



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

**7A26
DUAL TRACE
AMPLIFIER**

INSTRUCTION MANUAL

**Tektronix, Inc.
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Beaverton, Oregon 97077**

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Product Group 42

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INSTRUMENT SERIAL NUMBERS

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

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

TABLE OF CONTENTS

	PAGE
SECTION 1 OPERATING INSTRUCTIONS	
7A26 Features	1-1
Installation	1-1
General Operating Information	1-1
7A26 Front-panel Controls and Connectors	1-2
Basic Applications	1-4
SECTION 2 SPECIFICATION	
Introduction	2-1
Electrical Characteristics	2-1
Environmental Characteristics	2-2
Physical Characteristics	2-2
WARNING	
<i>The remaining portion of this Table of Contents lists the servicing instructions. These servicing instructions are for use by qualified personnel only. To avoid electrical shock, do not perform any servicing other than that called out in the operating instructions unless qualified to do so.</i>	
SECTION 3 THEORY OF OPERATION	
Introduction	3-1
Block Diagram	3-1
Detailed Circuit Description	3-1
SECTION 4 MAINTENANCE	
Introduction	4-1
Preventive Maintenance	4-1
Troubleshooting	4-1
Corrective Maintenance	4-3
Troubleshooting Chart	4-5
Repackaging for Shipment	4-8
SECTION 5 CALIBRATION	
Introduction	5-1
Performance Check	5-1
Test Equipment Required	5-1
Calibration Procedure	5-3
Index to Calibration Procedure	5-3
SECTION 6 ELECTRICAL PARTS LIST	
Parts Ordering Information	
Abbreviations and Symbols	
SECTION 7 DIAGRAMS AND CIRCUIT BOARD ILLUSTRATIONS	
Symbols and Reference Designators	
SECTION 8 MECHANICAL PARTS LIST	
Mechanical Parts List Information	
Index of Mechanical Parts Illustrations	
Mechanical Parts List	
CHANGE INFORMATION & TEST EQUIPMENT	

OPERATORS SAFETY SUMMARY

The following safety information applies to all operators and service personnel. Specific warnings and cautions will be found 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.

DO NOT REMOVE INSTRUMENT COVERS

To avoid electric-shock hazard, operating personnel must not remove the protective instrument covers. Component replacement and internal adjustments must be made by qualified service personnel only.

DO NOT OPERATE IN EXPLOSIVE ATMOSPHERE

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

WARNING

CAUTION

GROUNDING THE INSTRUMENT

To reduce electrical-shock hazard, the mainframe (oscilloscope) chassis must be properly grounded. Refer to the mainframe manual for grounding information.

PREVENT INSTRUMENT DAMAGE

Plug-in units should not be installed or removed without first turning the instrument power off, to prevent instrument damage.

SERVICE SAFETY SUMMARY

FOR QUALIFIED SERVICE PERSONNEL ONLY

Refer also to the preceding Operators Safety Summary.

The following are safety precautions which appear in the servicing information sections of this manual. This Servicing Safety Summary is in addition to the Operators Safety Summary given previously.

WARNING

DO NOT SERVICE ALONE

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

DISCONNECT INSTRUMENT POWER

To avoid electric-shock disconnect the instrument from the power source before removing protective panels, soldering, or replacing components.

SILICONE GREASE HANDLING

Handle silicone grease with care. Avoid getting the silicone grease in your eyes. Wash hands thoroughly after use.

CAUTION

AVOID EXCESSIVE MOISTURE

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

USE PROPER CLEANING AGENTS

Avoid the use of chemical cleaning agents which might damage the plastic used in this instrument. Use a non-residue type of cleaner, preferably isopropyl alcohol, totally denatured ethyl alcohol, or Freon TF. Before using any other type of cleaner, consult your Tektronix Service Center or representative.

DO NOT USE PIN SOCKETS FOR CONNECTION POINTS

The spring tension of the pin sockets ensures a good connection between the circuit board and the pin. This spring tension can be destroyed by using the pin sockets as a connecting point for spring-loaded probe tips, alligator clips, etc.

EXERCISE CARE WHEN CHECKING DIODES

When checking diodes, do not use an ohmmeter scale that has a high internal current, since high currents may damage the diodes under test.

EXERCISE CARE WHEN SOLDERING ON MULTI-LAYER BOARDS

All but the Readout circuit board in the instrument are multi-layer type boards with a conductive path laminated between the top and bottom board layers. All soldering on these boards should be done with extreme care to prevent breaking the connections to this center conductor. Only experienced maintenance personnel should attempt repair of these boards.

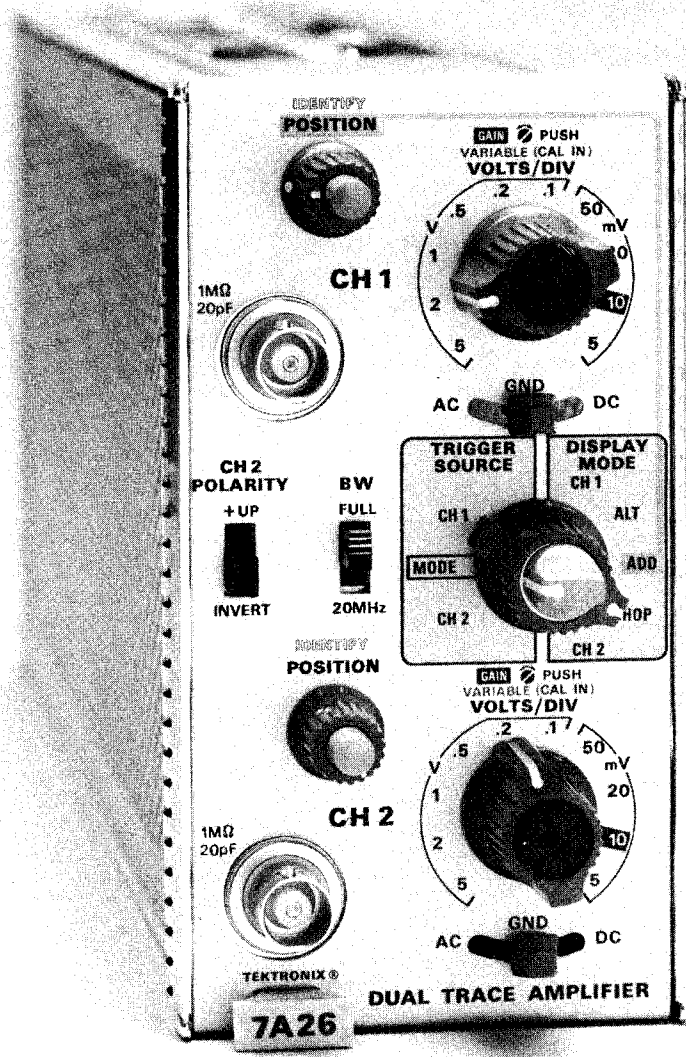


Fig. 1-1. 7A26 Dual Trace Amplifier.

OPERATING INSTRUCTIONS

7A26 Features

The 7A26 Dual Trace Amplifier plug-in unit is designed for use with TEKTRONIX 7000-Series Oscilloscopes. The 7A26 is a dual-channel wide-bandwidth amplifier. Internal gain and compensation circuits are automatically switched to correspond to the setting of the VOLTS/DIV switch. Channel 2 can be inverted for differential measurements.

PRELIMINARY INFORMATION

Installation

The 7A26 is calibrated and ready for use as received. It can be installed in any compartment of TEKTRONIX 7000-series oscilloscopes, but is intended for principal use in vertical plug-in compartments. To install, align the upper and lower rails of the 7A26 with the oscilloscope tracks and fully insert it. The front will be flush with the front of the oscilloscope when the 7A26 is fully inserted, and the latch at the bottom-left corner of the 7A26 will be in place against the front panel. See Fig. 1-2.

To remove the 7A26, pull on the latch (which is inscribed with the unit identification "7A26") and the 7A26 will unlatch. Continue pulling on the latch to slide the 7A26 out of the oscilloscope.

GENERAL OPERATING INFORMATION

Introduction

For single-trace operation, either of the two identical amplifier channels can be used independently by setting the DISPLAY MODE and TRIGGER SOURCE switches to CH 1 or CH 2 and connecting the signal to be observed to the appropriate input. In the discussions to follow, single-trace operations using CH 1 only apply equally to CH 2 only.

Signal Connections

In general, probes offer the most convenient means of connecting a signal to the input of the 7A26. A 10X attenuation probe offers a high input impedance and allows the circuit under test to perform very close to normal operating conditions.

Any TEKTRONIX probe, with a readout coding ring can be used with TEKTRONIX 7A-series amplifier units equipped with readout. The readout coding ring on the probe connects to a circuit in the amplifier unit which automatically corrects the readout displayed on the CRT to the actual deflection factor at the tip of the probe being

used. For probes to be used with amplifier units with or without readout, see the Tektronix, Inc. catalog.

Vertical Gain Check and Adjustment

To check the gain of either channel, set the VOLTS/DIV switch to 10 mV and connect 40 millivolts, 1 kilohertz signal from the oscilloscope calibrator to the input connector of the channel being checked. The vertical deflection should be exactly four divisions. If not, adjust the front-panel GAIN for exactly four divisions of deflection. The GAIN adjustment is engaged by pressing in the GAIN control knob and turning the knob with a narrow-blade screwdriver (see Fig. 1-3 Front Panel Controls and Connectors). Turn the knob clockwise, then counterclockwise, until the GAIN control is engaged. When the GAIN control is engaged, the vertical deflection will change as the knob is turned. Turn the GAIN control knob with the screwdriver until the deflection is set to exactly four divisions, then remove the screwdriver.

Input Coupling

The Channel 1 and Channel 2 coupling (AC-GND-DC) switches allow a choice of input coupling methods. The type of display desired and the applied signal will determine the coupling to use.

The DC coupling position must be used to display the DC component of the signal. It must also be used to display AC signals below about 30 hertz (ten hertz with a 10X probe) and square waves with low-frequency components as these signals are attenuated in the AC position.

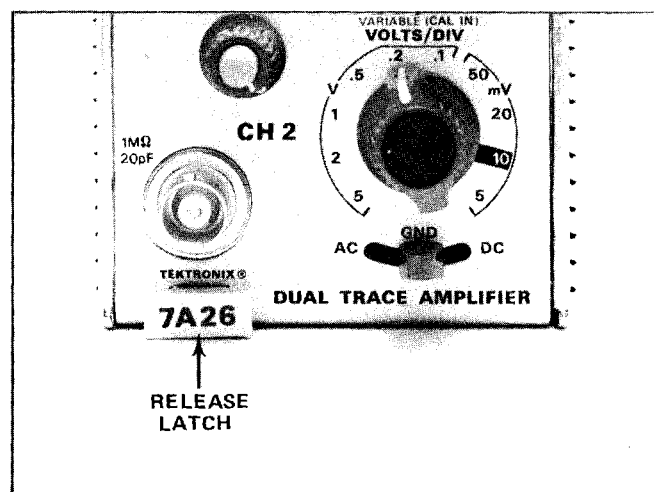


Fig. 1-2. Release latch.

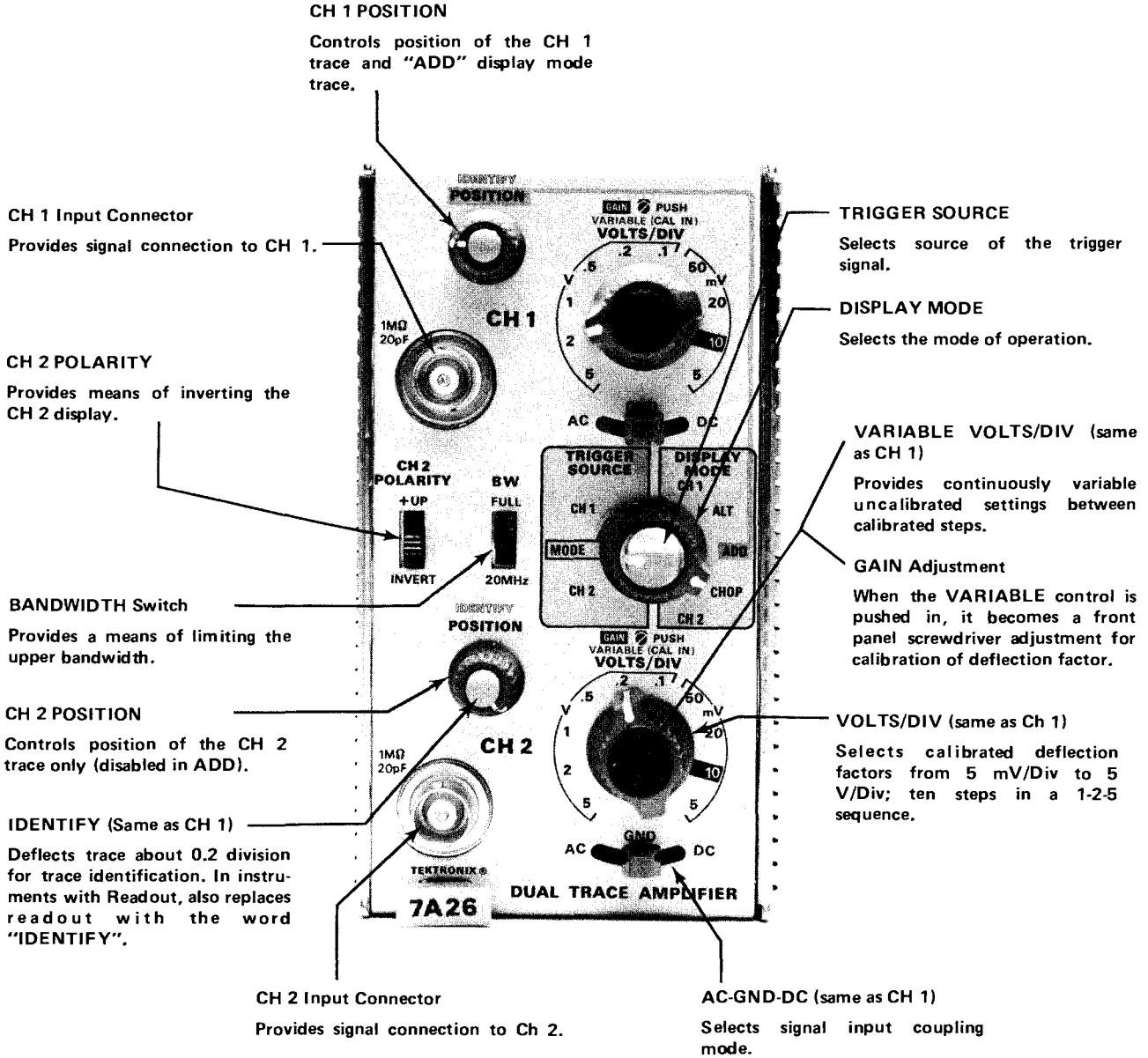


Fig. 1-3. 7A26 front-panel controls and connectors.

In the AC coupling position, the DC component of the signal is blocked by a capacitor in the input circuit. The AC coupling position provides the best display of signals with a DC component much larger than the AC components. The precharge feature should be used with large DC inputs. To use this feature, first set the coupling to GND. Connect the probe to the circuit and wait about two seconds for the coupling capacitor to charge. Then set the coupling to AC.

The GND position provides a ground reference at the input of the amplifier without externally grounding the input connectors. However, the signals connected to the inputs are not grounded, and the same DC load is presented to the signal source.

VOLTS/DIV and VARIABLE Controls

The amount of vertical deflection produced by a signal is determined by the signal amplitude, the attenuation factor of the probe, the setting of the VOLTS/DIV switch, and the setting of the VARIABLE control. Calibration deflection factors indicated by the settings of the VOLTS/DIV switch apply only when the VARIABLE control is in the calibrated (CAL IN) position.

The VARIABLE control provides variable, uncalibrated settings between the calibrated steps of the VOLTS/DIV switch. With the VARIABLE control fully counter-clockwise and the VOLTS/DIV set to 5 volts/division the uncalibrated vertical deflection factor is extended to at least 12.5 volts/division. By applying a calibrated voltage source to the input connector, any specific deflection factor can be set within the range of the VARIABLE control.

CH 2 POLARITY Switch

The CH 2 POLARITY switch may be used to invert the displayed waveform of the signal applied to the CH 2 input. This is particularly useful in added operation of the 7A26 when differential measurements are to be made. The CH 2 POLARITY switch has two positions, +UP and INVERT. In the +UP position, the displayed waveform will have the same polarity as the applied signal and a positive DC voltage will move the CRT trace up. In the INVERT position, a positive-going waveform at the CH 2 input will be displayed on the CRT in inverted form and a positive DC voltage will move the trace down.

DISPLAY MODE Switch

For single-trace operation, apply the signal either to the CH 1 input or the CH 2 input and set the DISPLAY MODE switch to the corresponding position: CH 1 or CH 2.

To display a signal in one channel independently when a signal is also applied to the other channel, simply select the desired channel by setting the DISPLAY MODE switch to the appropriate CH 1 or CH 2 position.

Alternate Mode. The ALT position of the DISPLAY MODE switch produces a display which alternates between channel 1 and channel 2 with each sweep on the CRT. Although the ALT mode can be used at all sweep rates, the CHOP mode provides a more satisfactory display at sweep rates below about 0.5 millisecond/division. At slow sweep rates alternate mode switching becomes visually perceptible.

Add Mode. The ADD position of the DISPLAY MODE switch can be used to display the sum or difference of two signals, for common-mode rejection to remove an undesired signal. The overall deflection factor in the ADD mode with both VOLTS/DIV switches set to the same position is the deflection factor indicated by either VOLTS/DIV switch. However, if the CH 1 and CH 2 VOLTS/DIV switches are set to different deflection factors, the resultant amplitude is difficult to determine from the CRT display. In this case, the voltage amplitude of the resultant display can be determined accurately only if the amplitude of the signal applied to one channel is known. In the ADD mode, positioning of the trace is controlled by the channel 1 POSITION control only.

Chop Mode. The CHOP position of the DISPLAY MODE switch produces a display which is electronically switched between channels at approximately a 500 kilohertz rate (controlled by mainframe). In general the CHOP mode provides the best display at sweep rates slower than about 0.5 millisecond/division or whenever dual-trace, non-repetitive phenomena is to be displayed.

TRIGGER SOURCE Switch

CH 1. The CH 1 position of the TRIGGER SOURCE switch provides a trigger signal obtained from the signal applied to the CH 1 input connector. This provides a stable display of the signal applied to the CH 1 input connector.

CH 2. The CH 2 position of the TRIGGER SOURCE switch provides a trigger signal obtained from the signal applied to the CH 2 input connector. This provides a stable display of the signal applied to the CH 2 input connector.

MODE. In this position of the TRIGGER SOURCE switch, the trigger signal for the time-base unit is dependent on the setting of the DISPLAY MODE switch. The trigger

Operating Instructions—7A26

source for each position of the DISPLAY MODE switch is as follows:

MODE	TRIGGER SIGNAL SOURCE
CH 1	Channel 1
CH 2	Channel 2
ADD	Algebraic sum of channel 1 and channel 2
CHOP	Algebraic sum of channel 1 and channel 2
ALT	Alternates between channel 1 and channel 2

Trace Identification

When the IDENTIFY button is pressed, the trace is deflected about 0.2 division to identify the 7A26 trace. This feature is particularly useful when multiple traces are displayed. When the IDENTIFY button is pressed on instruments with readout, the deflection factor readout is replaced with the word "IDENTIFY".

BW Switch

Provides a means of limiting the upper bandwidth. FULL: Allows the 7A26 to operate at full bandwidth. 20 MHz: Reduces the upper bandwidth of the 7A26 to about 20 megahertz.

BASIC APPLICATIONS

General

The following information describes the procedures and techniques for making basic measurements with a 7A26 and the associated TEKTRONIX oscilloscope and time-base. These applications are not described in detail since each application must be adapted to the requirements of the individual measurements. This instrument can also be used for many applications not described in this manual. Contact your local TEKTRONIX Field Office or representative for assistance in making specific measurements with this instrument.

Peak-to-Peak Voltage Measurements (AC)

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

1. Apply the signal to either input connector.
2. Set the DISPLAY MODE and TRIGGER SOURCE switches to display the channel used.
3. Set the coupling switch to AC.

NOTE

For low-frequency signals below about 30 hertz use the DC position to prevent attenuation of the signal.

4. Set the VOLTS/DIV switch to display about five divisions of the waveform vertically.

5. Set the time-base Triggering controls for a stable display. Set the time-base unit to a sweep rate which displays several cycles of the waveform.

6. Turn the 7A26 POSITION control so the lower portion of the waveform coincides with one of the graticule lines below the center horizontal line, and the top of the waveform is within the viewing area. With the time-base Position control, move the display so one of the upper peaks lies near the center vertical line (see Fig. 1-4).

7. Measure the divisions of vertical deflection peak-to-peak. Check that the VARIABLE (VOLTS/DIV) control is in the CAL IN position.

NOTE

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

8. Multiply the deflection measured in step 7 by the VOLTS/DIV switch setting. Include the attenuation factor of the probe if used.

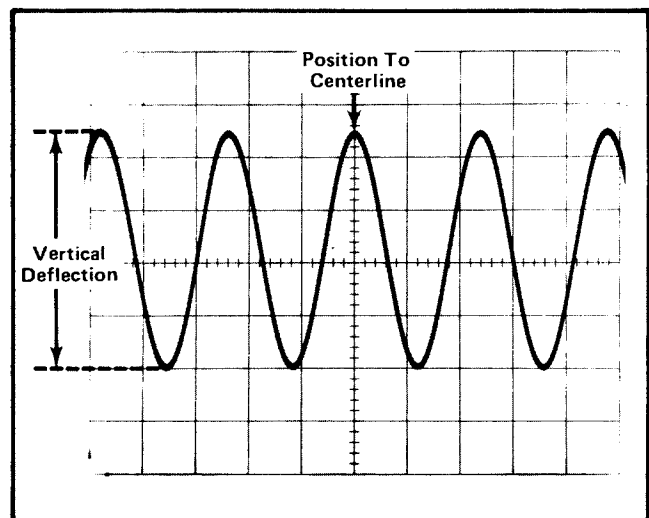


Fig. 1-4. Measuring the peak-to-peak voltage of a waveform.

EXAMPLE: Assume that the peak to peak vertical deflection is 4.5 divisions (see Fig. 1-4) using a 10X attenuator probe, and the VOLTS/DIV switch is set to 1 V.

$$\text{Volts Peak to Peak} = \text{vertical deflection (divisions)} \times \text{VOLTS/DIV setting} \times \text{probe attenuation factor}$$

Substituting the given values:

$$\text{Volts Peak-to-Peak} = 4.5 \times 1 \times 10$$

The peak-to-peak voltage is 45 volts.

Instantaneous Voltage Measurements (DC)

To measure the DC level at a given point on a waveform, proceed as follows:

1. Connect the signal to either input connector.
2. Set the DISPLAY MODE and TRIGGER SOURCE switches to display the channel used.
3. Set the VOLTS/DIV switch to display about five divisions of the waveform.
4. Set the coupling switch to GND and position the trace to the bottom graticule line or other reference line. If the voltage is negative with respect to ground, position the trace to the top graticule line. Do not move the POSITION control after this reference line has been established.

NOTE

To measure a voltage level with respect to a voltage other than ground, make the following changes to step 4. Set the coupling switch to DC and apply the reference voltage to the input connector. Then position the trace to the reference line.

5. Set the coupling switch to DC. The ground reference line can be checked at any time by switching to the GND position.

6. Set the time-base Triggering controls for a stable display. Set the time-base sweep rate for an optimum display of the waveform.

7. Measure the distance in divisions between the reference line and the point on the waveform at which the DC level is to be measured. For example, in Fig. 1-5 the measurement is between the reference line and point A.

8. Establish the polarity of the waveform. With the CH 2 POLARITY switch in the +UP position, any point above the reference line is positive.

9. Multiply the distance measured in step 7 by the VOLTS/DIV setting. Include the attenuation factor of the probe, if used.

EXAMPLE: Assume the vertical distance measured is 3.6 divisions (see Fig. 1-5) and the waveform is above the reference line using a 10X probe with a VOLTS/DIV setting of 0.5 V.

Using the formula:

$$\text{Instantaneous Voltage} = \text{vertical distance (divisions)} \times \text{polarity} \times \text{VOLTS/DIV setting} \times \text{probe attenuation factor}$$

Substituting the given values:

$$\text{Instantaneous Voltage} = 3.6 \times +1 \times 0.5 \text{ V} \times 10$$

The instantaneous voltage is 18 volts.

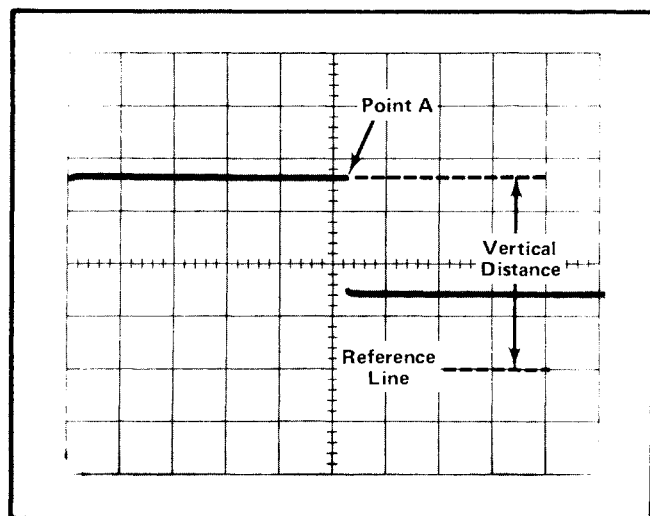


Fig. 1-5. Measuring instantaneous voltage with respect to some reference.

Comparison Measurements

In some applications it may be desirable to establish arbitrary units of measurement other than those indicated by the VOLTS/DIV switch. This is particularly useful when comparing unknown signals to a reference amplitude. One use for the comparison-measurement technique is to facilitate calibration of equipment where the desired amplitude does not produce an exact number of divisions of deflection. The adjustment will be easier and more accurate if arbitrary units of measurement are established so that the correct adjustment is indicated by an exact number of divisions of deflection. The following procedure describes how to establish arbitrary units of measure for comparison measurements.

To establish an arbitrary vertical deflection factor based upon a specific reference amplitude, proceed as follows:

1. Connect the reference signal to the input connector. Set the time-base unit sweep rate to display several cycles of the signal.

2. Set the VOLTS/DIV switch and the VARIABLE control to produce a display which is an exact number of vertical divisions in amplitude. Do not change the VARIABLE control after obtaining the desired deflection.

3. To establish an arbitrary vertical deflection factor so the amplitude of an unknown signal can be measured accurately at any setting of the VOLTS/DIV switch, the amplitude of the reference signal must be known. If it is not known, it can be measured before the VARIABLE VOLTS/DIV control is set in step 2.

4. Divide the amplitude of the reference signal (volts) by the product of the vertical deflection (divisions) established in step 2 and the setting of the VOLTS/DIV switch. This is the vertical conversion factor.

$$\text{Vertical Conversion Factor} = \frac{\text{reference signal amplitude (volts)}}{\text{vertical deflection (divisions)} \times \text{VOLTS/DIV switch setting}}$$

5. To measure the amplitude of an unknown signal, disconnect the reference signal and connect the unknown signal to the input connector. Set the VOLTS/DIV switch to a setting that provides sufficient vertical deflection to make an accurate measurement. Do not readjust the VARIABLE control.

6. Measure the vertical deflection in divisions and calculate the amplitude of the unknown signal using the following formula.

$$\text{Signal Amplitude} = \text{VOLTS/DIV setting} \times \text{vertical conversion factor} \times \text{vertical deflection (divisions)}$$

EXAMPLE: Assume a reference signal amplitude of 30 volts, a VOLTS/DIV setting of 5 V and the VARIABLE control adjusted to provide a vertical deflection of four divisions. Substituting these values in the vertical conversion factor formula (step 4):

$$\text{Vertical Conversion Factor} = \frac{30 \text{ V}}{4 \times 5 \text{ V}} = 1.5$$

Then with a VOLTS/DIV setting of 2 V, the peak-to-peak amplitude of an unknown signal which produces a vertical deflection of five divisions can be determined by using the signal amplitude formula (step 6):

$$\text{Signal Amplitude} = 2 \text{ V} \times 1.5 \times 5 = 15 \text{ volts}$$

Dual-Trace Phase Difference Measurements

Phase comparison between two signals of the same frequency can be made using the dual-trace feature of the 7A26. This method of phase difference measurement can be used up to the frequency limit of the oscilloscope system. To make the comparison, use the following procedure:

1. Set the CH 1 and CH 2 coupling switches to the same position, depending on the type of coupling desired.

2. Set the DISPLAY MODE to ALT or CHOP. In general, CHOP is more suitable for low frequencies and ALT is more suitable for high frequencies. Set the TRIGGER SOURCE to CH 1.

3. Connect the reference signal to the CH 1 input and the comparison signal to the CH 2 input. Use coaxial cables or probes which have similar time delay characteristics to connect the signals to the input connectors.

4. If the signals are of opposite polarity, set the CH 2 POLARITY switch to invert the channel 2 display. (Signals may be of opposite polarity due to 180° phase difference; if so, take this into account in the final calculation.)

5. Set the VOLTS/DIV switches and the VARIABLE controls of the two channels so the displays are equal and about five divisions in amplitude.

6. Set the time-base unit to a sweep rate which displays about one cycle of the waveforms. Set the Triggering controls for a stable display.

7. Center the waveforms on the graticule with the 7A26 POSITION controls.

8. Adjust the time-base Variable Time/Div control until one cycle of the reference signal occupies exactly eight horizontal divisions between the second and tenth vertical lines of the graticule (see Fig. 1-6). Each division of the graticule represents 45° of the cycle ($360^\circ \div 8 \text{ divisions} = 45^\circ/\text{division}$). The sweep rate can now be stated in terms of degrees as $45^\circ/\text{division}$.

9. Measure the horizontal difference between corresponding points on the waveform.

10. Multiply the measured distance (in divisions) by $45^\circ/\text{division}$ to obtain the exact amount of phase difference.

EXAMPLE: Assume a horizontal difference of 0.3 division with a sweep rate of $45^\circ/\text{division}$ as shown in Fig. 1-6.

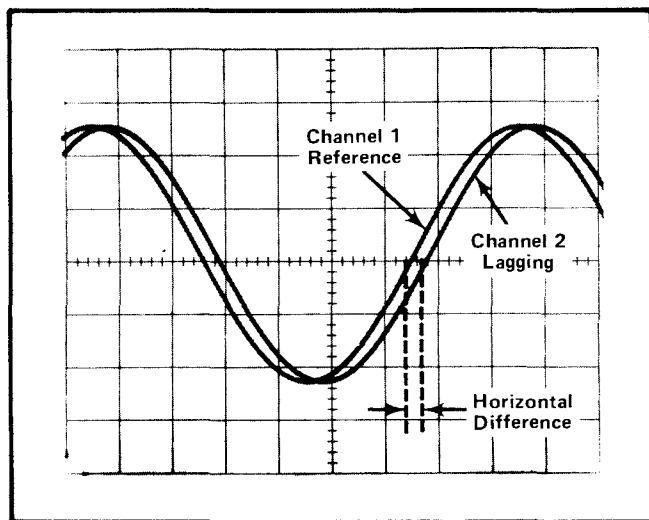


Fig. 1-6. Measuring phase difference between two signals.

Using the formula:

$$\text{Phase Difference} = \frac{\text{horizontal difference (divisions)}}{\text{sweep rate (degrees/division)}} \times$$

Substituting the given values:

$$\text{Phase Difference} = 0.3 \times 45^\circ$$

The phase difference is 13.5° .

High Resolution Phase Measurements

More accurate dual-trace phase measurements can be made by increasing the sweep rate (without changing the Variable Time/Div control). One of the easiest ways to increase the sweep rate is with the time-base Magnifier switch. Set the Magnifier to X10 and determine the magnified sweep rate by dividing the sweep rate obtained previously by the amount of sweep magnification.

EXAMPLE: If the sweep rate is increased 10 times by the Magnifier, the magnified sweep rate is $45^\circ/\text{division} \div 10 = 4.5^\circ/\text{division}$. Fig. 1-7 shows the same signals as used in Fig. 1-6 but with the Magnifier set to X10. With a horizontal difference of 3 divisions, the phase difference is:

$$\text{Phase Difference} = \frac{\text{horizontal difference (divisions)}}{\text{magnified sweep rate (degrees/division)}} \times$$

Substituting the given values:

$$\text{Phase Difference} = 3 \times 4.5^\circ$$

The phase difference is 13.5° .

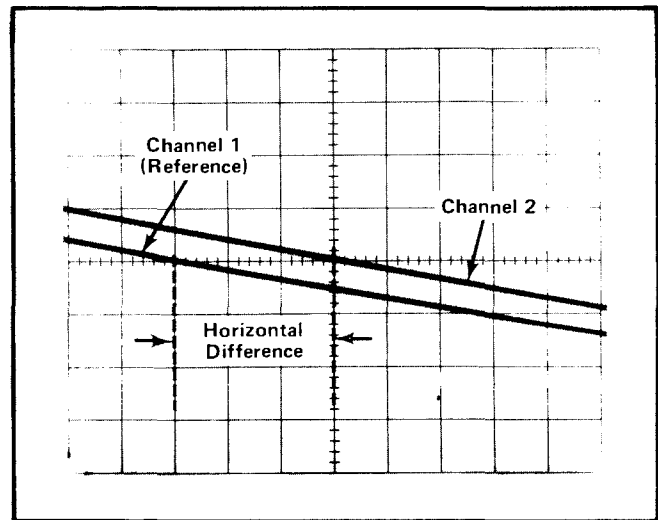


Fig. 1-7. High resolution phase measurement using time-base magnifier.

Common Mode Rejection

The ADD feature of the 7A26 can be used to display signals which contain undesirable components. These undesirable components can be eliminated through common-mode rejection. The procedure is as follows:

1. Set the DISPLAY MODE switch to ALT or CHOP and the TRIGGER SOURCE switch to MODE.

2. Connect the signal containing both the desired and undesired information to the CH 1 input connector.

3. Connect a signal similar to the unwanted portion of the CH 1 signal to the CH 2 input connector. For example, in Fig. 1-8 a line-frequency signal is connected to Channel 2 to cancel out the line-frequency component of the Channel 1 signal.

4. Set both coupling switches to the same setting, DC or AC, depending on the applied signal.

5. Set the VOLTS/DIV switches so the signals are about equal in amplitude.

6. Set the DISPLAY MODE switch to ADD. Set the CH 2 POLARITY switch to INVERT so the common-mode signals are of opposite polarity.

7. Adjust the Channel 2 VOLTS/DIV switch and VARIABLE control for maximum cancellation of the common-mode signal. The signal which remains should be only the desired portion of the channel 1 signal.

EXAMPLE: An example of this mode of operation is shown in Fig. 1-8. The signal applied to Channel 1 contains unwanted line frequency components (Fig. 1-8A). A corresponding line frequency signal is connected to Channel 2 (Fig. 1-8B). Fig. 1-8C shows the desired portion of the signal as displayed when common-mode rejection is used.

The above procedure can also be used for examining a signal superimposed on some DC level when DC coupling is used. A DC voltage of the proper polarity applied to Channel 2 can be used to cancel out the DC portion of the signal applied to Channel 1.

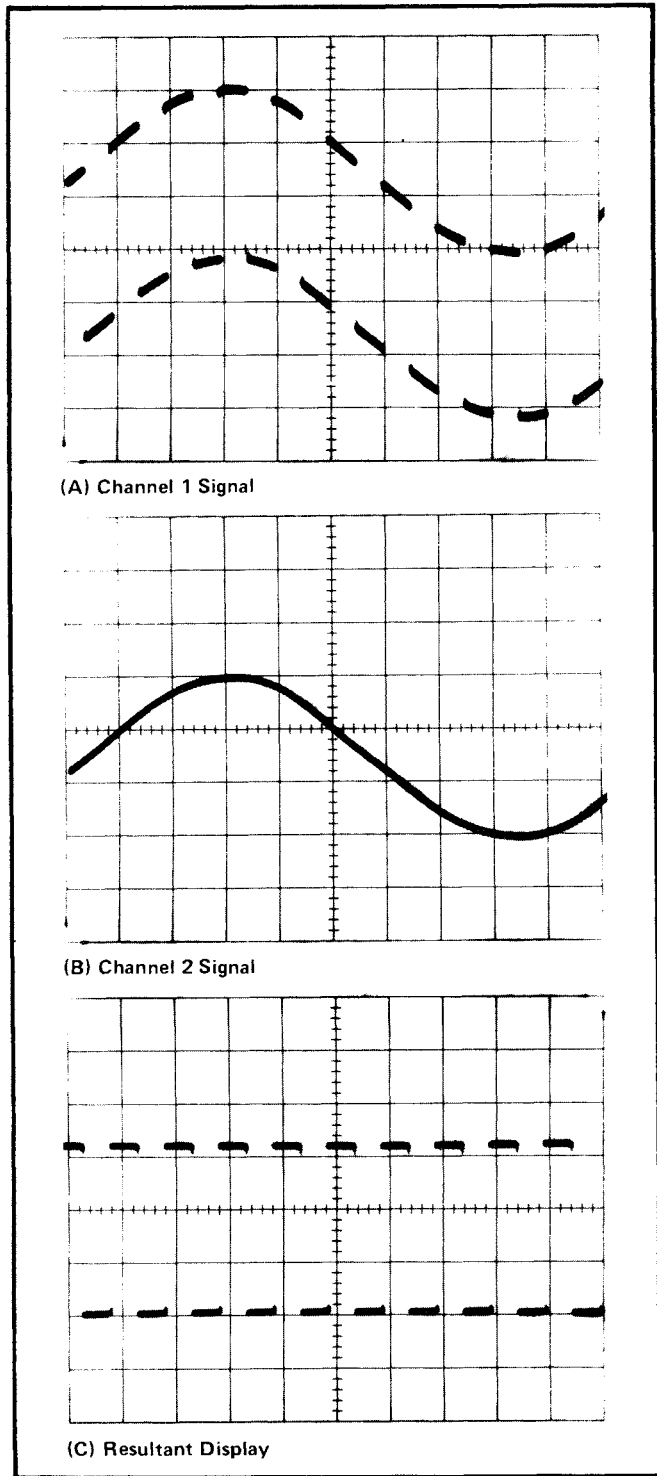


Fig. 1-8. Using the ADD mode for common-mode rejection. (A) Channel 1 signal contains desired information along with line-frequency component. (B) Channel 2 contains line frequency only. (C) Resultant CRT display using common-mode rejection.

SPECIFICATION

Introduction

The following electrical characteristics are valid over the stated environmental range for instruments calibrated at an ambient temperature of +20°C to +30°C, and after a five-minute warmup unless otherwise noted.

TABLE 2-1

Electrical

Characteristic	Performance Requirement	Supplemental Information
Deflection Factor		
Calibrated Range	5 mV/Div to 5 V/Div; ten steps in a 1,2,5 sequence.	Aberrations; 5 mV and 10 mV. +4.0%, -4.0%, total not to exceed 6% P-P; 20 mV to 5 V, not to exceed 8%.
Deflection Factor Accuracy	Within 2% with GAIN adjusted at 10 mV/Div.	
Uncalibrated (VARIABLE)		Continuously variable between calibrated steps; extends deflection factor to at least 12.5 volts per division.
GAIN Range		
BW FULL/20 MHz Gain Match	20 MHz gain within 1% full gain.	Permits adjustment of deflection factor for calibrated operation with all 7000-series oscilloscopes.
Frequency Response		
Upper Bandwidth	Depends upon oscilloscope used.	See the oscilloscope mainframe specifications or the current Tektronix, Inc. catalog.
Lower Bandwidth (AC coupled)	10 hertz or less.	
20 MHz Bandwidth		20 MHz, ± 3 MHz.
Risetime		21 ns maximum.
Maximum Input Voltage		
DC Coupled		250 volts, (DC + Peak AC); AC component 500 volts peak-to-peak maximum, one kilohertz or less.
AC Coupled		500 volts, (DC + Peak AC); AC component 500 volts peak-to-peak maximum, one kilohertz or less.
Channel Isolation		50:1 display ratio up to 200 megahertz.

Table 2-1 (cont)

Characteristic	Performance Requirement	Supplemental Information
Input R and C		
Resistance		
SN B208879-below SN B208880-up		1 M Ω \pm 2%. 1 M Ω \pm 2%.
Capacitance		
SN B208879-below SN B208880-up		20 pF \pm 0.5 pF 22 pF \pm 0.5 pF
Overdrive Recovery Time		0.1 ms or less to recover to within one division after removal of overdrive signal of up to +75 divisions or -75 divisions regardless of overdrive signal duration.
Delay Time Difference Between Channels		200 picoseconds or less.
Common Mode Rejection Ratio	At least 10:1, DC to 50 MHz.	
Display Modes	Channel 1 only.	
	Dual-trace, alternate between channels.	
	Added algebraically.	
	Dual-trace chopped between channels.	
	Channel 2 trace only.	
Trigger Source Selection	Channel 1 only.	
	Follows DISPLAY MODE selection.	
	Channel 2 only.	

TABLE 2-2

Environmental Characteristic

	Refer to the specification for the associated mainframe.
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TABLE 2-3

Physical

	Size	Fits all 7000-series plug-in compartments.
	Weight	2 Pounds 9 Ounces (1.2 kilograms).

THEORY OF OPERATION

Introduction

This section of the manual contains a description of the circuitry used in the 7A26 amplifier. The 7A26 description begins with a discussion of the instrument using the block diagram shown in the Diagrams section. Then, each circuit is described in detail using the block diagram to show the interconnections between stages in each major circuit and the relationship of the front-panel controls to the individual stages.

Complete schematics of each circuit are given in the Diagrams section. Refer to these schematics throughout the following circuit description for electrical values and relationship.

BLOCK DIAGRAM

The Channel 1 Amplifier circuit provides gain setting, variable gain control, and trace positioning. The Channel 2 Amplifier provides signal polarity inversion in addition to gain setting, variable gain control, and trace positioning.

The signal to be displayed on the CRT is applied to the CH 1 or CH 2 INPUT connector. The signal passes through the input coupling switch, where the appropriate coupling is selected, to the attenuators. The VOLTS/DIV switch selects the correct amount of attenuation and the signal is passed to the Input Source Follower.

When the VOLTS/DIV switch is set to the 5 mV and 10 mV positions, the signal connected to the INPUT connector is passed through the attenuators without attenuation. When the VOLTS/DIV switch is set in the 5 mV position, the 2X Gain Amplifier operates at full gain. In all other positions of the VOLTS/DIV switch, the 2X Gain Amplifier's gain is reduced by two. Internal gain and balance adjustments are included in the 2X Amplifier.

Overall GAIN and VARIABLE gain is adjusted in the Gain Amplifier. Variable Balance and high frequency adjustments are also controlled in the Gain Amplifier. The output of the Gain Amplifier is connected to the Positioning circuitry where the POSITION and IDENTIFY functions are controlled. Channel 2 is identical to Channel 1, with the exception of the polarity inversion function in Channel 2.

The Display and Trigger Channel switch amplifiers provide differential signal outputs for the signal and trigger lines, from each channel, to a common display and trigger output. These stages also contain a bandwidth limiter that limits the upper frequency response to 20 megahertz.

The output of the Display and Trigger Channel switch Amplifier is connected to the oscilloscope mainframe via the interface connector.

Readout encoding circuitry used in the 7A26 is standard to the 7000-series.

DETAILED CIRCUIT DESCRIPTION

NOTE

The CH 1 and CH 2 amplifier circuits are identical with the exception of the CH 2 GAIN stage U2450, which includes a POLARITY inverting circuit. Only CH 1 is described in detail throughout this discussion.

AC-GND-DC Switch

Input signals connected to the INPUT connectors can be AC-coupled, DC-coupled, or internally disconnected. S100A is a cam-type switch; a contact-closure chart showing the operation is given on the schematic diagrams. When the AC-GND-DC switch is in the DC position, the INPUT signal is connected directly to the attenuators. In the AC position, the INPUT signal passes through capacitor C10. The capacitor prevents the DC component of the signal from passing to the amplifier. The GND position opens the signal path and connects the input circuit of the amplifier to ground. This provides a ground reference without the need to disconnect the applied signal from the INPUT connector. Resistor R102, connected across the AC-GND-DC switch, allows C10 to be pre-charged in the GND position.

Input Attenuator

The effective overall deflection factor of the 7A26 is determined by the setting of the VOLTS/DIV switch, S100B. The basic deflection factor is 5 millivolts per division of CRT deflection. To increase the basic deflection

Theory of Operation—7A26

factor to the values indicated on the front panel, precision attenuators are switched into the circuit. S100B is a cam-type switch and the dots on the contact-closure chart (see Diagram 1) indicate when the associated contacts are in the position shown (open or closed). In the 5 mV/Div and 10 mV/Div positions, the attenuators are not used; the input signal is connected directly to the Input Source Follower. The 10 mV/Div position decreases the gain of the 2X Gain Amplifier. For switch positions above 10 mV/Div, the attenuators are switched into the circuit singly or stacked to produce the deflection factor indicated on the front panel. These hybrid attenuators are frequency-compensated voltage dividers. For DC and low-frequency signals, the attenuators act as resistance dividers; at high frequencies the attenuator acts as a capacitive divider.

In addition to providing constant attenuation at all frequencies within the bandwidth of the instrument, the input attenuators are designed to maintain the same input RC characteristics (one megohm X 20 pF). Each attenuator contains an adjustable series capacitor to provide correct attenuation at high frequencies, and an adjustable shunt capacitor to provide correct input capacitance.

Input Source Follower

Below SN B080000. Q150A and Q140 form a cascode amplifier with Q150B providing constant current. R132 limits the current drive to the gate of Q150A. Dual-diode CR130 provides circuit protection by limiting the voltage swing at the gate of Q150A to about ± 9 volts. R134, C130, and the capacitance of R130 provide low frequency compensation. Input capacitance for the 5 mV and 10 mV positions is set by C134. The output of the 2X Gain Amplifier (U1350) is from the source of Q150A and high frequencies from the collector of Q140. R160 is used to balance the input to the 2X Gain Amplifier between the 5 mV and 10 mV positions.

SN B080000-Up. Q150A is a source follower with Q150B providing a constant current. R132 limits the current drive to the gate of Q150A. Dual-diode CR130 provides circuit protection by limiting the voltage swing at the gate of Q150A to about ± 10 volts. C130, C134, and the capacitance of R130 provides low frequency compensation. Input capacitance for the 5 mV and 10 mV positions is set by C130. The output of the 2X Gain Amplifier (U1350) is from the source of Q150A. C134 and R134 form a negative resistance network for Q150A.

2X Gain Amplifier

T1301 is a balun transformer which provides differential drive to U1350 at high frequencies. U1350 is a paraphase type amplifier with dual differential output capabilities.

In the 5 mV position, full drive is provided from pins 5 and 9 of U1350 to the U1450 load resistors R1401 and

R1403. In all other attenuator positions the signal path drive current through the load resistors is divided in half. The other half is diverted through pins 6 and 8 of U1350 and is dissipated in dummy load resistors R1343 and R1341.

CR1319 and R1319 maintain proper collector voltage while switching between the 5 mV and 10 mV positions. C1331, R1331, C1332 and R1332 are thermal compensations. C1334 and RT1334 provide high-frequency temperature compensation. R1336, C1336, C1345, L1345 and R1345 are high-frequency adjustments.

Fixed length inductors and capacitors are part of the Amplifier etched circuit board and provide T-coil peaking at the input of U1350.

Gain Amplifier

U1450 is a variable-gain cascode amplifier which sets the overall channel gain. The GAIN (R1423A) and VARIABLE (R1423B) controls determine the ratio of base currents through pins 11 and 12 of U1450. The base-current ratio determines the shared collector output levels between pins 5, 6 and 8, 9.

R1436 provides adjustable low frequency compensation. Fixed components R1434, C1434, C1436, R1431, and C1431 are thermal compensations. R1435 and C1435 are adjustable high frequency compensations. U1450 Input T-coil peaking inductors and capacitors are part of the etched circuit board. DC balance over the variable range is adjusted by R1353.

Position Circuit

Positioning current is added to the signal current of U1450 output from the current sources Q1470 and Q1490. R1465 controls the voltage at the bases of the current sources, which in turn determines the amount of positioning current added. R1467, R1466, and CR1465 provide trace shift current for the IDENTITY function.

Display Channel Switch Amplifier

The third cascode amplifier, U1550 is used for controlling the channel 1 display modes. When the DISPLAY CH 1 ON Level at pin 12 is HI, the channel 1 signal passes through the transistor pair with outputs at pins 5 and 9 to the level shifters. At the same time the DISPLAY CH 1 OFF Level at pin 11 is LO, turning off the second transistor pair collectors, pins 6 and 8. When pin 12 is HI, channel 1 is displayed and when pin 11 is HI channel 1 is not displayed. Pins 11 and 12 are always in opposite states, the levels being selected by the DISPLAY MODE switch S30A. The signal is routed through T-coiled bases of U1550 to the trigger amplifier switch, U1750, which is also T-coiled. C1531 and R1531 are high frequency adjustments.

Trigger Channel Switch Amplifier

U1750 is a cascode amplifier used as the trigger switch, and operates similarly to the Display Channel Switch Amplifier, U1550. The TRIGGER SOURCE switch, S30B determines the base levels on pins 11 and 12 of U1750 for trigger selection.

Display and Trigger Common Base Level Shifters

The Display Out Common Base Level Shifters, Q820, Q840, Q860, and Q880 are used to return the DC signal level to zero volts at the plug-in interface for display output. Bandwidth selection is obtained by controlling base currents with the BW switch, S32, Q820 and Q840 are shifters at FULL BANDWIDTH and Q860, Q880 are used at 20 megahertz. The level shifters also serve as a current summing point for CH 1 and CH 2 selection.

The pi filter is used in the collectors of Q860 and Q880. The pi filter is isolated from the output by CR860 and CR880 when the BW switch is in FULL.

The Trigger Output Common Base Level Shifters Q920, Q940, Q960, and Q980 operation is similar to the Display Output Shifters just discussed.

Channel 2 Gain-Polarity Amplifier

CH 2 operation is the same as CH 1. For circuit number reference the prefix number for CH 1 is 1 and CH 2 is 2. For instance, U2350 functions in CH 2 the same as does U1350 in CH 1. In CH 2 a Polarity feature is included in the second cascode amplifier U2450. S22A allows base drives to be reversed to U2450. Polarity Gain R2411, matches the gain in both polarity positions.

Translator

A schematic of the Translator circuit is shown on Diagram 4 in the Diagrams section. The translator, Q1050 and Q1070, increase the CHOP and ALT control logic DC levels from the mainframe to a usable level in the 7A26. CR1060 and CR1062 keep Q1050 and Q1070 from going into saturation.

Readout Encoding

The Readout Encoding circuit consists of switching resistors and probe sensing stage Q620. This circuit encodes the Channel 1 and 2, Row and Column output lines for readout of deflection factor, uncalibrated deflection factor (VARIABLE) information, and signal inversion (Channel 2

only). Data is encoded on these output lines by switching resistors between them and the time-slot input lines, or by adding current through Q620.

R647-CR647 are switched between time-slot three (TS-3) and Column output line when the CAL IN switch is in the uncal position. This results in the symbol > (greater than) being displayed preceding the deflection factor readout. R648 (Channel 2 only) is switched between TS-2 and the Column output line when the CH 2 POLARITY switch is in the INVERT position. This results in the symbol ↓ (inverted) being displayed preceding the deflection factor readout.

Switching resistors are used to indicate the setting of the VOLTS/DIV switch to the mainframe readout system. The dots on the contact-closure chart (see Diagram Section) indicate when the associated contacts on the VOLTS/DIV cam switch are closed. R633, R634, and R635 select the number 1, 2, or 5 depending on the combination that is switched in. R368 and R642 select the m (milli) prefix in the 5 mV through 0.5 V (500 mV) positions of the VOLTS/DIV switch. R639 and R643 select the V (volts) symbol in all ranges. R630, R631, and the output of the probe sensing stage (Q620) select the decimal point (number of zeroes), again depending on the resistor combination switched in by the VOLTS/DIV switch.

Probe sensing stage Q620 identifies the attenuation factor of the probe connected to the input connector by sensing the amount of current flowing from the current sink through the probe coding resistance. The output of this circuit corrects the mainframe readout system to include the probe attenuation factor. The third contact of the input connector provides the input to the probe sensing stage from the probe coding resistance (coded probes only; see Operating Instructions). The third contact is also used for the IDENTIFY input. The coding resistor forms a voltage divider with R621 through CR621 to the -15 V supply. The resultant voltage sets the bias on Q620 and determines, along with emitter resistor R622, the collector current. When the -15 volt time-slot pulse is applied to Interface Connector B33, Q620 is interrogated and its collector current is added to the column current output through Interface Connector A37.

With a 1X probe (or no probe) connected to the input connector, Q620 is turned off. The deflection factor readout is determined by the VOLTS/DIV switch position. With a 10X probe connected, the bias on Q620 will allow 100 microamperes of collector current to flow. This increases the deflection factor readout by a factor of 10.

Theory of Operation—7A26

The IDENTIFY button (S1465 on Diagram 2 or S2465 on Diagram 3) does two things when pressed:

1. It causes the trace representing the appropriate channel of the 7A26 to move about 0.3 division (see the front panel controls and connectors, Fig. 1-3).

2. It forward biases CR621 and Q620 to result in a sufficient amount of collector current which, when added to the column current output, replaces the deflection factor readout with the word "IDENTIFY".

These two actions aid in identifying the 7A26 trace when multiple traces are displayed. When the IDENTIFY button is released, the deflection factor readout and trace position are restored.

CR1465 in CH 1, and CR2465 in CH 2 isolate readout circuitry from the position circuitry. For further information on the operation of the readout system, see the oscilloscope instruction manual.

MAINTENANCE

Introduction

This section of the manual contains maintenance information for use in preventive maintenance, corrective maintenance, and troubleshooting of the 7A26.

Further maintenance information relating to general maintenance can be found in the instruction manuals for the 7000-series oscilloscopes.

PREVENTIVE MAINTENANCE

General

Preventive maintenance, consisting of cleaning, visual inspection, etc., performed on a regular basis, will improve the reliability of this instrument. Periodic checks of the semiconductor devices used in the unit are not recommended as a preventive maintenance measure.

Cleaning

CAUTION

Avoid the use of chemical cleaning agents which might damage the plastics used in this instrument. Special care should be taken when cleaning the Polyphenylene Oxide attenuator boards. Do not apply any solvent containing ketones, esters or halogenated hydrocarbons. To clean, use only water soluble detergents, ethyl, methyl or isopropyl alcohol.

Front Panel. Loose dust may be removed with a soft cloth or a dry brush. Water and mild detergent may be used; however, abrasive cleaners should not be used.

Interior. Cleaning the interior of the unit should precede calibration, since the cleaning process could alter the settings of the calibration adjustments. Use low-velocity compressed air to blow off the accumulated dust. Hardened dirt can be removed with a soft dry brush, cotton-tipped swab, or cloth dampened with a mild detergent and water solution.

Lubrication

Use a cleaning-type lubricant on shaft bushings, interconnecting plug contacts, and switch contacts. Lubricate switch detents with a heavier grease. A lubrication kit

containing the necessary lubricating materials and instructions is available through any TEKTRONIX Field Office. Order TEKTRONIX Part Number 003-0342-02.

TROUBLESHOOTING

General

The following is provided to augment information contained in other sections of this manual when troubleshooting the 7A26. The schematic diagrams, circuit description, and calibration sections should be used to full advantage. The theory of operation section gives detailed information on circuit behavior and output requirements.

Troubleshooting Aids

Diagrams. Circuit diagrams are given on foldout pages in Section 7. The circuit number and electrical value of each component in this instrument are shown on the diagrams.

Circuit Boards. The circuit boards used in the 7A26 are outlined on the schematic diagrams, and photographs of the boards are shown on the backs of the schematic diagrams. Each board-mounted electrical component is identified on the photograph by its circuit number.

Component and Wiring Color Code. Colored stripes or dots on resistors and capacitors signify electrical values, tolerances, etc., according to the EIA standard color code. Components not color coded usually have the value printed on the body.

The insulated wires used for interconnection in the 7A26 are color coded to facilitate tracing wires from one point to another in the unit.

Semiconductor Lead Configuration. The lead configurations of the semiconductor devices used in this instrument are shown on the foldout following the schematic diagrams.

Troubleshooting Equipment

The following equipment is useful for troubleshooting the 7A26.

1. Semiconductor Tester—Some means of testing the transistors, diodes, and FET's used in this instrument is helpful. A transistor-curve tracer such as the TEKTRONIX Type 576 will give the most complete information.

Maintenance—7A26

2. DC Voltmeter and Ohmmeter—A voltmeter is required for checking voltages within the circuits, and an ohmmeter for checking resistors and diodes.

3. Test Oscilloscope—A test oscilloscope is required to view waveforms at different points in the circuit. A TEKTRONIX 7000-series mainframe equipped with a readout system, 7D13 Digital Multimeter unit, 7B-series Time-Base unit, and a 7A-series amplifier unit with a 10X probe will meet the needs of both items 2 and 3.

4. Plug-in Extender—A fixture that permits operation of the unit outside of the plug-in compartment for better accessibility during troubleshooting. Order TEKTRONIX Part Number 067-0589-00.

Troubleshooting Procedure

This troubleshooting procedure is arranged in an order which checks the simple trouble possibilities before proceeding with extensive troubleshooting.

1. **Check Control Settings.** An incorrect setting of the 7A26 controls can indicate a trouble that does not exist. If there is any question about the correct function or operation of a control or front-panel connector, see the Operating Instructions section.

2. **Check Associated Equipment.** Before proceeding with troubleshooting of the 7A26 check that the equipment used with this instrument is operating correctly. If possible, substitute an amplifier unit known to be operating correctly into the indicator unit and see if the problem persists. Check that the input signals are properly connected and that the interconnecting cables are not defective.

3. **Visual Check.** Visually check the portion of the instrument in which the trouble is suspected. Many troubles can be located by visual indications, such as unsoldered connections, broken wires, damaged circuit boards, damaged components, etc.

4. **Check Instrument Performance.** Check the calibration of the unit or the affected circuit, by performing Performance Check of Section 5. The apparent trouble may only be a result of mis-adjustment, and may be corrected by calibration. Complete calibration instructions are given in Section 5.

5. **Check Voltages.** Often the defective component or stage can be located by checking the voltage in the circuit.

6. **Check Individual Components.** The following methods are provided for checking the individual components. Components which are soldered in place are best checked by disconnecting one end to isolate the measurement from the effects of surrounding circuitry.

NOTE

To locate intermittent or temperature sensitive components mounted on the attenuator board, Quik Freeze (Miller Stephenson, MS-240, TEKTRONIX Part Number 006-0173-01) is recommended. Dry ice or dichloro-difluoromethane (Freon 12, Dupont or Can-O-Gas) may also be used. Other types of circuit coolant may damage the polyphenylene oxide boards.

A. **TRANSISTORS.** The best check of transistor operation is actual performance under operating conditions. If a transistor is suspected of being defective, it can best be checked by substituting a component known to be good; however, be sure that circuit conditions are not such that a replacement might also be damaged. If substitute transistors are not available, use a dynamic tester (such as TEKTRONIX Type 576). Static-type testers may be used, but since they do not check operation under simulated operating conditions, some defects may go unnoticed. Be sure the power is off before attempting to remove or replace any transistor.

B. **DIODES.** A diode can be checked for an open or for a short circuit by measuring the resistance between terminals with an ohmmeter set to the R X 1k scale. The diode resistance should be very high in one direction and very low when the meter leads are reversed. Do not check tunnel diodes or back diodes with an ohmmeter.

CAUTION

Do not use an ohmmeter scale that has a high internal current. High currents may damage the diodes.

C. **RESISTORS.** Check resistors with an ohmmeter. Resistor tolerance is given in the Electrical Parts List. Resistors normally do not need to be replaced unless the measured value varies widely from the specified value.

D. **CAPACITORS.** A leaky or shorted capacitor can be detected by checking resistance with an ohmmeter on the highest scale. Use an ohmmeter which will not exceed the voltage rating of the capacitor. The resistance reading should be high after initial charge of the capacitor. An open capacitor can best be detected with a capacitance meter, or by checking whether the capacitor passes AC signals.

7. Repair and Readjust the Circuit. Special techniques required to replace components in this unit are given under Component Replacement. Be sure to check the performance of any circuit that has been repaired or that has had any electrical components replaced. Recalibration of the affected circuit may be necessary.

CORRECTIVE MAINTENANCE

General

Corrective maintenance consists of component replacement and instrument repair. Special techniques required to replace components in this instrument are given here.

Obtaining Replacement Parts

Standard Parts. All electrical and mechanical part replacements for the 7A26 can be obtained through your local TEKTRONIX Field Office or representative. However, many of the electronic components can be obtained locally in less time than is required to order them from Tektronix, Inc. Before purchasing or ordering replacement parts, check the parts list for value, tolerance, rating and description.

NOTE

When selecting replacement parts, it is important to remember that the physical size and shape of a component may affect the performance of the instrument, particularly at high frequencies. All replacement parts should be direct replacements unless it is known that a different component will not adversely affect instrument performance.

Special Parts. In addition to the standard electronic components, some special parts are used in the 7A26. These parts are manufactured or selected by Tektronix, Inc. in accordance with our specifications. Most of the mechanical parts used in this instrument have been manufactured by Tektronix, Inc. Order all special parts directly from your local TEKTRONIX Field Office or representative.

Ordering Parts. When ordering replacement parts from Tektronix, Inc., include the following information:

1. Instrument Type.
2. Instrument Serial Number.
3. A description of the part (if electrical, include circuit number).
4. TEKTRONIX Part Number.

Soldering Techniques

WARNING

Disconnect the instrument from the power source before soldering.

Attenuator Circuit Board. The Attenuator Circuit Boards are made from polyphenylene oxide because of its excellent electrical characteristics. Use more than normal care when cleaning or soldering this material. The following rules should be observed when removing or replacing parts:

1. Use a low-wattage soldering iron (not over 15 watts).
2. Do not apply more heat, or apply heat for a longer time, than is absolutely necessary.
3. Use some form of vacuum solder remover when removing multi-lead devices.
4. Do not apply any solvent containing ketones, esters or halogenated hydrocarbons.
5. To clean, use only water-soluble detergents, ethyl, methyl or isopropyl alcohol.

Circuit Boards (except Attenuator board). The components mounted on the circuit boards in the amplifier can be replaced using normal circuit board soldering techniques. Keep the following points in mind when soldering on the circuit boards:

1. Use a pencil-type soldering iron with a (wattage) rating from 15 to 50 watts.
2. Apply heat from the soldering iron to the junction between the component and the circuit board.
3. Heat-shunt the lead to the component by means of a pair of long-nose pliers.
4. Avoid excessive heating of the junction with the circuit board, as this could separate the circuit board wiring from the base material.
5. Use electronic grade 60-40 tin lead solder.

Maintenance—7A26

6. Clip off any excess lead length extending beyond the circuit board. Clean off any residual flux with a flux-removing solvent.

Metal Terminals. When soldering metal terminals (potentiometers, etc.) use 60-40 tin-lead solder and a 15 to 50 watt soldering iron. Observe the following precautions when soldering metal terminals:

1. Apply only enough heat to make the solder flow freely.
2. Apply only enough solder to form a solid connection. Excess solder may impair the function of the part.
3. If a wire extends beyond the solder joint, clip off the excess.
4. Clean the flux from the solder joint with a flux-removing solvent.

Component Replacement

WARNING

Disconnect the equipment from the power source before replacing components.

Semiconductor Replacement. Transistors should not be replaced unless actually defective. If removed from their sockets during routine maintenance, return them to their original sockets. Unnecessary replacement of transistors may effect the calibration of this instrument. When transistors are replaced, check the performance of the part of the instrument which may be affected.

Replacement semiconductors should be of the original type or a direct replacement. The pullout following the schematic diagram section shows the lead configurations of the semiconductors used in this instrument. If the replacement semiconductor is not of the original type, check the manufacturer's basing diagram for proper basing.

Circuit Board Removal

In general, the circuit boards used in the 7A26 need never be removed unless they must be replaced. Electrical connections to the boards are made by soldered connections. If it is necessary to replace a circuit board assembly, use the following procedures.

A. READOUT CIRCUIT BOARD REMOVAL

1. Disconnect the wires connected to the outside of the board.
2. Remove the screws holding the board to the mounting surface.
3. Disconnect the wires connected to the inside of the board.
4. Remove the board from the unit.
5. To replace the board, reverse the order of removal.

B. ATTENUATOR CIRCUIT BOARD REMOVAL

1. Remove the readout board for either channel as outlined in the previous procedure.
2. Disconnect the inductor, capacitor, power connector, and ground strap connected to the rear of the board.
3. Loosen the front set screw on the VARIABLE control shaft coupling (use a 0.050-inch hex-key wrench).
4. Remove the red VARIABLE control knob and glass rod from the control shaft.
5. Remove the knobs for either channel using a 1/16-inch hex-key wrench.
6. Remove the nut holding the positioning control using a 5/16-inch wrench.
7. Remove the attenuator shields.
8. Disconnect the wires and resistor from the INPUT BNC connector.
9. Remove the INPUT BNC connector.
10. Remove the attenuator board with cam switch from the instrument.
11. Replace by reversing the Removal Procedure.

C. AMPLIFIER CIRCUIT BOARD REMOVAL

1. Remove the plastic plug-in guide from the rear of the instrument.
2. Disconnect the wires connected to the amplifier board from the CH 1 and CH 2 readout board and all front panel controls, with the exception of the TRIGGER SOURCE/DISPLAY MODE switch.
3. Loosen the hex-socket screw in the coupling of both the VARIABLE control shafts using a 0.050-inch hex-key wrench. Pull both the VARIABLE knobs and shafts from the front of the instrument.
4. Loosen the hex-socket screws in both the TRIGGER SOURCE and DISPLAY MODE knobs. Remove knobs.
5. Disconnect the inductors, capacitors, power connectors, and ground straps from the front of the board.
6. Remove the screws and nuts securing the board to the chassis or other mounting surface.
7. Remove the board from the instrument.
8. To replace, reverse the order of removal.

Switch Replacement

Several types of switches are used in the 7A26. The slide and micro switches should be replaced as a unit if damaged. The following special maintenance information is provided for the cam-type switches.



Repair of cam-type switches should be undertaken only by experienced maintenance personnel. Switch alignment and spring tension of the contacts must be carefully maintained for proper operation of the switch. For assistance in maintenance of cam-type switches, contact your local TEKTRONIX Field Office or representative.

A. CAM-TYPE SWITCHES

A cam-type switch consists of a rotating cam, which is turned by the front-panel knobs, and a set of contacts mounted on an adjacent circuit board. These switch contacts are actuated by lobes on the cam. The VOLTS/DIV and AC-GND-DC (coupling) cam-type switches can be disassembled for inspection, cleaning, repair, or replacement as follows:

1. Remove the Readout board and the Attenuator board/switch assembly as described previously. The front switch section on the Attenuator board is the AC-GND-DC switch and the rear switch section is the VOLTS/DIV switch. The switches are now open for inspection or cleaning.
2. To completely remove the switch from the board, remove the two screws and four hexagonal posts which hold the cam-type switch to the circuit board.
3. To remove the cam from the front support block, remove the retaining ring from the shaft on the front of the switch and slide the cam out of the support block. Be careful not to lose the small detent roller.
4. To replace defective switch contacts, follow the instructions given in the switch repair kit.
5. To re-install the switch assembly, reverse the above procedure.

Troubleshooting Chart

The Troubleshooting Chart contained in Fig. 4-1 can be used without disassembling the equipment. It will indicate the circuit or circuits most likely to contain the source of the trouble being investigated.

To Use the chart, start at the top, working down and to the right. If a check provides a "yes" answer, proceed down along the solid line. If the answer to a check is "no", follow the broken line to the right. Exceptions to the direction of flow are indicated by arrows where they occur. Directions and questions are contained in rectangles. Probable trouble areas are indicated in triangles.

When checking the probable trouble area, associated leads, switches and other components should not be ignored. A transistor might be inoperative because of a defective resistor in series with it.

The chart is designed on the basis of single defects. Multiple problems may disrupt the logic, but it should still be effective in determining the problems, one at a time.

Recalibration After Repair

After any electrical component has been replaced, the calibration of that particular circuit should be checked, as well as the calibration of other closely related circuits. Refer to Section 5 for these procedures.

TROUBLESHOOTING CHART

EQUIPMENT SETUP

7A26

POSITION
CH 1, CH 2 VOLTS/Div 50 mV
VARIABLE Cal In
DISPLAY MODE¹ CH 1
CH 2 POLARITY +UP
BW FULL
CH 1, CH 2 Input
Switches GND
TRIGGER SOURCE MODE

Time Base

Triggering
Time/Div

Auto, AC, INT
1 ms

Oscilloscope

Intensity and Focus adjusted for sharp trace.

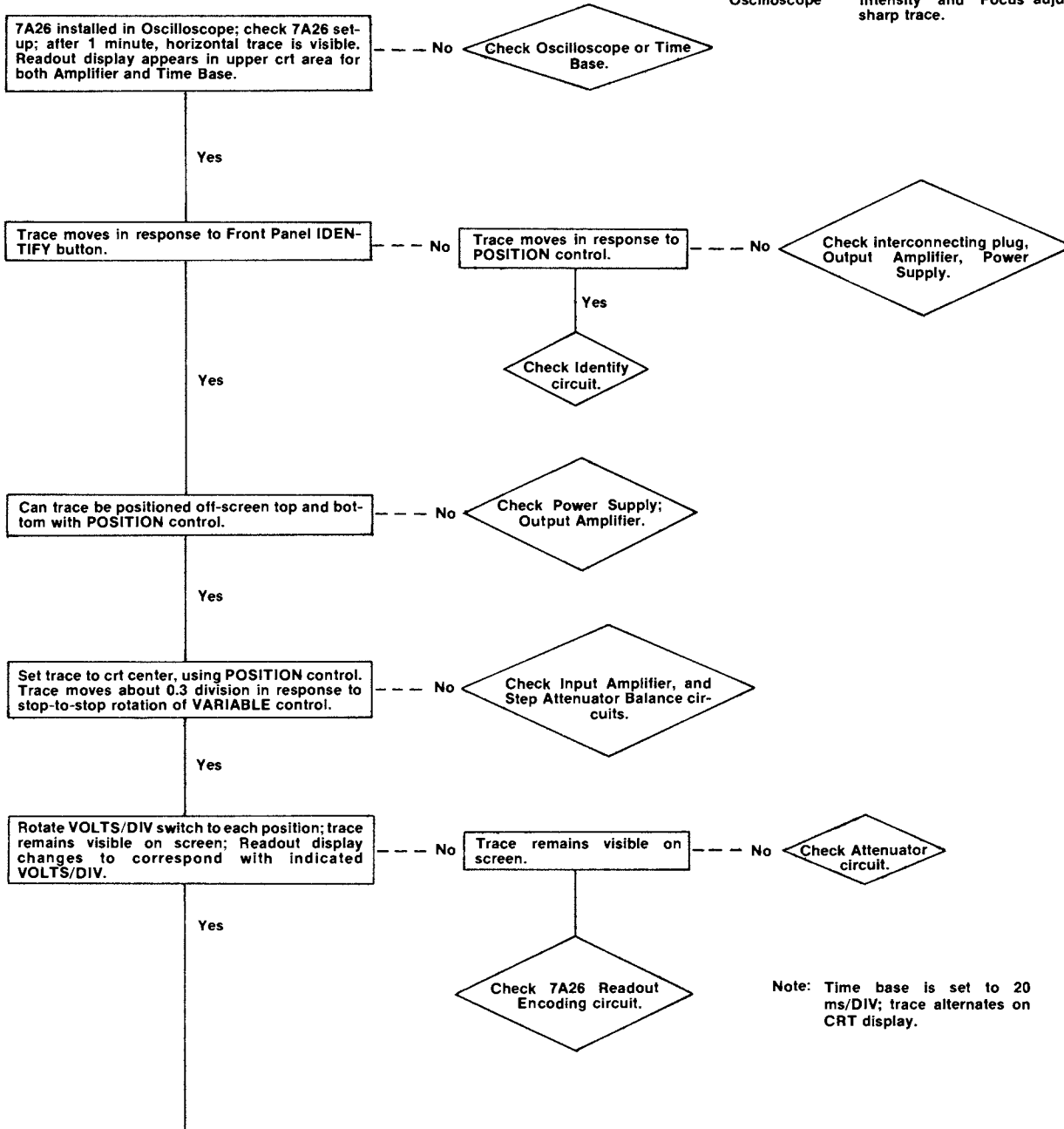
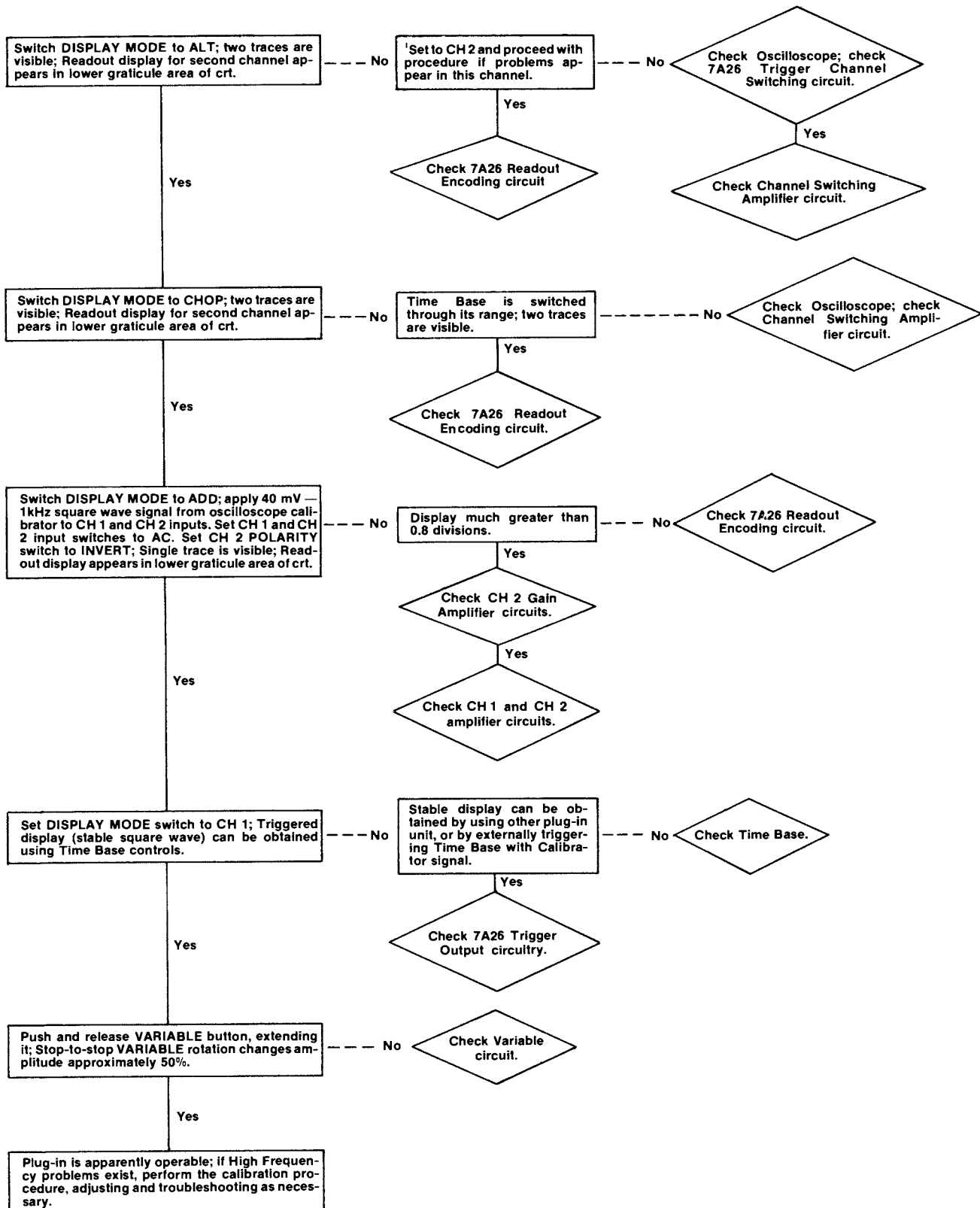


Fig. 4-1. Troubleshooting chart.



1484-17

Fig. 4-1 (cont).

REPACKAGING FOR SHIPMENT

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, 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.

CALIBRATION

Introduction

To assure instrument accuracy, check the calibration of the 7A26 every 1000 hours of operation, or every six months if used infrequently. Before complete calibration, thoroughly clean and inspect this instrument as outlined in the Maintenance section.

TEKTRONIX Field Service

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

Performance Check

The performance of this instrument can be checked by performing only the ✓ CHECK steps. Performing the steps marked with a ✓ indicate that the instrument is checked against the tolerances listed as a Performance Requirement (see Specification section).

Limits and tolerances given in other check steps are calibration guides and should not be interpreted as instrument specifications. Operator front-panel adjustments are adjusted as part of the Performance Check procedure.

Calibration

To verify proper calibration of the 7A26 and to prevent unnecessary re-calibration of the entire instrument, perform the Adjust— portion of a step only if the tolerance given in the Check— part of the step is not met.

For best overall instrument performance when performing a complete calibration procedure, make each adjustment to the exact setting even if the Check— is within allowable tolerance.

TEST EQUIPMENT REQUIRED

General

The following test equipment and accessories, or its equivalent, is required for complete calibration of the 7A26. Specifications given for the test equipment are the minimum necessary for accurate calibration. Therefore, the specifications of any test equipment used must meet or exceed the listed specifications. All test equipment is assumed to be correctly calibrated and operating within the listed specifications. Detailed operating instructions for the test equipment are not given in this procedure. Refer to the instruction manual for the test equipment if more information is needed.

Special Calibration Fixtures

Special TEKTRONIX calibration fixtures are used in this procedure only where they facilitate instrument calibration. These special calibration fixtures are available from Tektronix, Inc. Order by part number through your local TEKTRONIX Field Office or representative.

Calibration Equipment Alternatives

All of the listed test equipment is required to completely check and adjust this instrument. The Calibration procedure is based on the first item of equipment given as an example of applicable equipment. When other equipment is substituted, control settings or the calibration setup may need to be altered slightly to meet the requirements of the substitute equipment. If the exact item of test equipment given as an example in the Test Equipment list is not available, first check the Specifications column carefully to see if any other equipment is available which might suffice. Then check the Usage column to see what this item of test equipment is used for. If used for a check or adjustment which is of little or no importance to your measurement requirements, the item and corresponding step(s) can be deleted.

Signal Connections

Detailed signal-connection information is not given in this procedure except when critical for the particular test. Use a BNC T connector to simultaneously connect a signal to two inputs. Refer to the test equipment instruction manuals for other signal-connection information.

TEST EQUIPMENT

Description	Minimum Specifications	Usage	Examples of Applicable Test Equipment
1. Calibration oscilloscope.	7000-Series oscilloscope mainframe. 7900-Series required to check 7A26 maximum bandwidth.	Used throughout procedure to provide display.	TEKTRONIX 7904 Oscilloscope. Any TEKTRONIX 7000-Series oscilloscopes. Check Specifications for bandwidth.
2. Time Base Unit.	7B-Series time-base unit. Sweep speed to 2 ns/division.	Used throughout procedure to provide horizontal sweep.	TEKTRONIX 7B70 Time Base or equivalent.
3. Standard amplitude calibrator.	Amplitude accuracy, within 0.25%; signal amplitude, 20 mV to 20 V; frequency, 1 kHz square-wave.	Gain calibration.	TEKTRONIX Type PG 506 Calibration Generator. ¹
4. Square-wave generator.	Output capabilities: 12 V into 50 Ω with a risetime of at least 12 ns and a frequency of approximately 1 kHz; 500 mV into 50 Ω with a risetime of at least 1 ns to 100 kHz.	Input compensation and low frequency compensation.	TEKTRONIX Type PG 506 Calibration Generator. ¹
5. Pulse Generator.	Risetime of at least 70 ps, step amplitude of 200 mV into 50 Ω.	High frequency compensation.	TEKTRONIX Type 284 Pulse Generator.
6. High-frequency constant-amplitude signal generator.	Upper frequency range, 225 MHz; reference frequency, approximately 3 MHz; constant amplitude accuracy, within 2% of reference frequency; amplitude range, 0.5 V to 4 V peak-to-peak.	Bandwidth check.	TEKTRONIX Type SG 503 Signal Generator. ¹
7. Medium-frequency constant-amplitude sine-wave generator.	Frequency, variable from 50 to 75 megahertz; reference frequency, 50 kilohertz; output amplitude variable from 5 millivolts to 50 millivolts into 50 ohms; output amplitude constant within 3% at 50 kilohertz and 50 to 75 megahertz.	Common mode rejection.	TEKTRONIX Type SG 503 Signal Generator. ¹
8. Plug-in Extender	Provides access to 7A26 adjustments.	Used for aberrations check.	TEKTRONIX Calibration Fixture 067-0589-00.
Accessories			
1. BNC cable	Connectors, BNC; length, 42 inches.	Used throughout procedure.	TEKTRONIX Part Number 012-0057-01.
2. GR cable	Connectors, GR; impedance, 50 Ω; length, approximately 20 inches.	High frequency compensation.	TEKTRONIX Part Number 017-0515-00.
3. 5X attenuator	Connectors, GR; impedance, 50 Ω.	High frequency compensation.	TEKTRONIX Part Number 017-0079-00.
4. 10X attenuator	Connectors, GR; impedance, 50 Ω.	Used throughout procedure.	TEKTRONIX Part Number 017-0078-00.
5. RC normalizer SN B2088800 and up RC normalizer SN B208879 and below	Time constant, 1 M Ω X 22 pF; connectors, bnc; attenuation, 2X. Time constant, 1 M Ω X 20 pF; connectors, bnc; attenuation, 2X.	Input compensation Input compensation.	TEKTRONIX Part Number 067-0755-00 Tektronix Part Number 067-0538-00
6. Termination (through line)	Impedance, 50 Ω; connectors, GR to BNC male.	Used throughout procedure.	TEKTRONIX Part Number 017-0083-00.
7. Dual-input cable	Connectors, BNC; matched signal transfer to each input.	Common mode rejection.	TEKTRONIX Calibration Fixture 067-0525-01.
Adjustment tools			
1. Screwdriver	Three-inch shaft, 3/32-inch bit.	Used for potentiometer adjustments.	Xcelite R-3323.
2. Low-capacitance screwdriver	1 1/2-inch shaft.	Used for variable capacitor adjustments.	TEKTRONIX Part Number 003-0000-00.
3. Tuning tool	Handle with inserts.	Used for capacitance and attenuator adjustments.	TEKTRONIX Part Numbers 003-0307-00, 003-0334-00, and 003-0497-00.

¹ Requires TM 500-Series Power Module.

CALIBRATION PROCEDURE

CH 1 and CH 2

General

The following procedure is arranged so the 7A26 can be calibrated with the least interaction of adjustments and reconnection of equipment. The control settings and test equipment setups throughout this procedure continue from the preceding steps unless otherwise noted.

POSITION	Midrange
VOLTS/DIV	10 mV
AC-GND-DC	DC

NOTE

Control titles which are printed on the front panel of the 7A26 are capitalized (e.g., POSITION). Internal adjustments and associated equipment controls are initially capitalized only (e.g., oscilloscope Vertical Mode).

Preliminary Procedure for Calibration

1. Remove the oscilloscope left side cover and side panel of plug-in.
2. Insert the 7A26 in the calibration oscilloscope Left Vertical compartment.
3. Insert the time-base unit into the calibration oscilloscope Horizontal compartment.
4. Turn oscilloscope on and allow 20 minutes warm-up before proceeding.

NOTE

This instrument should be calibrated at an ambient temperature of +20°C to +30°C for best overall accuracy. The performance of the instrument can be checked at any temperature within the 0°C to +50°C range.

Preliminary Control Settings

Set the calibration oscilloscope and time-base unit for a sharp, well-defined trace. Set the 7A26 controls as follows:

7A26

DISPLAY MODE	CH 1
TRIGGER SOURCE	MODE
CH 2 POLARITY	+UP
BW	FULL

INDEX TO CALIBRATION PROCEDURE

1. Check/Adjust Channel 1 and 2 2X BAL and DC Balance (R160, R1353), (R1423A, R2423A). Check CH 2 POLARITY switch, and BW switch balance. Page 5-4
- ✓ 2. Check/Adjust Channel 1 and 2 GAIN (R1317, R2317). Page 5-4
Check/Adjust Polarity Gain (R2410).
- ✓ 3. Check Channel 1 and 2 Deflection Factor Accuracy. Page 5-5
- ✓ 4. Check Channel 1 and 2 VARIABLE (VOLTS/DIV) Range. Page 5-6
- ✓ 5. Check Channel 1 and 2 Trace IDENTIFY. Page 5-6
6. Check/Adjust Channel 1 and 2 Attenuator Compensation, (C134, C106, C107, C110, C111, C114, C115, C118, C119). Page 5-6
7. Check/Adjust Channel 1 and 2 Low-Frequency Compensation (R1436, R2436). Page 5-6
8. Check/Adjust Channel 1 and 2 High-Frequency Compensation (C2336, R2336, C2435, R2435, C2531, R2531, C2345, R2345), (C1336, R1336, C1435, R1435, C1531, R1531, C1345, R1345). Page 5-7
- ✓ 9. Check Common-Mode Rejection Ratio. Page 5-7
- ✓ 10. Check Alternate Operation. Page 5-7

Calibration—7A26

- √11. Check Chopped Operation. Page 5-7
- √12. Check TRIGGER SOURCE Operation. Page 5-8
- √13. Check Channel 1 and 2 Bandwidth. Page 5-8

Location of Adjustments

The locations of the 7A26 adjustments are shown in Fig. 7-7 on the fold-out page following the schematic diagrams.

1. Check/Adjust Channel 1 and 2 DC Balance

a. Position the trace to the center horizontal line with the CH 1 POSITION control.

b. ADJUST—Channel 1 2X BAL adjustment R160 for minimum vertical trace shift as the CH 1 VOLTS/DIV control is moved between the 5 mV and 10 mV positions. The trace should not move more than 0.5 division vertically.

c. Set the CH 1 VOLTS/DIV control to 5 mV.

d. Push and release the CH 1 VARIABLE (VOLTS/DIV) control to its outward position.

e. CHECK—Turn the VARIABLE control from fully counterclockwise to fully clockwise. Trace should not move more than 0.5 division vertically.

f. ADJUST—Channel 1 DC Balance, R1353, for minimum trace shift as the CH 1 VARIABLE control is rotated from fully counterclockwise to fully clockwise.

g. Set the CH 1 VARIABLE control to the CAL IN position.

h. Set the DISPLAY MODE switch to CH 2.

i. Position the trace to the center horizontal line with the CH 2 POSITION control.

j. ADJUST—Channel 2 2X BAL adjustment R160 for minimum vertical trace shift as the CH 2 VOLTS/DIV control is moved between the 5 mV and 10 mV positions. The trace should not move more than 0.5 division vertically.

k. Set the CH 2 VOLTS/DIV control at 5 mV.

l. CHECK—While switching from +UP to INVERT, trace should not move more than 0.5 division vertically.

m. ADJUST—Channel 2 DC Balance, R2353, for minimum trace shift while switching CH 2 POLARITY from +UP to INVERT.

n. Set the CH 2 POLARITY switch to +UP.

o. CHECK—Shift the BW switch between FULL and 20 MHz. The trace should not move more than 0.5 division vertically.

p. Set the BW switch to FULL.

√2. Check/Adjust Channel 1 and 2 GAIN

a. Connect the standard amplitude calibrator to the CH 2 input connector with a BNC cable.

b. Set the standard amplitude calibrator for 20 millivolt square-wave output.

c. Position the display to the center of the graticule with the CH 2 POSITION control.

d. CHECK—CRT display for exactly four divisions in amplitude.

e. ADJUST—CH 2 GAIN adjustment (front panel) for exactly four divisions of deflection. To adjust, press in the GAIN knob with a screwdriver and turn until the GAIN control is engaged.

f. Set the CH 2 AC-GND-DC switch to AC.

g. CHECK—Shift the CH 2 POLARITY switch between +UP and INVERT. The trace amplitude should not change more than 0.05 division.

h. ADJUST—Polarity Gain R2411 for minimum gain change while shifting the CH 2 POLARITY switch between +UP and INVERT. Recheck CH 2 GAIN because of interaction between step e and h.

i. Set the CH 2 AC-GND-DC switch to DC.

j. Set the CH 2 VOLTS/DIV switch to 10 mV.

k. Set the standard amplitude calibrator for 50-millivolt square-wave output.

l. CHECK—CRT display for exactly five divisions in amplitude.

m. ADJUST—Channel 2 2X GAIN R2317 for exactly five divisions in amplitude.

n. Disconnect the standard amplitude calibrator from the CH 2 input connector and connect it to the CH 1 input connector.

o. Set the DISPLAY MODE switch to CH 1.

p. Set the standard amplitude calibrator for 20-millivolt square-wave output.

q. Position the display to the center of the graticule with the CH 1 POSITION control.

r. CHECK—CRT display for exactly four divisions in amplitude.

s. ADJUST—CH 1 GAIN adjustment (front panel) for exactly four divisions of deflection. To adjust, press in the

GAIN knob with a screwdriver and turn until the GAIN control is engaged.

t. Set the CH 1 VOLTS/DIV switch to 10 mV.

u. Set the standard amplitude calibrator for 50-millivolt square-wave output.

v. CHECK—CRT display for exactly five divisions in amplitude.

w. ADJUST—Channel 1 2X GAIN R1317 for exactly five divisions in amplitude.

√3. Check Channel 1 and 2 Deflection Factor Accuracy

a. CHECK—Using the CH 1 VOLTS/DIV and standard amplitude calibrator settings given in Table 5-1, check vertical deflection within 2% in each position of the CH 1 VOLTS/DIV switch.

b. Disconnect the standard amplitude calibrator from the CH 1 input connector and connect it to the CH 2 input connector.

c. Set the DISPLAY MODE switch to CH 2.

d. Repeat part a of this step for channel 2.

TABLE 5-1

Vertical Deflection Accuracy

VOLTS/DIV Switch Setting	Standard Amplitude Calibrator Output	Vertical Deflection in Divisions	Maximum Error for ±2% Accuracy (divisions)
5 mV	20 mV	4	±.08
10 mV	50 mV	5	Set in step 2
20 mV	0.1 V	5	±0.1
50 mV	0.2 V	4	±.08
.1 V	0.5 V	5	±0.1
.2 V	1 V	5	±0.1
.5 V	2 V	4	±.08
1 V	5 V	5	±0.1
2 V	10 V	5	±0.1
5 V	20 V	4	±.08

4. Check Channel 1 and 2 VARIABLE (VOLTS/DIV) Range

- a. Set the Channel 1 and 2 VOLTS/DIV switches to 10 mV and the standard amplitude calibrator for a 50-millivolt output.
- b. Press and release the CH 2 VARIABLE control to its outward position.
- c. CHECK—With the CH 2 VARIABLE control fully counterclockwise, check for two divisions or less of deflection. Change POLARITY switch to INVERT and check for two divisions or less. Return to the +UP position.
- d. Return the CH 2 VARIABLE control to the CAL IN position.
- e. Disconnect the standard amplitude calibrator from the CH 2 input connector and connect it to the CH 1 input connector.
- f. Set the DISPLAY MODE switch to CH 1.
- g. Repeat parts b, c, and d of this step for channel 1.
- h. Disconnect all test equipment.

5. Check Channel 1 and 2 Trace IDENTIFY

- a. Center the CRT display vertically with the CH 1 POSITION control.
- b. CHECK—Press the IDENTIFY button and check that the trace moves upward.
- c. Set the DISPLAY MODE switch to CH 2 and repeat parts a and b of this step for Channel 2.

6. Check/Adjust Channel 1 and 2 Low-Frequency Compensation

- a. Connect the Square-wave Generator to the 7A26 CH 1 input through a 10X 50 Ω attenuator and a 50 Ω terminator.
- b. Set the Square-wave Generator to obtain approximately six vertical divisions of a 1 kHz square wave.
- c. ADJUST—R1436, and R1431, LF compensation control, for best flat top (minimum tilt).

- d. Disconnect the Square-wave Generator from CH 1 and connect to the CH 2 input connector.
- e. Set the DISPLAY MODE switch to CH 2.
- f. ADJUST—R2436, and R2431, LF compensation control, for best flat top (minimum tilt).
- g. Disconnect all test equipment.

7. Check/Adjust Channel 1 and 2 Attenuator Compensation

- a. (SN B208879-below) Connect the Square-wave Generator high-amplitude output to the CH 2 input connector through a 10X 50 Ω attenuator, 50 Ω termination, and a 20 pF RC Normalizer.
(SN B208880-up, as above using a 22 pF RC Normalizer.)
- b. Set the CH 1 and CH 2 VOLTS/DIV switches to 5 mV.
- c. Set the Square-wave Generator to obtain a 1 kHz, six-division display.
- d. ADJUST—And check CH 2 attenuator compensations as given in Table 5-2 for optimum square corner and flat top on the displayed waveform (use tuning tool). Maintain a six-division display for all VOLTS/DIV switch positions, removing the 10X attenuator and the 50 Ω termination when necessary.

TABLE 5-2
Attenuator Compensation

VOLTS/DIV Switch Setting	Adjust for Optimum	
	Square Corner	Flat Top
5 mV	*C130	—
10 mV	Check	Check
20 mV	C106	C107
50 mV	C110	C111
.1 V	C114	C115
.2 V	Check	Check
.5 V	Check	Check
1 V	C118	C119
2 V	Check	Check
5 V	Check	Check

*C134 Below SN B080000

- e. Disconnect the Normalizer from CH 2 and connect to the CH 1 input connector.
- f. Set the DISPLAY MODE switch to CH 1.
- g. Repeat part b of this step for channel 1.
- h. Disconnect the Square-wave Generator from the 7A26 and return the CH 1 and CH 2 VOLTS/DIV switch to 10 mV.

8. Check/Adjust Channel 1 and 2 High-Frequency Compensation

- a. Set the CH 1 and CH 2 VOLTS/DIV switches to 10 mV.
- b. Connect the Pulse Generator to the 7A26 CH 2 input through a 5X 50 Ω attenuator and a 50 Ω terminator.
- c. Set the time-base unit to obtain a triggered display at a rate of approximately 0.2 μ s per division.
- d. Position the top of the waveform to 1 division above center screen. Note the peak to peak amplitude.
- e. CHECK—Aberrations should not exceed +4% or -4% and 6% peak to peak of the pulse amplitude noted in part d.
- f. ADJUST — High-frequency compensations C2336, R2336, C2432, C2435, R2435, C2531, R2531, C2345, and R2345 for best front corner and flat top.
- g. Remove the 7A26 from the Vertical compartment and insert the Plug-in Extender into the same compartment.
- h. Insert the 7A26 into the Plug-in Extender.
- i. Reverse the trigger cable connections from A11 to A13, and B11 to B13 of the Plug-in Extender.
- j. CHECK—Aberrations should not exceed +10% or -10% and 15% peak to peak total of the pulse amplitude.
- k. ADJUST—High-frequency compensation C2721 for minimum aberrations.
- l. Repeat step f.
- m. Remove the Plug-in Extender from the Vertical compartment and insert the 7A26 into the compartment.
- n. Disconnect the Pulse Generator from CH 2 and connect to the CH 1 input through a 5X 50 Ω attenuator and a 50 Ω terminator.
- o. Set the DISPLAY MODE switch to CH 1.
- p. CHECK—Aberrations should not exceed +4% or -4% and 6% peak to peak of the pulse amplitude.
- q. ADJUST — High-frequency compensations C1336, R1336, C1432, C1435, R1435, C1531, R1531, C1345, and R1345 for best front corner flat top.
- r. Remove the 7A26 from the Vertical compartment and insert the Plug-in Extender into the compartment.
- s. Insert the 7A26 into the Plug-in Extender.
- t. CHECK—Aberrations should not exceed +10% or -10%, and 15% peak to peak total of the pulse amplitude.
- u. ADJUST—High-frequency compensation C1721 for minimum aberrations.
- v. Repeat part q.
- w. Remove the Plug-in Extender from the Vertical compartment and insert the 7A26 into the compartment.
- x. ADJUST—C134 for best compromise between 10, 20, and 50 mV positions for first 20 n sec of pulse.
- y. Disconnect all test equipment.
- z. Repeat step 6.

✓ 9. Check Common-Mode Rejection Ratio

- a. Set the CH 1 and CH 2 VOLTS/DIV switches to 5 mV.
- b. Connect the medium-frequency generator to the CH 1 and CH 2 input connectors through the 50 Ω termination and the dual-input cable.
- c. Set the constant-amplitude generator for an eight-division display (40 millivolts) at 50 megahertz.
- d. Change the following control settings:

DISPLAY MODE	ADD
CH 2 POLARITY	INVERT

Calibration—7A26

e. CHECK—CRT display for 0.8 division or less deflection (common-mode rejection ratio 10:1 or better).

f. Disconnect all test equipment.

✓ **10. Check Alternate Operation**

a. Set the DISPLAY MODE switch to ALT.

b. Position the traces about two divisions apart.

c. Turn the time-base unit time/division switch through-out its range.

d. CHECK—Trace alternation between channel 1 and 2 at all sweep rates. At faster sweep rates, alternation will not be apparent; instead display appears as two traces on the screen.

✓ **11. Check Chopped Operation**

a. Set the DISPLAY MODE switch to CHOP.

b. CHECK—CRT display for two traces.

✓ **12. Check Trigger Source Operation**

a. Change the following control settings:

DISPLAY MODE	ALT
TRIGGER SOURCE	CH 1

b. Connect the Indicator oscilloscope cal out connector to the CH 1 input connector.

c. Set the time-base unit for a stable display at a sweep rate of 0.5 millisecond/division.

d. Connect the square-wave generator through a 50 Ω termination to the CH 2 input connector. Set CH 2 to .2 V/div.

e. Set the square-wave generator for a one-division (200 millivolts) one-kilohertz signal.

f. CHECK—CRT display; CH 1 trace is stable and CH 2 trace cannot be triggered.

g. Set the TRIGGER SOURCE switch to CH 2.

h. Adjust the time-base triggering for a stable display.

i. CHECK—CRT display; CH 2 trace is stable and CH 1 trace cannot be triggered.

j. Set the TRIGGER SOURCE switch to MODE.

k. CHECK—CRT display; CH 1 trace and CH 2 trace can both be triggered.

l. Disconnect all test equipment.

✓ **13. Check Channel 1 and 2 Bandwidth**

a. Connect the high-frequency constant amplitude signal generator to the 7A26 CH 1 input through a 50 Ω termination.

b. Set the high-frequency constant amplitude signal generator to the reference frequency of 3 MHz and adjust the output amplitude to obtain a 6 division display.

c. Change the frequency of the high-frequency constant amplitude signal generator to the value given in Table 5-3 relative to the individual mainframe.

d. CHECK—That the amplitude of the display is 4.2 divisions or greater.

TABLE 5-3

System Bandwidth

Mainframe	Bandwidth
7900-Series	*200 megahertz
7700-Series	*150 megahertz
7600-Series	*100 megahertz
7500-Series	* 90 megahertz
7400-Series	* 60 megahertz

*See part c of step 13.

e. Disconnect the high-frequency constant signal generator and 50 Ω termination from CH 1 and connect to CH 2 input.

f. Set the DISPLAY MODE switch to CH 2.

g. Repeat parts b, c, and d of this step for CH 2.

h. Disconnect all test equipment.

This completes the calibration for the 7A26.

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

Replaceable Electrical Parts—7A26

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
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
17856	SILICONIX, INC.	2201 LAURELWOOD DRIVE	SANTA CLARA, CA 95054
24546	CORNING GLASS WORKS, ELECTRONIC COMPONENTS DIVISION	550 HIGH STREET	BRADFORD, PA 16701
24931	SPECIALITY CONNECTOR CO., INC.	2620 ENDRESS PLACE	GREENWOOD, IN 46142
32997	BOURNS, INC., TRIMPOT PRODUCTS DIV.	1200 COLUMBIA AVE.	RIVERSIDE, CA 92507
50157	MIDWEST COMPONENTS INC.	P. O. BOX 787 1981 PORT CITY BLVD.	MUSKEGON, MI 49443
56289	SPRAGUE ELECTRIC CO.	87 MARSHALL ST.	NORTH ADAMS, MA 01247
59660	TUSONIX INC.	2155 N FORBES BLVD	TUCSON, AZ 85705
72982	ERIE TECHNOLOGICAL PRODUCTS, INC.	644 W. 12TH ST.	ERIE, PA 16512
73138	BECKMAN INSTRUMENTS, INC., HELIPOT DIV.	2500 HARBOR BLVD.	FULLERTON, CA 92634
73899	JFD ELECTRONICS COMPONENTS CORP.	PINETREE ROAD	OXFORD, NC 27565
74970	JOHNSON, E. F., CO.	299 10TH AVE. S. W.	WASECA, MN 56093
75042	TRW ELECTRONIC COMPONENTS, IRC FIXED RESISTORS, PHILADELPHIA DIVISION	401 N. BROAD ST. S. MAIN ST.	PHILADELPHIA, PA 19108
76854	OAK INDUSTRIES, INC., SWITCH DIV.		CRYSTAL LAKE, IL 60014
78488	STACKPOLE CARBON CO.		ST. MARYS, PA 15857
79727	C-W INDUSTRIES	550 DAVISVILLE RD., P O BOX 96	WARMINISTER, PA 18974
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
90201	MALLORY CAPACITOR CO., DIV. OF P. R. MALLORY AND CO., INC.	3029 E. WASHINGTON STREET P. O. BOX 372	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

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A1	670-2324-01	B010100	B059999	CKT BOARD ASSY:ATTENUATOR	80009	670-2324-01
A1	670-2324-00	B060000	B079999	CKT BOARD ASSY:ATTENUATOR	80009	670-2324-00
A1	670-2324-03	B080000	B119999	CKT BOARD ASSY:ATTENUATOR	80009	670-2324-03
A1	670-2324-05	B120000	B208879	CKT BOARD ASSY:ATTENUATOR	80009	670-2324-05
A1	670-2324-07	B208880	B219999	CKT BOARD ASSY:ATTENUATOR	80009	670-2324-07
A1	670-2324-08	B220000		CKT BOARD ASSY:ATTENUATOR	80009	670-2324-08
A2	670-2549-00	B010100	B049999	CKT BOARD ASSY:AMPLIFIER	80009	670-2549-00
A2	670-2549-01	B050000	B069999	CKT BOARD ASSY:AMPLIFIER	80009	670-2549-01
A2	670-2549-02	B070000	B083789	CKT BOARD ASSY:AMPLIFIER	80009	670-2549-02
A2	670-2549-03	B083790	B089999	CKT BOARD ASSY:AMPLIFIER	80009	670-2549-03
A2	670-2549-04	B090000	B109999	CKT BOARD ASSY:AMPLIFIER	80009	670-2549-04
A2	670-2549-05	B110000	B139377	CKT BOARD ASSY:AMPLIFIER	80009	670-2549-05
A2	670-2549-06	B139378	B149999	CKT BOARD ASSY:AMPLIFIER	80009	670-2549-06
A2	670-2549-07	B150000	B159999	CKT BOARD ASSY:AMPLIFIER	80009	670-2549-07
A2	670-2549-08	B160000	B191299	CKT BOARD ASSY:AMPLIFIER	80009	670-2549-08
A2	670-2549-10	B191300	B219999	CKT BOARD ASSY:AMPLIFIER	80009	670-2549-10
A2	670-2549-13	B220000	B229999	CKT BOARD ASSY:AMPLIFIER	80009	670-2549-13
A2	670-2549-15	B230000	B245519	CKT BOARD ASSY:AMPLIFIER	80009	670-2549-15
A2	670-2549-17	B245520	B251089	CKT BOARD ASSY:AMPLIFIER	80009	670-2549-17
A2	670-2549-21	B251090		CKT BOARD ASSY:AMPLIFIER	80009	670-2549-21
A3	670-2310-01	B010100	B059999	CKT BOARD ASSY:READOUT	80009	670-2310-01
A3	670-2310-00	B060000	B149999	CKT BOARD ASSY:READOUT	80009	670-2310-00
A3	670-2310-04	B150000	B179999	CKT BOARD ASSY:READOUT	80009	670-2310-04
A3	670-2310-06	B180000	B195171	CKT BOARD ASSY:READOUT	80009	670-2310-06
A3	670-2310-08	B195172	B251089	CKT BOARD ASSY:READOUT	80009	670-2310-08
A3	670-2310-09	B251090		CKT BOARD ASSY:READOUT	80009	670-2310-09
C10	285-0816-01	B010100	B119999	CAP.,FXD,PLSTC:0.019UF,10%,600V	80009	285-0816-01
C10	285-1132-00	B120000		CAP.,FXD,PLSTC:0.019UF,10%,600V	80009	285-1132-00
C13	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C15	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C49	283-0003-00	B180000		CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	2DDH66J103Z
C106	307-1010-00			ATTENUATOR,FXD:2X	80009	307-1010-00
C107	-----			(PART OF C106)		
C110	307-1012-00			ATTENUATOR,FXD:5X	80009	307-1012-00
C111	-----			(PART OF C110)		
C114	307-1013-01			ATTENUATOR,FXD:10X	80009	307-1013-01
C115	-----			(PART OF C114)		
C117	281-0626-00	B010100	B079999	CAP.,FXD,CER DI:3.3PF,1%,500V	59660	0301080C0J0339B
C118	307-1013-01			ATTENUATOR,FXD:10X	80009	307-1013-01
C119	-----			(PART OF C118)		
C130	281-0670-00	B010100	B079999	CAP.,FXD,CER DI:1.8PF,+/-0.1PF,500V	04222	7040-C0K-1R8B
C130	281-0064-00	B080000		CAP.,VAR,PLSTC:0.25-1.5PF,600V	74970	273-0001-101
C132	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C133	283-0160-00	B208880		CAP.,FXD,CER DI:1.5PF,10%,50V	93958	1C15RB
C134	281-0064-00			CAP.,VAR,PLSTC:0.25-1.5PF,600V	74970	273-0001-101
C140	281-0615-00	B010100	B079999	CAP.,FXD,CER DI:3.9PF,+/-0.5PF,200V	59660	374018C0J0399D
C140	290-0536-00	B080000		CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
C142	283-0156-00	B080000		CAP.,FXD,CER DI:1000PF,+100-0%,200V	96733	R2670
C150	281-0562-00	B010100	B079999	CAP.,FXD,CER DI:39PF,10%,500V	59660	301-000U2J0390K
C154	283-0000-00	B010100	B079999	CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C156	283-0156-00	B080000		CAP.,FXD,CER DI:1000PF,+100-0%,200V	96733	R2670
C158	290-0536-00			CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL

Replaceable Electrical Parts—7A26

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
C190	281-0600-00	B010100	B079999	CAP.,FXD,CER DI:35PF,10%,500V	59660	308-000C0G0350K
C621	283-0000-00	B010100	B179999	CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C621	283-0177-00	B180000		CAP.,FXD,CER DI:1UF,+80-20%,25V	04222	SR302E105ZAA
C630	283-0000-00	B010100	B179999	CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C631	283-0000-00	B100000	B179999	CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C634	283-0000-00	B010100	B179999	CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C635	283-0000-00	B010100	B179999	CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C638	283-0000-00	B010100	B179999	CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C643	283-0000-00	B010100	B179999	CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C647	283-0000-00	B010100	B179999	CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C648	283-0003-00	B010100	B179999	CAP.,FXD,CER DI:0.01UF,+80-20%,150V	59821	2DDH66.103Z
C649	283-0000-00	B010100	B179999	CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C820	283-0010-00	B010100	B173947	CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	1C10Z5U503Z050B
C820	283-0341-00	B173948		CAP.,FXD,CER DI:0.047UF,10%,100V	72982	8121N153X7R0473K
C840	283-0010-00	B010100	B173947	CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	1C10Z5U503Z050B
C840	283-0341-00	B173948		CAP.,FXD,CER DI:0.047UF,10%,100V	72982	8121N153X7R0473K
C860	283-0640-00			CAP.,FXD,MICA D:160PF,1%,100V	00853	D155F161F0
C880	281-0603-00			CAP.,FXD,CER DI:39PF,5%,500V	59660	0301080C0G0390
C920	283-0010-00	B010100	B173947	CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	1C10Z5U503Z050B
C920	283-0341-00	B173948		CAP.,FXD,CER DI:0.047UF,10%,100V	72982	8121N153X7R0473K
C940	283-0010-00	B010100	B173947	CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	1C10Z5U503Z050B
C940	283-0341-00	B173948		CAP.,FXD,CER DI:0.047UF,10%,100V	72982	8121N153X7R0473K
C960	283-0640-00			CAP.,FXD,MICA D:160PF,1%,100V	00853	D155F161F0
C980	281-0603-00			CAP.,FXD,CER DI:39PF,5%,500V	59660	0301080C0G0390
C1012	290-0512-00	B010100	B039999	CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C1012	290-0536-00	B040000	B251454	CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
C1012	290-0804-00	B251455		CAP.,FXD,ELCTLT:10UF,+50-10%,25V	55680	ULA1E100TEA
C1014	283-0002-00	B010100	B251454	CAP.,FXD,CER DI:0.01UF,+80-20%,500V	59821	SDDH69L103Z
C1014	283-0773-00	B251455		CAP.,FXD,MICA D:578PF,1%,300V	00853	D15-3F5780F0
C1018	290-0512-00	B010100	B039999	CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C1018	290-0536-00	B040000	B251454	CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
C1018	290-0804-00	B251455		CAP.,FXD,ELCTLT:10UF,+50-10%,25V	55680	ULA1E100TEA
C1022	290-0512-00	B010100	B039999	CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C1022	290-0536-00	B040000	B251454	CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
C1022	290-0804-00	B251455		CAP.,FXD,ELCTLT:10UF,+50-10%,25V	55680	ULA1E100TEA
C1024	283-0002-00	B010100	B251454	CAP.,FXD,CER DI:0.01UF,+80-20%,500V	59821	SDDH69L103Z
C1024	283-0773-00	B251455		CAP.,FXD,MICA D:578PF,1%,300V	00853	D15-3F5780F0
C1028	290-0512-00	B010100	B039999	CAP.,FXD,ELCTLT:22UF,20%,15V	56289	196D226X0015KA1
C1028	290-0536-00	B040000	B251454	CAP.,FXD,ELCTLT:10UF,20%,25V	90201	TDC106M025FL
C1028	290-0804-00	B251455		CAP.,FXD,ELCTLT:10UF,+50-10%,25V	55680	ULA1E100TEA
C1032	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C1034	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C1070	281-0589-00	B070000		CAP.,FXD,CER DI:170PF,5%,500V	72982	301000Z5D0171J
C1073	281-0819-00	B245520		CAP.,FXD,CER DI:33PF,5%,50V	72982	8035BC0G330
C1311	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C1327	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C1329	283-0000-00	B010100	B159999	CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C1331	281-0540-00	B010100	B109999	CAP.,FXD,CER DI:51PF,5%,500V	59660	301-000U2J0510J
C1331	281-0549-00	B110000		CAP.,FXD,CER DI:68PF,10%,500V	59660	301-000U2J0680K
C1332	283-0203-00	B010100	B109999	CAP.,FXD,CER DI:0.47UF,20%,50V	04222	5R305SE474MAA
C1332	-----			(NOMINAL VALUE, SELECTED)		
C1332	283-0177-00	B110000	B139377	CAP.,FXD,CER DI:1UF,+80-20%,25V	04222	SR302E105ZAA
C1332	283-0203-00	B139378		CAP.,FXD,CER DI:0.47UF,20%,50V	04222	5R305SE474MAA

Replaceable Electrical Parts—7A26

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
C1336	281-0158-00			CAP.,VAR,CER D1:7-45PF,25V	73899	DVJ-5006
C1338	283-0154-00	B191300		CAP.,FXD,CER DI:22PF,5%,50V	59660	8111B065C0G0220J
C1338	-----			(NOMINAL VALUE, SELECTED)		
C1339	281-0519-00	B010100	B109999	CAP.,FXD,CER DI:47PF,+/-4.7PF,500V	59660	308-000C0G0470K
C1339	281-0158-00	B110000		CAP.,VAR,CER D1:7-45PF,25V	73899	DVJ-5006
C1345	281-0186-00	B010100	B099999	CAP.,VAR,PLSTC:1.1-3.5PF,100V	74970	273-0005-005
C1345	281-0218-00	B100000		CAP.,VAR,CER DI:1-5PF,+2-2.5%,100V	59660	513-013A1-5
C1431	283-0142-00	B010100	B029999	CAP.,FXD,CER DI:0.0027UF,5%,200V	59660	875571YEE0272J
C1431	283-0110-00	B030000	B059999	CAP.,FXD,CER DI:0.005UF,+80-20%,150V	59660	855-547-E-502Z
C1431	283-0100-00	B060000	B109999	CAP.,FXD,CER DI:0.0047UF,10%,200V	56289	2C20C0G472K200B
C1431	-----			(NOMINAL VALUE, SELECTED)		
C1431	283-0051-00	B110000	B139377	CAP.,FXD,CER DI:0.0033UF,5%,100V	56289	1C20C0G332J100B
C1431	-----			(NOMINAL VALUE, SELECTED)		
C1431	283-0119-00	B139378		CAP.,FXD,CER DI:2200PF,5%,200V	59660	855-536Y5E0222J
C1431	-----			(NOMINAL VALUE, SELECTED)		
C1432	281-0122-00	B083790		CAP.,VAR,CER DI:2.5-9PF,100V	59660	518-000A2.5-9
C1433	281-0628-00			CAP.,FXD,CER DI:15PF,5%,500V	59660	301-000C0G0150J
C1434	281-0546-00			CAP.,FXD,CER DI:330PF,10%,500V	59660	301000X5P331K
C1435	281-0158-00			CAP.,VAR,CER D1:7-45PF,25V	73899	DVJ-5006
C1436	283-0010-00	B010100	B109999	CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	1C10Z5U503Z050B
C1436	283-0058-00	B110000	B139377	CAP.,FXD,CER DI:0.027UF,10%,100V	56289	1C20X7R273K100B
C1436	-----			(NOMINAL VALUE, SELECTED)		
C1436	283-0268-00	B139378		CAP.,FXD,CER DI:0.015UF,10%,50V	56289	1C20X7R153K050B
C1436	-----			(NOMINAL VALUE, SELECTED)		
C1480	281-0534-00			CAP.,FXD,CER DI:3.3PF,+/-0.25PF,500V	04222	7001-COJ-3R3C
C1490	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C1531	281-0161-00			CAP.,VAR,CER DI:5-15PF,350V	59660	518-000A5-15
C1533	283-0177-00	B010100	B109999	CAP.,FXD,CER DI:1UF,+80-20%,25V	04222	SR302E105ZAA
C1533	281-0658-00	B110000		CAP.,FXD,CER DI:6.2PF,+/-0.25PF,500V	59660	301-000C0H0629C
C1721	281-0123-00	B050000		CAP.,VAR,CER DI:5-25PF,100V	59660	518-000A5-25
C2311	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C2327	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C2329	283-0000-00	B010100	B159999	CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C2331	281-0540-00	B010100	B109999	CAP.,FXD,CER DI:51PF,5%,500V	59660	301-000U2J0510J
C2331	281-0549-00	B110000		CAP.,FXD,CER DI:68PF,10%,500V	59660	301-000U2J0680K
C2332	283-0203-00	B010100	B139377	CAP.,FXD,CER DI:0.47UF,20%,50V	04222	5R305SE474MAA
C2332	283-0203-00	B139378		CAP.,FXD,CER DI:0.47UF,20%,50V	04222	5R305SE474MAA
C2332	-----			(NOMINAL VALUE, SELECTED)		
C2336	281-0158-00			CAP.,VAR,CER D1:7-45PF,25V	73899	DVJ-5006
C2338	283-0154-00	B191300		CAP.,FXD,CER DI:22PF,5%,50V	59660	8111B065C0G0220J
C2338	-----			(NOMINAL VALUE, SELECTED)		
C2339	281-0519-00	B010100	B109999	CAP.,FXD,CER DI:47PF,+/-4.7PF,500V	59660	308-000C0G0470K
C2339	281-0158-00	B110000		CAP.,VAR,CER D1:7-45PF,25V	73899	DVJ-5006
C2345	281-0186-00	B010100	B099999	CAP.,VAR,PLSTC:1.1-3.5PF,100V	74970	273-0005-005
C2345	281-0218-00	B100000		CAP.,VAR,CER DI:1-5PF,+2-2.5%,100V	59660	513-013A1-5
C2423	283-0000-00			CAP.,FXD,CER DI:0.001UF,+100-0%,500V	59660	831610Y5U0102P
C2431	283-0142-00	B010100	B029999	CAP.,FXD,CER DI:0.0027UF,5%,200V	59660	875571YEE0272J
C2431	283-0110-00	B030000	B059999	CAP.,FXD,CER DI:0.005UF,+80-20%,150V	59660	855-547-E-502Z
C2431	283-0100-00	B060000	B109999	CAP.,FXD,CER DI:0.0047UF,10%,200V	56289	2C20C0G472K200B
C2431	-----			(NOMINAL VAUE, SELECTED)		
C2431	283-0051-00	B110000	B139377	CAP.,FXD,CER DI:0.0033UF,5%,100V	56289	1C20C0G332J100B
C2431	-----			(NOMINAL VALUE, SELECTED)		
C2431	283-0119-00	B139378		CAP.,FXD,CER DI:2200PF,5%,200V	59660	855-536Y5E0222J
C2431	-----			(NOMINAL VALUE, SELECTED)		

Replaceable Electrical Parts—7A26

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
C2432	281-0122-00	B083790		CAP.,VAR,CER DI:2.5-9PF,100V	59660	518-000A2.5-9
C2433	281-0628-00			CAP.,FXD,CER DI:15PF,5%,500V	59660	301-000C0G0150J
C2434	281-0546-00			CAP.,FXD,CER DI:330PF,10%,500V	59660	301000X5P331K
C2435	281-0158-00			CAP.,VAR,CER DI:7-45PF,25V	73899	DVJ-5006
C2436	283-0010-00	B010100	B109999	CAP.,FXD,CER DI:0.05UF,+100-20%,50V	56289	1C10Z5U503Z050B
C2436	283-0058-00	B110000	B139377	CAP.,FXD,CER DI:0.027UF,10%,100V	56289	1C20X7R273K100B
C2436	-----			(NOMINAL VALUE, SELECTED)		
C2436	283-0268-00	B139378		CAP.,FXD,CER DI:0.015UF,10%,50V	56289	1C20X7R153K050B
C2436	-----			(NOMINAL VALUE, SELECTED)		
C2480	281-0659-00			CAP.,FXD,CER DI:4.3PF,+/-0.25PF,500V	59660	301-000C0H0439C
C2531	281-0161-00			CAP.,VAR,CER DI:5-15PF,350V	59660	518-000A5-15
C2533	283-0177-00	B010100	B139377	CAP.,FXD,CER DI:1UF,+80-20%,25V	04222	SR302E105ZAA
C2720	281-0627-00	B020000		CAP.,FXD,CER DI:1PF,+/-0.25PF,500V	04222	77001-C0K-1R0C
C2720	-----			(C2720 TEST SELECTED AS NEEDED)		
C2721	281-0123-00	B050000		CAP.,VAR,CER DI:5-25PF,100V	59660	518-000A5-25
CR130	152-0321-00			SEMICONV DEVICE:SILICON,30V,0.1A	07263	FSA1480
CR621	152-0141-02			SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR630	152-0141-02	B180000		SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR631	152-0141-02	B010100	B099999	SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR631	152-0141-02	B180000		SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR634	152-0141-02	B180000		SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR635	152-0141-02	B180000		SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR638	152-0141-02	B180000		SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR647	152-0141-02			SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR648	152-0141-02	B180000		SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR860	152-0141-02			SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR880	152-0141-02			SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR960	152-0141-02			SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR980	152-0141-02			SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR1050	152-0141-02			SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR1052	152-0141-02			SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR1056	152-0141-02	B070000		SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR1058	152-0141-02			SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR1060	152-0141-02	B010100	B069999	SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR1062	152-0141-02	B010100	B069999	SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR1301	152-0141-02	B090000		SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR1319	152-0141-02			SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR1465	152-0141-02			SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR2301	152-0141-02	B090000		SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR2319	152-0141-02			SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR2465	152-0141-02			SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR2476	152-0141-02			SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
CR2496	152-0141-02			SEMICONV DVC,DI:SW,SI,30V,150MA,30V,DO-35	12969	NDP0263 (1N4152)
J10	131-0679-00	B010100	B073246	CONNECTOR,RCPT,:BNC,MALE,3 CONTACT	24931	28JR168-1
J10	131-0679-02	B073247		CONNECTOR,RCPT,:BNC,MALE,3 CONTACT	24931	28JR270-1
L118	108-0557-00	B010100	B079999	COIL,RF:35NH	80009	108-0557-00
L806	108-0420-00	B010100	B159999	COIL,RF:FIXED,60NH	80009	108-0420-00
L808	108-0420-00	B010100	B159999	COIL,RF:FIXED,60NH	80009	108-0420-00
L860	108-0311-00			COIL,RF:FIXED,153NH	80009	108-0311-00
L861	276-0507-00	B160000		SHIELDING BEAD,:FERRITE	78488	57-3443
L880	108-0311-00			COIL,RF:FIXED,153NH	80009	108-0311-00

Replaceable Electrical Parts—7A26

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
L881	276-0507-00	B160000		SHIELDING BEAD,:FERRITE	78488	57-3443
L960	108-0311-00			COIL,RF:FIXED,153NH	80009	108-0311-00
L980	108-0311-00			COIL,RF:FIXED,153NH	80009	108-0311-00
L1070	276-0507-00	B110000		SHIELDING BEAD,:FERRITE	78488	57-3443
L1345	108-0420-00			COIL,RF:FIXED,60NH	80009	108-0420-00
L2345	108-0420-00			COIL,RF:FIXED,60NH	80009	108-0420-00
LR107	108-0744-00	B010100	B079999	COIL,RF:FIXED,80NH	80009	108-0744-00
LR111	108-0745-00	B010100	B079999	COIL,RF:FIXED,95NH	80009	108-0745-00
LR701	108-0407-00	B083790		COIL,RF:FIXED,37NH	80009	108-0407-00
LR701	-----			(LR701 TEST SELECTED AS NEEDED)		
LR703	108-0407-00	B083790		COIL,RF:FIXED,37NH	80009	108-0407-00
LR703	-----			(LR703 TEST SELECTED AS NEEDED)		
LR1010	108-0184-00			COIL,RF:3.2UH(WOUND ON A 10 OHM RES	80009	108-0184-00
LR1014	108-0184-00			COIL,RF:3.2UH(WOUND ON A 10 OHM RES	80009	108-0184-00
LR1020	108-0184-00			COIL,RF:3.2UH(WOUND ON A 10 OHM RES	80009	108-0184-00
LR1024	108-0184-00			COIL,RF:3.2UH(WOUND ON A 10 OHM RES	80009	108-0184-00
Q140	151-0367-00	B010100	B079999	TRANSISTOR:SILICON,NPN,SEL FROM 3571TP	04713	SPS 8811
Q150	151-1032-00			TRANSISTOR:SILICON,FET,DUAL	17856	DN399
Q620	151-0254-00	B010100	B179999	TRANSISTOR:SILICON,NPN	03508	X38L3118
Q620	151-0281-00	B180000		TRANSISTOR:SILICON,NPN	03508	X16P4039
Q820	153-0606-00	B010100	B109999	SEMICON DVC,SE:MATCHED,6V,15MA	80009	153-0606-00
Q820	153-0644-00	B110000	B219999	TRANSISTOR:MATCHED PAIR	80009	153-0644-00
Q820	153-0653-00	B220000		SEMICON DVC SE:(4) MATCHED	80009	153-0653-00
Q840	-----			(PART OF Q820)		
Q860	-----			(PART OF Q820)		
Q880	-----			(PART OF Q820)		
Q920	151-0271-00			TRANSISTOR:SILICON,PNP	04713	SPS8236
Q940	151-0271-00			TRANSISTOR:SILICON,PNP	04713	SPS8236
Q960	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q980	151-0221-00			TRANSISTOR:SILICON,PNP	04713	SPS246
Q1050	151-0341-00	B010100	B069999	TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
Q1050	151-0347-00	B070000	B109999	TRANSISTOR:SILICON,NPN	56289	T7916
Q1050	151-0302-00	B110000		TRANSISTOR:SILICON,NPN	07263	S038487
Q1070	151-0341-00	B010100	B069999	TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
Q1070	151-0347-00	B070000	B109999	TRANSISTOR:SILICON,NPN	56289	T7916
Q1070	151-0302-00	B110000		TRANSISTOR:SILICON,NPN	07263	S038487
Q1470	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
Q1490	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
Q2470	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
Q2490	151-0341-00			TRANSISTOR:NPN,SI,TO-106	04713	SPS6919
R10	315-0560-00			RES.,FXD,CMPSN:56 OHM,5%,0.25W	57668	NTR25J-E56E0
R13	316-0101-00			RES.,FXD,CMPSN:100 OHM,10%,0.25W	01121	CB1011
R102	317-0105-00			RES.,FXD,CMPSN:1M OHM,5%,0.125W	01121	BB1055
R104	315-0560-00			RES.,FXD,CMPSN:56 OHM,5%,0.25W	57668	NTR25J-E56E0
R106	317-0330-00	B080000	B208879	RES.,FXD,CMPSN:33 OHM,5%,0.125W	01121	BB3305
R106	-----			(NOMINAL VALUE, SELECTED)		
R106	317-0390-00	B208880		RES.,FXD,CMPSN:39 OHM,5%,0.125W	01121	BB3905

Replaceable Electrical Parts—7A26

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R110	317-0470-00	B080000	B208879	RES.,FXD,CMPSN:47 OHM,5%,0.125W	01121	BB4705
R110	317-0620-00	B208880	B219999	RES.,FXD,CMPSN:62 OHM,5%,0.125W	01121	BB6205
R110	-----			(NOMINAL VALUE, SELECTED)		
R110	317-0560-00	B220000		RES.,FXD,CMPSN:56 OHM,5%,0.125W	01121	BB5605
R110	-----			(NOMINAL VALUE, SELECTED)		
R114	317-0220-00	B080000		RES.,FXD,CMPSN:22 OHM,5%,0.125W	01121	BB2205
R115	315-0430-00	B010100	B079999	RES.,FXD,CMPSN:43 OHM,5%,0.25W	01121	CB4305
R115	315-0560-00	B080000		RES.,FXD,CMPSN:56 OHM,5%,0.25W	57668	NTR25J-E56E0
R118	315-0360-00	B010100	B079999	RES.,FXD,CMPSN:36 OHM,5%,0.25W	01121	CB3605
R118	315-0750-00	B080000		RES.,FXD,CMPSN:75 OHM,5%,0.25W	57668	NTR25J-E75E0
R119	317-0360-00	B080000	B208879	RES.,FXD,CMPSN:36 OHM,5%,0.125W	01121	BB3605
R119	317-0220-00	B208880	B219999	RES.,FXD,CMPSN:22 OHM,5%,0.125W	01121	BB2205
R119	-----			(NOMINAL VALUE, SELECTED)		
R119	317-0360-00	B220000		RES.,FXD,CMPSN:36 OHM,5%,0.125W	01121	BB3605
R119	-----			(NOMINAL VALUE, SELECTED)		
R130	321-0481-00			RES.,FXD,FILM:1M OHM,1%,0.125W	91637	CMF55116G10003F
R132	316-0474-00			RES.,FXD,CMPSN:470K OHM,10%,0.25W	01121	CB4741
R133	-----	B010100	B208879	(SELECTED AND ADDED IF NECESSARY)		
R133	317-0360-00	B208880		RES.,FXD,CMPSN:36 OHM,5%,0.125W	01121	BB3605
R133	-----			(NOMINAL VALUE, SELECTED)		
R134	315-0751-00	B010100	B079999	RES.,FXD,CMPSN:750 OHM,5%,0.25W	57668	NTR25J-E750E
R134	315-0471-00	B080000		RES.,FXD,CMPSN:470 OHM,5%,0.25W	57668	NTR25J-E470E
R140	315-0621-00	B010100	B079999	RES.,FXD,CMPSN:620 OHM,5%,0.25W	57668	NTR25J-E620E
R140	315-0201-00	B080000		RES.,FXD,CMPSN:200 OHM,5%,0.25W	57668	NTR25J-E200E
R142	315-0132-00	B010100	B079999	RES.,FXD,CMPSN:1.3K OHM,5%,0.25W	57668	NTR25J-E01K3
R142	315-0621-00	B080000		RES.,FXD,CMPSN:620 OHM,5%,0.25W	57668	NTR25J-E620E
R144	315-0221-00	B010100	B079999	RES.,FXD,CMPSN:220 OHM,5%,0.25W	57668	NTR25J-E220E
R145	315-0560-00	B010100	B079999	RES.,FXD,CMPSN:56 OHM,5%,0.25W	57668	NTR25J-E56E0
R150	315-0200-00			RES.,FXD,CMPSN:20 OHM,5%,0.25W	01121	CB2005
R151	315-0560-00	B010100	B079999	RES.,FXD,CMPSN:56 OHM,5%,0.25W	57668	NTR25J-E56E0
R152	315-0200-00			RES.,FXD,CMPSN:20 OHM,5%,0.25W	01121	CB2005
R154	316-0105-00	B010100	B079999	RES.,FXD,CMPSN:1M OHM,10%,0.25W	01121	CB1051
R156	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	57668	NTR25J-E200E
R158	315-0621-00			RES.,FXD,CMPSN:620 OHM,5%,0.25W	57668	NTR25J-E620E
R160	311-1268-00			RES.,VAR, NONWIR:120 OHM,10%,0.50W	32997	3329P-L58-103
R162	315-0200-00			RES.,FXD,CMPSN:20 OHM,5%,0.25W	01121	CB2005
R164	315-0562-00	B010100	B019999	RES.,FXD,CMPSN:5.6K OHM,5%,0.25W	57668	NTR25J-E05K6
R164	315-0472-00	B110000		RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
R620	315-0471-00	B180000		RES.,FXD,CMPSN:470 OHM,5%,0.25W	57668	NTR25J-E470E
R621	321-0223-00	B010100	B179999	RES.,FXD,FILM:2.05K OHM,1%,0.125W	91637	MFF1816G20500F
R621	321-0222-00	B180000		RES.,FXD,FILM:2K OHM,1%,0.125W	91637	MFF1816G20000F
R622	321-0299-00			RES.,FXD,FILM:12.7K OHM,1%,0.125W	91637	MFF1816G12701F
R629	315-0101-00	B180000		RES.,FXD,CMPSN:100 OHM,5%,0.25W	57668	NTR25J-E 100E
R630	315-0154-00			RES.,FXD,CMPSN:150K OHM,5%,0.25W	57668	NTR25J-E150K
R631	315-0753-00			RES.,FXD,CMPSN:75K OHM,5%,0.25W	57668	NTR25J-E75K0
R633	315-0753-00			RES.,FXD,CMPSN:75K OHM,5%,0.25W	57668	NTR25J-E75K0
R634	315-0154-00			RES.,FXD,CMPSN:150K OHM,5%,0.25W	57668	NTR25J-E150K
R635	321-0344-00			RES.,FXD,FILM:37.4K OHM,1%,0.125W	91637	MFF1816G37401F
R637	315-0471-00	B150000	B179999	RES.,FXD,CMPSN:470 OHM,5%,0.25W	57668	NTR25J-E470E
R638	315-0154-00			RES.,FXD,CMPSN:150K OHM,5%,0.25W	57668	NTR25J-E150K
R639	315-0753-00			RES.,FXD,CMPSN:75K OHM,5%,0.25W	57668	NTR25J-E75K0
R640	315-0753-00			RES.,FXD,CMPSN:75K OHM,5%,0.25W	57668	NTR25J-E75K0
R642	315-0513-00			RES.,FXD,CMPSN:51K OHM,5%,0.25W	57668	NTR25J-E51K0
R643	321-0344-00			RES.,FXD,FILM:37.4K OHM,1%,0.125W	91637	MFF1816G37401F

Replaceable Electrical Parts—7A26

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R645	315-0154-00			RES.,FXD,CMPSN:150K OHM,5%,0.25W	57668	NTR25J-E150K
R646	315-0154-00			RES.,FXD,CMPSN:150K OHM,5%,0.25W	57668	NTR25J-E150K
R647	315-0133-00			RES.,FXD,CMPSN:13K OHM,5%,0.25W	01121	CB1335
R648	315-0154-00			RES.,FXD,CMPSN:150K OHM,5%,0.25W	57668	NTR25J-E150K
R802	315-0560-00			RES.,FXD,CMPSN:56 OHM,5%,0.25W	57668	NTR25J-E56E0
R804	315-0560-00	B010100	B159999	RES.,FXD,CMPSN:56 OHM,5%,0.25W	57668	NTR25J-E56E0
R804	315-0560-00	B170000		RES.,FXD,CMPSN:56 OHM,5%,0.25W	57668	NTR25J-E56E0
R806	323-0094-00			RES.,FXD,FILM:93.1 OHM,1%,0.50W	75042	CECT0-93R10F
R808	323-0094-00			RES.,FXD,FILM:93.1 OHM,1%,0.50W	75042	CECT0-93R10F
R810	315-0111-00			RES.,FXD,CMPSN:110 OHM,5%,0.25W	57668	NTR25J-E110E
R811	315-0111-00			RES.,FXD,CMPSN:110 OHM,5%,0.25W	57668	NTR25J-E110E
R812	315-0560-00	B010100	B159999	RES.,FXD,CMPSN:56 OHM,5%,0.25W	57668	NTR25J-E56E0
R812	315-0560-00	B170000		RES.,FXD,CMPSN:56 OHM,5%,0.25W	57668	NTR25J-E56E0
R814	315-0560-00			RES.,FXD,CMPSN:56 OHM,5%,0.25W	57668	NTR25J-E56E0
R820	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	57668	NTR25J-E220E
R822	321-0222-00	B010100	B229999	RES.,FXD,FILM:2K OHM,1%,0.125W	91637	MFF1816G20000F
R822	315-0202-00	B230000		RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R824	321-0146-00	B010100	B229999	RES.,FXD,FILM:324 OHM,1%,0.125W	91637	MFF1816G324R0F
R824	315-0511-00	B230000		RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R828	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	57668	NTR25J-E270E
R829	321-0157-00	B010100	B229999	RES.,FXD,FILM:422 OHM,1%,0.125W	91637	MFF1816G422R0F
R830	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	57668	NTR25J-E270E
R832	321-0222-00	B010100	B229999	RES.,FXD,FILM:2K OHM,1%,0.125W	91637	MFF1816G20000F
R832	315-0202-00	B230000		RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R834	321-0146-00	B010100	B229999	RES.,FXD,FILM:324 OHM,1%,0.125W	91637	MFF1816G324R0F
R834	315-0511-00	B230000		RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R840	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	57668	NTR25J-E220E
R846	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	01121	CB1215
R860	315-0470-00	B010100	B219999	RES.,FXD,CMPSN:47 OHM,5%,0.25W	57668	NTR25J-E47E0
R860	315-0161-00	B220000		RES.,FXD,CMPSN:160 OHM,5%,0.25W	57668	NTR25J-E 160E
R880	315-0470-00	B010100	B219999	RES.,FXD,CMPSN:47 OHM,5%,0.25W	57668	NTR25J-E47E0
R880	315-0161-00	B220000		RES.,FXD,CMPSN:160 OHM,5%,0.25W	57668	NTR25J-E 160E
R890	323-0193-00			RES.,FXD,FILM:1K OHM,1%,0.50W	75042	CECT0-1001F
R892	323-0193-00			RES.,FXD,FILM:1K OHM,1%,0.50W	75042	CECT0-1001F
R902	315-0111-00			RES.,FXD,CMPSN:110 OHM,5%,0.25W	57668	NTR25J-E110E
R904	315-0111-00			RES.,FXD,CMPSN:110 OHM,5%,0.25W	57668	NTR25J-E110E
R906	323-0094-00			RES.,FXD,FILM:93.1 OHM,1%,0.50W	75042	CECT0-93R10F
R908	323-0094-00			RES.,FXD,FILM:93.1 OHM,1%,0.50W	75042	CECT0-93R10F
R912	315-0330-00	B010100	B049999	RES.,FXD,CMPSN:33 OHM,5%,0.25W	01121	CB3305
R912	315-0390-00	B050000		RES.,FXD,CMPSN:39 OHM,5%,0.25W	57668	NTR25J-E39E0
R914	315-0330-00	B010100	B049999	RES.,FXD,CMPSN:33 OHM,5%,0.25W	01121	CB3305
R914	315-0390-00	B050000		RES.,FXD,CMPSN:39 OHM,5%,0.25W	57668	NTR25J-E39E0
R920	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	57668	NTR25J-E220E
R928	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	57668	NTR25J-E270E
R930	315-0271-00			RES.,FXD,CMPSN:270 OHM,5%,0.25W	57668	NTR25J-E270E
R940	315-0221-00			RES.,FXD,CMPSN:220 OHM,5%,0.25W	57668	NTR25J-E220E
R946	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	01121	CB1215
R960	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	57668	NTR25J-E47E0
R980	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	57668	NTR25J-E47E0
R990	323-0193-00			RES.,FXD,FILM:1K OHM,1%,0.50W	75042	CECT0-1001F
R992	323-0193-00			RES.,FXD,FILM:1K OHM,1%,0.50W	75042	CECT0-1001F
R1010	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	57668	NTR25J-E47E0
R1012	315-0470-00			RES.,FXD,CMPSN:47 OHM,5%,0.25W	57668	NTR25J-E47E0

Replaceable Electrical Parts—7A26

Ckt No.	Tektronix Part No.	Serial/Model No.		Name & Description	Mfr Code	Mfr Part Number
		Eff	Dscont			
R1032	315-0330-00	B010100	B159999	RES.,FXD,CMPSN:33 OHM,5%,0.25W	01121	CB3305
R1032	317-0330-00	B160000		RES.,FXD,CMPSN:33 OHM,5%,0.125W	01121	BB3305
R1034	315-0330-00	B010100	B159999	RES.,FXD,CMPSN:33 OHM,5%,0.25W	01121	CB3305
R1034	317-0330-00	B160000		RES.,FXD,CMPSN:33 OHM,5%,0.125W	01121	BB3305
R1050	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	57668	NTR25J-E10K0
R1052	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	57668	NTR25J-E 100E
R1054	315-0751-00	B070000		RES.,FXD,CMPSN:750 OHM,5%,0.25W	57668	NTR25J-E750E
R1060	315-0272-00	B010100	B069999	RES.,FXD,CMPSN:2.7K OHM,5%,0.25W	57668	NTR25J-E02K7
R1060	315-0911-00	B070000	B219999	RES.,FXD,CMPSN:910 OHM,5%,0.25W	57668	NTR25J-E910E
R1060	301-0911-00	B220000		RES.,FXD,CMPSN:910 OHM,5%,0.50W	01121	EB9115
R1062	315-0103-00			RES.,FXD,CMPSN:10K OHM,5%,0.25W	57668	NTR25J-E10K0
R1063	315-0751-00	B010100	B069999	RES.,FXD,CMPSN:750 OHM,5%,0.25W	57668	NTR25J-E750E
R1063	315-0331-00	B070000		RES.,FXD,CMPSN:330 OHM,5%,0.25W	57668	NTR25J-E330E
R1065	315-0241-00	B010100	B069999	RES.,FXD,CMPSN:240 OHM,5%,0.25W	01121	CB2415
R1065	315-0561-00	B070000		RES.,FXD,CMPSN:560 OHM,5%,0.25W	01121	CB5615
R1070	315-0302-00	B010100	B069999	RES.,FXD,CMPSN:3K OHM,5%,0.25W	57668	NTR25J-E03K0
R1070	315-0102-00	B070000		RES.,FXD,CMPSN:1K OHM,5%,0.25W	57668	NTR25JE01K0
R1072	315-0623-00	B010100	B069999	RES.,FXD,CMPSN:62K OHM,5%,0.25W	01121	CB6235
R1072	315-0822-00	B070000		RES.,FXD,CMPSN:8.2K OHM,5%,0.25W	01121	CB8225
R1074	315-0751-00	B070000		RES.,FXD,CMPSN:750 OHM,5%,0.25W	57668	NTR25J-E750E
R1081	315-0241-00			RES.,FXD,CMPSN:240 OHM,5%,0.25W	01121	CB2415
R1083	315-0621-00			RES.,FXD,CMPSN:620 OHM,5%,0.25W	57668	NTR25J-E620E
R1085	315-0392-00			RES.,FXD,CMPSN:3.9K OHM,5%,0.25W	57668	NTR25J-E03K9
R1311	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	57668	NTR25J-E05K1
R1313	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	57668	NTR25J-E05K1
R1315	315-0392-00			RES.,FXD,CMPSN:3.9K OHM,5%,0.25W	57668	NTR25J-E03K9
R1317	311-1265-00			RES.,VAR,NONWIR:2K OHM,10%,0.50W	32997	3329P-L58-202
R1319	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
R1320	323-0177-00			RES.,FXD,FILM:680 OHM,1%,0.50W	91637	MFF1226G681R0F
R1323	323-0177-00			RES.,FXD,FILM:680 OHM,1%,0.50W	91637	MFF1226G681R0F
R1327	316-0822-00			RES.,FXD,CMPSN:8.2K OHM,10%,0.25W	01121	CB8221
R1329	315-0822-00			RES.,FXD,CMPSN:8.2K OHM,5%,0.25W	01121	CB8225
R1331	315-0132-00			RES.,FXD,CMPSN:1.3K OHM,5%,0.25W	57668	NTR25J-E01K3
R1332	315-0242-00	B010100	B109999	RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	57668	NTR25J-E02K4
R1332	315-0102-00	B110000	B139377	RES.,FXD,CMPSN:1K OHM,5%,0.25W	57668	NTR25JE01K0
R1332	-----			(NOMINAL VALUE, SELECTED)		
R1332	315-0242-00	B139378		RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	57668	NTR25J-E02K4
R1334	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	01121	CB1215
R1336	311-0622-00	B010100	B159999	RES.,VAR,NONWIR:100 OHM,10%,0.50W	32997	3329H-G48-101
R1336	311-1259-00	B160000		RES.,VAR,NONWIR:100 OHM,10%,0.50W	32997	3329P-L58-101
R1337	315-0271-00	B110000		RES.,FXD,CMPSN:270 OHM,5%,0.25W	57668	NTR25J-E270E
R1337	-----			(NOMINAL VALUE, SELECTED)		
R1338	315-0360-00			RES.,FXD,CMPSN:36 OHM,5%,0.25W	01121	CB3605
R1339	315-0360-00			RES.,FXD,CMPSN:36 OHM,5%,0.25W	01121	CB3605
R1340	315-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.25W	57668	NTR25J-E180E
R1341	321-0076-00	B010100	B159999	RES.,FXD,FILM:60.4 OHM,1%,0.125W	91637	MFF1816G60R40F
R1341	315-0560-00	B160000		RES.,FXD,CMPSN:56 OHM,5%,0.25W	57668	NTR25J-E56E0
R1343	321-0076-00	B010100	B159999	RES.,FXD,FILM:60.4 OHM,1%,0.125W	91637	MFF1816G60R40F
R1343	315-0560-00	B160000		RES.,FXD,CMPSN:56 OHM,5%,0.25W	57668	NTR25J-E56E0
R1345	311-0978-00	B010100	B159999	RES.,VAR,NONWIR:250 OHM,10%,0.50W	73138	82-4-2
R1345	311-1260-00	B160000		RES.,VAR,NONWIR:250 OHM,10%,0.50W	32997	3329P-L58-251
R1347	323-0140-00			RES.,FXD,FILM:280 OHM,1%,0.50W	75042	CECT0-2800F
R1351	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
R1353	311-1268-00			RES.,VAR,NONWIR:10K OHM,10%,0.50W	32997	3329P-L58-103

Replaceable Electrical Parts—7A26

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R1401	321-0076-00			RES.,FXD,FILM:60.4 OHM,1%,0.125W	91637	MFF1816G60R40F
R1403	321-0076-00			RES.,FXD,FILM:60.4 OHM,1%,0.125W	91637	MFF1816G60R40F
R1413	315-0272-00			RES.,FXD,CMPSN:2.7K OHM,5%,0.25W	57668	NTR25J-E02K7
R1416	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	57668	NTR25J-E200E
R1418	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	57668	NTR25J-E01K5
R1419	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R1420	323-0198-00	B010100	B019999	RES.,FXD,FILM:1.13K OHM,1%,0.50W	91637	MFF1226G11300F
R1420	323-0197-00	B020000		RES.,FXD,FILM:1.1K OHM,1%,0.50W	75042	CECT0-1101F
R1421	323-0198-00	B010100	B019999	RES.,FXD,FILM:1.13K OHM,1%,0.50W	91637	MFF1226G11300F
R1421	323-0197-00	B020000		RES.,FXD,FILM:1.1K OHM,1%,0.50W	75042	CECT0-1101F
R1422	315-0152-00	B010100	B149999	RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	57668	NTR25J-E01K5
R1422	315-0202-00	B150000		RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R1423	311-1465-01	B010100	B149999	RES.,VAR, NONWIR:PNL,1K X 2.5K OHM,0.5W,SW	80009	311-1465-01
R1423	311-1854-00	B150000		RES.,VAR, NONWIR:1K OHM,10%,0.50W	01121	14M403
R1423	-----			(R1423A)		
R1423	311-1853-00	B150000		RES.,VAR, NONWIR:2.5K OHM,10%,0.50W	01121	18M838
R1423	-----			(R1423B)		
R1425	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	57668	NTR25J-E05K1
R1430	315-0360-00	B020000	B109999	RES.,FXD,CMPSN:36 OHM,5%,0.25W	01121	CB3605
R1431	315-0162-00	B010100	B029999	RES.,FXD,CMPSN:1.6K OHM,5%,0.25W	01121	CB1625
R1431	315-0122-00	B030000	B139377	RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	57668	NTR25J-E01K2
R1431	-----			(NOMINAL VALUE, SELECTED)		
R1431	315-0182-00	B139378	B159999	RES.,FXD,CMPSN:1.8K OHM,5%,0.25W	57668	NTR25J-E1K8
R1431	-----			(NOMINAL VALUE, SELECTED)		
R1431	311-1267-00	B160000		RES.,VAR, NONWIR:5K OHM,10%,0.50W	32997	3329P-L58-502
R1432	315-0360-00	B020000	B109999	RES.,FXD,CMPSN:36 OHM,5%,0.25W	01121	CB3605
R1434	315-0182-00	B010100	B139377	RES.,FXD,CMPSN:1.8K OHM,5%,0.25W	57668	NTR25J-E1K8
R1434	315-0222-00	B139378		RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	57668	NTR25J-E02K2
R1435	311-0978-00	B010100	B159999	RES.,VAR, NONWIR:250 OHM,10%,0.50W	73138	82-4-2
R1435	311-1260-00	B160000		RES.,VAR, NONWIR:250 OHM,10%,0.50W	32997	3329P-L58-251
R1436	311-1269-00			RES.,VAR, NONWIR:20K OHM,10%,0.50W	32997	3329P-L58-203
R1465	311-1320-00			RES.,VAR, NONWIR:5K OHM,1W,W/SW	12697	381CM-39700
R1466	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	57668	NTR25J-E27K0
R1467	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	57668	NTR25J-E27K0
R1470	315-0561-00			RES.,FXD,CMPSN:560 OHM,5%,0.25W	01121	CB5615
R1472	315-0183-00			RES.,FXD,CMPSN:18K OHM,5%,0.25W	01121	CB1835
R1474	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	57668	NTR25J-E330E
R1490	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R1492	315-0183-00			RES.,FXD,CMPSN:18K OHM,5%,0.25W	01121	CB1835
R1494	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	57668	NTR25J-E330E
R1498	315-0911-00			RES.,FXD,CMPSN:910 OHM,5%,0.25W	57668	NTR25J-E910E
R1511	315-0202-00	B010100	B069999	RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R1511	315-0102-00	B070000		RES.,FXD,CMPSN:1K OHM,5%,0.25W	57668	NTR25JE01K0
R1512	315-0202-00	B010100	B069999	RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R1512	315-0102-00	B070000		RES.,FXD,CMPSN:1K OHM,5%,0.25W	57668	NTR25JE01K0
R1514	315-0152-00	B010100	B069999	RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	57668	NTR25J-E01K5
R1514	315-0751-00	B070000	B245519	RES.,FXD,CMPSN:750 OHM,5%,0.25W	57668	NTR25J-E750E
R1514	315-0621-00	B245520		RES.,FXD,CMPSN:620 OHM,5%,0.25W	57668	NTR25J-E620E
R1516	315-0202-00	B010100	B069999	RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R1516	315-0102-00	B070000		RES.,FXD,CMPSN:1K OHM,5%,0.25W	57668	NTR25JE01K0
R1517	315-0202-00	B010100	B069999	RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R1517	315-0102-00	B070000		RES.,FXD,CMPSN:1K OHM,5%,0.25W	57668	NTR25JE01K0
R1518	315-0821-00	B245520		RES.,FXD,CMPSN:820 OHM,5%,0.25W	57668	NTR25J-E 820E

Replaceable Electrical Parts—7A26

Ckt No.	Tektronix Part No.	Serial/Model No.		Name & Description	Mfr Code	Mfr Part Number
		Eff	Dscont			
R1519	315-0152-00	B010100	B069999	RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	57668	NTR25J-E01K5
R1519	315-0751-00	B070000	B245519	RES.,FXD,CMPSN:750 OHM,5%,0.25W	57668	NTR25J-E750E
R1519	315-0621-00	B245520		RES.,FXD,CMPSN:620 OHM,5%,0.25W	57668	NTR25J-E620E
R1520	323-0206-00			RES.,FXD,FILM:1.37K OHM,1%,0.50W	75042	CECT0-1371F
R1523	323-0206-00			RES.,FXD,FILM:1.37K OHM,1%,0.50W	75042	CECT0-1371F
R1531	311-0978-00	B010100	B159999	RES.,VAR,NONWIR:250 OHM,10%,0.50W	73138	82-4-2
R1531	311-1260-00	B160000		RES.,VAR,NONWIR:250 OHM,10%,0.50W	32997	3329P-L58-251
R1533	315-0332-00	B010100	B109999	RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	57668	NTR25J-E03K3
R1533	315-0151-00	B110000		RES.,FXD,CMPSN:150 OHM,5%,0.25W	57668	NTR25J-E150E
R1701	321-0076-00			RES.,FXD,FILM:60.4 OHM,1%,0.125W	91637	MFF1816G60R40F
R1703	321-0076-00			RES.,FXD,FILM:60.4 OHM,1%,0.125W	91637	MFF1816G60R40F
R1705	323-0119-00			RES.,FXD,FILM:169 OHM,1%,0.50W	75042	CECT0-1690F
R1711	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R1712	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R1714	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	57668	NTR25J-E01K5
R1716	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R1717	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R1719	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	57668	NTR25J-E01K5
R1720	323-0206-00			RES.,FXD,FILM:1.37K OHM,1%,0.50W	75042	CECT0-1371F
R1721	315-0270-00	B050000	B109999	RES.,FXD,CMPSN:27 OHM,5%,0.25W	01121	CB2705
R1722	315-0150-00	B110000		RES.,FXD,CMPSN:15 OHM,5%,0.25W	01121	CB1505
R1723	323-0206-00			RES.,FXD,FILM:1.37K OHM,1%,0.50W	75042	CECT0-1371F
R1724	315-0150-00	B110000		RES.,FXD,CMPSN:15 OHM,5%,0.25W	01121	CB1505
R2313	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	57668	NTR25J-E05K1
R2315	315-0392-00			RES.,FXD,CMPSN:3.9K OHM,5%,0.25W	57668	NTR25J-E03K9
R2317	311-1265-00			RES.,VAR,NONWIR:2K OHM,10%,0.50W	32997	3329P-L58-202
R2319	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
R2320	323-0177-00			RES.,FXD,FILM:680 OHM,1%,0.50W	91637	MFF1226G681R0F
R2323	323-0177-00			RES.,FXD,FILM:680 OHM,1%,0.50W	91637	MFF1226G681R0F
R2327	315-0822-00			RES.,FXD,CMPSN:8.2K OHM,5%,0.25W	01121	CB8225
R2329	315-0822-00			RES.,FXD,CMPSN:8.2K OHM,5%,0.25W	01121	CB8225
R2331	315-0132-00			RES.,FXD,CMPSN:1.3K OHM,5%,0.25W	57668	NTR25J-E01K3
R2332	315-0202-00	B010100	B109999	RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R2332	315-0112-00	B110000	B139377	RES.,FXD,CMPSN:1.1K OHM,5%,0.25W	01121	CB1125
R2332	315-0242-00	B139378		RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	57668	NTR25J-E02K4
R2332	-----			(NOMINAL VALUE, SELECTED)		
R2334	315-0121-00			RES.,FXD,CMPSN:120 OHM,5%,0.25W	01121	CB1215
R2336	311-0622-00	B010100	B159999	RES.,VAR,NONWIR:100 OHM,10%,0.50W	32997	3329H-G48-101
R2336	311-1259-00	B160000		RES.,VAR,NONWIR:100 OHM,10%,0.50W	32997	3329P-L58-101
R2337	315-0271-00	B110000		RES.,FXD,CMPSN:270 OHM,5%,0.25W	57668	NTR25J-E270E
R2337	-----			(NOMINAL VALUE, SELECTED)		
R2338	315-0360-00			RES.,FXD,CMPSN:36 OHM,5%,0.25W	01121	CB3605
R2339	315-0360-00			RES.,FXD,CMPSN:36 OHM,5%,0.25W	01121	CB3605
R2340	315-0181-00			RES.,FXD,CMPSN:180 OHM,5%,0.25W	57668	NTR25J-E180E
R2341	321-0076-00	B010100	B159999	RES.,FXD,FILM:60.4 OHM,1%,0.125W	91637	MFF1816G60R40F
R2341	315-0560-00	B160000		RES.,FXD,CMPSN:56 OHM,5%,0.25W	57668	NTR25J-E56E0
R2343	321-0076-00	B010100	B159999	RES.,FXD,FILM:60.4 OHM,1%,0.125W	91637	MFF1816G60R40F
R2343	315-0560-00	B160000		RES.,FXD,CMPSN:56 OHM,5%,0.25W	57668	NTR25J-E56E0
R2345	311-0978-00	B010100	B159999	RES.,VAR,NONWIR:250 OHM,10%,0.50W	73138	82-4-2
R2345	311-1260-00	B160000		RES.,VAR,NONWIR:250 OHM,10%,0.50W	32997	3329P-L58-251
R2347	323-0140-00			RES.,FXD,FILM:280 OHM,1%,0.50W	75042	CECT0-2800F
R2351	315-0472-00			RES.,FXD,CMPSN:4.7K OHM,5%,0.25W	57668	NTR25J-E04K7
R2353	311-1268-00			RES.,VAR,NONWIR:10K OHM,10%,0.50W	32997	3329P-L58-103

Replaceable Electrical Parts—7A26

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R2401	321-0076-00			RES.,FXD,FILM:60.4 OHM,1%,0.125W	91637	MFF1816G60R40F
R2403	321-0076-00			RES.,FXD,FILM:60.4 OHM,1%,0.125W	91637	MFF1816G60R40F
R2410	315-0102-00			RES.,FXD,CMPSN:1K OHM,5%,0.25W	57668	NTR25JE01K0
R2411	311-0635-00	B010100	B159999	RES.,VAR,NONWW:TRMR,1K OHM,10%,0.5%,0.5W	02111	65Y102T010
R2411	311-1263-00	B160000		RES.,VAR,NONWIR:1K OHM,10%,0.50W	32997	3329P-L58-102
R2413	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	57668	NTR25J-E200E
R2415	315-0162-00	B010100	B029999	RES.,FXD,CMPSN:1.6K OHM,5%,0.25W	01121	CB1625
R2415	315-0162-00	B030000	B219999	RES.,FXD,CMPSN:1.6K OHM,5%,0.25W	01121	CB1625
R2415	-----			(NOMINAL VALUE, SELECTED)		
R2415	315-0132-00	B220000		RES.,FXD,CMPSN:1.3K OHM,5%,0.25W	57668	NTR25J-E01K3
R2415	-----			(NOMINAL VALUE, SELECTED)		
R2416	315-0201-00			RES.,FXD,CMPSN:200 OHM,5%,0.25W	57668	NTR25J-E200E
R2418	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	57668	NTR25J-E01K5
R2419	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R2420	323-0198-00	B010100	B019999	RES.,FXD,FILM:1.13K OHM,1%,0.50W	91637	MFF1226G11300F
R2420	323-0197-00	B020000		RES.,FXD,FILM:1.1K OHM,1%,0.50W	75042	CECT0-1101F
R2421	323-0198-00	B010100	B019999	RES.,FXD,FILM:1.13K OHM,1%,0.50W	91637	MFF1226G11300F
R2421	323-0197-00	B020000		RES.,FXD,FILM:1.1K OHM,1%,0.50W	75042	CECT0-1101F
R2422	315-0202-00	B010100	B029999	RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R2422	315-0182-00	B030000	B149999	RES.,FXD,CMPSN:1.8K OHM,5%,0.25W	57668	NTR25J-E1K8
R2422	315-0202-00	B150000		RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R2423	311-1465-01	B010100	B149999	RES.,VAR,NONWIR:PNL,1K X 2.5K OHM,0.5W,SW	80009	311-1465-01
R2423	311-1854-00	B150000		RES.,VAR,NONWIR:1K OHM,10%,0.50W	01121	14M403
R2423	311-1853-00	B150000		RES.,VAR,NONWIR:2.5K OHM,10%,0.50W	01121	18M838
R2425	315-0512-00			RES.,FXD,CMPSN:5.1K OHM,5%,0.25W	57668	NTR25J-E05K1
R2430	315-0360-00	B020000	B109999	RES.,FXD,CMPSN:36 OHM,5%,0.25W	01121	CB3605
R2431	315-0162-00	B010100	B029999	RES.,FXD,CMPSN:1.8K OHM,5%,0.25W	01121	CB1625
R2431	315-0122-00	B030000	B139377	RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	57668	NTR25J-E01K2
R2431	-----			(NOMINAL VALUE, SELECTED)		
R2431	315-0182-00	B139378	B159999	RES.,FXD,CMPSN:1.8K OHM,5%,0.25W	57668	NTR25J-E1K8
R2431	-----			(NOMINAL VALUE, SELECTED)		
R2431	311-1267-00	B160000		RES.,VAR,NONWIR:5K OHM,10%,0.50W	32997	3329P-L58-502
R2432	315-0360-00	B020000	B109999	RES.,FXD,CMPSN:36 OHM,5%,0.25W	01121	CB3605
R2434	315-0182-00	B010100	B139377	RES.,FXD,CMPSN:1.8K OHM,5%,0.25W	57668	NTR25J-E1K8
R2434	315-0222-00	B139378		RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	57668	NTR25J-E02K2
R2435	311-0978-00	B010100	B159999	RES.,VAR,NONWIR:250 OHM,10%,0.50W	73138	82-4-2
R2435	311-1260-00	B160000		RES.,VAR,NONWIR:250 OHM,10%,0.50W	32997	3329P-L58-251
R2436	311-1269-00			RES.,VAR,NONWIR:20K OHM,10%,0.50W	32997	3329P-L58-203
R2465	311-1320-00			RES.,VAR,NONWIR:5K OHM,1W,W/SW	12697	381CM-39700
R2466	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	57668	NTR25J-E27K0
R2467	315-0273-00			RES.,FXD,CMPSN:27K OHM,5%,0.25W	57668	NTR25J-E27K0
R2470	315-0511-00			RES.,FXD,CMPSN:510 OHM,5%,0.25W	01121	CB5115
R2472	315-0183-00			RES.,FXD,CMPSN:18K OHM,5%,0.25W	01121	CB1835
R2474	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	57668	NTR25J-E330E
R2476	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R2490	315-0561-00			RES.,FXD,CMPSN:560 OHM,5%,0.25W	01121	CB5615
R2492	315-0183-00			RES.,FXD,CMPSN:18K OHM,5%,0.25W	01121	CB1835
R2494	315-0331-00			RES.,FXD,CMPSN:330 OHM,5%,0.25W	57668	NTR25J-E330E
R2496	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R2498	315-0911-00			RES.,FXD,CMPSN:910 OHM,5%,0.25W	57668	NTR25J-E910E
R2511	315-0202-00	B010100	B069999	RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R2511	315-0102-00	B070000		RES.,FXD,CMPSN:1K OHM,5%,0.25W	57668	NTR25JE01K0
R2512	315-0202-00	B010100	B069999	RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R2512	315-0102-00	B070000		RES.,FXD,CMPSN:1K OHM,5%,0.25W	57668	NTR25JE01K0

Replaceable Electrical Parts—7A26

Ckt No.	Tektronix Part No.	Serial/Model No.		Name & Description	Mfr Code	Mfr Part Number
		Eff	Dscont			
R2514	315-0152-00	B010100	B069999	RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	57668	NTR25J-E01K5
R2514	315-0751-00	B070000	B245519	RES.,FXD,CMPSN:750 OHM,5%,0.25W	57668	NTR25J-E750E
R2514	315-0621-00	B245520		RES.,FXD,CMPSN:620 OHM,5%,0.25W	57668	NTR25J-E620E
R2516	315-0202-00	B010100	B069999	RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R2516	315-0102-00	B070000		RES.,FXD,CMPSN:1K OHM,5%,0.25W	57668	NTR25JE01K0
R2517	315-0202-00	B010100	B069999	RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R2517	315-0102-00	B070000		RES.,FXD,CMPSN:1K OHM,5%,0.25W	57668	NTR25JE01K0
R2518	315-0821-00	B245520		RES.,FXD,CMPSN:820 OHM,5%,0.25W	57668	NTR25J-E 820E
R2519	315-0152-00	B010100	B069999	RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	57668	NTR25J-E01K5
R2519	315-0751-00	B070000	B245519	RES.,FXD,CMPSN:750 OHM,5%,0.25W	57668	NTR25J-E750E
R2519	315-0621-00	B245520		RES.,FXD,CMPSN:620 OHM,5%,0.25W	57668	NTR25J-E620E
R2520	323-0206-00			RES.,FXD,FILM:1.37K OHM,1%,0.50W	75042	CECT0-1371F
R2523	323-0206-00			RES.,FXD,FILM:1.37K OHM,1%,0.50W	75042	CECT0-1371F
R2531	311-0978-00	B010100	B159999	RES.,VAR,NONWIR:250 OHM,10%,0.50W	73138	82-4-2
R2531	311-1260-00	B160000		RES.,VAR,NONWIR:250 OHM,10%,0.50W	32997	3329P-L58-251
R2533	315-0242-00	B010100	B109999	RES.,FXD,CMPSN:2.4K OHM,5%,0.25W	57668	NTR25J-E02K4
R2533	315-0202-00	B110000	B139377	RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R2701	321-0076-00			RES.,FXD,FILM:60.4 OHM,1%,0.125W	91637	MFF1816G60R40F
R2703	321-0076-00			RES.,FXD,FILM:60.4 OHM,1%,0.125W	91637	MFF1816G60R40F
R2705	323-0119-00			RES.,FXD,FILM:169 OHM,1%,0.50W	75042	CECT0-1690F
R2711	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R2712	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R2714	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	57668	NTR25J-E01K5
R2716	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R2717	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	57668	NTR25J-E02K0
R2719	315-0152-00			RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	57668	NTR25J-E01K5
R2720	323-0206-00			RES.,FXD,FILM:1.37K OHM,1%,0.50W	75042	CECT0-1371F
R2721	315-0270-00	B050000	B109999	RES.,FXD,CMPSN:27 OHM,5%,0.25W	01121	CB2705
R2722	315-0150-00	B110000		RES.,FXD,CMPSN:15 OHM,5%,0.25W	01121	CB1505
R2723	323-0206-00			RES.,FXD,FILM:1.37K OHM,1%,0.50W	75042	CECT0-1371F
R2724	315-0150-00	B110000		RES.,FXD,CMPSN:15 OHM,5%,0.25W	01121	CB1505
RT1334	307-0125-00			RES.,THERMAL:500 OHM,10%,25 DEG C	50157	2D1595
RT1433	307-0125-00			RES.,THERMAL:500 OHM,10%,25 DEG C	50157	2D1595
RT2334	307-0125-00			RES.,THERMAL:500 OHM,10%,25 DEG C	50157	2D1595
RT2433	307-0125-00			RES.,THERMAL:500 OHM,10%,25 DEG C	50157	2D1595
S22	260-0816-00	B010100	B247304	SWITCH,SLIDE:DPDT,0.5A,125VAC	79727	GF-126-0012A
S22	260-1833-00	B247305		SWITCH,SLIDE:DPDT	82389	11P-1092
S30	260-1493-00			SWITCH,ROTARY:DISPLAY MODE/TRIGGER SOURCE	76854	5-43681-411
S30	262-0965-00	B010100	B069999	SWITCH,WIRED:DISPLAY MODE/TRIGGER SOURCE	80009	262-0965-00
S30	262-0965-01	B070000	B229999	SWITCH,WIRED:DISPLAY MODE/TRIGGER SOURCE	80009	262-0965-01
S30	262-0965-02	B230000		SWITCH,WIRED:DISPLAY MODE/TRIGGER SOURCE	80009	262-0965-02
S32	260-0816-00	B010100	B247304	SWITCH,SLIDE:DPDT,0.5A,125VAC	79727	GF-126-0012A
S32	260-1833-00	B247305		SWITCH,SLIDE:DPDT	82389	11P-1092
S100	-----			(NONREPLACEABLE SUBPART OF A3)		
S1423	-----			(PART OF R1423)		
S1465	-----			(PART OF R1465)		
S2423	-----			(PART OF R2423)		
S2465	-----			(PART OF R2465)		

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
T11	276-0525-00			CORE,FERRITE:0.196 ID X 0.437"OD	01121	T037C351A
T12	276-0525-00			CORE,FERRITE:0.196 ID X 0.437"OD	01121	T037C351A
T1301	120-0286-00			XFMR,TOROID:2 TURNS,BIFILAR	80009	120-0286-00
T1430	120-0286-00	B110000		XFMR,TOROID:2 TURNS,BIFILAR	80009	120-0286-00
T1520	120-0286-00	B110000		XFMR,TOROID:2 TURNS,BIFILAR	80009	120-0286-00
T2301	120-0286-00			XFMR,TOROID:2 TURNS,BIFILAR	80009	120-0286-00
T2430	120-0286-00	B110000		XFMR,TOROID:2 TURNS,BIFILAR	80009	120-0286-00
T2520	120-0286-00	B110000		XFMR,TOROID:2 TURNS,BIFILAR	80009	120-0286-00
U1350	155-0078-07	B010100	B019999	MICROCIRCUIT,LI:ML,VERT AMPL,SEL	80009	155-0078-07
U1350	155-0078-03	B020000	B139377	MICROCIRCUIT,LI:ML,VERTICAL AMPL,SEL	80009	155-0078-03
U1350	155-0078-10	B139378		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10
U1450	155-0078-07	B010100	B019999	MICROCIRCUIT,LI:ML,VERT AMPL,SEL	80009	155-0078-07
U1450	155-0078-03	B020000	B139377	MICROCIRCUIT,LI:ML,VERTICAL AMPL,SEL	80009	155-0078-03
U1450	155-0078-10	B139378		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10
U1550	155-0078-05	B010100	B019999	MICROCIRCUIT,LI:ML,VERT AMPL,SEL	80009	155-0078-05
U1550	155-0078-01	B020000	B139377	MICROCIRCUIT,LI:ML,VERT AMPL,SEL	80009	155-0078-01
U1550	155-0078-13	B139378		MICROCIRCUIT,LI:ML,VERTICAL AMPL,SEL	80009	155-0078-13
U1750	155-0078-05	B010100	B019999	MICROCIRCUIT,LI:ML,VERT AMPL,SEL	80009	155-0078-05
U1750	155-0078-01	B020000	B139377	MICROCIRCUIT,LI:ML,VERT AMPL,SEL	80009	155-0078-01
U1750	155-0078-13	B139378		MICROCIRCUIT,LI:ML,VERTICAL AMPL,SEL	80009	155-0078-13
U2350	155-0078-07	B010100	B019999	MICROCIRCUIT,LI:ML,VERT AMPL,SEL	80009	155-0078-07
U2350	155-0078-03	B020000	B139377	MICROCIRCUIT,LI:ML,VERTICAL AMPL,SEL	80009	155-0078-03
U2350	155-0078-10	B139378		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10
U2450	155-0078-07	B010100	B019999	MICROCIRCUIT,LI:ML,VERT AMPL,SEL	80009	155-0078-07
U2450	155-0078-03	B020000	B029999	MICROCIRCUIT,LI:ML,VERTICAL AMPL,SEL	80009	155-0078-03
U2450	155-0078-00	B030000	B139377	MICROCIRCUIT,LI:ML,VERT AMPL	80009	155-0078-00
U2450	155-0078-10	B139378		MICROCIRCUIT,LI:ML,VERTICAL AMPLIFIER	80009	155-0078-10
U2550	155-0078-05	B010100	B019999	MICROCIRCUIT,LI:ML,VERT AMPL,SEL	80009	155-0078-05
U2550	155-0078-01	B020000	B139377	MICROCIRCUIT,LI:ML,VERT AMPL,SEL	80009	155-0078-01
U2550	155-0078-13	B139378		MICROCIRCUIT,LI:ML,VERTICAL AMPL,SEL	80009	155-0078-13
U2750	155-0078-05	B010100	B019999	MICROCIRCUIT,LI:ML,VERT AMPL,SEL	80009	155-0078-05
U2750	155-0078-01	B020000	B139377	MICROCIRCUIT,LI:ML,VERT AMPL,SEL	80009	155-0078-01
U2750	155-0078-13	B139378		MICROCIRCUIT,LI:ML,VERTICAL AMPL,SEL	80009	155-0078-13
VR824	152-0662-00	B230000		SEMICONV DEVICE:ZENER,0.4W,5V,1%	04713	SZG195
VR834	152-0662-00	B230000		SEMICONV DEVICE:ZENER,0.4W,5V,1%	04713	SZG195

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.

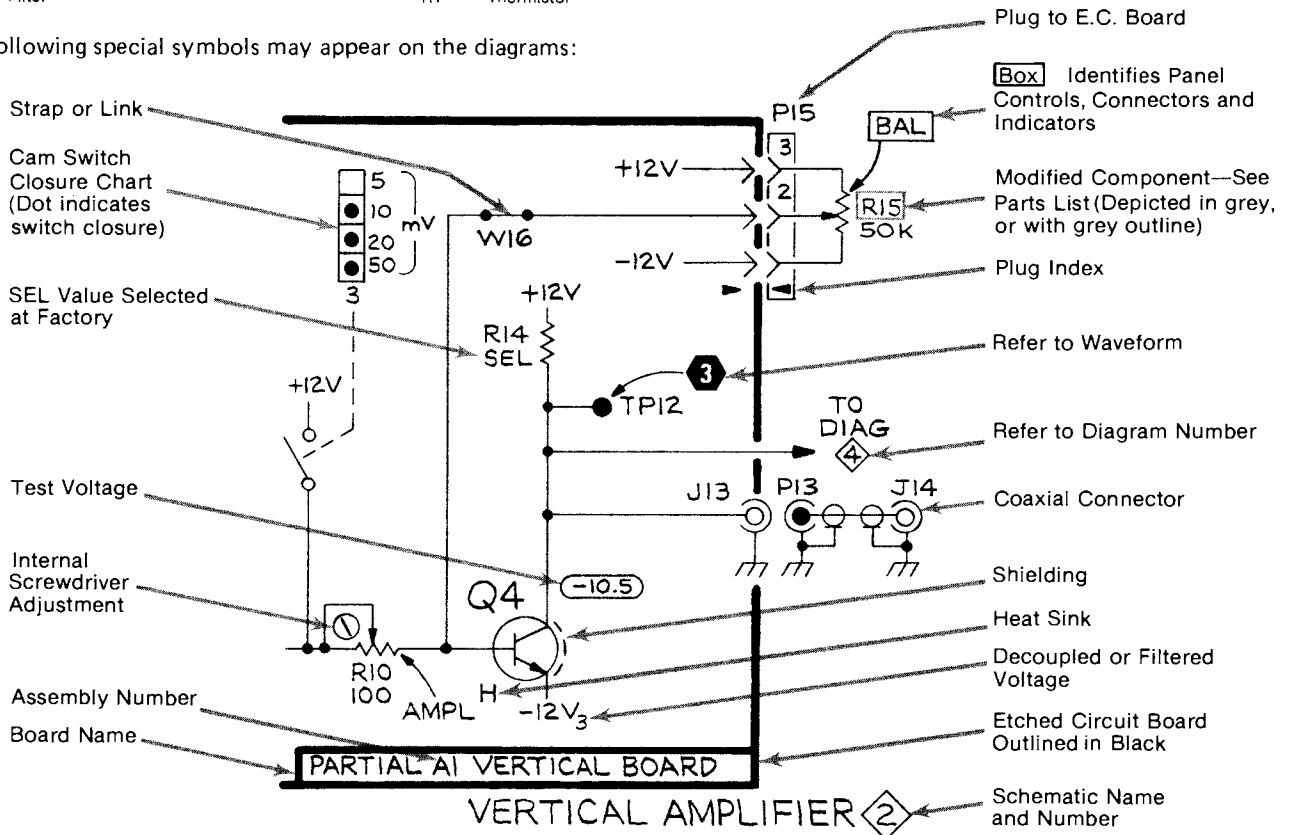
Other ANSI standards that are used in the preparation of diagrams by Tektronix, Inc. are:

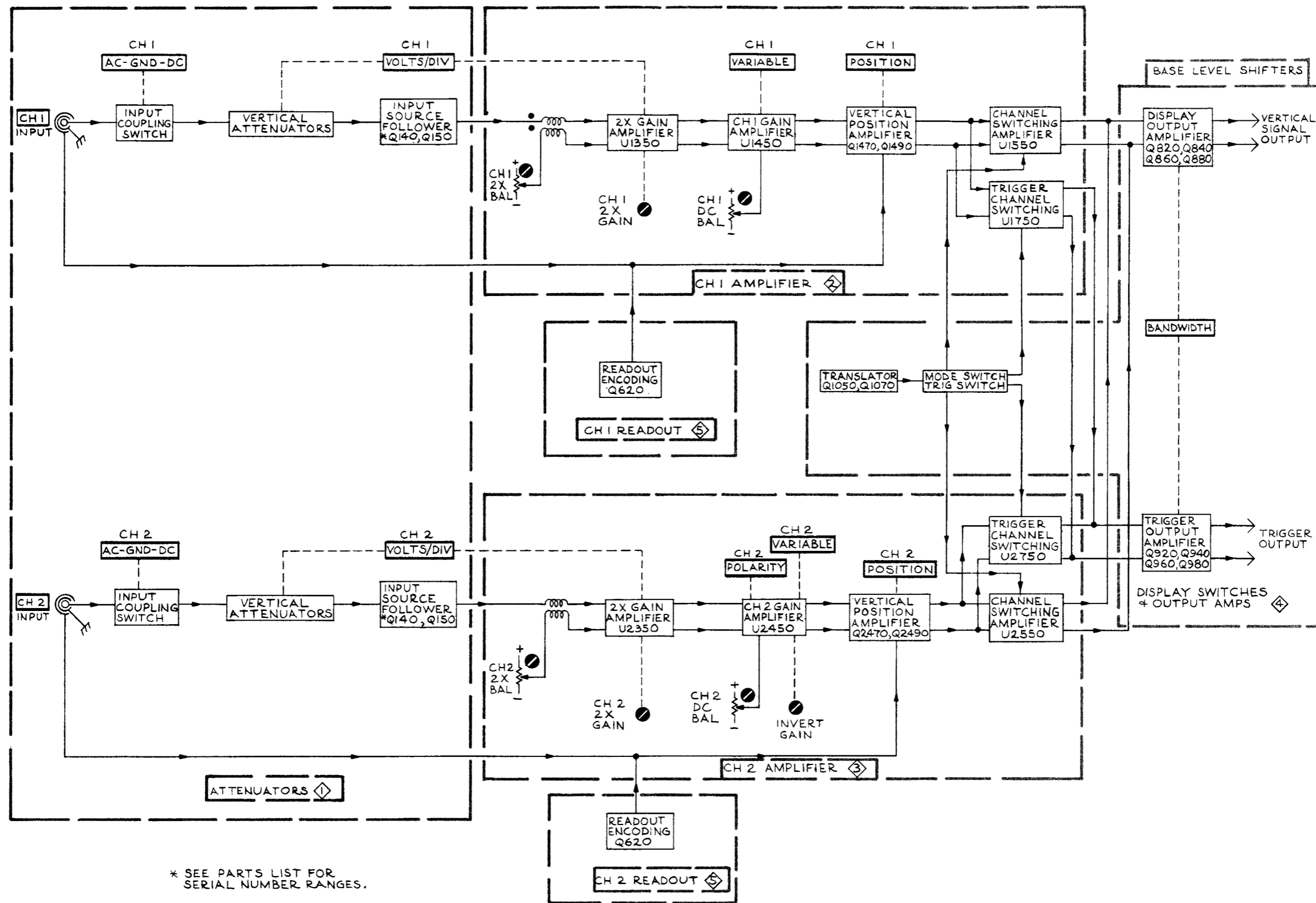
- Y14.15, 1966 Drafting Practices.
- Y14.2, 1973 Line Conventions and Lettering.
- Y10.5, 1968 Letter Symbols for Quantities Used in Electrical Science and Electrical Engineering.

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				

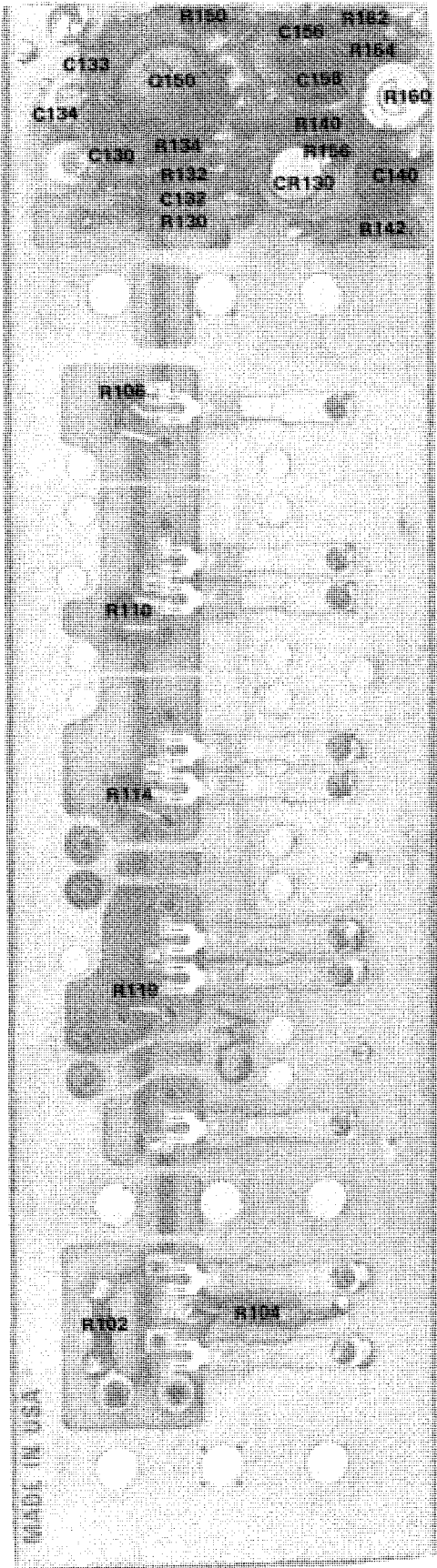
The following special symbols may appear on the diagrams:





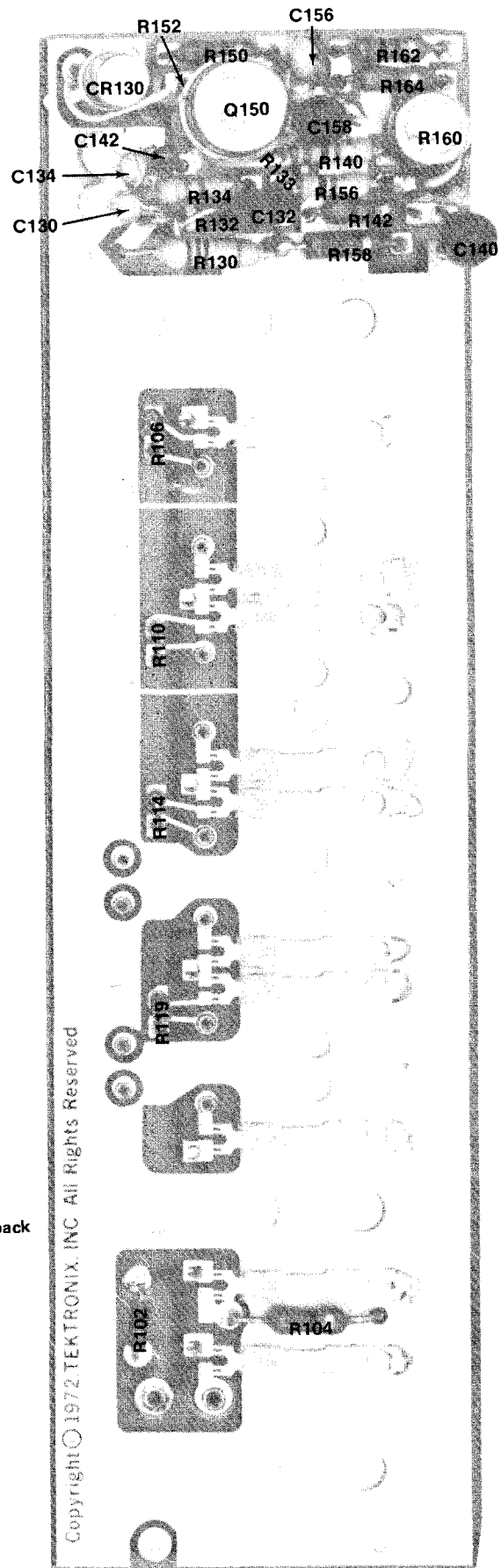
BLOCK DIAGRAM

A1 ATTENUATOR BDS
VOLTAGE & WAVEFORM
CONDITIONS



1484-33

A1 Attenuator board
(SN B208880 & UP)



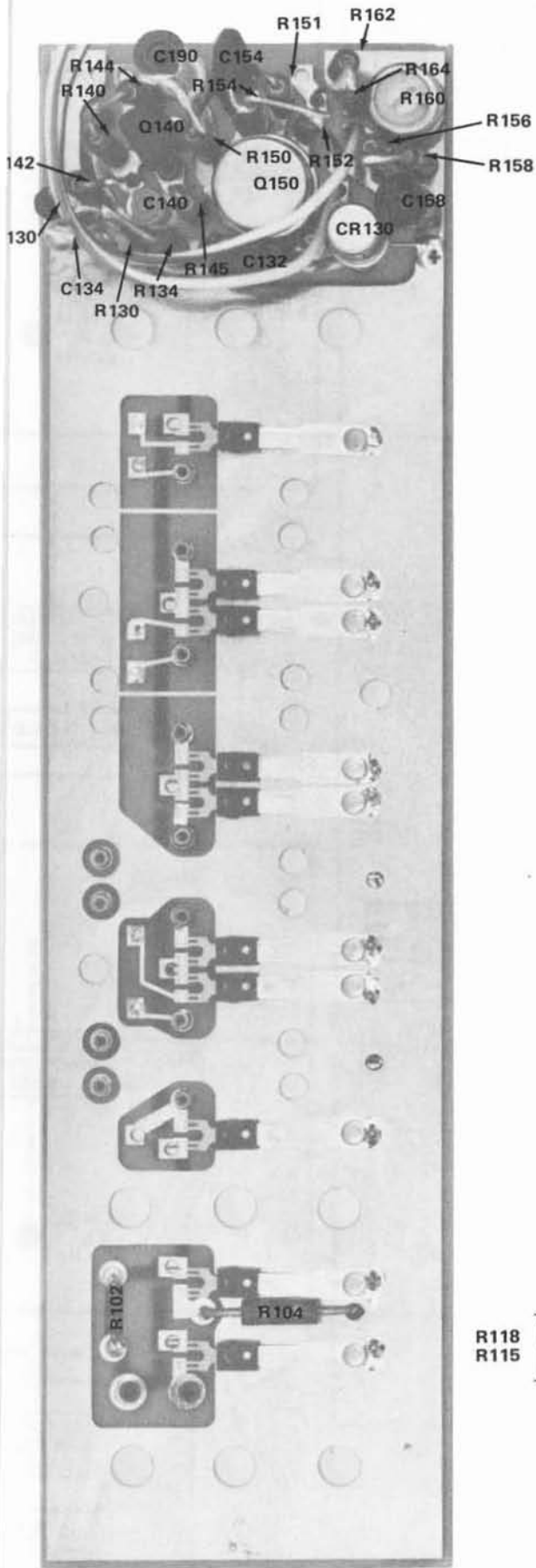
1484-25

A1 Attenuator Board
(SN B080000 - B208879)

Located on back
of board

- C142
- R158
- R152

R118 } Located
R115 } on
 } other
 } side
 } of
 } board

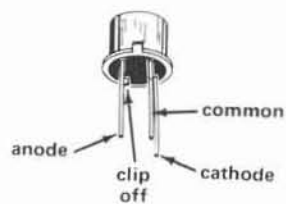
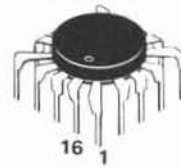


1484-26

A1 Attenuator Board
(SN B079999-below)

REV APR 1984

NOTE
LEAD CONFIGURATIONS AND CASE STYLES ARE TYPICAL, BUT MAY VARY DUE TO VENDOR CHANGES OR INSTRUMENT MODIFICATIONS.



1484-27

FIG. 7-1. Semiconductor Electrode Configurations.

Scans by Outsource-Options =>

VOLTAGES AND WAVEFORMS

The voltages and waveforms shown on this diagram may be obtained by using the recommended test equipment and test set-ups listed below.

RECOMMENDED TEST EQUIPMENT

ITEM	SPECIFICATIONS	RECOMMENDED TYPE
Oscilloscope system	Deflection factor 10 mV to 2 V/div. Input impedance 10 Megohms Frequency response dc to 25 MHz.	a. Tektronix 7000-series oscilloscope equipped with readout, 7B-series Time-Base 7A16A Amplifier, and a 1X probe. (7A13 Differential Comparator used in place of 7A16A for calibrated offset voltages).
Voltmeter (Non-loading digital multimeter)	Input impedance 10 Megohms Range (full scale) 2 V to 20 V	a. Tektronix DM501 Digital Multimeter, with power module (oscilloscope system must have readout). b. Fairchild Model 7050, or equivalent.
Plug-in extender	Capable of extending the 7A26 from the oscilloscope plug-in compartment	a. Tektronix Part No. 067-0589-00 (rigid) or Tektronix Part No. 067-0616-00 (flexible).

7A26 Control Settings

CH 1 and CH 2 VOLTS/DIV	5 mV
CH 1 and CH 2 Input switches	DC
CH 1 and CH 2 POSITION	center trace on graticule
DISPLAY MODE	CH 1
TRIGGER SOURCE	MODE
CH 2 POLARITY	+ UP

Voltage Conditions

Voltage measurements are taken with no signal applied and the trace centered on the graticule. The voltmeter common is connected to chassis ground. The 7A26 is connected to one of the vertical compartments of the oscilloscope mainframe through the plug-in extender. The 7D13, if used, is inserted into the other vertical compartment.

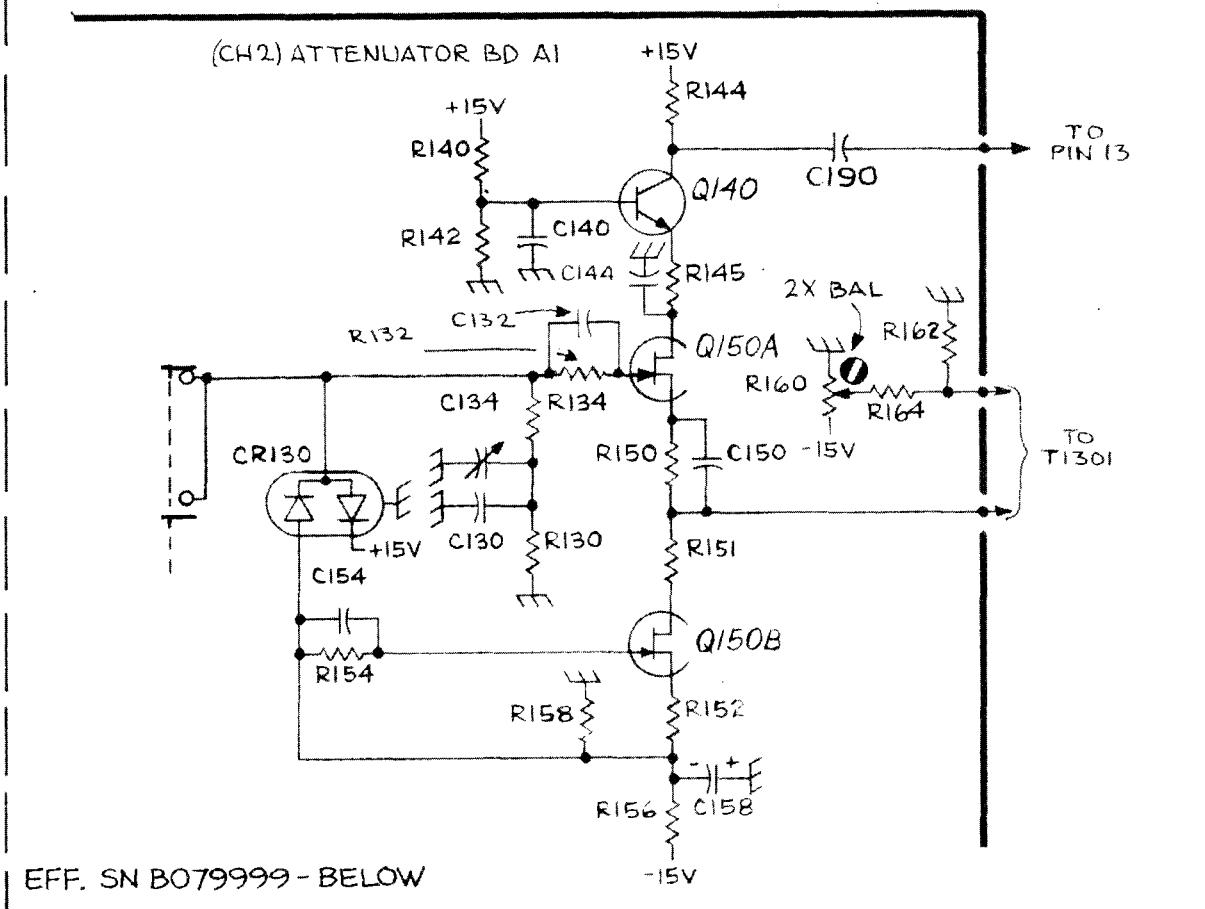
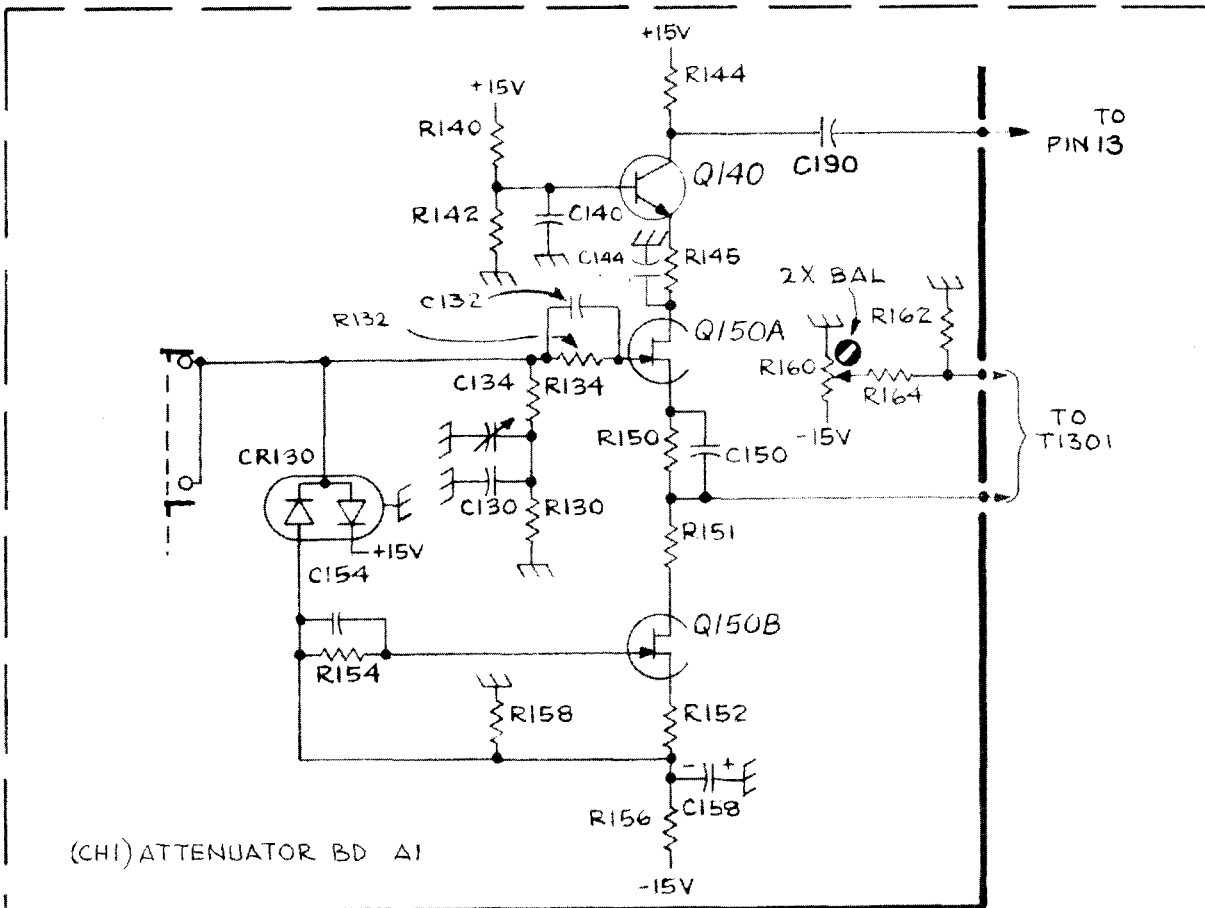
Waveform Conditions

The 7A26 is connected to one of the vertical compartments of the oscilloscope mainframe through the plug-in extender. The amplifier plug-in, 7A16A or 7A13, is inserted into the other vertical compartment. A 1-kilohertz, 40 millivolt signal is applied to the CH 1 input of the 7A26. The oscilloscope Trigger Source is set to trigger the time-base unit from the 7A26 output.

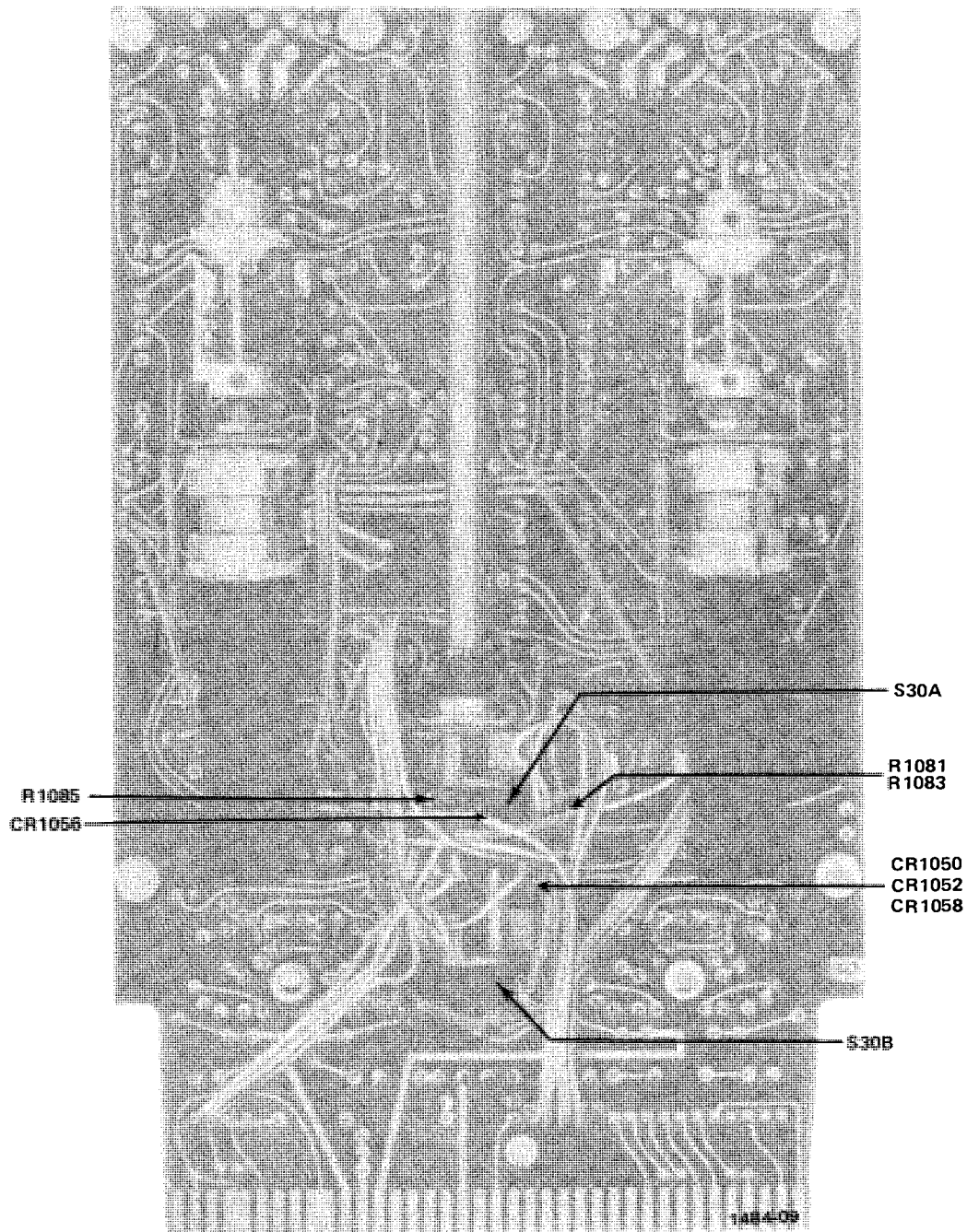
If the 7A16A Amplifier plug-in is used, the input should be ac coupled.

NOTE

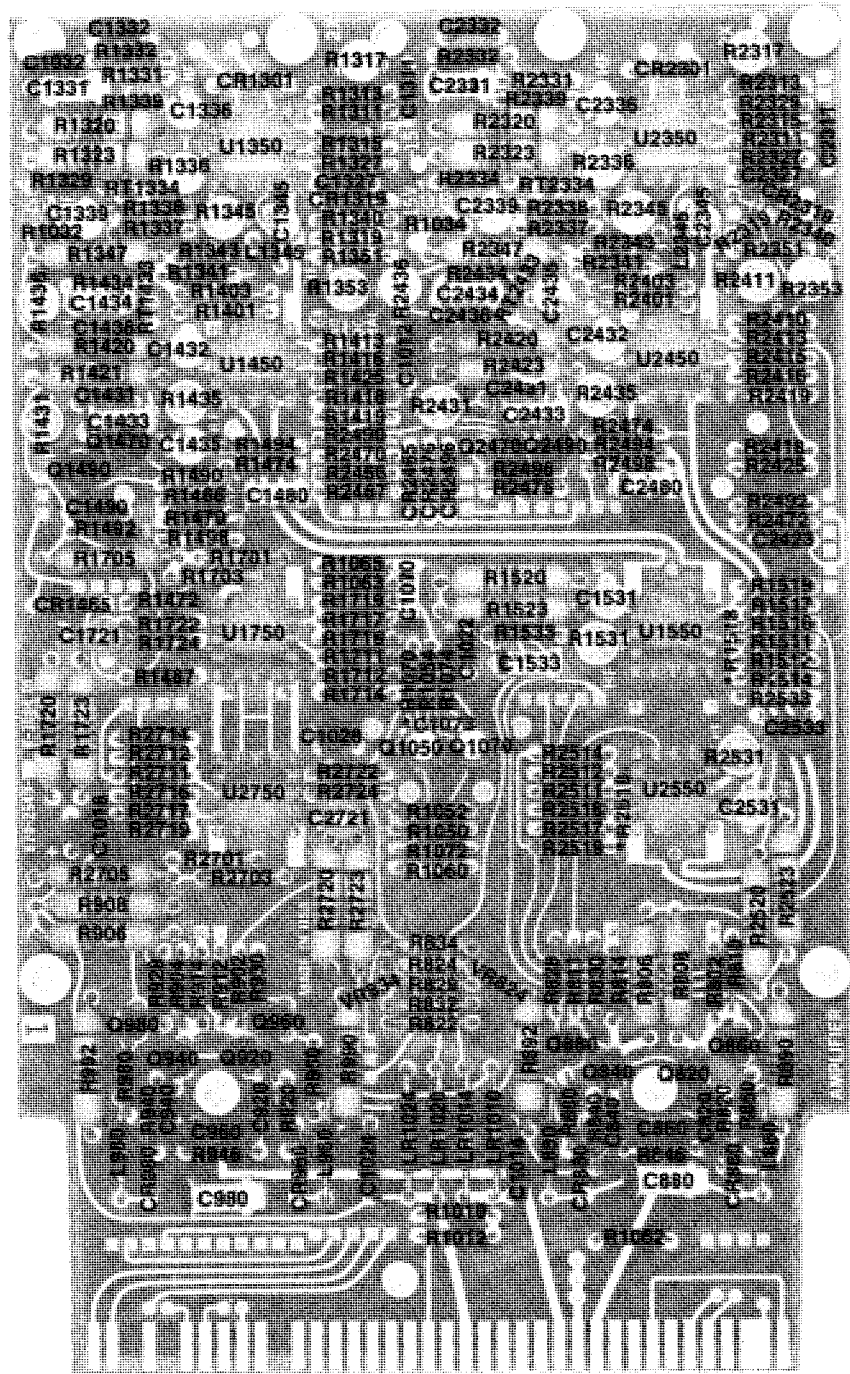
Voltages and waveforms are not absolute and may vary between instruments.



EFF. SN B079999 - BELOW



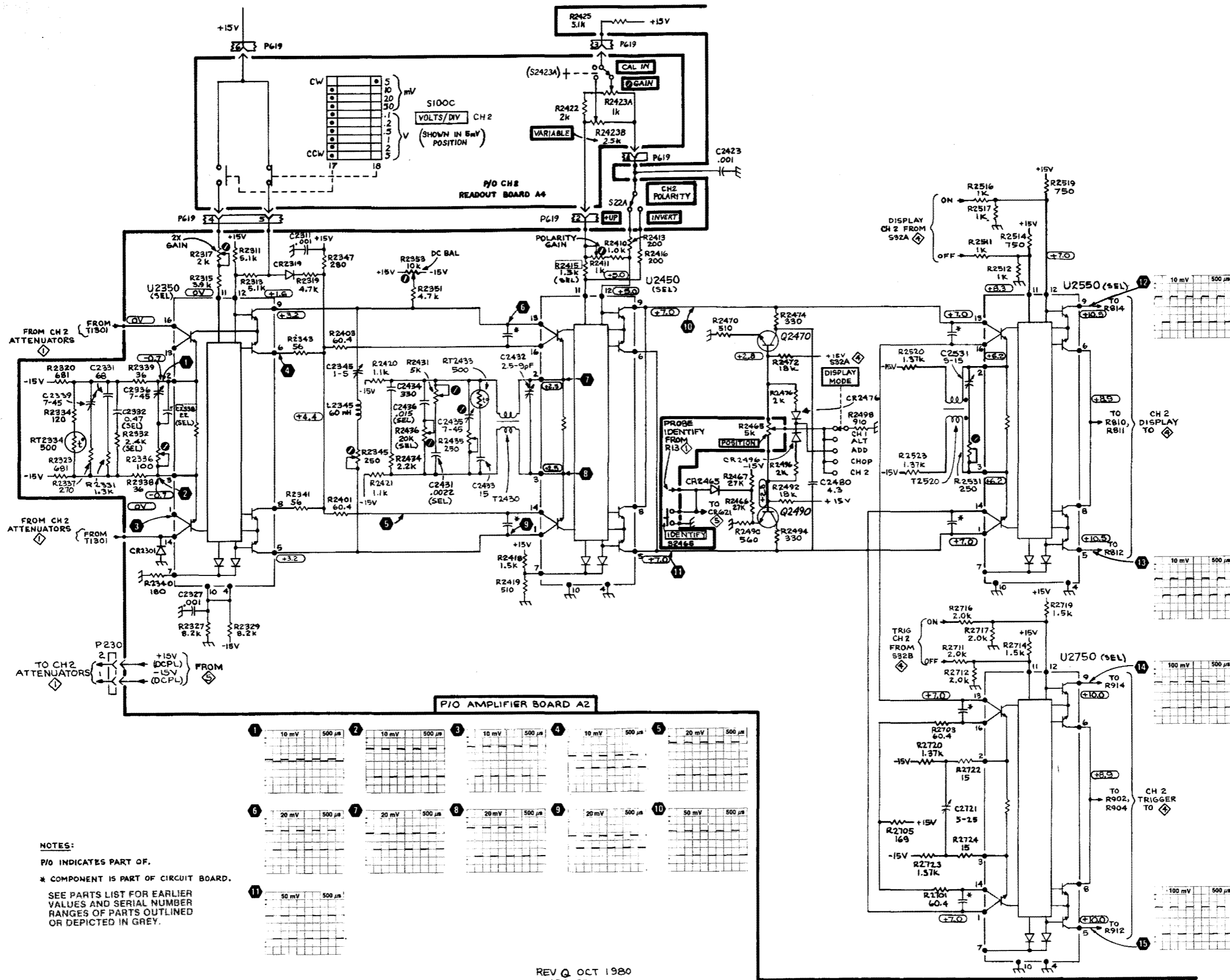
A2 Amplifier Board, Rear View.



Back of board.
 *C1338
 *C2338

*See Parts List for
 serial number ranges.

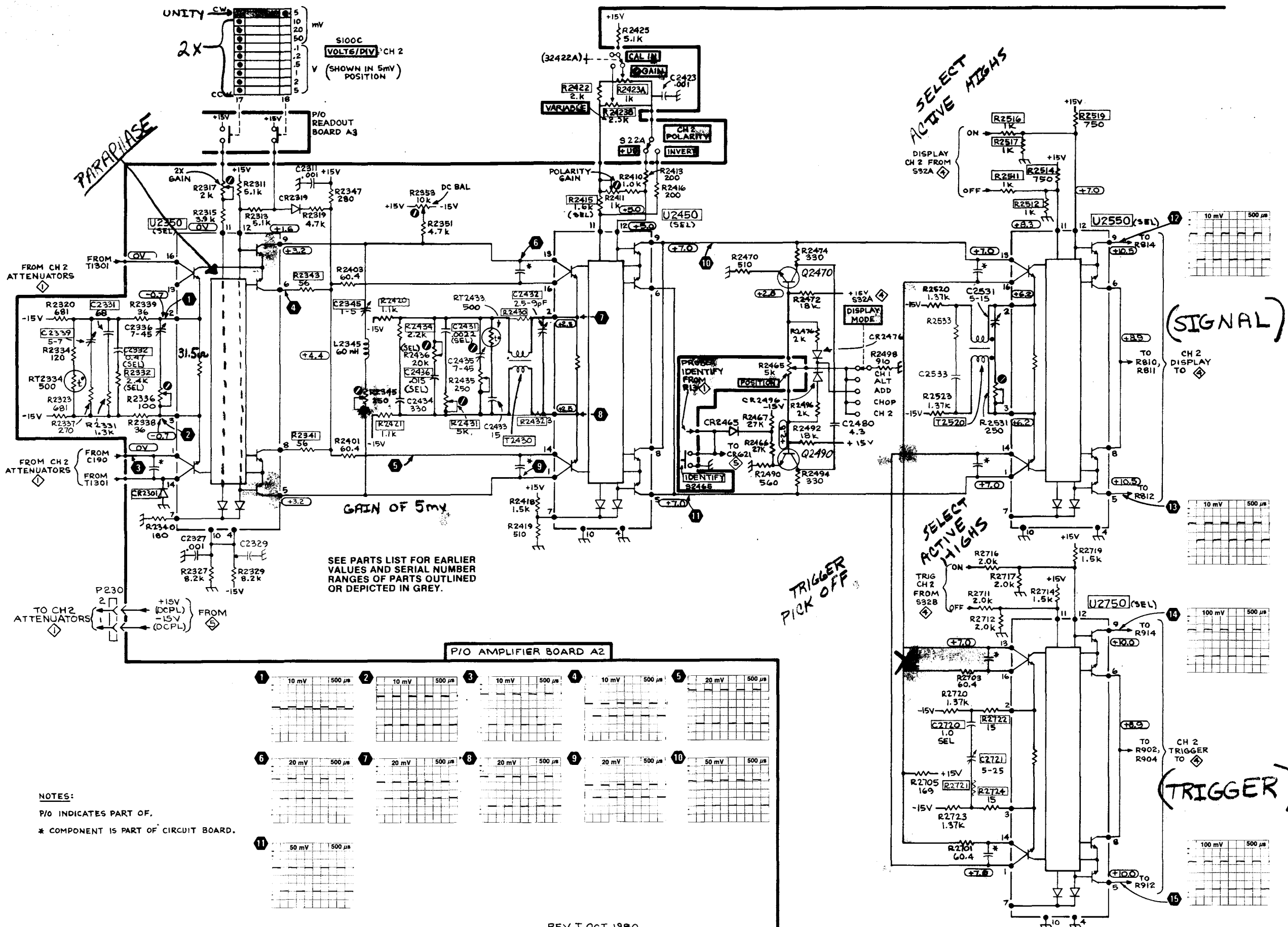
A2 Amplifier Board, SN B160000-above.



NOTES:
 P/O INDICATES PART OF.
 * COMPONENT IS PART OF CIRCUIT BOARD.
 SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.

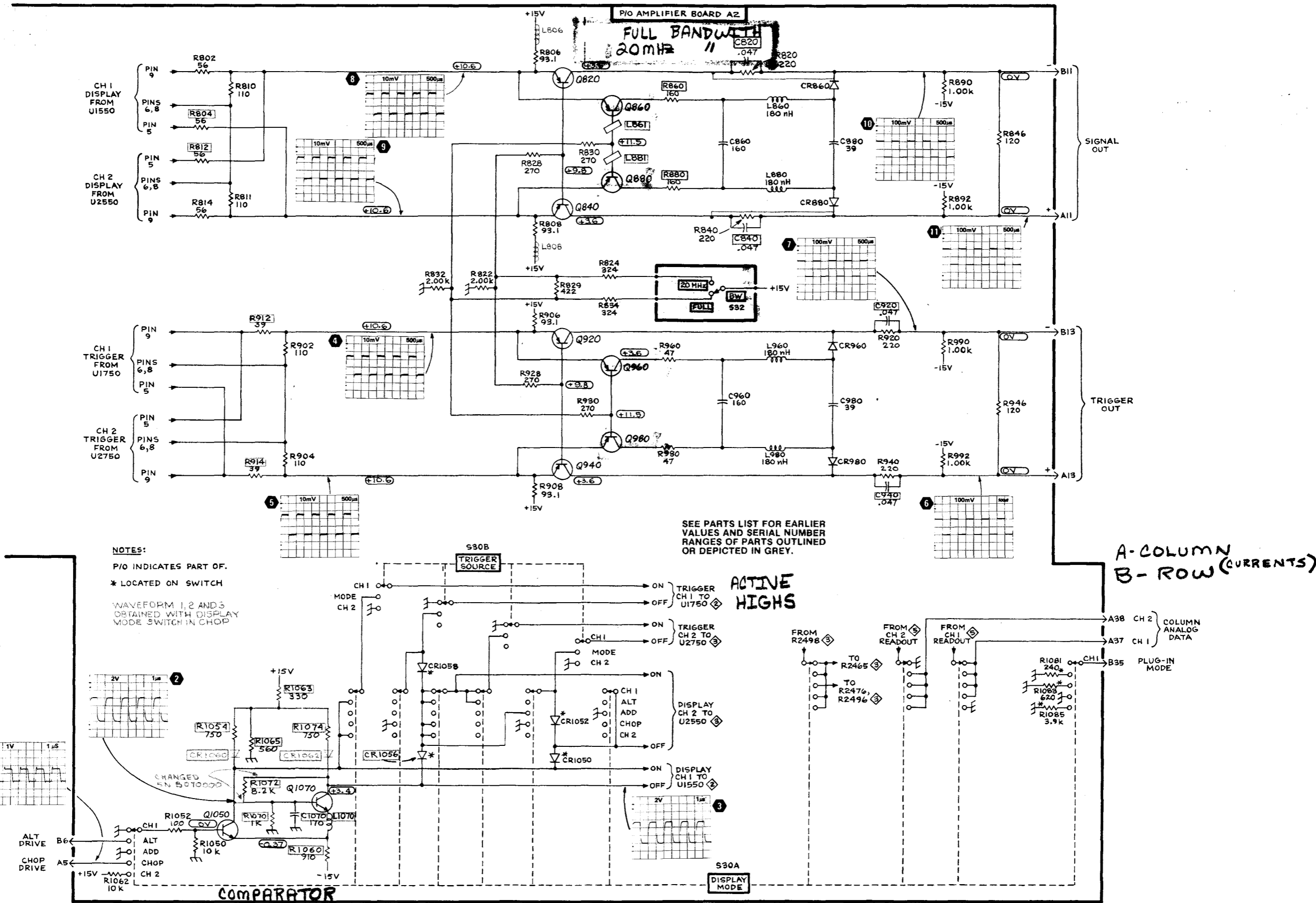
REV Q OCT 1980
 1484-29

CH 2 AMPLIFIER 3 SN B18000-UP kif 12.73



REV I OCT 1980
1484-B

CHANNEL 2 AMPLIFIER (SN B179999-BELOW) 3



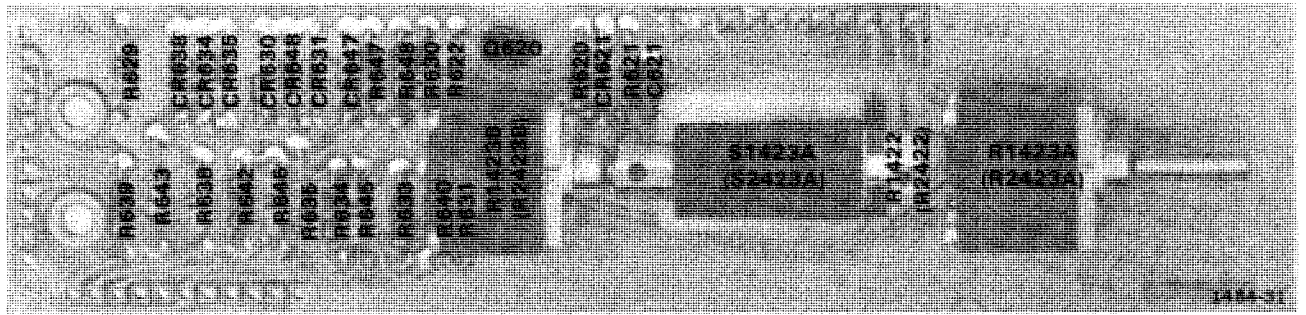
NOTES:
 P/O INDICATES PART OF.
 * LOCATED ON SWITCH

WAVEFORM 1, 2 AND 3 OBTAINED WITH DISPLAY MODE SWITCH IN CHOP

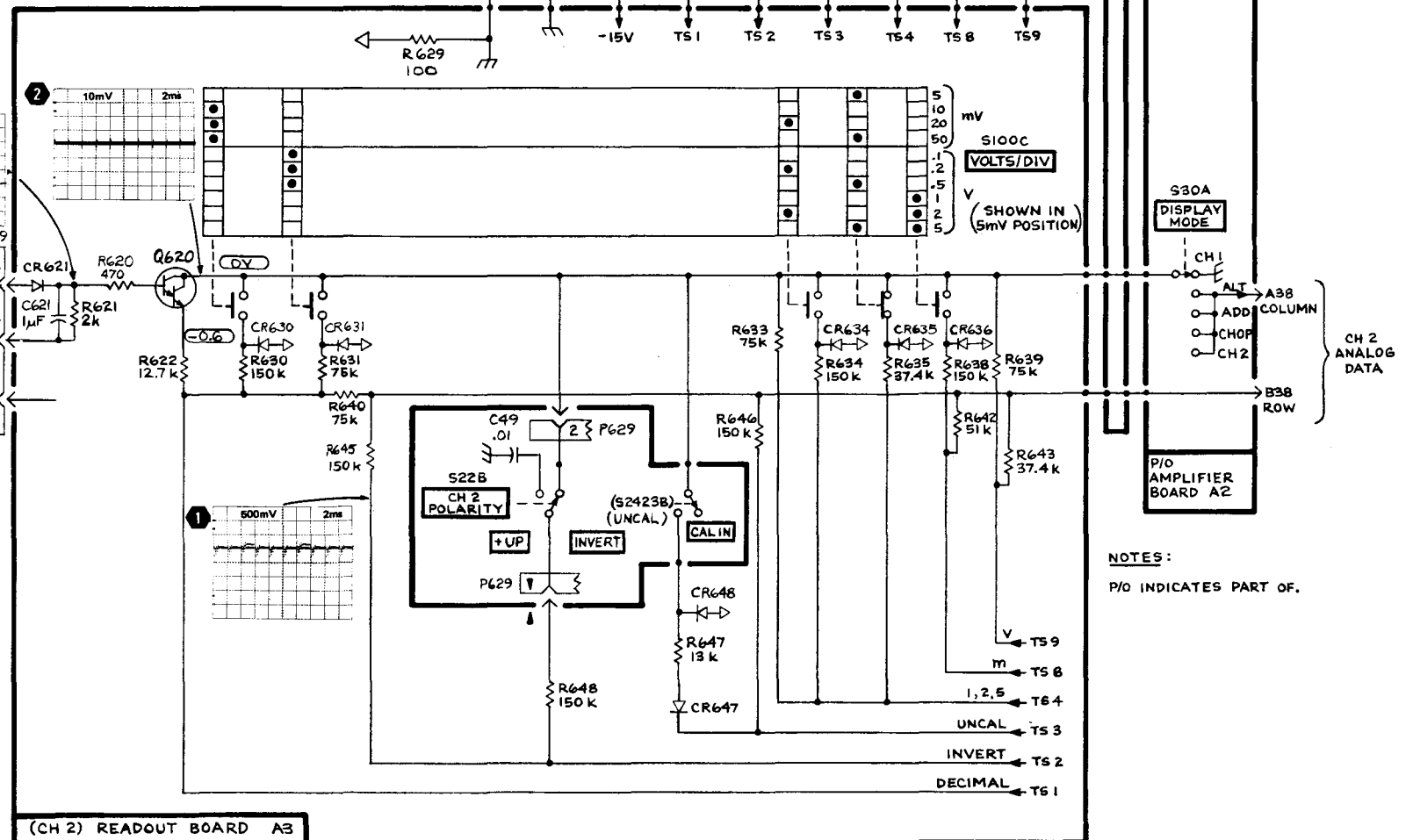
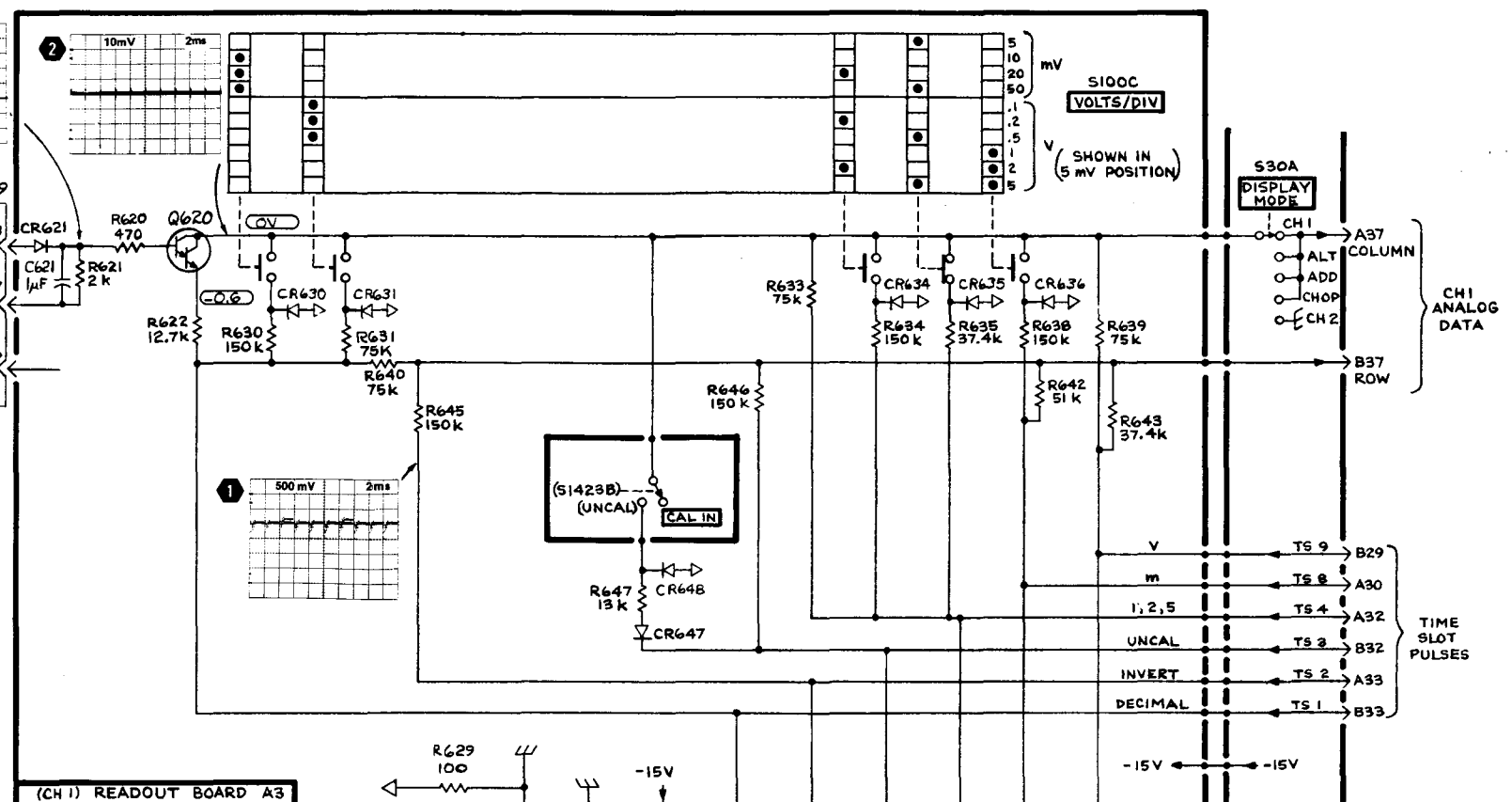
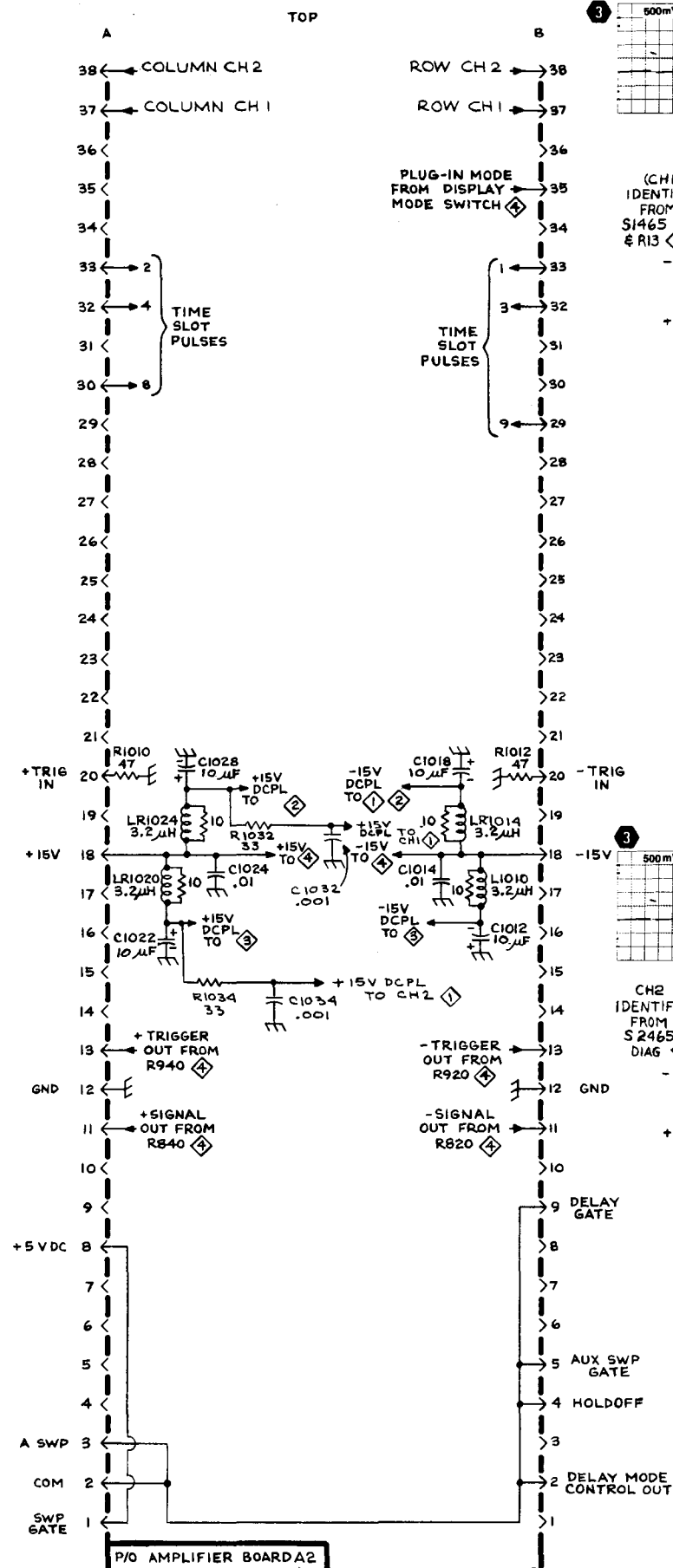
SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.

ACTIVE HIGHS

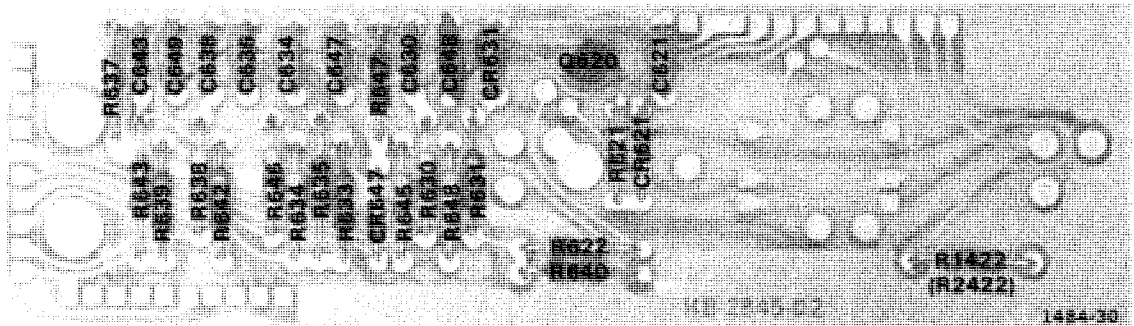
A-COLUMN
 B-ROW (CURRENTS)



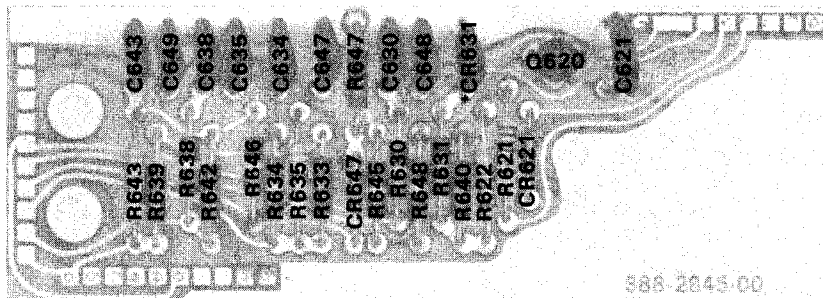
A3 Readout Board SN B180000—Up.



NOTES:
 P/O INDICATES PART OF.

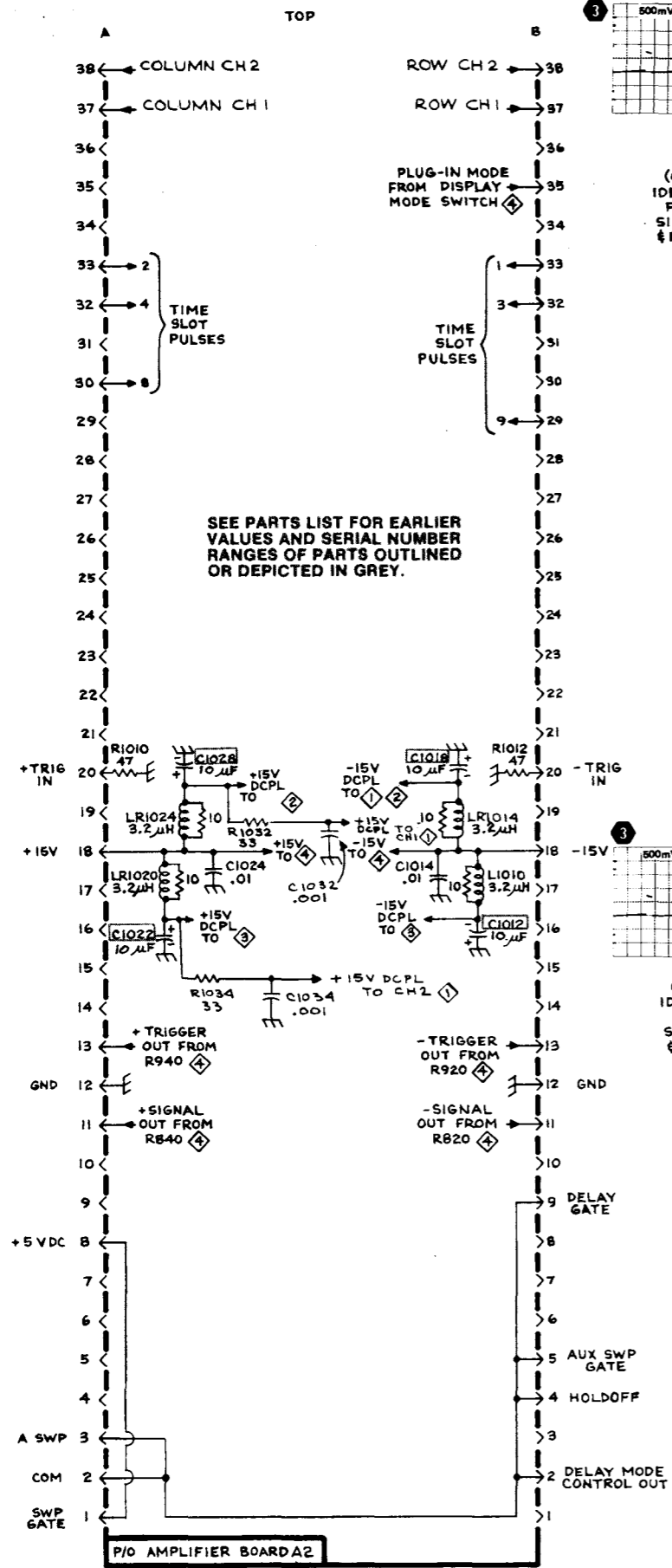


A3 Readout Board SN B150000—179999.

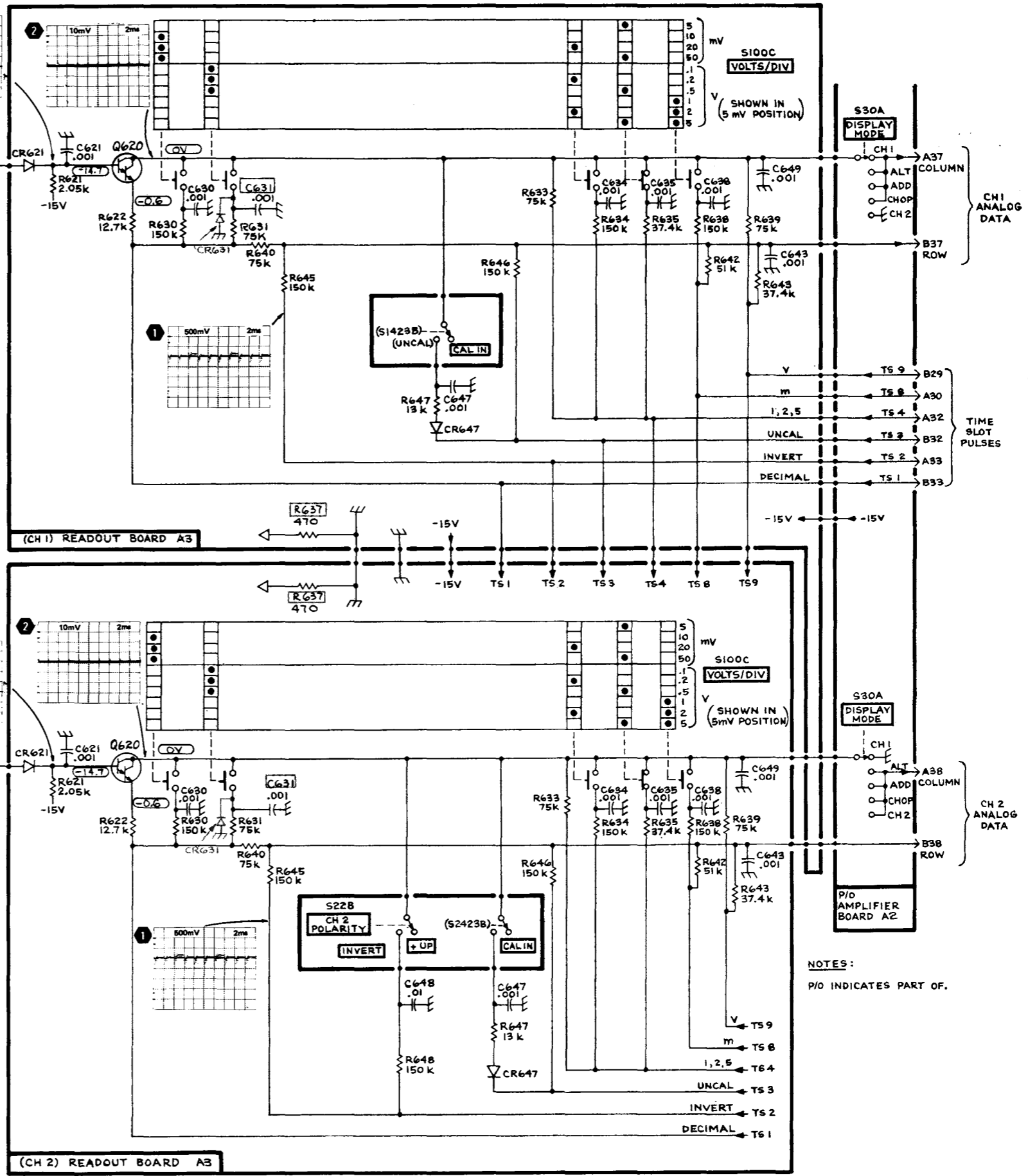


*See Parts List for serial number ranges.

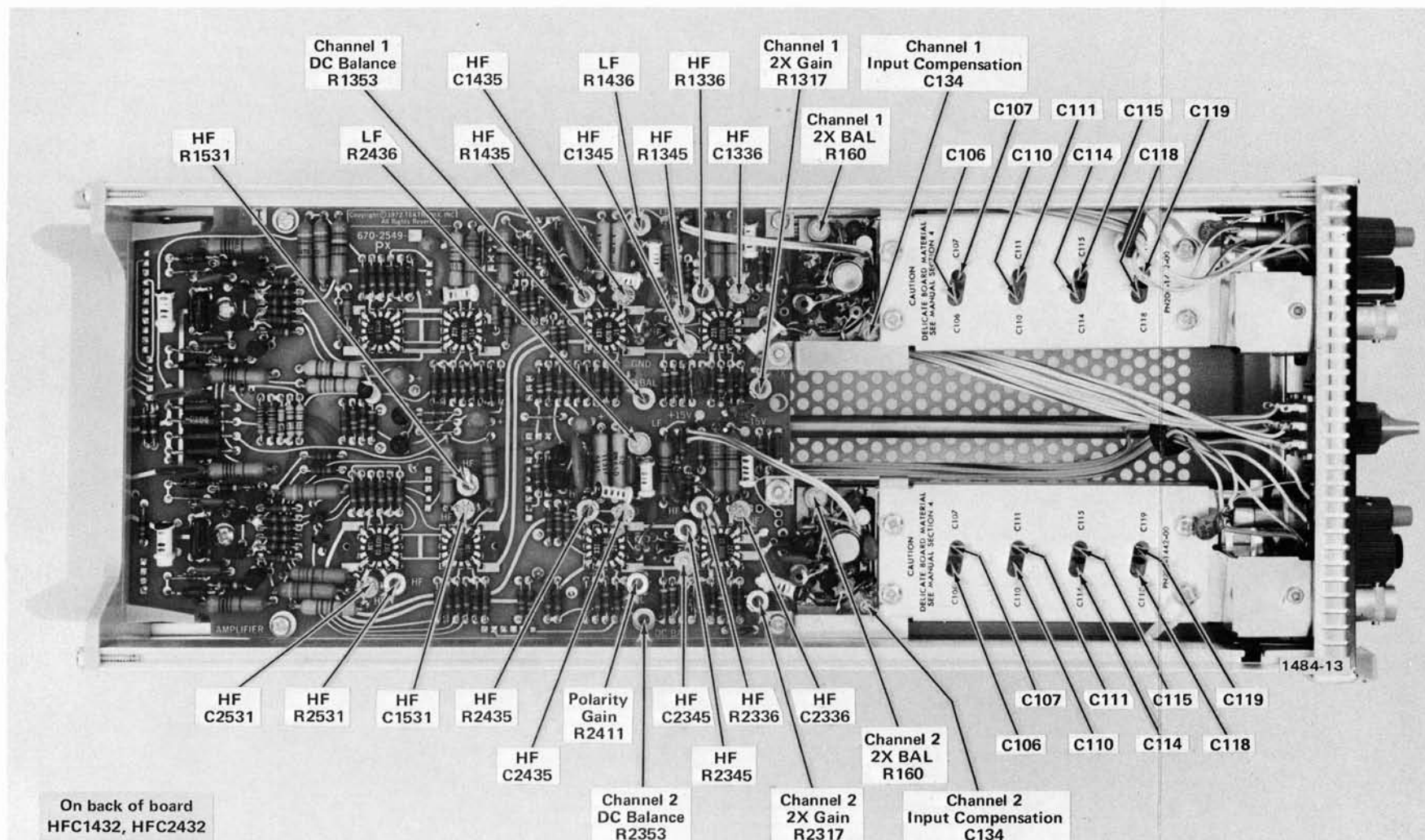
A3 Readout Board SN B149999—below.



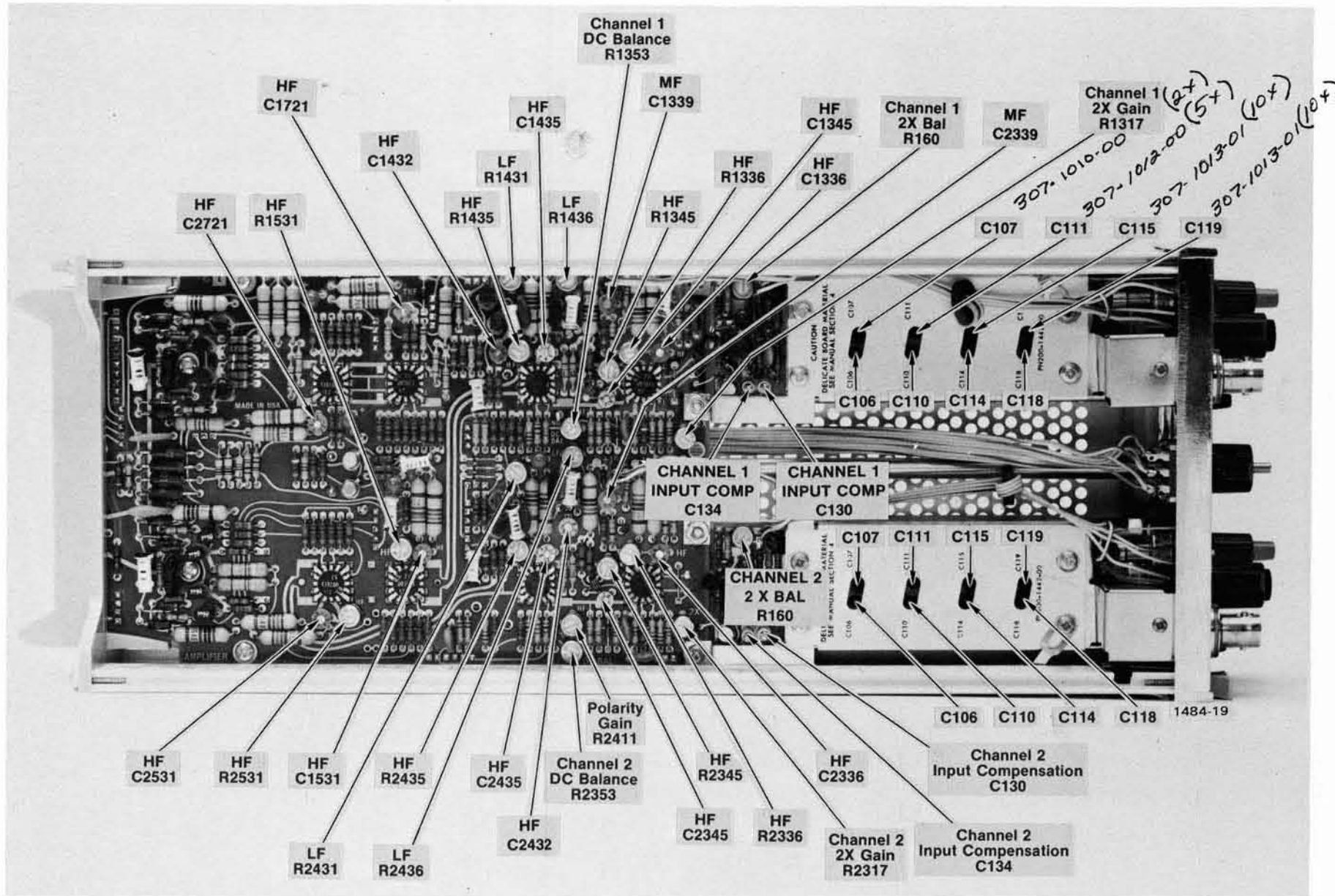
SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.



NOTES:
P/O INDICATES PART OF.



Location of Adjustments SN B159999-below



ADJUSTMENT LOCATIONS

Location of Adjustments SN B160000-above

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	ELCTRN	ELECTRON	IN	INCH	SE	SINGLE END
ACTR	NUMBER SIZE	ELEC	ELECTRICAL	INCAND	INCANDESCENT	SECT	SECTION
ADPTR	ACTUATOR	ELCTLT	ELECTROLYTIC	INSUL	INSULATOR	SEMICOND	SEMICONDUCTOR
ALIGN	ADAPTER	ELEM	ELEMENT	INTL	INTERNAL	SHLD	SHIELD
AL	ALIGNMENT	EPL	ELECTRICAL PARTS LIST	LPHLDR	LAMPHOLDER	SHLDR	SHOULDERED
ASSEM	ALUMINUM	EOPT	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	SO	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	HLCP	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	IDNT	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 CIRRRUS DRIVE	BEAVERTON, OR 97005
000EX	O'HARA METAL PRODUCT COMPANY	542 BRANNAN STREET	SAN FRANCISCO, CA 94107
000FW	WESTERN SINTERING CO INC.	2620 STEVENS DRIVE	RICHLAND, WA 99352
00779	AMP, INC.	P.O. BOX 3608	HARRISBURG, PA 17105
08261	SPECTRA-STRIP CORP.	7100 LAMPSON AVE.	GARDEN GROVE, CA 92642
12360	ALBANY PRODUCTS CO., DIV. OF PNEUMO DYNAMICS CORPORATION	145 WOODWARD AVENUE	SOUTH NORWALK, CT 06586
22526	BERG ELECTRONICS, INC.	YOUK EXPRESSWAY	NEW CUMBERLAND, PA 17070
22599	ESNA, DIV. OF AMERACE CORPORATION	16150 STAGG STREET	VAN NUYS, CA 91409
24931	SPECIALITY CONNECTOR CO., INC.	2620 ENDRESS PLACE	GREENWOOD, IN 46142
42838	NATIONAL RIVET AND MFG. CO.	1-21 EAST JEFFERSON ST.	WAUPUN, WI 53963
70278	ALLIED STEEL AND CONVEYORS, DIV. OF SPARTON CORP.	17333 HEALY	DETROIT, MI 48212
72228	CONTINENTAL SCREW CO., DIV. OF AMTEL, INC.	459 MT. PLEASANT	NEW BEDFORD, MA 02742
73743	FISCHER SPECIAL MFG. CO.	446 MORGAN ST.	CINCINNATI, OH 45206
78189	ILLINOIS TOOL WORKS, INC. SHAKEPROOF DIVISION	ST. CHARLES ROAD	ELGIN, IL 60120
79136	WALDES, KOHINOOR, INC.	47-16 AUSTEL PLACE	LONG ISLAND CITY, NY 11101
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
83385	CENTRAL SCREW CO.	2530 CRESCENT DR.	BROADVIEW, IL 60153
84830	LEE SPRING COMPANY, INC.	30 MAIN STREET	BROOKLYN, NY 11201
86928	SEASTROM MFG. COMPANY, INC.	701 SONORA AVENUE	GLENDALE, CA 91201
87308	N. L. INDUSTRIES, INC., SOUTHERN SCREW DIV.	P. O. BOX 1360	STATESVILLE, NC 28677
92101	SCHULZE MFG, 50 INGOLD RD BURLINGAME, CA 94010		
93907	TEXTRON INC. CAMCAR DIV	600 18TH AVE	ROCKFORD, IL 61101
97464	INDUSTRIAL RETAINING RING CO.	57 CORDIER ST.	IRVINGTON, NJ 07111
98978	INTERNATIONAL ELECTRONIC RESEARCH CORP.	135 W. MAGNOLIA BLVD.	BURBANK, CA 91502

Fig. & Index No.	Tektronix Part No.	Serial/Model No.		Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
		Eff	Dscont					
1-1	131-0679-00	B010100	B073741	2		CONNECTOR,RCPT.:BNC,MALE,3 CONTACT	24931	28JR168-1
	131-0679-02	B073742		2		CONNECTOR,RCPT.:BNC,MALE,3 CONTACT ***** (ATTACHING PARTS) *****	24931	28JR270-1
-1.1	220-0497-00			2		NUT,PLAIN,HEX.:0.5-28 X 0.562 INCH HEX,BRS	73743	ORD BY DESCR
-1.2	210-1039-00			2		WASHER,LOCK:INT,0.521 ID X 0.625 INCH O ***** (END ATTACHING PARTS) *****	24931	ORD BY DESCR
-2	366-1059-00			2		PUSH BUTTON:GRAY	80009	366-1059-00
-3	366-1077-00			2		KNOB:GRAY	80009	366-1077-00
	213-0153-00			2		.SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	ORD BY DESCR
-4	366-1308-00			2		KNOB:RED	80009	366-1308-00
	213-0153-00			2		.SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	ORD BY DESCR
-5	366-1299-00			2		KNOB:GRAY	80009	366-1299-00
	213-0153-00			4		.SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	ORD BY DESCR
-5.1	214-3369-00	B249160		2		SPRING,GROUND:CU BE	80009	214-3369-00
-6	366-1163-00			1		KNOB:LIGHT GRAY	80009	366-1163-00
	213-0153-00			1		.SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	ORD BY DESCR
-7	366-1165-00			1		KNOB:GRAY	80009	366-1165-00
	213-0153-00			2		.SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	ORD BY DESCR
-8	366-0215-02			2		KNOB:LEVER SWITCH	80009	366-0215-02
-9	333-1594-00	B010100	B208879	1		PANEL,FRONT:	80009	333-1594-00
	333-1594-01	B208880		1		PANEL,FRONT:	80009	333-1594-01
-10	366-1058-45			1		KNOB:GRAY ***** (ATTACHING PARTS) *****	80009	366-1058-45
-11	214-1095-00			1		PIN,SPG,SPLIT:0.094 OD X 0.187 INCH LONG ***** (END ATTACHING PARTS) *****	22599	52-022-094-0187
-12	105-0076-02	B010100	B245379	1		REL BAR,LATCH:PLUG-IN UNIT	80009	105-0076-02
	105-0076-04	B245380		1		RELEASE BAR,LCH:PLUG-IN UNIT	80009	105-0076-04
-13	214-1280-00			1		SPRING,HLCPS:0.14 OD X 1.126"L,0.16"DIA	80009	214-1280-00
-14	348-0235-00			2		SHLD GSKT,ELEC:4.734 INCH LONG	92101	ORD BY DESCR
	214-1035-00	B242000	B249159	1		SPRING,HLCPS:0.3 OD X 0.265 L	84830	LC-026D-4SS
	210-0905-00	B242000	B249159	1		WASHER,FLAT:0.256 ID X 0.05 THK,BRS	83385	ORD BY DESCR
-15	358-0216-00			1		BUSHING,PLASTIC:0.257 ID X 0.412 INCH OD	80009	358-0216-00
-16	-----			2		SWITCH,SLIDE:(SEE S22A,B,S32 REPL) ***** (ATTACHING PARTS) *****		
-17	211-0030-00			4		SCREW,MACHINE:2-56 X 0.25,FLH,82DEG,STL	83385	ORD BY DESCR
-18	210-0404-00			4		NUT,PLAIN,SPLIN: ***** (END ATTACHING PARTS) *****	80009	210-0404-00
-19	386-1447-54			1		SUBPANEL,FRONT: ***** (ATTACHING PARTS) *****	80009	386-1447-54
-20	213-0192-00	B010100	B223841	4		SCR,TPG,THD FOR:6-32 X 0.50 INCH,PNH STL	87308	ORD BY DESCR
	213-0793-00	B223842		4		SCREW,TPG,TF:6-32 X 0.4375,TAPTITE,FIL ***** (END ATTACHING PARTS) *****	93907	ORD BY DESCR
-21	131-1075-00			1		CONTACT,ELEC:GROUNDING,CU BE HEAT TRTD	80009	131-1075-00
-22	-----			2		RES.,VAR:(SEE R1465, R2465 REPL) ***** (ATTACHING PARTS) *****		
-23	210-0583-00			2		NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
-24	210-0223-01			2		TERMINAL,LUG:0.25 INCH DIA,SE,60 DEG BEN ***** (END ATTACHING PARTS) *****	86928	ORD BY DESCR
	672-0051-00	B010100	B059999	2		CKT BOARD ASSY:READOUT/ATTENUATOR	80009	672-0051-00
	672-0051-01	B060000	B079999	2		CKT BOARD ASSY:READOUT/ATTENUATOR	80009	672-0051-01
	672-0051-02	B080000	B119999	2		CKT BOARD ASSY:READOUT/ATTENUATOR	80009	672-0051-02
	672-0051-03	B120000	B149999	2		CKT BOARD ASSY:READOUT/ATTENUATOR	80009	672-0051-03
	672-0051-04	B150000	B179999	2		CKT BOARD ASSY:READOUT/ATTENUATOR	80009	672-0051-04
	672-0051-06	B180000	B208879	2		CKT BOARD ASSY:READOUT/ATTENUATOR	80009	672-0051-06
	672-0051-09	B208880	B249159	2		CKT BOARD ASSY:READOUT/ATTENUATOR	80009	672-0051-09
	672-0051-11	B249160	B251089	2		CKT BOARD ASSY:READOUT/ATTENUATOR	80009	672-0051-11
	672-0051-13	B251090		2		CKT BOARD ASSY:READOUT/ATTENUATOR ***** (ATTACHING PARTS) *****	80009	672-0051-13
-25	211-0008-00	B010100	B246700	2		SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ	83385	ORD BY DESCR
	213-0912-00	B246701		2		SCREW,TPG,TF:4-20 X 0.25,PNH,STL,CD,PL ***** (END ATTACHING PARTS) *****	72228	ORD BY DESCR

Replaceable Mechanical Parts—7A26

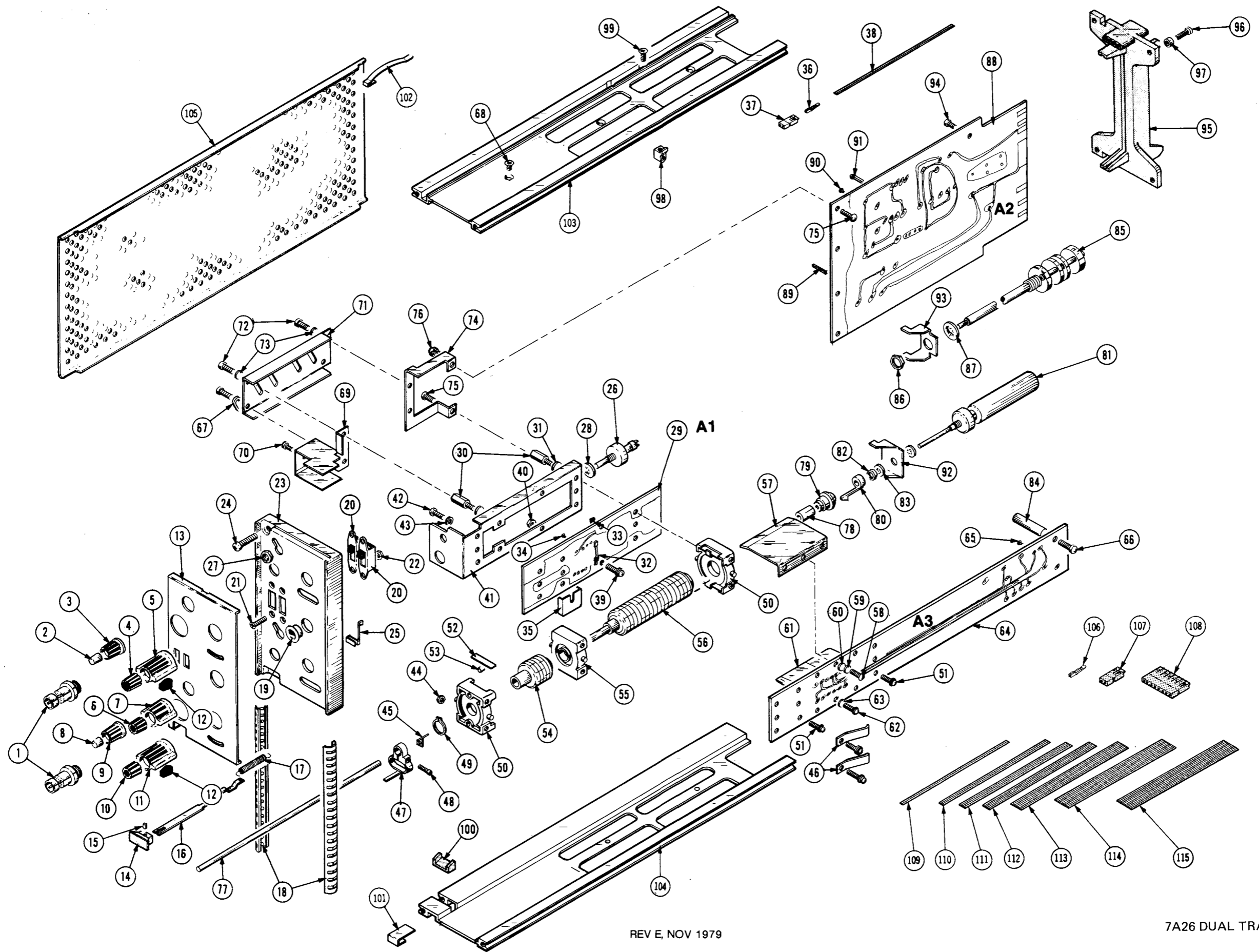
Fig. & Index No.	Tektronix Part No.	Serial/Model No.		Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-	-----			-		CKT BOARD ASSY INCLUDES:		
-26	-----			2		.CKT BOARD ASSY:ATTENUATOR(SEE A1 REPL) ***** (ATTACHING PARTS)*****		
-27	129-0299-00			8		.POST,ELEC-MECH:HEX,0.333 INCH LONG	80009	129-0299-00
-28	210-0004-00			8		.WASHER,LOCK:#4 INTL,0.015 THK,STL CD PL	000BK	ORD BY DESCR
-29	211-0001-00			6		.SCREW,MACHINE:2-56 X 0.25 INCH,PNH STL	87308	ORD BY DESCR
-30	210-0053-00			6		.WASHER,LOCK:INTL,0.092 ID X 0.175"OD	83385	ORD BY DESCR
-31	210-1110-00			6		.WASHER,FLAT:0.092 ID X 0.14 OD BRS	86928	ORD BY DESCR
-32	210-0405-00			6		.NUT,PLAIN,HEX:2-56 X 0.188,BRS,CD PL ***** (END ATTACHING PARTS)*****	73743	12157-50
	-----			-		CKT BOARD ASSY INCLUDES:		
-33	131-1030-00			20		..CONT ASSY,ELEC:CAM SWITCH,BOTTOM	80009	131-1030-00
-34	131-1031-00			20		..CONTACT ASSY,EL:CAM SWITCH,TOP	80009	131-1031-00
-35	210-0779-00	B010100	B200569	20		..RIVET,TUBULAR:0.051 OD X 0.115 INCH LONG	42838	RA-29952715
	210-3082-00	B200570		20		..EYELET,METALLIC:0.047 OD X 0.133 L,BRASS	80009	210-3082-00
-36	136-0252-01	B010100	B079999	52		..CONTACT,ELEC:0.178 INCH LONG	00779	1-332095-2
	136-0252-01	B080000		52		..CONTACT,ELEC:0.178 INCH LONG	00779	1-332095-2
-37	136-0333-00			4		..SOCKET,PIN TERM:U/W 0.03 DIA PINS	00779	1-331677-4
-38	337-1406-00			2		..SHLD,ELECTRICAL:CAM CONTACTS	80009	337-1406-00
-39	198-3048-00			2		..WIRE SET,ELEC:	80009	198-3048-00
	131-0707-00			4		...CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD	22526	47439
	352-0169-00			2		...HLDR,TERM CONN:2 WIRE,BLACK	80009	352-0169-00
	175-0825-00			FT		...WIRE,ELECTRICAL:2 WIRE RIBBON	80009	175-0825-00
-40	214-0269-00	B130000	B227149	2		...HEAT SINK,XSTR:0.312 DIA X 0.75 L	98978	TXD-032-75
-41	441-1097-00			2		.CHAS,PL-IN UNIT:ATTENUATOR ***** (ATTACHING PARTS)*****	80009	441-1097-00
-42	211-0097-00			4		.SCREW,MACHINE:4-40 X 0.312 INCH,PNH STL	83385	ORD BY DESCR
-43	210-0004-00			4		.WASHER,LOCK:#4 INTL,0.015 THK,STL CD PL ***** (END ATTACHING PARTS)*****	000BK	ORD BY DESCR
-44	131-0963-00	B010100	B191199	4		.CONTACT,ELEC:GROUNDING	000EX	ORD BY DESCR
	131-0963-00	B191200	B149999	1		.CONTACT,ELEC:GROUNDING	000EX	ORD BY DESCR
-45	131-0907-00			4		.CONTACT,ELEC:GROUNDING,CU BE ALBALOY PL ***** (ATTACHING PARTS)*****	80009	131-0907-00
-46	211-0292-00			4		.SCR,ASSEM WSHR:4-40 X 0.29,BRS NI PL ***** (END ATTACHING PARTS)*****	78189	ORD BY DESCR
	105-0243-00	B010100	B191199	2		.ACTUATOR,SWITCH:AC,DC ***** (ATTACHING PARTS)*****	80009	105-0243-00
	213-0214-00	B010100	B191199	2		.SCREW,CAP SCH:2-56 X 0.375"HEX HD STL ***** (END ATTACHING PARTS)*****	70278	ORD BY DESCR
	263-1018-00	B010100	B079999	2		.SW CAM ACTR AS:	80009	263-1018-00
	263-1018-01	B080000		2		.SW CAM ACTR AS: ***** (ATTACHING PARTS)*****	80009	263-1018-01
-47	211-0116-00	B010100	B149999	8		.SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS	83385	ORD BY DESCR
	211-0292-00	B150000		8		.SCR,ASSEM WSHR:4-40 X 0.29,BRS NI PL ***** (END ATTACHING PARTS)*****	78189	ORD BY DESCR
-48	105-0243-00	B191200		2		.CAM SW ASSY INCLUDES: ..ACTUATOR,SWITCH:AC,DC ***** (ATTACHING PARTS)*****	80009	105-0243-00
-49	213-0214-00	B191200		2		..SCREW,CAP SCH:2-56 X 0.375"HEX HD STL ***** (END ATTACHING PARTS)*****	70278	ORD BY DESCR
	131-0963-00	B150000		4		..CONTACT,ELEC:GROUNDING	000EX	ORD BY DESCR
-50	354-0391-00	B010100	B059999	4		..RING,RETAINING:0.395"FREE ID X 0.025" S	97464	3100-43-CD
	354-0390-00	B060000		2		..RING,RETAINING:0.338 ID X 0.025" THK,STL	79136	5100-37MD
	354-0443-00	B060000		2		..RING,RETAINING:0.328 FREE ID X 0.448 OD	97464	200-37
-51	210-0406-00			20		..NUT,PLAIN,HEX:4-40 X 0.188,BRS,CD PL	73743	12161-50
-52	401-0081-02	B010100	B059999	2		..BEARING,CAM SW:FRONT	80009	401-0081-02
	401-0180-00	B060000	B079999	2		..BEARING,CAM SW:FRONT & REAR	80009	401-0180-00
	401-0180-02	B080000	B191199	2		..BEARING,CAM SW:W/INSERT	80009	401-0180-02
	401-0180-00	B191200		2		..BEARING,CAM SW:FRONT & REAR	80009	401-0180-00
-53	214-1139-00			2		..SPRING,FLAT:0.885 X 0.156 CU BE GLD CLR	80009	214-1139-00
	214-1139-02			4		..SPRING,FLAT:GREEN COLORED	80009	214-1139-02
	214-1139-03			4		..SPRING,FLAT:RED COLORED	80009	214-1139-03
-54	214-1127-00	B010100	B059999	8		..ROLLER,DETENT:0.125 DIA X 0.125,SST	80009	214-1127-00
	214-1752-00	B060000		8		..ROLLER,DETENT:	80009	214-1752-00

Fig. & Index No.	Tektronix Part No.	Serial/Model No.		Qty	Name & Description					Mfr Code	Mfr Part Number
		Eff	Dscont		1	2	3	4	5		
1-55	105-0397-00	B010100	B059999	2	..ACTUATOR,CAM SW:DC,GND,AC					80009	105-0397-00
	105-0397-01	B060000		2	..ACTUATOR,CAM SW:DC,GND,AC					80009	105-0397-01
-55.1	-----				..(ACTUATOR NO LONGER INCLUDES SHAFT)						
	384-0878-01	B060000		2	..SHAFT,CAM SW:FRONT					80009	384-0878-01
-56	401-0115-00	B010100	B059999	2	..BEARING,CAM SW:CENTER					80009	401-0115-00
	401-0178-00	B060000		2	..BEARING,CAM SW:CENTER					80009	401-0178-00
-57	105-0398-00	B010100	B059999	2	..ACTUATOR,CAM SW:ATTEN					80009	105-0398-00
	105-0398-01	B060000		2	..ACTUATOR,CAM SW:ATTEN					80009	105-0398-01
	-----				..(ACTUATOR NO LONGER INCLUDES SHAFT)						
-57.1	384-0880-00	B060000		2	..SHAFT,CAM SW:REAR					80009	384-0880-00
-58	337-1754-00			2	.SHIELD,ELEC:ATTENUATOR ***** (ATTACHING PARTS) *****					80009	337-1754-00
-59	213-0120-00	B010100	B085114	6	.SCR,TPG,THD FOR:2-32 X 0.250 INCH,PNH STL					83385	ORD BY DESCR
	211-0001-00	B085115		6	.SCREW,MACHINE:2-56 X 0.25 INCH,PNH STL					87308	ORD BY DESCR
-60	210-0053-00			6	.WASHER,LOCK:INTL,0.092 ID X 0.175" OD					83385	ORD BY DESCR
-61	210-1008-00	B010100	B191199	6	.WASHER,FLAT:0.09 ID X 0.188" OD,BRS					12360	ORD BY DESCR
	210-1110-00	B191200		6	.WASHER,FLAT:0.092 ID X 0.14 OD BRS ***** (END ATTACHING PARTS) *****					86928	ORD BY DESCR
-62	337-1418-01	B010100	B199799	2	.SHIELD,ELEC:CAM SWITCH CASTING					80009	337-1418-01
	337-1418-02	B199800		2	.SHIELD,ELEC:CIRCUIT BOARD ***** (ATTACHING PARTS) *****					80009	337-1418-02
-63	211-0001-00			6	.SCREW,MACHINE:2-56 X 0.25 INCH,PNH STL					87308	ORD BY DESCR
-64	210-0053-00			6	.WASHER,LOCK:INTL,0.092 ID X 0.175" OD					83385	ORD BY DESCR
-65	210-1008-00	B010100	B191199	6	.WASHER,FLAT:0.09 ID X 0.188" OD,BRS					12360	ORD BY DESCR
	210-1110-00	B191200		6	.WASHER,FLAT:0.092 ID X 0.14 OD BRS ***** (END ATTACHING PARTS) *****					86928	ORD BY DESCR
-66	-----			2	.CKT BOARD ASSY:READOUT(SEE A3 REPL)						
-67	136-0252-04	B010100	B072899	6	..SOCKET,PIN TERM:U/W 0.016-0.018 DIA PINS					22526	75060-007
-68	136-0350-00	B072900		2	..SOCKET,PLUG-IN:3 PIN,LOW PROFILE					80009	136-0350-00
-69	-----			4	..RESISTOR,VAR:(SEE R1423A,R2423 REPL)						
-70	361-0515-00	B150000		4	..SPACER,SWITCH:PLASTIC					80009	361-0515-00
-71	214-1190-02	B150000		2	..CPLG,SHAFT,RGD:0.125 OD TO 0.081 OD,AL					80009	214-1190-02
-72	214-1136-00	B150000		2	..ACTUATOR,SL SW:DUAL DPST					80009	214-1136-00
-73	351-0180-00	B150000		2	..SLIDE,GUIDE:SWITCH ACTUATOR					80009	351-0180-00
-74	131-0604-00	B150000		6	..CONTACT,ELEC:CKT BD SW,SPR,CU BE					80009	131-0604-00
	131-0608-00	B251090		22	..TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD					22526	48283-036
-75	210-0288-00			2	TERMINAL,LUG:0.125 ID X 1.125 INCH LONG ***** (ATTACHING PARTS) *****					80009	210-0288-00
-76	211-0105-00			2	SCREW,MACHINE:4-40 X 0.188,100 DEG,FLH ST					83385	ORD BY DESCR
-77	210-0586-00			2	NUT,PL,ASSEM WA:4-40 X 0.25,STL,CD PL					78189	211-041800-00
-78	211-0007-00			2	SCREW,MACHINE:4-40 X 0.188,PNH STL,CD PL ***** (END ATTACHING PARTS) *****					83385	ORD BY DESCR
-79	337-1716-00			2	SHIELD,ELEC:ATTENUATOR ***** (ATTACHING PARTS) *****					80009	337-1716-00
-80	213-0055-00			2	SCR,TPG,THD FOR:2-32 X 0.188 INCH,PNH STL ***** (END ATTACHING PARTS) *****					93907	ORD BY DESCR
-81	200-1442-00			2	COVER,CHASSIS:ATTENUATOR ***** (ATTACHING PARTS) *****					80009	200-1442-00
-82	211-0007-00			6	SCREW,MACHINE:4-40 X 0.188,PNH STL,CD PL					83385	ORD BY DESCR
-83	210-0994-00	B010100	B191299	6	WASHER,FLAT:0.125 ID X 0.25" OD,STL					86928	5702-201-20
	210-0004-00	B191300		6	WASHER,LOCK:#4 INTL,0.015 THK,STL CD PL ***** (END ATTACHING PARTS) *****					000BK	ORD BY DESCR
-84	407-1172-00			2	BRACKET,CKT BD:BRASS ***** (ATTACHING PARTS) *****					80009	407-1172-00
-85	211-0008-00			4	SCREW,MACHINE:4-40 X 0.250,PNH,STL,POZ					83385	ORD BY DESCR
-86	210-0586-00			2	NUT,PL,ASSEM WA:4-40 X 0.25,STL,CD PL ***** (END ATTACHING PARTS) *****					78189	211-041800-00
-87	384-1194-00	B010100	B149999	2	EXTENSION SHAFT:7.22 L X 0.123 OD EPOXY-GL					80009	384-1194-00
	384-1178-00	B150000		2	EXTENSION SHAFT:0.123 OD X 6.1 INCH LONG					80009	384-1178-00
-88	384-1388-00	B150000		2	EXTENSION SHAFT:3.02 L X 0.078 OD,SST,PSVT					80009	384-1388-00
-89	376-0039-00	B010100	B019999	2	ADPT,SHAFT,CPLG:0.128 AND 0.082" DIA SHAFT					80009	376-0039-00
	376-0152-00	B020000		2	CPLG,SHAFT,RGD:0.075 & 0.125 ID,AL					80009	376-0152-00
-90	376-0125-00			2	COUPLER,CAM SW:					80009	376-0125-00
-90.1	354-0251-00			4	RING,COUPLING:0.251 ID X 0.375 INCH OD,AL					80009	354-0251-00

Replaceable Mechanical Parts—7A26

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-91	376-0124-00			2		ARM, SWITCH ACTR: DRIVER	80009	376-0124-00
-92	-----			2		RES., VAR: (SEE R1423, R2423 REPL) ***** (ATTACHING PARTS) *****		
-93	210-0583-00	B010100	B149999	2		NUT, PLAIN, HEX: 0.25-32 X 0.312 INCH, BRS	73743	2X20317-402
-94	210-0046-00	B010100	B149999	4		WASHER, LOCK: 0.261 ID, INTL, 0.018 THK, BRS ***** (END ATTACHING PARTS) *****	78189	1214-05-00-0541C
-95	129-0080-00	B010100	B149999	2		SPACER, POST: 0.875 L, W/4-40 THD, NYLON	80009	129-0080-00
	129-0554-00	B150000	B246700	2		SPACER, POST: 0.975" L W/4-40 THD, PLSTC	80009	129-0554-00
	129-0554-01	B246701		2		SPACER, POST: 0.975L W/0.094 ID ***** (ATTACHING PARTS) *****	80009	129-0554-01
-96	211-0008-00	B010100	B246700	2		SCREW, MACHINE: 4-40 X 0.250, PNH, STL, POZ	83385	ORD BY DESCR
	213-0912-00	B246701		2		SCREW, TPG, TF: 4-20 X 0.25, PNH, STL, CD, PL ***** (END ATTACHING PARTS) *****	72228	ORD BY DESCR
-97	-----			1		SWITCH, WIRED: (SEE S30 REPL) ***** (ATTACHING PARTS) *****		
-98	210-0590-00			1		NUT, PLAIN, HEX.: 0.375-32 X 0.438" BRS	73743	2X28269-402
-99	210-0012-00			1		WASHER, LOCK: INTL, 0.384 ID, INTL, 0.022 TH ***** (END ATTACHING PARTS) *****	78189	1220-02-00-0541C
	-----			-		SWITCH ASSY INCLUDES:		
	175-0826-00			FT		.WIRE, ELECTRICAL: 3 WIRE RIBBON	80009	175-0826-00
	175-0827-00			FT		.CABLE, SP, ELEC: 4, 26 AWG, STRD, PVC JKT, RBN	08261	SS04267(1061)0C
	175-0828-00			FT		.WIRE, ELECTRICAL: 5 WIRE RIBBON	08261	SS-0526-710610C
-100	-----			1		CKT BOARD ASSY: AMPLIFIER (SEE A2 REPL) ***** (ATTACHING PARTS) *****		
-101	211-0008-00			2		SCREW, MACHINE: 4-40 X 0.250, PNH, STL, POZ ***** (END ATTACHING PARTS) *****	83385	ORD BY DESCR
	-----			-		CKT BOARD ASSY INCLUDES:		
-102	131-0608-00	B010100	B251089	4		.TERMINAL, PIN: 0.365 L X 0.025 PH BRZ GOLD	22526	48283-036
	131-0608-00	B251090		41		.TERMINAL, PIN: 0.365 L X 0.025 PH BRZ GOLD	22526	48283-036
	131-0589-00	B251090		4		.TERMINAL, PIN: 0.46 L X 0.025 SQ	22526	48283-029
-103	136-0252-04	B010100	B072899	162		.SOCKET, PIN TERM: U/W 0.016-0.018 DIA PINS	22526	75060-007
	136-0252-07	B072900		120		.SOCKET, PIN CONN: W/O DIMPLE	22526	75060-012
-104	136-0350-00	B072900		14		.SOCKET, PLUG-IN: 3 PIN, LOW PROFILE	80009	136-0350-00
-105	214-0579-00			1		.TERM, TEST POINT: BRS CD PL	80009	214-0579-00
-106	407-0553-00	B010100	B149999	2		.BRACKET, CMPNT: BRASS ALBALOY PL	80009	407-0553-00
-107	407-0912-00			1		.BRACKET, CKT BD: BRASS CU-SN-ZN PL	80009	407-0912-00
-108	386-1402-00			1		PANEL, REAR: ***** (ATTACHING PARTS) *****	80009	386-1402-00
-109	213-0192-00	B010100	B223841	4		SCR, TPG, THD FOR: 6-32 X 0.50 INCH, PNH STL	87308	ORD BY DESCR
	213-0793-00	B223842		4		SCREW, TPG, TF: 6-32 X 0.4375, TAPTITE, FIL	93907	ORD BY DESCR
-110	361-0326-00			1		SPACER, SLEEVE: 0.18 ID X 0.25 OD X 0.10" L ***** (END ATTACHING PARTS) *****	80009	361-0326-00
-111	220-0547-01			4		NUT, BLOCK: 0.38 X 0.26 X 0.282 (2) 4-40 ***** (ATTACHING PARTS) *****	000FW	ORD BY DESCR
-112	211-0105-00			4		SCREW, MACHINE: 4-40 X 0.188, 100 DEG, FLH ST ***** (END ATTACHING PARTS) *****	83385	ORD BY DESCR
-113	105-0075-00			1		BOLT, LATCH: 7A & 7B SER PL-IN	80009	105-0075-00
-114	214-1054-00			1		SPRING, FLAT: 0.825 X 0.322, SST	80009	214-1054-00
-115	214-1061-00			1		SPRING, GROUND: FLAT	80009	214-1061-00
-116	426-0736-00			1		FR SECT, PLUG-IN: TOP	80009	426-0736-00
-117	426-0737-00			1		FR SECT, PLUG-IN: BOTTOM	80009	426-0737-00
-118	337-1064-04	B010100	B249624	2		SHIELD, ELEC: SIDE PLUG-IN UNITS	80009	337-1064-00
	337-1064-00	B249625		2		SHIELD ELEC: SIDE PLUG-IN UNITS	80009	337-1064-00
-119	198-2150-00	B010100	B251089	1		WIRE SET, ELEC:	80009	198-2150-00
	198-2150-01	B251090		1		WIRE SET, ELEC: 198-2150-01	80009	198-2150-01
	175-5420-00	B010100	B251089	2		.CA ASSY, SP, ELEC: 2, 26 AWG, 4.0 L, RIBBON	80009	175-5420-00
	175-5420-01	B251090		2		.CA ASSY, SP, ELEC: 2, 26 AWG, 4.0 L, RIBBON	80009	175-5420-01
-120	175-0825-00			AR		.WIRE, ELECTRICAL: 2 WIRE RIBBON	80009	175-0825-00
-121	131-0707-00			4		.CONTACT, ELEC: 22-26 AWG, BRS & CU BE GOLD	22526	47439
	352-0169-02			1		.HLDR, TERM CONN: 2 WIRE, RED	80009	352-0169-00

Fig. & Index No.	Tektronix Part No.	Serial/Model No.		Qty	1 2 3 4 5	Name & Description	Mfr	
		Eff	Dscont				Code	Mfr Part Number
1-	175-5424-00	B010100	B251089	2		.CA ASSY,SP,ELEC:3,26 AWG,3.5 L,RIBBON	80009	175-5424-00
	175-5424-01	B251090		2		.CA ASSY,SP,ELEC:3,26 AWG,3.5 L,RIBBON	80009	175-5424-01
-122	175-0826-00			AR		..WIRE,ELECTRICAL:3 WIRE RIBBON	80009	175-0826-00
	131-0707-00			6		..CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD	22526	47439
	352-0161-01			1		..CONN BODY,PL,EL:3 WIRE BROWN	80009	352-0161-01
	175-5421-00	B010100	B251089	1		.CA ASSY,SP,ELEC:4,26 AWG,10.75 RIBBON	80009	175-5421-00
	175-5421-01	B251090		1		.CA ASSY,SP,ELEC:4,26 AWG,10.75 L,RIBBON	80009	175-5421-01
-123	175-0827-00			AR		..CABLE,SP,ELEC:4,26 AWG,STRD,PVC JKT,RBN	08261	SS04267(1061)0C
	131-0707-00			4		..CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD	22526	47439
	352-0162-01			1		..CONN BODY,PL,EL:4 WIRE BROWN	80009	352-0162-01
	175-5422-00	B010100	B251089	1		.CA ASSY,SP,ELEC:5,26 AWG,3.0 L,RIBBON	80009	175-5422-00
	175-5422-01	B251090		1		.CA ASSY,SP,ELEC:5,26 AWG,3.0 L,RIBBON	80009	175-5422-01
-124	175-0828-00			AR		..WIRE,ELECTRICAL:5 WIRE RIBBON	08261	SS-0526-710610C
	131-0707-00			10		..CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD	22526	47439
	352-0163-04			2		..HLDR,TERM CONN:5 WIRE,YELLOW	80009	352-0163-04
	175-9594-00	B251090		1		.CA ASSY,SP,ELEC:6,26 AWG,3.0 L,RIBBON	80009	175-9594-00
-125	175-0829-00			AR		..WIRE,ELECTRICAL:6 WIRE RIBBON	08261	SS-0626-710610C
	131-0707-00			12		..CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD	22526	47439
	352-0164-03			2		..HLDR,TERM CONN:6 WIRE,ORANGE	80009	352-0164-03
	175-5419-00	B010100	B251089	1		.CA ASSY,SP,ELEC:8,26 AWG,12.0 L,RIBBON	80009	175-5419-00
	175-5419-01	B251090		1		.CA ASSY,SP,ELEC:8,26 AWG,12.0 L,RIBBON	80009	175-5419-01
	131-0707-00			8		..CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD	22526	47439
-126	352-0169-09			1		..HLDR,TERM CONN:2 WIRE,WHITE	80009	352-0169-09
	352-0161-03			1		..CONN BODY,PL,EL:3 WIRE ORANGE	80009	352-0161-03
	352-0161-04			1		..CONN BODY,PL,EL:3 WIRE YELLOW	80009	352-0161-04
-127	175-0831-00			AR		..WIRE,ELECTRICAL:8 WIRE RIBBON	08261	SS-0826-710610C
	175-5418-00	B010100	B251089	1		.CA ASSY,SP,ELEC:9,26 AWG,3.5 L,RIBBON	80009	175-5418-00
	175-5418-01	B251090		1		.CA ASSY,SP,ELEC:9,26 AWG,5.5 L,RIBBON	80009	175-5418-01
	131-0707-00			18		..CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD	22526	47439
-128	175-0832-00			AR		..WIRE,ELECTRICAL:9 WIRE RIBBON	08261	SS-0926(1061)0C
	352-0163-02			2		..HLDR,TERM CONN:5 WIRE,RED	80009	352-0163-02
	352-0164-01			2		..HLDR,TERM CONN:6 WIRE,BROWN	80009	352-0164-01
-129	352-0166-09			2		..HLDR,TERM CONN:8 WIRE,WHITE	80009	352-0166-09
	352-0161-02			2		..CONN BODY,PL,EL:3 WIRE RED	80009	352-0161-02
	195-1520-00	B010100	B251089	2		.LEAD,ELECTRICAL:26 AWG,2.5 L,9-1	80009	195-1520-00
	196-2495-00	B251090		2		.LEAD,ELECTRICAL:6 AWG,2.5 L,9-1	80009	196-2495-00
	131-0707-00			2		..CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD	22526	47439
	195-1521-00	B010100	B251089	2		.LEAD,ELECTRICAL:26 AWG,2.5 L,9-2	80009	195-1521-00
	196-2496-00	B251090		2		.LEAD,ELECTRICAL:26 AWG,2.5 L,9-2	80009	196-2496-00
	131-0707-00			2		..CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD	22526	47439
	195-5252-00	B010100	B251089	2		.LEAD,ELECTRICAL:26 AWG,2.5 L,9-3	80009	195-5252-00
	195-5252-01	B251090		2		.LEAD,ELECTRICAL:26 AWG,2.5 L,9-3	80009	195-5252-01
	131-0707-00			2		..CONTACT,ELEC:22-26 AWG,BRS & CU BE GOLD	22526	47439



REV E, NOV 1979

7A26 DUAL TRACE AMPLIFIER

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
STANDARD ACCESSORIES												
2-	070-1484-01			1						MANUAL,TECH:INSTRUCTION	80009	070-1484-01

ACCESSORIES

MANUAL CHANGE INFORMATION

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

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

A single change may affect several sections. Since the change information sheets are carried in the manual until all changes are permanently entered, some duplication may occur. If no such change pages appear following this page, your manual is correct as printed.

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