


P6201 PROBE

*Please Check for
CHANGE INFORMATION
at the Rear of This Manual*

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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

CHARACTERISTICS

The P6201 is an active (FET) probe providing unity gain and DC to 900 MHz bandwidth. The low input-capacitance of the probe permits coupling of high-frequency signals to an oscilloscope input with minimum loading on the circuit under test. Plug-on attenuator heads provide higher input resistance, reduced input capacitance, and attenuation of the signal. Effective DC offset range is also increased when using an attenuator head.

The P6201 is designed primarily for use with TEKTRONIX 7000-Series, 475, or 485 Oscilloscopes, but may be used with 50-ohm sampling instruments and conventional oscilloscopes (with 1 M Ω input resistance). The internal 50-ohm termination may be switched in or out to adapt the probe output to either 1-megohm or 50-ohm inputs.

The probe includes a locking-type BNC connector which provides scale-factor readout information to instruments having the readout capability. The 10X and 100X attenuator heads also couple readout information to the instrument via the output connector.

The P6201 may be powered from the probe power output of the 7500, 7700, and 7900-Series Mainframes, the 475 and 485 Oscilloscopes, or by the 1101 Accessory Power Supply.

ELECTRICAL CHARACTERISTICS

Bandwidth	DC to 900 MHz.
Risetime	
Probe Only	0.39 ns or less
Probe Attenuation	1X within 3%. 10X within 4% (with attenuator). 100X within 4% (with attenuator).
Input Impedance	
Probe Only	100 k Ω (within 1%) shunted by 3.0 pF (within 10%). See R _p , X _p curves.

Attenuator Heads	1 M Ω (within 1%) shunted by \approx 1.5 pF. See R _p , X _p Curves.
Input Dynamic Range	
1X	\pm 0.6 V (1.2 V peak-to-peak) maximum with \pm 5.6 V DC offset.
10X	\pm 6 V (12 V peak-to-peak) maximum with \pm 56 V DC offset.
100X	\pm 60 V (120 V peak-to-peak) maximum with \pm 200 V DC offset. Not to exceed \pm 200 V (DC + peak AC).
Noise (Tangential)	300 μ V or less at output (150 μ V RMS).
DC Stability (Drift with Temperature Change)	
Probe Only	Less than 50 μ V/ $^{\circ}$ C at output.
Probe and Amplifier	Less than 300 μ V/ $^{\circ}$ C at output.
Output Impedance (50 Ω TERM Switch Set to INT)	25 Ω (for use with 1 M Ω inputs).
Output Load Required (50 Ω TERM Switch Set to EXT)	50 Ω within 1 Ω .
Signal Delay (Probe Tip to Amplifier Output)	\approx 11.2 ns, Differential delay between two probes 0.1 ns or less.
Maximum Input Voltage (AC or DC Coupled)	
1X	\pm 100 V, derated with frequency. See voltage versus frequency curve.
10X and 100X	\pm 200 V (DC + peak AC), derated with frequency.
LF Response (–3 db), AC Coupled	10 Hz or lower. 10X attenuator extends LF response to \leq 1 Hz. With 100X attenuator, LF response is \leq 10 Hz.

Characteristics—P6201 Probe

ELECTRICAL CHARACTERISTICS (cont)

Power Requirements +15 V at \cong 105 mA and -15 V at \cong 110 mA. Total power, 3.2 W.

PHYSICAL CHARACTERISTICS

Probe Cable Length 72.0 inches, 182.88 cm (nominal).

Probe Power Cable Length 51.0 inches, 129.54 cm (nominal) including Lemo Connector.

Amplifier Box Dimensions Length (including connector and knob) 4.485 inches (11.39 cm) maximum.

Width, \cong 1.180 inches (3.0 cm).

Height, \cong 1.62 inches (4.11 cm).

Probe Body Dimensions Diameter, 0.58 inch (1.47 cm) maximum outside diameter.

Length, 3.430 inches (8.71 cm).

PHYSICAL CHARACTERISTICS (cont)

Length with attenuator head, 4.780 inches (12.14 cm).

Attenuator Head Dimensions Diameter, 0.690 inch (1.75 cm) maximum outside diameter.

Length, 2.27 inches (5.77 cm).

Weight (Includes Standard Accessories) 24.5 ounces (694.58 grams).

ENVIRONMENTAL CHARACTERISTICS

The probe will operate within specifications over the following ranges; Temperature, 0°C to +50°C. Altitude, to 15,000 feet.

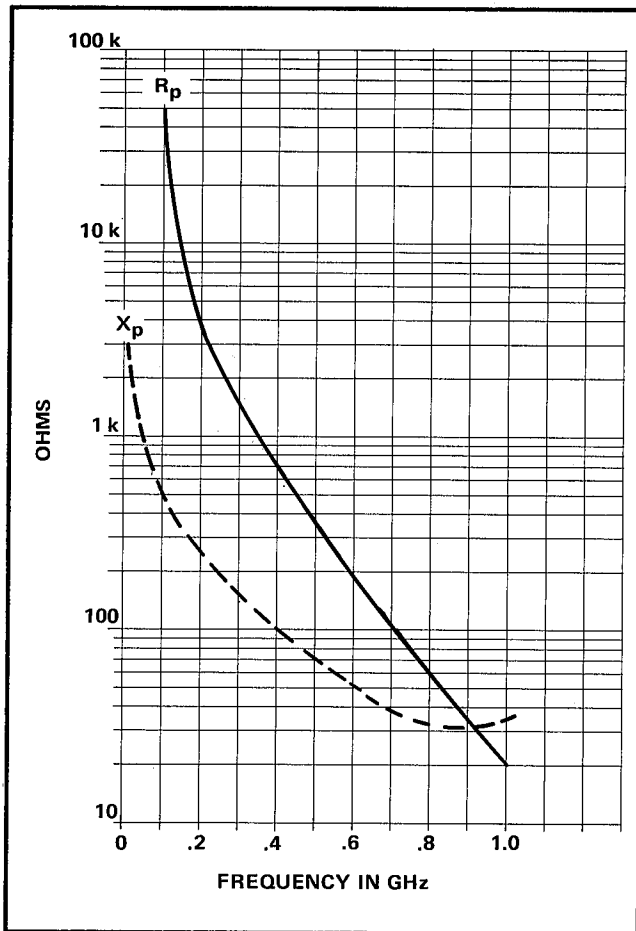


Fig. 1-1. P6201 Probe alone. Input X_p and R_p as a function of frequency.

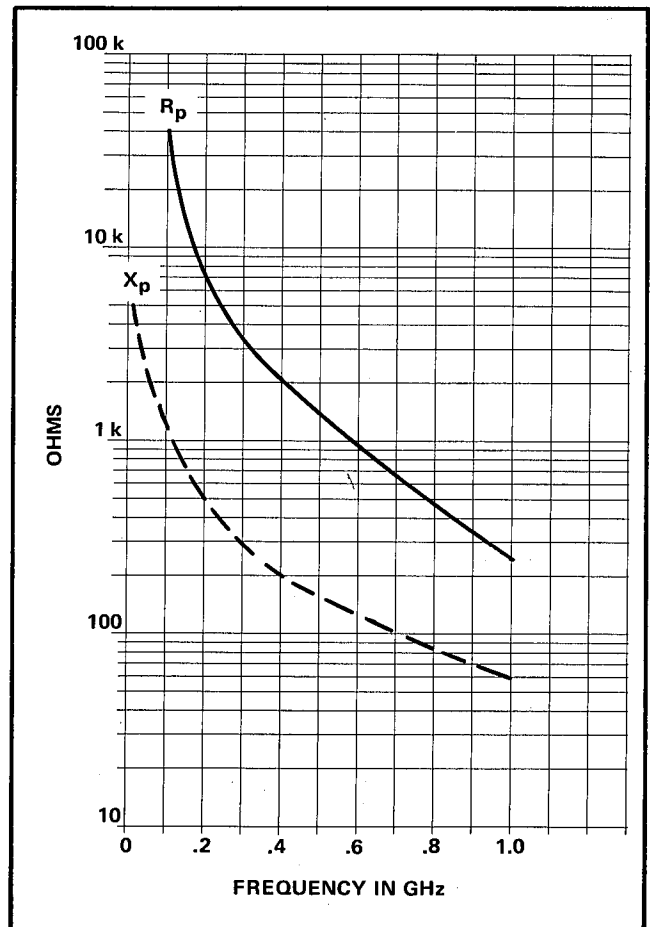


Fig. 1-2. P6201 Probe with 10X or 100X attenuator. Input X_p and R_p as a function of frequency.

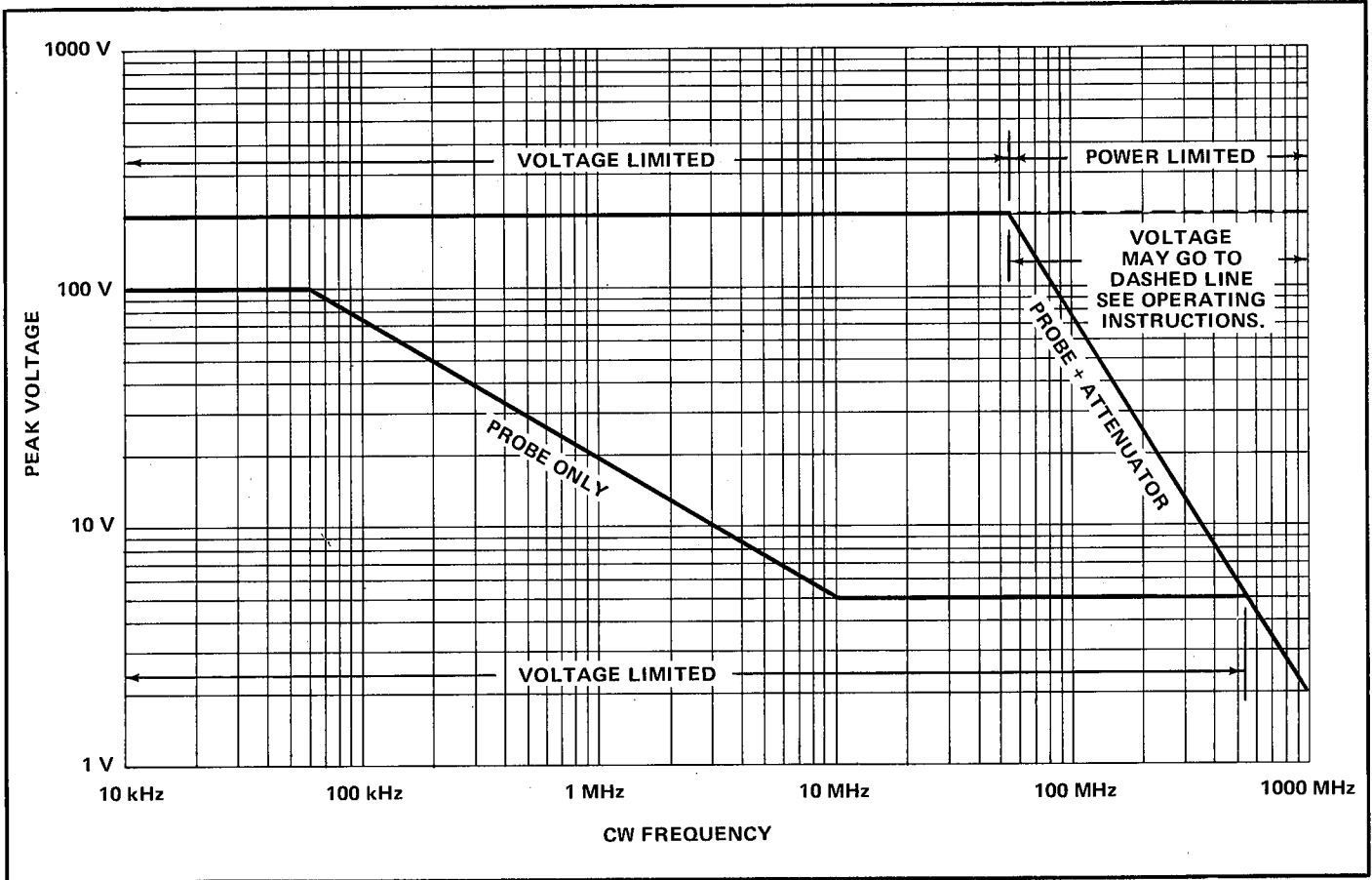
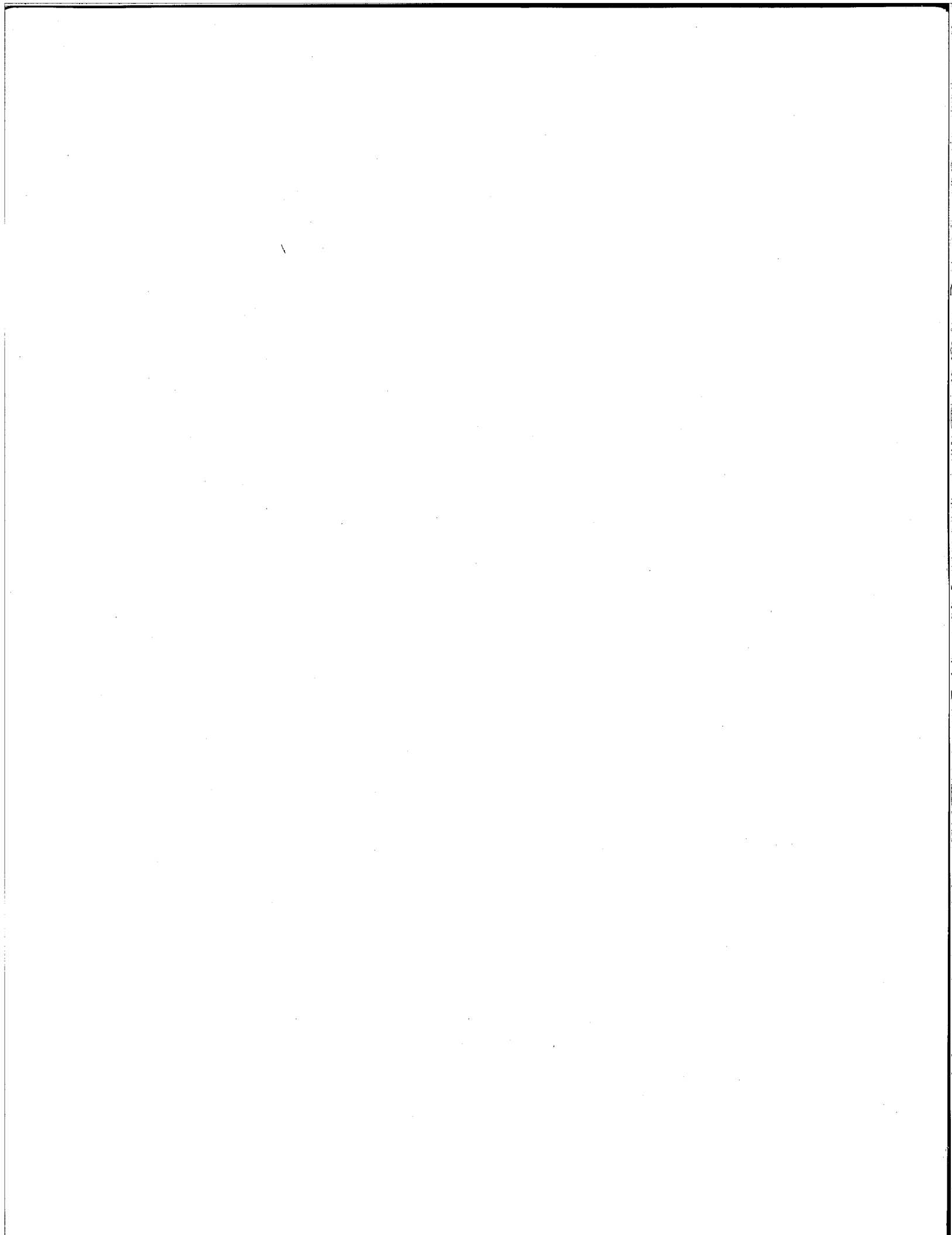


Fig. 1-3. P6201 Probe, and probe with attenuator, typical voltage derating with frequency.



OPERATING INSTRUCTIONS

General

The P6201 Probe is an active probe, designed to use with instruments having either a 50 ohm or a 1 megohm input impedance. The probe is terminated into an internal switchable 50 ohm termination when it is used with instruments that have a 1 megohm input impedance. The P6201 can be powered from the Probe Power output of a 7000-Series indicator, 475 and 485 Oscilloscopes, or from a Type 1101 Accessory Power Supply.

Probe attenuation is 1X within 3% when terminated into 50 ohm. Additional attenuation is provided by two (10X and 100X) accessory attenuators that plug onto the probe head. These provide attenuation up to 100X (1X probe and 100X attenuator). The attenuators cannot be stacked. They are matched or compensated to the probe head, but not to each other. When the probe is properly terminated into 50 ohms, its frequency response is DC to 900 MHz (equivalent to risetime of 389 ps or less).

The probe includes a locking-type BNC connector which provides scale-factor readout information to instruments having the readout capability. The 10X and 100X attenuator heads couple scale-factor readout information to the instrument via the output connector.

Probe Handling

The P6201 Probe has been designed to be as rugged as possible consistent with good high-frequency response and miniature size. However, as with all precision devices, the probe and cable should be handled carefully to avoid damage. Special care should be taken that the cable is not crushed or pulled very hard. The removable probe tip should also be treated with special care. Use caution when inserting the probe tip into attenuators or other jacks to make sure that the tip is aligned with the receptacle. Avoid dropping the probe head. Some of the most sensitive circuitry of the probe is in the probe body. When not in use, protect the probe tip from damage with the IC test tip adapter. Spare probe tips are provided.

Power Source

The probe power connector is designed to connect to the probe power receptacle on the 7000-Series indicator, 475 and 485 Oscilloscopes or the 1101 Accessory Power Supply. The probe requires +15 V DC at approximately 105 mA and -15 V DC at approximately 110 mA to operate. See circuit diagram for pin identification.

Probe Connector and Controls

The P6201 Probe contains an offset adjustment, offset polarity, input coupling and termination switches. Fig. 2-1 shows the location of these controls.

The BNC output connector is an integral part of the offset housing. The locking-type BNC connector couples scale-factor readout information from the 10X and 100X attenuators to instruments having the readout capability.

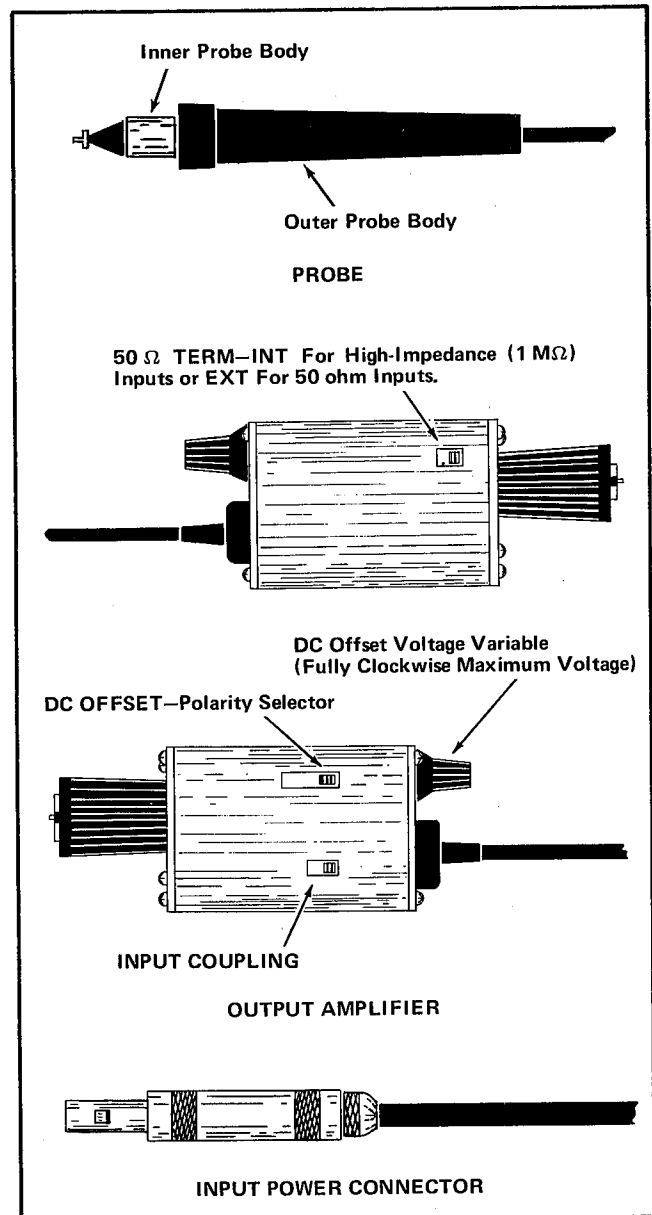


Fig. 2-1. Probe connectors and controls.

Operating Instructions—P6201 Probe

The offset range of the DC OFFSET VARIABLE control is at least 5.6 volts. The DC OFFSET polarity (+ and -) is selected by the + OFF - switch. Adding either of the two attenuators (10X and 100X) increases the offset range by the attenuation factor of the attenuator up to a maximum usable voltage of 200 volts.

The INPUT COUPLING switch selects whether the input signal is AC or DC coupled into the probe.

The output of the P6201 Probe must always be terminated into 50 ohms. This is accomplished by connecting an internal 50 ohm termination (50 Ω TERM switch set to INT) into the probe output circuit when the probe is connected to an oscilloscope having a 1 megohm input impedance. When the probe is connected to an instrument having a 50 ohm input impedance, the 50 Ω TERM switch is set to EXT (internal 50 ohm termination disconnected from probe output circuit).

Dynamic Range

The dynamic (signal) range for the P6201 Probe and the probe with attenuators is illustrated in Fig. 2-2. The dynamic range or maximum input signal capability for the probe alone, properly terminated, is + and -0.6 V peak (1.2 V peak-to-peak). This 0.6 V signal can be offset + and - 5.6 V, so the maximum dynamic window with DC offset is + and -6.2 V (AC + DC). If signals with amplitudes greater than this are to be measured, use the appropriate attenuator to reduce the signal voltage and DC offset down to the probe input limitation.

If the full dynamic range of the probe is used (± 600 mV), a signal compression amount of up to 4% may occur. However, by reducing the input signal to ± 400 mV, the signal compression drops to 1% or less.

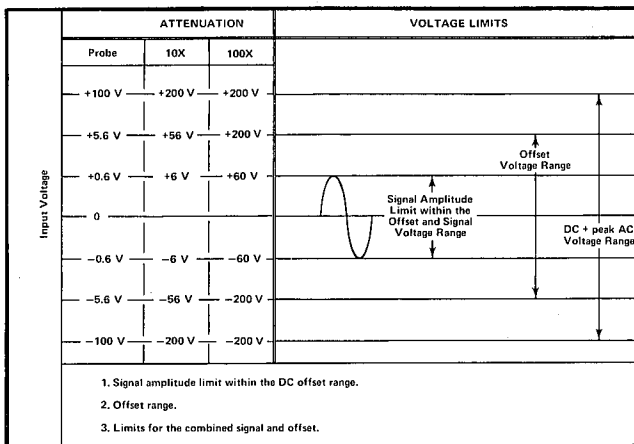


Fig. 2-2. Dynamic and offset limitations for P6201 Probe and the probe with attenuators.

Maximum Voltage and Power Limitations

The power handling capability of the probe and attenuators is dependent on the series resistor inside the probe or attenuator body. The input voltage limitation depends on the input amplifier capabilities and the signal duty factor. The P6201 Probe is designed to withstand up to 100 V (DC + peak AC) at low frequencies. The 10X and 100X attenuators are designed to withstand up to 200 V (DC + peak AC) at low frequencies. Voltage in excess of this may damage the probe or attenuator.

In Section 1 is a Maximum Voltage Derating Curve (Fig. 1-4) for the P6201 Probe and attenuators. The voltage must be reduced to offset the increased power dissipation if a signal with a duty factor of one is to be measured. Pulse peak voltages in excess of the curve can be measured if the average power of the signal is estimated. The following equation may be used to estimate the maximum input voltage for a periodic signal such as a pulsed waveform:

$$E_{\max} = \frac{\text{Voltage from the derating curve}}{\sqrt{\text{Duty Factor}}} + \text{DC Components}$$

$$\text{where duty factor} = \frac{\text{Pulse duration}}{\text{Pulse Period}}$$

Attenuators

The P6201 Probe accessories include two attenuators. The attenuators extend the input signal amplitude range of the probe in multiples of 10X and 100X, when they are attached to the probe head. To attach an attenuator to the probe head, push on the desired attenuator over the probe tip. Only one attenuator can be used at a time with the probe. The attenuators are compensated to the probe head and not each other. Attenuator compensation is possible with an insulating screwdriver through the hole in the side of the attenuator outer body.

First Time Operation

1. Connect the P6201 to the input connector of the test oscilloscope.

NOTE

Push the probe tightly against the instrument panel while tightening the BNC connector shell to assure good contact of the readout tab to the oscilloscope/plug-in readout ring.

2. Set the 50 Ω TERM, DC OFFSET polarity, and INPUT COUPLING switches to their correct or desired positions.

3. Connect the probe power connector to the power receptacle on the back panel of the oscilloscope or the 1101 Accessory Power Supply.

4. Set the oscilloscope Volts/Div to 10 mV. Switch the oscilloscope Input Coupling to GND, center the oscilloscope sweep with the centering controls, then switch the oscilloscope amplifier Input Coupling to DC.

5. Connect the probe to the signal source (see Signal Connectors) and note the oscilloscope display.

6. Adjust the DC Offset controls through their range with the polarity switch in either position and note their effects on the display. See Using DC Offset.

Use of DC Offset

The probe offset capability allows the input signal to be positioned to the center of the dynamic window or operating range of the probe amplifier. This assures optimum probe transient response. To prepare the probe for this operation, switch the Input Coupling of the oscilloscope amplifier unit to GND position or disconnect the probe connector from the oscilloscope input. Center the trace in the graticule area with the oscilloscope Position controls. Reconnect the probe to the oscilloscope input and switch the Input Coupling to DC position. Do not change the oscilloscope Position control setting, but use the P6201 Probe Offset controls to center the signal on the CRT graticule area. This assures that the observed signal is centered within the probe dynamic window.

NOTE

Set DC OFFSET switch to OFF when using AC INPUT COUPLING.

Probe Connections to the Signal Source¹

The input resistance of the probe is 100 k Ω with zero offset voltage. The static input resistance decreases to approximately 90 k Ω when offset is adjusted for 0 V DC output with a DC voltage present at the input. (11.1 μ A/volt of offset is drawn from the source by the probe). Adding an attenuator to the probe reduces this offset loading so the input resistance remains near 1 megohm as DC offset is added. The AC or dynamic loading of the probe is not affected by DC Offset; however, it does depend on frequency. Figs. 1-2 and 1-3 illustrate the shunt input resistance and capacitive loading of the probe and attenuators as a function of frequency. Refer to these

¹ TEKTRONIX Measurement Concept booklet on Probe Measurements (Part Number 062-1120-00) is a recommended treatise.

graphs when probe loading is a concern. When possible, the probe should be connected to a low impedance point in the circuit to minimize this circuit loading.

Signal connections should be made directly to the tip of the probe or its attenuators. Establish a good ground connection as directly as possible between the probe ground and the signal source ground. Long ground leads can induce ground loops between the probe amplifier and the signal source, generating considerable signal distortion.¹ Use one of the supplied clips or connectors to ground the probe to an outside terminal. If the ground plane is adjacent to the signal source, the ground electrical contact tip (PN 131-1302-00) is suggested as a grounding method. If the low-frequency signal source has a coaxial connector, a probe tip-to-test point jack adapter (PN 103-0164-00) and a probe tip adapter (PN 013-0084-01 for probe tip to BNC, or 017-0076-00 for probe tip to GR connector) may be used to connect the probe tip to the signal source. If the high-frequency signal is a 50 ohm source and has a coaxial connector, then probe tip adapter (PN 017-0094-00 for probe tip to GR connector) may be used to connect the probe tip to the signal source. This coaxial environment improves performance and reduces interface problems with the signal source. It is good practice to always keep the ground lead as short as possible and to use a ground lead even for low frequency measurements.

Use of Probe Accessories

The standard accessories supplied with the P6201 Probe facilitate connecting the probe into a test circuit. Use as follows:

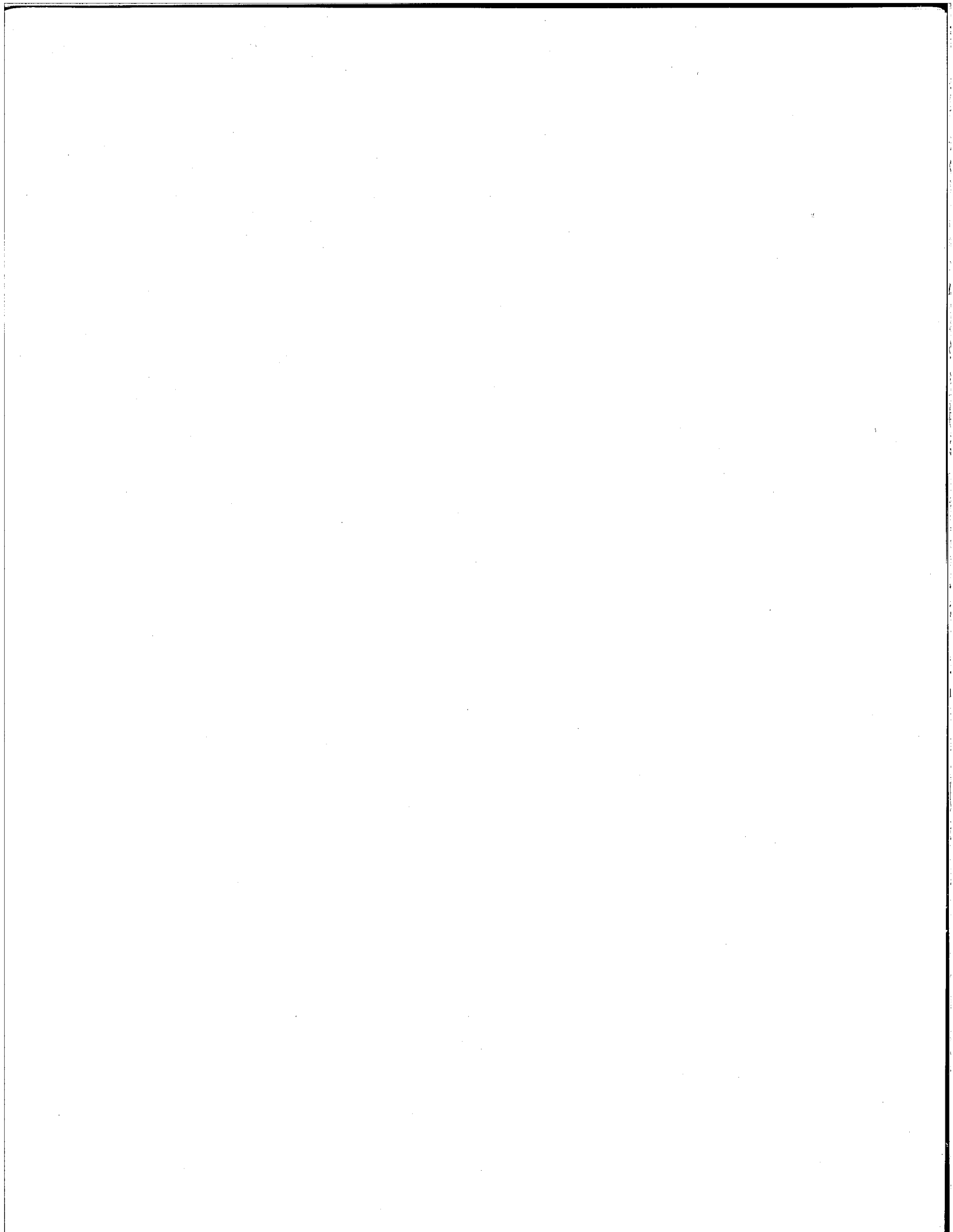
Retractable Hook Tip—Slip on over probe tip. Pull back at flange while holding probe body to expose the hook tip.

12-inch Ground Lead—Screw one threaded end into side of probe body. The minigator clip may be screwed onto the other end.

Insulating Sleeve—The small plastic tube may be slid over the probe tip to insulate the ground surface (just behind the tip) when probing in compact circuitry.

Ground Electrical Contact and Ground Contact Insulator—The spring is slid over the probe tip for making short signal ground connections. The insulating sleeve is then slipped over the spring to reduce the possibility of shorts.

Probe Tip-to-Test Point Jack Adapter—The adapter is slipped on over probe tip to provide a smaller probe tip diameter. The adapter adds approximately 1 pF to the input capacitance of the probe.



CIRCUIT DESCRIPTION

The P6201 Probe system uses a DC re-insertion amplifier technique to obtain low drift and broad-band performance. The input signal is simultaneously coupled (in parallel paths) to the AC Amplifier and the DC & Low-frequency Amplifier. See Fig. 3-1. Outputs from these stages are combined in the Output Amplifier.

DC & Low-frequency Amplifier

The input signal is coupled through R130 and the INPUT COUPLING switch to U200, an operational amplifier. When AC coupling is selected, C200 blocks the DC signal path.

C220 (5-25 pF variable) bootstraps the input capacitance at pin 2 of U200. This serves to stabilize the crossover of the DC & Low-frequency system to the AC system.

The VARIABLE control (R200) and the position selected on the DC OFFSET switch determine the offset voltage applied to the input (pin 2) of U200. R200 is adjusted to bring pin 2 to zero volts with up to ± 5.6 V at

the input side of R130. The Output Zero adjustment (R250) provides a DC balance between pins 2 and 3.

Ground signals are coupled through R290 to pin 3 of U200, which serves to cancel ground difference signals between the probe body and the output box.

Overall low-frequency gain is set by a 10X division of the input signal (through R130 and R265) and the X10 gain set resistors (R280 and R295) for the low-frequency closed loop gain.

The output signal from U200 is coupled via terminal A and R397 to the base of Q350.

AC & High-frequency Amplifier System

AC signal components are coupled to the gate of Q100 (FET) through R100/R120 and C100. Q100 is connected as a source follower, providing high input-resistance and low-noise performance at the probe input. Q120 and Q130 are emitter follower stages which provide high-frequency current gain and impedance isolation between input and output.

The output signal from the AC Amplifier stage is coupled from the emitter of Q130 through R185/R190 and C300 to the base of Q300.

Output Amplifier

The Output Amplifier includes Q300, Q320, and Q350. Signals from the DC & Low-frequency Amplifier and the AC Amplifier are combined in this stage to form the output signal. A forced cross-over is achieved by means of feedback from the collector of Q320 through R350 to pin 3 of U200.

R370 sets the high-frequency gain of the Output Amplifier to match the gain of the DC & Low-frequency Amplifier. C315, C325, and C358 are high frequency peaking and compensation adjustments. R355 and RT360 form a gain-vs-temperature compensation network.

The parallel $50\ \Omega$ strip-line transformer at the output of Q300 and Q320 increases the cutoff frequency of the output stage by inverting the output of Q300, thus adding to the output of Q320 (in the cutoff frequency range only).

R398 provides the necessary $50\ \Omega$ load when using the probe with other than $50\ \Omega$ systems, such as $1\ \text{M}\Omega$ oscilloscope inputs. The output amplifier must have the proper load impedance in order to maintain constant gain over the bandpass of the probe.

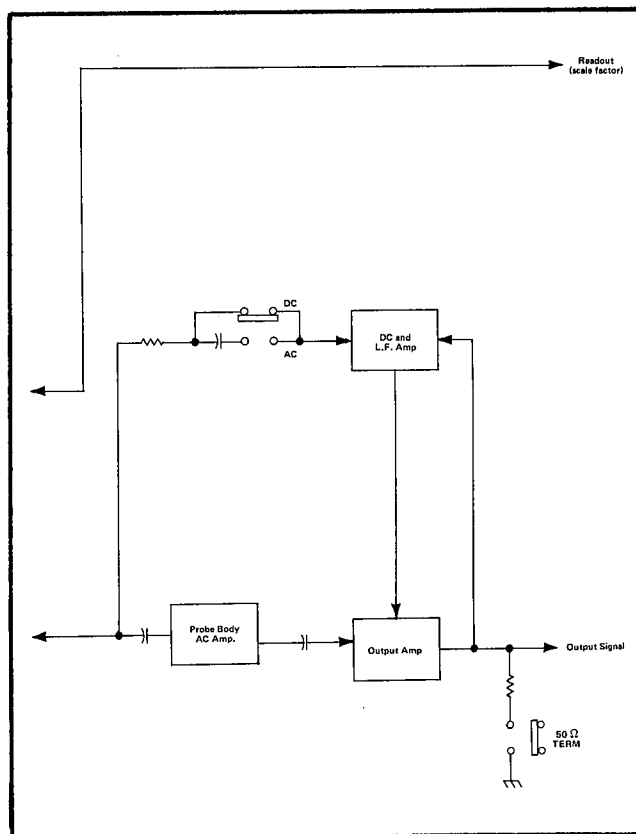
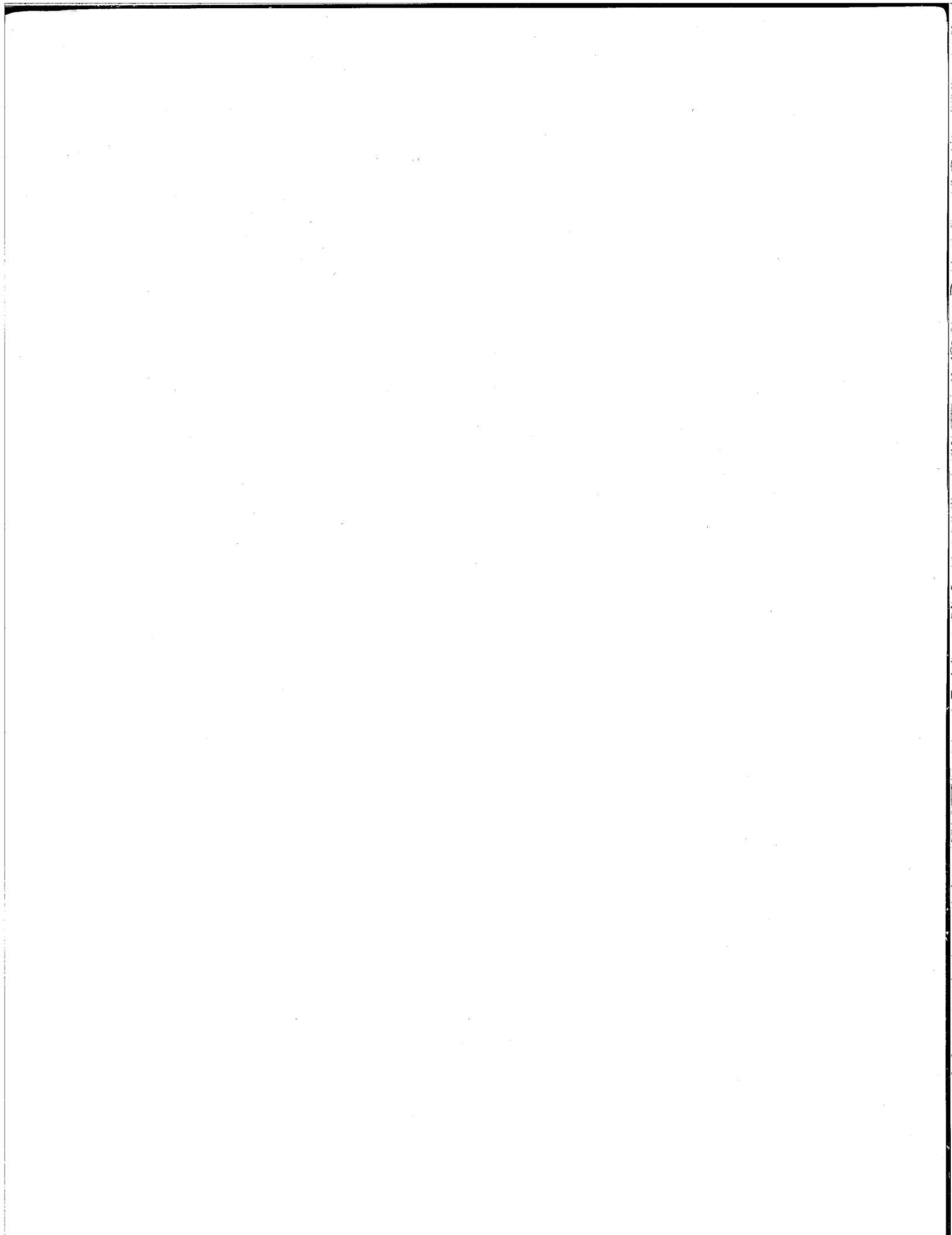


Fig. 3-1. P6201 Probe Block Diagram.



MAINTENANCE

Introduction

This section of the manual contains maintenance information for use in preventive and corrective maintenance.

Cover Removal

CAUTION

Disconnect the probe power before removing the probe head barrel or the covers for the offset housing and output connector box. This will prevent accidental destruction of the solid state devices on the circuit boards.

Probe Body

Access to the circuit board inside the probe is accomplished by unscrewing the outer probe body while holding the inner probe body. See Fig. 4-1.

The outer probe body should only be removed to adjust or troubleshoot the circuitry. The cover protects the circuitry from dust and shields the amplifier from stray electromagnetic fields.

Output Amplifier

The Output Amplifier housing cover consists of two housing halves with each half being held in place by two screws on each end.

Remove either housing half by removing the two screws in each end of the housing half, then pulling the housing half straight out. If the housing half will not pull straight out easily, loosen the rear panel center two screws.

Attenuators

Remove the attenuator from the probe. Access to the interior circuit board is now obtained by unscrewing the attenuator insulator inside the outer attenuator body.

Probe Tip Replacement

Using a pair of pliers unscrew the damaged tip and screw the new tip in, see Fig. 4-1.

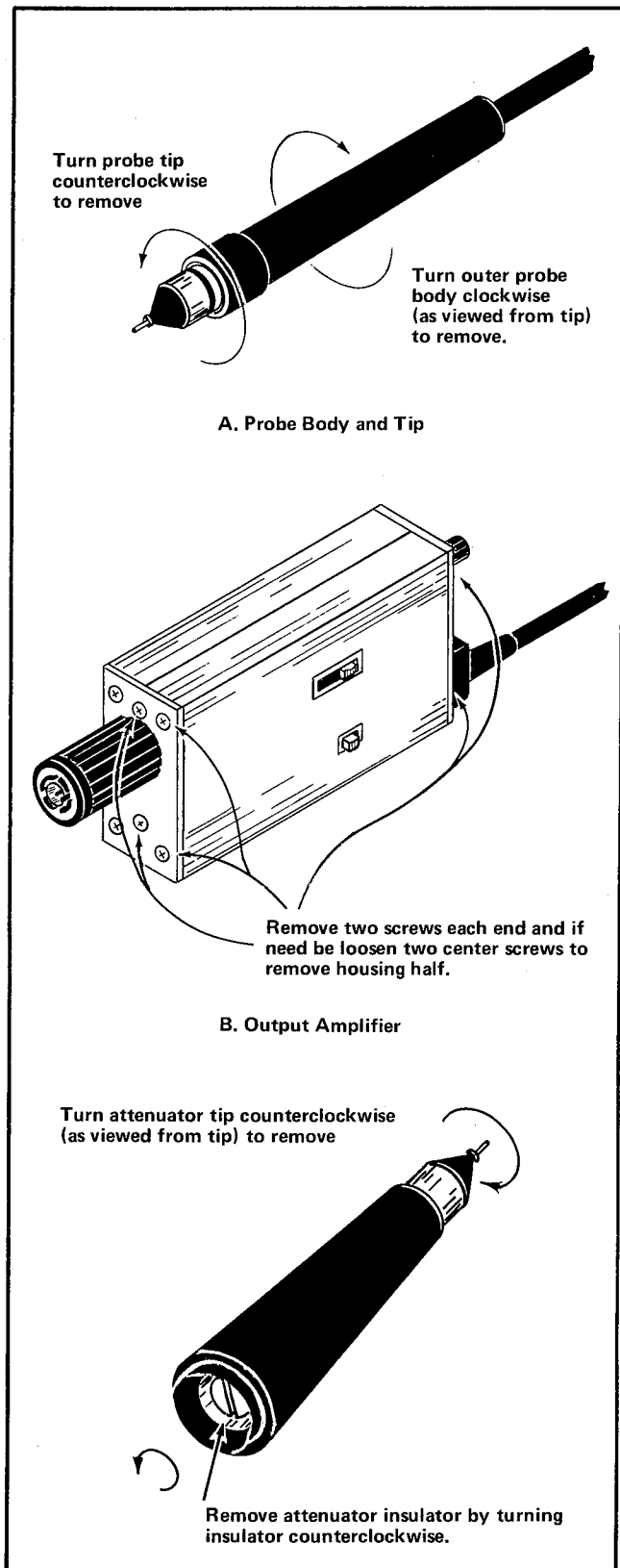


Fig. 4-1. Probe body, output amplifier, and attenuator interior access methods and probe tip replacement.

PREVENTIVE MAINTENANCE

Preventive maintenance consists of recalibration, if needed, visual inspection from damaged components, and cleaning. The schedule for the preventive maintenance depends on the environment in which the probe is operated and the amount of use. With average conditions (laboratory situation) a preventive maintenance program should be conducted about every 1,000 hours of probe operation or every six months if the probe is used only occasionally.

Cleaning

Normally the circuit boards in the interior of the probe, output amplifier, or attenuators will not require cleaning unless a cover has been left off for an extended period. Use low pressure air to blow away accumulated dust, then a cotton-tipped applicator dampened with a solution of mild detergent soap and water may be used for additional cleaning. After cleaning, allow ample time for drying before applying power.



CAUTION

Avoid the use of chemical cleaning agents which might damage the plastics used in this instrument. Avoid chemicals which contain benzene, toluene, xylene, acetone or similar solvents.

Visual Inspection

After cleaning, circuit boards should be carefully checked for such defects as poor connections, damaged parts, and bent leads. The remedy for most defects is obvious; however, if heat damaged components are noticed it is an indication that other trouble is present in the circuit and measures should be taken to check this out.

When inspecting the circuit boards, a good magnifying glass or low power eye glass (approximately 4X) will aid in conducting a thorough visual check.

Transistor and Integrated Circuit Checks

Periodic checks of transistors, FET's and IC's are not recommended. The best measure of semiconductor performance is operation in the circuit. This is checked during the recalibration of the probe. Any substandard components will usually be detected at this time.

Recalibration

To ensure accuracy, the probe should be checked about every 1000 hours of operation or every six months if used occasionally. The calibration procedure will usually indicate potential problems so that corrective measures can be taken before the probe fails to function properly.

TROUBLESHOOTING

The following describes a few aids that may assist in locating any trouble. After the defective component has been located, refer to Corrective Maintenance procedure for removal and replacement instructions.

Before looking for trouble in the probe, check to ensure that the oscilloscope or associated equipment is operating properly.

Diagram. The circuit diagram of the P6201 Probe is given at the rear of the manual. Circuit numbers and electrical values of the components are shown on the diagram. Portions of the circuitry mounted on the circuit boards are within the outline for that board.

Circuit Board Illustrations. All of the electrical components in the P6201 Probe are mounted on the circuit boards, illustrations of which are given at the rear of the manual.

Check Voltages

NOTE

The mounting screws and nuts holding the two circuit boards to the output amplifier box provide the ground return for the boards. If the screws and nuts are loosened or removed, a ground return for each circuit board to the output amplifier box must be provided.

Use a high resistance (20,000 ohms/volt or higher) meter for voltage measurements.

CORRECTIVE MAINTENANCE

Replacement Parts

Replacements for all electrical and mechanical parts used in the P6201 Probe can be obtained through your local TEKTRONIX Field Office or representative. Some of the standard electronic components may be obtained more quickly by purchasing them locally. Before ordering or purchasing any replacement parts, refer to the Parts List in this manual for the required characteristics and correct description.

In addition to the standard electronic components, many special parts and components are used in the P6201 Probe. These parts are manufactured by or for Tektronix, Inc. and are selected to meet specific requirements. Most of

the mechanical parts used in the Probe are manufactured by Tektronix, Inc. and therefore are not available from other sources. Order all special parts directly from your TEKTRONIX Field Office or representative. Include the following information: The instrument type and serial number; a complete description of the part as described in the Parts List; and, if it is an electrical component, give the circuit number.

Circuit Boards

Wired circuit boards for the P6201 Probe and Output Amplifier can be ordered from Tektronix, Inc. Refer to the Parts List for information on how to order. The following procedures describe the removal or replacement of these circuit boards.

Probe Circuit Board Replacement

Remove the outer probe body and probe tip, see Fig. 4-1. Unsolder all wires including the one connected to the readout contact ring. Slide the readout contact ring onto the probe cable to position it out of the way. Use special care when unsoldering the coaxial connections so as not to melt the dielectric.

Using a de-soldering tool such as size 3 solder wick material and a 50 watt soldering iron, remove as much solder as possible from the three circuit board solder connections to the inner probe body. To separate the circuit board from the inner probe body, slide a thin knife blade between the circuit board and the inner probe body. Be careful not to twist the circuit board as it is being separated from the inner probe body.

To install the circuit board, insert the front of the circuit board into the nose of the inner probe body, then align the rear of the circuit board with the step near the rear of the inner probe body, see Fig. 4-2. The remainder of the installation is a reversal of the removal procedure.

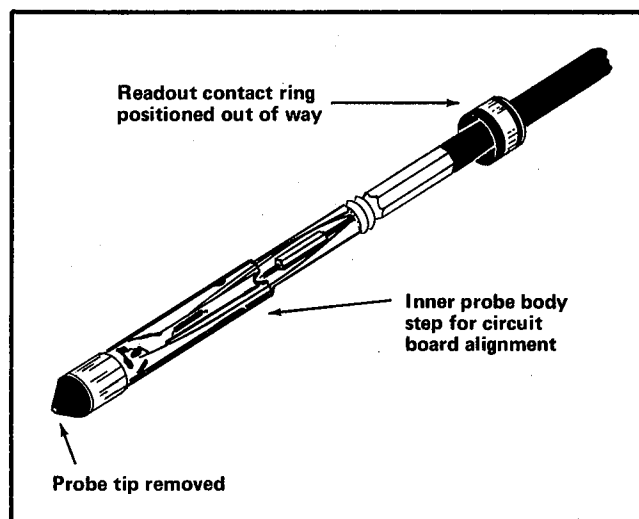


Fig. 4-2. Probe circuit board replacement.

Output Amplifier Circuit Board Replacement

Remove the two housing halves of the cover, see Fig. 4-1. Unsolder all wires including the center conductor of the coaxial cable. Use a de-soldering tool such as size 3 solder wick material to clear the wire holes for later re-insertion of the wires. Remove the screws, washers and nuts and remove the circuit boards.

To install the circuit board, reverse the removal procedure.

Attenuator Circuit Board Replacement

Unscrew the attenuator insulator and attenuator tip, see Fig. 4-1. Using a pair of long nose pliers extract the circuit.

To install the circuit board, reverse the removal procedure. Be careful to position the compensation adjustment opposite the hole in the outer attenuator body.

Probe Cable Replacement

Remove the outer probe body and the two housing halves of the output amplifier cover, see Fig. 4-1. Unsolder all wires including the coaxial wire on both ends of the probe cable. It is not necessary to unsolder the input power cable wires inside the output amplifier. Unsolder and remove the input power connector.

Unscrew (right-hand thread) the probe cable from the inner probe body and slip the outer probe body off the probe cable. Remove the 4-40 hex cap screw from the output amplifier, then slip the cable nipple holder, input power cable nipple off of the input power cable and at the same time remove the probe cable and its attached ferrule holder from the output amplifier.

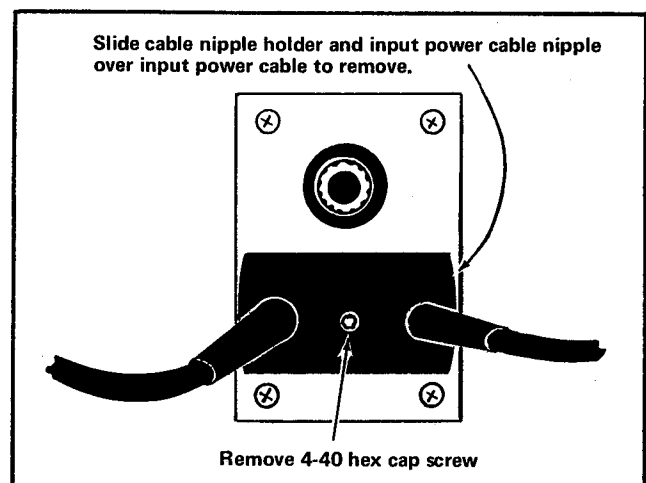


Fig. 4-3. Probe cable replacement.

Soldering Suggestions

1. Use a pencil type soldering iron with a power rating of 15 watts for circuit board component replacement and a 50 watt soldering iron for probe circuit board removal.
2. Apply heat for minimum time to the junction between the component and the circuit board to melt the solder.
3. Heat-sink the lead of the component with a pair of long nose pliers.
4. Use electronic grade 60-40 tin-lead solder.
5. After the new component has been installed, clip off any excess lead extending beyond the circuit board and clean off any residual flux with a flux-removing solvent.

Be careful that the solvent does not remove any printing from the circuit board.

Transistor and Integrated Circuit Replacement

Transistors and integrated circuits should not be replaced unless actually defective. If removed during routine maintenance, return them to their original sockets. Unnecessary replacement of transistors or IC's may affect the calibration of this instrument. When transistors or IC's are replaced, it will be necessary to completely recalibrate the P6201.

Replacement transistors or IC's should be of the original type or a direct replacement. Fig. 4-4 shows the lead configuration of the transistors and IC's used in this instrument. If a transistor is replaced by a transistor made by a different manufacturer than the original, check the manufacturer's basing diagram for correct basing.

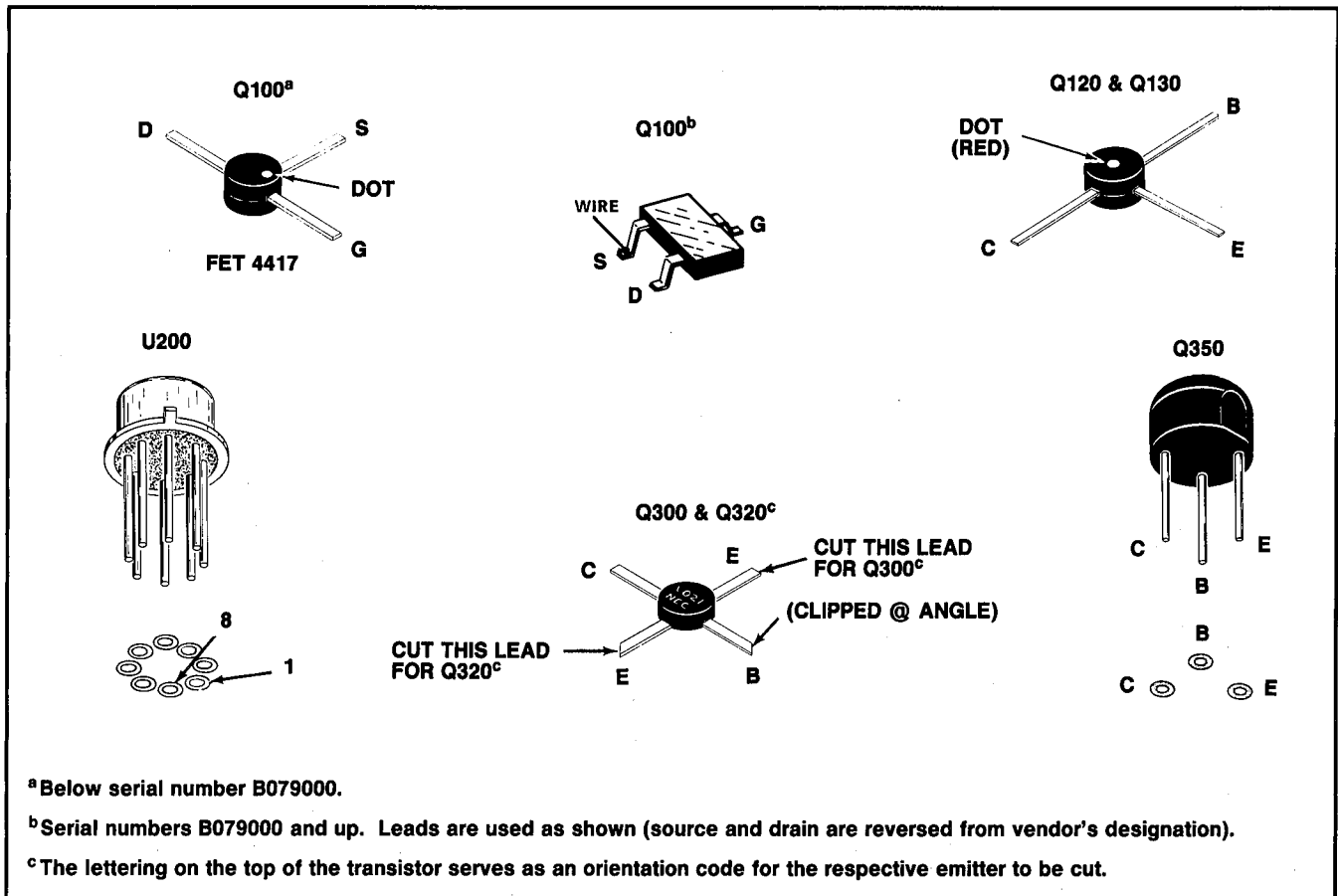


Fig. 4-4. Lead configurations of the transistors and integrated circuits used in the P6201 Probe.

CALIBRATION

Introduction

Complete calibration is given in this section. The probe can be returned to original performance by completion of this procedure. Limits, tolerances, and waveforms in this procedure are given as calibration guides, and are not instrument specifications.

To ensure accuracy, the probe should be checked and recalibrated about every 1,000 hours of operation, or every six months if used infrequently.

Table 5-1
TEST EQUIPMENT REQUIRED

Item	Minimum Requirements	Recommended Example
1. Real-Time Oscilloscope with Differential Comparator Amplifier	Bandwidth: dc to at least 100 MHz; Minimum deflection factor: 10 mV/division or less; Input impedance: 1 M Ω .	TEKTRONIX 7704A Oscilloscope with 7A13 (vertical) and 7B80 (horizontal) Plug-Ins.
2. Sampling Test Oscilloscope	Bandwidth: dc to at least 1 GHz; Minimum deflection factor: 1 mV/division or less; Input impedance: 50 ohms.	TEKTRONIX 7S12 (Time Domain Reflectometer) with S-1 or S-2 and S-53 (Sampling Heads), used in conjunction with the 7704A Oscilloscope.
3. Fast-Rise Generator	Frequency: 10 kHz; Risetime: 1 ns or less.	TEKTRONIX PG 506. ^a
4. Square Wave Generator	Frequency: 10 kHz and 100 kHz; Output amplitude: adjustable to 1.2 V.	
5. Amplitude Calibrator	Amplitude: 250 mV into 50 ohms; Waveform: positive-going square wave.	
6. Fast-Rise Pulser	Output amplitude: 200 mV; Risetime: 70 ps; Pulse width: > 1 μ s.	TEKTRONIX 284 Pulse Generator.
7. DMM		TEKTRONIX DM 501A ^a or DM 502A. ^a
8. Probe Power Supply	TEKTRONIX 1101A Accessory Power Supply (not needed if a TEKTRONIX Oscilloscope equipped with Probe Power is used).	
9. GR-to-bnc female adapter (2 required)		Tektronix Part No. 017-0063-00.
10. P6201 Probe Tip-to-GR 50- Ω Termination Adapter		Tektronix Part No. 017-0094-00.
11. 50- Ω bnc 5X attenuator		Tektronix Part No. 011-0060-02.
12. Precision 50- Ω bnc feed-through termination		Tektronix Part No. 011-0129-00.
13. 50- Ω bnc feed-through termination		Tektronix Part No. 011-0049-01.
14. Precision 50- Ω bnc cable (2 required)		Tektronix Part No. 012-0482-00.
15. P6201 Probe Tip-to-bnc Adapter		Tektronix Part No. 013-0145-00.
16. Low-capacitance screwdriver		Tektronix Part No. 003-0675-00.

^a Requires a TEKTRONIX TM 500- or TM 5000-Series Power Module mainframe.

TEST EQUIPMENT REQUIRED

General

The test equipment listed in Table 5-1, or its equivalent, is required for complete calibration of the P6201. Specifications given are the minimum necessary for accurate calibration. All test equipment is assumed to be correctly calibrated and operating within the given specifications. If equipment is substituted, it must meet or exceed the specifications of the recommended equipment.

PROCEDURE

General

This procedure uses the equipment listed in Table 5-1. If equipment is substituted, control settings or test equipment setup may need to be altered to meet the requirements of the test equipment used.

Any needed maintenance should be performed before proceeding with the calibration. Troubles which become apparent during the procedure should be corrected immediately.

Best overall performance will be provided if each adjustment is made to the exact setting, even if the CHECK is within allowable limits.

1. Check and Adjust FET Bias, Output Zero, and Output Bias

a. Remove the screws holding the two housing halves onto the output amplifier and remove the two housing halves (covers). (Refer to Section 4, Maintenance.)

b. Unscrew the outer probe body from the probe tip to gain access to the probe circuit board. (Refer to Section 4.)

c. Connect the probe's power cable to the oscilloscope probe power connector or to the 1101A Accessory Power Supply (Item 8).

d. Connect the DMM (Item 7) leads between the source of Q100 (Fig. 5-1) and ground.

e. ADJUST—R150A (Serial number B079000 and up only) for a DMM reading of $+0.400\text{ V} \pm 0.050\text{ V}$. (Serial number B076840 through B078999, adjust for $+0.025\text{ V}$ to $+0.050\text{ V}$.)

f. Disconnect the DMM and connect the P6201 to the $1\text{ M}\Omega$ vertical input of a real-time oscilloscope (Item 1).

g. Set the P6201 50- Ω TERM to INT, DC OFFSET polarity to OFF, and INPUT COUPLING to DC.

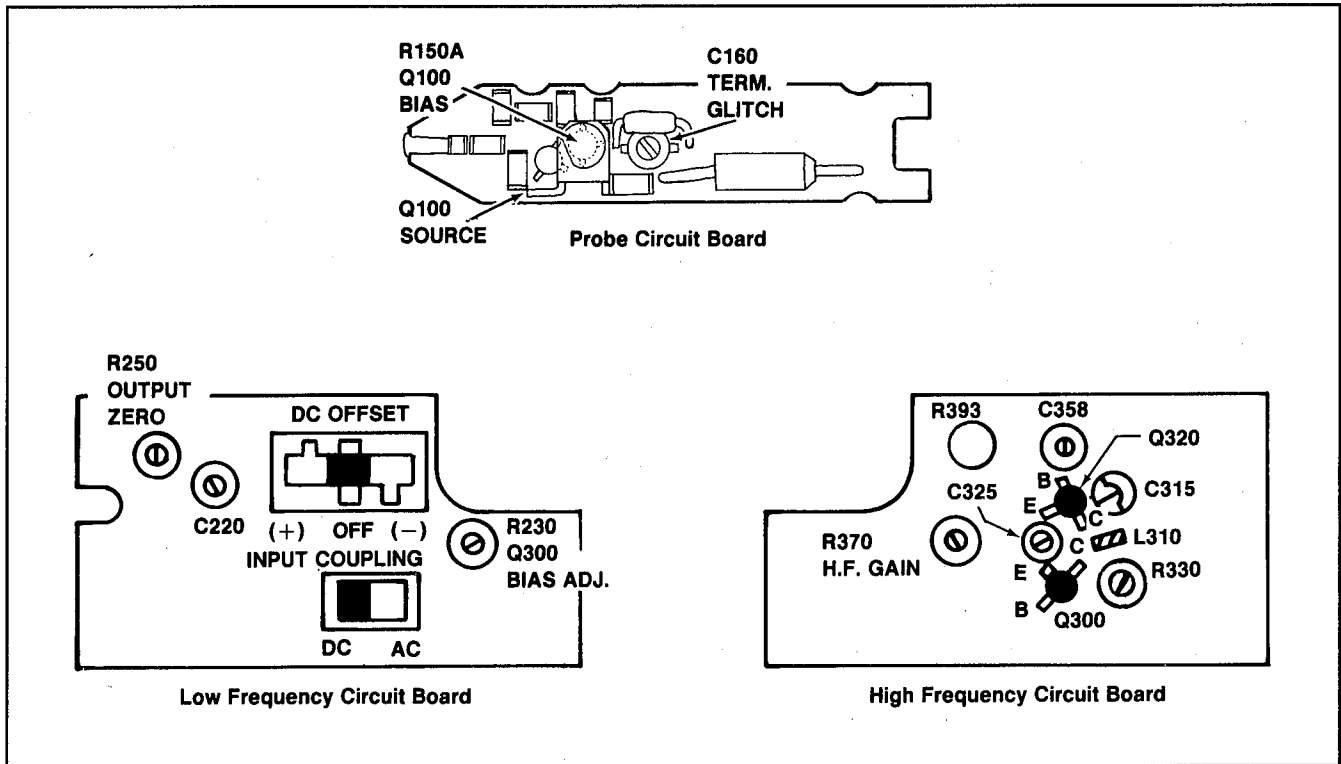


Fig. 5-1. Circuit board adjustment and test point locations.

h. Set the oscilloscope vertical input coupling switch to GND and VOLTS/DIV for maximum sensitivity. Set the oscilloscope time-base for a free-running trace. Position the trace to graticule center.

i. Set the oscilloscope input coupling switch to DC.

j. ADJUST—Output Zero, R250 (Fig. 5-1) to return the oscilloscope trace to the graticule center.

k. Connect the DMM leads between the base of Q300 (Fig. 5-1) and ground.

l. CHECK—DMM for a reading of $-3.3 \text{ V} \pm 25 \text{ mV}$.

m. ADJUST—Bias Adj., R230 (Fig. 5-1) for a reading of -3.3 V .

n. Disconnect the DMM and temporarily reinstall the two housing halves on the output amplifier. Allow the P6201 to warm up for 20 minutes or more with the housing halves in place.

o. Remove the P6201 housing halves and repeat steps h, i, and j.

2. Check and Adjust Termination Glitch

a. Connect the P6201 and equipment as shown in Fig. 5-2.

b. Set the P6201 50-Ω TERM switch to EXT.

c. Set the sampling oscilloscope VOLTS/DIV to 20 mV and TIME/DIV to 5 ns.

d. Locate a glitch approximately 20 ns from the positive step of the waveform. This glitch represents the probe's cable length $\times 2$.

e. ADJUST—C160 (Serial number B076840 and up only) for minimum glitch. It may be necessary to increase the sensitivity of the oscilloscope to see the effect of C160.

f. Disconnect the probe tip and adapter and screw the outer probe body back onto the probe board.

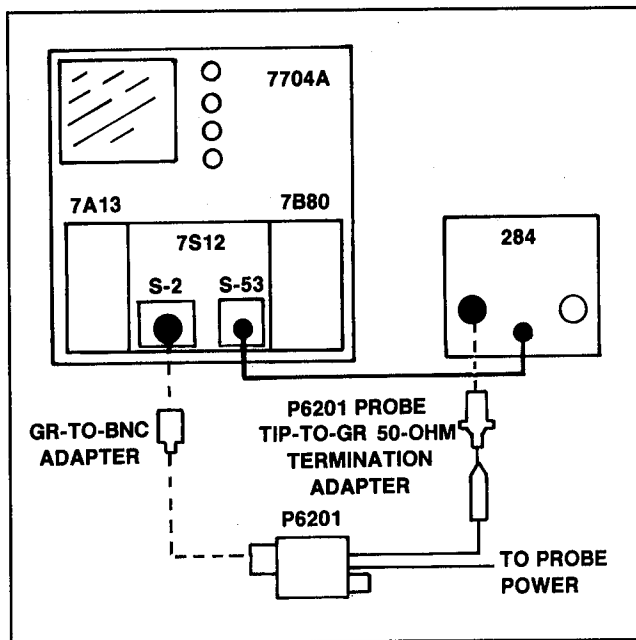


Fig. 5-2. Setup for testing with sampling oscilloscope.

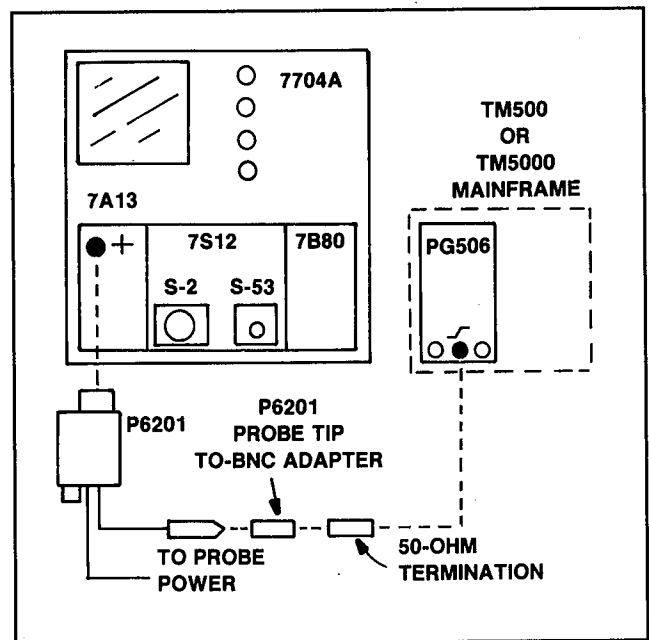


Fig. 5-3. Setup for testing with real-time oscilloscope.

3. Check and Adjust High-Frequency Gain and Cross-Over Phase

- a. Connect the P6201 and equipment as shown in Fig. 5-3.
- b. Set the oscilloscope TIME/DIV to .2 ms and VOLTS/DIV to 50 mV. Set the fast-rise generator (Item 3) to 10 kHz and adjust the amplitude for a 5-division display.
- c. ADJUST—R370 (High-Frequency Gain) and C220 (Cross-Over Phase) for optimum flatness on the top of the waveform. Refer to Figs. 5-4 and 5-5.
- d. Disconnect the fast-rise generator and termination from the P6201 tip and adapter.

NOTE

High-Frequency Gain and Cross-Over Phase adjustments interact with High-Frequency Compensation adjustments. If any adjustments are made in parts 3 or 8 of this procedure, the other part should be performed. This should be continued until no further adjustments are made.

4. Check Gain

- a. Connect a precision bnc cable (Item 14) from the amplitude calibrator (Item 5) to the oscilloscope with a 50- Ω termination (Item 13) at the oscilloscope.

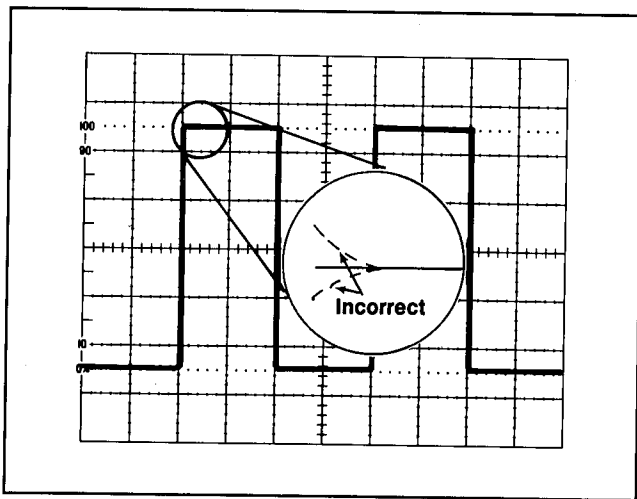


Fig. 5-4. Correct and incorrect examples of high-frequency gain adjustment.

b. Set the oscilloscope VOLTS/DIV to 50 mV and the amplitude calibrator for a 5-division display (a PG506 dial reading of 500 mV produces 250 mV into 50 ohms, resulting in a 5-division display at 50 mV/div.).

c. Adjust the amplitude calibrator or the oscilloscope VOLTS/DIV VARIABLE if necessary to obtain a display that is exactly 5-divisions in amplitude.

d. Disconnect the cable and termination.

e. Connect the same 50- Ω termination to the amplitude calibrator. To this, connect the P6201 Probe Tip-to-bnc Adapter (Item 15) and the probe tip.

f. Connect the P6201 output amplifier to the oscilloscope. Make certain that the 50- Ω TERM switch is set to INT.

g. CHECK—for a 5-division display, $\pm 3\%$ (0.15 divisions).

5. Check AC-DC and 50- Ω Termination Switches

a. Center the waveform on the oscilloscope with both the P6201 and the oscilloscope coupling switches set to DC.

b. Set the P6201 INPUT COUPLING switch to AC.

c. CHECK—that the waveform position drops approximately 2 1/2 divisions.

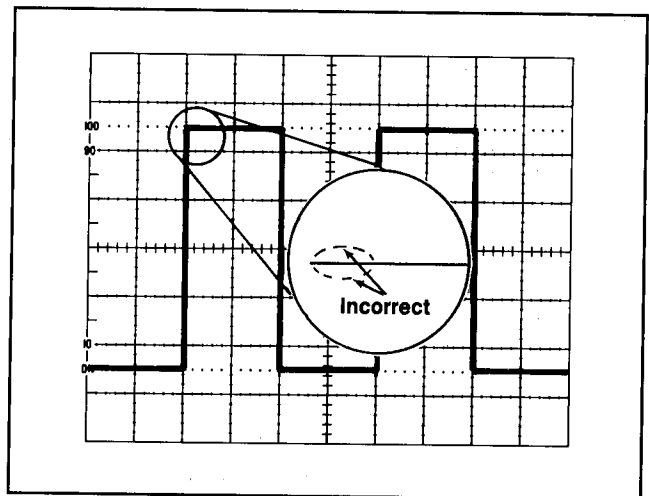


Fig. 5-5. Correct and incorrect cross-over phase adjustment.

- d. Set the P6201 INPUT COUPLING switch to DC.
- e. Adjust the amplitude calibrator or the oscilloscope VOLTS/DIV VARIABLE if necessary to obtain a display that is exactly 5-divisions in amplitude.
- f. Install a precision 50- Ω termination (Item 12) between the P6201 output amplifier and the oscilloscope input connector.
- g. Set the P6201 50- Ω TERM switch to EXT.
- h. CHECK—for a 5-division display, $\pm 2\%$ (0.1 divisions).
- i. Remove the precision 50- Ω termination and reset the 50- Ω TERM switch to INT.
- j. Disconnect the generator-termination-adapter assembly.

6. Check OFFSET Range

- a. Set the 7A13 VOLTS/DIV. to .5 V, input coupling to GND, and POSITION to position the trace on the center graticule line.
- b. Connect the DMM (Item 7) to the 7A13 Vc OUT. Set the 7A13 COMPARISON VOLTAGE to +, and adjust for a DMM readout of 5.6 V.
- c. Remove the DMM and connect the P6201 tip to the Vc OUT connector.
- d. Set the 7A13 input coupling to DC.
- e. Set the P6201 DC OFFSET to + and rotate the OFFSET VARIABLE ccw.
- f. CHECK—that the trace is at least 1.7 divisions above graticule center.
- g. Rotate the OFFSET VARIABLE cw.
- h. CHECK—that the trace moves down to graticule center or lower.

- i. Set the OFFSET VARIABLE ccw.
- j. Set both the 7A13 COMPARISON VOLTAGE and the P6201 DC OFFSET to —.
- k. CHECK—that the trace is at least 1.7 divisions below graticule center.
- l. Rotate the OFFSET VARIABLE cw.
- m. CHECK—that the trace moves up to graticule center or higher.
- n. Set the OFFSET VARIABLE ccw, DC OFFSET to OFF, and the 7A13 COMPARISON VOLTAGE to 0 V. Remove the probe tip from the 7A13.

7. Check Compression and Expansion

CAUTION

The PG506 High Amplitude Square-Wave Generator is capable of delivering enough signal amplitude to seriously damage the P6201, due to high frequencies that are contained in square waves. Follow this procedure carefully. For more information, refer to Fig. 1-3 for voltage derating vs. frequency curves.

- a. Set the square-wave generator (Item 4) amplitude to minimum and frequency to 10 kHz.
- b. Connect a bnc 5X attenuator (Item 11) and the P6201 Probe Tip-to-bnc Adapter (Item 15) to the high amplitude square-wave generator.
- c. Connect the probe tip to the adapter.
- d. Set the oscilloscope VOLTS/DIV to .2 V.
- e. Set the P6201 INPUT COUPLING to AC, DC OFFSET to OFF, and 50- Ω TERM to INT.
- f. Carefully adjust the generator for a 6-division display.

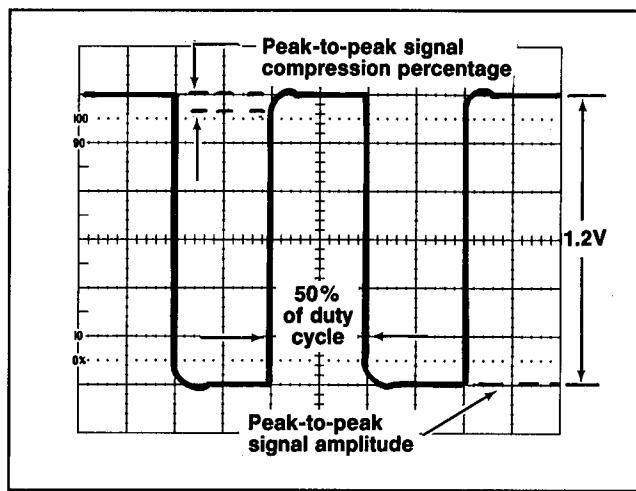


Fig. 5-6. Signal compression measurement.

g. CHECK—compression for 5% or less. Refer to Fig. 5-6.

h. Return the generator amplitude to minimum.

i. Disconnect the generator.

8. Check and Adjust High-Frequency Compensation

a. Connect the equipment as shown in Fig. 5-2.

b. Set the P6201 50- Ω TERM switch to EXT.

c. Set the sampling oscilloscope VOLTS/DIV to 50 mV and TIME/DIV to 1 ns.

d. CHECK—waveform aberrations must be +5%, -3%, or a total of 7% or less peak-to-peak in the first 5 ns of the waveform following the step transition; and +3%, -3%, or a total of 5% or less peak-to-peak after the first 5 ns of the waveform.

e. ADJUST—See Table 5-2 and Fig. 5-1 for adjustments. Adjust for optimum transient response and risetime. (For P6201's below serial number B076840: If probe components are replaced, R185 may have to be changed; a lower value will raise the front corner of the square wave and a higher value will lower it. R185 is located on the Probe Circuit Board. Refer to Section 4, Maintenance, for access instructions.)

Table 5-2

Adjustment	Use of Adjustment
C358	Primarily affects the front corner and the first 1.5 ns of the waveform.
C315	Adjusted for minimum effect unless otherwise necessary to reduce aberrations.
C325	Affects the first 3 ns of the waveform; also has some effect on the front corner amplitude.
R330	Transfers energy between the 1st and 2nd 250 ps of the waveform. Set fully ccw, make the other adjustments, and then use R330 to minimize aberrations.
R393	Affects the flatness on the top of the waveform after the first 3 ns.

NOTE

High-Frequency Compensation adjustments interact with High-Frequency Gain and Cross-Over Phase adjustments. If any adjustments are made in parts 3 or 8 of this procedure, the other part should be performed. This should be continued until no further adjustments are made.

9. Calculate Probe Risetime

a. Perform parts a, b, and c of step 8.

b. Measure the system risetime (sampling test oscilloscope plus probe).

c. Disconnect the P6201 and the P6201 Probe Tip-to-GR 50- Ω Termination Adapter.

d. Connect a GR-to-bnc female adapter (Item 9) to the fast-rise pulser.

e. Connect a precision 50- Ω bnc cable (Item 14) from the adapter to the sampling oscilloscope.

f. Measure the sampling oscilloscope risetime.

g. Using the following formula, calculate the P6201 risetime.

$$T_R(\text{Probe}) = \sqrt{\left\{ T_R(\text{System}) \right\}^2 - \left\{ T_R(\text{Scope}) \right\}^2}$$

h. CHECK—P6201 risetime is 0.39 ns or less.

10. Check and Adjust 10X and 100X Attenuator Compensation

- a. Connect the P6201 and equipment as shown in Fig. 5-3 with the P6201 10X (or 100X) attenuator on the probe tip.
- b. Set the P6201 50-Ω TERM switch to INT.
- c. Set the oscilloscope VOLTS/DIV to 10 mV and TIME/DIV to 10 μs.
- d. Set the square-wave generator for a 100 kHz, 5-division display.
- e. CHECK—For a square leading corner on the waveform.

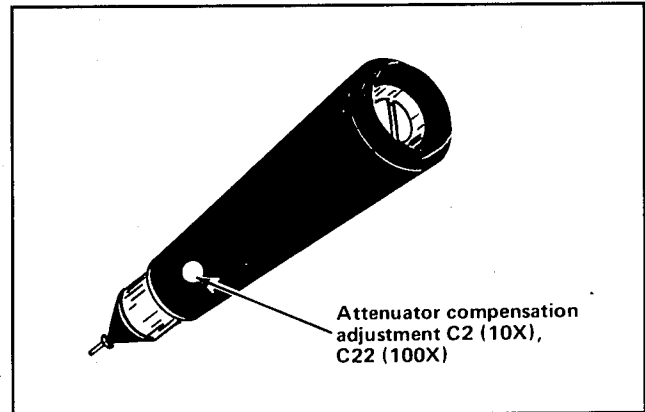
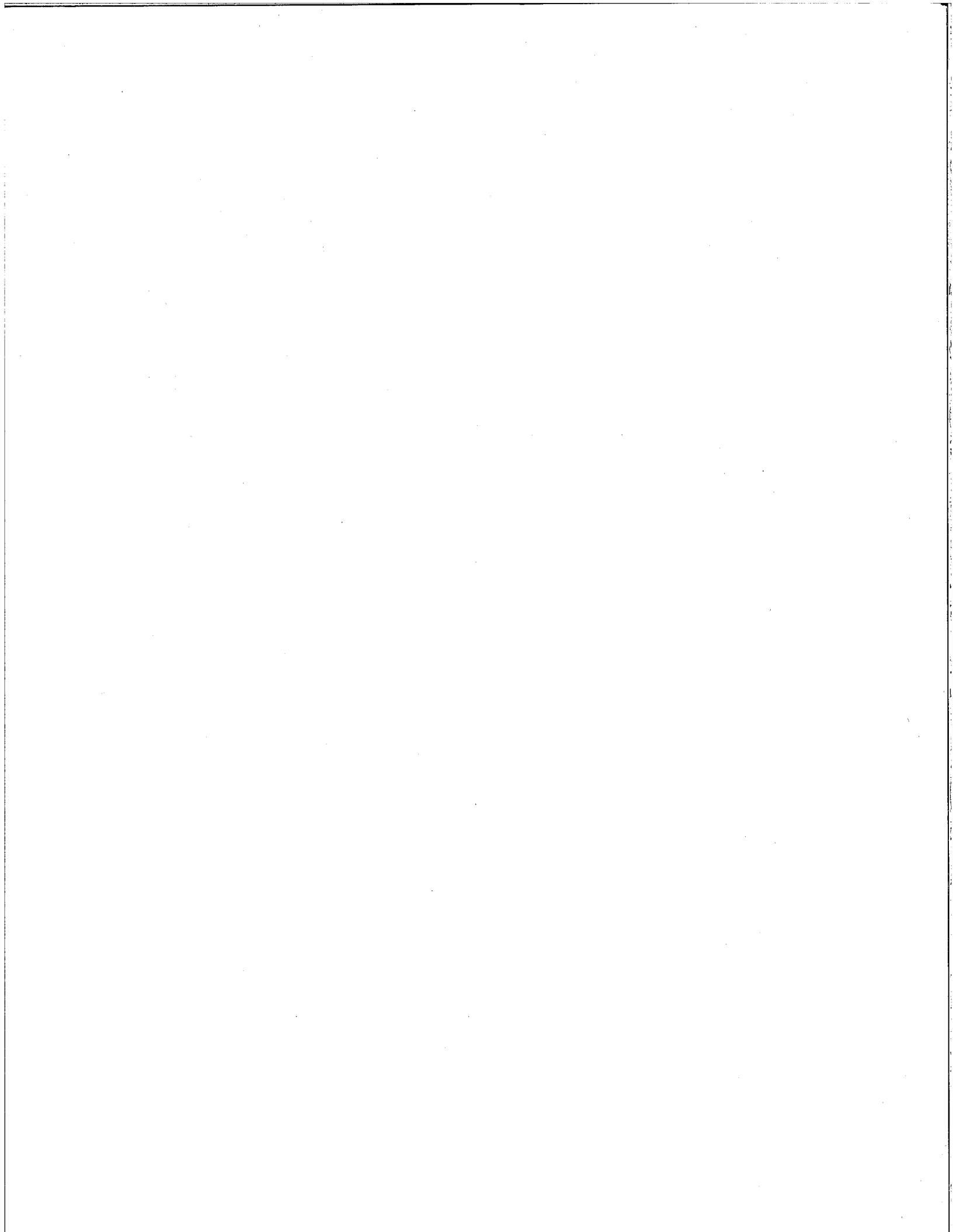


Fig. 5-7. Location of attenuator compensation adjustment.

- f. ADJUST—C2 (10X) or C22 (100X), Attenuator Compensation, for a square leading corner on the display. See Fig. 5-7 for adjustment location.

This completes the calibration procedure. Disconnect all test equipment and replace the output amplifier housing halves (covers).



REPLACEABLE ELECTRICAL PARTS

PARTS ORDERING INFORMATION

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

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

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

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

LIST OF ASSEMBLIES

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

CROSS INDEX-MFR. CODE NUMBER TO MANUFACTURER

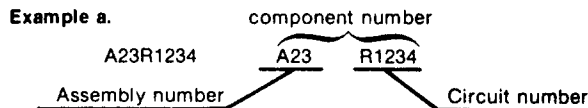
The Mfr. Code Number to Manufacturer index for the Electrical Parts List is located immediately after this page. The Cross Index provides codes, names and addresses of manufacturers of components listed in the Electrical Parts List.

ABBREVIATIONS

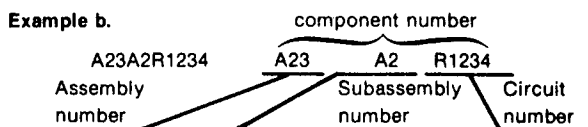
Abbreviations conform to American National Standard Y1.1.

COMPONENT NUMBER (column one of the Electrical Parts List)

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



Read: Resistor 1234 of Assembly 23



Read: Resistor 1234 of Subassembly 2 of Assembly 23

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

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

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

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

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

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

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

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

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

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

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

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

Indicates actual manufacturers part number.

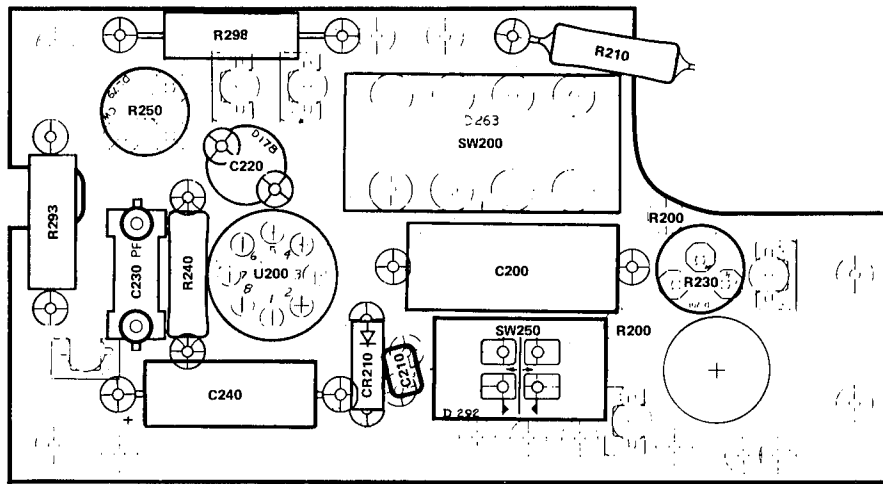
CROSS INDEX - MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip Code
00213	NYTRONICS COMPONENTS GROUP INC SUBSIDIARY OF NYTRONICS INC	ORANGE ST	DARLINGTON SC 29532
01121	ALLEN-BRADLEY CO	1201 SOUTH 2ND ST	MILWAUKEE WI 53204
03888	KOI PYROFILM CORP	60 S JEFFERSON RD	MHIPPANY NJ 07981
04099	CAPCO INC	FORESIGHT INDUSTRIAL PARK P O BOX 2164	GRAND JUNCTION CO 81501
04222	AVX CERAMICS DIV OF AVX CORP	19TH AVE SOUTH P O BOX 867	MYRTLE BEACH SC 29577
04713	MOTOROLA INC SEMICONDUCTOR GROUP	5005 E MCDOWELL RD	PHOENIX AZ 85008
05397	UNION CARBIDE CORP MATERIALS SYSTEMS DIV	11901 MADISON AVE	CLEVELAND OH 44101
07716	TRM INC TRM ELECTRONICS COMPONENTS TRM IRC FIXED RESISTORS/BURLINGTON	2850 MT PLEASANT AVE	BURLINGTON IA 52601
10389	ILLINOIS TOOL WORKS INC	1714 N DAMEN AVE	CHICAGO IL 60647
11236	CTS OF BERNE INC	406 PARR ROAD	BERNE IN 46711
12697	CLAROSTAT MFG CO INC	LOWER WASHINGTON ST	DOVER NH 03820
14193	CAL-R INC	1601 OLYMPIC BLVD	SANTA MONICA CA 90404
14433	ITT SEMICONDUCTORS DIV		WEST PALM BEACH FL
19701	MEPCO/ELECTRA INC A NORTH AMERICAN PHILIPS CO	P O BOX 760	MINERAL WELLS TX 76067
23223	CTS MICROELECTRONICS INC	1201 CUMBERLAND AVE P O BOX 1278	WEST LAFAYETTE IN 47902
24546	CORNING GLASS WORKS	550 HIGH ST	BRADFORD PA 16701
25403	AMPEREX ELECTRONIC CORP SEMICONDUCTOR AND MICROCIRCUITS DIV	PROVIDENCE PIKE	SLATERSVILLE RI 02876
32997	BOURNS INC TRIMPOT DIV	1200 COLUMBIA AVE	RIVERSIDE CA 92507
51642	CENTRE ENGINEERING INC	2820 E COLLEGE AVE	STATE COLLEGE PA 16801
51959	VICLAN INC	7373A ENGINEER RD P O BOX 81403	SAN DIEGO CA 92138
52262	MICROPLEX INC	2126 S LYON ST	SANTA ANA CA 92705
54583	TDK ELECTRONICS CORP	755 EASTGATE BLVD	GARDEN CITY NY 11530
57668	ROHM CORP	16931 MILLIKEN AVE	IRVINE CA 92713
59660	TUSONIX INC	2155 N FORBES BLVD	TUCSON, ARIZONA 85705
73138	BECKMAN INSTRUMENTS INC HELIPOT DIV	2500 HARBOR BLVD	FULLERTON CA 92634
79727	C-M INDUSTRIES	550 DAVISVILLE RD P O BOX 96	WARMINSTER PA 18974
80009	TEKTRONIX INC	4900 S W GRIFFITH DR P O BOX 500	BEAVERTON OR 97077
80031	MEPCO/ELECTRA INC	22 COLUMBIA RD	MORRISTOWN NJ 07960
91637	DALE ELECTRONICS INC	P O BOX 609	COLUMBUS NE 68601
96733	SAN FERNANDO ELECTRIC MFG CO	1501 FIRST ST	SAN FERNANDO CA 91341

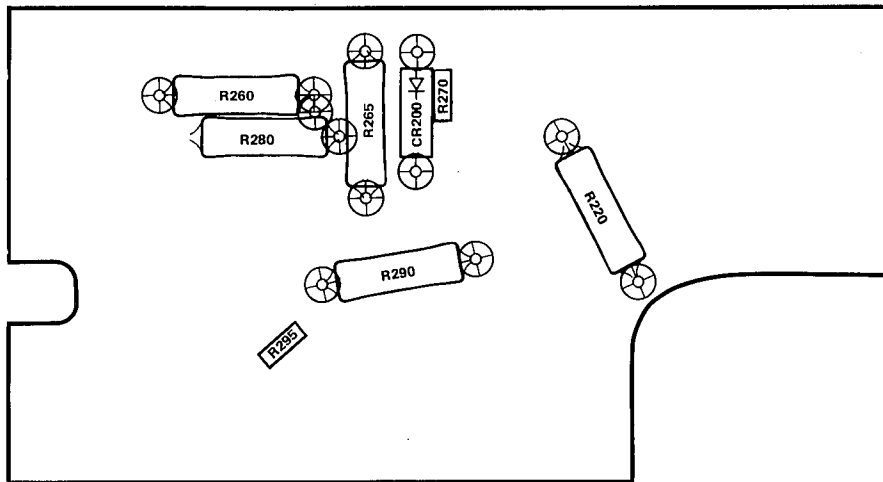
Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
A1	670-2210-00	B010100	B059999	CIRCUIT BD ASSY:PROBE	80009	670-2210-00
A1	670-2210-01	B060000	B076839	CIRCUIT BD ASSY:PROBE	80009	670-2210-01
A1	670-2210-03	B076840	B078999	CIRCUIT BD ASSY:PROBE	80009	670-2210-03
A1	670-2210-04	B079000		CIRCUIT BD ASSY:PROBE	80009	670-2210-04
A2	670-2211-00	B010100	B039999	CIRCUIT BD ASSY:ATTENUATOR 60 X	80009	670-2211-00
A2	670-2211-01	B040000	B059999	CIRCUIT BD ASSY:	80009	670-2211-01
A2	670-2211-02	B060000		CIRCUIT BD ASSY:10X ATTEN	80009	670-2211-02
A3	670-2212-00			CIRCUIT BD ASSY:	80009	670-2212-00
A4	670-2296-00	B010100	B059999	CIRCUIT BD ASSY:HI FREQ OUTPUT AMPLIFIER	80009	670-2296-00
A4	670-2296-01	B060000	B076839	CIRCUIT BD ASSY:HF OUT AMPL	80009	670-2296-01
A4	670-2296-03	B076840		CIRCUIT BD ASSY:HF OUT AMPL	80009	670-2296-03
A5	670-2297-00	B010100	B059999	CIRCUIT BD ASSY:LOW FREQ OUTPUT AMPLIFIER	80009	670-2297-00
A5	670-2297-01	B060000		CIRCUIT BD ASSY:LF & PMR SPLY	80009	670-2297-01
C1	283-0310-00	B010100	B039999	CAP,FXD,CER DI:2.5PF,+/-0.25PF,100V	04222	08051A2R5CA8060
C2	-----			(NONREPLACEABLE SUBPART OF 670-2211-00)		
C3	283-0310-00	B010100	B059999	CAP,FXD,CER DI:2.5PF,+/-0.25PF,100V	04222	08051A2R5CA8060
C3	283-0311-00	B060000		CAP,FXD,CER DI:4.7PF,+/-0.25PF,100V	51959	1005C4R7C3T
C21	283-0320-00			CAP,FXD,CER DI:1PF,0.25%,50V	54583	C2012C0G1H1R0C
C22	-----			(NONREPLACEABLE SUBPART OF 670-2212-00)		
C23	283-0332-00			CAP,FXD,CER DI:47PF,5%,50V	51642	5150050N750470JA
C100	283-0314-00			CAP,FXD,CER DI:100PF,10%,100V	04222	08051A101KA2075
C120	283-0311-00			CAP,FXD,CER DI:4.7PF,+/-0.25PF,100V	51959	1005C4R7C3T
C130	283-0315-00			CAP,FXD,CER DI:470PF,10%,100V	04222	10051A471KA2065
C140	283-0315-00			CAP,FXD,CER DI:470PF,10%,100V	04222	10051A471KA2065
C150	283-0315-00			CAP,FXD,CER DI:470PF,10%,100V	04222	10051A471KA2065
C155	283-0320-00			CAP,FXD,CER DI:1PF,0.25%,50V	54583	C2012C0G1H1R0C
C160	283-0310-00	B010100	B076839	CAP,FXD,CER DI:2.5PF,+/-0.25PF,100V	04222	08051A2R5CA8060
C160	281-0285-00	B076840		CAP,VAR,PLASTIC:1.5-6.0PF,25V	80009	281-0285-00
C170	290-0308-00	B010100	B046190	CAP,FXD,ELCTLT:1UF,20%,35V TANTALUM	24546	HV105A-20/9011
C170	290-0267-00	B046191		CAP,FXD,ELCTLT:1UF,20%,35V	05397	T320A105M035AS
C180	290-0308-00	B010100	B078999	CAP,FXD,ELCTLT:1UF,20%,35V TANTALUM	24546	HV105A-20/9011
C180	290-0267-00	B079000		CAP,FXD,ELCTLT:1UF,20%,35V	05397	T320A105M035AS
C200	285-0919-00			CAP,FXD,PLASTIC:0.22UF,10%,100V	04099	TEK-15-A
C210	283-0176-00			CAP,FXD,CER DI:0.0022UF,20%,50V	04222	SR205C222MAA
C220	281-0123-00	B010100	B046190	CAP,VAR,CER DI:5-25PF,100V	59660	518-000A5-25
C220	281-0158-00	B046191	B059999	CAP,VAR,CER DI:7-45PF,25V	59660	518-006 G 7-45
C220	281-0158-01	B060000		CAP,VAR,CER DI:7-45 PF,100V	80009	281-0158-01
C230	281-0528-00			CAP,FXD,CER DI:82PF,+/-8.2PF,500V	59660	301-000U2M0820K
C240	290-0134-00			CAP,FXD,ELCTLT:22UF,20%,15V	05397	T110B226M015AS
C295	283-0139-00	B076840		CAP,FXD,CER DI:150PF,20%,50V	05397	C312C151M5G5CA
C300	290-0247-00			CAP,FXD,ELCTLT:5.6UF,10%,6V	05397	T322B565K006AS
C302	283-0320-00	B060000	B076839	CAP,FXD,CER DI:1PF,0.25%,50V	54583	C2012C0G1H1R0C
C305	283-0220-00			CAP,FXD,CER DI:0.01UF,20%,50V	04222	3429 050C 103M
C310	283-0252-00	B076840		CAP,FXD,CER DI:0.001UF,10%,50V	04222	ULA105C102K2T60
C315	281-0218-00			CAP,VAR,CER DI:1-5PF,+2 -2.5%,100V	59660	513-011A1-5
C320	283-0315-00			CAP,FXD,CER DI:470PF,10%,100V	04222	10051A471KA2065
C325	281-0196-00	B010100	B060646	CAP,VAR,CER DI:10-38PF,250V	80031	2805F 01038
C325	281-0219-00	B060647		CAP,VAR,CER DI:5-35PF,+2 -2.5%,100V	59660	513-011 A 5-35
C330	283-0325-00			CAP,FXD,CER DI:47PF,10%,100V	04222	10051A470KA2065
C350	283-0177-00			CAP,FXD,CER DI:1UF,+80-20%,25V	04222	SR302E105ZAATR
C355	283-0310-00	B010100	B029999	CAP,FXD,CER DI:2.5PF,+/-0.25PF,100V	04222	08051A2R5CA8060
C355	-----	B030000	B076839	(TEST SELECTABLE)		
C358	281-0218-00			CAP,VAR,CER DI:1-5PF,+2 -2.5%,100V	59660	513-011A1-5
C360	283-0111-00			CAP,FXD,CER DI:0.1UF,20%,50V	05397	C330C104M5U1CA
C365	283-0209-00			CAP,FXD,CER DI:1UF,20%,50V	96733	SC358U105MS
C375	283-0311-00			CAP,FXD,CER DI:4.7PF,+/-0.25PF,100V	51959	1005C4R7C3T
CR200	152-0246-00			SEMICOND DVC,DI:SM,SI,40V,200MA,DO-7	14433	MG1537TK
CR210	152-0246-00			SEMICOND DVC,DI:SM,SI,40V,200MA,DO-7	14433	MG1537TK
L300	108-0737-00	B010100	B029999	COIL,RF:FIXED,40NH	80009	108-0737-00

Component No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Name & Description	Mfr. Code	Mfr. Part No.
L310	108-0737-00			COIL, RF: FIXED, 40NH	80009	108-0737-00
L393	108-0170-01			COIL, RF: FIXED, 360NH	80009	108-0170-01
Q100	151-1023-00	B010100	8053094	TRANSISTOR: FET, N-CHAN, SI,	80009	151-1023-00
Q100	151-1023-01	B053095	8078999	TRANSISTOR: FE, SI, N-CHANNEL	04713	SMCM485
Q100	151-5025-00	B079000		TRANSISTOR: JFET, N CHANNEL	80009	151-5025-00
Q120	151-0362-01	B010100	8513	TRANSISTOR: PNP, SI, U-43	80009	151-0362-01
Q120	151-0362-00	8514		TRANSISTOR: PNP, SI, U-43	04713	SMT1105
Q130	151-0362-01	B010100	8513	TRANSISTOR: PNP, SI, U-43	80009	151-0362-01
Q130	151-0362-00	8514		TRANSISTOR: PNP, SI, U-43	04713	SMT1105
Q300	151-0416-00	B010100	8029999	TRANSISTOR: NPN, SI	80009	151-0416-00
Q300	151-0475-00	B030000	8059999	TRANSISTOR: NPN, SI	25403	BFR91
Q300	151-0475-01	B060000	8513	TRANSISTOR: SCREENED	80009	151-0475-01
Q300	151-0475-00	8514		TRANSISTOR: NPN, SI	25403	BFR91
Q320	151-0416-00	B010100	8029999	TRANSISTOR: NPN, SI	80009	151-0416-00
Q320	151-0475-00	B030000	8059999	TRANSISTOR: NPN, SI	25403	BFR91
Q320	151-0475-01	B060000	8513	TRANSISTOR: SCREENED	80009	151-0475-01
Q320	151-0475-00	8514		TRANSISTOR: NPN, SI	25403	BFR91
Q350	151-0341-00			TRANSISTOR: NPN, SI, T0-106	04713	SPS6919
R1	321-0807-01			RES, FXD, FILM: 900K OHM, 0.5%, 0.125W, TC=TO	19701	5033R0900K0D
R2	307-0240-00			RES, FXD, CMPSN: 50 OHM, 10%, 0.075W	23223	50A10L
R3	317-0680-00			RES, FXD, CMPSN: 68 OHM, 5%, 0.125W	01121	886805
R4	-----			(NONREPLACEABLE SUBPART OF 204-0557-00)		
R21	321-0790-01			RES, FXD, FILM: 990K OHM, 0.5%, 0.125W, TC=TO MI	07716	CEAD99002D
R22	307-0240-00			RES, FXD, CMPSN: 50 OHM, 10%, 0.075W	23223	50A10L
R23	325-0036-00			RES, FXD, FILM: 11.1K OHM, 1%, 0.05W, TC=TO	91637	CMF50G11101F
R24	317-0430-00			RES, FXD, CMPSN: 43 OHM, 5%, 0.125W	01121	884305
R25	317-0220-00			RES, FXD, CMPSN: 22 OHM, 5%, 0.125W	01121	882205
R26	-----			(NONREPLACEABLE SUBPART OF 204-0558-00)		
R120	307-0240-00	B010100	8059999	RES, FXD, CMPSN: 50 OHM, 10%, 0.075W	23223	50A10L
R120	307-0514-00	B060000		RES, FXD, FILM: 27 OHM, 1%, 0.075W	52262	MCRA270FYZ
R130	325-0121-00			RES, FXD, FILM: 90K OHM, 0.5%, 0.05W, TC=TO	80009	325-0121-00
R140	317-0106-00			RES, FXD, CMPSN: 10M OHM, 5%, 0.125W	01121	881065
R150	317-0202-00	B010100	8076839	RES, FXD, CMPSN: 2K OHM, 5%, 0.125W	01121	882025
R150	311-2342-00	B076840		RES, VAR, NONNM: TRMR, 1K OHM, 25%	80009	311-2342-00
R150	321-5017-00	B076840		RES, FXD, FILM: 825 OHM, 1%, 0.125W	01121	BCK8250FT
R160	317-0511-00			RES, FXD, CMPSN: 510 OHM, 5%, 0.125W	01121	885115
R170	317-0161-00			RES, FXD, CMPSN: 160 OHM, 5%, 0.125W	01121	881615
R180	317-0301-00			RES, FXD, CMPSN: 300 OHM, 5%, 0.125W	01121	883015
R185	-----	B010100	8076839	(SELECTABLE IN RANGE OF 90 OHM TO 3K OHM, 5%, 0.25W, FOR BEST RESPONSE IN COMBINATION WITH CABLE ASSEMBLY AND A1 CKT BD)		
R190	307-0240-00	B010100	8076839	RES, FXD, CMPSN: 50 OHM, 10%, 0.075W	23223	50A10L
R190	325-0045-00	B076840		RES, FXD, FILM: 46.4 OHM, 0.5%, 0.05W, TC=150PPM	03888	PMES046.4 OHM.5%
R200	311-1413-00	B010100	8073445	RES, VAR, NONNM: PNL, 5K OHM, 0.75W	11236	VA305-6P1021
R200	311-2247-00	B073446		RES, VAR, NONNM: PNL, 5K OHM, 20%, 0.5W	12697	(MODEL388) ADVISE
R210	321-0263-00	B010100	8046190	RES, FXD, FILM: 5.36K OHM, 1%, 0.125W, TC=TO	07716	CEAD53600F
R210	315-0512-00	B046191		RES, FXD, FILM: 5.1K OHM, 5%, 0.25W	57668	NTR25J-E05K1
R220	321-0388-00	B010100	8046190	RES, FXD, FILM: 107K OHM, 1%, 0.125W, TC=TO	07716	CEAD10702F
R220	315-0104-00	B046191		RES, FXD, FILM: 100K OHM, 5%, 0.25W	57668	NTR25J-E100K
R230	311-0634-00	B010100	8046190	RES, VAR, NONNM: TRMR, 500 OHM, 0.5W	32997	3329H-L58-501
R230	311-1263-00	B046191		RES, VAR, NONNM: 1K OHM, 10%, 0.50W	32997	3329P-L58-102
R240	321-0452-00	B010100	8046191	RES, FXD, FILM: 499K OHM, 1%, 0.125W, TC=TO	19701	5043ED499K0F
R240	315-0474-00	B046191		RES, FXD, FILM: 470K OHM, 5%, 0.25W	19701	5043CX470K0J92U
R250	311-1271-00			RES, VAR, NONNM: TRMR, 50K OHM, 0.5W	32997	3329P-L58-503
R260	321-0151-00			RES, FXD, FILM: 365 OHM, 1%, 0.125W, TC=TO	07716	CEAD365R0F
R265	321-0978-01			RES, FXD, FILM: 11.02K OHM, 0.1%, 0.125W, T=T2	01121	ADVISE
R270	317-0514-00			RES, FXD, CMPSN: 510K OHM, 5%, 0.125W	01121	885145
R280	321-0293-03			RES, FXD, FILM: 11.0K OHM, 0.25%, 0.125W, TC=T2	24546	NC55C1102C
R290	321-0381-03			RES, FXD, FILM: 90.9K OHM, 0.25%, 0.125W, T=T2	07716	CEAC90901C
R293	308-0714-00			RES, FXD, WW: 46.4 OHM, 1%, 1W	00213	10005-46R40F

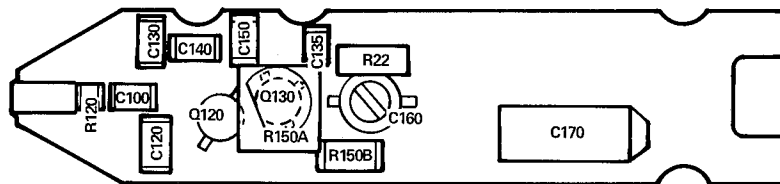
Component No.	Tektronix Part No.	Serial/Assembly No. Effective Dscont		Name & Description	Mfr. Code	Mfr. Part No.
R295	325-0121-00			RES,FXD,FILM:90K OHM,0.5%,0.05M,TC=TO	80009	325-0121-00
R298	308-0715-00			RES,FXD,WM:78 OHM,1%	00213	10005-78-1
R300	321-0223-00	B010100	B046190	RES,FXD,FILM:2.05K OHM,1%,0.125M,TC=TO	80009	321-0223-00
R300	315-0182-00	B046191		RES,FXD,FILM:1.8K OHM,5%,0.25M	57668	NTR25J-E1K8
R305	-----	B030000	B076839	(SELECTABLE IN RANGE OF 15 OHM TO 30 OHM, 5%,0.125M, FOR BEST RESPONSE IN COMBINATION WITH Q300,Q320 AND U200)		
R305	317-0300-00	B076840		RES,FXD,CMPNSN:30 OHM,5%,0.125M	01121	BB3005
R310	317-0102-00	B010100	B029999	RES,FXD,CMPNSN:1K OHM,5%,0.125M	01121	BB1025
R310	317-0911-00	B030000	B076839	RES,FXD,CMPNSN:910 OHM,5%,0.125M	01121	BB9115
R310	321-0193-00	B076840		RES,FXD,FILM:1K OHM,1%,0.125M,TC=TO	19701	5033ED1K00F
R325	322-0126-00			RES,FXD,FILM:200 OHM,1%,0.25M,TC=TO	19701	5043RD200R0F
R330	317-0300-00	B010100	B029999	RES,FXD,CMPNSN:30 OHM,5%,0.125M	01121	BB3005
R330	311-1260-00	B076840		RES,VAR,NONWM:TRMR,250 OHM,0.5M	32997	3329P-L58-251
R335	317-0270-00			RES,FXD,CMPNSN:27 OHM,5%,0.125M	01121	BB2705
R340	321-0080-00			RES,FXD,FILM:66.5 OHM,1%,0.125M,TC=TO	91637	CMF55116666R50F
R345	322-0126-00			RES,FXD,FILM:200 OHM,1%,0.25M,TC=TO	19701	5043RD200R0F
R350	315-0102-00			RES,FXD,FILM:1K OHM,5%,0.25M	57668	NTR25JE01K0
R355	317-0151-00			RES,FXD,CMPNSN:150 OHM,5%,0.125M	01121	BB1515
R365	325-0051-00	B010100	B046190	RES,FXD,FILM:18.2 OHM,1%,0.5M,TC=TO	19701	5023RD18R20F
R365	317-0220-00	B046191	B076839	RES,FXD,CMPNSN:22 OHM,5%,0.125M	01121	BB2205
R365	321-5004-00	B076840		RES,FXD,FILM:22.1 OHM,1%,0.125M	57668	MCR18FWEA22E1
R368	-----			(SELECTABLE IN RANGE OF 500 OHM TO 1K OHM, 5%,0.125M, FOR BEST RESPONSE IN COMBINATION WITH Q300,Q320 AND U200)		
R370	311-0978-00			RES,VAR,NONWM:TRMR,250 OHM,0.5M	73138	82-4-2
R375	317-0201-00	B010100	B050863	RES,FXD,CMPNSN:200 OHM,5%,0.125M (NOMINAL VALUE,SELECTED)	01121	BB2015
R375	317-0121-00	B050864		RES,FXD,CMPNSN:120 OHM,5%,0.125M (SELECTABLE FROM RANGE OF 130-200 OHM)	01121	BB1215
R380	322-0119-00			RES,FXD,FILM:169 OHM,1%,0.25M,TC=TO	91637	CMF6042G169R0F
R390	322-0119-00			RES,FXD,FILM:169 OHM,1%,0.25M,TC=TO	91637	CMF6042G169R0F
R393	311-0622-01			RES,VAR,NONWM:TRMR,100 OHM,0.5M	32997	3329H-K28-101
R395	317-0272-00			RES,FXD,CMPNSN:2.7K OHM,5%,0.125M	01121	BB2725
R397	317-0101-00			RES,FXD,CMPNSN:100 OHM,5%,0.125M	01121	BB1015
R398	325-0053-00			RES,FXD,FILM:50 OHM,1%,0.05M,TC=TO	91637	CMF50-F50R00F
R399	317-0151-00			RES,FXD,CMPNSN:150 OHM,5%,0.125M	01121	BB1515
RT360	307-0343-00			RES,THERMAL:200 OHM,10%	14193	ST-4524
S200	260-0984-00			SWITCH,SLIDE:DPTT,0.5A,125V	79727	G-128-S-0012
S250	260-0960-01			SWITCH,SLIDE:FORM Z,0.5A,120VDC,BLACK BTTN	10389	23-021-043
S300	260-0960-01			SWITCH,SLIDE:FORM Z,0.5A,120VDC,BLACK BTTN	10389	23-021-043
U200	156-0223-00			MICROCKT,LINEAR:OPNL AMPL	04713	LM308H



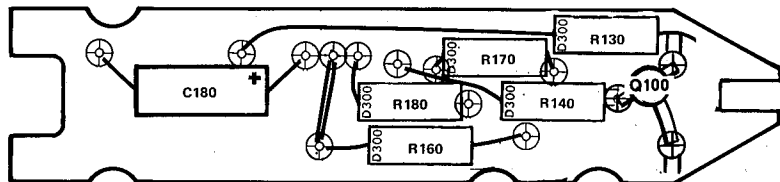
LOW FREQUENCY (FRONT)



LOW FREQUENCY (BACK)

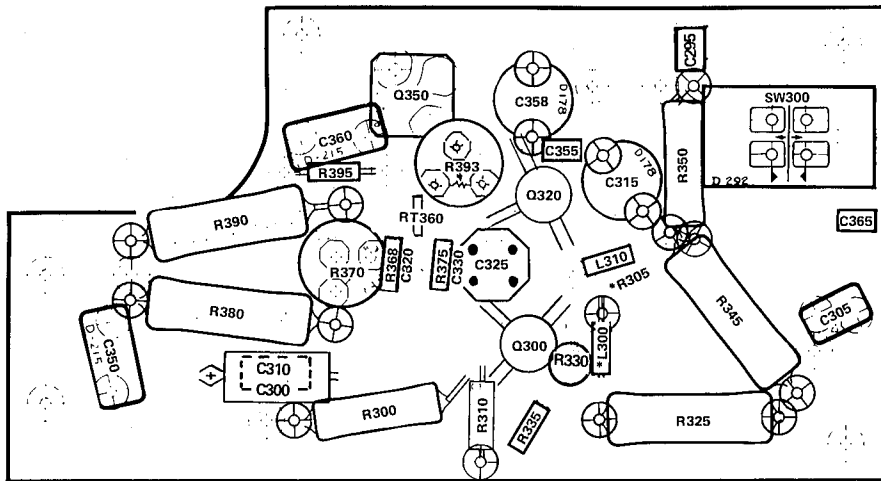


PROBE-FET (FRONT)

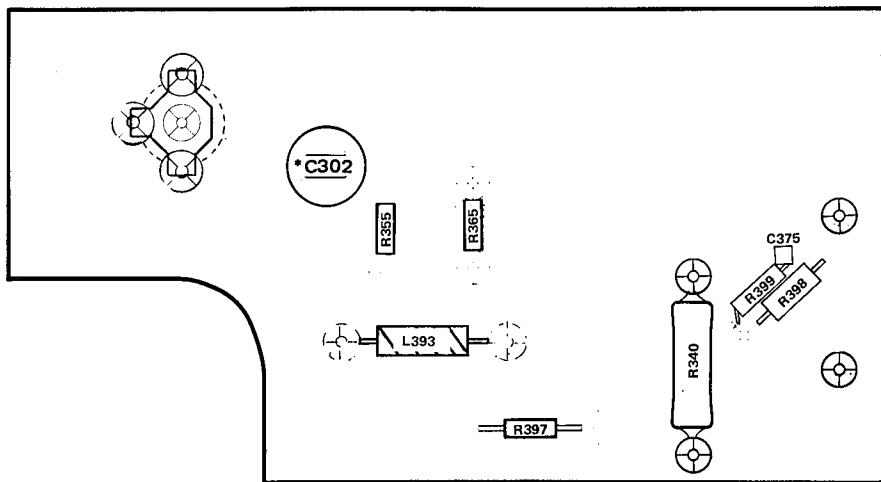


PROBE-FET (BACK)

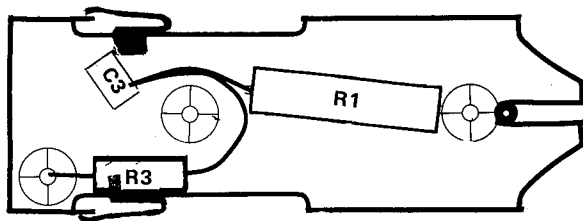
*See Parts List for serial number ranges.



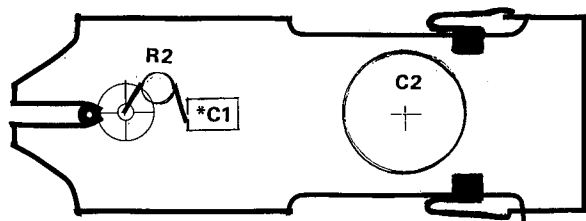
HIGH FREQUENCY OUTPUT (FRONT)



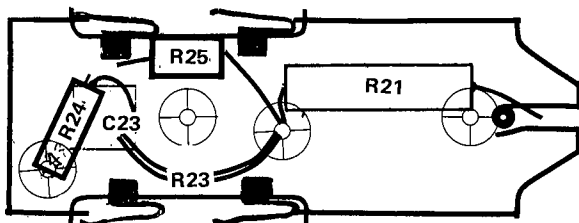
HIGH FREQUENCY OUTPUT (BACK)



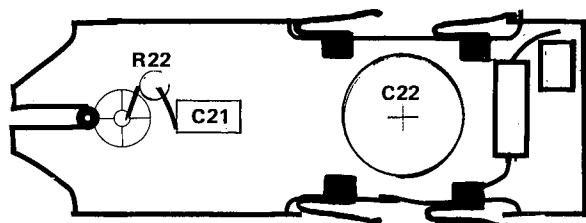
X10 ATTEN (FRONT)



X10 ATTEN (BACK)

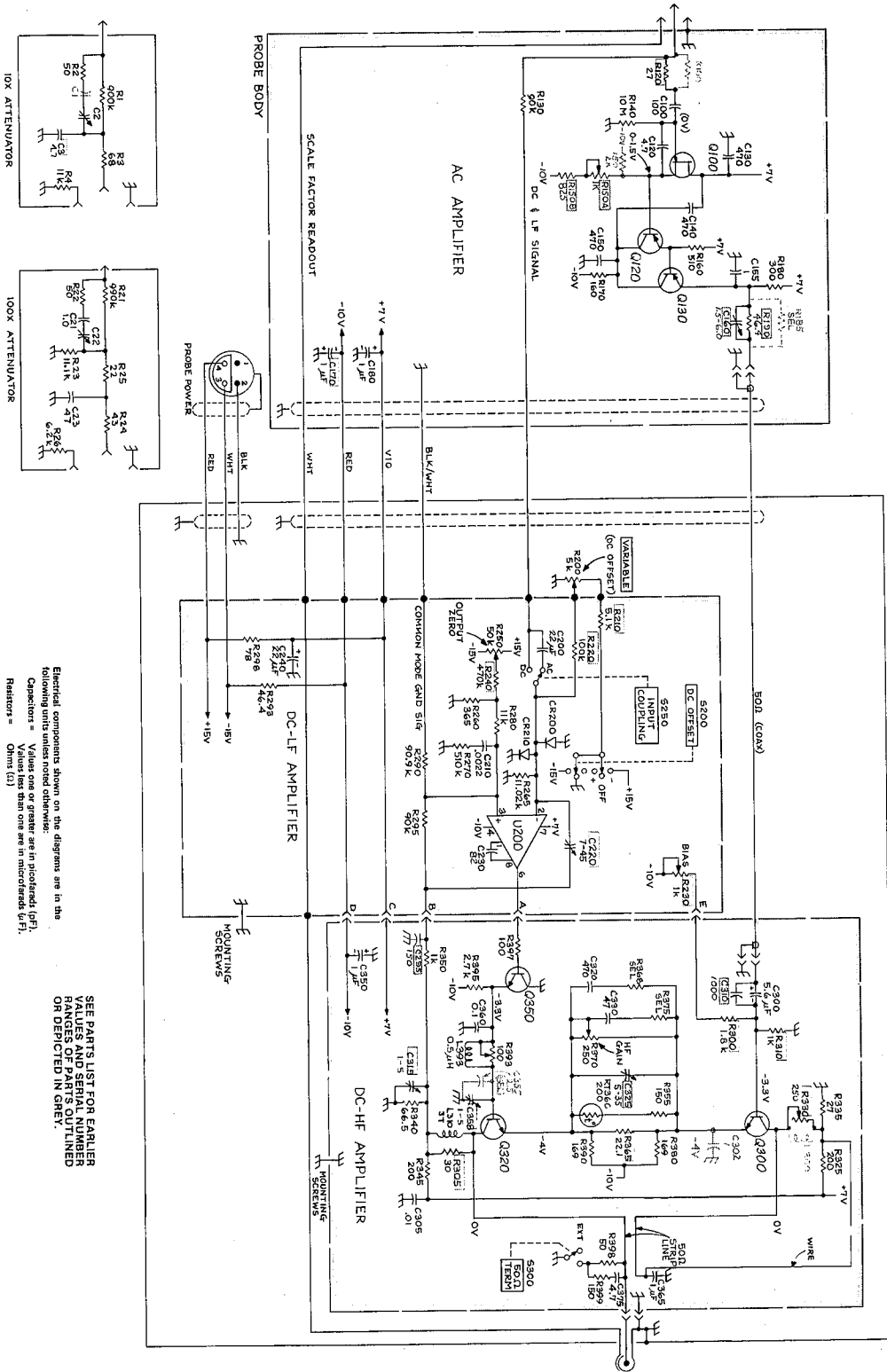


X100 ATTEN (FRONT)



X100 ATTEN (BACK)

*See Parts List for serial number ranges.



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)

SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER OR DESIGNATED IN GREY.

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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.

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.

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.

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
000CY	NORTHWEST FASTENER SALES, INC.	7923 SW CIRrus DRIVE	BEAVERTON, OR 97005
00779	AMP, INC.	P.O. BOX 3608	HARRISBURG, PA 17105
07111	PNEUMO DYNAMICS CORPORATION	4800 PRUDENTIAL TOWER	BOSTON, MA 02199
10389	CHICAGO SWITCH, INC.	2035 WABANSIA AVE.	CHICAGO, IL 60647
22526	BERG ELECTRONICS, INC.	YOUK EXPRESSWAY	NEW CUMBERLAND, PA 17070
73743	FISCHER SPECIAL MFG. CO.	446 MORGAN ST.	CINCINNATI, OH 45206
77900	SHAKEPROOF		
	DIV OF ILLINOIS TOOL WORKS	SAINT CHARLES RD	ELGIN, IL 60120
78189	ILLINOIS TOOL WORKS, INC.		
	SHAKEPROOF DIVISION	ST. CHARLES ROAD	ELGIN, IL 60120
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
83385	CENTRAL SCREW CO.	2530 CRESCENT DR.	BROADVIEW, IL 60153
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
T1312	LEMO USA, INC.	P.O. BOX 6626	SANTA ROSA, CA 95406
T1741	COLMAN FASTENERS CO LTD	HATTONS ROAD OFF WESTINGHOUSE	
		ROAD, TRAFFORD PARK	MANCHESTER M 17 1DF ENGLAND

P6201 Probe

Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective	Dscont	Qty	12345	Name & Description	Mfr. Code	Mfr. Part No.
1-						OPTIONAL ACCESSORIES		
	017-0094-00			1		TERMN, PROBE: 50 OHM, 1M FOR 010-6201-00		
-1	205-0142-00			1		.SHELL, ELEC CONN: BNC, LOCKING		
-2	342-0076-00			2		.INSULATOR, CONN: NYLON		
-3	131-1049-00			1		.CONTACT, ELEC: CONN READOUT, CU BE SIL PL		
-4	204-0473-00			1		.CONN BODY, RCPT: BNC, COMP BOX		
-5	204-0472-00			1		.CONN BODY, RCPT: BNC, LOCKING		
-6	358-0072-00			1		.INSULATOR, BSHG: 0.192 ID X 0.192 OD X 0.323		
-7	131-1257-00			1		.CONTACT, ELEC: BNC CTR COND, BRASS SIL PL		
-8	342-0134-00			1		.INSULATOR, BSHG: 0.086 ID X 0.275 OD X 0.8 L		
-9	131-1135-00			1		.CONTACT, ELEC: CKT BD TO CONN, CU BE GLD PL		
-10	386-2264-00			1		.PANEL, REAR: OUTPUT AMPLIFIER		
-11	380-0286-00	B010100	B073445	1		.HSG HALF, AMPL: LEFT, ALUMINUM		
	380-0286-01	B073446		1		.HSG HALF, AMPL: LEFT, AL P6201 (ATTACHING PARTS)		
-12	211-0001-00			4		.SCREW, MACHINE: 2-56 X 0.25, PNH, STL (END ATTACHING PARTS)		
-13	380-0287-00	B010100	B073445	1		.HSG HALF, AMPL: RIGHT, ALUMINUM		
	380-0287-01	B073446		1		.HSG HALF, AMPL: RIGHT, AL (ATTACHING PARTS)		
-14	211-0001-00			4		.SCREW, MACHINE: 2-56 X 0.25, PNH, STL (END ATTACHING PARTS)		
-15	210-0021-00			1		.WASHER, LOCK: 0.476 ID, INTL, 0.018 THK, STL		
-16	210-0941-00			1		.WASHER, FLAT: 0.448 ID X 0.688 OD X 0.033, STL .L		
-17	358-0454-00			1		.BSHG, MACH THD: 0.437-28 X 0.218 ID, BRS CU-S .N-ZN PL, 0.366 L		
-18	386-2266-00			2		.SUPPORT, CKT BD: FRONT (ATTACHING PARTS)		
-19	211-0022-00	B010100	B046190	2		.SCREW, MACHINE: 2-56 X 0.188, PNH, STL		
	210-0001-00	B046191		2		.WASHER, LOCK: #2 INTL, 0.013 THK, STL (END ATTACHING PARTS)		
-20	-----			1		.CKT BOARD ASSY: L.F. OUTPUT AMP (SEE A5 REPL)		
-21	136-0252-04			7		..SOCKET, PIN TERM: U/W 0.016-0.018 DIA PINS		
-22	136-0263-03			5		..SOCKET, PIN TERM: U/W 0.025 SQ PINS		
-23	214-2250-00			1		..INSULATOR, PLATE: SLIDE SWITCH, FISH PAPER		
-24	-----			1		..SWITCH, SLIDE: 0.5A, 120VDC, CKT BD MT ..(SEE S250 REPL)		
-25	-----			1		..SWITCH, SLIDE: DP3T, 0.5A, 125V ..(SEE S200 REPL)		

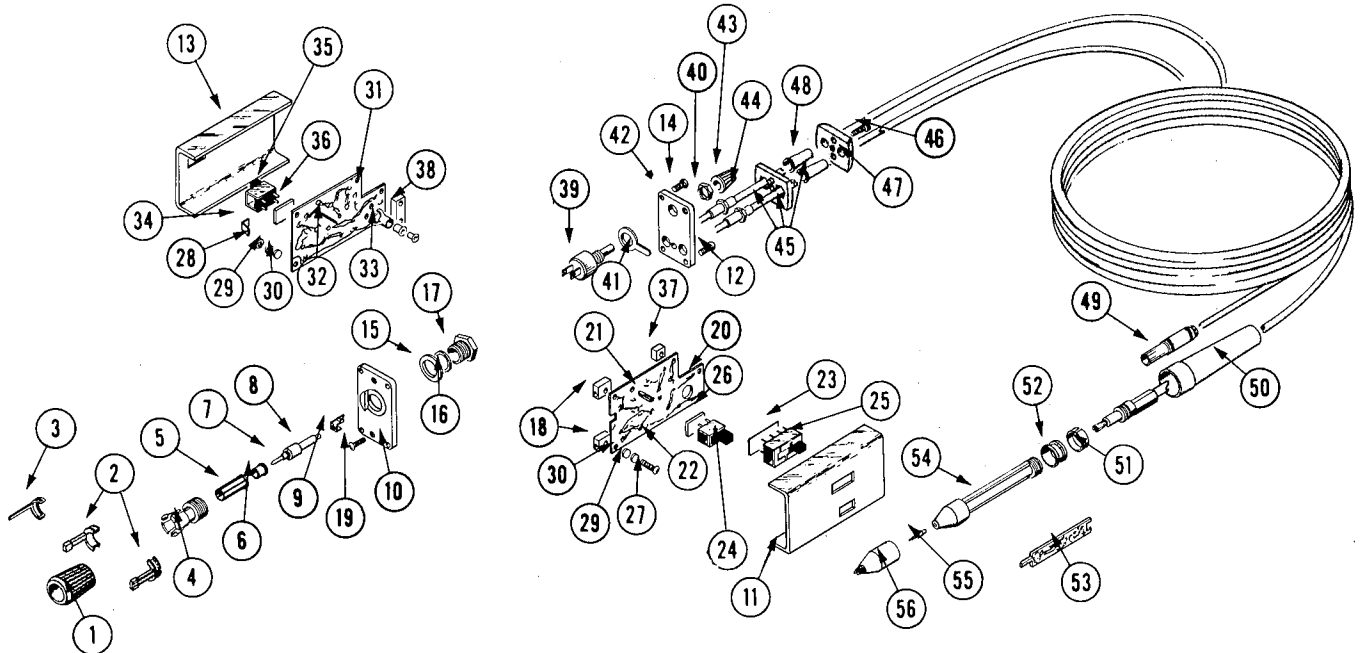


Fig. & Index No.	Tektronix Part No.	Serial/Assembly No.		Qty	12345	Name & Description	Mfr.	
		Effective	Dscont				Code	Mfr. Part No.
1-26	386-2400-00			1		..SPACER,PLATE:0.3 X 0.5 X 0.5,BLK DELRIN ..(ATTACHING PARTS FOR CKT BD)		
-27	211-0181-00			5		..SCREW,MACHINE:2-56 X 0.375,PNH,BRS		
-28	220-0627-00			5		..NUT,PLAIN,HEX:2-56 X 0.156 HEX,BRS NP		
-29	210-0053-00	B010100	B046190	10		..WASHER,LOCK:#2 SPLIT,0.02 THK STL		
	210-0001-00	B046191		10		..WASHER,LOCK:#2 INTL,0.013 THK,STL		
-30	210-1008-00	B010100	B046190	10		..WASHER,FLAT:0.09 ID X 0.188 OD X 0.02,BRS ..(END ATTACHING PARTS)		
-31	-----			1		..CKT BD ASSY:H.F. OUTPUT AMPL(SEE A4 REPL)		
-32	131-0787-00			5		..TERMINAL,PIN:0.64 L X 0.025 SQ PH BRZ		
-33	131-1003-00			1		..CONN,RCPT,ELEC:CKT BD MT,3 PRONG		
-34	131-1134-00			2		..CONTACT,ELEC:CKT BD TO SHLD,CU BE NI PL		
-35	-----			1		..SWITCH,SLIDE:0.5A,120VDC,CKT BD MT ..(SEE S300 REPL)		
-36	386-2400-00			1		..SPACER,PLATE:0.3 X 0.5 X 0.5,BLK DELRIN		
-37	386-2270-00			1		..SUPPORT,CKT BD:TOP		
-38	386-2267-00	B010100	B073445	1		..SUPPORT,CKT BD:REAR		
	386-2267-02	B073446		1		..SUPPORT,CKT BD:REAR		
-39	-----			1		..RESISTOR,VAR:(SEE R200 REPL) ..(ATTACHING PARTS)		
-40	210-0583-00			1		..NUT,PLAIN,HEX:0.25-32 X 0.312,BRS CD PL		
-41	210-0223-00			1		..TERMINAL,LUG:0.26 ID,LOCKING,BRZ TIN PL ..(END ATTACHING PARTS)		
-42	386-2265-00			1		..PANEL,FRONT:OUTPUT AMPLIFIER		
-43	366-0494-04			1		..KNOB:GY,0.127 ID X 0.5 OD X 0.531 H		
	213-0153-00			1		..SETSCREW:5-40 X 0.125,STL		
-44	175-1276-00			1		..CA ASSY,SP,ELEC:3,26 AWG,54.0 L		
-45	175-1359-02			1		..CABLE ASSY,RF:50 OHM COAX,5,26 AWG,77.0 L ..(ATTACHING PARTS)		
-46	211-0183-00			1		..SCREW,CAP:4-40 X 0.5,SCH,STL,CD PL,HEX REC		
-47	352-0219-00			1		..HOLDER,CA NIP:CHARCOAL GRAY ACETAL		
-48	200-1063-00			1		..CABLE NIP,ELEC:0.143-0.17 ID X 0.718 L,GY ..(END ATTACHING PARTS)		
-49	131-0778-00			1		..CONN,PLUG,ELEC:'LEMO',2 MALE,2 FEMALE		
-50	204-0533-00			1		..BODY,PROBE:OUTER		
-51	131-1271-00			1		..CONTACT,ELEC:READOUT RING,BRS,CU-SN-ZN PL		
-52	342-0151-00			1		..INSUL,RODOT CON:DELTRIN		
-53	-----			1		..CKT BOARD ASSY:PROBE(SEE A1 REPL)		
-54	204-0532-01			1		..BODY,PROBE:INNER W/INSUL		
-55	206-0200-00			1		..TIP,PROBE:		
-56	015-0222-00			1		..TIP,PROBE:IC TEST		

P6201 Probe

Fig. & Index No.	Tektronix Part No.	Serial/Assembly No.		Qty	12345	Name & Description	Mfr.	
		Effective	Dscont				Code	Mfr. Part No.
2-	010-0376-00			1		ATTEN HD, PROBE:P6201, 10X		
	010-0377-00			1		ATTEN HD, PROBE:P6201, 100X		
-1	015-0222-00			1		.TIP, PROBE: IC TEST		
-2	206-0200-00			1		.TIP, PROBE:		
-3	204-0557-00			1		.BODY, ATTENUATOR: 10X		
	204-0558-00			1		.BODY, ATTENUATOR: 100X		
-4	-----			1		.CKT BOARD ASSY:ATTEN 10X (SEE A2 REPL)		
				1		.CKT BOARD ASSY:ATTEN 100X (SEE A3 REPL)		
-5	136-0252-00			1		..SOCKET, PIN TERM:U/W 0.019 DIA PINS		
-6	131-0845-00			1		..CONTACT, ELEC:CTR, PROBE,CU BE SIL PL		
-7	384-0680-01			1		..PIN, STR, HEADED:0.41 OD X 0.16 L,BRS		
-8	210-1045-00			1		..WASHER, FLAT:0.045 ID X 0.1 OD X 0.01,8RS		
-9	210-1047-00			1		..WASHER, SPR TNSN:Y-SHAPE,NI-BE		
-10	388-0930-00			1		..CIRCUIT BOARD:CAPACITOR ROTOR		
-11	214-0971-00			2		..INSULATOR,MSHR:0.047 ID X 0.203 OD X 0.00 ..25		
-12	344-0102-01			6		..CLIP, ELECTRICAL:PROBE GROUND,CU BE		
-13	342-0150-00			1		..INSULATOR,BSHG:0.3 ID X 0.36 OD X 0.3 L,PC		

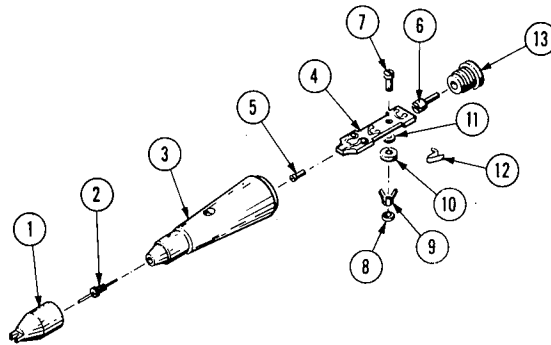
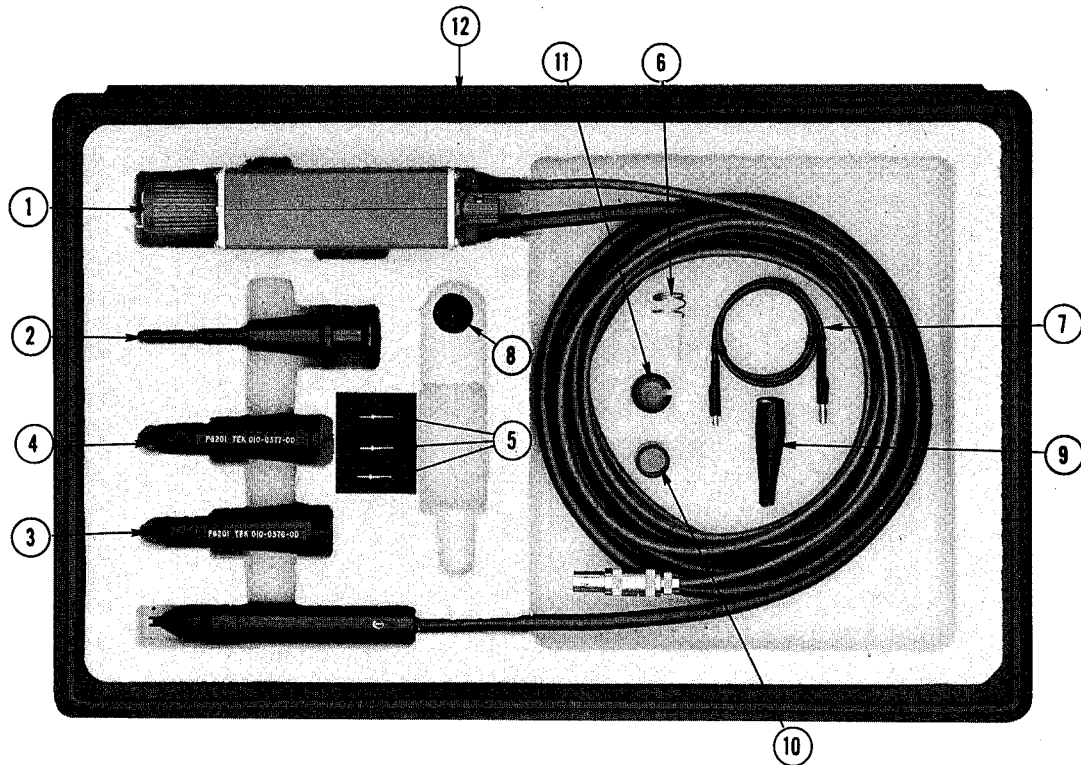
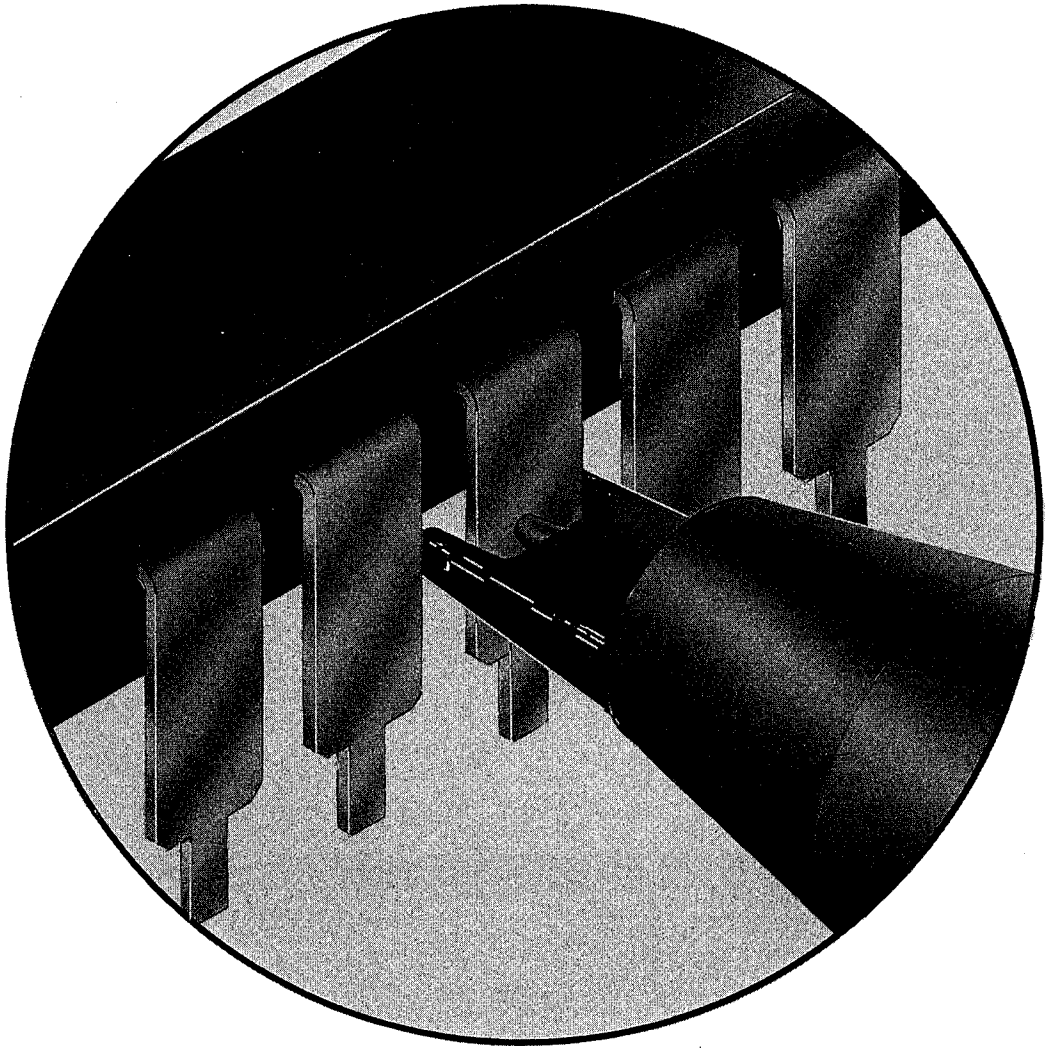


Fig. & Index No.	Tektronix Part No.	Serial/Assembly No. Effective Dscont	Qty	12345	Name & Description	Mfr. Code	Mfr. Part No.
3-							
STANDARD ACCESSORIES							
-2	013-0135-00		1		.TIP, PROBE: RETRACTABLE HOOK		
-3	010-0376-00		1		.ATTEN HD, PROBE: P6201, 10X		
-4	010-0377-00		1		.ATTEN HD, PROBE: P6201, 100X		
-5	206-0200-00		3		.TIP, PROBE:		
-6	131-1302-00		1		.CONTACT, ELEC: GROUNDING, SST		
-7	175-0848-02		1		.LEAD, ELECTRICAL: STRD, 18 AWG, 12.25 L		
-8	103-0164-00		1		.ADPTR, PROBE TIP: TEST POINT		
-9	344-0046-00		1		.CLIP, ELECTRICAL: ALLIGATOR, 1.56 L		
-10	166-0557-00		1		.COVER, GRND: 0.381 ID X 0.43 OD X 0.385 L		
-11	342-0180-00		1		.COVER, GRD CONT: ABS		
-12	016-0156-02		1		.CASE, CRYG, PROBE:		
	070-1306-00		1		.MANUAL, TECH: INSTRUCTION		
	352-0351-00		1		.HOLDER, PROBE: BLACK ABS		





The probe tip (item 56 of the Mechanical Parts List) serves the function of protecting the metal probe tip from damage and as an aid in checking integrated circuits (as illustrated) or other circuitry in close quarters.