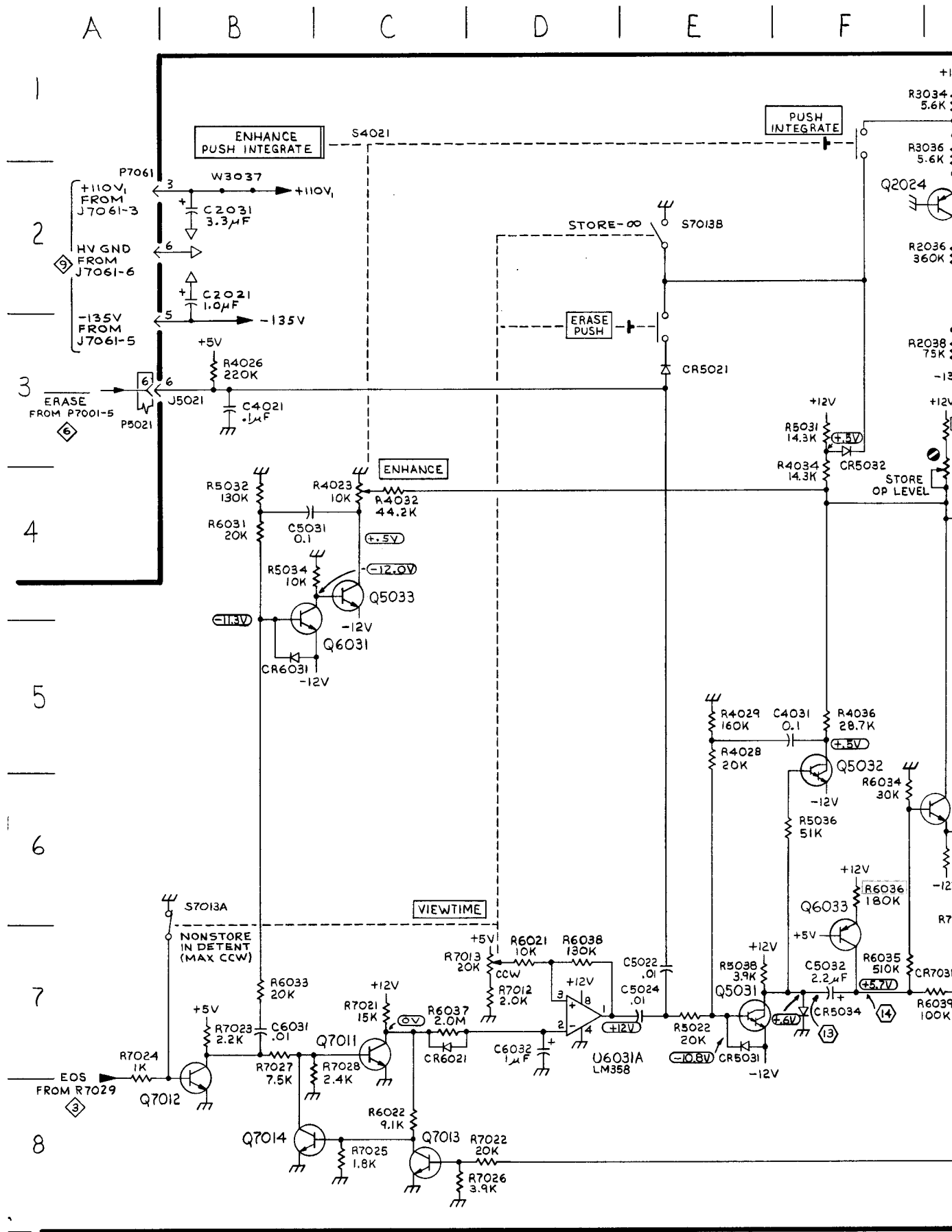


2636-33
REV NOV 1982

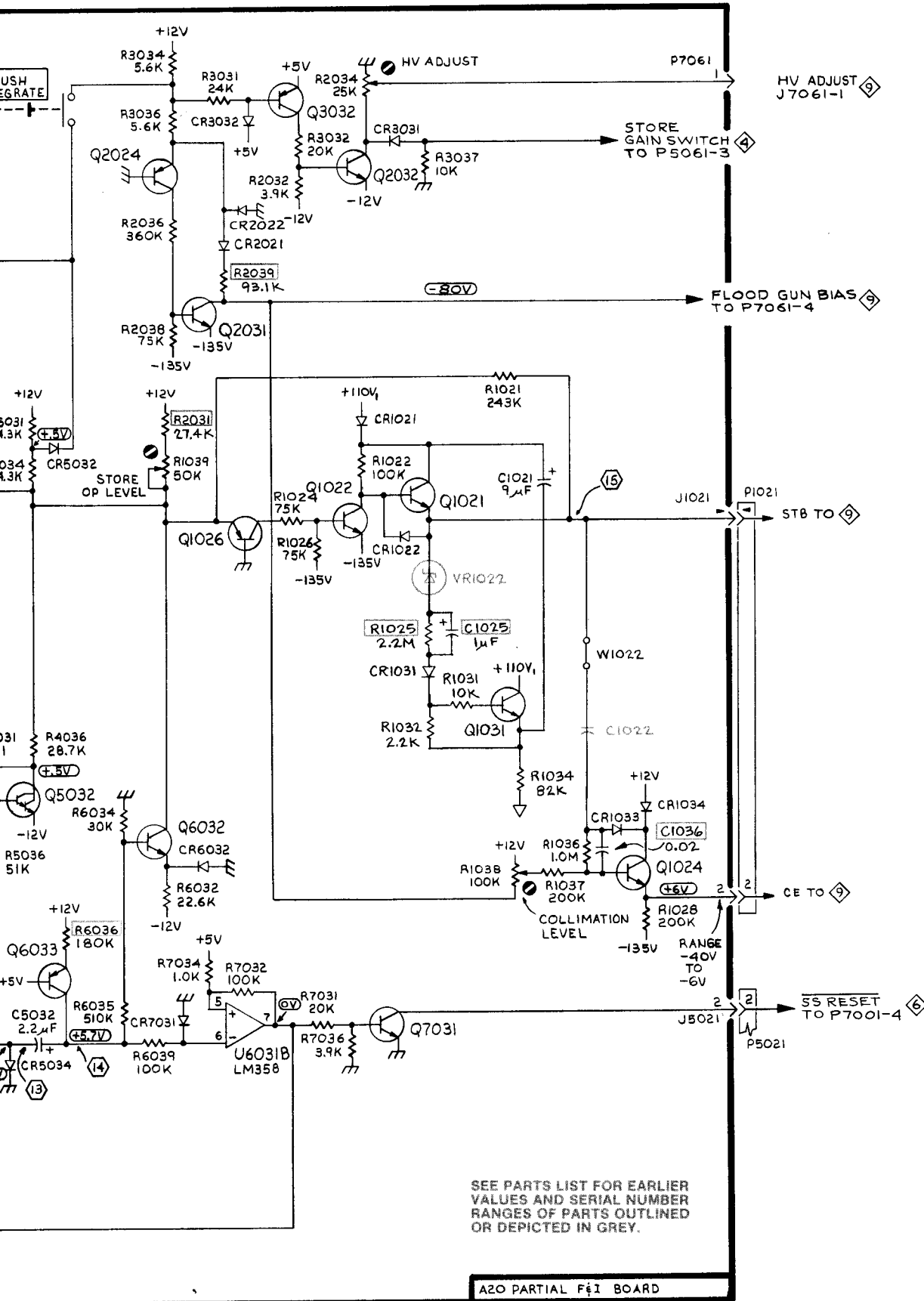
CRT, HIGH VOLTAGE AND Z AXIS 9

Table 8-10 COMPONENTS SCHEMATIC LOCATIONS

A20 PARTS LOCATED ON 10					
CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
C1021	K4	R1021	K3	R7022	D8
C1022	K5	R1022	J4	R7023	B7
C1025	K4	R1024	H4	R7024	A7
C1036	L6	R1025	J4	R7025	C8
C2021	B2	R1026	H4	R7026	C8
C2031	B2	R1028	L6	R7027	B7
C4021	B3	R1031	J5	R7028	C7
C4031	F5	R1032	J5	R7031	J7
C5022	E7	R1034	K5	R7032	H7
C5024	E7	R1036	K6	R7034	H7
C5031	B4	R1037	K6	R7036	J7
C5032	F7	R1038	K6		
C6031	B7	R1039	H4	S4021	C1
C6032	D7	R2031	H3	S7013A	B6
		R2032	H2	S7013B	E2
CR1021	J3	R2034	J1		
CR1022	J4	R2036	H3	U6031A	D7
CR1031	J4	R2038	H3	U6031B	H7
CR1033	K6	R2039	H2		
CR1034	L6	R3031	H1	VR1022	J4
CR2021	H2	R3032	J2		
CR2022	H2	R3034	H1	W1022	K5
CR3031	J2	R3036	H1		
CR3032	H1	R3037	J2		
CR5021	E3	R4023	C4		
CR5031	E7	R4026	B3		
CR5032	F3	R4028	E5		
CR5034	F7	R4029	E5		
CR6021	C7	R4032	C4		
CR6031	B5	R4034	F4		
CR6032	H6	R4036	F5		
CR7031	H7	R5022	E7		
		R5031	F3		
Q1021	J4	R5032	B4		
Q1022	J4	R5034	B4		
Q1024	K6	R5036	F6		
Q1026	H4	R5038	E7		
Q1031	K5	R6021	D7		
Q2024	H2	R6022	C8		
Q2031	H3	R6031	B4		
Q2032	J2	R6032	H6		
Q3032	H1	R6033	B7		
Q5031	E7	R6034	F6		
Q5032	F5	R6035	F7		
Q5033	C4	R6036	F6		
Q6031	C5	R6037	C7		
Q6032	H6	R6038	D7		
Q6033	F6	R6039	H7		
Q7011	C7	R7012	D7		
Q7012	B8	R7013	D7		
Q7013	C8	R7021	C7		
Q7014	B8				
Q7031	J7				



F | H | J | K | L | M



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

A20 PARTIAL F&I BOARD

STORAGE

STORAGE

10 JS

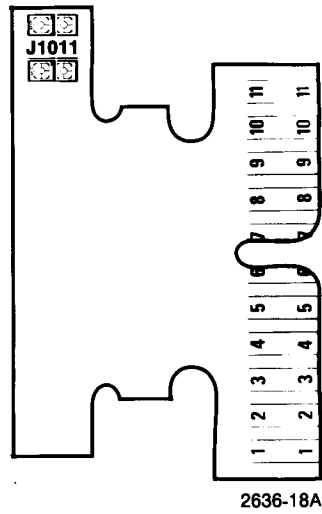


Fig. 8-10. A90-Interface circuit board assembly.

Table 8-11 COMPONENTS SCHEMATIC LOCATIONS

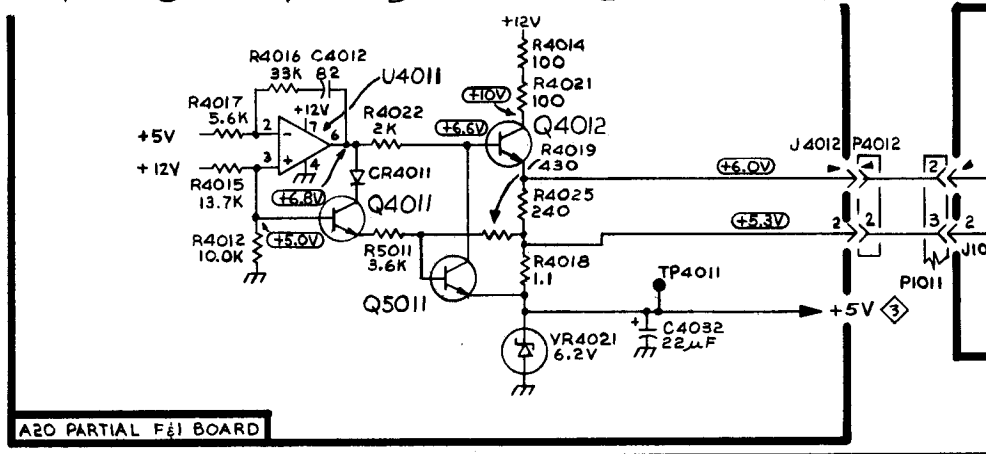
A20 PARTS LOCATED ON		11	
CKT NO	GRID LOC		
C4012	D1		
C4032	E2		
CR4011	D1		
Q4011	D2		
Q4012	E1		
Q5011	D2		
R4012	C2		
R4014	E1		
R4015	C1		
R4016	C1		
R4017	C1		
R4018	E2		
R4019	E1		
R4021	E1		
R4022	D1		
R4025	E2		
R5011	D2		
U4011	D1		
VR4021	E2		
A30 PARTS LOCATED ON		11	
CKT NO	GRID LOC	CKT NO	GRID LOC
C6041	K7	Q8053	F3
C6051	K4	Q8061	E3
C6052	H5	Q8062	D4
C7051	D7		
C7052	C7	R6041	D6
C7053	C5	R6042	D6
C7055	D7	R6051	C7
C8061	D4	R6053	J5
		R6054	C6
CR6041	K7	R6061	J5
CR6042	C6	R6062	J5
CR6051	C6	R7051	D6
CR6061	J5	R7052	C7
CR7041	E6	R7053	E7
CR7051	C6	R7054	C5
CR8041	H8	R7056	H6
CR8061	K5	R7057	E6
		R7061	C5
F8051	J3	R7062	C5
F9051	J3	R8041	J8
		R8042	H7
Q6041	C6	R8051	D7
Q7041	E6	R8052	F8
Q7042	F7	R8053	E8
Q7043	F8	R8055	F3
Q7051	H8	R8062	E4
Q7052	E6	R9041	F7
Q7053	F4	R9051	J8
Q7054	C7	R9052	J3
Q7061	E5	R9053	F4
Q7062	C5	R9054	C3
Q7063	C5	R9055	E4
Q8051	D8		
Q8052	E8		
		S2031	C6
		VR6062	C5
		VR7052	H6
		VR7061	H6

E-POWER SUPPLY



A | B | C | D | E | F

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A20 PARTIAL FEI BOARD

+33.5V
FILTERED
DC

12A*
12B*

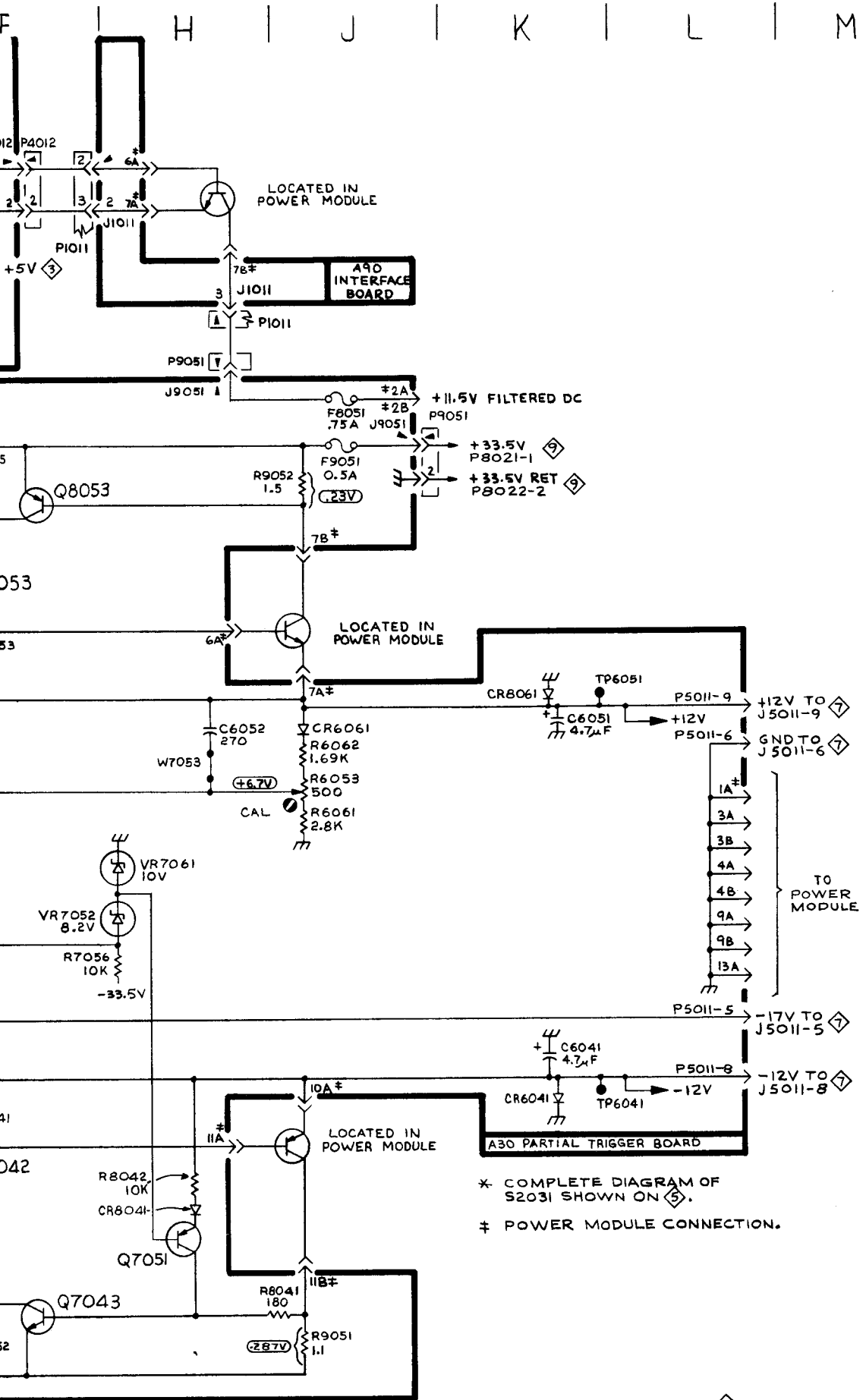
STBY
CH1
CH2
LINE
EXT
INT

-33.5V
FILTERED
DC

8A*
8B*

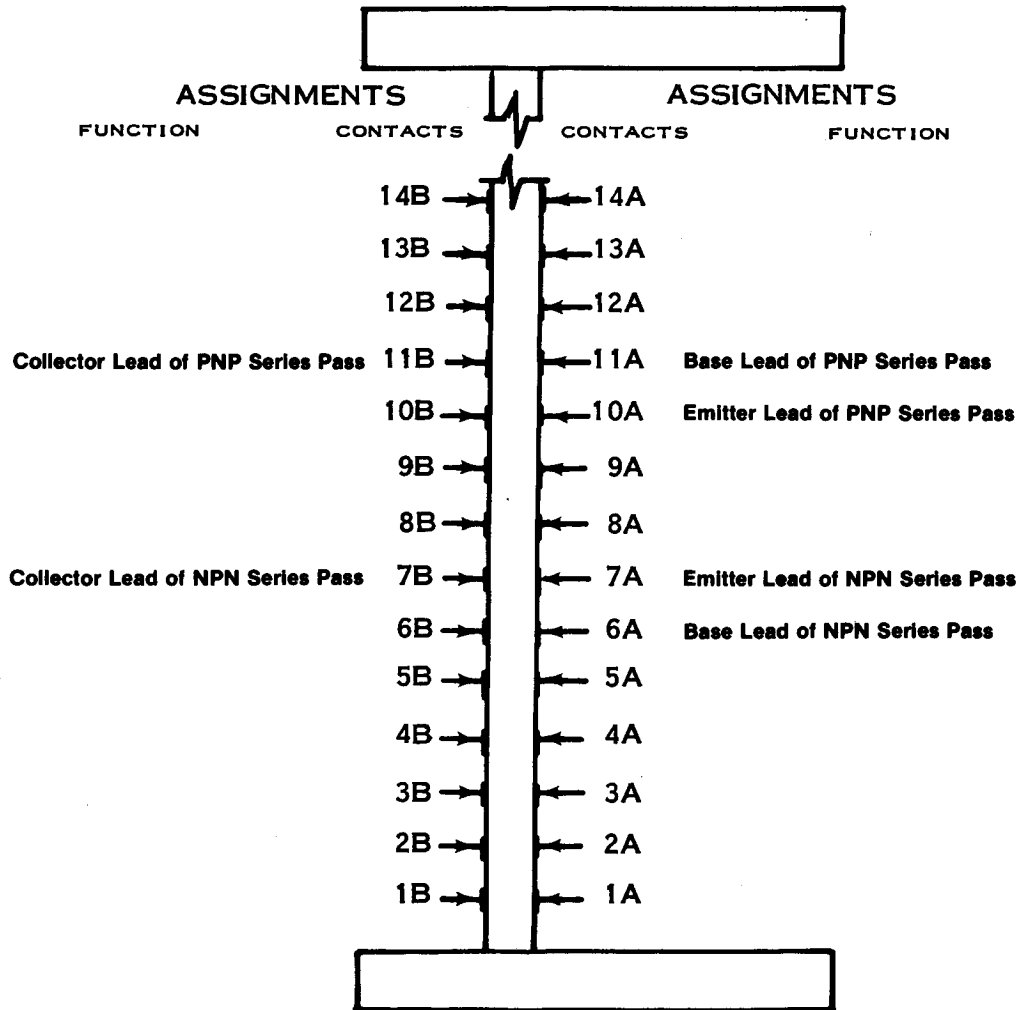
SC503

REV B FEB1980
2636-35



* COMPLETE DIAGRAM OF S2031 SHOWN ON (5).
 ‡ POWER MODULE CONNECTION.

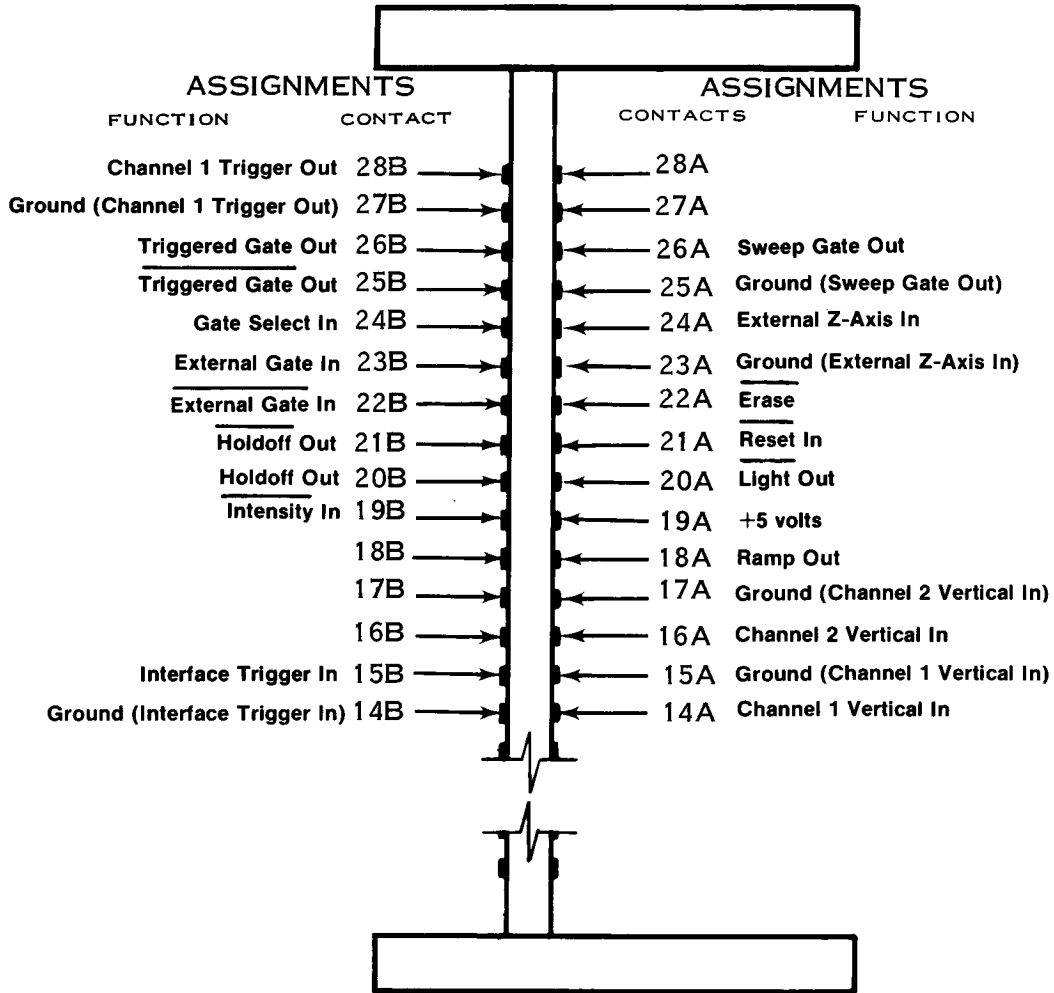
INTERFACE BOARD CONNECTOR REAR VIEW



2636-22

Fig. 8-12.

TRIGGER BOARD CONNECTOR REAR VIEW



2636-21

Fig. 8-11.

Step 1
Cal
TP1011

Step 1
TP1012

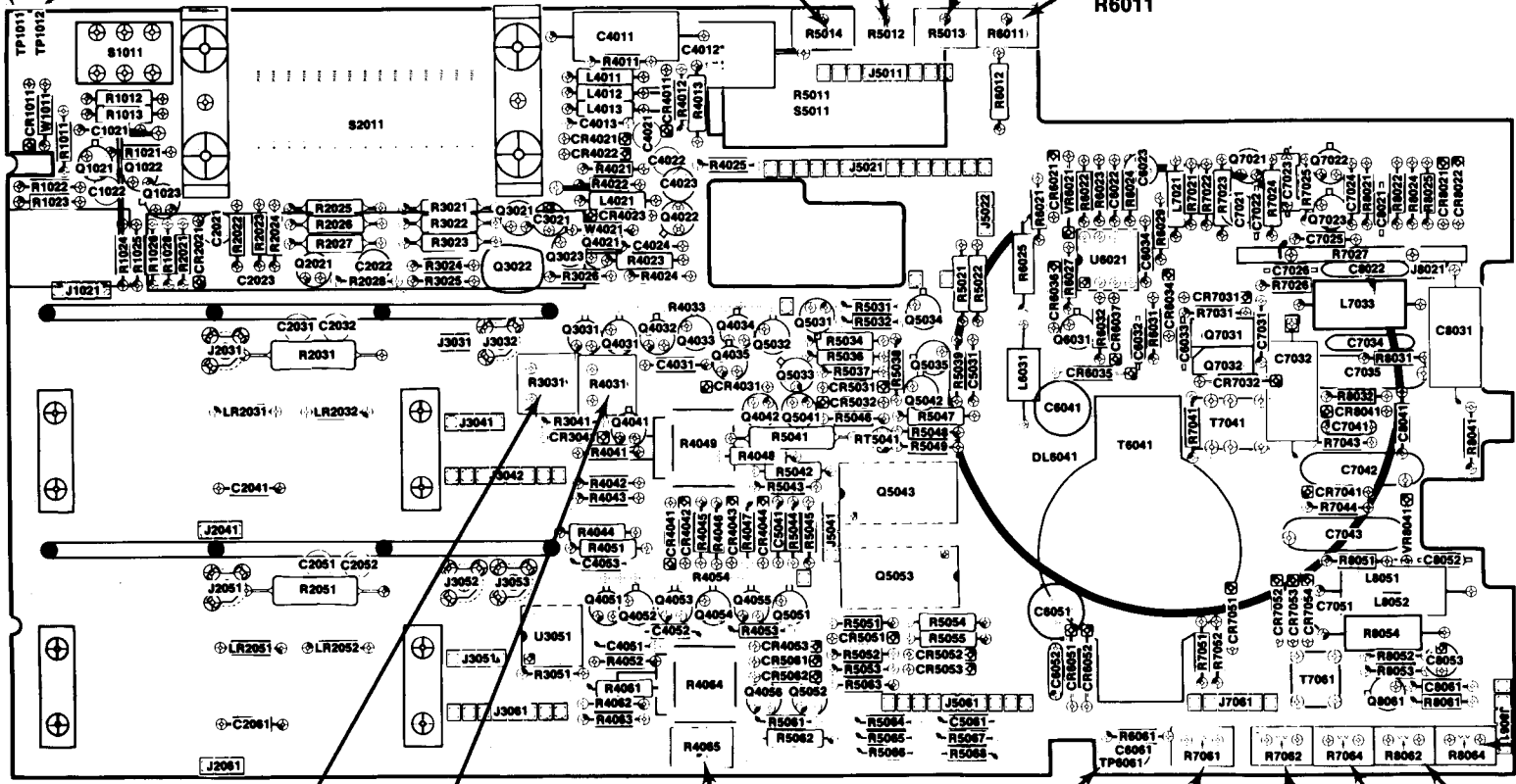
Step 15
Mag Reg
R5014

Step 18
X Gain
R5012

Step 16
Sweep Gain
R5013

Step 17
X10 Gain
R6011

ADJ



Step 4
Beam
R8064

Step 9
Step Bal 2
R3031

Step 13
Ch 2 Gain
R4031

Step 9
Step Bal 1
R4065

Step 4
Beam
Current
TP6061

Step 5
Crt Bal
R7061

Step 7
Rot'n
R7062

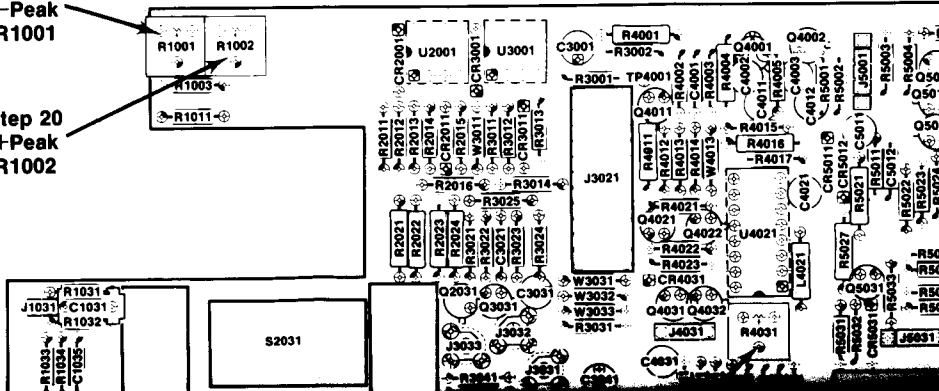
Step 8
Astig
R7064

Step 6
Geom
R8062

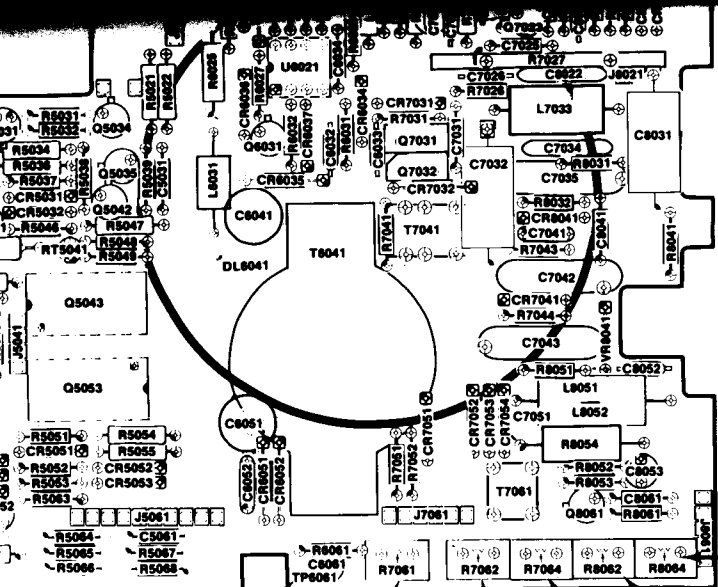
Fig. 8-13 Main Board.

Step 20
-Peak
R1001

Step 20
+Peak
R1002



A10



Step 4 Beam R8064

Step 4 Beam Current TP6061

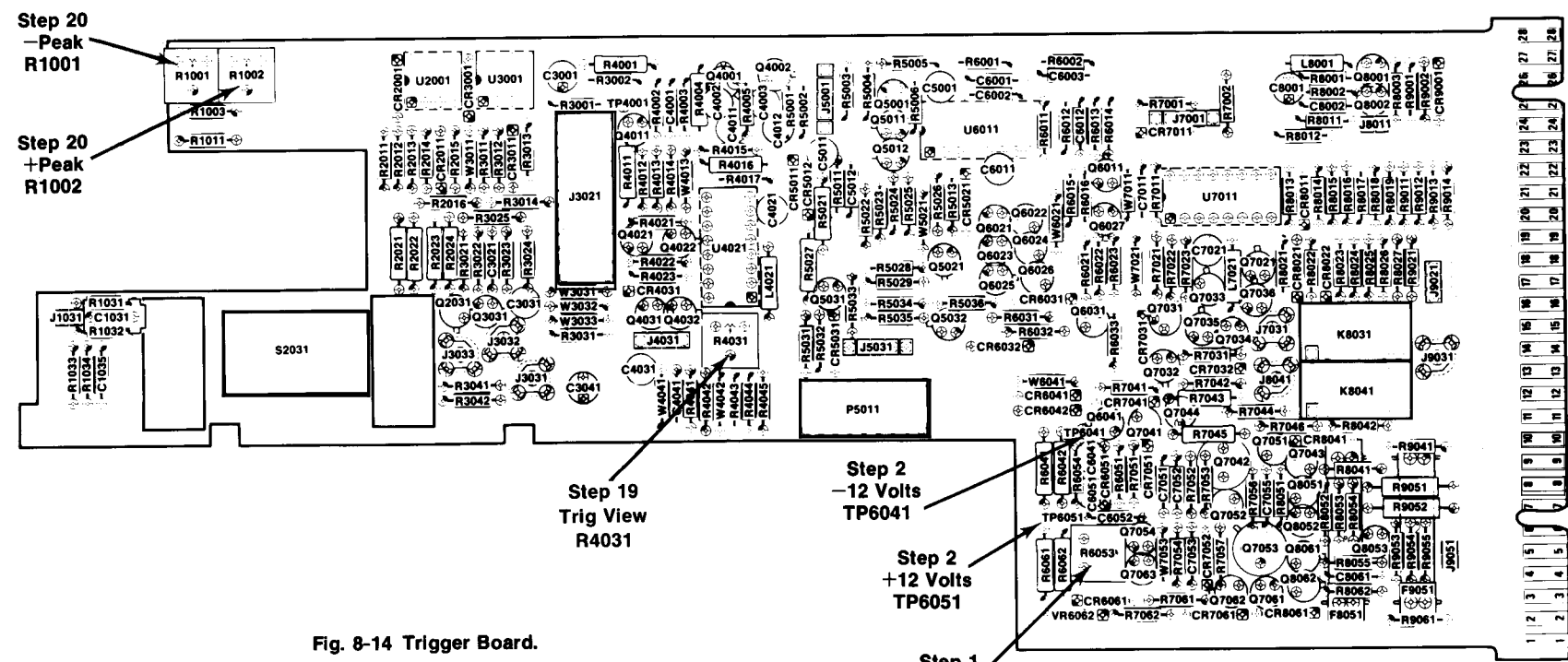
Step 5 Crt Bal R7061

Step 7 Rot'n R7062

Step 8 Astig R7064

Step 6 Geom R8062

2636-19A



Step 20 -Peak R1001

Step 20 +Peak R1002

Step 19 Trig View R4031

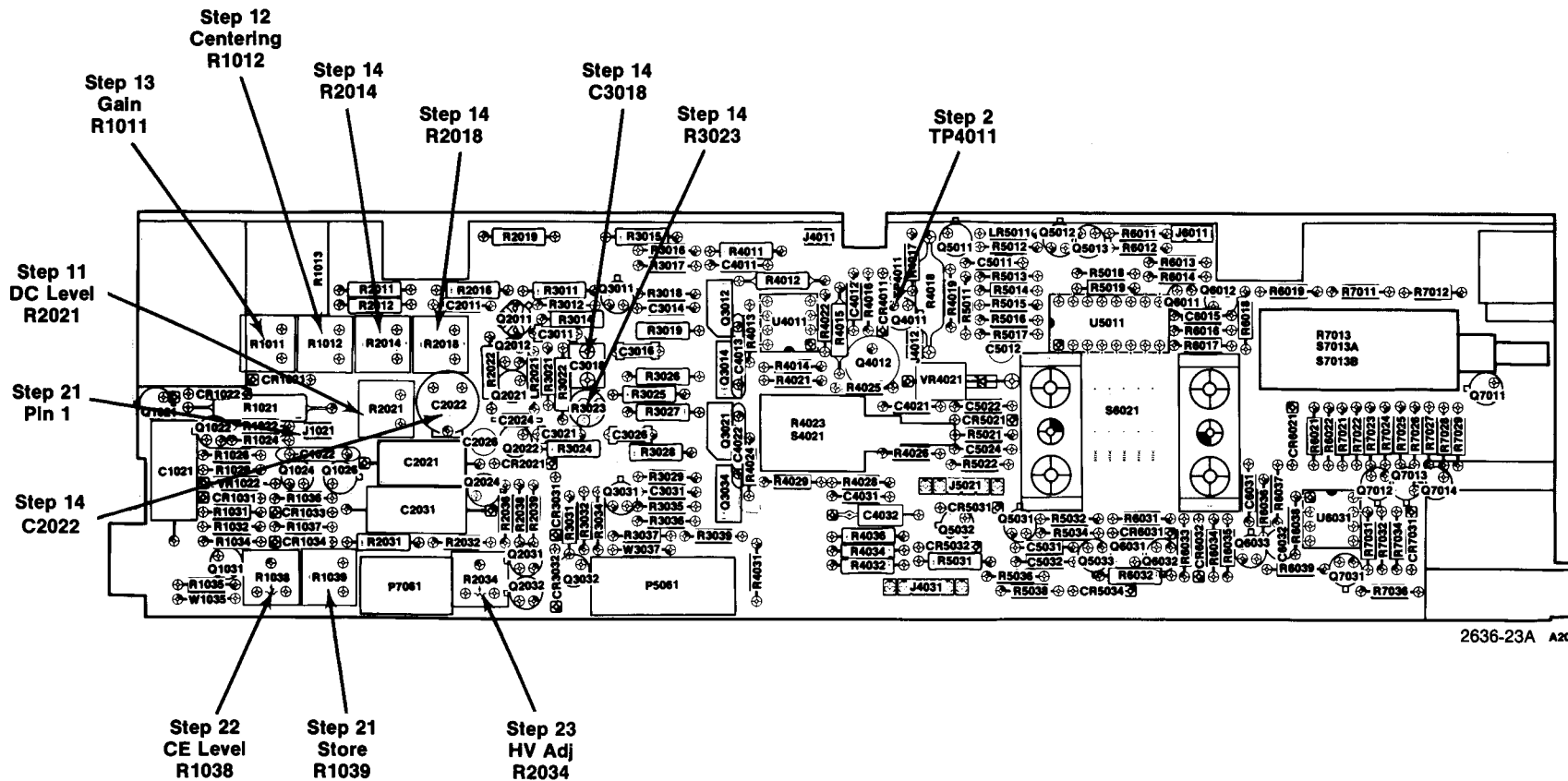
Step 2 -12 Volts TP6041

Step 2 +12 Volts TP6051

Step 1 Cal R6053

Fig. 8-14 Trigger Board.

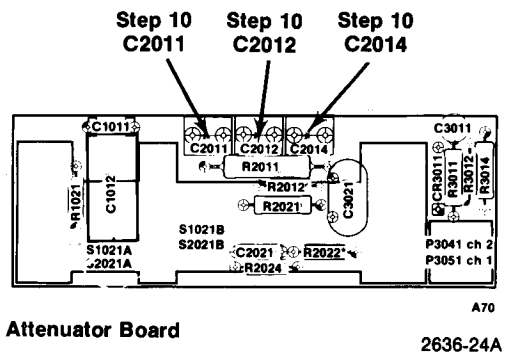
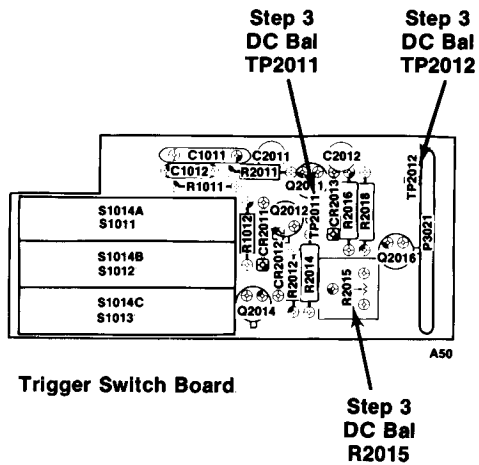
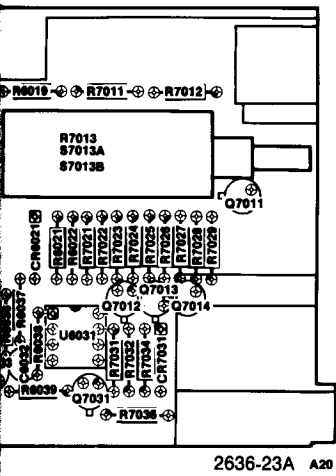
ADJUSTMENTS



2636-23A A20

Fig. 8-15. Focus and Intensity Board.

ENTS



ADJUSTMENT LOCATIONS

Fig. 8-16. Trigger Switch Board and Attenuator Board.

REPLACEABLE MECHANICAL PARTS

PARTS ORDERING INFORMATION

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

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

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

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

SPECIAL NOTES AND SYMBOLS

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

FIGURE AND INDEX NUMBERS

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

INDENTATION SYSTEM

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

```

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

```

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

Attaching parts must be purchased separately, unless otherwise specified.

ITEM NAME

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

ABBREVIATIONS

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

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
000BK	STAUFFER SUPPLY	105 SE TAYLOR	PORTLAND, OR 97214
000CY	NORTHWEST FASTENER SALES, INC.	7923 SW CIRRUS DRIVE	BEAVERTON, OR 97005
000EX	O'HARA METAL PRODUCT COMPANY	542 BRANNAN STREET	SAN FRANCISCO, CA 94107
0000M	SONY/TEKTRONIX CORPORATION	P O BOX 14, HANEDA AIRPORT	TOKYO 149, JAPAN
00779	AMP, INC.	P O BOX 3608	HARRISBURG, PA 17105
05820	WAKEFIELD ENGINEERING, INC.	AUDUBON ROAD	WAKEFIELD, MA 01880
06229	ELECTROVERT, INC.	86 HARTFORD AVENUE	MT. VERNON, NY 10553
07707	USM CORP., USM FASTENER DIV.	510 RIVER RD.	SHELTON, CT 06484
08261	SPECTRA-STRIP CORP.	7100 LAMPSON AVE.	GARDEN GROVE, CA 92642
11897	PLASTIGLIDE MFG. CORPORATION	P O BOX 867, 1757 STANFORD ST.	SANTA MONICA, CA 90406
12327	FREEWAY CORPORATION	9301 ALLEN DRIVE	CLEVELAND, OH 44125
13103	THERMALLOY COMPANY, INC.	2021 W VALLEY VIEW LANE P O BOX 34829	DALLAS, TX 75234
22526	BERG ELECTRONICS, INC.	YOUK EXPRESSWAY	NEW CUMBERLAND, PA 17070
23050	PRODUCT COMPONENTS CORP	30 LORRAINE AVE.	MT VERNON, NY 10553
24618	TRANSCON MFG. CO.	2655 PERTH ST.	DALLAS, TX 75220
26365	GRIES REPRODUCER CO., DIV. OF COATS AND CLARK, INC.	125 BEECHWOOD AVE.	NEW ROCHELLE, NY 10802
28520	HEYMAN MFG. CO.	147 N. MICHIGAN AVE.	KENILWORTH, NJ 07033
46384	PENN ENGINEERING AND MFG. CORP.	P O BOX 311	DOYLESTOWN, PA 18901
57668	R-OHM CORP.	16931 MILLIKEN AVE.	IRVINE, CA 92713
71159	BRISTOL SOCKET SCREW, DIV. OF AMERICAN CHAIN AND CABLE CO., INC.	P O BOX 2244, 40 BRISTOL ST.	WATERBURY, CT 06720
71785	TRW, CINCH CONNECTORS	1501 MORSE AVENUE	ELK GROVE VILLAGE, IL 60007
73743	FISCHER SPECIAL MFG. CO.	446 MORGAN ST.	CINCINNATI, OH 45206
73803	TEXAS INSTRUMENTS, INC., METALLURGICAL MATERIALS DIV.	34 FOREST STREET	ATTLEBORO, MA 02703
74445	HOLO-KROME CO.	31 BROOK ST. WEST	HARTFORD, CT 06110
78189	ILLINOIS TOOL WORKS, INC. SHAKEPROOF DIVISION	ST. CHARLES ROAD	ELGIN, IL 60120
78553	EATON CORPORATION, ENGINEERED FASTENERS DIVISION, TINNEMAN PLANT	PO BOX 6688, 8700 BROOKPARK RD.	CLEVELAND, OH 44101
79136	WALDES, KOHINOOR, INC.	47-16 AUSTEL PLACE	LONG ISLAND CITY, NY 11101
79807	WROUGHT WASHER MFG. CO.	2100 S. O BAY ST.	MILWAUKEE, WI 53207
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
83385	CENTRAL SCREW CO.	2530 CRESCENT DR.	BROADVIEW, IL 60153
85471	BOYD, A. B., CO.	2527 GRANT AVENUE	SAN LEANDRO, CA 94579
87308	N. L. INDUSTRIES, INC., SOUTHERN SCREW DIV.	P. O. BOX 1360	STATESVILLE, NC 28677
93907	TEXTRON INC. CAMCAR DIV	600 18TH AVE	ROCKFORD, IL 61101
95987	WECKESSER CO., INC.	4444 WEST IRVING PARK RD.	CHICAGO, IL 60641
98159	RUBBER TECK, INC.	19115 HAMILTON AVE., P O BOX 389	GARDENA, CA 90247

Replaceable Mechanical Parts—SC 503

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-1	337-1399-04		2		SHIELD,ELEC:SIDE	80009	337-1399-04
-2	200-1837-01	B010100 B010749	2		COVER,PLUG-IN:TOP & BOTTOM	80009	200-1837-01
	200-1837-02	B010750	2		COVER,PLUG-IN:TOP & BOTTOM (ATTACHING PARTS)	80009	200-1837-02
-3	211-0214-00		2		SCREW,MACHINE:4-40 X 0.25 INCH,TRH STL - - - * - - -	83385	OBD
-4	200-1780-01		1		COVER,HV:BOTTOM,ALUMINUM (ATTACHING PARTS)	80009	200-1780-01
-5	211-0008-00		2		SCREW,MACHINE:4-40 X 0.250,PNH,STL,CD PL	83385	OBD
-6	210-0851-00		2		WASHER,FLAT:0.119 ID X 0.375 INCH OD,STL - - - * - - -	12327	OBD
-7	200-2063-00		1		COVER,PLUG-IN: (ATTACHING PARTS)	80009	200-2063-00
-8	211-0008-00		2		SCREW,MACHINE:4-40 X 0.250,PNH,STL,CD PL - - - * - - -	83385	OBD
-9	366-1391-01		3		KNOB:GY,0.081 ID,0.28 OD,0.32 H	80009	366-1391-01
	213-0725-00		6		. SETSCREW:3-48 X 0.095 INCH,HEX SOC STL	74445	OBD
-10	366-1077-01		3		KNOB:GRAY,0.127 ID,0.5 OD,0.531H	80009	366-1077-01
	213-0246-00		3		. SETSCREW:5-40 X 0.093 ITL BK OXD,HEX SKT	71159	OBD
-11	366-1564-01	B010100 B011034	1		KNOB:SIL GY,0.125 ID,0.312 OD,0.853 H	80009	366-1564-01
	366-1564-03	B011035	1		KNOB:GY,0.312 OD X 0.868 H	80009	366-1564-03
-12	366-1519-04		1		KNOB:GY,WHT DOT,0.081 ID,0.3 OD,0.36 H	80009	366-1519-04
	213-0075-00		1		. SETSCREW:4-40 X 0.094,STL BK OXD,HEX SKT	000BK	OBD
-13	366-1747-00		1		KNOB:GY,DSPL 0.277ID,0.392 OD,0.466 H	80009	366-1747-00
	213-0246-00		1		. SETSCREW:5-40 X 0.093 ITL BK OXD,HEX SKT	71159	OBD
-14	366-1023-07		2		KNOB:GRAY,0.127 ID,0.392 OD,0.466	80009	366-1023-07
	213-0246-00		2		. SETSCREW:5-40 X 0.093 ITL BK OXD,HEX SKT	71159	OBD
-15	366-1031-08		2		KNOB:GY,CAL/W/ARROW,0.127 ID,0.392 OD	80009	366-1031-08
	213-0246-00		2		. SETSCREW:5-40 X 0.093 ITL BK OXD,HEX SKT	71159	OBD
-16	366-1733-02		2		KNOB:GY,1.0 OD X 0.8 H,W/SHAFT	80009	366-1733-02
-17	366-1405-04		1		KNOB:WHITE,CAL,0.082 ID,0.45 OD	80009	366-1405-04
	213-0048-00		1		. SETSCREW:4-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-18	366-1735-01		1		KNOB:GY,SEC/DIV,0.252 ID,0.72 OD,0.79 H	80009	366-1735-01
	213-0153-00		2		. SETSCREW:5-40 X 0.125,STL BK OXD,HEX SKT	000CY	OBD
-19	220-0633-00		1		NUT,PLAIN,KNURL:0.25-28 X 0.25 INCH L,BRS	80009	220-0633-00
-20	355-0170-00		1		STUD,SHOULDERED:6-32 X 0.40 INCH LONG	80009	355-0170-00
-21	-----		2		CONNECTOR,RCPT:(SEE J500 & J510 REPL)		
-22	210-0331-00		2		TERMINAL,LUG:0.375 ID,STEEL (ATTACHING PARTS)	80009	210-0331-00
-23	211-0008-00		2		SCREW,MACHINE:4-40 X 0.250,PNH,STL,CD PL - - - * - - -	83385	OBD
-24	-----		1		CONNECTOR,RCPT:(SEE J520 REPL)		
-25	210-0255-00		1		TERMINAL,LUG:0.391 ID,LOCKING,BRS CD PL	80009	210-0255-00
-26	348-0067-00		1		GROMMET,PLASTIC:0.312 INCH DIA	80009	348-0067-00
-27	358-0599-00		2		BUSHING,SLEEVE:0.125 ID X 0.234 THK,PLSTC	28520	B-187-125
-28	366-1691-01		6		PUSH BUTTON:GRAY,EJECTOR PIN MARK	80009	366-1691-01
-29	426-1206-01		6		FRAME,PUSH BTN:MOMENTARY,GRAY PLASTIC	80009	426-1206-01
-30	105-0719-00		1		LATCH,RETAINING:PLUG-IN (ATTACHING PARTS)	80009	105-0719-00
-31	213-0113-00		1		SCR,TPG,THD FOR:2-32 X 0.312 INCH,PNH STL - - - * - - -	93907	OBD
-32	105-0718-00		1		BAR,LATCH RLSE:	80009	105-0718-00
-33	366-1690-00		1		KNOB:SIL GY,0.53 X 0.23 X 1.059	80009	366-1690-00
-34	384-1513-00		1		EXTENSION SHAFT:8.94 L X 0.123 OD,PLASTIC	80009	384-1513-00
-35	376-0029-00		1		CPLG,SHAFT,RGD:0.128 ID X 0.312 OD X 0.5" L	80009	376-0029-00
	213-0075-00		2		. SETSCREW:4-40 X 0.094,STL BK OXD,HEX SKT	000BK	OBD
-36	-----		1		RES.,VAR,NONWIR:(SEE R530 REPL) (ATTACHING PARTS)		
-37	210-0583-00		1		NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
-38	210-0940-00		1		WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL - - - * - - -	79807	OBD
-39	-----		1		RES.,VAR,NONWIR:(SEE R532A,B REPL) (ATTACHING PARTS)		
-40	210-0583-00		1		NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
-41	210-0940-00		1		WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL - - - * - - -	79807	OBD

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Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-42	200-1809-00		1		COVER,VAR RES:HIGH VOLTAGE	80009	200-1809-00
-43	343-0002-00	B010100 B032219	1		CLAMP,LOOP:0.188 INCH DIA	95987	3-16-6B
	343-0144-00	B032220	1		CLAMP,LOOP:0.125 INCH ID,BLK NYLON (ATTACHING PARTS)	95987	1-8-2
-44	211-0008-00		1		SCREW,MACHINE:4-40 X 0.250,PNH,STL,CD PL	83385	OBD
-45	210-0851-00	B010100 B032219X	1		WASHER,FLAT:0.119 ID X 0.375 INCH OD,STL - - - * - - -	12327	OBD
-46	-----		1		RES.,VAR,NONWIR:(SEE R550 REPL) (ATTACHING PARTS)		
-47	210-0583-00		1		NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
-48	210-0940-00		1		WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL - - - * - - -	79807	OBD
-49	-----		1		RES.,VAR,NONWIR:(SEE R540 REPL) (ATTACHING PARTS)		
-50	210-0583-00		1		NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
-51	210-0940-00		1		WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL - - - * - - -	79807	OBD
-52	361-0143-00		1		WASHER,KEY:0.281 ID X 0.562 INCH OD	80009	361-0143-00
-53	343-0013-00		1		CLAMP,LOOP:0.375 ID,PLASTIC (ATTACHING PARTS)	95987	3-8-6B
-54	211-0008-00		1		SCREW,MACHINE:4-40 X 0.250,PNH,STL,CD PL	83385	OBD
-55	210-0851-00		1		WASHER,FLAT:0.119 ID X 0.375 INCH OD,STL - - - * - - -	12327	OBD
-56	333-2407-00	B010100 B011539	1		PANEL,FRONT:	80009	333-2407-00
	333-2407-01	B011540	1		PANEL,FRONT: (ATTACHING PARTS)	80009	333-2407-01
-57	211-0537-00		1		SCREW,MACHINE:6-32 X 0.375 INCH,TRH STL - - - * - - -	83385	OBD
-58	-----		2		LAMP,LED:(SEE DS500 & DS510 REPL)		
-59	337-2203-00		1		SHLD,IMPLOSION:BLUE POLYCARBONATE	80009	337-2203-00
-60	214-1700-00		1		SPRING,FLAT:73MM X 3.2MM,PH BRZ	0000M	214-1700-00
-61	386-3160-00		1		SUPPORT,CRT:FRONT	80009	386-3160-00
-62	386-3134-03		1		SUBPANEL,FRONT:PAINTED GRAY (ATTACHING PARTS)	80009	386-3134-03
-63	213-0123-00		4		SCREW,TPG,TF:6-32 X 0.375,SPCL TYPE,FLH - - - * - - -	93907	OBD
-64	213-0795-00		1		SETSCREW:0.375-32 X 0.54,0.375 OD,PL	80009	213-0795-00
-65	255-0334-00		1		PLASTIC CHANNEL:12.75 X 0.175X 0.155,NYL	11897	122-37-2500
-66	407-1623-00		1		BRACKET,PANEL:REAR (ATTACHING PARTS)	80009	407-1623-00
-67	211-0507-00		3		SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL - - - * - - -	83385	OBD
-68	351-0449-00		2		GUIDE,CKT BOARD: (ATTACHING PARTS)	80009	351-0449-00
-69	211-0062-00		4		SCREW,MACHINE:2-56 X 0.312,PNH,STL	83385	OBD
-70	210-0405-00		4		NUT,PLAIN,HEX.:2-56 X 0.188 INCH,BRS	73743	12157-50
-71	210-0001-00		4		WASHER,LOCK:INTL,0.092 ID X 0.18"OD,STL - - - * - - -	78189	1202-00-00-0541C
-72	-----		1		CKT BOARD ASSY:INTERFACE(SEE A90 REPL)		
-73	131-0608-00		6		TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
-74	386-3135-01		1		PANEL,REAR: (ATTACHING PARTS)	80009	386-3135-01
-75	213-0192-00		2		SCR,TPG,THD FOR:6-32 X 0.50 INCH,PNH STL	87308	OBD
-76	211-0507-00		2		SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
-77	386-3657-01		2		SUPPORT,PLUG IN: - - - * - - -	93907	OBD
-78	220-0625-00		2		NUT,SHEET SPR:6-32 THD,STL	78553	C8090-632-24
-79	386-1316-00		1		SUPPORT,CRT:REAR	80009	386-1316-00
-80	136-0696-00		1		SKT,PL-IN ELEK:ELCTR N TUBE,10 CONT,W/LEADS	80009	136-0696-00
-81	252-0562-00		FT		PLASTIC CHANNEL:0.100 X 0.120,POLYETHYLENE	06229	GS2
-82	334-3300-00		2		MARKER,IDENT:MARKED DANGER200V	80009	334-3300-00
-83	358-0281-00		2		GROMMET,PLASTIC:BLACK,U-SHAPED,0.375ID	80009	358-0281-00
-84	334-1379-00		1		LABEL:CRT,ADHESIVE BACK	80009	334-1379-00
-85	-----		1		COIL,TUBE,DEFL:(SEE L500 REPL)		
	348-0090-00		2		PAD,CUSHIONING:2.03 X 0.69 X 0.312	85471	OBD

Replaceable Mechanical Parts—SC 503

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
1-86	337-2437-00		1						SHIELD,CRT:	80009	337-2437-00
-87	426-1199-01		1						FR SECT,PLUG-IN:BOTTOM	80009	426-1199-01
-88	-----		1						CKT BOARD ASSY:TRIGGER SW(SEE A50 REPL) (ATTACHING PARTS)		
-89	211-0244-00		1						SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH STL - - - * - - -	78189	OBD
	-----								CKT BOARD ASSY INCLUDES:		
-90	-----		2						. SWITCH PB ASSY:(SEE S1011 & S1012 REPL)		
-91	-----		1						. SWITCH PB ASSY:(SEE S1013 REPL)		
-92	-----		1						. SWITCH PB ASSY:(SEE S1014 REPL)		
-93	343-0495-03		2						. CLIP,SWITCH:FRONT,7.5 MM,3 UNIT (ATTACHING PARTS)	80009	343-0495-03
-94	210-3033-00		3						. EYELET,METALLIC:0.59 OD X 0.156 INCH LONG - - - * - - -	07707	SE-25
-95	343-0499-03	B010100 B021859	2						. CLIP,SWITCH:7.5 MM,4 UNIT	80009	343-0499-03
	343-0499-12	B021860	2						. CLIP,SWITCH:REAR,7.5MM X 3 UNIT (ATTACHING PARTS)	80009	343-0499-12
-96	210-3033-00		3						. EYELET,METALLIC:0.59 OD X 0.156 INCH LONG - - - * - - -	07707	SE-25
-97	214-0579-00		2						. TERM,TEST POINT:BRS CD PL	80009	214-0579-00
-98	131-1425-00		1						. CONTACT SET,ELE:R ANGLE,0.150" L,STR OF 36	22526	65521-136
-99	-----		1						CKT BOARD ASSY:HORIZ DEFL(SEE A40 REPL) (ATTACHING PARTS)		
-100	211-0244-00		1						SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH STL - - - * - - -	78189	OBD
	-----								CKT BOARD ASSY INCLUDES:		
-101	136-0577-00		1						. CONNECTOR,RCPT,:6 CONTACT	22526	65001-015
-102	136-0260-02		1						. SKT,PL-IN ELEK:MICROCIRCUIT,16 DIP,LOW CLE	71785	133-51-92-008
-103	220-0665-00		1						. NUT,PLAIN,HEX.:SLFLKG,4-40 X0.25",PLSTC (ATTACHING PARTS)	23050	OBD
-104	211-0213-00		1						. SCREW,MACHINE:4-40 X 0.312 INCH,PNH NYLON - - - * - - -	23050	OBD
-105	214-0579-00		2						. TERM,TEST POINT:BRS CD PL	80009	214-0579-00
-106	136-0514-00		1						. SKT,PL-IN ELEC:MICROCIRCUIT,8 DIP	73803	CS9002-8
-107	129-0455-00		1						. SPACER,POST:0.305 L,W/4-40 THD THRU BRS	80009	129-0455-00
	672-0700-00		1						CKT BOARD ASSY:TRIGGER (ATTACHING PARTS)	80009	672-0700-00
-108	212-0109-00		2						SCREW,MACHINE:8-32 X 0.188 FILH,STL - - - * - - -	83385	OBD
	-----		1						. ACTR ASSY,CAM S:(SEE S2031 REPL) (ATTACHING PARTS)		
-109	211-0244-00		4						. SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH STL - - - * - - -	78189	OBD
	-----								. DRUM ASSY INCLUDES:		
-110	200-1332-00		1						. COVER,CAM SW:	80009	200-1332-00
-111	131-1248-00		1						. CONTACT,ELEC:SHAFT GND,NI BE	80009	131-1248-00
-112	210-0406-00		2						. NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	12161-50
-113	214-1704-01		2						. SPRING,FLAT:CAM SW DETENT,0.008 INCH THK	80009	214-1704-01
-114	214-1127-00		2						. ROLLER,DETENT:0.125 DIA X 0.125,SST	80009	214-1127-00
-115	105-0723-00		1						. STOP,ACTUATOR:MICRO SWITCH (ATTACHING PARTS)	80009	105-0723-00
-116	354-0219-00		1						. RING,RETAINING:FOR 0.25 INCH SHAFT	79136	5103-25-MD-R
-117	401-0155-00		1						. BEARING,CAM SW:FRONT - - - * - - -	80009	401-0155-00
-118	210-0406-00		2						. NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	12161-50
-119	401-0156-00		1						. BEARING,CAM SW:REAR	80009	401-0156-00
-120	-----		1						. CKT BOARD ASSY:TRIGGER(SEE A30 REPL)		
-121	131-0604-00		10						. CONTACT,ELEC:CKT BD SW,SPR,CU BE	80009	131-0604-00
-122	351-0213-00		1						. POST,CKT BD MTG:0.285 L X 0.219 OD,BRS	80009	351-0213-00
-123	136-0631-00		1						. SOCKET,PLUG-IN:9 PIN FEMALE	00779	1-380949-9
	136-0547-00		2						. CONNECTOR,RCPT,:6 PIN,FEMALE	00779	1-380949-6
-124	129-0455-00		1						. SPACER,POST:0.305 L,W/4-40 THD THRU BRS	80009	129-0455-00
-125	214-0579-00		3						. TERM,TEST POINT:BRS CD PL	80009	214-0579-00
-126	344-0154-00		4						. CLIP,ELECTRICAL:FUSE,CKT BD MT	80009	344-0154-00
-127	131-0566-00		13						. BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	57668	JWW-0200E0

Replaceable Mechanical Parts—SC 503

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
1-128	131-0608-00			28	.	.	.	.	.	TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
-129	-----			6	.	.	.	.	.	CONNECTOR BUDY:(SEE J3031,3032,3053,7031, J8041,9031 REPL)		
-130	136-0252-07			6	.	.	.	.	.	SOCKET,PIN CONN:W/O DIMPLE	22526	75060-012
-131	136-0514-00			2	.	.	.	.	.	SKT,PL-IN ELEC:MICROCIRCUIT,8 DIP	73803	CS9002-8
-132	136-0260-02			3	.	.	.	.	.	SKT,PL-IN ELEK:MICROCIRCUIT,16 DIP,LOW CLE	71785	133-51-92-008
-133	343-0007-00			2	.	.	.	.	.	CLAMP,LOOP: (ATTACHING PARTS)	95987	5-8-6B
-134	211-0012-00			2	.	.	.	.	.	SCREW,MACHINE:4-40 X 0.375,PNH STL CD PL	83385	OBD
	672-0699-00			1	.	.	.	.	.	CKT BOARD ASSY:MAIN	80009	672-0699-00
-135	384-1380-00			1	.	.	.	.	.	EXTENSION SHAFT:5.2 L X 0.081 OD,SST,PSVT	80009	384-1380-00
-136	376-0050-00			1	.	.	.	.	.	CPLG,SHAFT,FLEX:FOR 0.081/0.125 INCH SHAFTS	80009	376-0050-00
	213-0022-00			4	.	.	.	.	.	SETSCREW:4-40 X 0.188 INCH,HEX SOC STL	74445	OBD
	343-0007-00			1	.	.	.	.	.	CLAMP,LOOP: (ATTACHING PARTS)	95987	5-8-6B
	211-0012-00			2	.	.	.	.	.	SCREW,MACHINE:4-40 X 0.375,PNH STL CD PL	83385	OBD
	210-0803-00			2	.	.	.	.	.	WASHER,FLAT:0.15 ID X 0.032 THK,STL CD PL	12327	OBD
	-----			1	.	.	.	.	.	DRUM ASSY CAM S:(SEE S2011 REPL) (ATTACHING PARTS)		
-137	211-0116-00			4	.	.	.	.	.	SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	OBD
	131-0963-00			1	.	.	.	.	.	CONTACT,ELEC:GROUNDING	000EX	OBD
-138	200-2107-00			1	.	.	.	.	.	COVER,CAM SW:15 ELEMENT,ALUMINUM (ATTACHING PARTS)	80009	200-2107-00
-139	211-0008-00			4	.	.	.	.	.	SCREW,MACHINE:4-40 X 0.250,PNH,STL,CD PL	83385	OBD
-140	210-0004-00			4	.	.	.	.	.	WASHER,LOCK:#4 INTL,0.015THK,STL CD PL	000BK	OBD
-141	131-0963-00			1	.	.	.	.	.	CONTACT,ELEC:GROUNDING	000EX	OBD
-142	210-0406-00			2	.	.	.	.	.	NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	12161-50
-143	214-1139-03			1	.	.	.	.	.	SPRING,FLAT:RED COLORED	80009	214-1139-03
	214-1139-02			1	.	.	.	.	.	SPRING,FLAT:GREEN COLORED	80009	214-1139-02
-144	214-1752-00			2	.	.	.	.	.	ROLLER,DETENT:	80009	214-1752-00
-145	105-0754-00			1	.	.	.	.	.	ACTUATOR,CAM SW:TIME/DIV	80009	105-0754-00
-146	384-0878-07			1	.	.	.	.	.	SHAFT,CAM SW:OUTER CONCENTRIC W/DRIVER (ATTACHING PARTS)	80009	384-0878-07
-147	354-0390-00			1	.	.	.	.	.	RING,RETAINING:0.338 ID X 0.025" THK,STL	79136	5100-37MD
-148	401-0180-00			1	.	.	.	.	.	BEARING,CAM SW:FRONT & REAR	80009	401-0180-00
-149	210-0406-00			2	.	.	.	.	.	NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	12161-50
-150	401-0178-01			1	.	.	.	.	.	BEARING,CAM SW:CENTER/REAR	80009	401-0178-01
-151	384-1503-00			3	.	.	.	.	.	EXTENSION SHAFT:5.4 L X 0.124DIA,PLASTIC	80009	384-1503-00
-152	376-0029-00			2	.	.	.	.	.	CPLG,SHAFT,RGD:0.128 ID X 0.312 OD X 0.5"L	80009	376-0029-00
	213-0075-00			2	.	.	.	.	.	SETSCREW:4-40 X 0.094,STL BK OXD,HEX SKT	000BK	OBD
-153	672-0703-00			2	.	.	.	.	.	CKT BOARD ASSY:ATTENUATOR	80009	672-0703-00
	-----			-	.	.	.	.	.	EACH ACTUATOR ASSY INCLUDES:		
-154	214-2567-00			2	.	.	.	.	.	LEVER,SWITCH:AC-GND-DC	80009	214-2567-00
-155	386-3879-00			1	.	.	.	.	.	SPRT,CAM SWITCH: (ATTACHING PARTS)	80009	386-3879-00
-156	211-0244-00			4	.	.	.	.	.	SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH STL	78189	OBD
-157	-----			1	.	.	.	.	.	CKT BOARD ASSY:ATTEN,R & L(SEE A70,A71 REPL) (ATTACHING PARTS)		
-158	211-0116-00	B010100	B011019	3	.	.	.	.	.	SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	OBD
	211-0679-00	B011020		3	.	.	.	.	.	SCR,ASSEM WSHR:4-40 X 0.25 L,PNH,BRASS	78189	OBD
	-----			-	.	.	.	.	.	CKT BOARD ASSY INCLUDES:		
-159	131-0604-00			6	.	.	.	.	.	CONTACT,ELEC:CKT BD SW,SPR,CU BE	80009	131-0604-00
-160	136-0630-00			1	.	.	.	.	.	SKT,PL-IN ELEK:CKT CARD,4 CONT,FEMALE	00779	1-380949-4
-161	-----			1	.	.	.	.	.	CKT BOARD ASSY:GAIN,R & L(SEE A60,A61 REPL) (ATTACHING PARTS)		
-162	211-0116-00	B010100	B011019	3	.	.	.	.	.	SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	OBD
	211-0679-00	B011020		3	.	.	.	.	.	SCR,ASSEM WSHR:4-40 X 0.25 L,PNH,BRASS	78189	OBD

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
1-	-----		-						. . . CKT BOARD ASSY INCLUDES:		
-163	131-2189-00		1						. . . CONN,RCPT,ELEC:CKT BD,3 CONT,FEMALE	22526	65001-119
-164	131-0604-00		11						. . . CONTACT,ELEC:CKT BD SW,SPR,CU BE	80009	131-0604-00
-165	136-0252-04		6						. . . SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS	22526	75060-007
	131-0566-00		2						. . . BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	57668	JWW-0200E0
	136-0632-00		1						. . . SOCKET,PLUG-IN:8 PIN,FEMALE	00779	1-380949-8
	-----		1						. . . ACTUATOR ASSY:(SEE S2021A,B REPL) (ATTACHING PARTS)		
	211-0116-00	B010100 B011019	3						. . . SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	OBD
	211-0679-00	B011020	3						. . . SCR,ASSEM WSHR:4-40 X 0.25 L,PNH,BRASS	78189	OBD
	-----		-						. . . ACTUATOR ASSY INCLUDES:		
-166	210-0406-00		2						. . . NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	12161-50
-167	214-1126-01		2						. . . SPRING,FLAT:0.7 X 0.125,CU BE GRN CLR	80009	214-1126-01
-168	214-1752-00		2						. . . ROLLER,DETENT:	80009	214-1752-00
-169	401-0402-00		1						. . . BEARING,CAM SW:END	80009	401-0402-00
-170	105-0772-00		1						. . . ACTUATOR,CAM SW:AC-GROUND-DC	80009	105-0772-00
-171	210-0406-00		2						. . . NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	12161-50
-172	401-0369-00		1						. . . BEARING,CAM SW:CENTER,0.6 DIA	80009	401-0369-00
-173	105-0771-00		1						. . . ACTUATOR,CAM SW:ATTENUATOR	80009	105-0771-00
-174	210-0406-00		2						. . . NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	12161-50
-175	214-1126-01		2						. . . SPRING,FLAT:0.7 X 0.125,CU BE GRN CLR	80009	214-1126-01
-176	214-1752-00		2						. . . ROLLER,DETENT:	80009	214-1752-00
-177	401-0402-00		1						. . . BEARING,CAM SW:END	80009	401-0402-00
-178	-----		1						. . . CKT BOARD ASSY:MAIN(SEE A10 REPL)		
-179	-----		1						. . . CKT BOARD ASSY:HV(SEE A80 REPL) (ATTACHING PARTS)		
-180	211-0558-00		1						. . . SCREW,MACHINE:6-32 X 0.250 BDGH,NYL,SLOT	26365	921-1150-0014
-181	385-0016-00		1						. . . SPACER,POST:1.0 L W/6-32 THD THRU,NYLON (ATTACHING PARTS)	80009	385-0016-00
-182	211-0558-00		1						. . . SCREW,MACHINE:6-32 X 0.250 BDGH,NYL,SLOT	26365	921-1150-0014
-183	-----		1						. . . RES.,VAR,NONWIR:(SEE R5011 REPL)		
-184	361-0515-00		1						. . . SPACER,SWITCH:PLASTIC	80009	361-0515-00
-185	-----		2						. . . RES.,VAR,NONWIR:(SEE R4049 & R4064 REPL)		
-186	337-2428-00		1						. . . SHIELD,ELEC:HIGH VOLTAGE (ATTACHING PARTS)	80009	337-2428-00
-187	211-0244-00		2						. . . SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH STL	78189	OBD
-188	334-2363-00		2						. . . MARKER INDENT:WARNING,DANGER,HV	80009	334-2363-00
	334-3300-00		1						. . . MARKER,IDENT:MARKED DANGER200V	80009	334-3300-00
	210-0921-00		1						. . . WASHER,MICA:0.50 X 0.141 X 0.005 INCH THK	80009	210-0921-00
-189	337-2517-00		2						. . . SHIELD,ELEC:CIRCUIT BOARD	80009	337-2517-00
-190	136-0252-04		119						. . . SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS	22526	75060-007
-191	-----		5						. . . CONNECTOR,BODY:(SEE J2031,J2051,J3032, J3052,J3053 REPL)		
-192	131-0566-00		2						. . . BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	57668	JWW-0200E0
-193	214-0579-00		3						. . . TERM,TEST POINT:BRS CD PL	80009	214-0579-00
-194	131-0608-00		13						. . . TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
-195	131-0589-00		30						. . . TERMINAL,PIN:0.46 L X 0.025 SQ	22526	48283-029
-196	131-0604-00		15						. . . CONTACT,ELEC:CKT BD SW,SPR,CU BE	80009	131-0604-00
-197	136-0514-00		2						. . . SKT,PL-IN ELEC:MICROCIRCUIT,8 DIP	73803	CS9002-8
-198	136-0269-02		2						. . . SKT,PL-IN ELEC:MICROCIRCUIT,14 DIP,LOW CLE	73803	CS9002-14
-199	131-1857-00		1						. . . TERM. SET,PIN:36/0.025 SQ PIN,ON 0.1 CTRS	22526	65500136
	346-0032-00		1						. . . STRAP,RETAINING:0.075 DIA X 4.0 L,MLD RBR	98159	2859-75-4
-200	220-0829-00		4						. . . NUT,PRESSMOUNT:4-40 X 0.216 OD,STL CD PL	46384	KF2-440
-201	131-0639-00		4						. . . CONTACT,ELEC:SPR CLIP TYPE	22526	44642
	198-3548-00		1						. . . WIRE SET,ELEC:	80009	198-3548-00
-202	119-0975-00		1						. . . DELAY LINE,ELEC:140NS,150 OHMS (ATTACHING PARTS)	80009	119-0975-00
-203	211-0097-00		2						. . . SCREW,MACHINE:4-40 X 0.312 INCH,PNH STL	83385	OBD
	-----		-						. . . DELAY LINE INCLUDES:		
	131-1721-00		2						. . . CONTACT,ELEC:DELAY LINE,0.035 DIA MALE	80009	131-1721-00

Replaceable Mechanical Parts—SC 503

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
1-204	426-1493-00		1	.	.	.	.	.	MOUNT,DLY LINE:BOTTOM,ALUMINUM	80009	426-1493-00
	672-0701-00		1	.	.	.	.	.	CKT BOARD ASSY:FOCUS & INTENSITY	80009	672-0701-00
-205	384-1502-00		1	.	.	.	.	.	EXTENSION SHAFT:5.0 L X 0.081DIA,SST	80009	384-1502-00
	376-0039-00		1	.	.	.	.	.	ADPT,SHAFT,CPLG:0.128 AND 0.082"DIA SHAFT	80009	376-0039-00
	213-0075-00		2	.	.	.	.	.	SETSCREW:4-40 X 0.094,STL BK OXD,HEX SKT	000BK	OBD
	-----		1	.	.	.	.	.	ACTUATOR ASSY:(SEE S6021 REPL)		
-206	200-1660-00		1	.	.	.	.	.	COVER,CAM SW.:5 ELEMENTS	80009	200-1660-00
-207	131-1248-00		1	.	.	.	.	.	CONTACT,ELEC:SHAFT GND,NI BE	80009	131-1248-00
-208	210-0406-00		2	.	.	.	.	.	NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	12161-50
-209	214-1704-01		2	.	.	.	.	.	SPRING,FLAT:CAM SW DETENT,0.008 INCH THK	80009	214-1704-01
-210	214-1127-00		2	.	.	.	.	.	ROLLER,DETENT:0.125 DIA X 0.125,SST	80009	214-1127-00
-211	105-0773-00		1	.	.	.	.	.	ACTUATOR,CAM SW:VERTICAL MODE (ATTACHING PARTS)	80009	105-0773-00
-212	354-0219-00		1	.	.	.	.	.	RING,RETAINING:FOR 0.25 INCH SHAFT - - - * - - -	79136	5103-25-MD-R
-213	401-0155-00		1	.	.	.	.	.	BEARING,CAM SW:FRONT	80009	401-0155-00
-214	210-0406-00		2	.	.	.	.	.	NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	12161-50
-215	401-0156-00		1	.	.	.	.	.	BEARING,CAM SW:REAR	80009	401-0156-00
-216	-----		1	.	.	.	.	.	CKT BOARD ASSY:F & I(SEE A20 REPL) (ATTACHING PARTS)		
-217	211-0244-00		4	.	.	.	.	.	SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH STL - - - * - - -	78189	OBD
-218	-----		1	.	.	.	.	.	RES.,VAR,NONWIR:(SEE R1013 REPL) (ATTACHING PARTS)		
-219	210-0583-00		1	.	.	.	.	.	NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
-220	210-0046-00		1	.	.	.	.	.	WASHER,LOCK:0.261 ID,INTL,0.018 THK,BRS - - - * - - -	78189	1214-05-00-0541C
-221	136-0514-00		2	.	.	.	.	.	SKT,PL-IN ELEC:MICROCIRCUIT,8 DIP	73803	CS9002-8
-222	136-0252-07	XB032220	12	.	.	.	.	.	SOCKET,PIN CONN:W/O DIMPLE	22526	75060-012
-223	131-0604-00		5	.	.	.	.	.	CONTACT,ELEC:CKT BD SW,SPR,CU BE	80009	131-0604-00
-224	136-0260-02		1	.	.	.	.	.	SKT,PL-IN ELEC:MICROCIRCUIT,16 DIP,LOW CLE	71785	133-51-92-008
-225	136-0548-00		1	.	.	.	.	.	CONNECTOR,RCPT.:SIDE ENTRY,10CONTACT	00779	2-380949-0
	136-0547-00		1	.	.	.	.	.	CONNECTOR,RCPT.:6 PIN,FEMALE	00779	1-380949-6
-226	342-0324-00		1	.	.	.	.	.	INSULATOR,DISC:TO-5 TRANSISTOR	13103	7717-5N-BLUE
-227	131-0608-00		21	.	.	.	.	.	TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
-228	214-0579-00		1	.	.	.	.	.	TERM,TEST POINT:BRZ CD PL	80009	214-0579-00
-229	131-0566-00		2	.	.	.	.	.	BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	57668	JWW-0200E0
-230	129-0455-00		1	.	.	.	.	.	SPACER,POST:0.305 L,W/4-40 THD THRU BRS	80009	129-0455-00
-231	386-3263-00		1	.	.	.	.	.	PL,VAR RES MTG:	80009	386-3263-00
-232	343-0765-00	B010100 B032219X	2	.	.	.	.	.	CLAMP,HEAT SINK:POLYPHENYLENESULFIDE (ATTACHING PARTS)	80009	343-0765-00
-233	211-0008-00	B010100 B032219X	2	.	.	.	.	.	SCREW,MACHINE:4-40 X 0.250,PNH,STL,CD PL - - - * - - -	83385	OBD
-234	214-2744-00	B010100 B032219	1	.	.	.	.	.	HEAT SINK,XSTR:(4) TO-202,AL	80009	214-2744-00
	214-3427-00	B032220	1	.	.	.	.	.	HEAT SINK,XSTR:TO-39,AL (ATTACHING PARTS)	80009	214-3427-00
-235	211-0008-00		1	.	.	.	.	.	SCREW,MACHINE:4-40 X 0.250,PNH,STL,CD PL - - - * - - -	83385	OBD
-236	210-1294-00		4	.	.	.	.	.	WASHER,FLAT:0.128 ID X 0.06 THK	13103	B-375-120-62
-237	214-1611-00	XB032220	4	.	.	.	.	.	HEAT SINK,ELEC:0.280 ID,W/ 4-40 THREADS (ATTACHING PARTS)	05820	260-4T5E-C4631
-238	211-0040-00	XB032220	4	.	.	.	.	.	SCREW,MACHINE:4-40 X 0.25",BDGH PLSTC - - - * - - -	26365	OBD
-239	386-1130-00	XB032220	4	.	.	.	.	.	INSULATOR DISC:TRANSISTOR,NYLON	13103	7717-15N
-240	-----		1	.	.	.	.	.	RES.,VAR:(SEE R7013 REPL)		
-241	214-1061-00		1	.	.	.	.	.	SPRING,GROUND:FLAT	80009	214-1061-00
-242	426-1245-02		1	.	.	.	.	.	FR SECT,PLUG-IN:TOP LEFT	80009	426-1245-02
-243	426-1246-00		1	.	.	.	.	.	FR SECT,PLUG-IN:RIGHT SIDE,TOP AND BOTTOM	80009	426-1246-00
-244	179-2603-00		1	.	.	.	.	.	WIRING HARNESS,:CHASSIS	80009	179-2603-00
-245	352-0169-00		3	.	.	.	.	.	HLDR,TERM CONN:2 WIRE BLACK	80009	352-0169-00
-246	352-0161-00		2	.	.	.	.	.	HLDR,TERM CONN:3 WIRE,BLACK	80009	352-0161-00
-247	352-0162-02		2	.	.	.	.	.	CONN BODY,PL,EL:4 WIRE RED	80009	352-0162-02
	352-0162-03		1	CONN BODY,PL,EL:4 WIRE ORANGE	80009	352-0162-03
-248	352-0163-03		1	CONN BODY,PL,EL:5 WIRE ORANGE	80009	352-0163-03

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Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
1-249	352-0164-04		1						. CONN BODY,PL,EL:6 WIRE YELLOW	80009	352-0164-04
	198-3821-00		1						WIRE SET,ELEC:	80009	198-3821-00
-250	131-0707-00		29						. CONNECTOR,TERM:22-26 AWG,BRS& CU BE GOLD	22526	47439
-251	131-1538-00		3						. CONTACT,ELEC:CRIMP-ON,22-26 AWG WIRE	22526	75369-002
-252	352-0164-06		1						. CONN BODY,PL,EL:6 WIRE BLUE	80009	352-0164-06
-253	352-0163-05		1						. CONN BODY,PL,EL:5 WIRE GREEN	80009	352-0163-05
-254	352-0161-02		1						. CONN BODY,PL,EL:3 WIRE RED	80009	352-0161-02
	352-0161-03		4						. CONN BODY,PL,EL:3 WIRE ORANGE	80009	352-0161-03
-255	352-0169-00		3						. HLDR,TERM CONN:2 WIRE BLACK	80009	352-0169-00
-256	175-0863-00		FT						. WIRE,ELECTRICAL:2 WIRE RIBBON	08261	SS-0222-7(1061)
-257	175-0826-00		FT						. WIRE,ELECTRICAL:3 WIRE RIBBON	80009	175-0826-00
-258	175-0828-00		FT						. WIRE,ELECTRICAL:5 WIRE RIBBON	08261	SS-0526-710610C
-259	175-0829-00		FT						. WIRE,ELECTRICAL:6 WIRE RIBBON	08261	SS-0626-710610C
	006-0531-00		1						. STRAP,TIEDOWN,E:BLUE PLASTIC BEADED	24618	700-3688

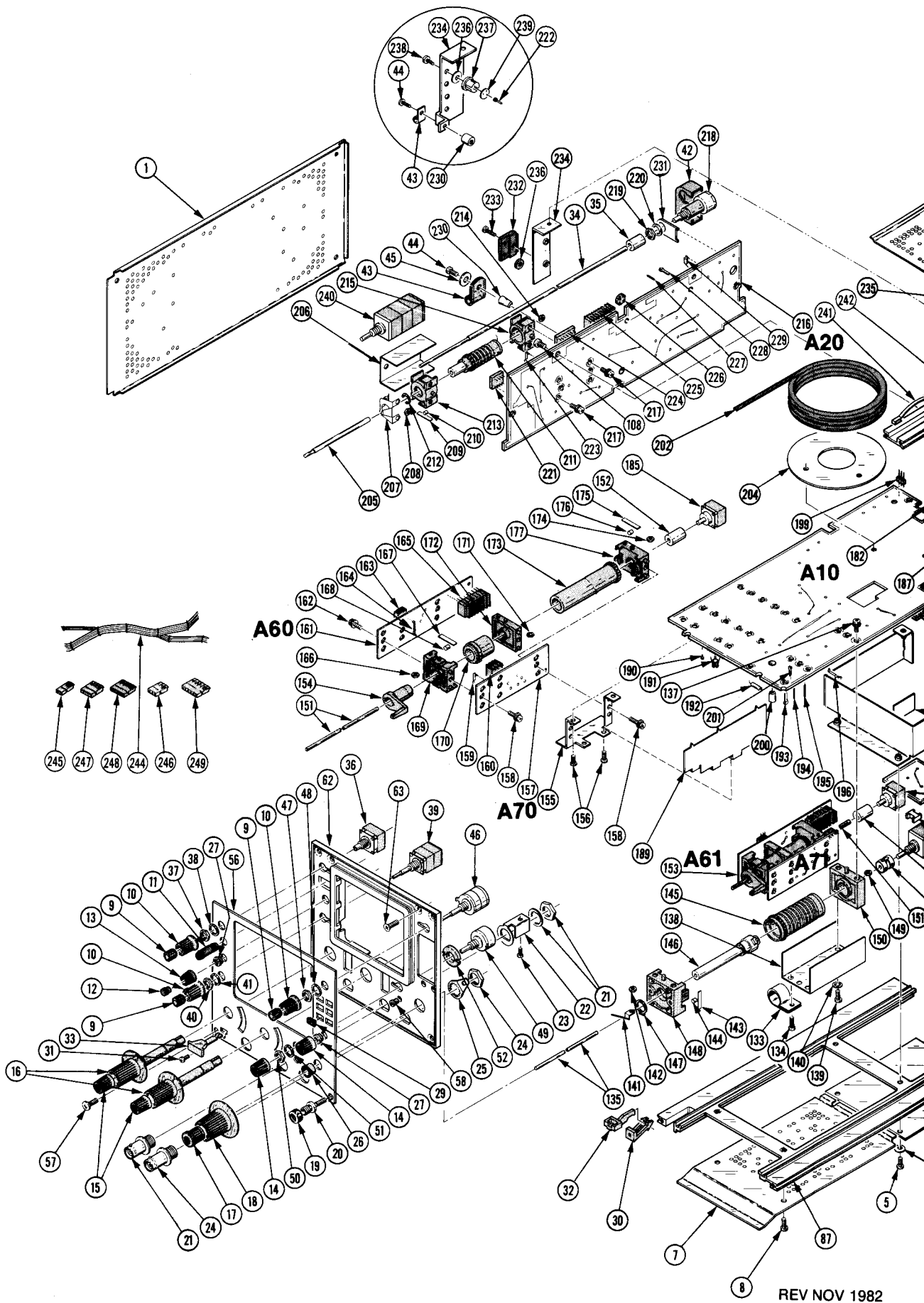


FIG. 1 EXPLODED

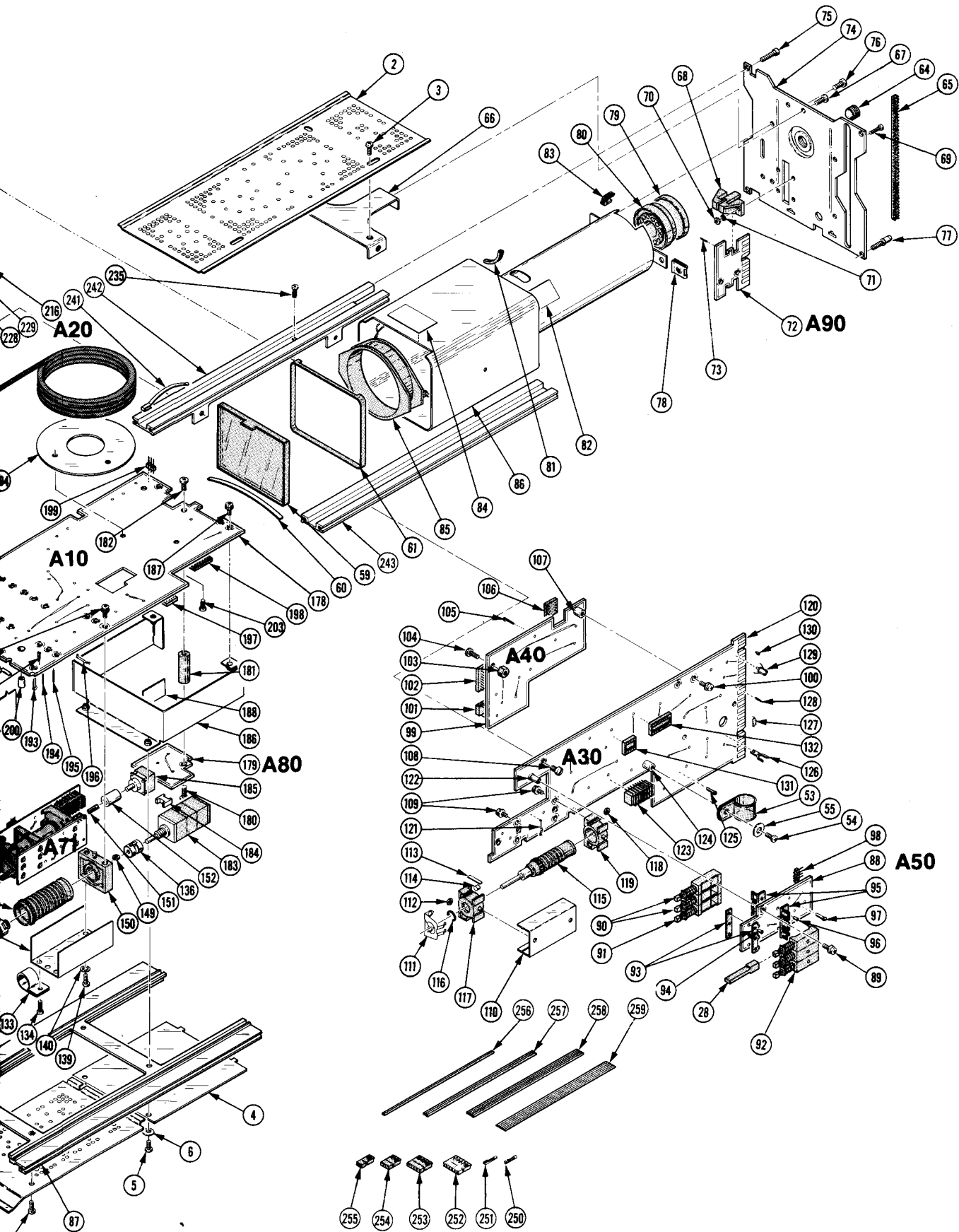


Fig. & Index No.	Tektronix Part No.	Serial/Model No.		Qty						Name & Description	Mfr Code	Mfr Part Number	
		Eff	Dscont		1	2	3	4	5				
	070-2636-02			1							MANUAL, TECH: INSTRUCTION	80009	070-2636-02

ACCESSORIES