

**TEKTRONIX®**

**067-0700-00**

7D12 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.**

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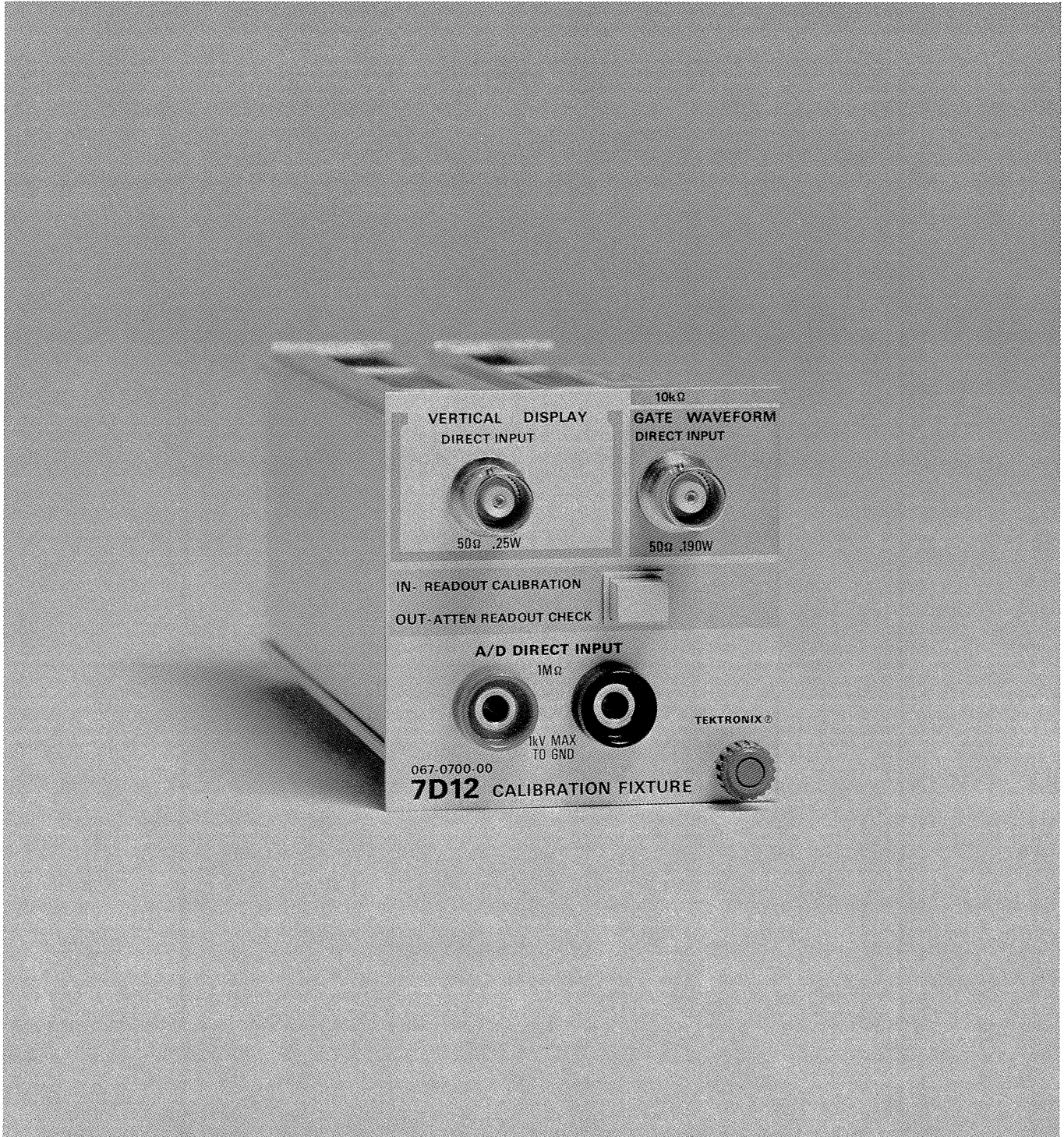


Figure 1. 7D12 Calibration Fixture.



# CHARACTERISTICS

## ELECTRICAL

### SIGNAL INPUTS

<b>Vertical Display</b>	
Termination Resistance	51 $\Omega$ , within 5%, 250 mW
In 7D12	
Scale Factor	
Attenuator Setting	
1 X	87 mV/div
2 X	174 mV/div
5 X	435 mV/div
Accuracy	within 3%
Bandwidth	$\geq 100$ MHz
Aberrations	+5%, -5%, total not to exceed 10% peak to peak
<b>Gate Waveform</b>	
In 7D12	
Termination Resistance	50 $\Omega$ , within 1.5%, 190 mW
Bandwidth	$\geq 100$ MHz
<b>A/D Direct Input</b>	
Range	+2.0 V to -2.0 V
Input Resistance	1 M $\Omega$ within 1%
Accuracy	within 1%
Maximum Non-Destruct Input Voltage	1 kV peak between input connectors. 1 kV peak between either connector and ground.
Common Mode Rejection Ratio (In 7D12)	80 dB at 60 Hz (using 100 $\Omega$ unbalance in either input connector)
Normal Mode Rejection Ratio (In 7D12)	50 dB at 60 Hz

SIGNAL OUTPUT

Readout Calibration	
Output Current	−0.9 mA, within 1% with +15.0 V mainframe supply. Varies linearly by −60 $\mu$ A/V with the +15 V supply

ENVIRONMENTAL

Temperature Range	0°C to 65°C
Altitude	To 15,000 foot

PHYSICAL

Height	6.5 cm (2.6 inches)
Width	6.4 cm (2.5 inches)
Length	20.4 cm (8.0 inches)
Weight	227 grams (8 ounces)

# OPERATING INSTRUCTIONS

## FUNCTIONS OF CONTROLS AND CONNECTORS

### VERTICAL DISPLAY Connector

Provides a 50  $\Omega$  terminated direct input to the 7D12 vertical display.

### GATE WAVEFORM Connector

Provides a direct input to the 7D12 50  $\Omega$  terminated gate waveform display.

### Readout Mode Switch

**READOUT CALIBRATION**—Provides the channel 2 column with a constant current for the 8's reference level, to display a row of ten 8's.

**ATTEN READOUT CHECK**—Allows the attenuator 1-2-5 readout to be displayed in channel 2.

### A/D DIRECT INPUT Connectors

Provides a direct input for signals to the 7D12 A/D converter circuitry, and displays the readout in channel 1.





# THEORY OF OPERATION

## INTRODUCTION

The following is a brief discussion of the basic operation of the major circuits in the 7D12 Calibration Fixture (067-0700-00). The simplified block diagram in Figure 2 and on the schematic is provided to aid in understanding this discussion.

## GATE WAVEFORM DIRECT INPUT

The gate waveform signal is routed directly from connector J1 to the 7D12 (50-ohm terminated input) gate waveform display circuit.

## VERTICAL DISPLAY DIRECT INPUT

The vertical display signal is routed from connector J4 to the 7D12 vertical display circuit. Resistor R8 provides proper signal termination and R7 provides damping.

## ATTENUATOR READOUT CHECK

This calibration fixture provides an interconnection from the 7D12 attenuator switch to the readout system. The readout system displays the amount of attenuation (1, 2, or 5 times) as determined by the attenuator switch setting.

## READOUT CALIBRATION

Integrated circuit U16 provides a precise 900 microampere current through the 7D12 to the readout system. When the proper calibration current is present, ten 8's appear in the channel 2 readout position (lower readout).

U16 is an operational amplifier used as a current converter. Negative feedback, provided through R14, attempts to stabilize the negative input with the positive input level. Loading variations (from about 0 to -300 millivolts), control the positive input level with positive feedback through R18.

## A/D DIRECT INPUT

Input signals are routed to connectors J21 (positive) and J24 (negative). A 1 megohm input termination is provided by R23 and R24. Resistor R22 protects the 7D12 input against excessive input voltage. Signal filtering is provided by C24 and C25. Decimal-point encoding for channel 1 is provided by R28 and R32. The V suffix is encoded by R30 and R34.

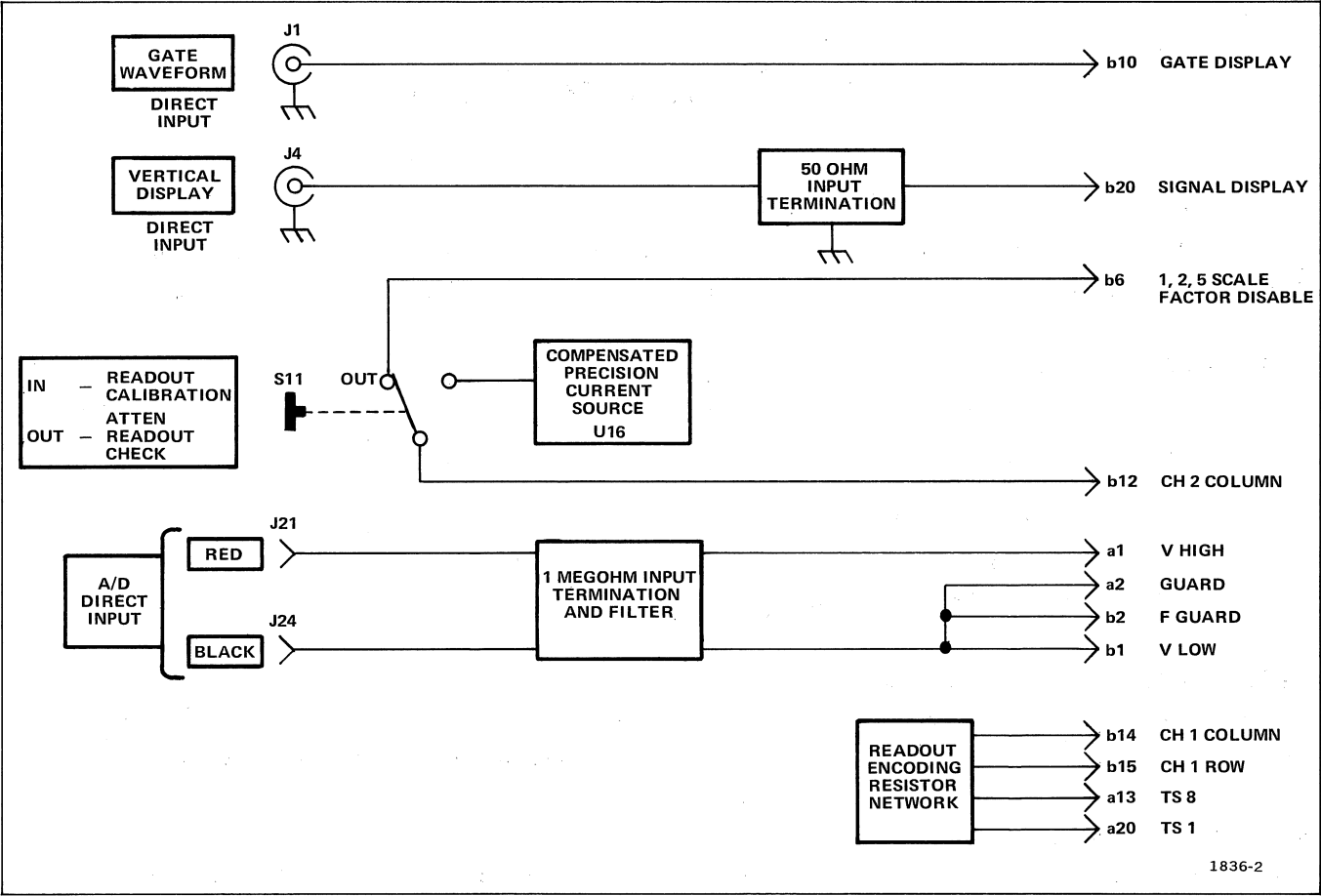


Figure 2. Block Diagram.

# MAINTENANCE

## INTRODUCTION

This section of the manual contains information for use in preventive maintenance, corrective maintenance, and troubleshooting of the 7D12 Calibration Fixture.

Further maintenance information relating to component color codes and soldering techniques can be found in the instruction manuals for the 7000-Series oscilloscopes.

## PREVENTIVE MAINTENANCE

Preventive maintenance, performed on a regular basis, will improve the reliability of this instrument. Periodic checks on the semiconductor devices used in the unit are not recommended as a preventive-maintenance measure. See semiconductor-checking information given under Troubleshooting.

## CLEANING

### CAUTION

*Avoid the use of abrasive or chemical cleaning agents that might damage the plastics or dissolve the lubricants used in this instrument. Do not use benzene, toluene, xylene, acetone, MEK, MIBK, carbon tetrachloride, trichlor, trichlene, methylalcohol, methylene chloride, sulfuric acid, Freon TA-TC-TE-TF-12-22, or similar solvents.*

### Front Panel

Loose dust may be removed with a soft cloth or a dry brush. Water and mild detergent may also be used.

### Interior

Use low-velocity compressed air to blow off the accumulated dust. Remove stubborn dirt with isopropyl alcohol, petroleum ether, white kerosene, or a solution of 1% mild liquid detergent and 99% water.

## PERFORMANCE CHECK

The Performance Check procedure can be helpful in isolating major troubles in the unit. Moreover, minor troubles not apparent during regular operation may be revealed and corrected.

## TROUBLESHOOTING

The following information is provided to aid in troubleshooting the 7D12 Calibration Fixture. The schematic, Theory of Operation and Performance Check sections can also be used to troubleshoot this instrument. The Theory of Operation section gives detailed information on circuit behavior and output requirements.

### TROUBLESHOOTING AIDS

#### Diagrams

A circuit diagram is given on a foldout page. The circuit number and electrical value of each component in this instrument are shown on the diagram. Important voltages are also shown.

#### Circuit Board

The circuit board used in the 7D12 Calibration Fixture is outlined on the diagram, and a drawing of the board-mounted components is shown in the back with the diagram; each board-mounted electrical component is identified by its circuit number.

#### Component and Wiring Color Code

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

### TROUBLESHOOTING EQUIPMENT

A voltmeter for checking voltages within the circuit and an ohmmeter for checking resistors, capacitors, and diodes is useful for troubleshooting the 7D12 Calibration Fixture. A Tektronix DM 501 Digital Multimeter with Power Module is recommended.

### TROUBLESHOOTING PROCEDURE

The following procedure is recommended for effectively troubleshooting the 7D12 Calibration Fixture.

- 1. CHECK CONTROL SETTING.** An incorrect control setting or input can indicate a trouble that does not exist. If there is any question about the correct function or operation of a control or front-panel connector, see Operating Instructions.
- 2. CHECK ASSOCIATED EQUIPMENT.** Before proceeding with troubleshooting, check that the equipment used with the Calibration Fixture is operating correctly. If possible, substitute equipment known to be operating correctly and see if the problem persists. Check that the inputs are properly connected and that the interconnecting cables are not defective.
- 3. VISUAL CHECK.** Visually check the instrument. Many troubles can be located visually, such as unsoldered connections, broken wires, damaged circuit board, or damaged components, etc.
- 4. CHECK INSTRUMENT PERFORMANCE.** Localize the trouble to a circuit by using the Performance Check procedure.



**5. CHECK VOLTAGES.** Often the defective component or stage can be located by checking for the correct voltage in the circuit. Typical voltages are given on the schematic and might vary slightly between instruments. To obtain operating conditions similar to those used to take these readings, see the instructions in the Diagram section.

**6. CHECK INDIVIDUAL COMPONENTS.** The following methods are provided for checking the individual components in the 7D12 Calibration Fixture. Components that are soldered in place are best checked by disconnecting one end to isolate the measurement from the effects of surrounding circuitry.

**Integrated Circuits (IC's).** A good understanding of the circuit is essential to troubleshooting circuits containing IC's. IC's can be checked with a voltmeter, test oscilloscope, or by direct substitution. Use care when checking voltages around the IC's so that adjacent leads are not shorted together. When substituting a suspected component, check that circuit conditions are normal so that the replacement IC will not also be damaged. Be sure the power is off before attempting to remove or replace any IC.

**Diodes.** A diode can be checked for an open or shorted condition by measuring the resistance between terminals. With an ohmmeter scale having an internal source of between 800 millivolts and 3 volts, the resistance should be very high in one direction and very low when the leads are reversed.

#### CAUTION

*Do not use an ohmmeter scale that has a high internal current source.*

*High currents may damage the diodes.*

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

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

**7. REPAIR AND CHECK THE CIRCUIT.** Special techniques required to replace components in this unit are given under Component Replacement. Be sure to check the performance of any circuit that has been repaired or that has had any electrical components replaced.

## REPLACEMENT PARTS

### STANDARD PARTS

All electrical and mechanical replacement parts for the 7D12 Calibration Fixture can be obtained through your local Tektronix Field Office or representative. However, many of the standard electrical components can be obtained locally in less time than is required to order them from Tektronix, Inc. Before purchasing or ordering replacement parts, check the parts list for value, tolerance, rating, and description.

#### NOTE

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

### SPECIAL PARTS

Some parts are manufactured or selected by Tektronix to satisfy particular requirements, or are manufactured for Tektronix to our specifications. Most of the mechanical parts used in this instrument have been manufactured by Tektronix. To determine manufacturer of special parts, refer to Parts List, Cross Index Mfr. Code Number to manufacturer. Order all special parts directly from your local Tektronix Field Office or representative.

### ORDERING PARTS

When ordering replacement parts from Tektronix, Inc., refer to the Parts Ordering Information and Special Notes and Symbols on the page immediately preceding the Electrical Parts List section. Include the following information:

1. Instrument type (067-0700-00).
2. Instrument serial number.
3. A description of the part (if electrical, include the circuit number).
4. Tektronix Part Number.

### SOLDERING TECHNIQUES

The following rules should be observed when removing or replacing parts:

1. Use small soldering iron (not over 15 watts on circuit boards).
2. Do not apply more heat, or apply heat for a longer time, than is absolutely necessary.
3. Clean parts as described under Cleaning.

## COMPONENT REPLACEMENT

The exploded-view drawing associated with the Mechanical Parts List may be helpful when disassembling or reassembling individual components or sub-assemblies.

### CIRCUIT-BOARD REMOVAL

In general, the circuit board used in the 7D12 Calibration Fixture need never be removed unless the board must be replaced. When it becomes necessary to remove the circuit board assembly, use the following procedure:

1. Remove rear two screws holding side panels and slide out to remove side panels.
2. Disconnect both coaxial cables. These cables have plugs on both ends.
3. Remove four screws securing rear plate to frame.
4. Remove retaining clip from rear of module-retaining screw, and slide out module-retaining screw from the front.
5. Rotate rear plate and slide over circuit-board connector.
6. Remove nuts on banana jacks using 3/8-inch wrench.
7. Pull circuit board out.

### CIRCUIT BOARD REPLACEMENT

#### NOTE

To maintain the correct input polarity, the black banana jack should be on the switch side of the circuit board.

1. Bend new solder lugs to match the original solder lugs. Place solder lugs on banana jacks. Place nuts over the solder lugs and finger tighten.
2. Place circuit board tightly against front panel. Align solder lugs on circuit board, then solder to circuit board.
3. Tighten nuts on banana jacks.
4. Reverse the order of the first five steps of the removal procedure to assemble module.

## INTEGRATED CIRCUIT REPLACEMENT

### CAUTION

*Use care when removing integrated circuits to prevent lead damage.*

## PERFORMANCE CHECK AFTER REPAIR

After any electrical component has been replaced, the performance of that particular circuit should be checked. The Performance Check procedure provides a quick and convenient means of checking instrument operation.



# PERFORMANCE CHECK

## INTRODUCTION

The following procedure checks the performance of the 7D12 Calibration Fixture. All tolerances given in this procedure are intended to indicate proper operation only and should not be interpreted as instrument specifications.

**TABLE 5-1**  
**Test Equipment Required**

DESCRIPTION	MINIMUM SPECIFICATIONS	USAGE	EXAMPLES OF APPLICABLE TEST EQUIPMENT
1. Indicator Oscilloscope	Tektronix 7000-Series Oscilloscope equipped with a readout system and a calibrator square-wave output, 0.2 V and 0.4 V p-p into 50 $\Omega$ .	Used throughout procedure to provide a display and square-wave calibrator signal.	a. Tektronix 7704A Oscilloscope System. b. Tektronix 7904 Oscilloscope.
2. 7D12 A/D Converter		Used throughout procedure.	a. Tektronix 7D12 A/D Converter.
3. Time-base Unit	Tektronix 7-B Series.	Used throughout procedure to provide sweep.	a. Tektronix 7B53A Dual Time Base. b. Tektronix 7B92 Dual Time Base. c. Tektronix 7B70 Time Base.
4. Cable, Special Purpose	Connectors, pin-jack to BNC male; length, 20 inches.	Calibrator pin-jack signal coupling. Need depends on oscilloscope calibrator output.	a. Tektronix Part No. 175-1178-00.
5. 50 $\Omega$ Coaxial Cable	Impedance 50 $\Omega$ ; length, 42 inches; connectors, BNC male.	Used through procedure for signal coupling.	a. Tektronix Part No. 012-0057-01.
6. Adapter Jack	Connectors, dual banana plug to female BNC.	Used in procedure for coupling of coaxial cable to banana jacks.	a. Tektronix Part No. 103-0090-00.

## INDEX TO PERFORMANCE CHECK

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4. Check Gain Accuracy	<b>5-5</b>

## PRELIMINARY PROCEDURE FOR PERFORMANCE CHECK

### NOTE

The performance of this instrument can be checked at any temperature within 0°C to +50°C unless stated otherwise.

1. Insert 7D12 Calibration Fixture in 7D12 and install both in either vertical plug-in compartment of indicator oscilloscope.
2. Install time-base unit in horizontal compartment of indicator oscilloscope.
3. Connect indicator oscilloscope to power source that meets the voltage and frequency requirement of the oscilloscope.
4. Turn indicator oscilloscope on. Allow at least twenty minutes warmup before checking 7D12 calibration fixture performance.
5. Set indicator oscilloscope readout and intensity controls for a usable readout display on the crt. A/D direct input readout display should appear in the upper graticule divisions. Vertical display attenuation factor or ten 8's should appear in lower graticule divisions in a location corresponding to plug-in compartment used.

## VERTICAL DISPLAY

### EQUIPMENT REQUIRED

1. Indicator oscilloscope
2. 7D12 A/D Converter
3. 50 ohm coaxial cable

### 1. Check Display Attenuator Readout and Gain Accuracy

- a. Set controls as follows:

7D12 Calibration Fixture		
ATTEN READOUT CHECK		OUT
	7D12	
Vertical Display Atten		1 X
Triggering		Auto
Gate		Out-Off

- b. Position trace two divisions below center graticule line.

- c. Connect a 400 millivolt, 1 kilohertz signal from oscilloscope calibrator to VERTICAL DISPLAY DIRECT INPUT connector of calibration fixture.

- d. CHECK—Set 7D12 Vertical Display Atten switch to settings given in Table 5-2. Display amplitude and lower numerical readout display should be within limits for each switch setting listed in Table 5-2.

**TABLE 5-2**  
**Vertical Display Amplitude and Lower Numerical Readout**

7D12 Vertical Display Atten Switch	Display Amplitude (Divisions)		Lower Numerical Readout Display
	Min.	Max	
1 X	4.4	4.8	1
2 X	2.2	2.4	2
5 X	0.87	0.97	5

- e. Disconnect calibrator signal

## 2. Check Readout Calibration

- a. Set controls as follows:

7D12 Calibration Fixture  
READOUT CALIBRATION                      IN

Controls not mentioned can be set as desired.

- b. CHECK—Lower numerical readout display for a row of ten 8's.

## VOLTAGE READOUT DISPLAY

### EQUIPMENT REQUIRED

1. Indicator oscilloscope
2. 7D12 A/D Converter
3. 50 ohm coaxial cable
4. Dual banana-plug to female BNC adapter

## 3. Check A/D Direct Input

- a. Set controls as follows:

7D12 Calibration Fixture  
ATTEN READOUT CHECK                      OUT  
  
7D12  
Triggering                                      Auto

Controls not mentioned can be set as desired.

- b. CHECK—Voltage Readout display for a reading of approximately zero volts.
- c. Connect a 4 volt, 1 kilohertz signal from oscilloscope calibrator to calibration fixture A/D DIRECT INPUT jacks.
- d. CHECK—Voltage Readout display should read approximately +2 volts (depending upon accuracy of oscilloscope calibrator).



- e. Reverse the polarity to calibration fixture, A/D DIRECT INPUT jacks.
- f. CHECK—Voltage Readout display should read approximately  $-2$  volts.
- g. Disconnect calibrator signal.

## GATE DISPLAY

### EQUIPMENT REQUIRED

- 1. Indicator oscilloscope
- 2. 7D12 A/D Converter
- 3. 50 ohm coaxial cable

### 4. Check Gain Accuracy

- a. Set controls as follows:

	7D12	
Gate		On

Controls not mentioned can be set as desired.

- b. Set time-base unit for a sweep rate of 100 microseconds/division.
- c. Set gate trace 1 division below center horizontal graticule line.

d. Connect a 200 millivolt signal from oscilloscope calibrator to calibration fixture, Gate Waveform Direct Input connector.

- e. CHECK—Gate waveform amplitude to be from 1.5 to 2.5 divisions.
- f. Disconnect calibrator signal.

This completes Performance Check of the 7D12 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 ( $\mu$ F).  
Resistors = Ohms ( $\Omega$ ).

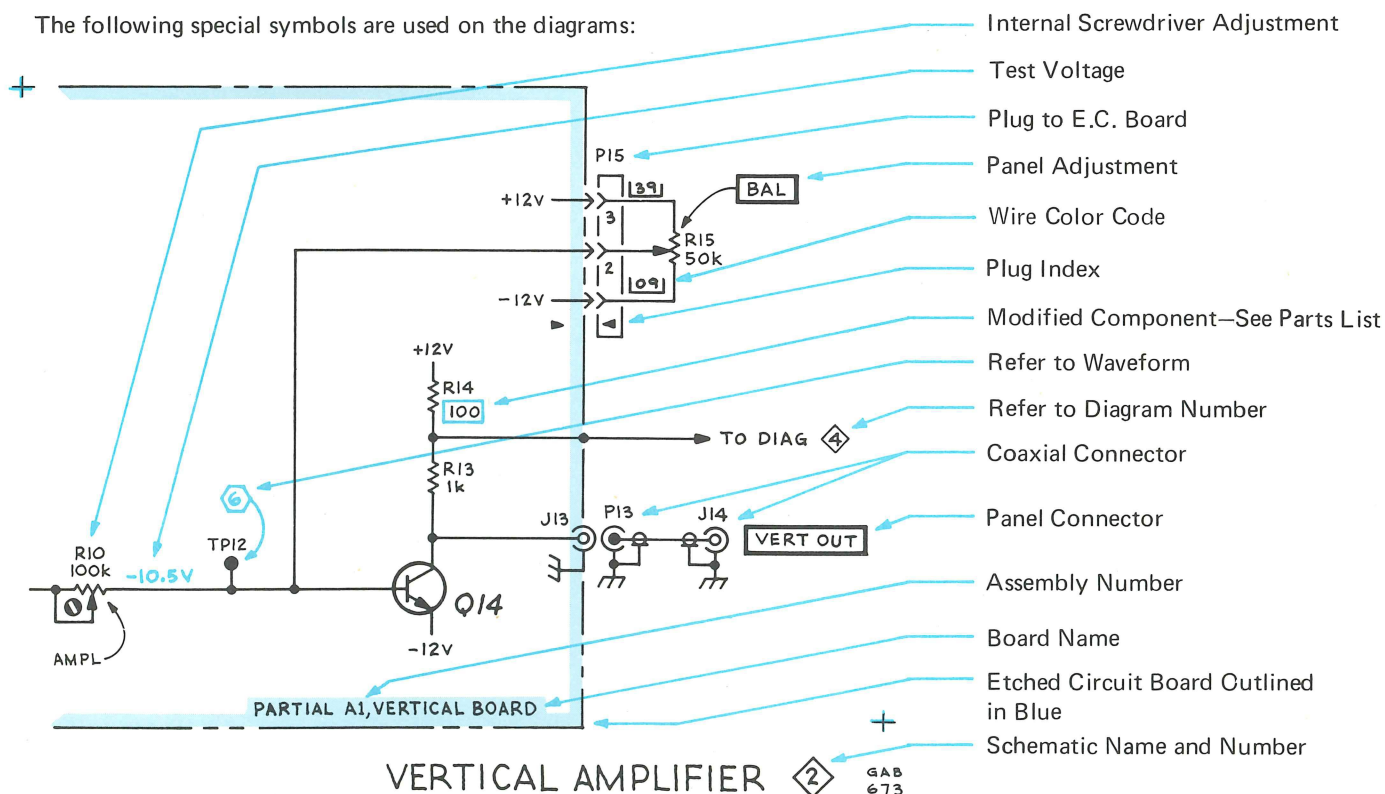
Symbols used on the diagrams are based on ANSI Standard Y32.2-1970.

Logic symbology is based on ANSI Y32.14-1973 in terms of positive logic. Logic symbols depict the logic function performed and may differ from the manufacturer's data.

The 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:



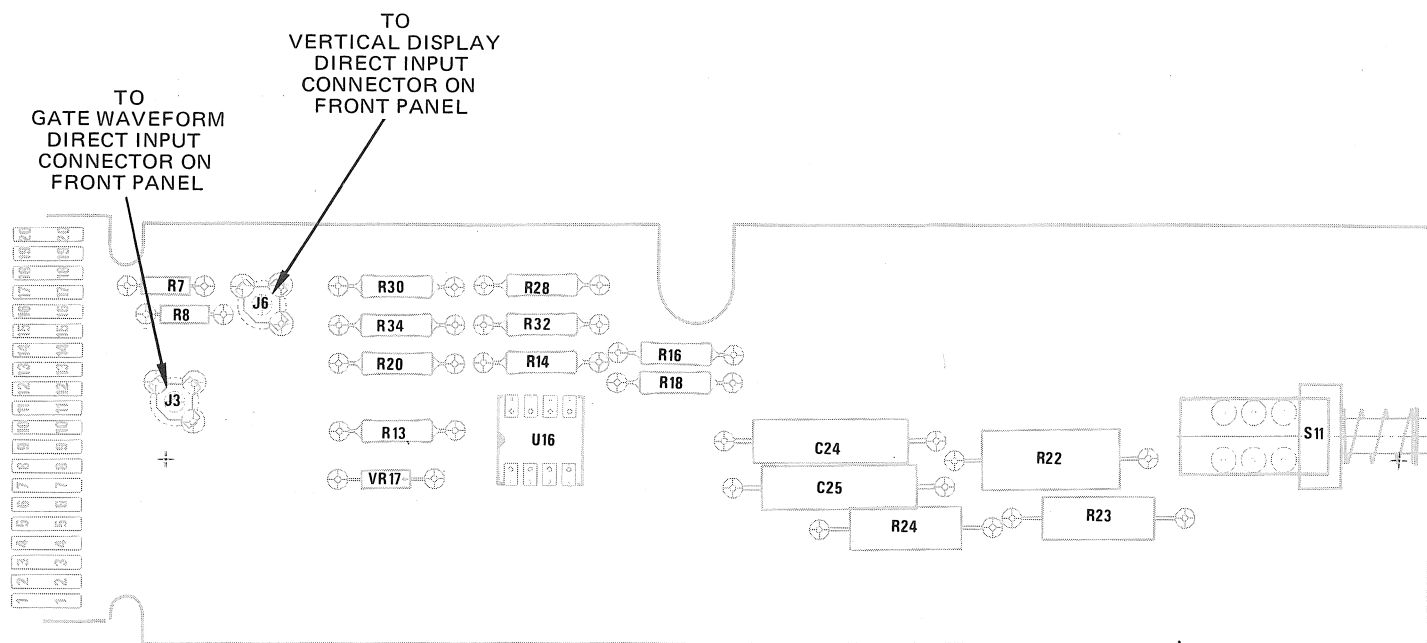
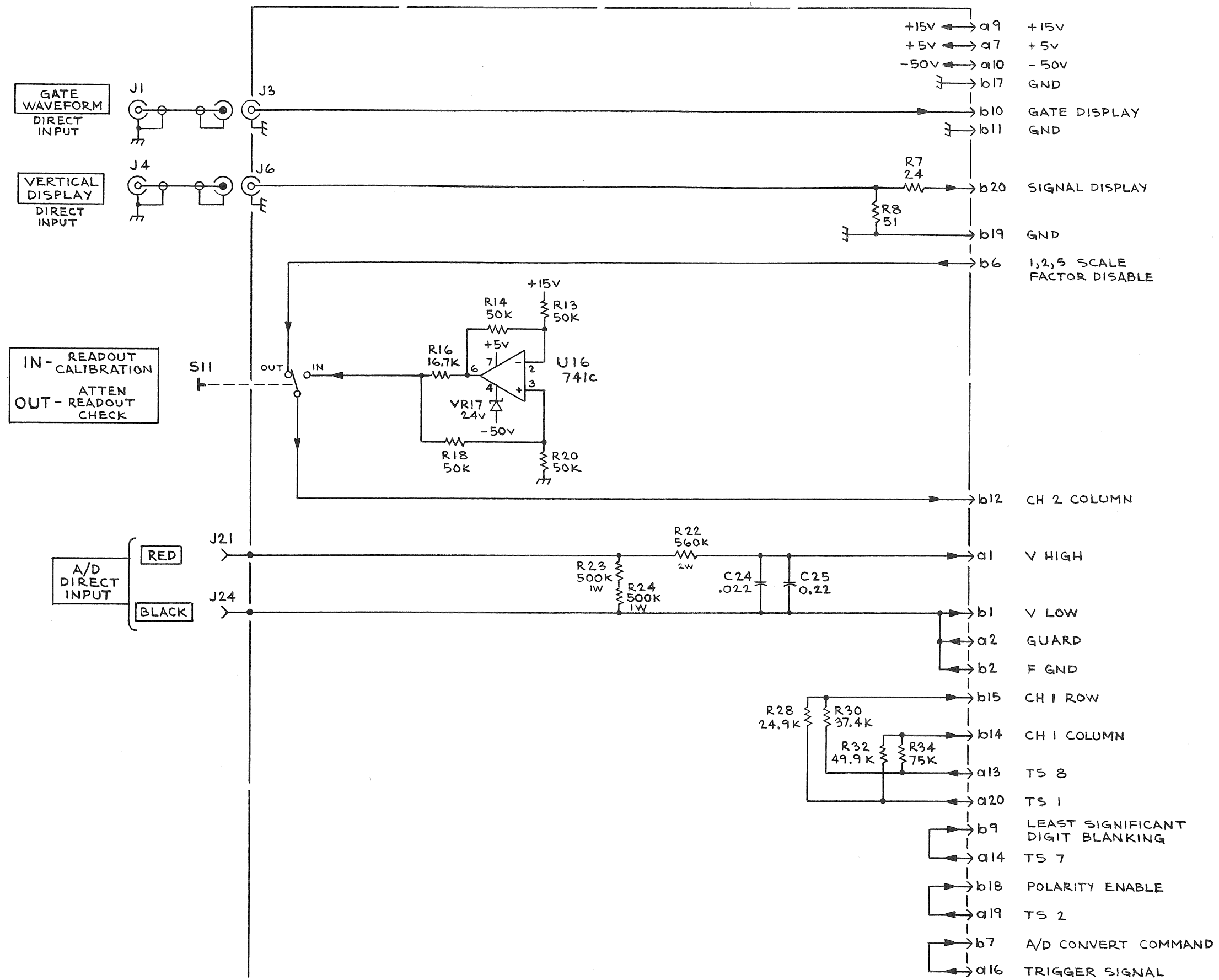


Fig. 3. 7D12 Test Module board component locations.



# 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	SEMICON	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
01002	General Electric Co., Industrial and Power Capacitor Products Dept.	John St.	Hudson Falls, NY 12839
01121	Allen-Bradley Co.	1201 2nd St. South	Milwaukee, WI 53204
04713	Motorola, Inc., Semiconductor Products Div.	5005 E. McDowell Rd.	Phoenix, AZ 85008
56289	Sprague Electric Co.		North Adams, MA 01247
75042	TRW Electronic Components, IRC Fixed Resistors, Philadelphia Division	401 N. Broad St.	Philadelphia, PA 19108
80009	Tektronix, Inc.	P. O. Box 500	Beaverton, OR 97005
82104	Standard Grigsby Co.	920 Rathbone Ave.	Aurora, IL 60507
91637	Dale Electronics, Inc.	P. O. Box 609	Columbus, NB 68601

## Electrical Parts List—067-0700-00

Ckt No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
A1	670-3286-01		CKT BOARD ASSY:TEST MODULE	80009	670-3286-01
C24	285-0683-00		CAP.,FXD,PLSTC:0.022UF,5%,100V	01002	64F15AC223
C25	285-0919-00		CAP.,FXD,PLSTC:0.22UF,10%,100V	56289	LP66A1B224K002
R7	317-0240-00		RES.,FXD,COMP:24 OHM,5%,0.125W	01121	BB2405
R8	315-0510-00		RES.,FXD,COMP:51 OHM,5%,0.25W	01121	CB5105
R13	321-0756-03		RES.,FXD,FILM:50K OHM,0.25%,0.125W	75042	CEAT2-5002C
R14	321-0756-03		RES.,FXD,FILM:50K OHM,0.25%,0.125W	75042	CEAT2-5002C
R16	321-1310-03		RES.,FXD,FILM:16.7K OHM,0.25%,0.125W	75042	CEAT2-16701C
R18	321-0756-03		RES.,FXD,FILM:50K OHM,0.25%,0.125W	75042	CEAT2-5002C
R20	321-0756-03		RES.,FXD,FILM:50K OHM,0.25%,0.125W	75042	CEAT2-5002C
R22	305-0564-00		RES.,FXD,COMP:560K OHM,5%,2W	01121	HB5645
R23	315-0105-00		RES.,FXD,COMP:1M OHM,5%,0.25W	01121	CB1055
R24	323-0740-01		RES.,FXD,COMP:500K OHM,0.5%,0.5W	91637	MFF1226G50002D
R28	321-0327-00		RES.,FXD,FILM:24.9K OHM,1%,0.125W	75042	CEAT0-2492F
R30	321-0344-00		RES.,FXD,FILM:37.4K OHM,1%,0.125W	75042	CEAT0-3742F
R32	321-0356-00		RES.,FXD,FILM:49.9K OHM,1%,0.125W	75042	CEAT0-4992F
R34	321-0373-00		RES.,FXD,FILM:75K OHM, 1%,0.125W	75042	CEAT0-7502F
S11	260-1623-00		SWITCH,PUSH:BEAM FINDER #1	82104	1540-P84020001
VR17	152-0265-00		SEMICOND DEVICE:ZENER,0.4W,56V	04713	1N970B





# MECHANICAL REPLACEABLE PARTS LIST

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

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

## SPECIAL NOTES AND SYMBOLS

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

## FIGURE AND INDEX NUMBERS

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

## INDENTATION SYSTEM

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

1	2	3	4	5	Name & Description
					<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	SEMICON	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	SLEEVING
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	OB	ORDER BY DESCRIPTION	TPG	TAPPING
ELECTLT	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

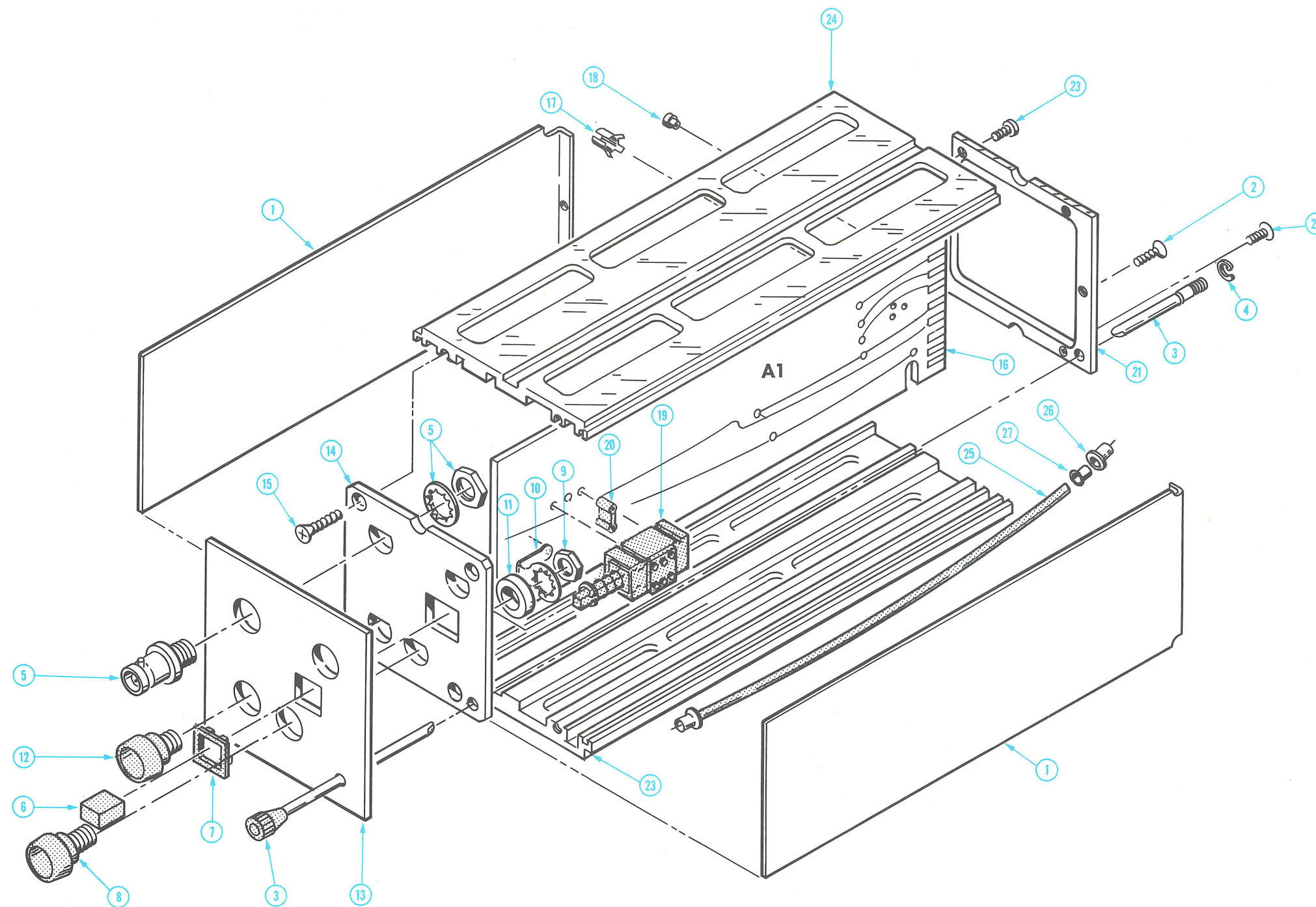
MFR.CODE	MANUFACTURER	ADDRESS	CITY,STATE,ZIP
22526	Berg Electronics, Inc.	Youk Expressway	New Cumberland, PA 17070
73743	Fischer Special Mfg. Co.	446 Morgan St.	Cincinnati, OH 45206
78189	Illinois Tool Works, Inc.		
	Shakeproof Division	St. Charles Road	Elgin, IL 60126
79136	Waldes, Kohinoor, Inc.	47-16 Austel Place	Long Island City, NY 11101
80009	Tektronix, Inc.	P. O. Box 500	Beaverton, OR 97005
82104	Standard Grigsby Co.	920 Rathbone Ave.	Aurora, IL 60507
83385	Central Screw Co.	2530 Crescent Dr.	Broadview, IL 60153

# Mechanical Parts List—067-0700-00

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	No. Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
-1	337-1677-00			2		SHIELD,ELEC:RIGHT AND LEFT SIDES (ATTACHING PARTS FOR EACH)	80009	337-1677-00
-2	213-0138-00			1		SCR,TPG,THD FOR:4-40 X 0.188 INCH,PNH STL - - - * - - -	83385	OBD
-3	384-0853-00			1		ROD,SECURING:PLUG-IN (ATTACHING PARTS)	80009	384-0853-00
-4	354-0163-00			1		RING,RETAINING: - - - * - - -	79136	5133-12MD
-5	131-1315-00			2		CONNECTOR,RCPT,:BNC,FEMALE	80009	131-1315-00
-6	366-1257-00			1		PUSHBUTTON:GRAY	80009	366-1257-00
-7	426-0681-00			1		FR,PUSHBUTTON:GRAY PLASTIC	80009	426-0681-00
-8	136-0498-00			1		JACK,TIP:BLACK (ATTACHING PARTS)	80009	136-0498-00
-9	210-0583-00			1		NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS	73743	2X20319-402
-10	210-0223-00			1		TERMINAL,LUG:0.25 INCH DIA,SE	78189	2101-14-03-2520N
-11	342-0137-00			1		INSULATOR,WSHR:0.266 ID X 0.50 " OD - - - * - - -	80009	342-0137-00
-12	136-0497-00			1		JACK,TIP:RED (ATTACHING PARTS)	80009	136-0497-00
	210-0583-00			1		NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS	73743	2X20319-402
	210-0223-00			1		TERMINAL,LUG:0.25 INCH DIA,SE	78189	2101-14-03-2520N
	342-0137-00			1		INSULATOR,WSHR:0.266 ID X 0.50 " OD - - - * - - -	80009	342-0137-00
-13	333-1883-00			1		PANEL,FRONT:	80009	333-1883-00
-14	386-3021-00			1		SUBPANEL,FRONT: (ATTACHING PARTS)	80009	386-3021-00
-15	213-0012-00			4		SCREW,MACHINE:4-40 X 0.375 INCH,FLH STL - - - * - - -	83385	OBD
-16	-----			1		CKT BOARD ASSY:TEST MODULE(SEE A1 EPL)		
-17	131-1003-00			2		. CONNECTOR BODY,:CKT BD MT,3 PRONG	80009	131-1003-00
-18	136-0252-04			7		. CONTACT,ELEC:0.188 INCH LONG	22526	75060
-19	260-1623-00			1		. SWITCH,PUSH:BEAM FINDER #1	82104	1540PB4020001
-20	361-0383-00			2		. SPACER,PB SW:CHARCOAL,0.33 INCH LONG	80009	361-0383-00
-21	386-2321-00			1		PLATE,REAR: (ATTACHING PARTS)	80009	386-2321-00
-22	213-0012-00			1		SCREW,MACHINE:4-40 X 0.375 INCH,FLH STL	83385	OBD
-23	213-0034-00			3		SCR,TPG,THD CTG:4-40 X 0.188 INCH,PNH STL - - - * - - -	83385	OBD
-24	426-0930-00			2		FRAME SECTION:TOP AND BOTTOM	80009	426-0930-00
-25	175-1255-00			FT		CABLE,RF:50 OHM,7.5 INCH LONG	80009	175-1255-00
-26	210-0774-00			4		EYELET,METALLIC:0.152 OD X 0.245 INCH L,BRS	80009	210-0774-00
-27	210-0775-00			4		EYELET,METALLIC:0.126 OD X 0.23 INCH L,BRS	80009	210-0775-00
						ACCESSORIES		
	062-1652-00			1		MANUAL,TECH:INSTRUCTION(NOT SHOWN)	80009	062-1652-00
						REPACKAGING		
	065-0226-00			1		CARTON ASSY:(NOT SHOWN)	80009	065-0226-00



FIG. 1



## 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.

