

TEKTRONIX®

067-0712-00

M2 GATE DELAY
CALIBRATION FIXTURE

INSTRUCTION MANUAL

Tektronix, Inc.
P.O. Box 500
Beaverton, Oregon 97005

Serial Number _____

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.

Specifications and price change privileges reserved.

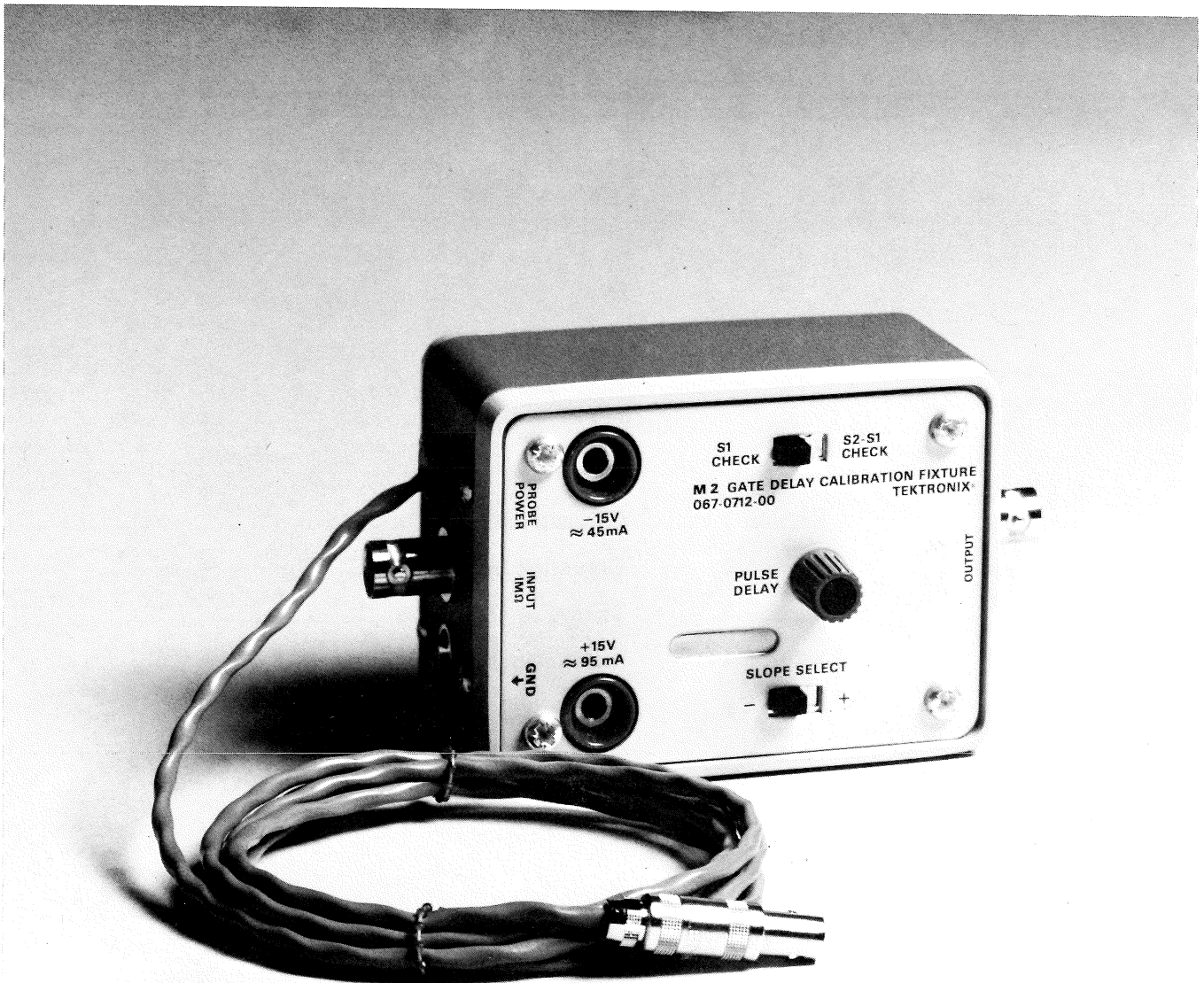
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Fig. 1. The Tektronix Type 067-0712-00 Calibration Fixture is a signal delay device. It is intended to provide a signal delay output that is variable from 40 to 600 nanoseconds at a minimum amplitude of 0.5 volt.

CHARACTERISTICS

Characteristics	Performance Requirement
ELECTRICAL	
Signal Input	
Resistance	1 M Ω , within 5%
Sensitivity Range	± 100 mV to ± 200 mV
Maximum Safe Input Voltage	100 V
Signal Output	
Amplitude	0.5 V minimum P-P into 50 Ω
Pulse Delay Range	15 ns to 600 ns
Power Input ¹	
DC Voltage	
+15 V	<100 mA
-15 V	50 mA
ENVIRONMENTAL	
Temperature Range	0 to 50°C
Altitude Range	0 to 15,000 ft
PHYSICAL	
Height	2.6 inches (6.60 cm)
Width	2.7 inches (6.86 cm)
Length	4.8 inches (12.19 cm)
Weight	10 ounces (284 grams)

¹The instrument is intended to be powered by the oscilloscope (main-frame) probe power output. If the oscilloscope being used is not equipped with probe power connectors, any power supply capable of delivering ± 15 volts at the above current ratings can be used via the front-panel banana receptacles.

OPERATING INSTRUCTIONS

FUNCTIONS OF CONTROLS AND CONNECTORS

Mode Switch

S₂ - S₁ CHECK—Selects the negative output pulse transition after the variable delay.

S₁ CHECK—Selects the positive output pulse transition after the variable delay.

PULSE DELAY Control

Determines the delay time between the input pulse transition and the first transition of the output pulse.

SLOPE SELECT Switch

Selects the negative or positive-going transition of the M2 input pulse for start of delay.

INPUT Connector

Provides input of the pulse to be delayed.

OUTPUT Connector

Provides output of the delayed pulse.

Probe Power Cable

Provides means of connecting to oscilloscope probe power connector.

Power Input Jack (–15 V)

Provides input for external –15-volt power supply.

Power Input Jack (+15 V)

Provides input for external +15-volt power supply.

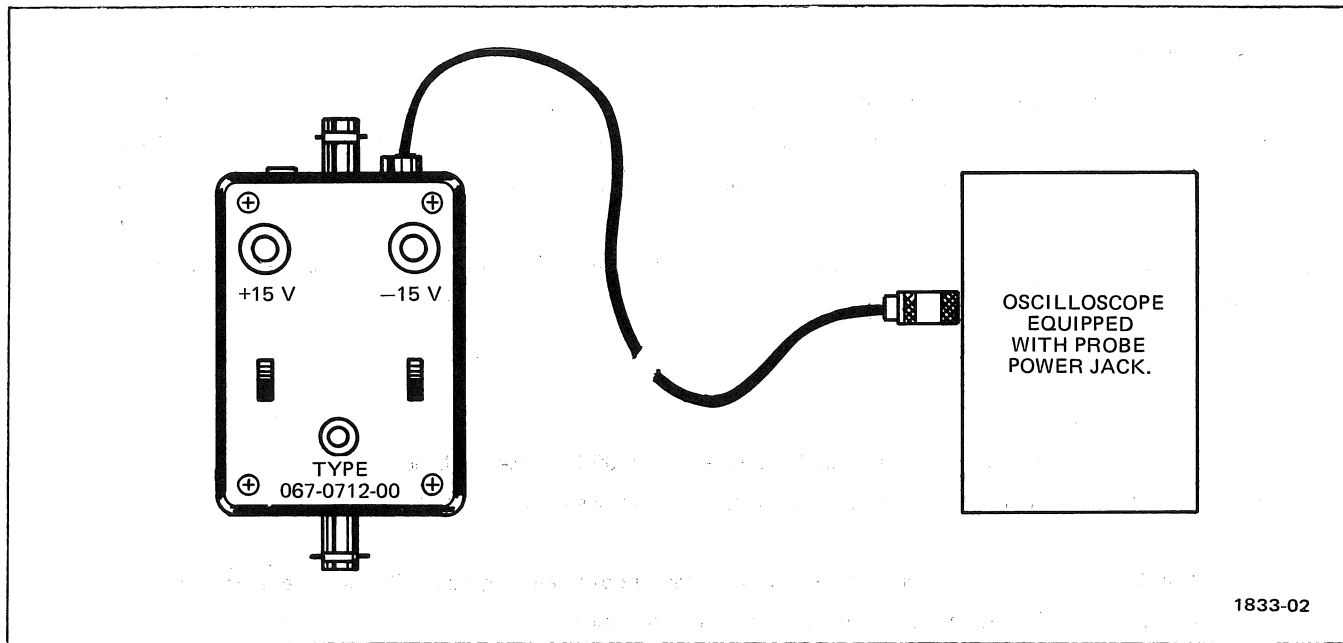
Ground Jack

Provides reference for +15-volt and –15-volt power supplies.

POWER CONNECTIONS

The M2 Gate Delay Calibration Fixture circuitry requires an external source of +15-volts and –15-volts. An external power source can be connected to the unit by one of two methods.

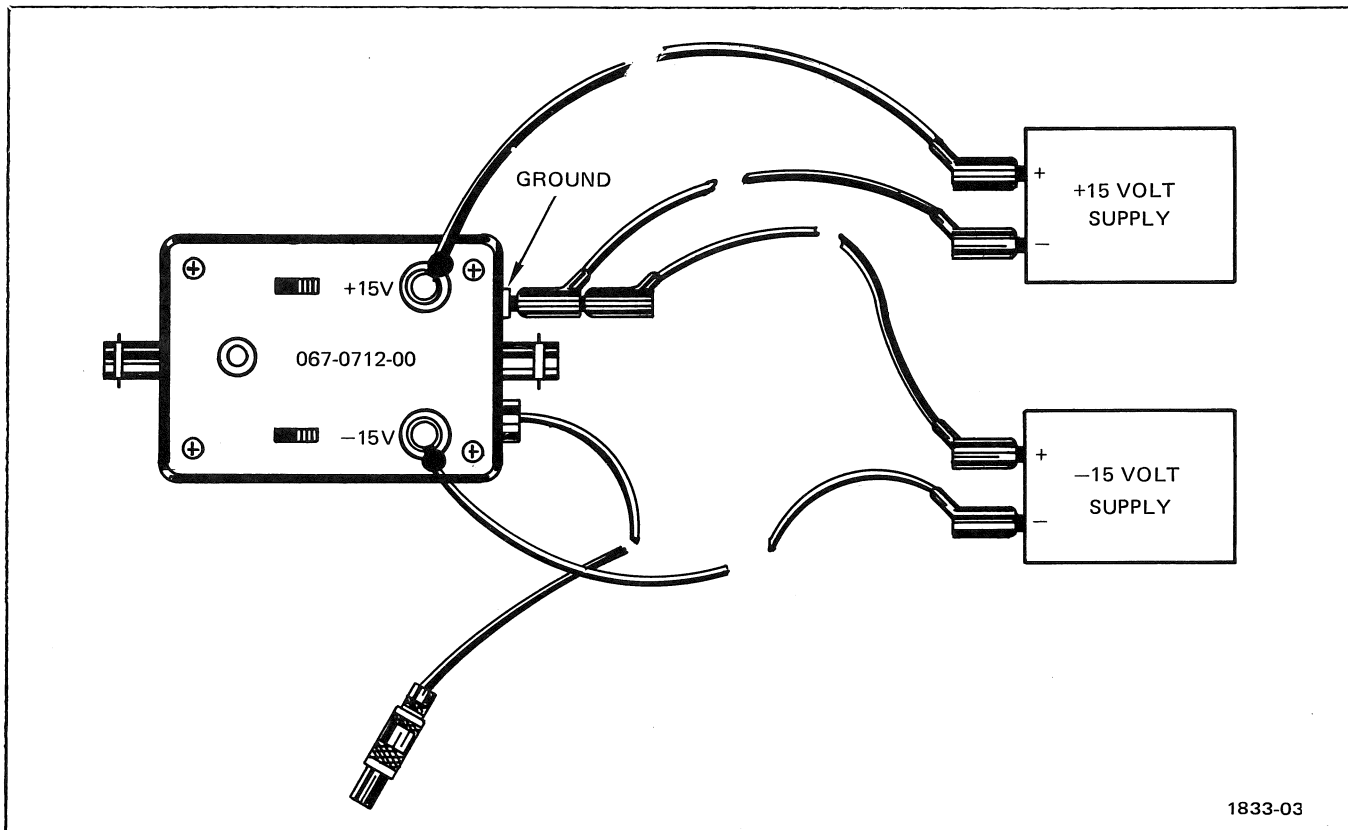
1. The oscilloscope probe power output can be connected to the Calibration Fixture using the compatible cable and connector extending from the unit. Refer to Fig. 2. If the oscilloscope is not equipped for probe power, use method 2.



1833-02

Fig. 2. Calibration Fixture power supplied from the oscilloscope probe power output.

2. The +15-volt and -15-volt jacks can be connected to a dual power supply. The common leads of each supply must be connected to the ground (chassis) connector on the unit. Refer to Fig. 3.



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Fig. 3. Calibration Fixture power supplied from separate power supplies.

CONTROLS

The SLOPE SELECT switch polarity setting is determined by the INPUT pulse transition. If the INPUT pulse transition changes from a negative voltage to zero volts, the proper polarity setting would be +. If the INPUT pulse transition changes from a positive voltage to zero volts, the proper polarity setting would be —.

The SLOPE SELECT switch and the time-base slope control should always be set to the same polarity to ensure proper triggering.

PULSE DELAY

A pulse to the INPUT connector can be delayed up to 600 nanoseconds before appearing at the OUTPUT connector. The PULSE DELAY control setting determines the amount of delay.

The S₁ CHECK Mode-switch setting allows a delayed positive-going pulse (S₁ measurement point) to be output as the INPUT pulse transition moves toward zero volts.

The S₂ - S₁ CHECK Mode-switch setting inverts the delayed pulse to a negative-going output (becoming the S₂ measurement point) as the INPUT pulse transition moves toward zero volts.

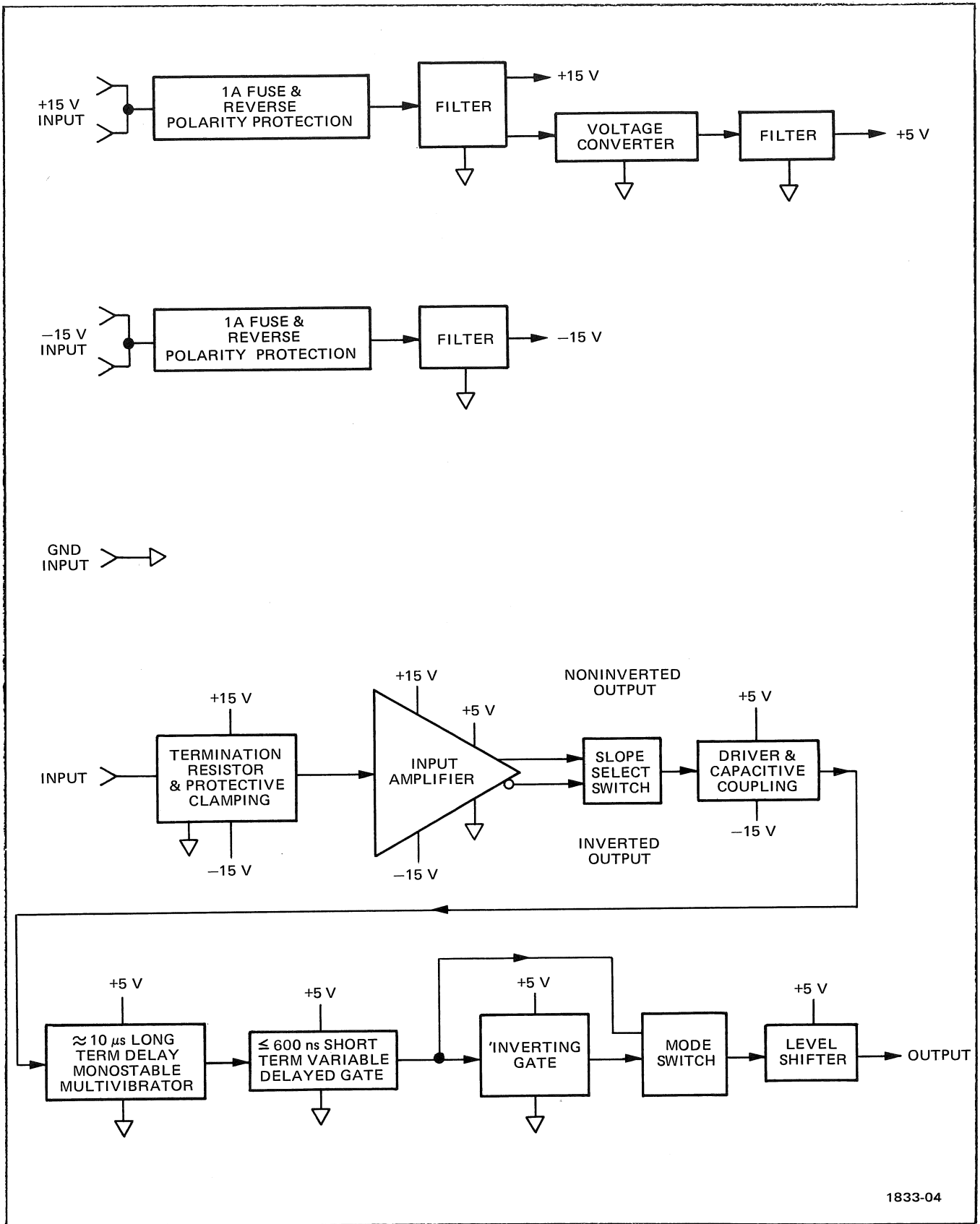
The Calibration Fixture Mode switch should always be set to the same position as the M2 Mode switch.

THEORY OF OPERATION

The instrument consists of several major circuit blocks. Refer to Block Diagram in Fig. 4. The +15 and -15-volt inputs each have reverse polarity protection and a filter circuit. The +15-volt supply is further converted to furnish a filtered +5-volt supply.

The input signal passes through a protective clamping circuit and termination resistor to a differential-output amplifier. The inverted or non-inverted amplifier output is selected by the SLOPE SELECT switch. The signal is then passed through an emitter-follower driver and capacitively coupled to a long-term delay monostable-multivibrator circuit and a short-term delayed gate circuit.

The Mode switch (S_2 - S_1 CHECK, S_1 CHECK) selects the short term delayed gate signal either directly or after it has passed through the inverting gate circuit. The signal then passes through a level shifter which references the output signal to a compatible M2 level.



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Fig. 4. M2 Gate Delay Calibration Fixture block diagram.

MAINTENANCE

GENERAL

This section contains a complete calibration procedure for the calibration fixture. The instrument will not often require calibration, but will need an occasional adjustment as components age or are replaced.

Calibration is a valuable part of preventive maintenance, since many types of minor troubles may be discovered and corrected before they become serious enough to disable the instrument.

All front-panel controls are in capital letters e.g., PULSE DELAY. The only internal adjustment is the amplifier balance (Amp Bal) adjustment.

To ensure that the calibration fixture maintains its performance, check the calibration after each 500 hours of operation or every six months if used intermittently.

Many of the components are standard electronic parts that may be purchased locally. However, all parts can be obtained from Tektronix through our local field engineer or representative. Before ordering, consult the parts list of this manual to determine the value, tolerance and Tektronix part number.

TEST EQUIPMENT REQUIRED

Oscilloscope	Tektronix 7704A or 7904.
7D12 A/D Converter	Tektronix 7D12 A/D Converter.
Pulse Generator	Tektronix Type 109 Pulse Generator.
Time-base unit	Tektronix 7B50, 7B70 Time Base, or 7B92 Dual Time Base.
Dc Voltmeter Resolution: 100 mV Range: 0 to 4 V.	Tektronix DM 501 Digital Multimeter with Power Module.
10X Probe (3.5 ft. recommended)	Tektronix P6053B or P6054A.
Capacitor Test Fixture	See construction, Figure 4.
T Connector Connectors, 2 BNC female, and 1 BNC male (two required)	Tektronix Part 103-0030-00.
Adapter BNC female to GR	Tektronix Part 017-0063-00.

Adapter BNC male to GR	Tektronix Part 017-0064-00.
93-ohm termination Connectors, BNC male and BNC female	Tektronix Part 011-0056-00.
Dc power supply 2 Vdc into 93Ω	Tektronix PS 501 Power Supply with power module.
Dual dc power supply +15 V and -15 V @ 100 mA and 50 mA (delete if oscilloscope has probe power output).	Tektronix PS 502 or PS 503 Power Supply with Power Module.
50-ohm coaxial cable (two required) One 18-inch One 42-inch	Tektronix Part 012-0076-00. Tektronix Part 012-0057-01.
Adapter BNC female to dual banana plug	Tektronix Part 103-0090-00.

CALIBRATION PROCEDURE

Adjust Amplifier Balance

Remove the calibration fixture bottom plate (four bottom screws on the wrap-around). Connect the instrument to a source of power. Connect a voltmeter across test points TP1 and TP2. See Fig. 9.

Adjust Amp Bal adjustment, R36, (refer to Fig. 9) for a meter reading of 0.000 volts within 100 millivolts.

Disconnect the meter leads and replace the bottom plate.

PERFORMANCE CHECK

Check Delay Range

1. Remove left side cover from 7D12 A/D Converter and left side cover from M2 module.
2. Remove oscilloscope left side cover.
3. Insert M2 module into 7D12 A/D Converter and install in left vertical compartment of indicator oscilloscope.
4. Install time-base unit in horizontal plug-in compartment of indicator oscilloscope.

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5. Turn indicator oscilloscope power on.
6. Set indicator oscilloscope modes to display time base and 7D12 A/D Converter. Select 7D12 A/D Converter as internal trigger source for time base.
7. Set indicator oscilloscope readout and intensity controls to obtain usable readout and display. Adjust focus and astigmatism controls as necessary for well defined characters in display.
8. Install appropriate connectors, termination, and Capacitor Test Fixture on 109 Pulse Generator as shown in Fig. 5.
9. Set 109 Pulse Generator amplitude control to zero and voltage range control to external power.

CAUTION

In order to avoid damage to connectors and attenuator it may be necessary to place 109 Pulse Generator on an object, such as a book, to align connectors.

10. Connect open end of 93-ohm termination directly (without using cables) to M2 input connector.
11. Connect -2 volts from dc power supply to BNC T connector on 109 Pulse Generator. See Fig. 5.
12. Connect output of GATE DELAY CALIBRATION FIXTURE to 7D12 A/D Converter Triggering Ext In connector using an 18-inch coaxial cable.
13. Connect 10X probe from GATE DELAY CALIBRATION FIXTURE INPUT connector to M2 logic board test point, TP 329. See Fig. 6. Connect probe ground strap to M2 chassis ground.
14. Set controls as follows:

7D12 A/D Converter

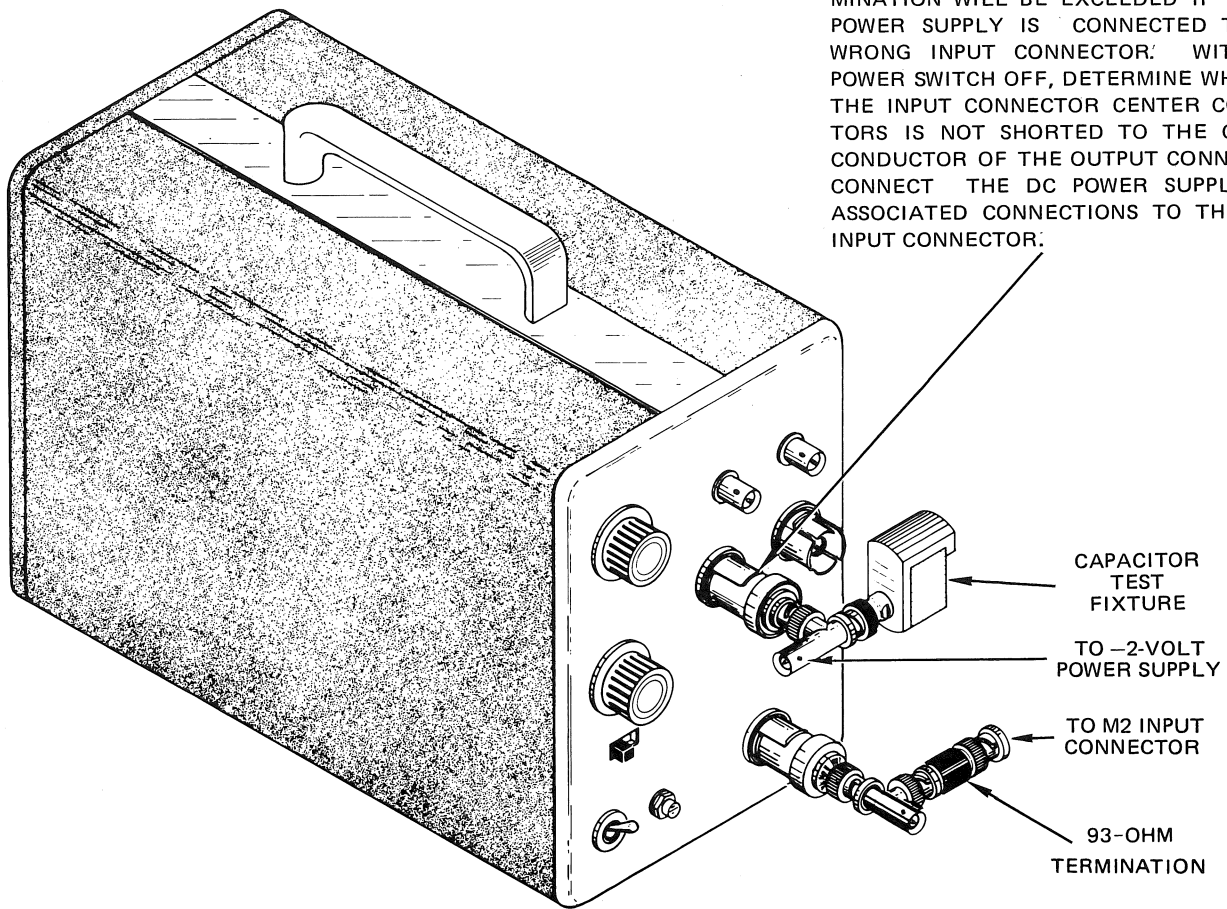
Vertical Display Atten	5 X
Triggering	Ext
Gate	On

M2

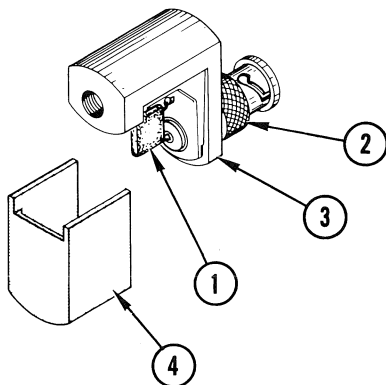
Mode	S1
Range	2 V
Coupling	Out Dc

GATE DELAY CALIBRATION FIXTURE

PULSE DELAY	Midrange
Mode Switch	S1
SLOPE SELECT	+



CAPACITOR TEST FIXTURE



- | | | |
|---|-------------|-------------------------------|
| ① | 283-0211-00 | 0.1 μ F CERAMIC CAPACITOR |
| ② | 131-0602-00 | CONNECTOR, RECEPTACLE |
| ③ | 426-0690-01 | FRAME, COMPENSATION BOX |
| ④ | 200-1158-00 | COVER, COMPENSATION BOX |

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Fig. 5. 109 Pulse Generator test setup.

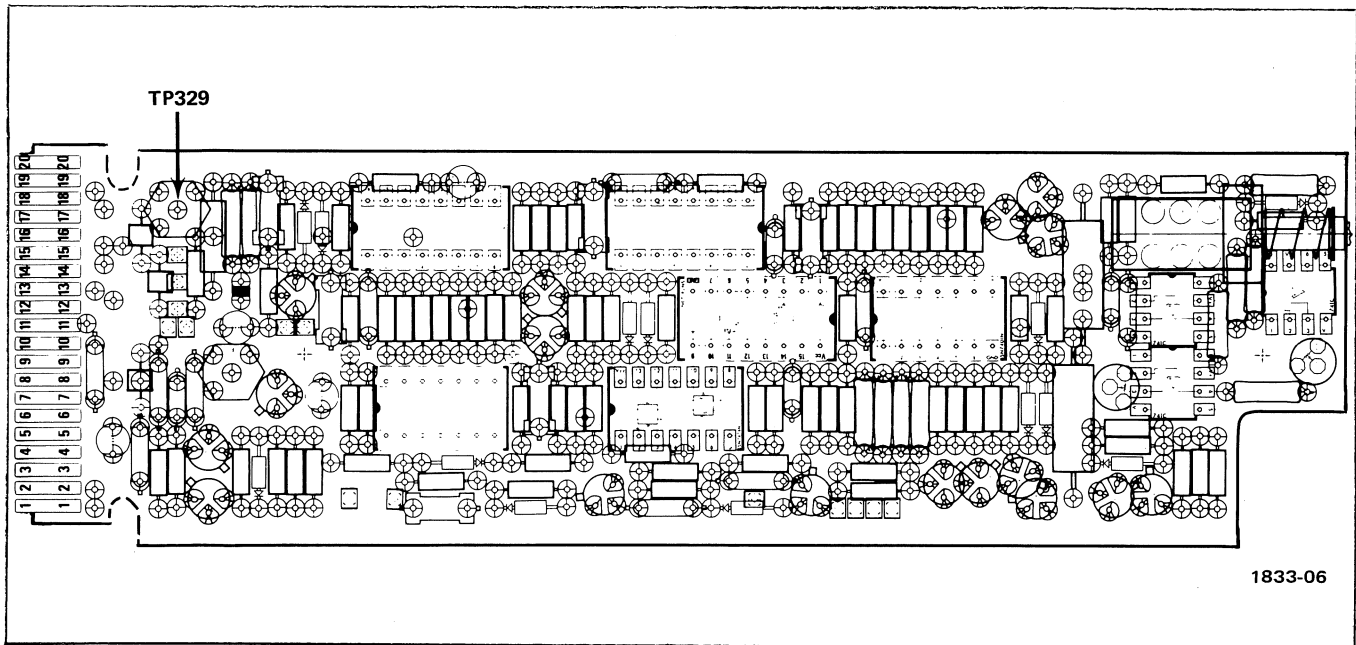


Fig. 6. (A3) M2 Logic board test point location.

15. Set time base to trigger on positive slope at a sweep rate of 10 nanoseconds per division.
16. Turn 109 Pulse Generator power on.
17. Set time-base triggering for stable display.
18. CHECK—Rotate PULSE DELAY control fully counterclockwise. Gate waveform (S₁ measurement point) must be less than 4 divisions (40 nanoseconds) from vertical display —1-volt reference point. See Fig. 7.
19. Set time-base sweep rate to 100 nanoseconds per division.
20. CHECK—Rotate PULSE DELAY control fully clockwise. Gate waveform (S₁ measurement point) should be greater than 6 divisions (600 nanoseconds) from vertical display —1-volt reference point. See Fig. 8.
21. Set M2 Mode switch to Out S₂ - S₁.
22. CHECK—Set GATE DELAY CALIBRATION FIXTURE Mode switch to S₂ - S₁ CHECK. Gate waveform transitions should change polarity.
23. CHECK—Gate waveform (S₂ measurement point) should be greater than 6 divisions (600 nanoseconds) from vertical display —1-volt reference point.
24. Set time-base sweep rate to 10 nanoseconds per division.

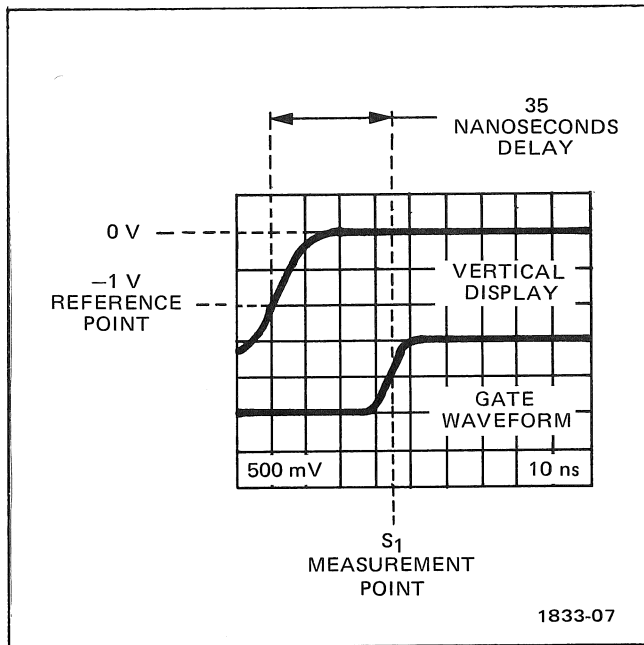


Fig. 7. Simulated display of gate waveform delayed less than 40 nanoseconds.

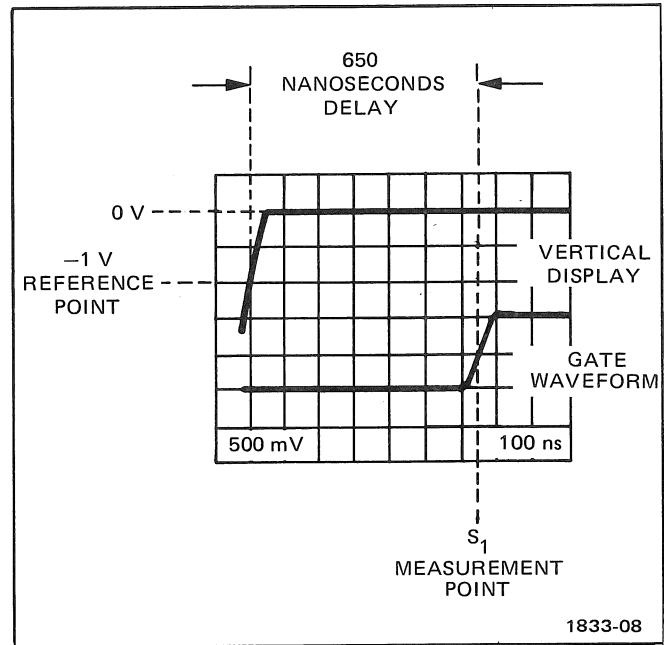


Fig. 8. Simulated display of gate waveform delayed more than 500 nanoseconds.

25. CHECK—Rotate PULSE DELAY control fully counterclockwise. Gate waveform (S_2 measurement point) should be less than 4 divisions (40 nanoseconds) from vertical display -1 -volt reference point.
26. Set SLOPE SELECT switch to $-$.
27. Set time base to trigger on negative slope.
28. Set dc power supply output for $+2$ volts.
29. CHECK—Gate waveform (S_2 measurement point) should be less than 4 divisions (40 nanoseconds) from vertical display $+1$ -volt reference point.
30. Set time base sweep rate to 100 nanoseconds per division.
31. CHECK—Rotate PULSE DELAY control fully clockwise. Gate waveform (S_2 measurement point) should be greater than 6 divisions (600 nanoseconds) from vertical display $+1$ -volt reference point.
32. Set M2 Mode switch to S_1 .
33. CHECK—Set GATE DELAY CALIBRATION FIXTURE Mode switch to S_1 CHECK. Gate waveform transitions should reverse polarity.
34. CHECK—Gate waveform (S_1 measurement point) should be greater than 6 divisions (600 nanoseconds) after vertical display $+1$ -volt reference point.

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35. Set time base sweep rate to 10 nanoseconds per division.

36. CHECK—Rotate PULSE DELAY control fully counterclockwise. Gate waveform (S₁ measurement point) should be less than 4 divisions (40 nanoseconds) from vertical display +1-volt reference point.

37. Disconnect all test connections and equipment.

38. Replace 7D12 A/D Converter, M2 and oscilloscope side covers.

This completes the calibration procedure for the M2 GATE DELAY CALIBRATION FIXTURE.

DIAGRAMS AND CIRCUIT BOARD ILLUSTRATIONS

Symbols and Reference Designators

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

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

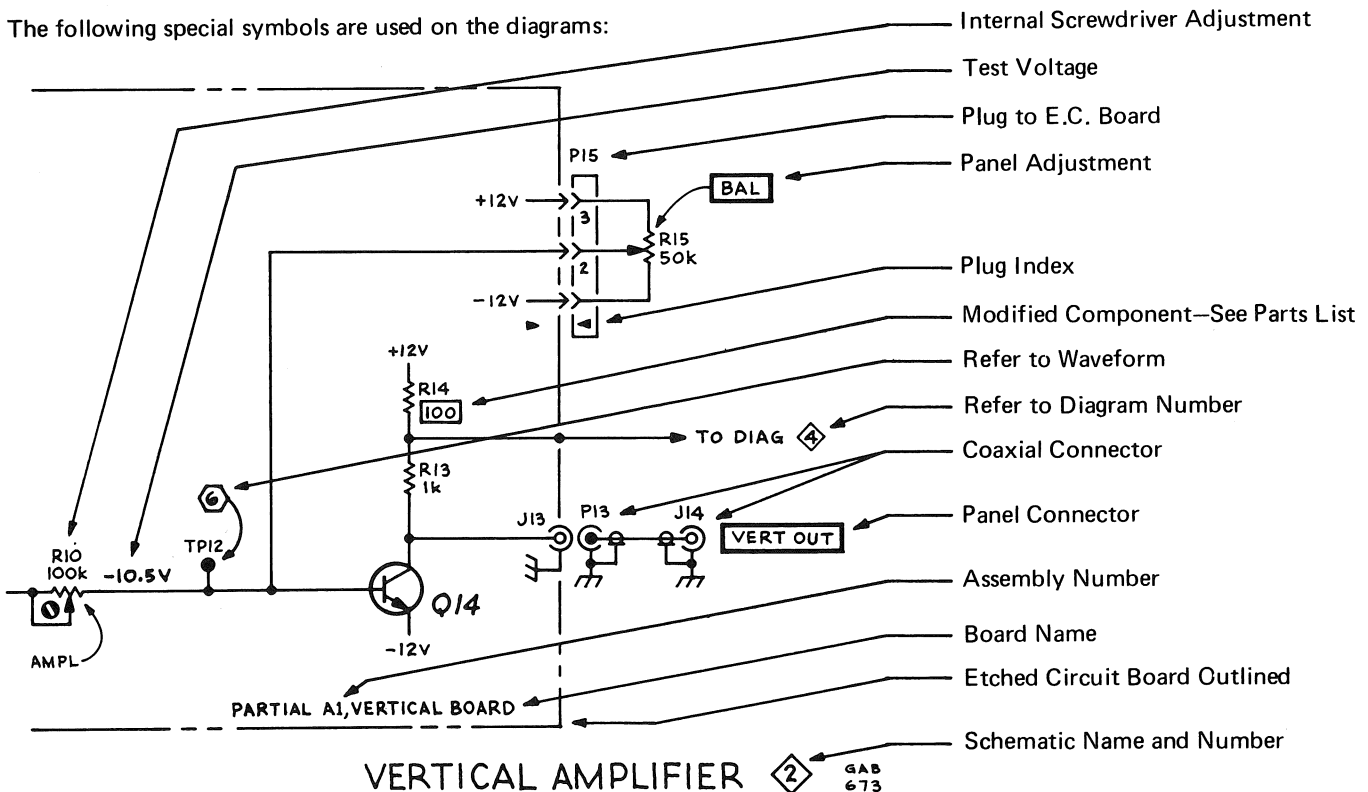
Symbols used on the diagrams are based on USA Standard Y32.2-1967.

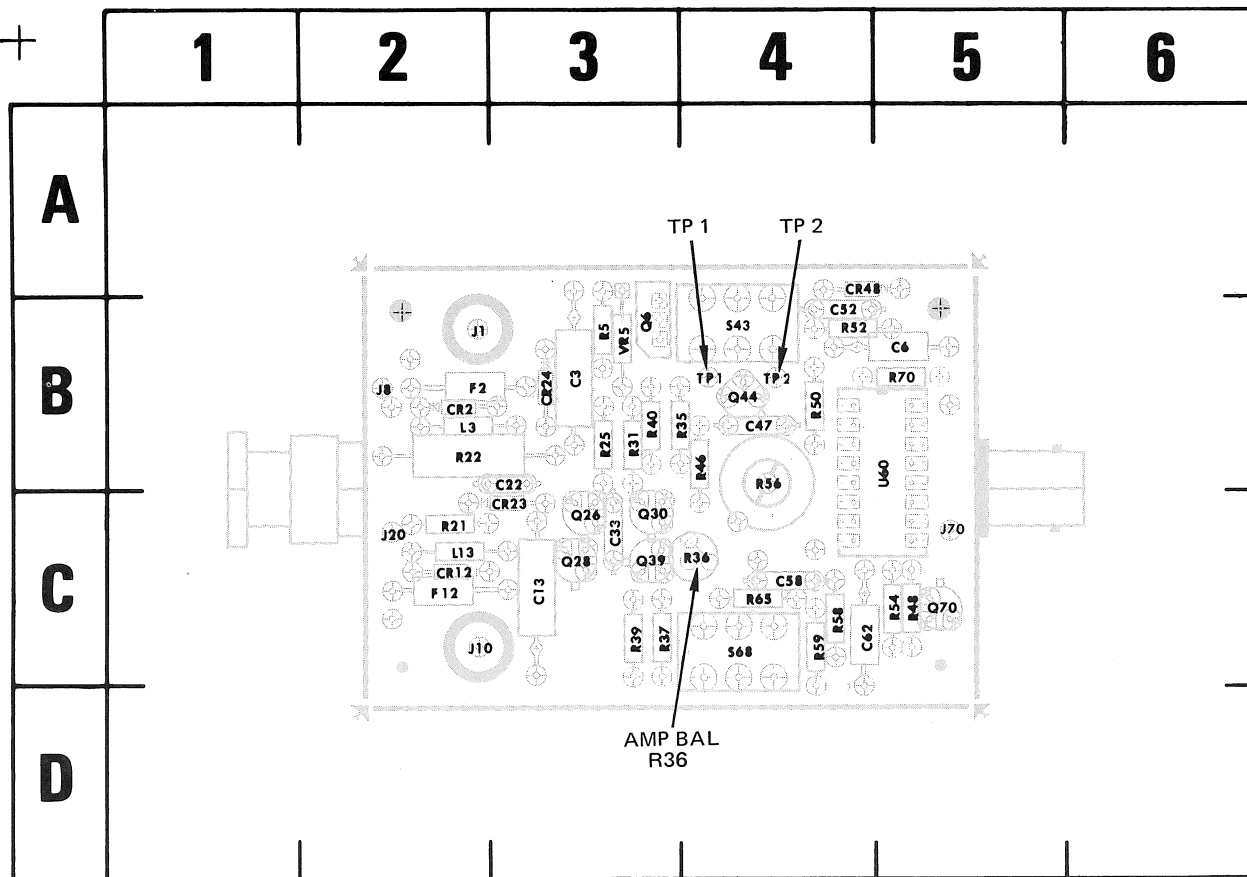
Logic symbology is based on MIL-STD-806B in terms of positive logic. Logic symbols depict the logic function performed and may differ from the manufacturer's data.

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

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

The following special symbols are used on the diagrams:



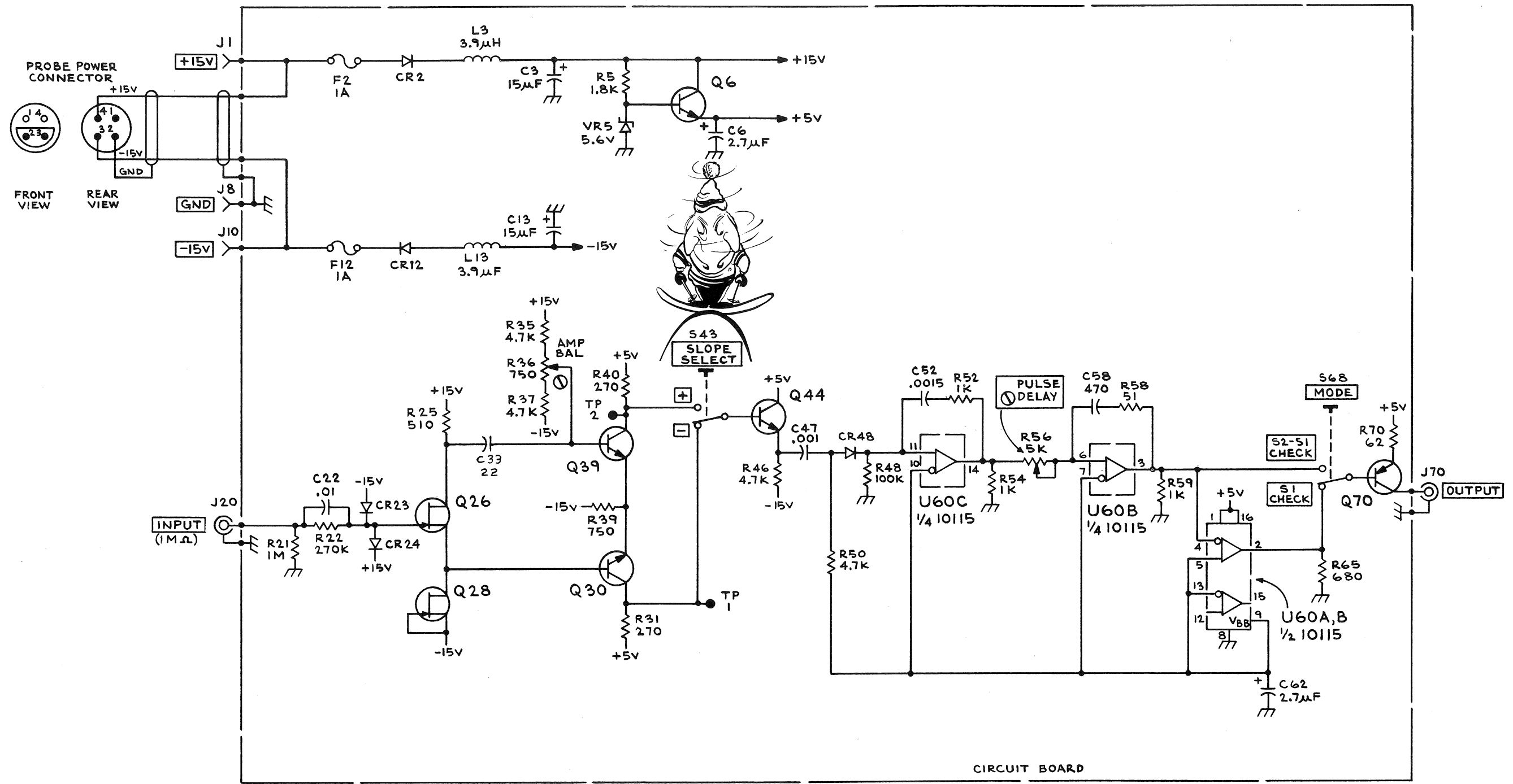


CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC	CKT NO	GRID LOC
C3	3B	CR12	2C	J20	2C	Q44	4B	R39	3C	R70	5B
C6	5B	CR23	3C	J70	5C	Q70	5C	R40	3B		
C13	3C	CR24	3B					R46	4B	S43	4B
C22	3B	CR48	4A	L3	2B	R5	3B	R48	5C	S68	4C
C33	3C			L13	2C	R21	2C	R50	4B		
C47	4B	F2	2B	Q6	3B	R22	2B	R52	4B	TP1	4B
C52	4B	F12	2C	Q26	3C	R25	3B	R54	5C	TP2	4B
C58	4C	J1	2B	Q28	3C	R31	3B	R56	4B		
C62	4C	J8	2B	Q30	3C	R35	4B	R58	4C	U60	5B
CR2	2B	J10	2C	Q39	3C	R36	4C	R59	4C		
						R37	3C	R65	4C	VR5	3B

Fig. 9. M2 Gate Delay Calibration Fixture circuit board.

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(A)

M2 GATE DELAY CALIBRATION FIXTURE

ELECTRICAL REPLACEABLE PARTS LIST

PARTS ORDERING INFORMATION

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

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

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

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

SPECIAL NOTES AND SYMBOLS

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

ITEM NAME

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

ABBREVIATIONS

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

CROSS INDEX MFR. CODE NUMBER TO MANUFACTURER

MFR.CODE	MANUFACTURER	ADDRESS	CITY,STATE,ZIP
00853	Sangamo Electric Co., S. Carolina Div.	P. O. Box 128	Pickens, SC 29671
01121	Allen-Bradley Co.	1201 2nd St. South	Milwaukee, WI 53204
01295	Texas Instruments, Inc., Components Group	P. O. Box 5012	Dallas, TX 75222
02735	RCA Corp., Solid State Division	Route 202	Somerville, NY 08876
03508	General Electric Co., Semi-Conductor Products Dept.	Electronics Park	Syracuse, NY 13201
04713	Motorola, Inc., Semiconductor Products Div.	5005 E. McDowell Rd.	Phoenix, AZ 85008
07263	Fairchild Semiconductor, A Div. of Fairchild Camera and Instrument Corp.	464 Ellis St.	Mountain View, CA 94040
07910	Teledyne Semiconductor	12515 Chadron Ave.	Hawthorne, CA 90250
12954	Dickson Electronics Corp.	8700 E. Thomas Rd.	Scottsdale, AZ 85252
56289	Sprague Electric Co.		North Adams, MA 01247
71400	Bussman Mfg., Division of McGraw Edison Co.	2536 W. University St.	St. Louis, MO 63107
72982	Erie Technological Products, Inc.	644 W. 12th St.	Erie, PA 16512
73138	Beckman Instruments, Inc., Helipot Div.	2500 Harbor Blvd.	Fullerton, CA 92634
80009	Tektronix, Inc.	P. O. Box 500	Beaverton, OR 97005

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
	670-3639-00		CKT BOARD ASSY:M2 GATE DELAY	80009	670-3639-00
C3	290-0135-00		CAP.,FXD,ELCTLT:15UF,20%,20V	12954	TS2K20-156
C6	290-0263-00		CAP.,FXD,ELCTLT:2.7UF,10%,15V	56289	150D275X9015A2
C13	283-0135-00		CAP.,FXD,CER DI:100PF,5%,500V	56289	40C321A
C22	283-0003-00		CAP.,FXD,CER DI:0.01UF,+80-20%,150V	72982	855-547E103Z
C33	283-0601-00		CAP.,FXD,MICA D:22PF,10%,300V	00853	D15-3C220K0
C47	283-0065-00		CAP.,FXD,CER DI:0.001UF,5%,100V	72982	805-505B102J
C52	283-0114-00		CAP.,FXD,CER DI:0.0015UF,5%,200V	72982	805-509E152J
C58	283-0597-00		CAP.,FXD,MICA D:470PF,10%,300V	00853	D153E471K0
C62	290-0263-00		CAP.,FXD,ELCTLT:2.7UF,10%,15V	56289	150D275X9015A2
CR2	152-0107-00		SEMICONV DEVICE:SILICON,375V,400MA	80009	152-0107-00
CR12	152-0107-00		SEMICONV DEVICE:SILICON,375V,400MA	80009	152-0107-00
CR23	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	07910	CD8220
CR24	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	07910	CD8220
CR48	152-0322-00		SEMICONV DEVICE:SILICON,15V	01295	A1108
F2	159-0114-00		FUSE,CARTRIDGE:1A,125VAC,FAST-BLOW	71400	GFA1
F12	159-0114-00		FUSE,CARTRIDGE:1A,125VAC,FAST-BLOW	71400	GFA1
L3	108-0245-00		COIL,RF:3.9UH	80009	108-0245-00
L13	108-0245-00		COIL,RF:3.9UH	80009	108-0245-00
Q6	151-0365-00		TRANSISTOR:SILICON,NPN	03508	D42C8
Q26	151-1040-00		TRANSISTOR:SILICON,FE-N-CHANNEL,DUAL	02735	2N140
Q28	151-1042-00		SEMICONV DVC SE-MATCHED PAIR FET	01295	2N5245
Q30	151-0367-00		TRANSISTOR:SILICON,NPN,SEL FROM 3571TP	80009	151-0367-00
Q39	151-0367-00		TRANSISTOR:SILICON,NPN,SEL FROM 3571TP	80009	151-0367-00
Q44	151-0367-00		TRANSISTOR:SILICON,NPN,SEL FROM 3571TP	80009	151-0367-00
Q70	151-0221-00		TRANSISTOR:SILICON,PNP	07263	S24849
R5	315-0182-00		RES.,FXD,COMP:1.8K OHM,5%,0.25W	01121	CB1825
R21	315-0105-00		RES.,FXD,COMP:1M OHM,5%,0.25W	01121	CB1055
R22	304-0274-00		RES.,FXD,COMP:270K OHM,10%,1W	01121	GB2741
R25	315-0511-00		RES.,FXD,COMP:510 OHM,5%,0.25W	01121	CB5115
R31	315-0270-00		RES.,FXD,COMP:27 OHM,5%,0.25W	01121	CB2705
R35	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R36	311-1262-00		RES.,VAR,NONWIR:750 OHM,10%,0.50W	73138	62PT-3620-751K
R37	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R39	315-0751-00		RES.,FXD,COMP:750 OHM,5%,0.25W	01121	CB7515
R40	315-0271-00		RES.,FXD,COMP:270 OHM,5%,0.25W	01121	CB2715
R46	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R48	315-0104-00		RES.,FXD,COMP:100K OHM,5%,0.25W	01121	CB1045
R50	315-0472-00		RES.,FXD,COMP:4.7K OHM,5%,0.25W	01121	CB4725
R51	315-0510-00		RES.,FXD,COMP:51 OHM,5%,0.25W	01121	CB5105
R52	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R54	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R56	311-0310-00		RES.,VAR,NONWIR:5K OHM,20%,0.50W	01121	W-7350A
R59	315-0102-00		RES.,FXD,COMP:1K OHM,5%,0.25W	01121	CB1025
R65	315-0681-00		RES.,FXD,COMP:680 OHM,5%,0.25W	01121	CB6815
R70	315-0620-00		RES.,FXD,COMP:62 OHM,5%,0.25W	01121	CB6205
S43	260-0723-00		SWITCH,SLIDE:DPDT,0.5A,125VAC	80009	260-0723-00
S68	260-0723-00		SWITCH,SLIDE:DPDT,0.5A,125VAC	80009	260-0723-00
U60	156-0308-00		MICROCIRCUIT,LI:QUAD DIFF LINE RECIEVER	04713	MC10115L
VR5	152-0175-00		SEMICONV DEVICE:ZENER,0.4W,5.6V,5%	04713	1N752A



MECHANICAL REPLACEABLE PARTS LIST

PARTS ORDERING INFORMATION

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

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

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

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

SPECIAL NOTES AND SYMBOLS

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

FIGURE AND INDEX NUMBERS

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

INDENTATION SYSTEM

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

1	2	3	4	5	<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. The separation symbol --- * --- indicates the end of attaching parts.

Attaching parts must be purchased separately, unless otherwise specified.

ITEM NAME

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

ABBREVIATIONS

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

CROSS INDEX MFR. CODE NUMBER TO MANUFACTURER

MFR.CODE	MANUFACTURER	ADDRESS	CITY, STATE, ZIP
0000A	Lemo USA	2015 2nd St.	Berkley, CA 94710
01295	Texas Instruments, Inc., Components Group	P. O. Box 5012	Dallas, TX 75222
28520	Heyman Mfg. Co.	147 N. Michigan Ave.	Kenilworth, NJ 07033
70485	Atlantic India Rubber Works, Inc.	571 W. Polk St.	Chicago, IL 60607
73138	Beckman Instruments, Inc., Helipot Div.	2500 Harbor Blvd.	Fullerton, CA 92634
73743	Fischer Special Mfg. Co.	446 Morgan St.	Cincinnati, OH 45206
74445	Holo-Krome Co.	31 Brook St. West	Hartford, CT 06110
78189	Illinois Tool Works, Inc. Shakeproof Division	St. Charles Road	Elgin, IL 60126
79807	Wrought Washer Mfg. Co.	2100 S. O Bay St.	Milwaukee, WI 53207
80009	Tektronix, Inc.	P. O. Box 500	Beaverton, OR 97005
83385	Central Screw Co.	2530 Crescent Dr.	Broadview, IL 60153
95712	Bendix Corp., The Electrical Components Div., Microwave Devices Plant	Hurricane Road	Franklin, IN 46131

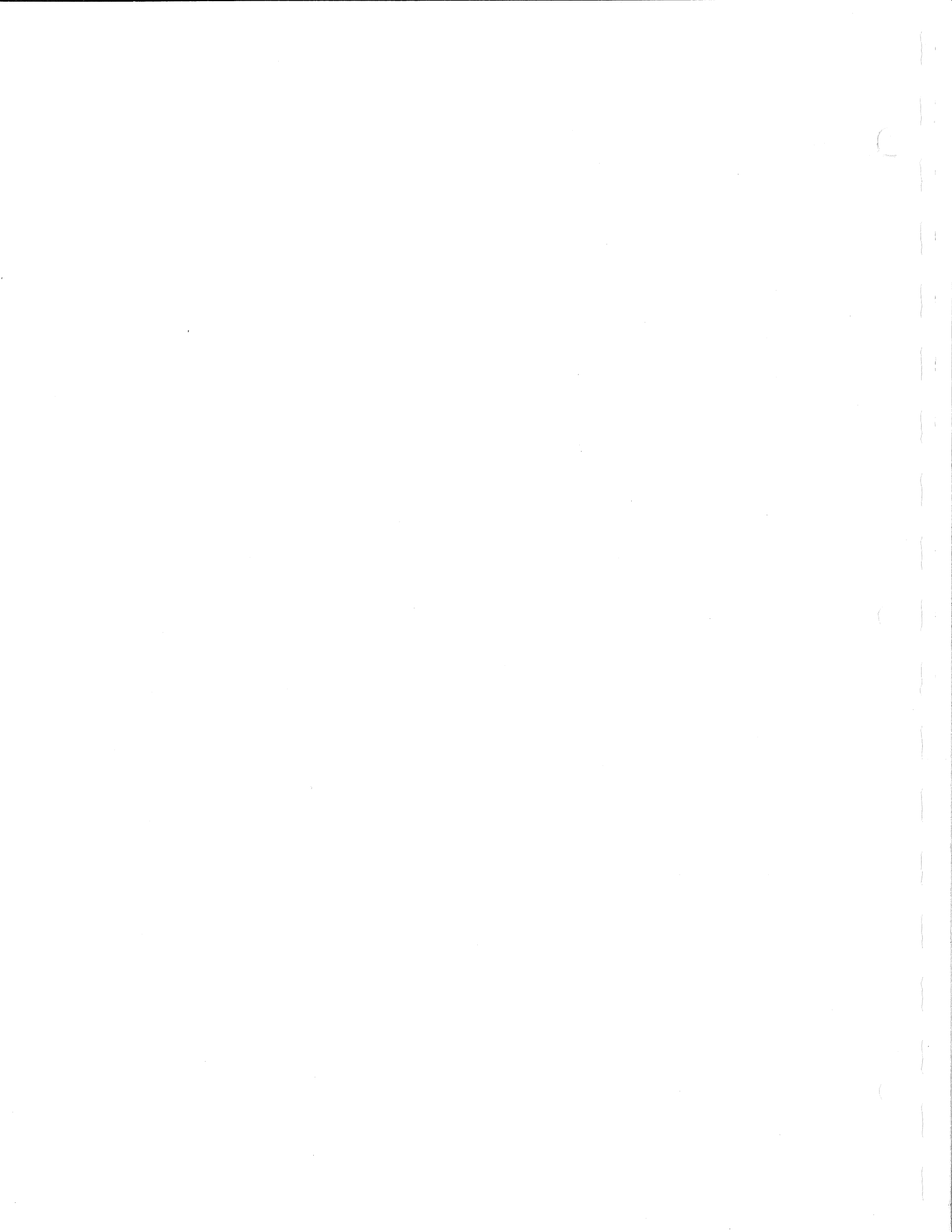
Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-1	348-0037-00			4		FOOT: RUBBER (ATTACHING PARTS FOR EACH)	70485	1059
-2	210-0586-00			1		NUT, PLAIN, EXT W: 4-40 X 0.25 INCH, STL	78189	OBD
-3	211-0097-00			1		SCREW, MACHINE: 4-40 X 0.312 INCH, PNH STL - - - * - - -	83385	OBD
-4	200-0276-02			1		COVER, REAR: (ATTACHING PARTS)	80009	200-0276-02
-5	211-0007-00			4		SCREW, MACHINE: 4-40 X 0.188 INCH, PNH STL - - - * - - -	83385	OBD
-6	131-0778-00			1		CONNECTOR, PLUG: QUICK DISCONNECT	0000A	F 0.304
-7	358-0091-00			1		BSHG, STRAIN RLF: HEYCO	28520	SR2MI
-8	175-0072-00			1		SPACER, SLEEVE:	80009	175-0072-00
-9	131-0106-00			2		CONNECTOR, RCPT, : FEMALE, BNC	95712	9856-1
-10	210-0255-00			1		TERMINAL, LUG: 0.391" ID INT TOOTH	80009	210-0255-00
-11	358-0409-00			1		BSHG, MACH. THD: 0.25-32 X 0.159 ID X 0.24 (ATTACHING PARTS)	80009	358-0409-00
-12	210-0583-00			1		NUT, PLAIN, HEX: 0.25-32 X 0.312 INCH, BRS	73743	2X20319-402
-13	210-0223-01			1		TERMINAL, LUG: 0.25 INCH DIA, SE, 60 DEG BEND - - - * - - -	78189	210-14-07-2520N
-14	380-0359-01			1		HSG, WRAP-AROUND: (ATTACHING PARTS)	80009	380-0359-01
-15	211-0007-00			2		SCREW, MACHINE: 4-40 X 0.188 INCH, PNH STL - - - * - - -	83385	OBD
-16	380-0359-02			1		HSG, WRAP-AROUND: (ATTACHING PARTS)	80009	380-0359-02
	211-0007-00			2		SCREW, MACHINE: 4-40 X 0.188 INCH, PNH STL - - - * - - -	83385	OBD
-17	366-1023-01			1		KNOB: GRAY	80009	366-1023-01
	213-0153-00			1		. SETSCREW: 5-40 X 0.125 INCH, HEX SOC STL	74445	OBD
-18	136-0497-00			2		JACK, TIP: RED (ATTACHING PARTS FOR EACH)	80009	136-0497-00
-19	210-0465-00			1		NUT, PLAIN, HEX.: 0.25-32 X 0.375 INCH BRS	73743	3095-402
-20	210-0046-00			1		WASHER, LOCK: INTL, 0.26 ID X 0.40" OD, STL - - - * - - -	78189	1214-05-00-0541C
-21	670-3639-00			1		CKT BOARD ASSY: (SEE EPL) (ATTACHING PARTS)	80009	670-3639-00
-22	210-0407-00			4		NUT, PLAIN, HEX.: 6-32 X 0.25 INCH, BRS - - - * - - -	73743	3038-0228-402
	-----			-		. CKT BOARD ASSY INCLUDES:		
-23	136-0260-02			1		. SOCKET, PLUG-IN: 16 CONTACT, LOW CLEARANCE	01295	C931602
-24	214-0579-00			2		. TERM., TEST PT: 0.40 INCH LONG	80009	214-0579-00
-25	311-1262-00			1		. RES., VAR, NONWIR: 750 OHM, 10%, 0.50W (ATTACHING PARTS)	73138	62PT-3620-751K
-26	210-0465-00			1		. NUT, PLAIN, HEX.: 0.25-32 X 0.375 INCH BRS	73743	3095-402
	210-0940-00			1		. WASHER, FLAT: 0.25 ID X 0.375 INCH OD, STL - - - * - - -	79807	OBD
-28	260-0723-00			2		. SWITCH, SLIDE: DPDT, 0.5A, 125VAC	80009	260-0723-00
-29	333-1849-00			1		PANEL, FRONT: (ATTACHING PARTS)	80009	333-1849-00
-30	129-0303-00			4		POST, ELEC-MECH: 0.25 OD X 0.237 INCH LONG	80009	129-0303-00
-31	211-0551-00			4		SCREW, MACHINE: 6-32 X 0.562 INCH, PNH STL - - - * - - -	83385	OBD
-32	200-0276-17			1		COVER, TEST UNIT: FRONT	80009	200-0276-17

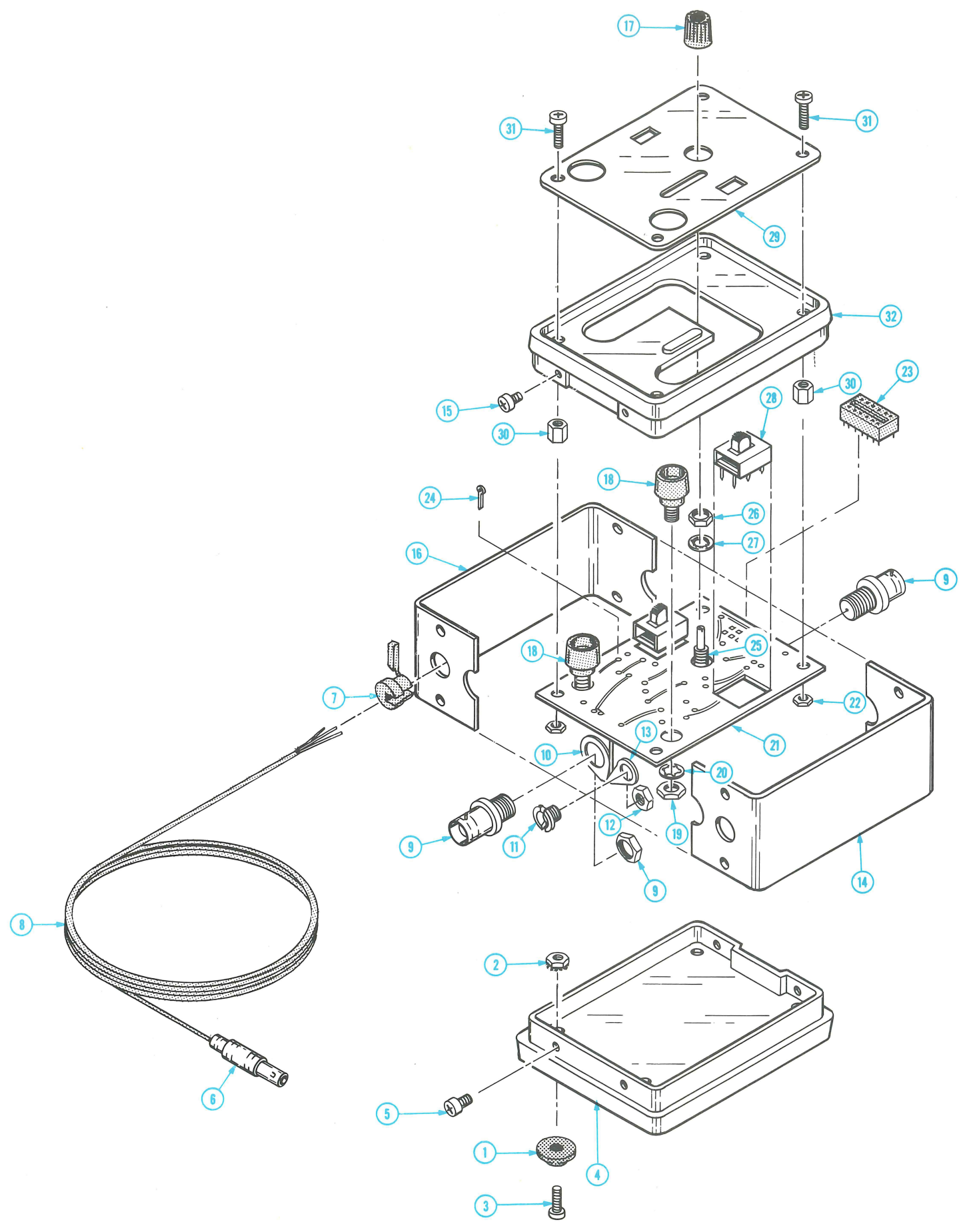
ACCESSORIES

070-1833-00	1	MANUAL, TECH: INSTRUCITON (NOT SHOWN)	80009	070-1833-00
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REPACKAGING

065-0222-00	1	CARTON ASSEMBLY: (NOT SHOWN)	80009	065-0222-00
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M2 GATE DELAY CALIBRATION FIXTURE



MANUAL CHANGE INFORMATION

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

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

A single change may affect several sections. Sections of the manual are often printed at different times, so some of the information on the change pages may already be in your manual. Since the change information sheets are carried in the manual until ALL changes are permanently entered, some duplication may occur. If no such change pages appear in this section, your manual is correct as printed.

