

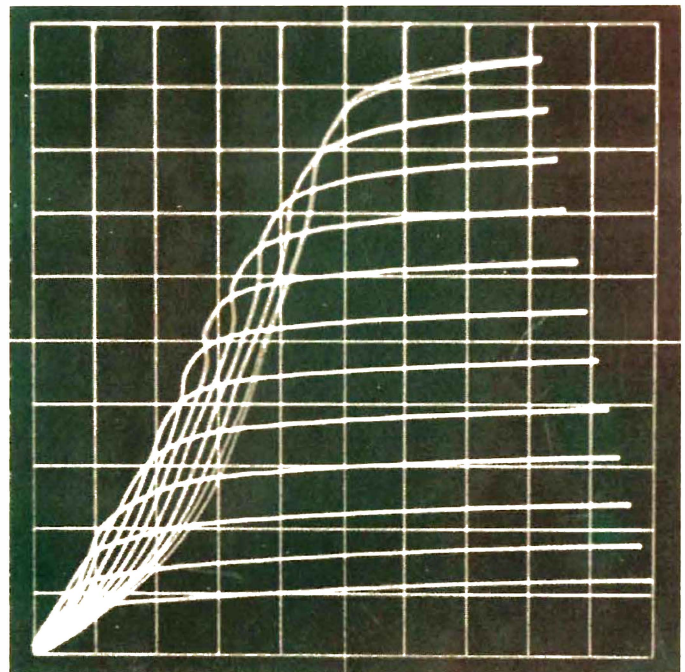
TECHNICAL DESCRIPTION

TYPE 570

CHARACTERISTIC-CURVE TRACER

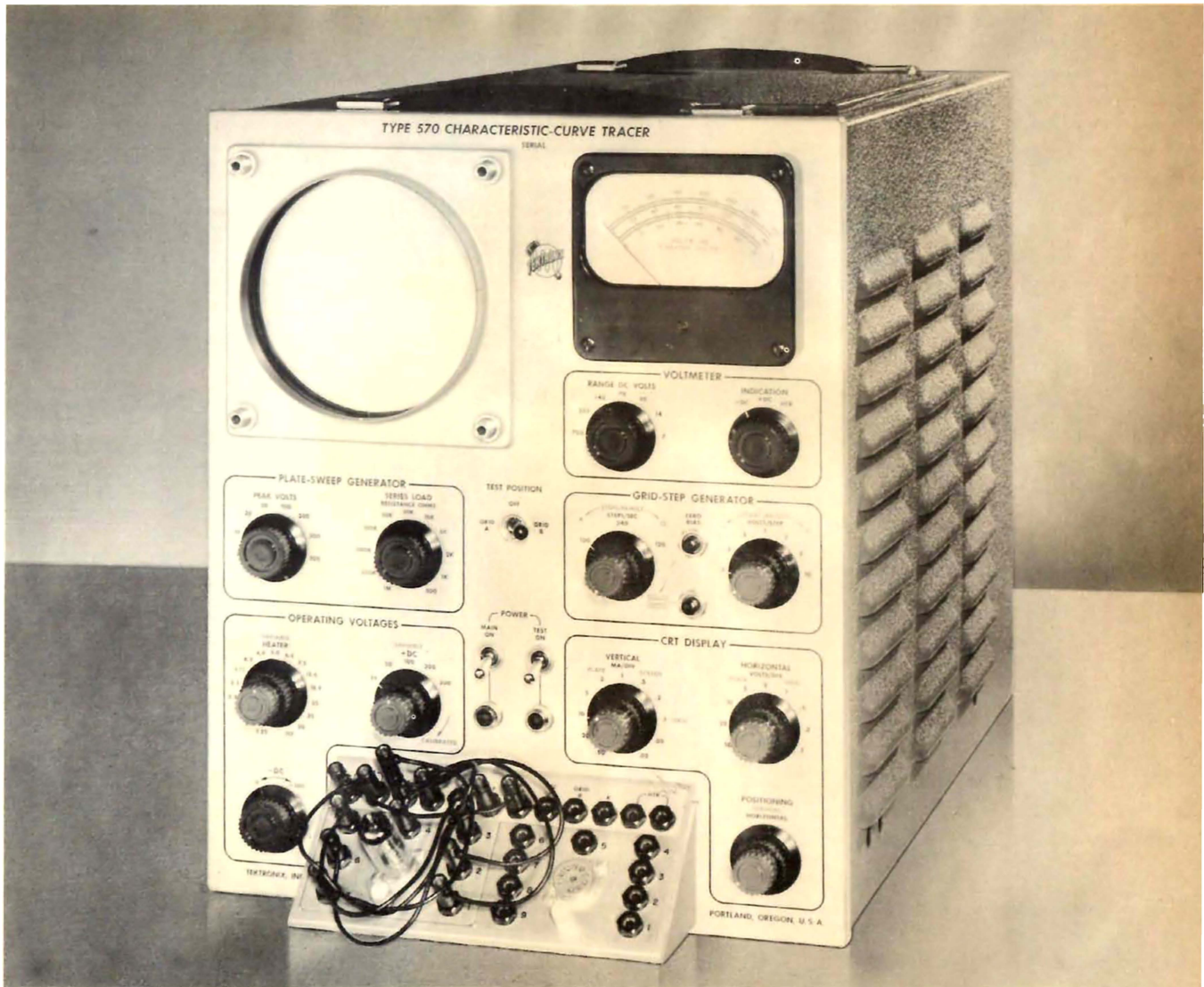


PLOTS ALL IMPORTANT
VACUUM TUBE CHARACTER-
ISTICS OVER A WIDE RANGE
OF OPERATING CONDITIONS



TYPE 570 CHARACTERISTIC-CURVE TRACER

Pictures Dynamic Vacuum-Tube Characteristics



Displays Families of Curves on CRT Screen

Four to twelve characteristic curves per family.

Plots All Important Characteristics

Plate current against plate or grid voltage.
Screen current against plate or grid voltage.
Grid current against plate or grid voltage.

Positive-Bias Curves

Plots up to 8 positive-bias curves per family.

Calibrated Controls

Accurate current and voltage readings directly from the crt screen.

Wide Display Range

11 current ranges from 0.02 ma/div to 50 ma/div.
9 voltage screens from 0.1 v/div to 50 v/div.
11 series-load resistors from 300 ohms to 1 megohm.
7 grid-step values from 0.1 v/step to 10 v/step.

GENERAL DESCRIPTION

The Tektronix Type 570 Characteristic-Curve Tracer presents an accurate graphic analysis of vacuum-tube characteristics under almost any conceivable operating conditions. Circuit design can now be tailored to more closely fit the operating characteristics of available tubes. Tubes can be selected faster and more accurately for circuits requiring other than average vacuum-tube operating characteristics. Two-socket arrangement with front-panel switching permits rapid comparisons between two tubes, or two sections of the same tube. You can also make rapid comparisons with preselected curves outlined on a crt mask. Patch-cord connector system with socket-adaptor plates gives you complete control of operating-condition setup. Various socket-adaptor plates furnished and wide range of heater voltages available fit the requirements of practically all receiving-type vacuum tubes.

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Type 570 Characteristic-Curve Displays

Fig. 1—Plate current plotted against plate voltage for one triode section of a 12AU7. Plate load is 5 k, peak plate-supply voltage is 500 v. Grid voltage is changed 5 v between curves, from -35 v. to zero. Vertical sensitivity is 5 ma/div, horizontal sensitivity 50 v/div. Calibrated controls permit accurate current and voltage readings directly from the screen.

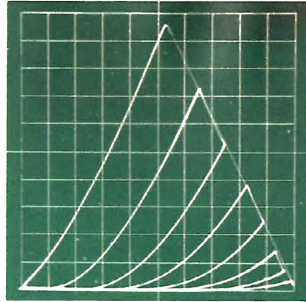


Fig. 2—Same triode section of 12AU7 with only 20-v peak plate supply and sensitivities increased to 0.2 ma/div vertical and 2 v/div horizontal. Grid voltage is changed 2 v between curves, from -14 v to zero. This is essentially a 25-times magnification of the lower left portion of Fig. 1, showing the operating characteristics at low plate supply voltage.

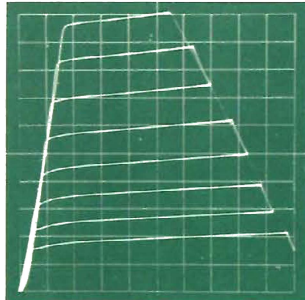
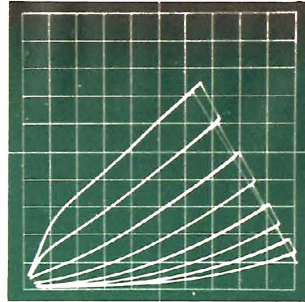


Fig. 3—6AN8 pentode Ep-Ip curves. Plate load 10 k, peak plate-supply voltage approximately 200 v, grid voltage changing 0.2 v/step from -1 v to +0.4 v, screen voltage 70 v, vertical sensitivity 1 ma/div, horizontal sensitivity 20 v/div.

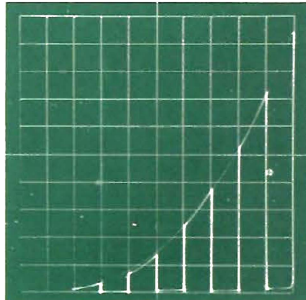


Fig. 4—Typical 12AU7 Eg-Ip curves. Plate load 5k, peak plate-supply voltage 500 v, grid voltage changing 5 v/step from -35 v to zero, vertical sensitivity 5 ma/div, horizontal sensitivity 5 v/div.

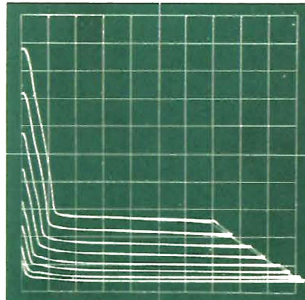


Fig. 5—6AN8 pentode Ep-Ig curves. Here screen-grid current is plotted against plate voltage. Plate load 10 k, peak plate-supply voltage 200 v, grid voltage changing 0.2 v/step from -1 v to +0.4 v, screen voltage 70 v, vertical sensitivity 1 ma/div, horizontal sensitivity 20 v/div.

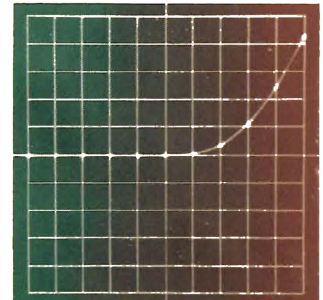


Fig. 6—Typical GERMANIUM DIODE curve. Inherent flexibility of the Type 570 permits accurate evaluation of diode characteristics and detailed examination of any part of the curve. Calibrated scales above are 0.2 v/div horizontal, 0.5 ma/div vertical, with zero points at center of screen.

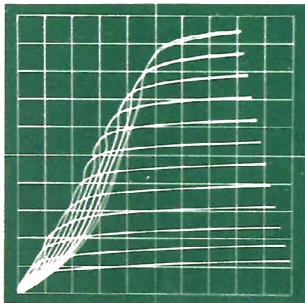


Fig. 7—Plate current—plate voltage.

Positive-Bias Curves

Series of pentode characteristic curves with grid voltage changing 2 volts/step from +16 v to below zero, illustrating Type 570 operation with eight positive-bias curves per family. Vacuum tube is a 6AQ5, under these conditions: Plate load . . . 300 ohms, peak plate voltage . . . 100 v, screen-grid voltage . . . 100 v. Vertical scale is 10 ma/division, horizontal scale is 10 v/division in Fig. 7, 8 and 9 . . . 2 v/division in Fig. 10, 11, and 12.

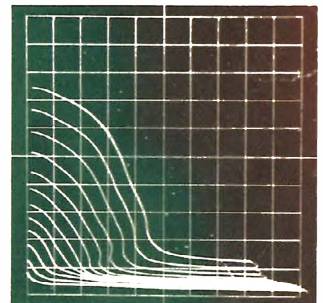


Fig. 8—Screen current—plate voltage.

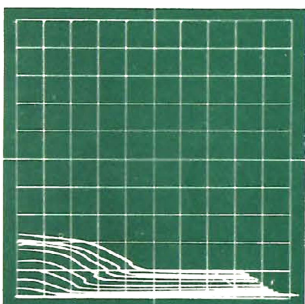


Fig. 9—Grid current—plate voltage.

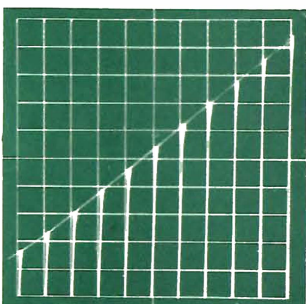


Fig. 10—Plate current—grid voltage.

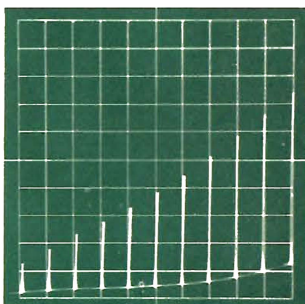


Fig. 11—Screen current—grid voltage.

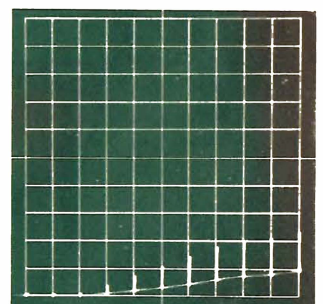


Fig. 12—Grid current—grid voltage.

MODIFICATION NOTES

SHORT FORM CATALOG

The Tektronix Short Form Catalog dated March, 1955 contains an error in the Type 53E/54E Plug-In Unit description. The statement immediately following the title—"sensitivity 5 microvolts/cm to 10 millivolts/cm in eight calibrated steps" should read "sensitivity **50** microvolts/cm to 10 millivolts/cm in eight calibrated steps." We sincerely hope this error hasn't caused you any inconvenience. Please correct the Type 53E/54E description in your copy of the Short Form Catalog.

TYPE 180 TIME-MARK GENERATOR

A series of field modifications are now available for the Type 180 Time-Mark Generator. Improved oscillator performance and better divider stability can be gained by performing these modifications.

Modification 180-438,444 for instrument serials 101-163 will improve the high-frequency divider stability, 100-kc trigger performance and marker phase relationship.

Modification Kit K180-438,444 \$5.45

Modification 180-553 for serials 101-293 will improve oscillator starting ability and increase frequency-range adjustment.

Modification Kit K180-553 \$7.15

Modification 180-1046 for serials 294-637 will further improve the stability of the high-frequency dividers.

Modification Kit K180-1046 No Charge

Modification Kit K180-1046 is applicable to serials 101-293 if modifications 180-438,444 and 180-553 have been made. All kits contain necessary components and instructions. When ordering, please specify *Serial Number* to make certain you get the proper instructions for modifying your instrument.

TYPE 53B PLUG-IN UNIT

Damage to C3342 (2x275 μ fd, 6v, EMT capacitor), located in the cathode circuit of V3302, can occur if an open heater should develop in the series-connected heaters, or if a cold Type 53B Unit is plugged into an operating scope. If this happens you will not be able to properly adjust the low-frequency compensation. The damage can be prevented by connecting a selenium rectifier in shunt with the capacitor at a low value.

This modification should be made on all units below serial 281, except 137, 172, 191, 221, 230, 231, 233, 237, 243-247, 250, 251, 253-278 which have already been modified. A kit containing the necessary components and installation instructions is now available.

Modification Kit K53B-1015 No Charge

TYPE 53C PLUG-IN UNIT

Some of the Type 53C Dual-Trace Plug-In Units, below serial 836, have switching transients when operated in the "chopped" mode. A modification can be made in those pre-amplifiers by adding two variable ceramic capacitors. The capacitors, 7-45 μ fd, are placed across the cathode resistors, R3583 and R4583, of the 12AU6 Switched Amplifiers. The capacitor placed across R3583 will be designated C3583, and the one across R4583 will be C4583. The resistors are located on the topside of the chassis near their respective tubes, V3553 and V3563; V4553 and V4563.

These capacitors should be adjusted with the dual-trace in the center of the screen, separated by approximately 2 cm. With OPERATING MODE switch in CHOPPED position,

without any signal being applied to the plug-in unit, observe the switching transient and adjust the capacitors to reduce the overshoot. Move the traces to the top and bottom of the crt graticule, decreasing the trace separation, and readjust capacitors if necessary. The adjustment of the capacitors should be just to the point where minimum overshoot is obtained.

TYPE 524D OSCILLOSCOPE

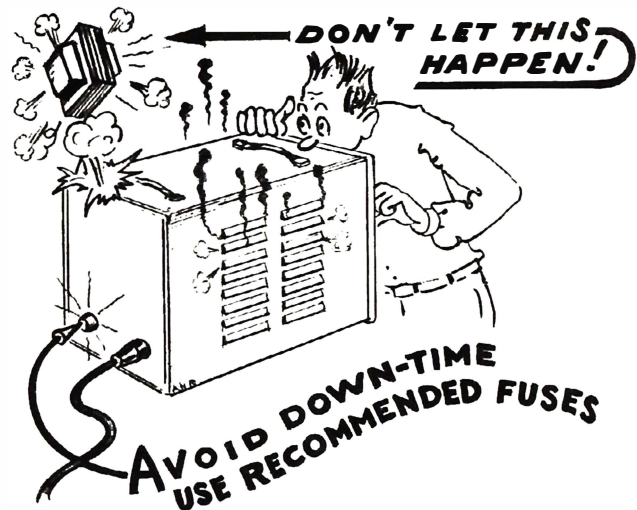
On all Type 524D's, below serial 1400, a modification can be made that will improve the flat response within $\pm 1\%$ to 5 megacycles. Such accuracy is needed to measure the radio-frequency "bursts" used in color TV. Normally, the Type 524D vertical amplifier is adjusted for optimum transient response which is necessary for display of short rise-time pulses. However, under these conditions the attenuation at 4 or 5 megacycles is too great for satisfactory use as a "burst" indicator. Modification kit K524-805, for serials 101 to 1399, will allow you to easily modify the vertical amplifier (essentially by changing the access panel) so you have a choice of: (1) FLAT response $\pm 1\%$ to 5 megacycles, (2) NORMAL response (wide-band), (3) IRE response, or (4) EX-Ternal.

Modification Kit K524-805 \$6.50

TYPE 517 OSCILLOSCOPE

Dependability of the Type 517 Indicator Unit can be improved by replacing V110, a 6J6 tube, with a 6X4 tube. This is a direct replacement and no wiring changes are necessary.

Dependability of the Type 517 Power Supply can be improved by adding two 100 ohm, 1 w, 10 %, composition peak limiting resistors in series with the cathodes of V401 and V415, 6X4 rectifiers. The resistors can be easily mounted between pins 2 and 7 on the 6X4 sockets; then move the wire presently on pin 7 over to pin 2. This modification should be made on all Type 517 scopes below serial 725.



Time-Lag Fuses		Fast-Blowing Fuses	
Type 105	3 amp	Type 517	4 amp
180	3 amp		5 amp
315	5 amp		6 amp
513	6 1/4 amp	524	6 amp
514	5 amp	531/535	6 amp

Please specify instrument type and Serial Number when ordering. All kit prices include transportation. Kits may be ordered from your Tektronix Field Office, Engineering Representative, or directly from the factory.

TYPE 570 CHARACTERISTIC-CURVE TRACER

Safety Switch—The extremely flexible operational-setup facility of the Type 570 requires that potentially dangerous voltages be present at the patch panel. All voltages to the patch panel can be removed by a front panel switch for safety and convenience while changing the operational setup. A jewel light indicates when power is present at the patch panel.

Regulated Power Supply—Electronic voltage regulation is used to compensate for line-voltage changes between 105 and 125 volts or 210 and 250 volts, and for variations in loading. All voltages affecting calibrations are fully regulated. Heater, negative-dc, and peak-plate supplies are unregulated.

Cathode-Ray Tube—A Tektronix T52P cathode-ray tube is used in the Type 570. Accelerating potential is approximately 3 kv. A P2 phosphor is supplied unless another phosphor is specifically requested.

Illuminated Graticule—The 10 x 10-division graticule is edge-lighted. Illumination control and focus, intensity, and astigmatism controls are accessible through a door in the top of the cabinet.

VACUUM TUBE COMPLEMENT

Split-load phase inverters and shaper amplifiers	2	6AN8
Rectifiers	2	6AL5
Cathode follower and step-control CF		12AT7
Clamp and coupling diode		6AL5
Grid-step generator		6AU6
Step-generator cathode followers		12AT7
Step multivibrator		6AN8
Disconnect diodes		6AL5
Step cathode followers		12BZ7
Step amplifiers	2	6AU6
Step amplifier		12AT7
Cathode follower		6CL6
Plate power-supply rectifiers	2	6AX4

Rectifier diodes		6AL5
Horizontal-deflection amplifiers	2	6AU6
Horizontal-deflection amplifier CF	2	6AU6
Horizontal deflection output amplifiers		6BQ7A
Vertical-deflection amplifiers	2	6AU6
Vertical-deflection output amplifiers		6BQ7A
Variable dc-supply rectifier		6AX5
Fixed dc-supply rectifiers	4	6X4
Regulator amplifiers	2	6AU6
Voltage reference		5651
Regulator amplifier and series regulator		6AN8
Regulator amplifier		6AN8
Series regulators	2	12B4
Series regulator		6CD6GA
Variable dc-supply CF		12AT7
High-voltage oscillator		6AQ5
Regulator amplifier and CF		12AU7
High-voltage rectifiers	2	5642
Cathode-ray tube		T52P2

MECHANICAL SPECIFICATIONS

Ventilation—Filtered, forced-air ventilation maintains safe operating temperatures.

Construction—Aluminum alloy chassis and cabinet.

Finish—Photo-etched anodized panel, gray wrinkle cabinet.

Dimensions—16½" high, 13" wide, 24½" deep.

Weight—67 pounds.

Power Requirements—105-125 or 210-250 v, 50 or 60 cycles, 200 watts.

Price **\$925** f.o.b. Portland (Beaverton), Oregon

Includes: 8 adapter plates
20 patch cords

Currently Available Extras

P2 crt phosphor normally furnished.

P1, P7, P11 optional No extra charge

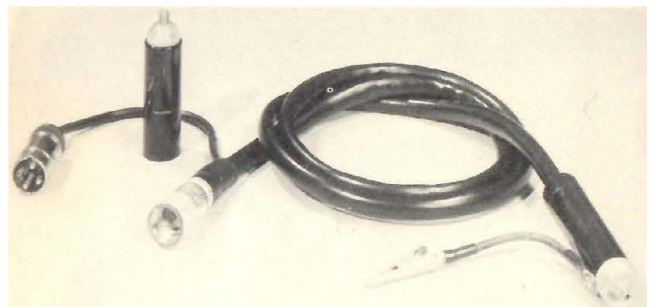
NEW ACCESSORIES FOR TEKTRONIX INSTRUMENTS

Low Capacitance Probe for Type 524 Oscilloscopes

P500CF (Stock No. 10-105) **Cathode-Follower Probe**—Presents low input capacitance with minimum attenuation. Input impedance is 40 megohms paralleled by 4 μmf , gain is 0.8 to 0.85. Input to probe is ac-coupled, limiting its low-frequency response to about 5 cycles. Amplitude distortion is less than 3% on unidirectional signals up to 5 volts. 10x attenuator head is included with probe, and should be used on signals exceeding a few volts to minimize amplitude distortion. With the attenuator head attached, the probe input impedance is approximately 10 megohms paralleled by 2 μmf . Probe output level is 11 v positive, making it necessary to use the ac-coupled position of the oscilloscope AC-DC switch.

P500CF Cathode-Follower Probe **\$64.00**
f.o.b. Portland (Beaverton), Oregon

Power Output for CF Probe—Type 524AD Oscilloscopes, currently in production, are equipped with a front-panel



connector for necessary probe voltages. (Caution—the 6.3 v ac is +120 v relative to the chassis.)

Type 524D Oscilloscopes were manufactured without a probe-power connector. A modification kit is now available for installing a front-panel probe-power connector on these instruments.

Modification Kit K524-1021A **\$5.00**

TEKTRONIX, INC.

AN OREGON CORPORATION

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