

010-6062-03

P6062A

PASSIVE PROBE

INSTRUCTION MANUAL

WARRANTY

All TEKTRONIX instruments are warranted against defective materials and workmanship for one year. Any questions with respect to the warranty should be taken up with your TEKTRONIX Field Engineer or representative.

All requests for repairs and replacement parts should be directed to the TEKTRONIX Field Office or representative in your area. This will assure you the fastest possible service. Please include the instrument Type Number or Part Number and Serial Number with all requests for parts or service.

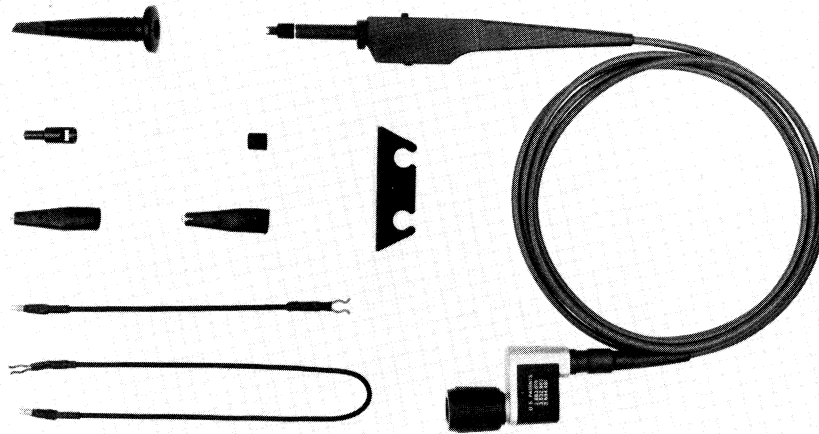
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P6062A PASSIVE PROBE



The P6062A Probe is a selectable 1X or 10X passive probe for use with dc to 100 MHz oscilloscopes that have a 15- to 47-pF input capacitance and a 1 M Ω input resistance.

A ground-reference push button provides a ground-reference signal at either 1X or 10X attenuation. This feature can also be used to determine which trace of a

multitrace display includes the signal from the probe. With a readout oscilloscope, the volts/division readout is electrically corrected to include the probe attenuation when the probe slide switch is set to the 10X position.

Adjustable frequency compensation is provided in the compensation box to match the probe to the oscilloscope input.

SPECIFICATIONS

Electrical

Attenuation: Same as oscilloscope in 1X position, within 3% in 10X position (oscilloscope input, 1 M Ω within 2%).

Input Resistance: Same as oscilloscope in 1X position. 10 M Ω within 0.5% (oscilloscope input, 1 M Ω within 2%) in 10X position.

Approximate Input Capacitance (With Probe Connected and Compensated in 10X Position):

3.5' (1.1 m) Probe		6' (1.8 m) Probe		9' (2.7 m) Probe	
1X	10X	1X	10X	1X	10X
100 pF	13.5 pF	105 pF	14 pF	135 pF	17 pF

Compensation Range: 15 pF to 47 pF.

Maximum Input Voltage: 500 V (dc + peak ac) to 450 kHz derated to 35 V at 10 MHz in 1X position. 500 V (dc + peak ac) to 3.5 MHz derated to 35 V at 50 MHz in 10X position. See Fig. 1.

Minimum Bandwidth (-3 dB) (With Probe Compensated in 10X Position):

3.5' (1.1 m) Probe		6' (1.8 m) Probe		9' (2.7 m) Probe	
1X	10X	1X	10X	1X	10X
8 MHz	*100 MHz	6.7 MHz	*100 MHz	4.5 MHz	*95 MHz

*When used with 466 oscilloscope.

Physical

Net Weight (including accessories): 3.5 foot (1.1 meter) probe: 4.5 oz. (128 grams); 6 foot (1.8 meter) probe: 5.0 oz. (145 grams); 9 foot (2.7 meter) probe: 5.5 oz. (156 grams).

Cable Length: Nominally 3.5 ft (1.1 meters), 6 ft (1.8 meters), or 9 ft (2.7 meters) between strain relief bases.

OPERATING CONSIDERATIONS

Circuit Loading

1X Switch Position. This position loads a circuit more than does the 10X position. The test point will see the oscilloscope input impedance ($1\text{ M}\Omega$ and 15 to 47 pF) paralleled by the capacitance of the probe cable and compensation network.

10X Switch Position. Although the probe dc input resistance is $10\text{ M}\Omega$, it can load a high-impedance circuit and distort the test signal. Therefore, when possible, select low-impedance test points. Also, as signal frequency increases, probe input impedance decreases, which increases the loading effect of the probe (see Fig. 1, 2, and 3).

Probe Grounding

A passive probe is a capacitive divider for high-frequency components. Inductance introduced by a long signal or ground lead will form a series resonant circuit that will "ring" if driven by a signal containing significant frequency components at or above circuit resonance. These oscillations can appear on the oscilloscope display and distort the true waveform. Ground leads and probe tip connections should be kept as short as possible to maintain the best fidelity.

Ground Reference

When the Ground Reference push button switch is pressed with the slide switch in the 1X attenuation position, the probe attenuation changes to 10X. Thus, the test signal is grounded through the probe $9\text{ M}\Omega$ resistor.

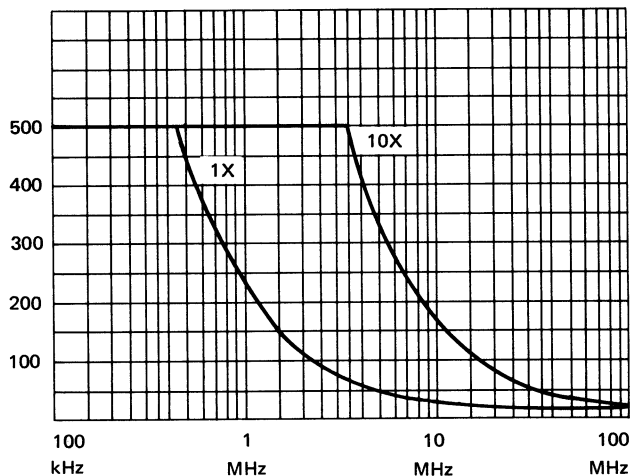


Fig. 1. Input voltage vs. frequency.

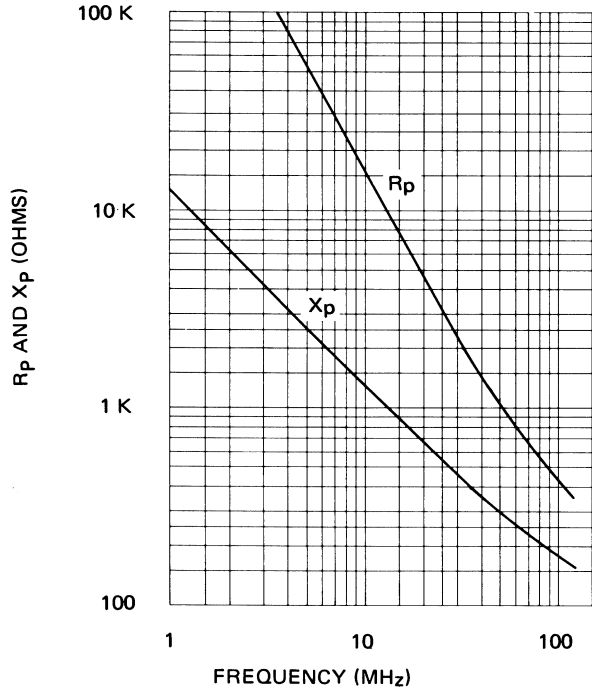


Fig. 2. Typical parallel reactance (X_p) and resistance (R_p) vs. frequency for 3.5 foot (1.1 meter) and 6 foot (1.8 meter) probe.

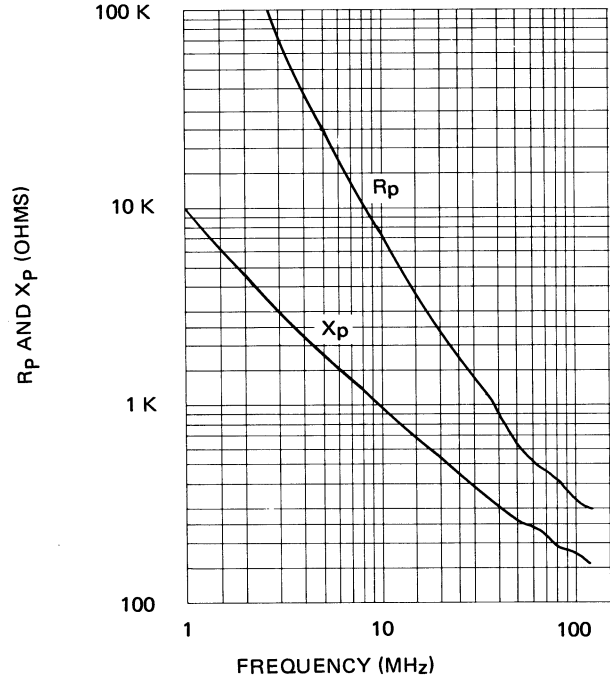


Fig. 3. Typical parallel reactance (X_p) and resistance (R_p) vs. frequency for 9 foot (2.7 meter) probe.

PROBE COMPENSATION

Due to slight variations in the input capacitance between oscilloscope input amplifiers (even on the same type), it is usually necessary to compensate the probe whenever it is transferred from one instrument to another, or from one channel to another for dual (multitrace) units.

Procedure

1. Touch probe tip to oscilloscope calibrator output connector and display several cycles of calibrator square wave at approximately 4 divisions in amplitude.
2. Adjust probe compensation (Fig. 4) for optimum flat top on display (Fig. 5).

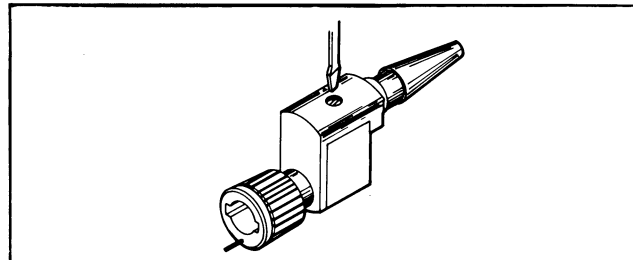


Fig. 4. Compensation adjustment location.

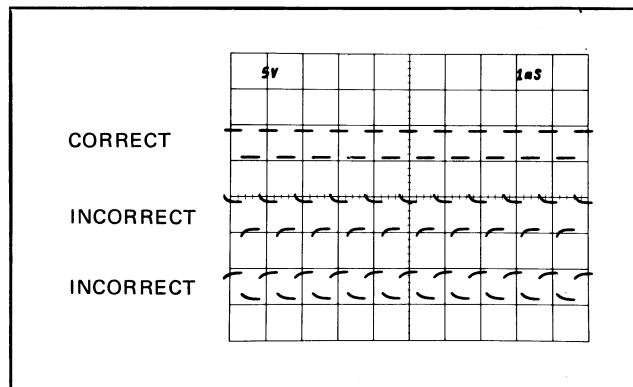
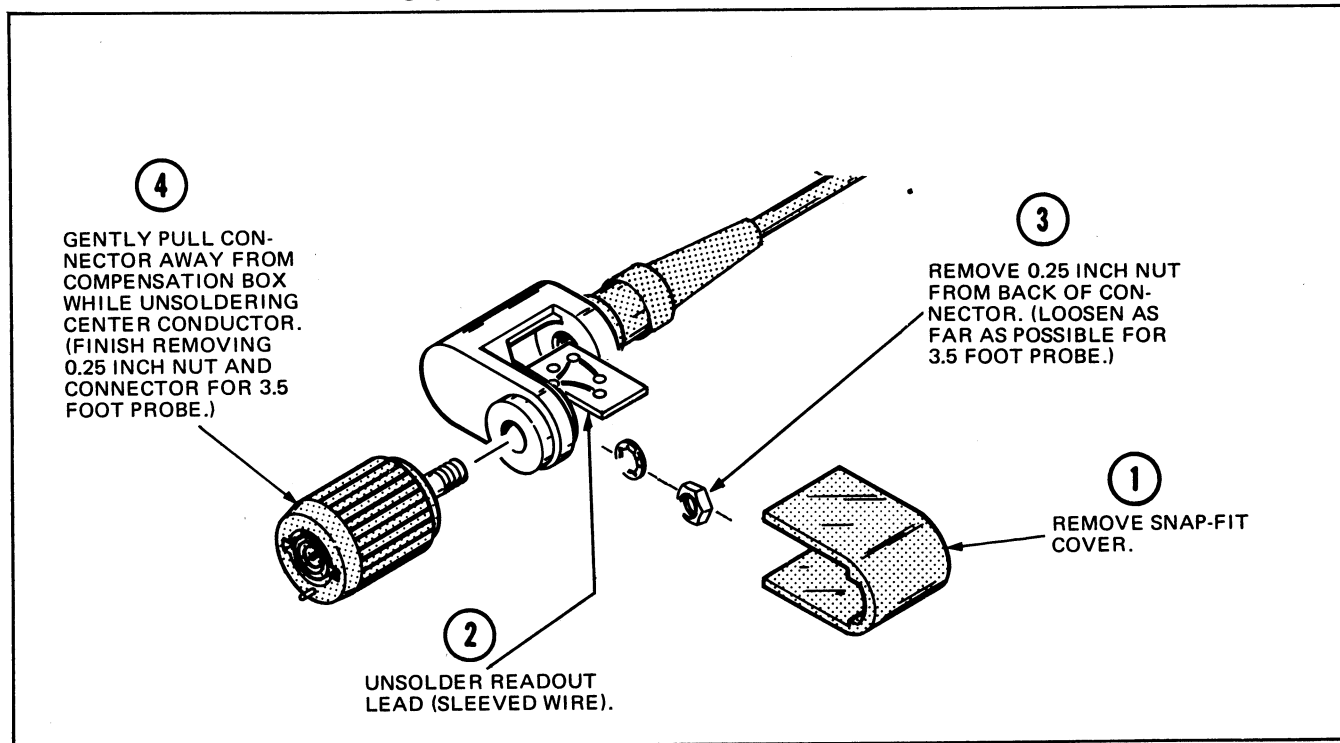
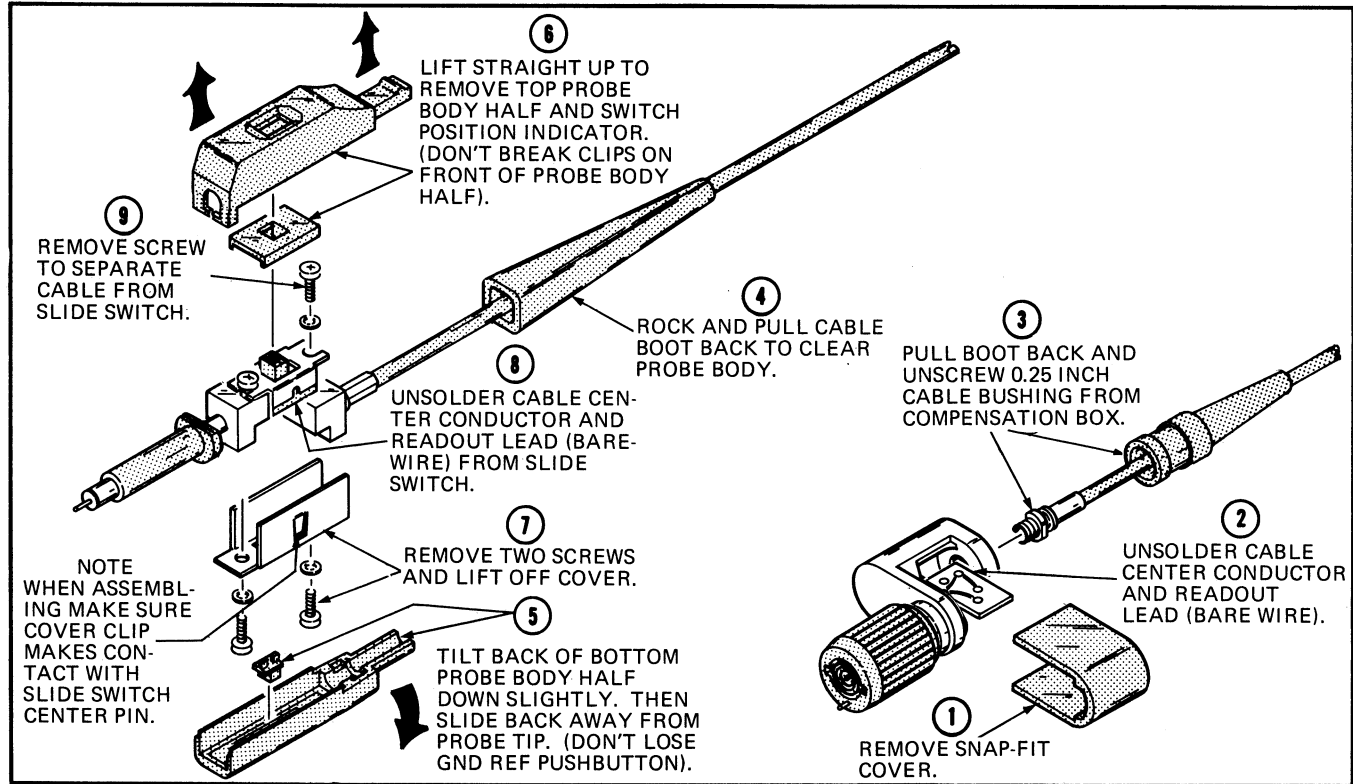


Fig. 5. Probe compensation displays.

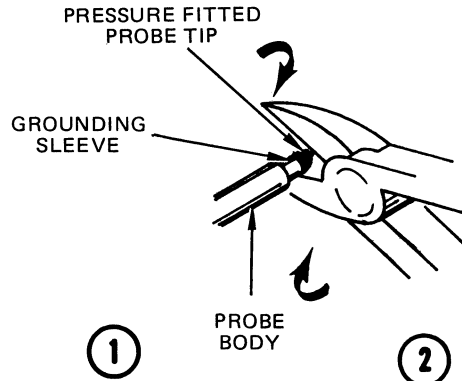
CONNECTOR REPLACEMENT



CABLE REPLACEMENT

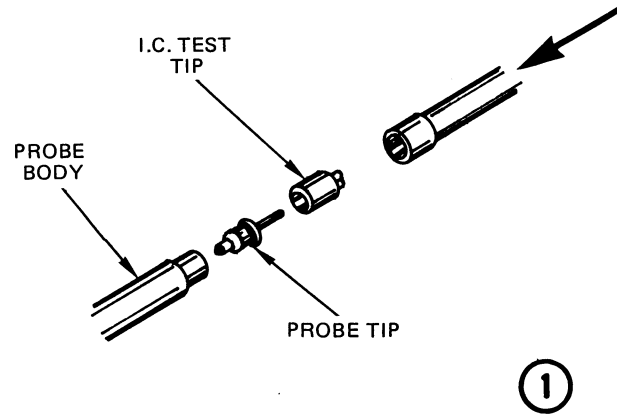


PROBE TIP REMOVAL AND REPLACEMENT



GRIP PROBE TIP BETWEEN PLASTIC AND GROUNDING SLEEVE WITH SHARP WIRE CUTTERS. DON'T SQUEEZE OR NICK GROUNDING SLEEVE.

PULL TIP FREE FROM GROUNDING SLEEVE WITH SIDEWAYS ROCKING MOTION.



ALIGN AS SHOWN AND PRESS INTO POSITION BY TAPPING SHARPLY WITH 3/16 INCH HOLLOW SHAFT NUT DRIVER (OR SIMILAR TOOL)

SCHEMATIC AND REPLACEABLE 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	<i>Name & Description</i>
	<i>Assembly and/or Component</i>
	<i>Attaching parts for Assembly and/or Component</i>
	<i>Detail Part of Assembly and/or Component</i>
	<i>Attaching parts for Detail Part</i>
	<i>Parts of Detail Part</i>
	<i>Attaching parts for Parts of Detail Part</i>

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.

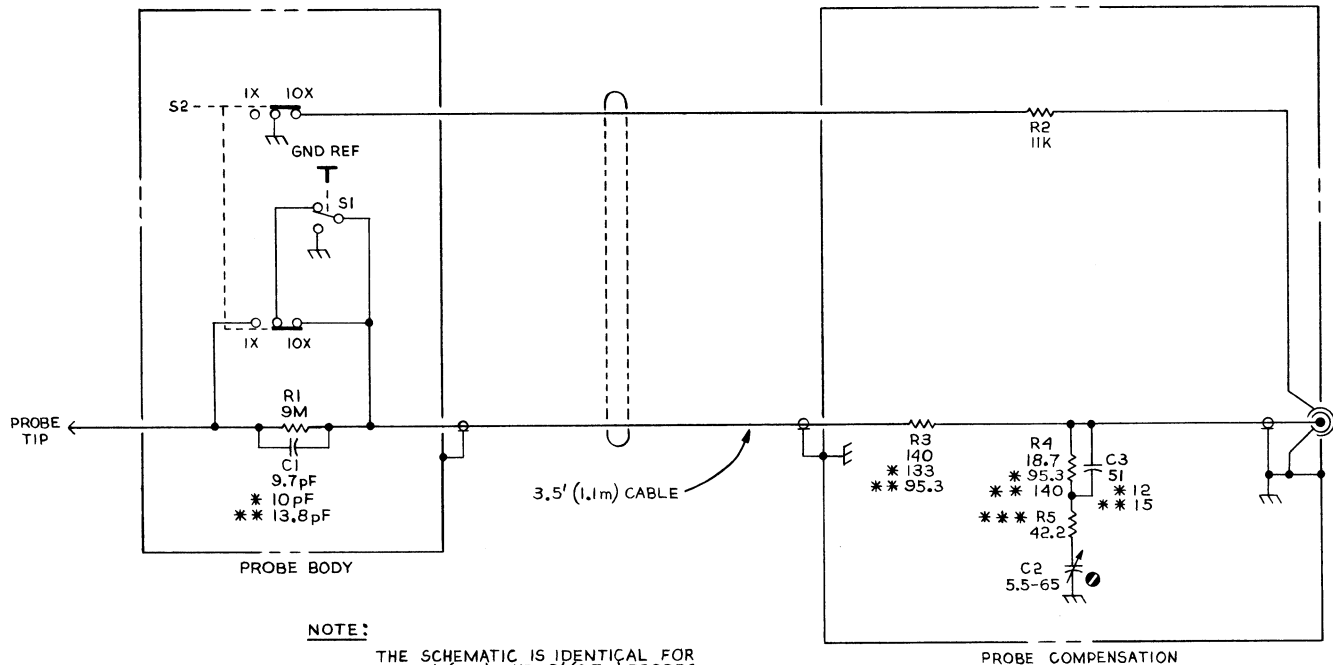
Attaching parts must be purchased separately, unless otherwise specified.

ABBREVIATIONS

ASSY	Assembly	COMP	Composition	IND	Indicator	STL	Steel
ATTEN	Attenuator	CONN	Connector	INSUL	Insulator	SUBASSY	Subassembly
BR5	Brass	DIA	Diameter	INTL	Internal	SW	Switch
BRZ	Bronze	DPDT	Two-pole double-throw	MT	Mount	TECH	Technical
B5HG	Bushing	ELEC	Electrical	OD	Outside diameter	VAR	Variable
CAP	Capacitor	FXD	Fixed	PL	Plate	V	Voltage
CER	Ceramic	GND	Ground	PLSTC	Plastic	W	With
CKT	Circuit	IC	Integrated circuit	PNH	Pan head		
COMP	Compensator	ID	Inside diameter	RET	Retractable		

CROSS INDEX MFR. CODE NUMBER TO MANUFACTURER

MFR. CODE	MANUFACTURER	ADDRESS	CITY,STATE,ZIP
01121	Allen-Bradley Co.	1201 2nd St. South	Milwaukee, WI 53204
72982	Erie Technological Products Inc.	644 W, 12th St.	Erie, PA 16512
73743	Fischer Special Mfg. Co.	446 Morgan St.	Cincinnati, OH 45206
75042	TRW Electronic Components, IRC Fixed Resistors, Philadelphia Division	401 N, Borad St.	Philadelphia, PA 19108
78189	Illinois Tool Works, Inc. Shakeproof Division	St. Charles Road	Elgin, IL 60126
80009	Tektronix, Inc.	P. O. Box 500	Beaverton, OR 97005
80031	Mepco/Electa Inc., A North American Phillips Co.	Columbia Rd.	Morristown, NJ 07960
83385	Central Screw Co.	2530 Crescent Dr.	Broadview, IL 60153
91637	Dale Electronics, Inc.	P. O. Box 609	Columbus, NB 68601



NOTE:

THE SCHEMATIC IS IDENTICAL FOR THE 6' (1.8m) AND 9' (2.7m) PROBES EXCEPT FOR THE VALUES PRECEDED BY ASTERISKS

- * COMPONENT VALUES FOR 6' (1.8m) PROBE
- ** COMPONENT VALUES FOR 9' (2.7m) PROBE
- *** R5 IS DELETED FROM THE 6' (1.8m) AND 9' (2.7m) PROBES

P6062A PROBE

FIG. 6 P6062A PROBE AND STANDARD ACCESSORIES

Fig. & Index No.	Tektronix Part No.	Serial/Model No.		Qty	1	2	3	4	5	Name & Description	Mfr	
		Eff	Dscont								Code	Mfr Part Number
6 -	P6062A			1						PROBE PACKAGE:P6062A,6 FOOT	80009	P6062A
	P6062A OPT 1			1						PROBE PACKAGE:P6062A,3.50 FOOT	80009	P6062A OPT 1
	P6062A OPT 2			1						PROBE PACKAGE:P6062A,9 FOOT	80009	P6062A CPT 2
	-----			-						. PROBE PACKAGE INCLUDES:		
-1	010-6062-00			1						. PROBE:P6062A,3.50 FOOT,W/IC TIP	80009	010-6062-00
	010-6062-02			1						. PROBE:P6062A,6 FOOT,W/IC TIP	80009	010-6062-02
	010-6062-04			1						. PROBE:P6062A,9 FOOT,W/IC TIP	80009	010-6062-04
-2	015-0201-00			1						. . TIP,PROBE:IC TEST(INCLUDED W/PROBE)	80009	015-0201-00
-3	352-0351-00			1						. HOLDER,PROBE:	80009	352-0351-00
-4	206-0114-00			1						. TIP,PROBE:	80009	206-0114-00
-5	013-0107-03			1						. TIP,PROBE:RET HOOK ASSY	80009	013-0107-03
-6	175-0124-01			1						. LEAD,ELEC:PROBE GND,5 INCHES LONG	80009	175-0124-01
-7	175-0125-01			1						. LEAD,ELEC:PROBE GND,12 INCHES LONG	80009	175-0125-01
-8	344-0046-00			2						. CLIP,ELEC:ALLIGATOR TYPE,W/COVER	80009	344-0046-00
-9	166-0404-01			1						. SLEEVE,INSUL:FOR 0.188 DIA PROBE BSHG	80009	166-0404-01
	016-0521-00			1						. POUCH,ACCESSORY:	80009	016-0521-00

Electrical Parts List—P6062A

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
010-6062-00 (3.50 FT)					
C1 ¹					
C2	281-0205-00		CAP.,VAR,PLSTC:5.5-65PF,100V	80031	C010EA-60E
C3	283-0299-00		CAP.,FXD,CER DI:51PF,5%,500V	72982	8121N501A510J
R1 ¹					
R2	317-0113-00		RES.,FXD,COMP:11K OHM,5%,0.125W	01121	BB1135
R3	322-0111-00		RES.,FXD,FILM:140 OHM,1%,0.25W	91637	MFF1421G140R0F
R4	321-0027-00		RES.,FXD,FILM:18.7 OHM,1%,0.125W	75042	CEAT0-18R70F
R5	321-0061-00		RES.,FXD,FILM:42.2 OHM,1%,0.125W	75042	CEAT0-42R20F
010-6062-02 (6 FT)					
C1 ²					
C2	281-0205-00		CAP.,VAR,PLSTC:5.5-65PF,100V	80031	C010EA-60E
C3	283-0168-00		CAP.,FXD,CER DI:12PF,5%,100V	72982	8111-100C0G0120J
R1 ²					
R2	317-0113-00		RES.,FXD,COMP:11K OHM,5%,0.125W	01121	BB1135
R3	322-0109-00		RES.,FXD,FILM:133 OHM,1%,0.25W	91637	MFF1421G133R0F
R4	322-0095-00		RES.,FXD,FILM:95.3 OHM,1%,0.25W	91637	MFF1421G95R30F

¹Available as assembly 206-0213-00 only.

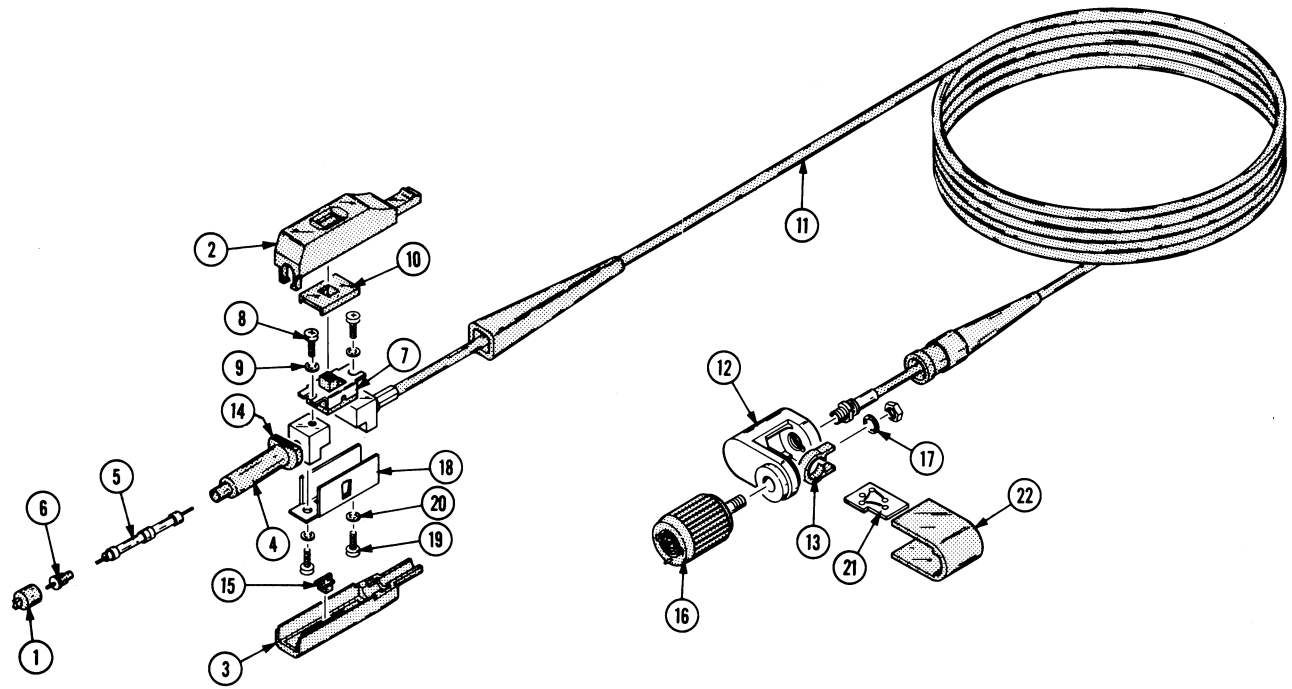
²Available as assembly 206-0212-00 only.

Electrical Parts List—P6062A

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
010-6062-04 (9 FT)					
C1 ¹					
C2	281-0205-00		CAP.,VAR,PLSTC:5.5-65PF,100V	80031	C010EA-60E
C3	283-0166-00		CAP.,FXD,CER DI:15PF,5%,50V	72982	8111-059C0G150J
R1 ¹					
R2	317-0113-00		RES.,FXD,COMP:11K OHM,5%,0.125W	01121	BB1135
R3	322-0095-00		RES.,FXD,FILM:95.3 OHM,1%,0.25W	91637	MFF1421G95R30F
R4	322-0114-00		RES.,FXD,FILM:150 OHM,1%,0.25W	91637	MFF1421G150ROF

¹Available as assembly 206-0211-00 only.

FIG. 7 EXPLODED



MECHANICAL PARTS LIST

Fig. & Index No.	Tektronix Part No.	Serial/Model No.		Qty	Name & Description	Mfr	
		Eff	Dscont			Code	Mfr Part Number
7-	010-6062-00			1	PROBE:P6062A,3.50 FOOT	80009	010-6062-00
	010-6062-02			1	PROBE:P6062A,6 FOOT	80009	010-6062-02
	010-6062-04			1	PROBE:P6062A,9 FOOT	80009	010-6062-04
	-----			-	. PROBE INCLUDES:		
-1	015-0201-00			1	. PROBE TIP:IC TEST	80009	015-0201-00
-2	204-0595-00			1	. BODY HALF,PROBE:TOP	80009	204-0595-00
-3	204-0596-01			1	. BODY HALF,PROBE:BOTTOM	80009	204-0596-01
-4	204-0598-00			1	. BODY,PROBE:	80009	204-0598-00
-5	206-0211-00			1	. ATTEN SUBASSY:PROBE SERIES 1X-10X(9FT)	80009	206-0211-00
	206-0212-00			1	. ATTEN SUBASSY:PROBE SERIES 1X-10X(6FT)	80009	206-0212-00
	206-0213-00			1	. ATTEN SUBASSY:PROBE SERIES 1X-10X(3.5FT)		
	-----			-	. . EACH ATTEN SUBASSY INCLUDES:		
-6	206-0191-00			1	. . TIP,PROBE:	80009	206-0191-00
-7	260-1470-01			1	. SWITCH,SLIDE DPDT:0.5A,125VAC,CKT BOARD MT (ATTACHING PARTS)	80009	260-1470-01
-8	211-0136-00			2	. SCREW,MACHINE:2-56 X 0.094 INCH,PNH STL	73743	OBD
-9	210-0001-00			2	. WASHER,LOCK:INTL,0.092 ID X 0.18 OD,STL	78189	1202-00-00-0541C
					- - - * - - -		
-10	214-2041-00			1	. IND,SW POSITION:	80009	214-2041-00
-11	175-1499-00			1	. CABLE ASSY,ELEC:3.5FT	80009	175-1499-00
	175-1507-00			1	. CABLE ASSY,ELEC:6FT	80009	175-1507-00
	175-1508-00			1	. CABLE ASSY,ELEC:9FT	80009	175-1508-00
-12	426-0690-04			1	. FRAME,COMP BOX:	80009	426-0690-04
-13	352-0381-00			1	. HOLDER,CAP:	80009	352-0381-00
-14	343-0447-00			1	. COLLAR,GND CLIP:MOLD PLSTC	80009	343-0447-00
-15	366-1529-00			1	. PUSHBUTTON:PROBE	80009	366-1529-00
-16	131-1070-00			1	. CONN,PLUG,FLEC:BNC (ATTACHING PARTS)	80009	131-1070-00
-17	210-0056-00			1	. WASHER,LOCK:SPLIT,0.047 ID X 0.32 OD,P BRZ	83385	OBD
	220-0572-00			1	. NUT,PLAIN,HEX.:10-32 X 0.25 INCH,PL BRZ	73743	OBD
					- - - * - - -		

MECHANICAL PARTS LIST

Fig. & Index No.	Tektronix Part No.	Serial/Model No.		Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
		Eff	Dscont									
-18	131-1532-00			1	.					CONTACT, ELEC: (ATTACHING PARTS)	80009	131-1532-00
-19	211-0136-00			2	.					SCREW, MACHINE: 2-56 X 0.094 INCH, PNH STL	73743	OED
-20	210-0001-00			2	.					WASHER, LOCK: INTL, 0.092 ID X 0.18 OD, STL	78189	1202-00-00-0541C
										- - - * - - -		
-21	670-3503-00			1	.					CKT BOARD ASSY: 3.5 FOOT PROBE	80009	670-3503-00
-22	200-1158-14			1	.					COVER, COMP BOX: 3.5 FOOT PROBE	80009	200-1158-14
	200-1158-15			1	.					COVER, COMP BOX: 6 FOOT PROBE	80009	200-1158-15
	200-1158-16			1	.					COVER, COMP BOX: 9 FOOT PROBE	80009	200-1158-16
	070-1671-00			1	.					MANUAL, TECH: (NOT SHOWN)	80009	070-1671-00