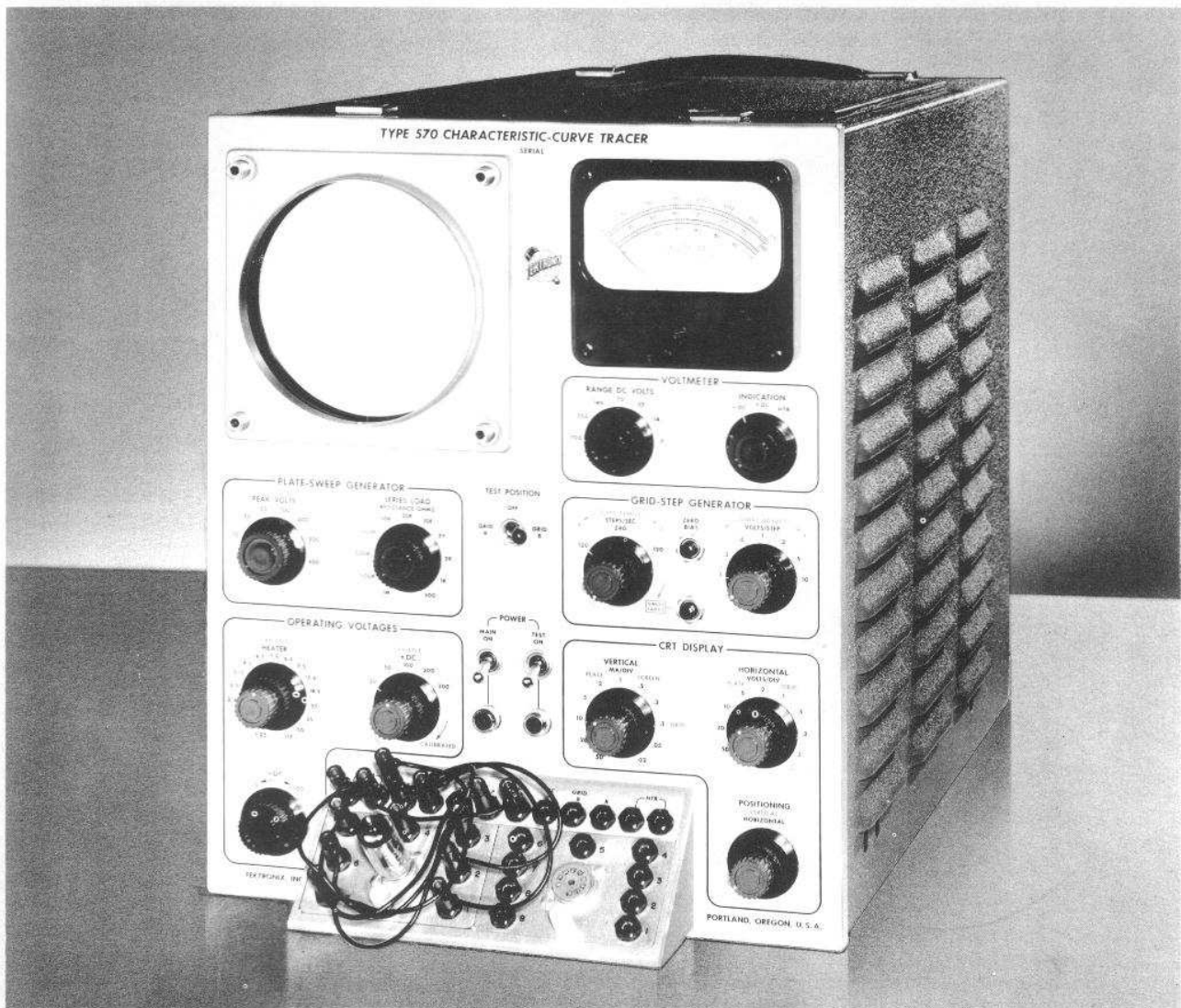


# TYPE 570 CHARACTERISTIC-CURVE TRACER

*Pictures Dynamic Vacuum-Tube Characteristics*



## **Displays Family 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 ranges 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.

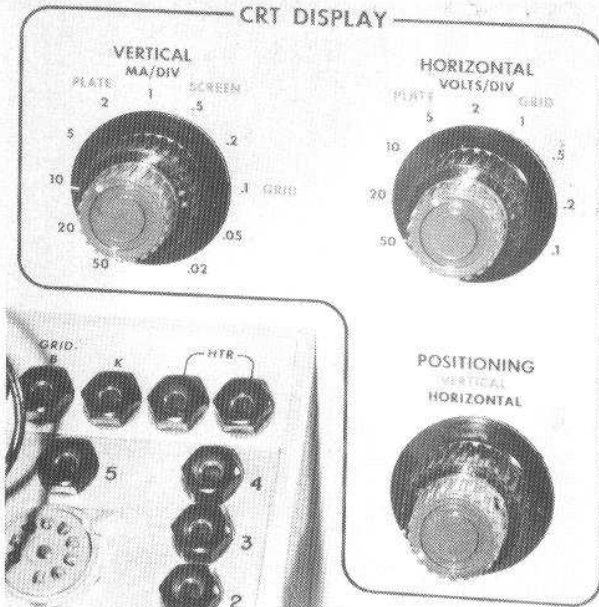
## **GENERAL DESCRIPTION**

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 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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## CATHODE-RAY-TUBE DISPLAY

**Vertical Axis**—Concentric controls provide for selection of plate, screen, or grid current display; and selection of any one of eleven current-per-division values—0.02, 0.05, 0.1, 0.2, 0.5, 1, 2, 5, 10, 20, and 50 ma/div. A graticule divides the screen into ten vertical divisions. Calibration accuracy is within 3%, permitting accurate current readings directly from the screen.



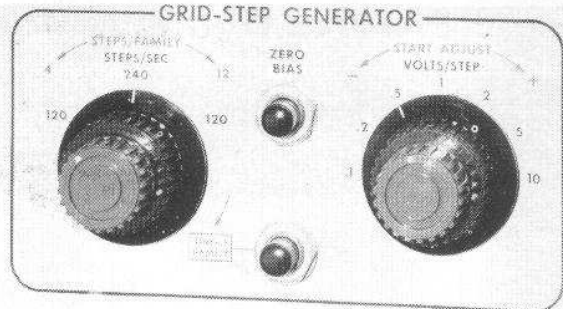
**Horizontal Axis**—Either plate or grid voltage can be displayed on the horizontal axis, and nine voltage-per-division values are available—0.1, 0.2, 0.5, 1, 2, 5, 10, 20, and 50 v/div. Ten horizontal divisions are scribed on the graticule. Calibration accuracy is within 3%, permitting accurate voltage readings directly from the screen.

**Positioning**—Concentric controls provide for both vertical and horizontal positioning of the display.

## GRID-STEP GENERATOR

**Family of Curves**—A variable control is provided to adjust the number of curves in the display. As few as four and as many as twelve curves can be selected. A single family can be safely displayed with the tube under heavy overload conditions by means of a position on the STEPS/FAMILY control and a push button. With the STEPS/FAMILY control in the single-family position, pressing the button applies the selected conditions to the tube for only a fraction of second. Use of the SINGLE FAMILY push button permits observation or photography of tube characteristics under unusual conditions without danger of damage to the tube under test.

The STEPS/SEC switch controls the switching-rate of the step generator. A 120 or 240-steps/sec rate can be selected. The extra 120-steps/sec position causes switching to occur at the opposite end of the characteristic

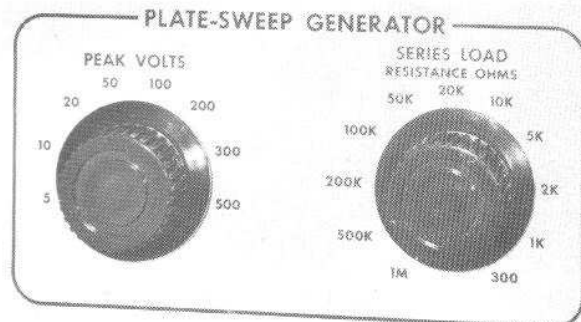


curve, for convenience when the area of interest is at either end of the curves displayed.

Bias voltage applied to the grid of the tube under test is impressed in a series of steps to produce the number of curves desired in the display. The voltage difference between steps is selected by a seven-position switch. Calibrated switch positions are: 0.1, 0.2, 0.5, 1, 2, 5, and 10 volts/step, accurate within 3%. Up to 150 ma peak grid current is available. A variable control is provided to adjust the starting point to a positive voltage, zero, or a negative voltage. Pressing the ZERO BIAS push button causes the display of the zero-bias curve only, to use as a reference in adjusting the starting point. As many as eight positive-bias curves can be included in the display.

## PLATE-SWEEP GENERATOR

An eleven-position switch selects the desired series-load resistance for the plate circuit of the tube under test. Series-load values are: 300 ohms, 1 k, 2 k, 5 k, 10 k,



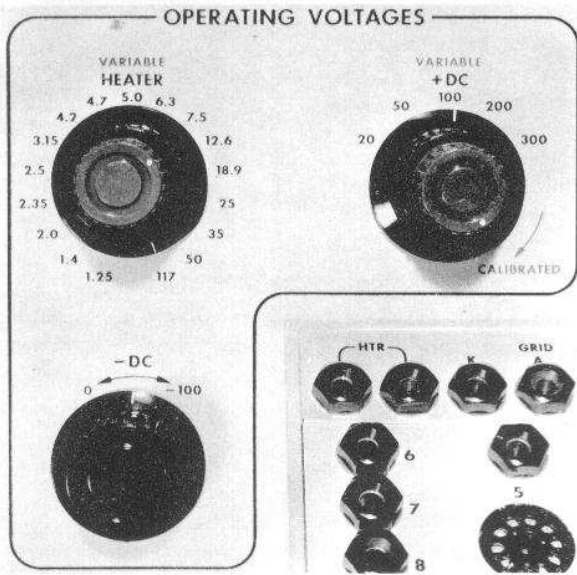
20 k, 50 k, 100 k, 200 k, 500 k, and 1 megohm. Power-handling capacity of all load resistors is sufficient to dissipate the maximum power available in the plate circuit.

The peak voltage applied to the plate through the series-load resistance is selected by an eight-position switch. Peak voltages are: 5, 10, 20, 50, 100, 200, 300, and 500 volts.

## OPERATING VOLTAGES

Heater voltage is available in 17 fixed steps: 1.25, 1.4, 2.0, 2.35, 2.5, 3.15, 4.2, 4.7, 5.0, 6.3, 7.5, 12.6, 18.9, 25, 35, 50, and 117 volts ac. A control permits adjusting the selected heater voltage approximately  $\pm 20\%$  for simulating the effects of low or high line voltage. The variable control provides sufficient spread

# TYPE 570 CHARACTERISTIC-CURVE TRACER



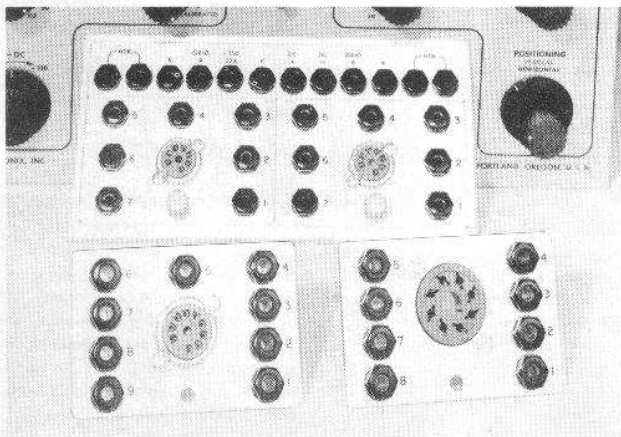
between steps to supply the proper heater voltage for practically all receiving-type vacuum tubes. Maximum power available from the heater transformer is 30 watts.

Positive dc voltage is available in five calibrated steps: 20, 50, 100, 200, and 300 volts, accurate within 3%. The positive voltage is also continuously variable from approximately 10 to 300 v. Up to 50 ma steady current is supplied. An adequate reserve is available for higher peak currents.

Negative dc voltage is available, continuously variable from 0 to -100 v. The negative dc supply is capable of delivering up to 1 watt.

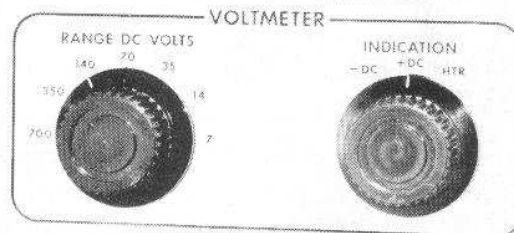
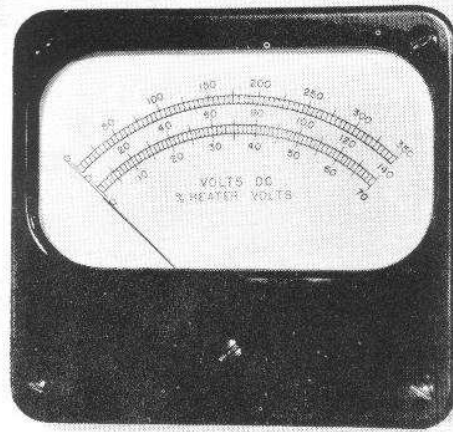
## ADAPTER PLATES

Eight quick-changing adapter plates are furnished with the Type 570 — 2 with octal sockets, 2 with nine-pin miniature sockets, 2 with seven-pin miniature sockets, and 2 with pilot holes only. Plate receptacle holds any two adapter plates at the same time. Small banana jacks connect to each socket terminal. Three types of patch cords are also furnished, making it possible to connect any tube element to any voltage supplied by the instrument.



## VOLTMETER

The built-in voltmeter indicates the positive and negative operating voltages in seven ranges: 0 to 7, 14, 35, 70, 140, 350, 700 volts, accurate within 2% of full scale. The voltmeter can be switched to show the percent of heater voltage indicated by the heater-voltage selector switch.



## OTHER FEATURES

**Tube-Socket Switching**—The TEST POSITION switch in the center of the front panel is used to switch in either of two vacuum tubes during comparison tests. It has an OFF position for changing tubes and for establishing a reference trace on the screen. Control-grid potential drops to -150 v in the off position.

**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 operation 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. P1 phosphor is supplied unless another phosphor is specifically requested.

**Illuminated Graticule**—The 10 x 10-division graticule is edge-lighted. Illumination control, and focus, in-

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tensity, 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 CF and voltage regulator CF		12AX7
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 rectifier	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	.....	T52P1

## 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—16 1/2" high, 13" wide, 24 1/2" deep.

Weight—75 pounds.

Power Requirements—105-125 or 210-250 v, 50 or 60 cycles, 400 watts maximum, 300 watts standby.

Price ..... **\$925**

Includes: 8—Adapter plates

26—Patch cords

1—Instruction manual

### Currently Available Extras

P1 crt phosphor normally furnished.

P2, P7, P11 optional ..... No extra charge

Price f.o.b. Portland (Beaverton), Oregon

## 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.

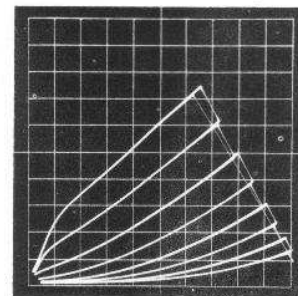
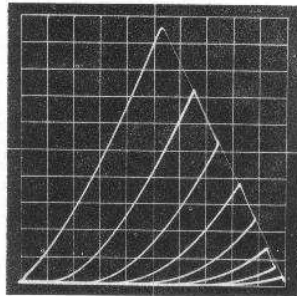


Fig. 2—Same triode section of 12AU7 with only 20-v peak plate supply and sensitivities increased to 0.2 ma/div vertical and 2 v/div horizontal. Grid voltage is changed 2 v between curves, from -14 v to zero. This is essentially a 25-times magnification of the lower left portion of Fig. 1, showing the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

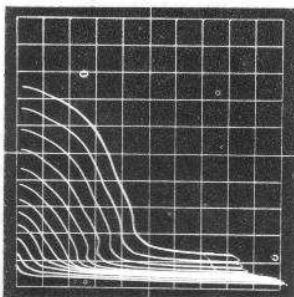


Fig. 3—Screen current plotted against plate voltage with positive grid bias on a 6AQ5. Plate load is 300 ohms, peak plate voltage is 100 v, screen-grid voltage is 100 v, with grid voltage changing 2 v/step from +16 v to below zero. Vertical scale is 10 ma/div, horizontal scale 10 v/div.

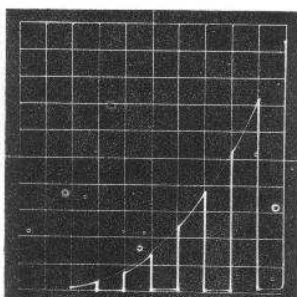


Fig. 4—Typical 12AU7 Eg-1p curves. Plate load 5 k, peak plate-supply voltage 500 v, grid voltage changing 5 v/step from -35 v to zero, vertical sensitivity 5 ma/div, horizontal sensitivity 5 v/div.

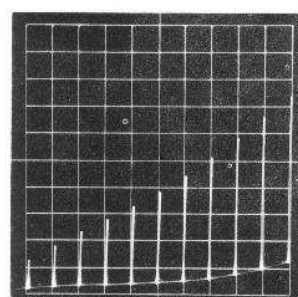


Fig. 5—Another family of curves with positive grid bias. Screen current is plotted against grid voltage. Operating conditions of the 6AQ5 are identical to Fig 3, except horizontal sensitivity is 2 v/div.

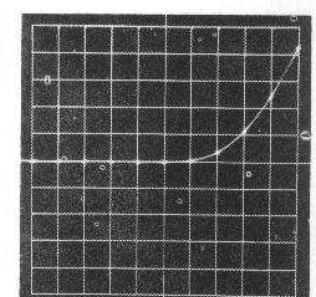


Fig. 6—Typical GERMANIUM DIODE curve. Inherent flexibility of the Type 570 permits accurate evaluation of diode characteristics and detailed examination of any part of the curve. Calibrated scales above are 0.2 v/div horizontal, 0.5 ma/div vertical, with zero points at center of screen.