

Tektronix®
COMMITTED TO EXCELLENCE

464

**STORAGE
OSCILLOSCOPE**

**WITH OPTIONS
SERVICE**

INSTRUCTION MANUAL

TEKTRONIX®

464

**STORAGE
OSCILLOSCOPE**

**WITH OPTIONS
SERVICE**

INSTRUCTION MANUAL

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

Serial Number _____

WARRANTY

Tektronix warrants that this product is free from defects in materials and workmanship. The warranty period is one (1) year from the date of shipment. Tektronix will, at its option, repair or replace the product if Tektronix determines it is defective within the warranty period and if it is returned, freight prepaid, to a service center designated by Tektronix.

Tektronix is not obligated to furnish service under this warranty

- a. to repair damage resulting from attempts by personnel other than Tektronix representatives to install, repair, or service the product;
- b. to repair damage resulting from improper use or from connecting the product to incompatible equipment;
- c. if personnel other than Tektronix representatives modify the hardware or software.

There is no implied warranty of fitness for a particular purpose. Tektronix is not liable for consequential damages.

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THE ACCESSORY POUCH ILLUSTRATED SHOULD REMAIN ATTACHED TO THE OSCILLOSCOPE. IT IS DESIGNED TO KEEP ACCESSORIES READILY AVAILABLE AND TO AFFORD THE OSCILLOSCOPE SOME PROTECTION IN TRANSIT.

THE ADJUSTABLE CARRYING HANDLE IS DESIGNED TO OFFER CONVENIENT STABLE, OPERATING POSITIONS, SUCH AS THOSE ILLUSTRATED.

STORAGE OR OPERATION OF THE OSCILLOSCOPE ON ITS FOUR REAR FEET IS NOT DESIRABLE. THE NEXT-TO-LAST LOCKING POSITION OF THE HANDLE PROVIDES THE MOST STABLE, NEAR-UPRIGHT, OPERATING POSITION. THE MOST STABLE OPERATING POSITIONS ARE ILLUSTRATED.



1653-7

Fig. 1-1. 464 Portable Storage Oscilloscope.

SPECIFICATION

Introduction

The Tektronix 464 is a dual-channel portable oscilloscope. The 464 storage system provides storage for displays with a writing speed up to 110-divisions/microsecond in the Fast mode. Storage viewing time is greater than 15 seconds at full stored display intensity—extending to more than 6 minutes using reduced intensity in the Save mode.

The dual-channel dc-to-100 megahertz vertical system provides calibrated deflection factors from 5 millivolts to 5 volts/division. The sweep trigger circuits are capable of stable triggering over the full bandwidth capabilities of the vertical deflection system. The horizontal deflection system provides calibrated sweep rates from 0.5 seconds

to 0.05 microsecond/division along with delayed sweep features for accurate relative-time measurements. A X10 magnifier extends the calibrated sweep rate to 5 nanoseconds/division. The instrument operates over a wide variation of line voltages and frequencies. Maximum power consumption is about 100 watts.

This instrument will meet the electrical characteristics listed in the Performance Requirement column of Table 1-1 following complete calibration as given in Section 5. The performance check procedure which is given in Section 2 provides a convenient method of checking instrument performance without making internal checks or adjustments. The following electrical characteristics apply over an ambient temperature range of -15°C to $+55^{\circ}\text{C}$, except as otherwise indicated. Warmup time for given accuracy is 20 minutes.

TABLE 1-1

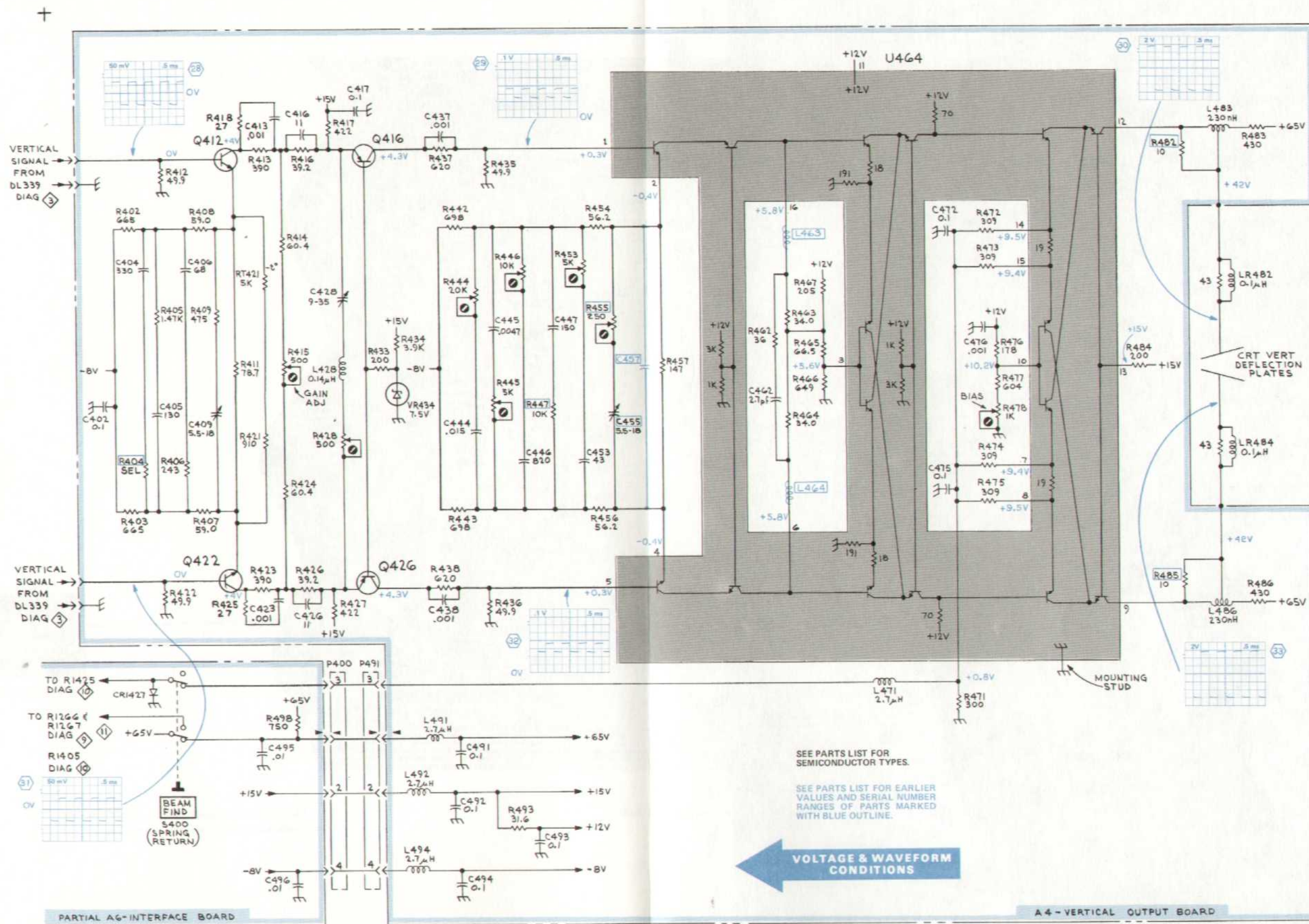
Electrical Characteristics

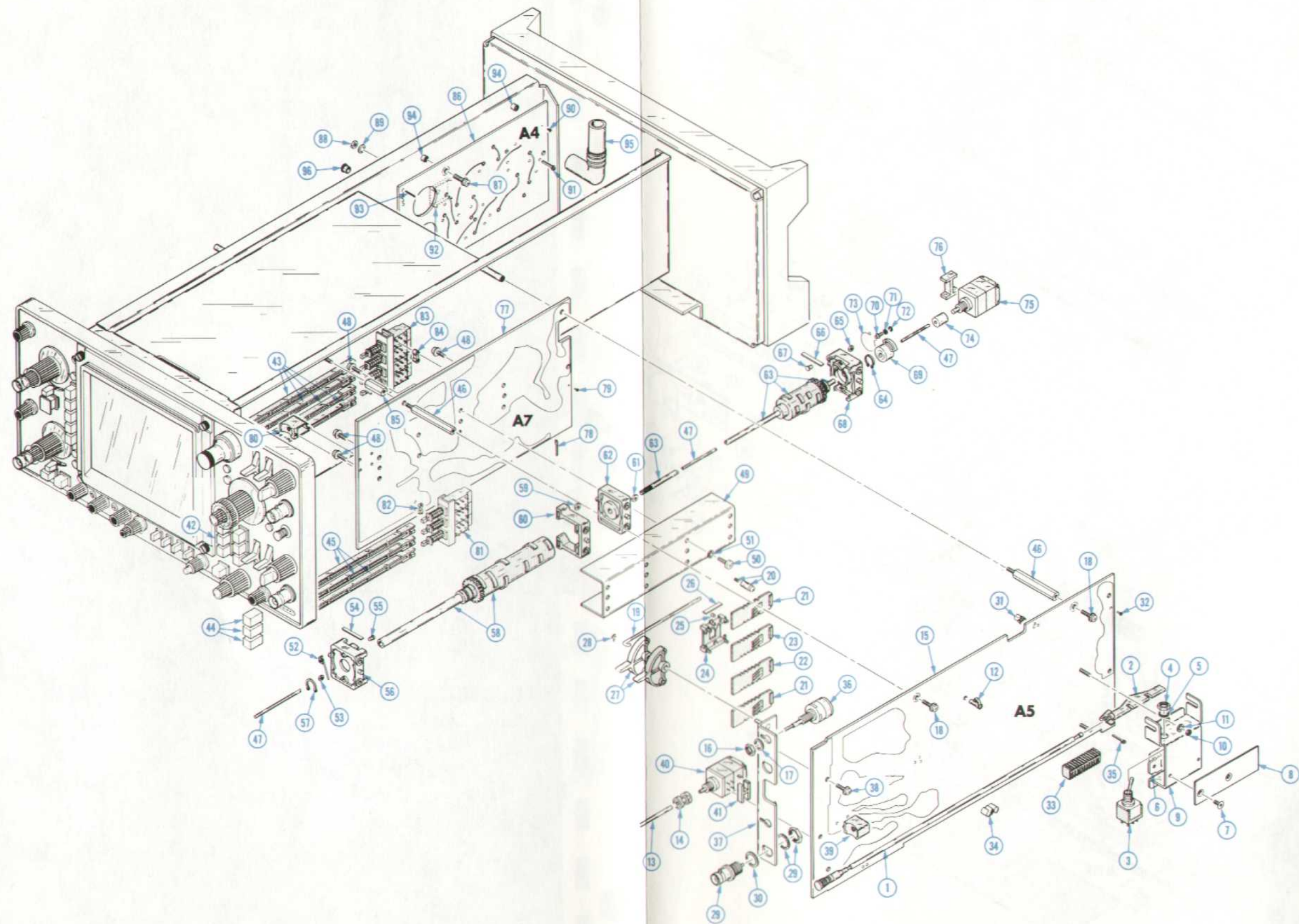
Characteristics	Performance Requirements	Supplemental Information
VERTICAL DEFLECTION SYSTEM (CH 1 and CH 2)		
Deflection Factor Calibrated Range	5 mV to 5 V/DIV in 10 steps; 1-2-5 sequence.	
Cascaded Operation (CH 1 VERT SIGNAL OUT Connected to CH 2)	Deflection Sensitivity at least 1 mV/Div. Bandwidth: Dc to at least 50 MHz.	CH 1 OUT connected to CH 2 input, ac coupled using a 50 Ω 42 inch cable terminated in 50 Ω at CH 2 input.
Uncalibrated (VAR VOLTS/DIV) Range	Provides continuously variable deflection factors between the calibrated steps. Extends maximum uncalibrated deflection factor to at least 12.5 volts per division in the 5 V/DIV position.	At least 2.5:1.
Low Frequency Linearity		0.1 division or less compression or expansion of 2 division signal at center screen positioned to the upper and lower extremes of the graticule area.
Deflection Factor Accuracy	Within 3% of indicated deflection.	With GAIN set at 5 mV/DIV.
Bandwidth	Dc to 100 MHz or greater (-15°C to $+40^{\circ}\text{C}$). DC to 85 MHz ($+40^{\circ}\text{C}$ to $+55^{\circ}\text{C}$).	With a 5 division, vertically centered, reference signal from a 25 Ω source and VAR VOLTS/DIV in calibrated position.

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
000BK	STAUFFER SUPPLY	105 SE TAYLOR	PORTLAND, OR 97214
000CY	NORTHWEST FASTENER SALES, INC.	7923 SW CIRURS DRIVE	BEAVERTON, OREGON 97005
000DX	KADEE QUALITY PRODUCTS COMPANY	720 S GRAPE	MEDFORD, OR 97501
000EX	O'HARA METAL PRODUCT COMPANY	542 BRANNAN STREET	SAN FRANCISCO, CA 94107
00779	AMP, INC.	P O BOX 3608	HARRISBURG, PA 17105
01009	ALDEN PRODUCTS COMPANY	117 N MAIN STREET	BROCKTON, MA 02403
01963	CHERRY ELECTRICAL PRODUCTS CORPORATION	3600 SUNSET AVENUE	WAUKEGAN, IL 60085
04713	MOTOROLA, INC., SEMICONDUCTOR PROD. DIV.	5005 E MCDOWELL RD, PO BOX 20923	PHOENIX, AZ 85036
04811	PRECISION COIL SPRING COMPANY	P O BOX 5450, 10107 ROSE ST.	EL MONTE, CA 91734
05006	TWENTIETH CENTURY PLASTICS, INC.	415 E WASHINGTON BLVD.	LOS ANGELES, CA 90015
05129	KILO ENGINEERING COMPANY	2015 D	LA VERNE, CA 91750
05820	WAKEFIELD ENGINEERING, INC.	AUDUBON ROAD	WAKEFIELD, MA 01880
07700	TECHNICAL WIRE AND PRODUCTS, INC.	129 DERMODY ST.	CRANFORD, NJ 07016
08261	SPECTRA-STRIP CORP.	7100 LAMPSON AVE.	GARDEN GROVE, CA 92642
08530	RELIANCE MICA CORP.	342-39TH ST.	BROOKLYN, NY 11232
09353	C AND K COMPONENTS, INC.	103 MORSE STREET	WATERTOWN, MA 02172
12014	CHICAGO RIVET AND MACHINE CO.	950 S. 25TH AVENUE	BELLWOOD, IL 60104
12327	FREEWAY CORPORATION	9301 ALLEN DRIVE	CLEVELAND, OH 44125
12360	ALBANY PRODUCTS CO., DIV. OF PNEUMO DYNAMICS CORPORATION	145 WOODWARD AVENUE	SOUTH NORWALK, CT 06586
16428	BELDEN CORP.	P. O. BOX 1331	RICHMOND, IN 47374
22526	BERG ELECTRONICS, INC.	YOUNG EXPRESSWAY	NEW CUMBERLAND, PA 17070
22670	G.M. NAMEPLATE, INC.	2040 15TH AVENUE WEST	SEATTLE, WA 98119
24011	ELECTRONIZED CHEMICALS CORPORATION	S BEDFORD STREET	BURLINGTON, MA 01803
24931	SPECIALTY CONNECTOR CO., INC.	3560 MADISON AVE.	INDIANAPOLIS, IN 46227
25088	SIEMENS CORP.	186 WOOD AVE. S	ISELIN, NJ 08830
27143	ATLAS SPRING AND MFG. CO.	1805 N. SPAULDING AVE.	CHICAGO, IL 60647
28520	HEYMAN MFG. CO.	147 N. MICHIGAN AVE.	KENILWORTH, NJ 07033
28817	CAL-METEX CORP., SUBSIDIARY OF METEX CORP.	509 HINDRY AVE.	INGLEWOOD, CA 90301
42838	NATIONAL RIVET AND MFG. CO.	1-21 EAST JEFFERSON ST.	WAUPUN, WI 53963
51316	ANGELUS WASHER AND STAMPING CO.	1411 ESPERANZA ST.	LOS ANGELES, CA 90023
55210	GETTIG ENG. AND MFG. COMPANY	PO BOX 85, OFF ROUTE 45	SPRING MILLS, PA 16875
70276	ALLEN MFG. CO.	P. O. DRAWER 570	HARTFORD, CT 06101
70278	ALLIED STEEL AND CONVEYORS, DIV. OF SPARTON CORP.	17333 HEALY	DETROIT, MI 48212
70318	ALLMETAL SCREW PRODUCTS CO., INC.	821 STEWART AVE.	GARDEN CITY, NY 11530
71159	BRISTOL SOCKET SCREW, DIV. OF AMERICAN CHAIN AND CABLE CO., INC.	P O BOX 2244, 40 BRISTOL ST.	WATERBURY, CT 06720
71279	CAMBRIDGE THERMIONIC CORP.	445 CONCORD AVE.	CAMBRIDGE, MA 02138
71400	BUSSMAN MFG., DIVISION OF MCGRAW-EDISON CO.	2536 W. UNIVERSITY ST.	ST. LOUIS, MO 63107
71590	CENTRALAB ELECTRONICS, DIV. OF GLOBE-UNION, INC.	P O BOX 858	FORT DODGE, IA 50501
73743	FISCHER SPECIAL MFG. CO.	446 MORGAN ST.	CINCINNATI, OH 45206
73803	TEXAS INSTRUMENTS, INC., METALLURGICAL MATERIALS DIV.	34 FOREST STREET	ATTLEBORO, MA 02703
74445	HOLO-KROME CO.	31 BROOK ST. WEST	HARTFORD, CT 06110
75497	LAMSON AND SESSIONS CO.	5000 TIEDEMAN ROAD	CLEVELAND, OH 44144
75915	LITTELFUSE, INC.	800 E. NORTHWEST HWY	DES PLAINES, IL 60016
78189	ILLINOIS TOOL WORKS, INC.	ST. CHARLES ROAD	ELGIN, IL 60120
79136	SHAKEPROOF DIVISION	47-16 AUSTEL PLACE	LONG ISLAND CITY, NY 11101
79807	WALDES, KOHINOOR, INC.	2100 S. O BAY ST.	MILWAUKEE, WI 53207
80009	WROUGHT WASHER MFG. CO.	P O BOX 500	BEAVERTON, OR 97077
83385	TEKTRONIX, INC.	2530 CRESCENT DR.	BROADVIEW, IL 60153
86445	CENTRAL SCREW CO.	2032 E. WESTMORELAND ST.	PHILADELPHIA, PA 19134
86928	PENN FIBRE AND SPECIALTY CO., INC.	701 SONORA AVENUE	PHILADELPHIA, PA 19134
91260	SEASTROM MFG. COMPANY, INC.	1729 JUNCTION AVE.	GLENDALE, CA 91201
93907	CONNOR SPRING AND MFG. CO.	600 18TH AVE.	SAN JOSE, CA 95112
97464	CAMCAR SCREW AND MFG. CO.	57 CORDIER ST.	ROCKFORD, IL 61101
98291	INDUSTRIAL RETAINING RING CO.	225 HOYT	IRVINGTON, NJ 07111
	SEAELECTRO CORP.		MAMARONECK, NY 10544

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	200-1411-00		1						RTNR,IMPLOSION:5.422 X 4.743X 0.441,GRAY	80009	200-1411-00
-2	213-0313-00		4						. THUMBSCREW:4-40 X 0.45 INCH,KNURLED	80009	213-0313-00
-3	337-1674-00	B010100 B050199	1						SHLD,ELCTR NUB:CRT	80009	337-1674-00
	337-1674-07	B050200	1						SHLD,ELCTR NUB:CRT	80009	337-1674-07
-4	366-0494-00		2						KNOB:GRAY WITH SETSCREW	80009	366-0494-00
	213-0246-00		1						. SETSCREW:5-40 X 0.093 ITL BK OXD,HEX SKT	71159	OBD
-5	366-1031-02		2						KNOB:RED,VAR,0.127ID X 0.392 OD	80009	366-1031-02
	213-0246-00		1						. SETSCREW:5-40 X 0.093 ITL BK OXD,HEX SKT	71159	OBD
-6	366-1426-00		1						KNOB:GRAY	80009	366-1426-00
	213-0153-00		2						. SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	OBD
-7	366-0215-02		2						KNOB:LEVER SWITCH	80009	366-0215-02
-8	366-1023-01		3						KNOB:GRAY	80009	366-1023-01
	213-0246-00		1						. SETSCREW:5-40 X 0.093 ITL BK OXD,HEX SKT	71159	OBD
-9	366-1319-00		1						KNOB:GRAY	80009	366-1319-00
	213-0725-00		1						. SETSCREW:3-48 X 0.095 INCH,HEX SOC STL	74445	OBD
-10	366-1215-00		1						KNOB:GRAY	80009	366-1215-00
	213-0153-00		1						. SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	OBD
-11	366-1059-00		1						PUSH BUTTON:GRAY	80009	366-1059-00
-12	366-1215-00		1						KNOB:GRAY	80009	366-1215-00
	213-0153-00		1						. SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	OBD
-13	331-0328-00		1						DIAL,CONTROL:10 TURN FOR 0.25 DIA SHAFT	05129	461-S-70
	213-0048-00		1						. SETSCREW:4-40 X 0.125 INCH,HEX SOC STL	74445	OBD
-14	366-1346-02		1						KNOB:RED	80009	366-1346-00
	213-0153-00		1						. SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	OBD
-15	366-1219-01		1						KNOB:GRAY--DLYD SWP	80009	366-1219-01
	213-0243-00		2						. SETSCREW:5-40 X 0.25 INCH,HEX SOC STL	70276	OBD
-16	354-0442-01		1						RING,KNOB SKIRT:CLEAR,1.45 OD	80009	354-0442-01
	213-0153-00		1						. SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	OBD
	213-0005-00		1						. SETSCREW:8-32 X 1.25 INCH,HEX SOC STL	74445	OBD
-17	401-0080-00		1						BRG,KNOB SKIRT:0.789 ID X 0.866"OD PLASTIC	80009	401-0080-00
-18	366-1327-00		1						KNOB:GRAY	80009	366-1327-00
	213-0153-00		1						. SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	OBD
-19	366-1280-00		1						KNOB:GRAY	80009	366-1278-00
	213-0153-00		1						. SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	OBD
-20	366-0494-00		1						KNOB:GRAY WITH SETSCREW	80009	366-0494-00
	213-0246-00		1						. SETSCREW:5-40 X 0.093 ITL BK OXD,HEX SKT	71159	OBD
-21	366-1278-00		2						KNOB:GRAY	80009	366-1278-00
	213-0153-00		1						. SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	OBD
-22	366-1280-00		2						KNOB:GRAY	80009	366-1278-00
	213-0153-00		1						. SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	OBD
-23	378-0803-01		2						LENS,LIGHT:CLEAR,ATTENUATOR	80009	378-0803-01
-24	378-0745-00		2						LENS,LIGHT:CLEAR,TIMING	80009	378-0745-00
-25	378-0803-00		2						LENS,LIGHT:CLEAR	80009	378-0803-00
-26	426-0681-00		16						FR,PUSH BUTTON:GRAY PLASTIC	80009	426-0681-00
-27	426-1072-00		4						FRAME,PUSH BTN:PLASTIC	80009	426-1072-00
-28	358-0378-01	B010100 B132999	13						BUSHING,SLEEVE:0.250 OD X 0.131 ID,PRESS MT	80009	358-0378-01
	358-0378-01	B133000	10						BUSHING,SLEEVE:0.250 OD X 0.131 ID,PRESS MT	80009	358-0378-01
	358-0599-00	B133000	10						BUSHING,SLEEVE:0.125 ID X 0.234 THK,PLSTC	28520	B-187-125
-29	358-0216-01		2						GROMMET,PLASTIC:	80009	358-0216-01
-30	358-0216-00		1						BUSHING,PLASTIC:0.257 ID X 0.412 INCH OD	80009	358-0216-00
-31	358-0540-00		2						BSHG,MACH.THD:0.25-32 X 0.128 ID X 0.24" L (ATTACHING PARTS)	80009	358-0540-00
-32	210-0583-00		2						NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
-33	210-0940-00		2						WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL - - - * - - -	79807	OBD
-34	358-0539-00		2						BSHG,MACH THD:HEX,0.375 DIA X 0.247" L (ATTACHING PARTS)	80009	358-0539-00
-35	210-0583-00		2						NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS	73743	2X20317-402
-36	210-0940-00		2						WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL	79807	OBD
	129-0532-00	XB010300 B070809	2						POST,ELEC-MECH:HEX,0.25-32 X 0.90 INCH L	80009	129-0532-00
	129-0213-00	B070810	2						SPACER,POST:1,156 L,W/0.25-32 THD - - - * - - -	80009	129-0213-00
-37	378-0635-00		4						LENS,LIGHT:WHITE	80009	378-0635-00
-38	333-1944-00		1						PANEL,FRONT:	80009	333-1944-00
-39	352-0340-00		2						LAMPHOLDER:SCALE FACTOR	80009	352-0340-00





TEKTRONIX®

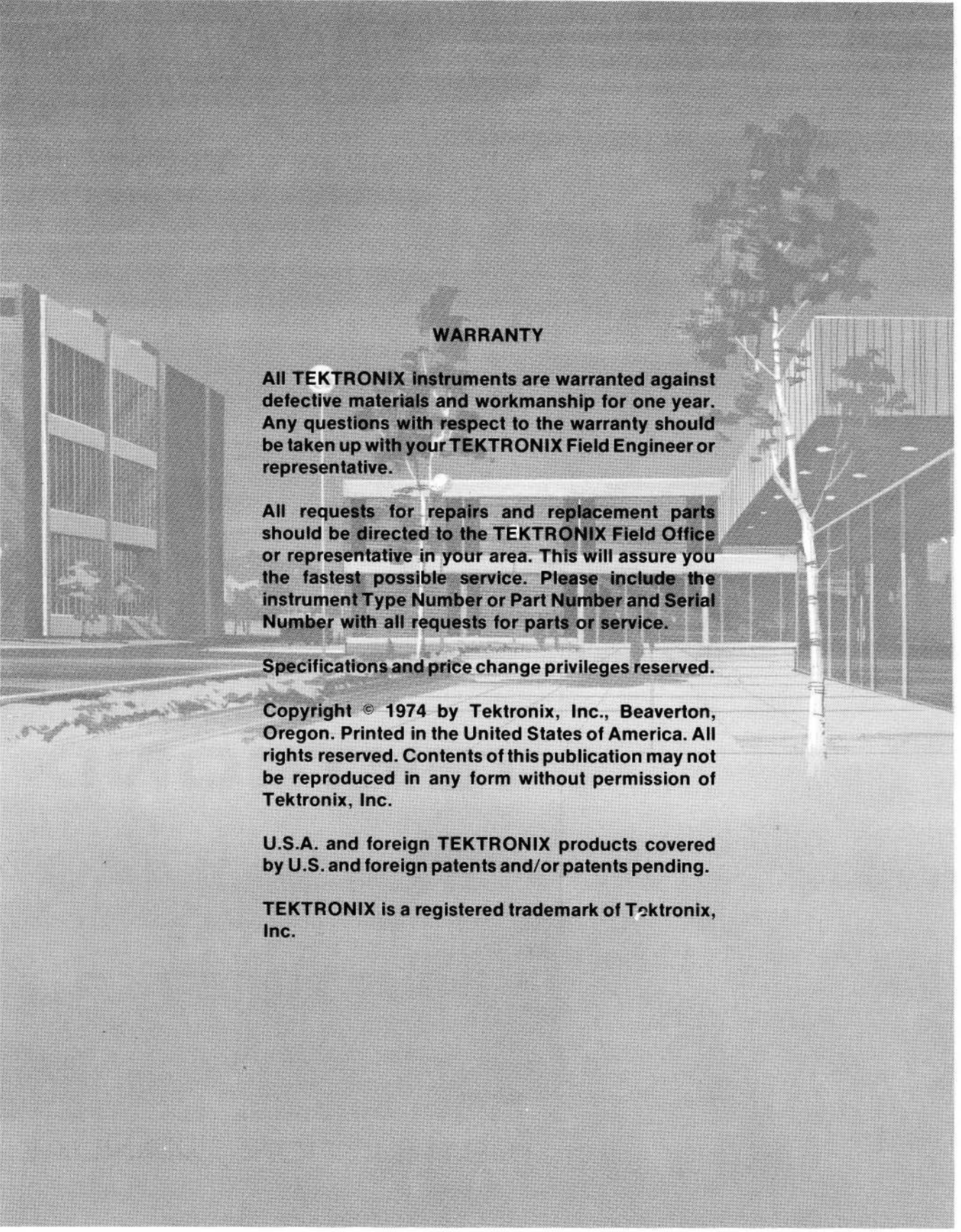
**DM43-DM40
DIGITAL
MULTIMETER**

SERVICE

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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1779-5

Fig. 1-1. DM43-DM40 Digital Multimeter.

SPECIFICATION

Introduction

The Tektronix DM43 is a digital multimeter added to the top of the 464, 465, 466, or 475 oscilloscope that measures dc voltage, resistance, temperature, and differential delay time (time between two points on oscilloscope trace).

The digital multimeter front panel contains the readout display, function, and range controls. Input terminals are located on the left side of the multimeter.

The readout is a $3\frac{1}{2}$ digit display using five 7-segment light emitting diodes. The decimal point is positioned by the Range setting in Volts and the Ohms function, the oscilloscope Time/Div setting and high-low range circuit of the multimeter in Time function, and by the function switch in Temperature function.

A negative polarity indication is automatic for negative dc voltages and temperatures with no polarity indication for positive measurements. A blinking display indicates over-range.

The DM40 is identical to the DM43, except that the temperature function, temperature probe, and temperature probe connector as well as the temperature converter circuitry is deleted.

The following specification applies over an ambient temperature range of $+15^{\circ}\text{C}$ to $+35^{\circ}\text{C}$, except where otherwise indicated.

ELECTRICAL

Dc Voltage

Ranges: 0 to 1.2 kV in .2 V, 2 V, 20 V, 200 V and 1.2 kV steps.

Resolution: 100 μV .

Accuracy: Within 0.1% of reading, ± 1 count.

Input Impedance: 10 M Ω on all ranges. User has option to remove a wire strap to increase input impedance to approximately 1000 M Ω on .2 V and 2 V ranges.

Rejection Ratio

Normal Mode: At least 60 dB at 50 Hz and 60 Hz power-line frequencies.

Common Mode: At least 100 dB at dc, and 80 dB at 50 Hz and 60 Hz power-line frequencies.

Recycle Time

Approximately 3.3 measurements per second.

Response Time

Within 0.5 second.

Maximum Safe Input Voltage

200 mV and 2 V Ranges: ± 500 V (dc + peak ac) between + and COMMON inputs.

20 V, 200 V, and 1.2 kV Ranges: ± 1200 V (dc + peak ac) between + and COMMON inputs or between + and chassis.

Common Floating Voltage

± 500 V (dc + peak ac) to chassis.

Resistance

Ranges: 0 to 20 M Ω in 200 Ω , 2 k Ω , 20 k Ω , 200 k Ω , 2 M Ω , and 20 M Ω steps.

Resolution: 0.1 Ω .

Accuracy: 200 Ω , 2 k Ω , and 20 M Ω ranges, within 0.75%, ± 1 count. 20 k Ω , 200 k Ω , and 2 M Ω ranges, within 0.3%, ± 1 count.

Recycle Time: Approximately 3.3 measurements per second.

Response Time: 200 Ω through 200 k Ω , within 1 second. 2 M Ω and 20 M Ω , 5 seconds.

Maximum Safe Input Voltage: 120 V rms between + and COMMON inputs for an indefinite time.

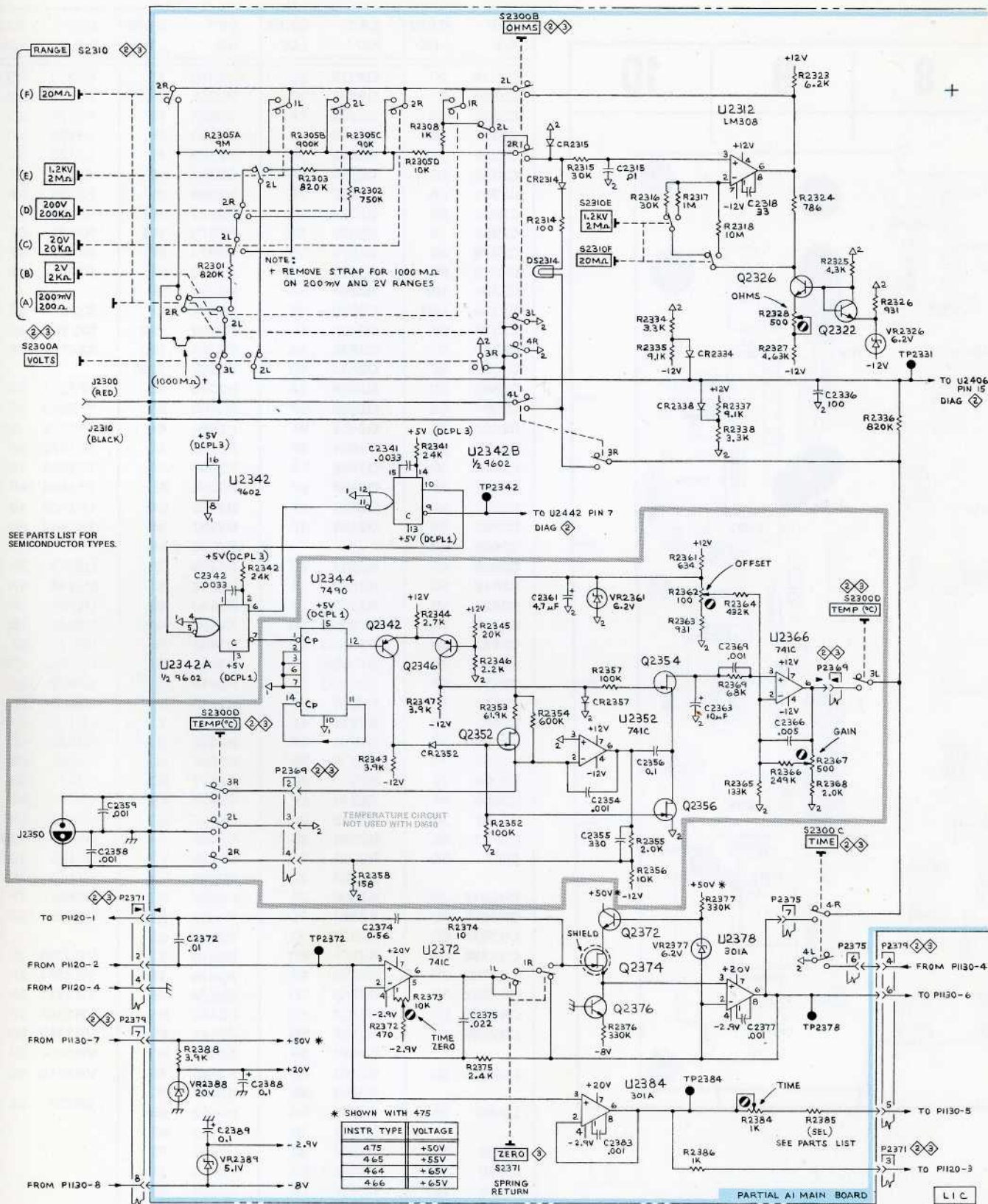
Temperature (With P6430 Probe) DM43 Only

Range: -55°C to $+150^{\circ}\text{C}$ in one range.

Accuracy (with constant temperature and infinite heat source). Probe calibrated to DM 43.

TABLE 1-1

DM43 Temp	$+15^{\circ}\text{C}$ to $+35^{\circ}\text{C}$	
P6430 Tip Temp	-55°C to $+125^{\circ}\text{C}$	$+125^{\circ}\text{C}$ to $+150^{\circ}\text{C}$
Accuracy	Within 2°C	Within 3°C
DM43 Temp	-15°C to $+15^{\circ}\text{C}$ and $+35^{\circ}\text{C}$ to $+55^{\circ}\text{C}$	
P6430 Tip Temp	-55°C to $+125^{\circ}\text{C}$	$+125^{\circ}\text{C}$ to $+150^{\circ}\text{C}$
Accuracy	Within 3°C	Within 4°C



INPUT CONVERTERS
DM 43 B010100-B010919
DM 40 B010100-B010499

**TEKTRONIX®**committed to
technical excellence**MANUAL CHANGE INFORMATION**PRODUCT DM43/DM40CHANGE REFERENCE C3/874ServiceDATE 8-22-74**CHANGE:****DESCRIPTION**

ELECTRICAL PARTS LIST AND SCHEMATIC CORRECTIONS

Page 6-12 DIFFERENCES BETWEEN STANDARD TIMING BOARD AND DVM TIMING BOARD

CHANGE: Heading and following text to read:

DIFFERENCES BETWEEN STANDARD TIMING BOARDS AND DM43/DM40 TIMING BOARDS

465

A7	670-3467-01	CKT BOARD ASSY:TIMING DM43/DM40 (465)
R1111	321-0265-00	RES.,FXD,FILM:5.62K OHM, 1%, 0.125W
R1112	321-0252-00	RES.,FXD,FILM:4.12K OHM, 1%, 0.125W
R1113	321-0154-00	RES.,FXD,FILM:392 OHM, 1%, 0.125W
R1142	321-0222-07	RES.,FXD,FILM:2K OHM, 0.1%, 0.125W
R1143	321-0193-07	RES.,FXD,FILM:1K OHM, 0.1%, 0.125W
R1144	321-0193-07	RES.,FXD,FILM:1K OHM, 0.1%, 0.125W

Page 6-13

CHANGE TO READ:

466/464

A7	670-3466-01	CKT BOARD ASSY: TIMING DM43/DM40 (466/464)
R812	321-0154-00	RES.,FXD,FILM:392 OHM, 1%, 0.125W
R815	321-0252-00	RES.,FXD,FILM:4.12K OHM, 1%, 0.125W
R817	321-0265-00	RES.,FXD,FILM:5.62K OHM, 1%, 0.125W
R1142	321-0222-07	RES.,FXD,FILM:2.0K OHM, 0.1%, 0.125W
R1143	321-0193-07	RES.,FXD,FILM:1.0K OHM, 0.1%, 0.125W
R1147	321-0193-07	RES.,FXD,FILM:1.0K OHM, 0.1%, 0.125W

Note: This insert replaces insert C2/874 dated 8-6-74.



WARNING

THE FOLLOWING SERVICING INSTRUCTIONS
ARE FOR USE BY QUALIFIED PERSONNEL ONLY.
TO AVOID PERSONAL INJURY, DO NOT
PERFORM ANY SERVICING OTHER THAN THAT
CONTAINED IN OPERATING INSTRUCTIONS
UNLESS YOU ARE QUALIFIED TO DO SO.

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

000811 **DM44**
DIGITAL
MULTIMETER
WITH OPTIONS
SERVICE

INSTRUCTION MANUAL

Tektronix, Inc.
P.O. Box 500
Beaverton, Oregon 97077
070-2036-01
Product Group 40

Serial Number _____

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are reserved.

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

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OPERATORS SAFETY SUMMARY

The general safety information in this part of the summary is for both operating and servicing personnel. Specific warnings and cautions will be found throughout the manual where they apply, but may not appear in this summary.

TERMS

In This Manual

CAUTION statements identify conditions or practices that could result in damage to the equipment or other property.

WARNING statements identify conditions or practices that could result in personal injury or loss of life.

As Marked on Equipment

CAUTION indicates a personal injury hazard not immediately accessible as one reads the marking, or a hazard to property including the equipment itself.

DANGER indicates a personal injury hazard immediately accessible as one reads the marking.

SYMBOLS

In This Manual



This symbol indicates where applicable cautionary or other information is to be found.

As Marked on Equipment



DANGER — High voltage.



Protective ground (earth) terminal.



ATTENTION — refer to manual.

Power Source

This product is intended to operate from a power source that will not apply more than 250 volts rms between the supply conductors or between either supply conductor and ground. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Grounding the Product

This product is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting to the product input or output terminals. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Use the Proper Power Cord

Use only the power cord and connector specified for your product.
Use only a power cord that is in good condition.

For detailed information on power cords and connectors, refer to the associated oscilloscope manual.

Refer cord and connector changes to qualified service personnel.

Use the Proper Fuse

To avoid fire hazard, use only the fuse specified in the parts list for your product, and which is identical in type, voltage rating, and current rating.

Refer fuse replacement to qualified service personnel.

Do Not Operate in Explosive Atmospheres

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

Do Not Remove Covers or Panels

To avoid personal injury, do not remove the product covers or panels. Do not operate the product without the covers and panels properly installed.

SERVICING SAFETY SUMMARY

FOR QUALIFIED SERVICE PERSONNEL ONLY

Refer also to the preceding Operators Safety Summary.

Do Not Service Alone

Do not perform internal service or adjustment of this product unless another person capable of rendering first aid and resuscitation is present.

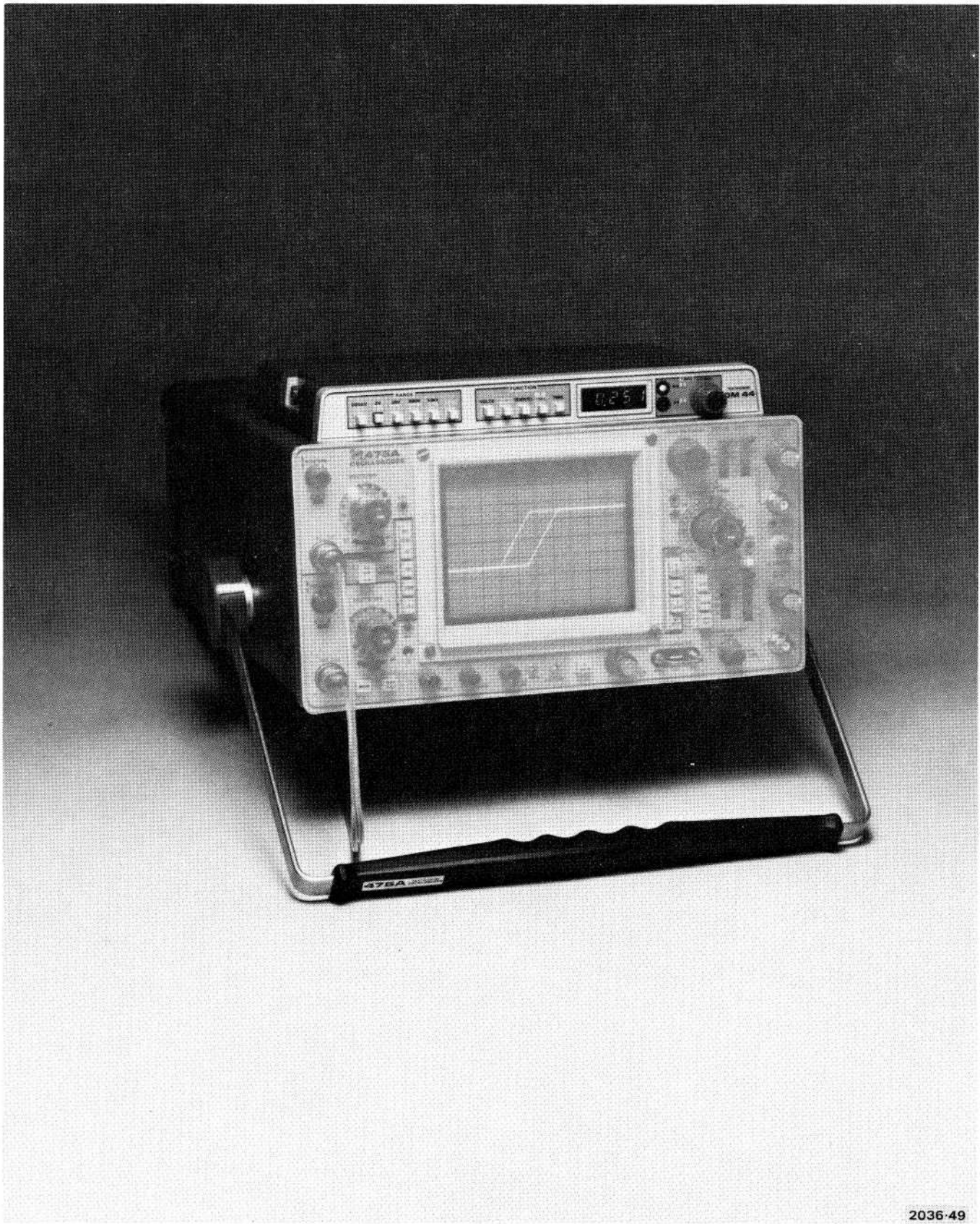
Use Care When Servicing With Power On

Dangerous voltages exist at several points in this product. To avoid personal injury, do not touch exposed connections and components while power is on.

Disconnect power before removing protective panels, soldering, or replacing components.

Power Source

This product is intended to operate from a power source that will not apply more than 250 volts rms between the supply conductors or between either supply conductor and ground. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.



2036-49

DM44 Digital Multimeter

SPECIFICATION

The DM44 is a digital multimeter, added to the top of the 464, 465, 465B, 466, 475, or 475A oscilloscope. This digital multimeter measures dc voltage, resistance, temperature, differential delay time (time between any 2 points on the oscilloscope trace), and reciprocal time (frequency if the period of one repetition is measured). The digital multimeter front panel contains the readout display, and function and range controls. Input terminals are located on the left side of the multimeter.

The readout is a 3-½ digit display using five 7-segment light-emitting diode displays. The decimal point is automatically positioned. Negative polarity indication is also automatic. A blinking display indicates an overrange condition.

The temperature probe is a standard accessory. Option 1 deletes the temperature probe.

TABLE 1-1
Electrical

Characteristics	Performance Requirement
DC VOLTAGE	
Ranges	0 to 1.2 kV in 5 steps (200 mV, 2 V, 20 V, 200 V, and 1.2 kV)
Resolution	100 μ V
Accuracy	Within 0.1% of reading, ± 1 count
Input Resistance	10 M Ω , all ranges (user has option to remove an internal wire strap to increase input resistance to 1000 M Ω on the 200 mV and 2 V ranges)
Normal/Common-Mode Rejection Ratio	
Normal Mode	At least 60 dB at 50 and 60 Hz
Common Mode	At least 100 dB at dc; 80 dB at 50 to 60 Hz
Recycle Time	Approximately 3.3 measurements per second
Response Time	Within 0.5 second
Temperature Dependence	45 parts/million/ $^{\circ}$ C
Maximum Safe Input Voltage, All Ranges	± 1200 V (dc + peak ac) between + and COMMON inputs or between + input and chassis
COMMON Floating Voltage	± 500 V (dc + peak ac) to chassis

TABLE 1-1 (cont.)
Electrical

Characteristics	Performance Requirement		
RESISTANCE			
Ranges	0 to 20 MΩ in six steps (200 Ω, 2 kΩ, 20 kΩ, 200 kΩ, 2 MΩ, and 20 MΩ)		
Resolution	0.1 Ω		
Accuracy			
200 Ω and 2 kΩ Ranges	Within 0.25%, ± 1 count, + probe resistance		
20 kΩ, 200 kΩ, and 2 MΩ Ranges	Within 0.25%, ± 1 count		
20 MΩ Range	Within 0.30%, ± 1 count		
Recycle Time	Approximately 3.3 measurements per second		
Response Time			
200 Ω through 200 kΩ Ranges	Within 1 second		
2 MΩ and 20 MΩ Ranges	Within 5 seconds		
Maximum Safe Input Voltage	120 V rms between + and COMMON inputs for an indefinitet time		
Current supplied to unknown resistance (approximate values, not guaranteed specification)	OHMS RANGE		CURRENT
	200 Ω and 2 kΩ		1 mA
	20 kΩ		100 μA
	200 kΩ		10 μA
	2 MΩ		1 μA
	20 MΩ		100 nA
TEMPERATURE (WITH P6430 PROBE)			
Range	−55°C to +150°C in one range		
Accuracy (with constant temperature and infinite heat source)	DM44 Ambient Temperature	P6430 Tip Temperature	Accuracy
Probe Calibrated to DM44	+15°C to +35°C	−55°C to +150°C	Within 2°C
	−15°C to +55°C	−55°C to +125°C	Within 3°C
	−15°C to +55°C	+125°C to +150°C	Within 4°C
TIME (DIFFERENTIAL DELAY)			
Accuracy			
+15°C to +35°C	Within 1% of reading, ± 1 count		
−15°C to +55°C	464, 465, 465B, and 466: Within 2.5%, ±1 count 475, and 475A: Within 1.5%, ±1 count		

TABLE 1-1 (cont.)
Electrical

Characteristics	Performance Requirement
1/TIME	
Accuracy	
+15°C to +35°C	Within 2% of reading, ± 1 count
-15°C to +55°C	464, 465, 465B, and 466: Within 3.5%, ± 1 count 475, and 475A: Within 3%, ± 1 count

TABLE 1-2
Environmental

Characteristics	Performance Requirement
TEMPERATURE	
Storage	-55°C to +75°C
Operating	-15°C to +55°C
Calibration	+15°C to +35°C
ALTITUDE	
Storage	To 50,000 feet
Operating	To 15,000 feet, maximum operating temperature decreased 1°C/1000 feet above 5,000 feet
HUMIDITY	5 cycles (120 hours); reference is MIL-E-16400F. Instrument must be in operation at least 2 hours
VIBRATION	15 minutes along each of 3 major axes at a total displacement of 0.025 inch, peak-to-peak, (4 g's at 55 Hz) with frequency varied from 10 to 55 to 10 Hz in 1 minute sweeps. All major resonances must be above 55 Hz.
SHOCK (OPERATING AND NONOPERATING)	30 g's, $\frac{1}{2}$ sine, 11 ms duration, 2 shocks per axis each direction for a total of 12 shocks

TABLE 1-3
Physical

Characteristics	Performance Requirement	
DM44 AND MAINFRAME WEIGHT	<u>465-475 DM44</u>	<u>464-466 DM44</u>
With Panel Cover, Accessories, and Pouch	29.5 lbs (13.4 kg)	31.0 lbs (14.0 kg)
Without Panel Cover, Accessories, and Pouch	26.5 lbs (12.0 kg)	28.0 lbs (12.7 kg)
DOMESTIC SHIPPING WEIGHT	36.0 lbs (16.7 kg)	38.9 lbs (17.6 kg)
DIMENSIONS	See Figure 1-1	

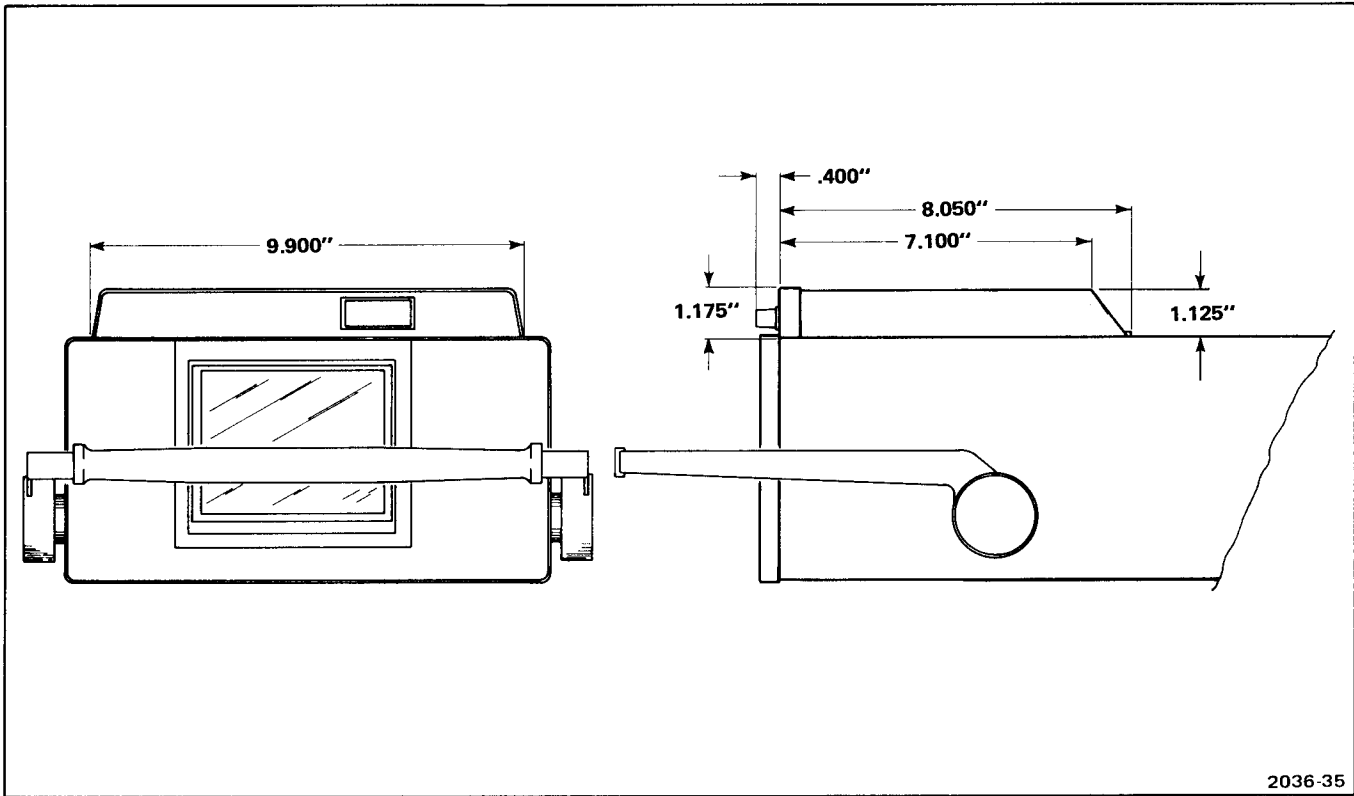


Fig. 1-1. DM44 dimensional drawing.

STANDARD ACCESSORIES
(Refer to Mechanical Parts List)

RECOMMENDED ACCESSORIES

1 PAIR TEST LEADS

One test lead with probe on one end and banana plug on the other. One test lead with grounding clip on one end and banana plug on the other.

order Tektronix Part 012-0427-00

OPERATING INFORMATION

The following information will familiarize you with the location and basic operation of the DM44. If you need detailed operating instructions, see the Operator's manual.

OPERATING VOLTAGE

The DM44 gets its operating voltage from the instrument to which it is attached. See the oscilloscope Service manual or the Operator's manual for operating voltage information.

CONTROLS, CONNECTORS, AND INDICATORS

Figure 2-1 shows the location of the DM44 controls, connectors, and indicators. The numbers in Figure 2-1 correspond to the number preceding the discussion of that control.

- ① **Input Connectors**—Two banana jacks, + (red) and COM (black), provide inputs for voltage and resistance only.
- ② **Probe Connector**—Input connector for the temperature probe.
- ③ **Readout**—A 3-½ digit display. Negative measurement indication is automatic for negative dc voltage and temperature. No polarity indication is shown for positive measurements. Decimal point location is automatic for all functions.
- ④ **RANGE**—Selects from .2 V to 1.2 kV in five ranges and from 200 Ω to 20 M Ω in 6 ranges. Maximum safe input voltage in the VOLTS function is 1.2 kV.
- ⑤ **FUNCTION**—Selects VOLTS, OHMS, TEMP ($^{\circ}$ C), 1/TIME, or TIME functions of the DM44.

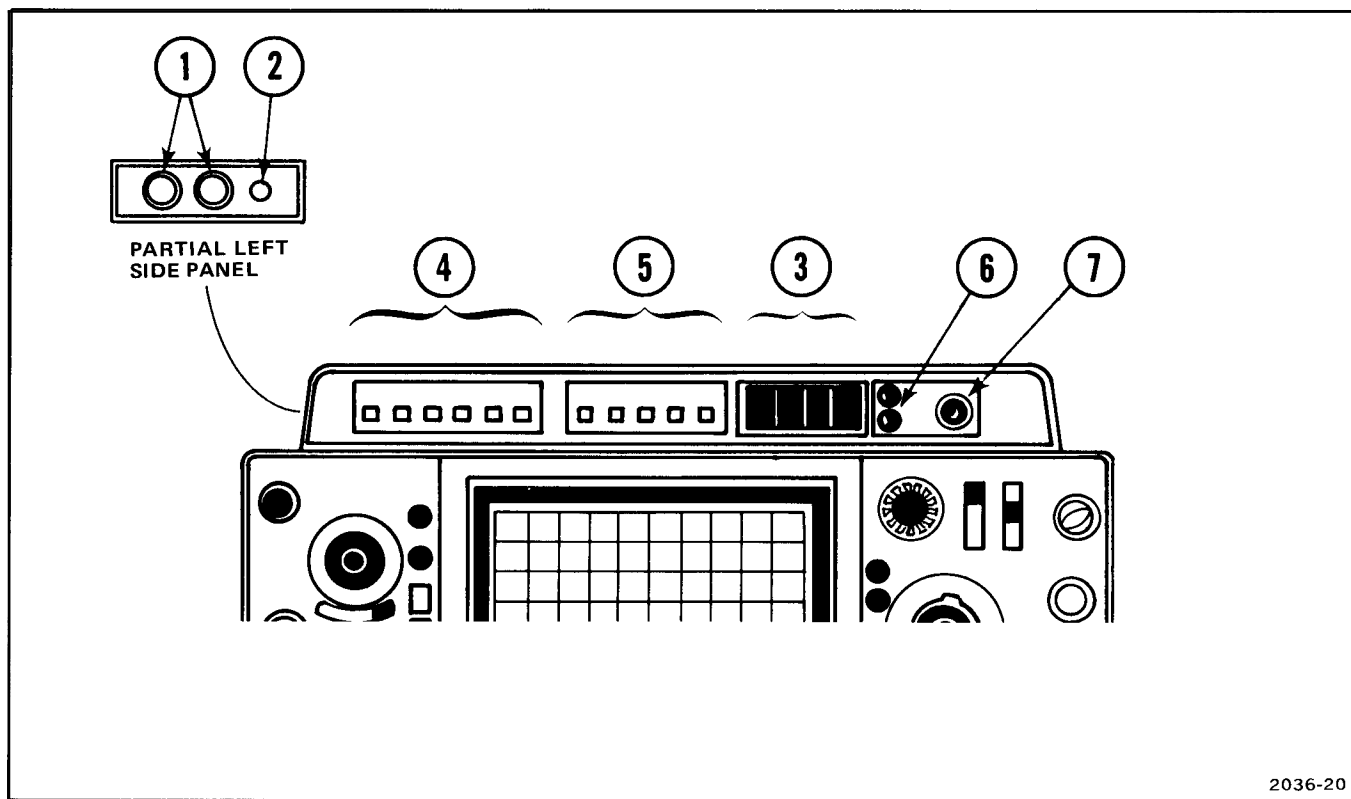


Fig. 2-1. DM44 controls, connectors, and indicators.

Replaceable Electrical Parts—DM44 Service

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
C3256	283-0198-00			CAP., FXD, CER DI: 0.22UF, 20%, 50V	72982	8121N083Z5U0224M
C3257	283-0198-00			CAP., FXD, CER DI: 0.22UF, 20%, 50V	72982	8121N083Z5U0224M
C3259	283-0198-00			CAP., FXD, CER DI: 0.22UF, 20%, 50V	72982	8121N083Z5U0224M
C3260	283-0198-00			CAP., FXD, CER DI: 0.22UF, 20%, 50V	72982	8121N083Z5U0224M
C3269	283-0177-00	XB010180		CAP., FXD, CER DI: 1UF, +80-20%, 25V	56289	273C5
	-----			(USED WITH 464, 465, 465B AND 466 ONLY)		
C3274	283-0198-00			CAP., FXD, CER DI: 0.22UF, 20%, 50V	72982	8121N083Z5U0224M
C3277	283-0212-00	XB010180		CAP., FXD, CER DI: 2UF, 20%, 50V	72982	8141N064Z5U205M
C3278	283-0198-00	B010100	B010179	CAP., FXD, CER DI: 0.22UF, 20%, 50V	72982	8121N083Z5U0224M
C3278	283-0204-00	B010180		CAP., FXD, CER DI: 0.01UF, 20%, 50V	72982	8121N061Z5U0103M
C3279	283-0198-00			CAP., FXD, CER DI: 0.22UF, 20%, 50V	72982	8121N083Z5U0224M
C3281	283-0177-00	XB025590		CAP., FXD, CER DI: 1UF, +80-20%, 25V	56289	273C5
C3282	283-0198-00			CAP., FXD, CER DI: 0.22UF, 20%, 50V	72982	8121N083Z5U0224M
C3302	283-0198-00			CAP., FXD, CER DI: 0.22UF, 20%, 50V	72982	8121N083Z5U0224M
C3303	283-0198-00			CAP., FXD, CER DI: 0.22UF, 20%, 50V	72982	8121N083Z5U0224M
C3321	283-0198-00			CAP., FXD, CER DI: 0.22UF, 20%, 50V	72982	8121N083Z5U0224M
C3322	283-0013-00			CAP., FXD, CER DI: 0.01UF, +100-0%, 1000V	56289	33C29A7
C3324	283-0198-00			CAP., FXD, CER DI: 0.22UF, 20%, 50V	72982	8121N083Z5U0224M
C3333	283-0696-00			CAP., FXD, MICA D: 2300PF, 1%, 500V	00853	D19-5E232F0
C3341	283-0198-00			CAP., FXD, CER DI: 0.22UF, 20%, 50V	72982	8121N083Z5U0224M
C3661	283-0198-00			CAP., FXD, CER DI: 0.22UF, 20%, 50V	72982	8121N083Z5U0224M
C3675	290-0535-00			CAP., FXD, ELCTLT: 33UF, 20%, 10V	56289	196D336X0010KA1
C3676	283-0198-00			CAP., FXD, CER DI: 0.22UF, 20%, 50V	72982	8121N083Z5U0224M
C3681	283-0198-00			CAP., FXD, CER DI: 0.22UF, 20%, 50V	72982	8121N083Z5U0224M
CR2510	150-1001-01			LAMP, LED: RED, 2V, 100MA	50434	HLMP-3200
CR2520	150-1001-01			LAMP, LED: RED, 2V, 100MA	50434	HLMP-3200
CR2610	152-0488-00			SEMICONV DEVICE: SILICON, 200V, 1500MA	04713	3N55 FAMILY
CR2622	152-0423-00			SEMICONV DEVICE: SILICON, 400V, 3A	04713	1N5000
CR2623	152-0423-00			SEMICONV DEVICE: SILICON, 400V, 3A	04713	1N5000
CR2636	152-0066-00			SEMICONV DEVICE: SILICON, 400V, 750MA	14433	LG4016
CR3013	152-0323-00	XB043400		SEMICONV DEVICE: SILICON, 35V, 0.1A (465 AND 465B ONLY)	80009	152-0323-00
CR3013	152-0323-00	XB049020		SEMICONV DEVICE: SILICON, 35V, 0.1A (464 AND 466 ONLY)	80009	152-0323-00
CR3013	152-0323-00	XB050840		SEMICONV DEVICE: SILICON, 35V, 0.1A (475 ONLY)	80009	152-0323-00
CR3013	152-0323-00	XB047080		SEMICONV DEVICE: SILICON, 35V, 0.1A (475A ONLY)	80009	152-0323-00
CR3013	152-0323-00	XB050775		SEMICONV DEVICE: SILICON, 35V, 0.1A (475APG ONLY)	80009	152-0323-00
CR3014	152-0323-00	XB043400		SEMICONV DEVICE: SILICON, 35V, 0.1A (465 AND 465B ONLY)	80009	152-0323-00
CR3014	152-0323-00	XB049020		SEMICONV DEVICE: SILICON, 35V, 0.1A (464 AND 466 ONLY)	80009	152-0323-00
CR3014	152-0323-00	XB050840		SEMICONV DEVICE: SILICON, 35V, 0.1A (475 ONLY)	80009	152-0323-00
CR3014	152-0323-00	XB047080		SEMICONV DEVICE: SILICON, 35V, 0.1A (475A ONLY)	80009	152-0323-00
CR3014	152-0323-00	XB050775		SEMICONV DEVICE: SILICON, 35V, 0.1A (475APG ONLY)	80009	152-0323-00
CR3016	152-0040-00			SEMICONV DEVICE: SILICON, 600V, 1A	15238	LG109
CR3062	152-0323-00			SEMICONV DEVICE: SILICON, 35V, 0.1A	80009	152-0323-00
CR3065	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR3066	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R
CR3074	152-0040-00			SEMICONV DEVICE: SILICON, 600V, 1A	15238	LG109
CR3075	152-0040-00			SEMICONV DEVICE: SILICON, 600V, 1A	15238	LG109
CR3120	152-0141-02			SEMICONV DEVICE: SILICON, 30V, 150MA	01295	1N4152R

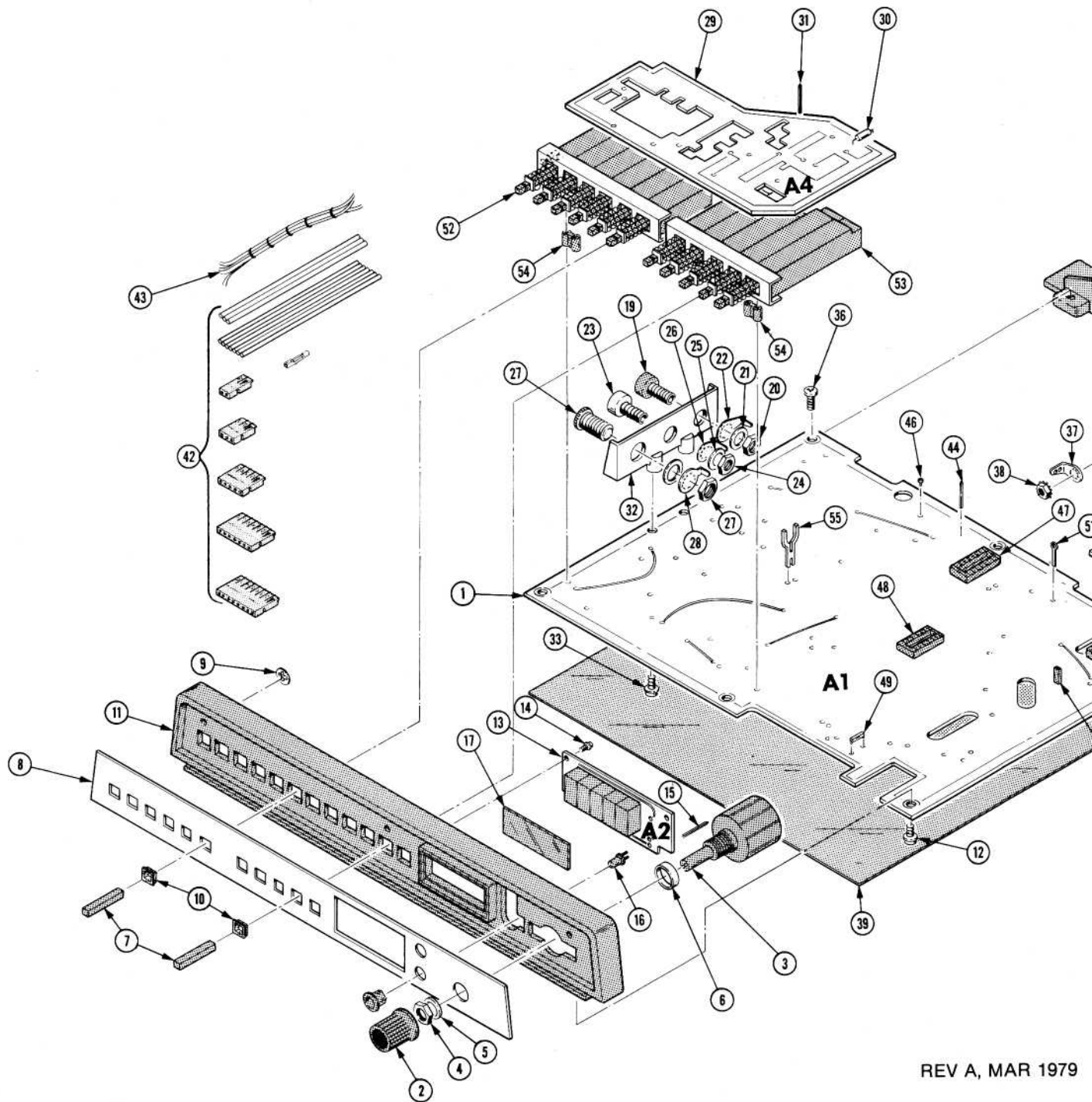
Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Discont	Name & Description	Mfr Code	Mfr Part Number
CR3133	152-0141-02			SEMICON D DEVICE:SILICON,30V,150MA	01295	1N4152R
CR3221	152-0075-00			SEMICON D DEVICE:GE,25V,40MA	14433	G866
CR3232	152-0141-02	B010100	B010179	SEMICON D DEVICE:SILICON,30V,150MA	01295	1N4152R
CR3232	152-0075-00	B010180		SEMICON D DEVICE:GE,25V,40MA	14433	G866
CR3234	152-0141-02	B010100	B010179	SEMICON D DEVICE:SILICON,30V,150MA	01295	1N4152R
CR3234	152-0075-00	B010180		SEMICON D DEVICE:GE,25V,40MA	14433	G866
CR3274	152-0141-02	B010100	B010179X	SEMICON D DEVICE:SILICON,30V,150MA	01295	1N4152R
CR3275	152-0141-02	B010100	B010179X	SEMICON D DEVICE:SILICON,30V,150MA	01295	1N4152R
CR3278	152-0075-00	XB010180		SEMICON D DEVICE:GE,25V,40MA	14433	G866
CR3279	152-0075-00	XB010180		SEMICON D DEVICE:GE,25V,40MA	14433	G866
CR3292	152-0141-02	B010100	B010179X	SEMICON D DEVICE:SILICON,30V,150MA	01295	1N4152R
CR3320	152-0141-02			SEMICON D DEVICE:SILICON,30V,150MA	01295	1N4152R
CR3321	152-0141-02			SEMICON D DEVICE:SILICON,30V,150MA	01295	1N4152R
CR3324	152-0141-02			SEMICON D DEVICE:SILICON,30V,150MA	01295	1N4152R
DS3016	150-0131-00			LAMP, INCAND:120V,0.025A	71744	120PS
J3350	136-0328-03			SOCKET,PIN TERM:HORIZ,SQ PIN RCPT	22526	47710
L3675	120-0407-00			XFMR,TOROID:5 TURNS SINGLE	80009	120-0407-00
P3277	131-0993-00			BUS, CONDUCTOR:2 WIRE BLACK	00779	850100-01
Q2632	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
Q2634	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
Q2636	151-0464-00			TRANSISTOR:SILICON,NPN	04713	SJE412
Q2638	151-0188-00			TRANSISTOR:SILICON,PNP	04713	SPS6868K
Q3045	151-0254-00			TRANSISTOR:SILICON,NPN	03508	X38L3118
Q3143	151-1022-00			TRANSISTOR:FET,N-CHAN,SI,F1782,T0-18	80009	151-1022-00
Q3153	151-0254-00			TRANSISTOR:SILICON,NPN	03508	X38L3118
Q3251	151-0435-00			TRANSISTOR:SILICON,PNP	04713	SPS8335
Q3269	151-0254-00			TRANSISTOR:SILICON,NPN	03508	X38L3118
Q3350	151-0301-00			TRANSISTOR:SILICON,PNP	27014	2N2907A
Q3355	151-0207-00			TRANSISTOR:SILICON,NPN	03508	X32D6191
Q3360	151-0207-00			TRANSISTOR:SILICON,NPN	03508	X32D6191
Q3365	151-0207-00			TRANSISTOR:SILICON,NPN	03508	X32D6191
Q3370	151-0207-00			TRANSISTOR:SILICON,NPN	03508	X32D6191
Q3380	151-0301-00			TRANSISTOR:SILICON,PNP	27014	2N2907A
Q3390	151-0301-00			TRANSISTOR:SILICON,PNP	27014	2N2907A
R2633	307-0114-00			RES.,FXD,CMPSN:6.2 OHM,5%,0.25W	01121	CB62G5
R2634	321-0274-00			RES.,FXD,FILM:6.98K OHM,1%,0.125W	91637	MFF1816G69800F
R2635	321-0274-00			RES.,FXD,FILM:6.98K OHM,1%,0.125W	91637	MFF1816G69800F
R2636	315-0392-00			RES.,FXD,CMPSN:3.9K OHM,5%,0.25W	01121	CB3925
R3002						
R3003						
R3004	325-0185-00			RES. SET,MTCHD:9M,900K,90K,10K OHM	03888	OBD
R3005						
R3006	323-0192-09			RES.,FXD,FILM:976 OHM,1%,0.50W	91637	MFF1226C976R0F
R3007	311-1276-00			RES.,VAR, NONWIR:50 OHM,+/-10%,0.5W	32997	3329W-L58-500
R3010	301-0824-00			RES.,FXD,CMPSN:820K OHM,5%,0.50W	01121	EB8245
R3011	301-0754-00			RES.,FXD,CMPSN:750K OHM,5%,0.50W	01121	EB7545
R3012	304-0824-00			RES.,FXD,CMPSN:820K OHM,10%,1W	01121	GB8241
R3016	315-0101-00			RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
R3019	304-0824-00			RES.,FXD,CMPSN:820K OHM,10%,1W	01121	GB8241
R3023	315-0225-00			RES.,FXD,CMPSN:2.2M OHM,5%,0.25W	01121	CB2255
R3030	321-0168-00			RES.,FXD,FILM:549 OHM,1%,0.125W	91637	MFF1816G549R0F
R3031	311-1260-00			RES.,VAR, NONWIR:250 OHM,10%,0.50W	32997	3329P-L58-251
R3032	321-1627-06			RES.,FXD,FILM:731.3K OHM,0.25%,0.125W	91637	MFF1816C73132C

Replaceable Electrical Parts—DM44 Service

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R3033	311-1895-00			RES., VAR, NONWIR: 2K OHM, 10%, 0.50W	32997	3299W-R27-202
R3034	321-0228-09			RES., FXD, FILM: 2.32K OHM, 1%, 0.125W	91637	MFF1816C23200F
R3041	321-0291-09			RES., FXD, FILM: 10.5K OHM, 1%, 0.125W	24546	NE55E1052F
R3043	321-1299-09			RES., FXD, FILM: 12.9K OHM, 1%, 0.125W	91637	MFF1816C12901F
R3044	321-1299-09			RES., FXD, FILM: 12.9K OHM, 1%, 0.125W	91637	MFF1816C12901F
R3045	315-0100-00			RES., FXD, CMPSN: 10 OHM, 5%, 0.25W	01121	CB1005
R3047	311-1680-00			RES., VAR, NONWIR: 250 OHM, 10%, 0.75W	73138	89-161-1
R3048	321-0228-09			RES., FXD, FILM: 2.32K OHM, 1%, 0.125W	91637	MFF1816C23200F
R3051	321-0313-09			RES., FXD, FILM: 17.8K OHM, 1%, 0.125W	24546	NE55E1782F
R3058	315-0106-00			RES., FXD, CMPSN: 10M OHM, 5%, 0.25W	01121	CB1065
R3062	315-0303-00			RES., FXD, CMPSN: 30K OHM, 5%, 0.25W	01121	CB3035
R3065	315-0622-00			RES., FXD, CMPSN: 6.2K OHM, 5%, 0.25W	01121	CB6225
R3068	321-0729-06			RES., FXD, FILM: 786 OHM, 0.25%, 0.125W	91637	MFF1816C786ROC
R3073	315-0101-00			RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R3077	321-0133-00			RES., FXD, FILM: 237 OHM, 1%, 0.125W	91637	MFF1816G237ROF
R3078	321-0347-09			RES., FXD, FILM: 40.2K OHM, 1%, 0.125W	91637	MFF1816C40201F
R3080	321-1642-06			RES., FXD, FILM: 72.3K OHM, 0.25%, 0.125W	91637	MFF1816C72301C
R3082	321-0183-00			RES., FXD, FILM: 787 OHM, 1%, 0.125W	91637	MFF1816G787ROF
R3083	311-1897-00			RES., VAR, NONWIR: 25K OHM, 10%, 0.50W	32997	3299W-1-253
R3084	321-0365-09			RES., FXD, FILM: 61.9K OHM, 1%, 0.125W	24546	NE55E6192F
R3086	321-0318-06			RES., FXD, FILM: 20K OHM, 0.25%, 0.125W	24546	NE55E2002C
R3088	321-0807-00			RES., FXD, FILM: 900K OHM, 1%, 0.125W	91637	HFF1104F90002F
R3089	321-0423-09			RES., FXD, FILM: 249K OHM, 1%, 0.125W	24546	NE55E2493F
R3090	321-0321-07			RES., FXD, FILM: 21.5K OHM, 0.1%, 0.125W	91637	MFF1816C21501B
R3093	321-0276-09			RES., FXD, FILM: 7.32K OHM, 1%, 0.125W	91637	MFF1816C73200F
R3094	321-0964-07			RES., FXD, FILM: 49.31K OHM, 0.1%, 0.125W	91637	MFF1816C49311B
R3095	311-1897-00			RES., VAR, NONWIR: 25K OHM, 10%, 0.50W	32997	3299W-1-253
R3098	304-0824-00			RES., FXD, CMPSN: 820K OHM, 10%, 1W	01121	GB8241
R3104	315-0104-00			RES., FXD, CMPSN: 100K OHM, 5%, 0.25W	01121	CB1045
R3105	315-0153-00			RES., FXD, CMPSN: 15K OHM, 5%, 0.25W	01121	CB1535
R3106	307-0106-00			RES., FXD, CMPSN: 4.7 OHM, 5%, 0.25W	01121	CB47G5
R3113	315-0332-00			RES., FXD, CMPSN: 3.3K OHM, 5%, 0.25W	01121	CB3325
R3115	315-0104-00			RES., FXD, CMPSN: 100K OHM, 5%, 0.25W	01121	CB1045
R3116	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R3117	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R3120	315-0222-00			RES., FXD, CMPSN: 2.2K OHM, 5%, 0.25W	01121	CB2225
R3132	315-0104-00			RES., FXD, CMPSN: 100K OHM, 5%, 0.25W	01121	CB1045
R3133	315-0104-00			RES., FXD, CMPSN: 100K OHM, 5%, 0.25W	01121	CB1045
R3137	315-0913-00			RES., FXD, CMPSN: 91K OHM, 5%, 0.25W	01121	CB9135
R3138	315-0913-00			RES., FXD, CMPSN: 91K OHM, 5%, 0.25W	01121	CB9135
R3140	311-1244-00			RES., VAR, NONWIR: 100 OHM, 10%, 0.50W	32997	3386X-T07-101
R3141	321-1643-07			RES., FXD, FILM: 11.03K OHM, 0.1%, 0.125W	91637	MFF1816C11031B
R3145	321-0385-07			RES., FXD, FILM: 100K OHM, 0.1%, 0.125W	91637	MFF1816C10002B
R3147	315-0104-00			RES., FXD, CMPSN: 100K OHM, 5%, 0.25W	01121	CB1045
R3153	315-0622-00			RES., FXD, CMPSN: 6.2K OHM, 5%, 0.25W	01121	CB6225
R3154	321-1642-06			RES., FXD, FILM: 72.3K OHM, 0.25%, 0.125W	91637	MFF1816C72301C
R3155	311-1896-00			RES., VAR, NONWIR: 5K OHM, 10%, 0.50W	32997	3299W-1-502
R3157	315-0474-00			RES., FXD, CMPSN: 470K OHM, 5%, 0.25W	01121	CB4745
R3158	315-0203-00			RES., FXD, CMPSN: 20K OHM, 5%, 0.25W	01121	CB2035
R3160	315-0154-00			RES., FXD, CMPSN: 150K OHM, 5%, 0.25W	01121	CB1545
R3161	315-0103-00			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R3162	311-0660-00	XB030601		RES., VAR, NONWIR: TRMR, 200K OHM, 0.5W	73138	82-35-1
R3164	311-0660-00	XB030601		RES., VAR, NONWIR: TRMR, 200K OHM, 0.5W	73138	82-35-1
R3165	315-0303-00			RES., FXD, CMPSN: 30K OHM, 5%, 0.25W	01121	CB3035
R3201	315-0222-00			RES., FXD, CMPSN: 2.2K OHM, 5%, 0.25W	01121	CB2225
R3202	315-0104-00			RES., FXD, CMPSN: 100K OHM, 5%, 0.25W	01121	CB1045
R3204	315-0222-00			RES., FXD, CMPSN: 2.2K OHM, 5%, 0.25W	01121	CB2225

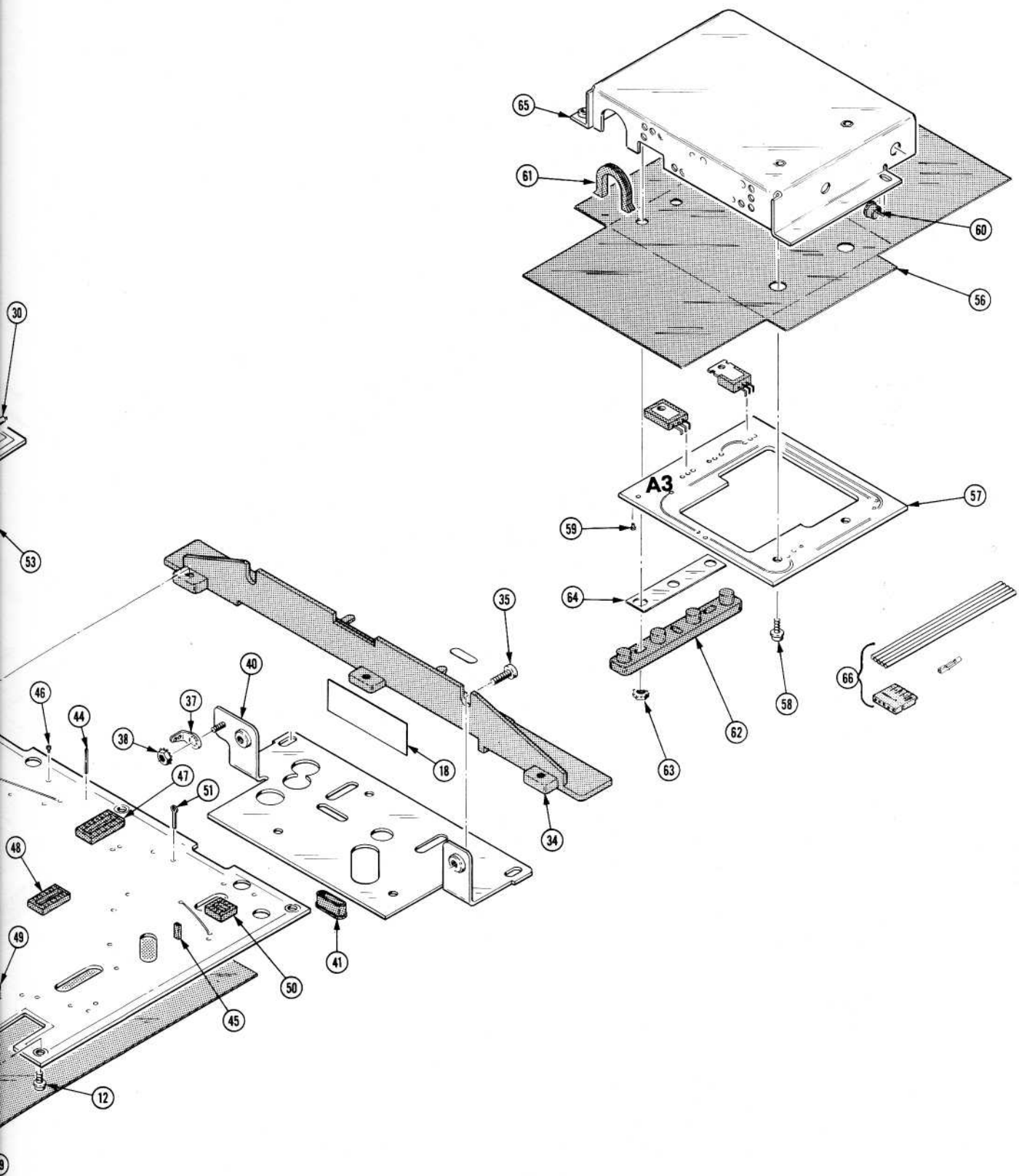
Replaceable Mechanical Parts—DM44 Service

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-41	348-0417-00		1	.	GROMMET, PLASTIC: 0.75 INCH DIA	80009	348-0417-00
-42	198-3163-00		1	.	WIRE SET, ELEC:	80009	198-3163-00
-43	179-2504-00		1	.	WIRING HARNESS, :MAIN	80009	179-2504-00
-44	131-0608-00		50	.	TERMINAL, PIN: 0.365 L X 0.025 PH BRZ GOLD	22526	47357
-45	131-0993-00		1	.	BUS, CONDUCTOR: 2 WIRE BLACK	00779	530153-2
-46	136-0252-07		79	.	SOCKET, PIN CONN: W/O DIMPLE	22526	75060-012
-47	136-0260-02		2	.	SKT, PL-IN ELEC: MICROCIRCUIT, 16 DIP, LOW CLE	71785	133-51-92-008
-48	136-0269-02		15	.	SKT, PL-IN ELEC: MICROCIRCUIT, 14 DIP, LOW CLE	73803	CS9002-14
-49	136-0328-03		17	.	SOCKET, PIN TERM: HORIZ, SQ PIN RCPT	22526	47710
-50	136-0514-00		1	.	SKT, PL-IN ELEC: MICROCIRCUIT, 8 DIP	73803	CS9002-8
-51	214-0579-00		24	.	TERM, TEST POINT: BRS CD PL	80009	214-0579-00
-52	-----		1	.	SWITCH, PB: (SEE S3020 REPL)		
-53	-----		1	.	SWITCH, PB: (SEE S3010 REPL)		
-54	361-0608-00		15	.	SPACER, PUSH SW: PLASTIC	80009	361-0608-00
-55	344-0154-00		2	.	CLIP, ELECTRICAL: FUSE, CKT BD MT	80009	344-0154-00
	672-0482-00		1	.	CKT BOARD ASSY: POWER SUPPLY	80009	672-0482-00
	-----		-	.	(464 AND 466 ONLY)		
	672-0453-00		1	.	CKT BOARD ASSY: POWER SUPPLY	80009	672-0453-00
	-----		-	.	(465, 475 AND 475A ONLY)		
-56	342-0238-00		1	.	INSULATOR, PLATE:	80009	342-0238-00
-57	-----		1	.	CKT BOARD ASSY: PWR SUP DMM (SEE A3 REPL) (ATTACHING PARTS)		
-58	211-0207-00		2	.	SCR, ASSEM WSHR: 4-40 X 0.312 DOUBLE SEMS	83385	OBD
	-----		-	.	----- * -----		
	-----		-	.	CKT BOARD ASSEMBLY INCLUDES:		
-59	136-0252-07		9	.	. SOCKET, PIN CONN: W/O DIMPLE	22526	75060-012
-60	348-0055-00		1	.	GROMMET, PLASTIC: 0.25 INCH DIA	80009	348-0055-00
-61	348-0141-00		1	.	GROMMET, PLASTIC: U-SHP, 0.625 X 0.658 INCH	80009	348-0141-00
-62	343-0507-00		1	.	RETAINER, XSTR:	80009	343-0507-00
	-----		-	.	(ATTACHING PARTS)		
-63	210-0586-00		3	.	NUT, PL, ASSEM WA: 4-40 X 0.25, STL CD PL	83385	OBD
	-----		-	.	----- * -----		
-64	342-0195-00		1	.	INSULATOR, PLATE: 0.70 X 3 INCHES LONG	08530	OBD
-65	441-1171-00		1	.	CHASSIS, SCOPE: INVERTER	80009	441-1171-00
-66	198-3066-00		1	.	WIRE SET, ELEC:	80009	198-3066-00
	-----		-	.	(464 AND 466 ONLY)		
	198-3058-00		1	.	WIRE SET, ELEC:	80009	198-3058-00
	-----		-	.	(465, 475 AND 475A ONLY)		



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10-004B

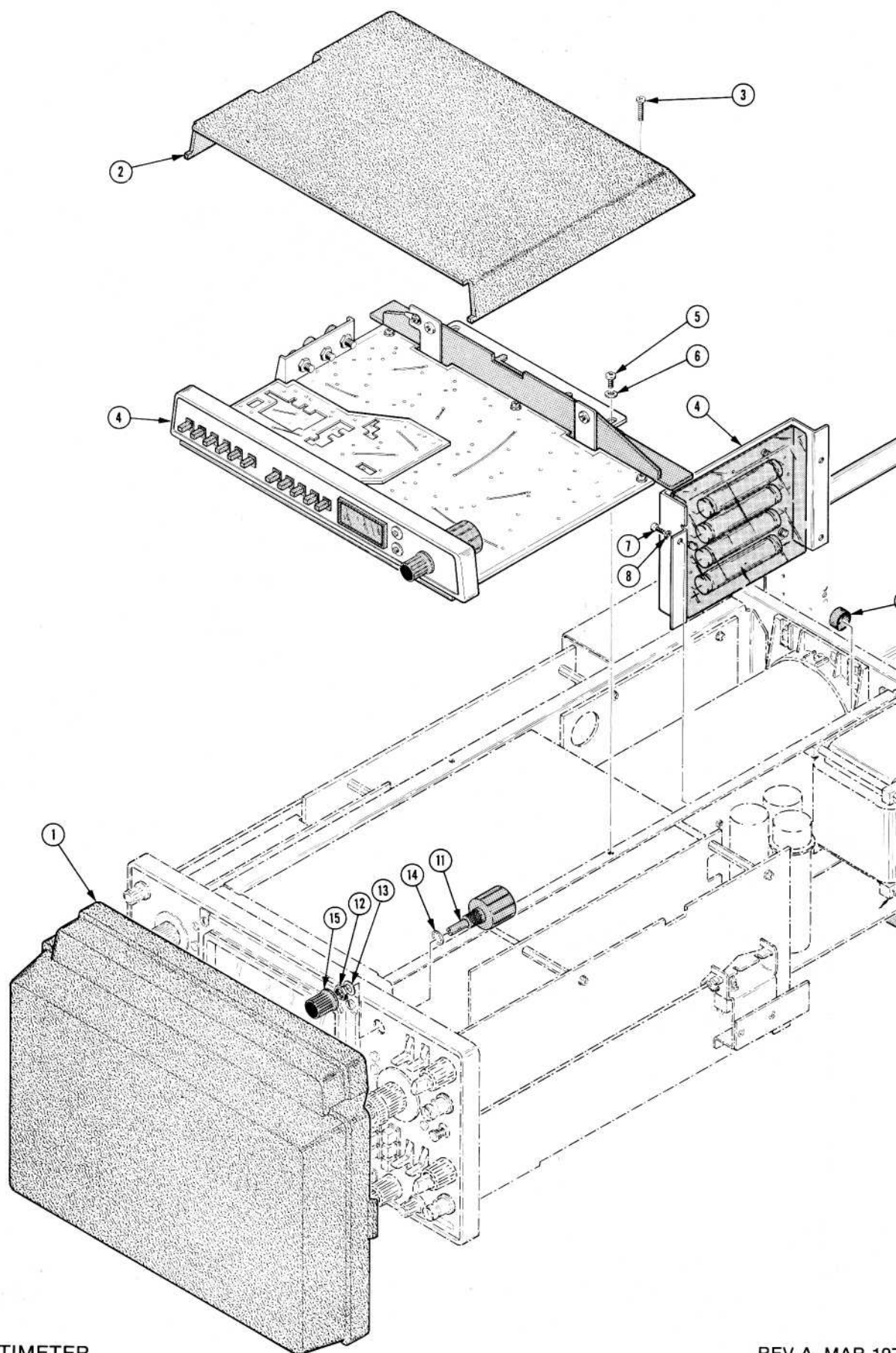


REV A, MAR 1979

DM44 DIGITAL MULTIMETER

10-004C

04B



DM44 DIGITAL MULTIMETER

REV A, MAR 197

10-004D

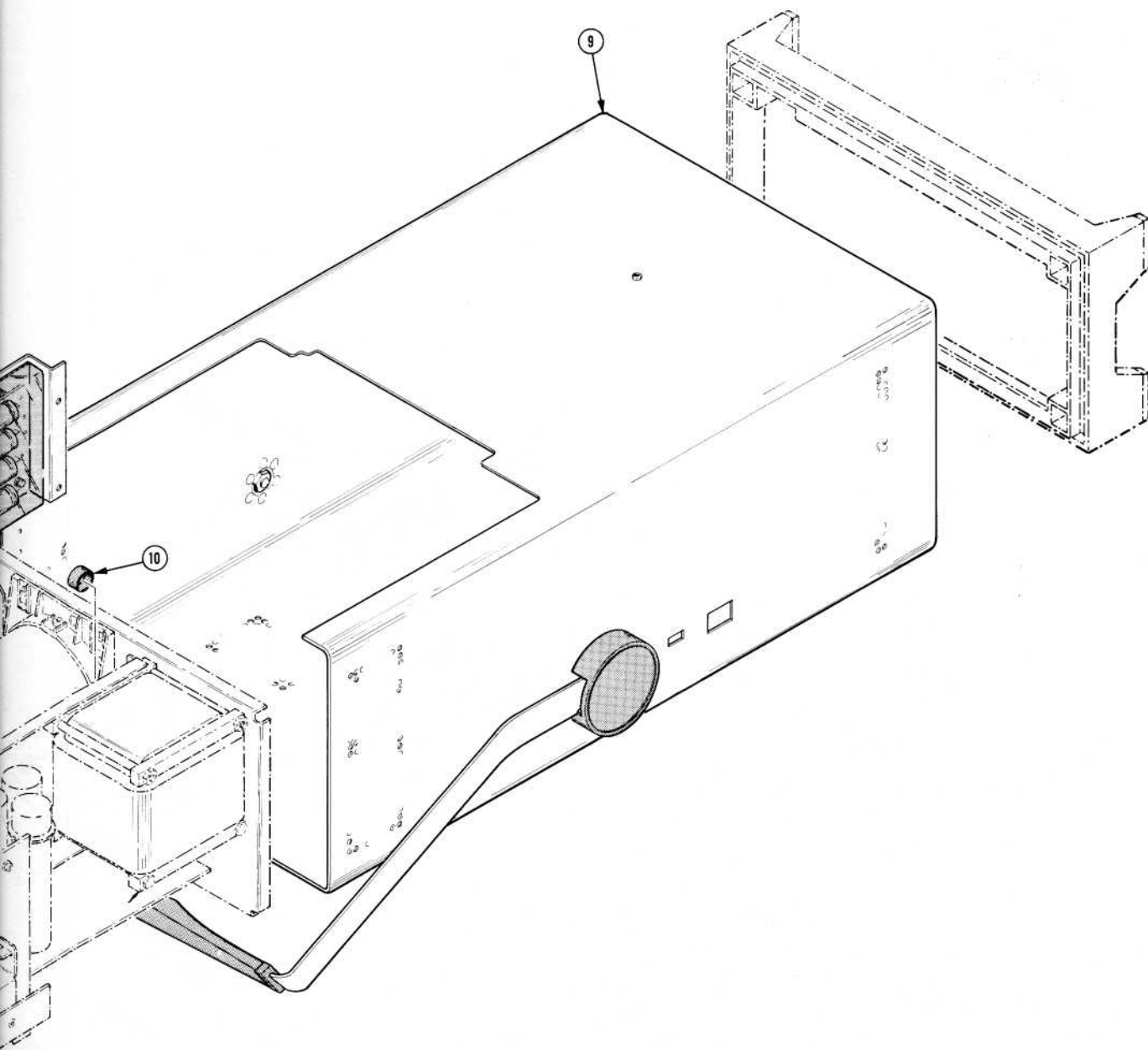


Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
2-1	200-1723-00		1		COVER,SCOPE:FRONT	80009	200-1723-00
-2	200-1722-00		1		COVER,SCOPE:FRONT	80009	200-1722-00
					(ATTACHING PARTS)		
-3	212-0130-00		2		SCREW,MACHINE:W/RTNR,8-32 X0.5 L,PNH,STL	29372	CA 13036-8-3-8
					- - - * - - -		
-4	-----		1		DM44:		
					(ATTACHING PARTS)		
-5	213-0146-00		2		SCR,TPG,THD FOR:6-20 X 0.313 INCH,PNH STL	83385	OBD
-6	210-0803-00		2		WASHER,FLAT:0.15 ID X 0.032 THK,STL CD PL	12327	OBD
-7	211-0008-00		3		SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL	83385	OBD
-8	210-0938-00		3		WASHER,FLAT:0.109 ID X 0.25 INCH OD,STL	75497	AN960-3
					- - - * - - -		
-9	437-0174-00		1		CABINET,SCOPE:W/DM40/DM43/DM44	80009	437-0174-00
	-----		-		(465 B010100-B305749 ONLY)		
	437-0174-02		1		CABINET,SCOPE:	80009	437-0174-02
	-----		-		(465 B305750 & UP ONLY)		
	437-0174-00		1		CABINET,SCOPE:W/DM40/DM43/DM44	80009	437-0174-00
	-----		-		(475 B010100-B269249 ONLY)		
	437-0174-02		1		CABINET,SCOPE:	80009	437-0174-02
	-----		-		(475 B269250 & UP ONLY)		
	437-0174-02		1		CABINET,SCOPE:	80009	437-0174-02
	-----		-		(465B AND 475A ONLY)		
	437-0176-00		1		CABINET,SCOPE:	80009	437-0176-00
	-----		-		(464 AND 466 ONLY)		
	437-0176-01		1		CABINET,SCOPE:	80009	437-0176-01
	-----		-		(OPTION 1Y ONLY)		
-10	348-0063-00		1		GROMMET,PLASTIC:0.50 INCH DIA	80009	348-0063-00
-11	-----		1		RESISTOR,VAR:(SEE R1110,R930,R816 REPL)		
	-----		-		(R1110 ON 465,R930 ON 475,475A, R816 ON 464,466)		
					(ATTACHING PARTS)		
-12	210-0590-00		1		NUT,PLAIN,HEX.:0.375 X 0.438 INCH,STL	73743	2X28269-402
-13	210-0978-00		1		WASHER,FLAT:0.375 ID X 0.50 INCH OD,STL	78471	OBD
-14	210-0012-00		1		WASHER,LOCK:INTL,0.375 ID X 0.50" OD STL	78189	1220-02-00-0541C
					- - - * - - -		
-15	366-1563-00		1		KNOB:GY,0.252 ID X0.825 OD X 0.67 H	80009	366-1563-00
	213-0153-00		2		. SETSCREW:5-40 X 0.125,STL BK OXD,HEX SKT	000CY	OBD
	198-3160-00	XB022570	1		WIRE SET,ELEC:	80009	198-3160-00
	-----		-		(475 AND 475A ONLY)		
	131-0707-00		36		. CONNECTOR,TERM:22-26 AWG,BRS& CU BE GOLD	22526	47439
	131-0708-00		1		. CONTACT,ELEC:0.48"L,28-32 AWG WIRE	22526	47437
	175-0825-00		FT		. WIRE,ELECTRICAL:2 WIRE RIBBON	80009	175-0825-00
	175-0830-00		FT		. WIRE,ELECTRICAL:7 WIRE RIBBON	08261	SS-0726-710610C
	175-0831-00		FT		. WIRE,ELECTRICAL:8 WIRE RIBBON	08261	SS-0826-710610C
	352-0166-00		4		. CONN BODY,PL,EL:8 WIRE BLACK	80009	352-0166-00
	352-0169-00		2		. HLDR,TERM CONN:2 WIRE BLACK	80009	352-0169-00
	352-0171-00		2		. HLDR,TERM CONN:1 WIRE BLACK	80009	352-0171-00

DIFFERENCES FOR MAIN PORTION OF STANDARD
INSTRUMENT WHEN EQUIPPED WITH DM44

CHANGE TO:

464	FIG.1-13	366-1563-00	KNOB:GY,0.252 ID X 0.825 OD X 0.67 H	80009	366-1563-00
465	FIG.1-26	366-1563-00	KNOB:GY,0.252 ID X 0.825 OD X 0.67 H	80009	366-1563-00
465B	FIG.1-11	366-1563-00	KNOB:GY,0.252 ID X 0.825 OD X 0.67 H	80009	366-1563-00
466	FIG.1-13	366-1563-00	KNOB:GY,0.252 ID X 0.825 OD X 0.67 H	80009	366-1563-00
475	FIG.1-39	366-1563-00	KNOB:GY,0.252 ID X 0.825 OD X 0.67 H	80009	366-1563-00
475A	FIG.1-39	366-1563-00	KNOB:GY,0.252 ID X 0.825 OD X 0.67 H	80009	366-1563-00
475	FIG.2-99	337-2079-00	SHIELD,ELEC:V O AMP	80009	337-2079-00

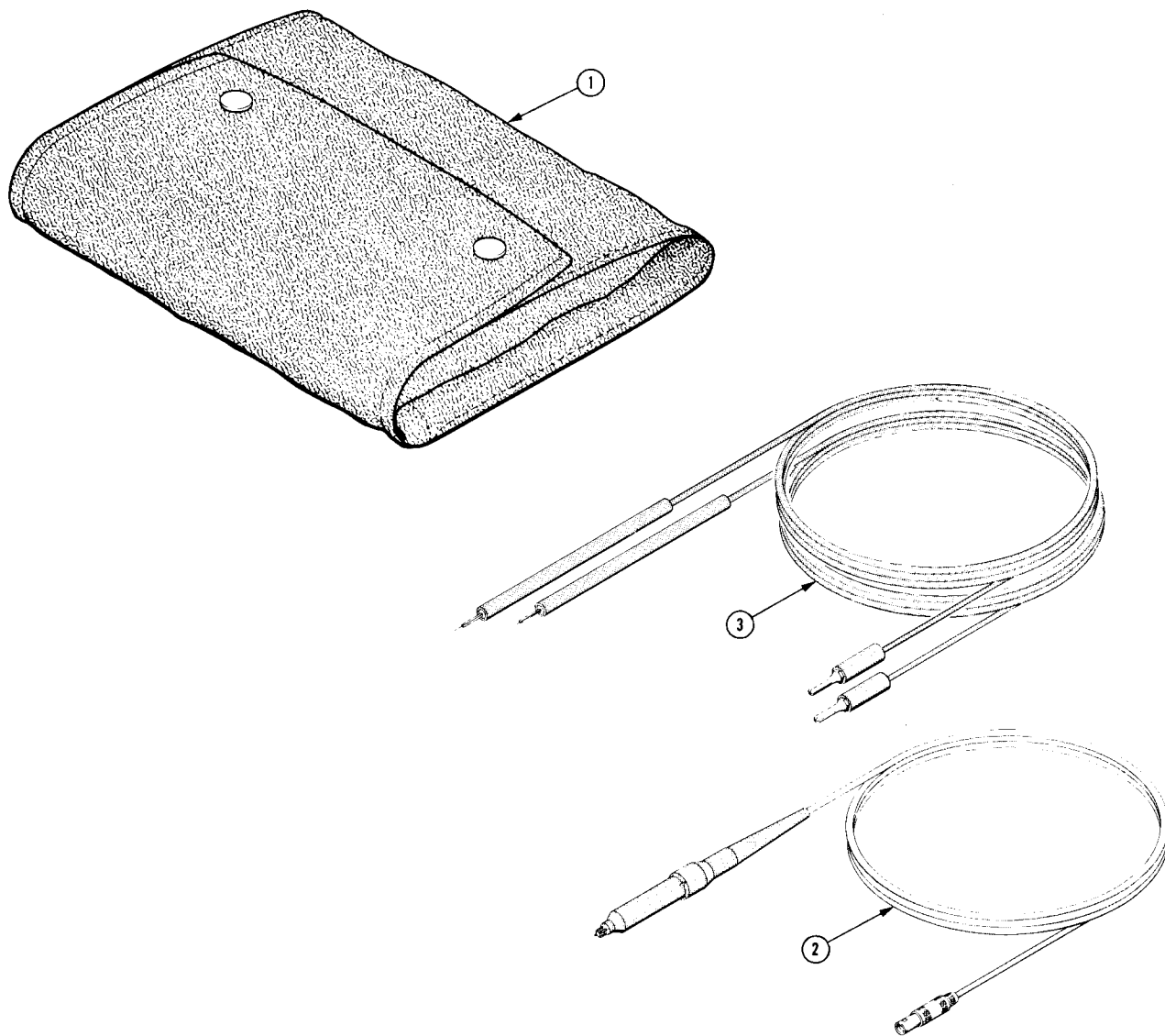


Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
3-1	016-0594-00			1						POUCH, ACCESSORY: W/HARDWARE	80009	016-0594-00
-2	010-6430-00			1						LEAD, TEST: 1.5 METERS LONG (TEMPERATURE)	80009	010-6403-00
-3	003-0120-00			1						LEAD, TEST: PAIR	80009	003-0120-00
	070-2036-01			1						MANUAL, TECH: SERVICE	80009	070-2036-01
	070-2037-00			1						MANUAL, TECH: OPERATORS, 464, 466	80009	070-2037-00
	070-2038-00			1						MANUAL, TECH: OPERATORS, 465	80009	070-2038-00
	070-2039-00			1						MANUAL, TECH: OPERATORS, 475	80009	070-2039-00
	070-2163-00			1						MANUAL, TECH: OPERATORS, 475A	80009	070-2163-00
	070-2756-00			1						MANUAL, TECH: OPERATORS, 465B	80009	070-2756-00

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10-006

MANUAL CHANGE INFORMATION

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

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

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