

TEKTRONIX



59

SHORT FORM  
CATALOG  
FEBRUARY 1959

# OSCILLOSCOPES WITH

Inherent characteristics of these Tektronix Oscilloscopes permit their conversion to many specialized applications through the use of interchangeable plug-in preamplifiers. Initial selection can include the Plug-In Units best suited to current requirements. When greater versatility becomes desirable, other available Type 53/54 Plug-In Units can be added at moderate cost to expand the application area.

## TYPE 551 DUAL-BEAM OSCILLOSCOPE

### Wide-Band Vertical Amplifiers

Main-unit risetimes—12 millimicroseconds.

Passbands and risetimes with Fast-Rise Plug-In Preamplifiers—dc to 25 mc, 0.014  $\mu$ sec.

### Signal-Handling Versatility

All Type 53/54 Plug-In Units can be used in both channels.

### 0.2- $\mu$ sec Signal-Delay Networks.

### Wide Sweep Range

0.02  $\mu$ sec/cm to 12 sec/cm. 24 calibrated steps from 0.1  $\mu$ sec/cm to 5 sec/cm.

Accurate 5x magnifier.

### Single Sweeps—Lockout-reset circuitry.

### Complete Triggering—Fully-automatic, or amplitude-level selection with preset or manual stability control.

### 10-kv Accelerating Potential

Brighter display for fast sweeps and low repetition rates.

### Separate Power Supply—electronic regulation.

Price, without plug-in units ..... \$1800.

*New*



*New*

## TYPE 533 OSCILLOSCOPE

### High Performance

DC to 15 MC, 0.023- $\mu$ sec Risetime with Fast-Rise Plug-In Units.

0.2  $\mu$ sec Signal Delay.

0.02  $\mu$ sec/cm to 15 sec/cm Sweep Range.

### Easy Operation

24 Calibrated direct-reading sweep rates, 0.1  $\mu$ sec/cm to 5 sec/cm.

Sweep Magnification—2, 5, 10, 20, 50 and 100 times.

Preset Triggering—Eliminates triggering adjustments in most applications.

Single-Sweep Operation—Lockout-reset circuitry for one-shot recording.

### High Writing Rate

250 cm/ $\mu$ sec—10 kv accelerating potential assures bright trace for single sweeps and low repetition rates. 6 cm by 10 cm viewing area.

### Electronically-Regulated Power Supplies.

Price, without plug-in units ..... \$1100.



*New*

## TYPE 543 OSCILLOSCOPE

DC to 30 MC, 0.012- $\mu$ sec Risetime with Fast-Rise Plug-In Units.

4 cm by 10 cm Viewing Area.

All other characteristics same as Type 533.

Price, without plug-in units \$1275.

# PLUG-IN PREAMPLIFIERS



## TYPE 541 OSCILLOSCOPE

Electrically identical to the Type 545, except that it is without provision for sweep delay.

Price, without plug-in units ... \$1200.

## TYPE 545 OSCILLOSCOPE

### DC to 30 MC Main Vertical Amplifier

0.012- $\mu$ sec Risetime with Fast-Rise Plug-In Units.

**Wide Sweep Range**—24 calibrated sweep rates from 0.1  $\mu$ sec/cm to 5 sec/cm. 5-x magnifier extends calibrated range to 0.02  $\mu$ sec/cm. Continuously variable from 0.02  $\mu$ sec/cm to 12 sec/cm.

**Sweep Delay**—Triggered or conventional sweep delay from 1  $\mu$ sec to 0.1 sec in 12 calibrated ranges. Range accuracy within 1%, incremental accuracy within 0.2% of full scale. (Other delay ranges available on special order).

**Versatile Triggering**—Amplitude-level selection with preset or manual stability control, and fully-automatic triggering.

**Balanced Delay Network**—0.2- $\mu$ sec signal delay.

### 10-KV Accelerating Potential

Bright trace at low repetition rates. 4 by 10 cm linear display.

### Amplitude Calibrator

0.2 mv to 100 v in 18 steps. Square wave, frequency about 1 kc.

Price, without plug-in units ..... \$1550.

## TYPE 535 OSCILLOSCOPE

Same specifications as the Type 545, with the following exceptions:

DC to 11 MC Main Vertical Amplifier,  
0.031- $\mu$ sec Risetime with Fast-Rise  
Plug-In Units.

0.25- $\mu$ sec signal delay.

6 by 10 cm linear display.

Price, without plug-in units ..... \$1400.



## TYPE 531 OSCILLOSCOPE

Electrically identical to the Type 535, except that it is without provision for sweep delay.

Price, without plug-in units .... \$995.

## Oscilloscopes with Plug-In Preamplifiers

	Vertical Frequency Response (with Type 53/54K Unit)	Signal Delay	Calibrated Sweep Range	Sweep Magnifier	Sweep Delay	Accelerating Potential	Price (without plug-in units)
TYPE 533	dc to 15 mc	0.2 $\mu$ sec	0.02 $\mu$ sec/cm to 5 sec/cm	2, 5, 10, 20, 50, 100x	None	10 kv	\$1100
TYPE 543	dc to 30 mc						\$1275
TYPE 541 Fast-Rise	dc to 30 mc	0.2 $\mu$ sec	0.02 $\mu$ sec/cm to 5 sec/cm	5x	None	10 kv	\$1200
TYPE 545 Fast-Rise	dc to 30 mc	0.2 $\mu$ sec	0.02 $\mu$ sec/cm to 5 sec/cm	5x	1 $\mu$ sec to 0.1 sec	10 kv	\$1550
TYPE 551 Dual-Beam	dc to 25 mc both beams	0.2 $\mu$ sec	0.02 $\mu$ sec/cm to 5 sec/cm	5x	None	10 kv	\$1800
TYPE 531 General Purpose	dc to 11 mc	0.25 $\mu$ sec	0.02 $\mu$ sec/cm to 5 sec/cm	5x	None	10 kv	\$995
Type 535 General Purpose	dc to 11 mc	0.25 $\mu$ sec	0.02 $\mu$ sec/cm to 5 sec/cm	5x	1 $\mu$ sec to 0.1 sec	10 kv	\$1400
Type 536 X-Y Curve Tracer	dc to 11 mc	None	See Type 53/54T Time-Base Gen.		None	4 kv	\$1050
TYPE 532 General Purpose	dc to 5 mc	None	0.2 $\mu$ sec/cm to 5 sec/cm	5x	None	4 kv	\$875

# OSCILLOSCOPES WITH

## TYPE 532 OSCILLOSCOPE

### DC to 5 MC Main Vertical Amplifier

0.07- $\mu$ sec Risetime with Wide-Band Plug-In Units.

### Sweep Range

21 calibrated sweep rates from 1  $\mu$ sec/cm to 5 sec/cm. 5-x magnifier extends calibrated range to 0.2  $\mu$ sec/cm. Continuously variable from 0.2  $\mu$ sec/cm to 12 sec/cm.

### Triggering

Amplitude-level selection with preset

or manual stability control, and fully-automatic triggering.

### 4-KV Accelerating Potential

8 by 10 cm linear display.

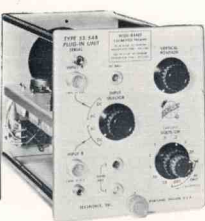
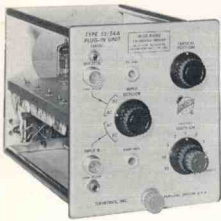
### Amplitude Calibrator

0.2 mv to 100 v in 18 steps. Square wave, frequency about 1 kc.

### Electronically-Regulated Power Supplies.

Price, without plug-in units . . . . \$875.

## Type 53/54 Plug-In Units



TYPE 53/54A

TYPE 53/54B

TYPE 53/54C

TYPE 53/54D

TYPE 53/54E

TYPE 53/54G

## CHARACTERISTICS OF PLUG-IN PREAMPLIFIERS

	Risetime and Passband of Combination — Plugged into Type				
	533	543-541-545	551	531-535-536	532
TYPE 53/54A Wide-Band DC	0.025 $\mu$ sec dc to 14 mc	0.018 $\mu$ sec dc to 20 mc	0.02 $\mu$ sec dc to 18 mc	0.035 $\mu$ sec dc to 10 mc	0.07 $\mu$ sec dc to 5 mc
TYPE 53/54B Wide-Band High-Gain	0.035 $\mu$ sec 2 c to 10 mc	0.03 $\mu$ sec 2 c to 12 mc	0.035 $\mu$ sec 2 c to 10 mc	0.04 $\mu$ sec 2 c to 9 mc	0.07 $\mu$ sec 2 c to 5 mc
	0.025 $\mu$ sec dc to 14 mc	0.018 $\mu$ sec dc to 20 mc	0.02 $\mu$ sec dc to 18 mc	0.035 $\mu$ sec dc to 10 mc	0.07 $\mu$ sec dc to 5 mc
TYPE 53/54C Dual-Trace DC	0.023 $\mu$ sec dc to 15 mc	0.015 $\mu$ sec dc to 24 mc	0.016 $\mu$ sec dc to 22 mc	0.035 $\mu$ sec dc to 10 mc	0.07 $\mu$ sec dc to 5 mc
TYPE 53/54D High-Gain DC Differential	0.18 $\mu$ sec dc to 2 mc	0.18 $\mu$ sec dc to 2 mc	0.18 $\mu$ sec dc to 2 mc	0.18 $\mu$ sec dc to 2 mc	0.18 $\mu$ sec dc to 2 mc
TYPE 53/54E Low-Level AC Differential	6 $\mu$ sec 0.06 cycles to 60 kc	6 $\mu$ sec 0.06 cycles to 60 kc	6 $\mu$ sec 0.06 cycles to 60 kc	6 $\mu$ sec 0.06 cycles to 60 kc	6 $\mu$ sec 0.06 cycles to 60 kc
TYPE 53/54G Wide-Band DC Differential	0.025 $\mu$ sec dc to 14 mc	0.018 $\mu$ sec dc to 20 mc	0.02 $\mu$ sec dc to 18 mc	0.035 $\mu$ sec dc to 10 mc	0.07 $\mu$ sec dc to 5 mc
TYPE 53/54H DC Coupled High- Gain Wide-Band	0.031 $\mu$ sec dc to 11 mc	0.023 $\mu$ sec dc to 15 mc	0.025 $\mu$ sec dc to 14 mc	0.037 $\mu$ sec dc to 9.5 mc	0.07 $\mu$ sec dc to 5 mc
TYPE 53/54K Fast-Rise DC	0.023 $\mu$ sec dc to 15 mc	0.012 $\mu$ sec dc to 30 mc	0.014 $\mu$ sec dc to 25 mc	0.031 $\mu$ sec dc to 11 mc	0.07 $\mu$ sec dc to 5 mc
TYPE 53/54L Fast-Rise High-Gain	0.023 $\mu$ sec 3 c to 15 mc	0.015 $\mu$ sec 3 c to 24 mc	0.023 $\mu$ sec 3 c to 15 mc	0.035 $\mu$ sec 3 c to 10 mc	0.07 $\mu$ sec 3 c to 5 mc
	0.023 $\mu$ sec dc to 15 mc	0.012 $\mu$ sec dc to 30 mc	0.014 $\mu$ sec dc to 25 mc	0.031 $\mu$ sec dc to 11 mc	0.07 $\mu$ sec dc to 5 mc

# PLUG-IN PREAMPLIFIERS



## TYPE 536 "X-Y" OSCILLOSCOPE

### Identical Horizontal and Vertical Main Amplifiers

DC to 10 MC, both amplifiers, with Type 53/54G Differential Plug-In Preamplifiers.

Less than 1° relative phase difference from dc to 15 mc. Phase balance can be obtained at any one frequency to over 25 mc.

Converts to general-purpose oscillo-

scope with Type 53/54T Time-Base Unit plugged into horizontal amplifier.

### 4-KV Accelerating Potential

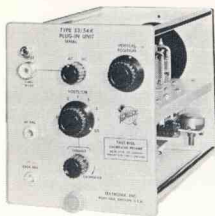
10 by 10 division viewing area.

### Amplitude Calibrator

0.2 mv to 100 v in 18 steps. Square wave, frequency about 1 kc

### Electronically-Regulated Power Supplies.

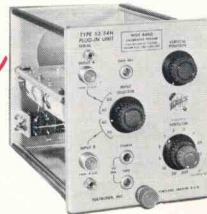
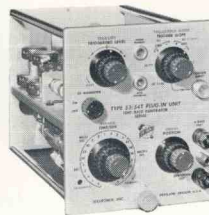
Price, without plug-in units . . . \$1050.



TYPE 53/54K



TYPE 53/54L



**Type 53/54T Time-Base Generator**—Provides the sweep voltages necessary for operating the Type 536 in the usual oscilloscope applications. Generates 22 calibrated sweep rates from 0.2  $\mu$ sec/div to 2 sec/div. 5-x magnifier is accurate at all sweep rates. Triggering is fully automatic, or manual with amplitude-level selection and preset or manual stability control. **Price \$235.**

**Type 53/54H Plug-In Unit**—a wide-band preamplifier with dc-coupling over its entire sensitivity range. Provides a maximum deflection factor of 5 mv/cm, dc-coupled, in all Tektronix Oscilloscopes with the Plug-In Feature. Passband and risetime with Type 533 Oscilloscope—dc to 11 mc, 0.031  $\mu$ sec. **Price \$185.**

**Type 53/54R Plug-In Unit**—a transistor testing unit for Tektronix Oscilloscopes with the Plug-In Feature. Supplies a fast-rising pulse and the required supply and bias voltages for measurement of transistor rise, fall, delay, and storage times. 400-ma collector supply, 100-ma bias supply, 5 m $\mu$ sec-risetime pulse. **Price \$300.**

*New*

*New*

*New*



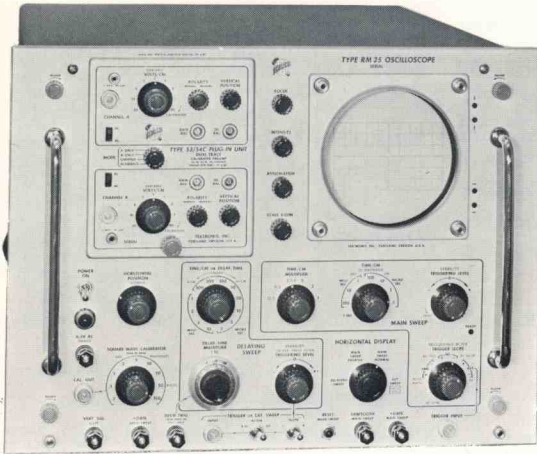
**Type 127 Preamplifier Power Supply**—a rack-mounting unit that supplies proper operating power to one or a combination of two Type 53/54 Plug-In Preamplifiers. Contains a differential dc-coupled amplifier stage with push-pull output. Risetime is 0.018  $\mu$ sec. Square-wave amplitude calibrator has 18 steps from 0.2 mv to 100 v. Dimensions — 8 $\frac{3}{4}$ " high, 19" wide, 20" rack depth. **Price \$525.**

Calibrated Deflection Factor	Input Capacitance	Price
0.05 v/cm to 20 v/cm	47 $\mu$ f	\$90
5 mv/cm to 0.05 v/cm	47 $\mu$ f	\$135
0.05 v/cm to 20 v/cm		
0.05 v/cm to 20 v/cm	20 $\mu$ f	\$250
1 mv/cm to 50 v/cm	47 $\mu$ f	\$155
50 $\mu$ v/cm to 10 mv/cm	50 $\mu$ f	\$175
0.05 v/cm to 20 v/cm	47 $\mu$ f	\$185
0.005 v/cm to 20 v/cm	47 $\mu$ f	\$185
0.05 v/cm to 20 v/cm	20 $\mu$ f	\$135
5 mv/cm to 2 v/cm		
0.05 v/cm to 20 v/cm	20 $\mu$ f	\$200

# RACK-MOUNTING OSCILLOSCOPES

with the Tektronix Plug-In Features

Types RM31, RM32, RM33, RM35, RM41, RM43, RM45 Oscilloscopes are mechanically rearranged Types 531, 532, 533, 535, 541, 543, 545 Oscilloscopes for mounting in a standard 19-inch rack. The chassis is attached to the cabinet on slide-out tracks. It can be pulled forward, tilted, and locked in any of seven positions for servicing convenience. Dimensions — 14" high, 19" wide, 22 1/2" rack depth.



## TYPE RM31 OSCILLOSCOPE

Electrically identical to the Tektronix Type 531  
**Price, without plug-in units . . . . . \$1095.**

## TYPE RM32 OSCILLOSCOPE

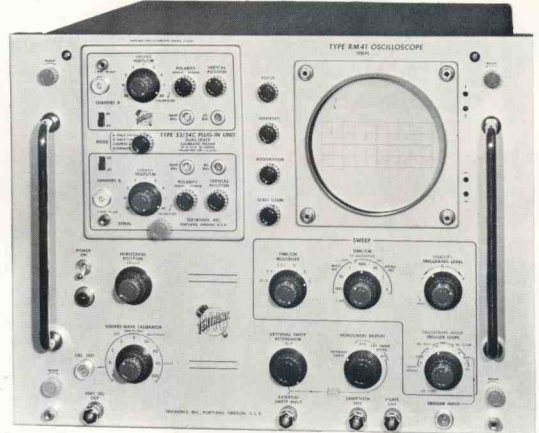
Electrically identical to the Tektronix Type 532  
**Price, without plug-in units . . . . . \$975.**

## TYPE RM33 OSCILLOSCOPE

Electrically identical to the Tektronix Type 533  
**Price, without plug-in units . . . . . \$1200.**

## TYPE RM35 OSCILLOSCOPE

Electrically identical to the Tektronix Type 535  
**Price, without plug-in units . . . . . \$1500.**



## TYPE RM41 OSCILLOSCOPE

Electrically identical to the Tektronix Type 541  
**Price, without plug-in units . . . . . \$1300.**

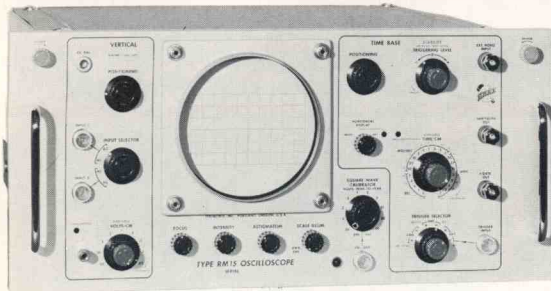
## TYPE RM43 OSCILLOSCOPE

Electrically identical to the Tektronix Type 543  
**Price, without plug-in units . . . . . \$1375.**

## TYPE RM45 OSCILLOSCOPE

Electrically identical to the Tektronix Type 545  
**Price, without plug-in units . . . . . \$1650.**

## OTHER RACK-MOUNTING MODELS

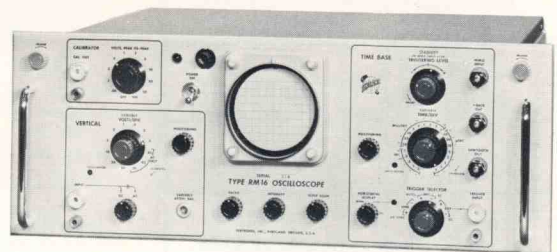


## TYPE RM15 RACK-MOUNTING OSCILLOSCOPE

A mechanical rearrangement of the Type 515A for rack-mounting. The electrical characteristics of the Type RM15 are the same as the Type 515A.

Slide-out Mounting.

**Dimensions**—8 3/4" high, 19" wide, 22 1/2" rack depth.  
**Price \$875.**



## TYPE RM16 and TYPE RM17 OSCILLOSCOPES

Mechanical rearrangements of Type 316 and Type 317 Oscilloscopes. Same electrical characteristics. Slide-out mountings. Dimensions: 7" h, 19" w, 17 5/8" d.

**Prices: Type RM16 — \$825. Type RM17 — \$875.**

**Type R516**—a two-unit model of the Type RM16 for racks of limited depth. Dimensions, Indicator—7" h, 19" w, 11 3/8" d; Power supply—7" h, 19" w, 5 1/2" d. 60" power cable. Fixed mounting. **Price \$875.**

# CATHODE-RAY OSCILLOSCOPES

## TYPE 502 DUAL-BEAM OSCILLOSCOPE

### High Sensitivity

200  $\mu\text{v/cm}$ , dc coupled, both beams.

### Differential Input

Both amplifiers, at all sensitivities.

### Curve Tracing With Two Beams

(Horizontal sensitivity to 0.1 v/cm.)

### Single-Beam Curve Tracing—200 $\mu\text{v/cm}$ , both axes.

### Frequency Response

Both amplifiers—dc to 100 kc at 200  $\mu\text{v/cm}$ , increasing to 200 kc at 1 mv/cm, to 400 kc at 50 mv/cm, and to 1 mc at 0.2 v/cm.

### Wide Sweep Range

21 direct-reading calibrated sweep rates from 1  $\mu\text{sec/cm}$  to 5 sec/cm.

### Accurate Sweep Magnifier—2, 5, 10, and 20 times.

### Automatic Triggering

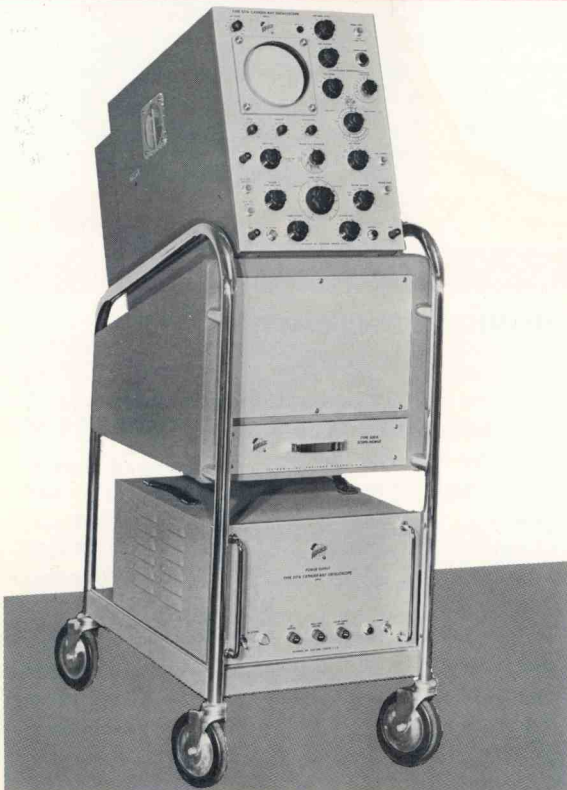
### Amplitude Calibrator—6 steps, 1 mv to 100 v.

### Electronically-Regulated Power Supplies

Input stages of both amplifiers have transistor-regulated parallel heater supplies.

Price ..... \$825.

*New*



## TYPE 517A OSCILLOSCOPE

### Excellent Transient Response

Vertical-amplifier risetime—7 millimicroseconds.  
Deflection factor—0.05 v/cm.  
Signal-displacement error—less than 2% of 2 cm.

### Fast Triggered Sweeps

Eleven calibrated rates from 0.01  $\mu\text{sec/cm}$  to 20  $\mu\text{sec/cm}$ .  
Sweep-displacement error—less than 2% of 8 cm.

### High Writing Rate

1100 cm/ $\mu\text{sec}$ . 24-kv accelerating potential on Tektronix metallized crt.

### Pulse-Type Amplitude Calibrator

### Trigger-Rate Generator

### Automatic Duty-cycle Limiter

### Cathode-Follower Input Probe

### Electronically-Regulated Power Supplies

**Highly Mobile**—Indicator unit and power supply mounted on Scope-Mobile.

Price ..... \$3500

# CATHODE-RAY OSCILLOSCOPES

## TYPE 310 PORTABLE OSCILLOSCOPE

**Vertical Response**—DC to 4 mc, 0.1 v/div to 50 v/div in 9 calibrated steps. 3 additional steps from 0.01 v/div to 0.1 v/div, at 2 cycles to 3.5 mc. Continuously variable from 0.01 v/div to 150 v/div.

**Risetime**—0.09  $\mu$ sec.

**Sweep Range**—0.1  $\mu$ sec/div to 0.6 sec/div, with 5x magnifier.

**Versatile Triggering**—Internal, external, line...ac or dc-coupled, and automatic triggering.

**Price \$595.**



*New*

## TYPE 317 PORTABLE OSCILLOSCOPE

**9-KV Accelerating Potential**—Bright trace at low sweep repetition rates.

**Vertical Response**—DC to 10 mc, 0.1 v/div to 50 v/div in 9 calibrated steps. 3 additional steps from 0.01 v/div to 0.1 v/div, at 2 cycles to 10 mc. Continuously variable from 0.01 v/div to 125 v/div.

**Risetime**—0.035  $\mu$ sec.

**Sweep Range**—0.2  $\mu$ sec/div to 6 sec/div, with 22 calibrated steps. Accurate 5x magnifier.

**Triggering**—Amplitude-level selection with preset or manual stability control, and automatic triggering.

**Price \$800.**

## Type 316 Portable Oscilloscope

**1.85-KV Accelerating Potential. Identical to Type 317 in all other specifications.**

**Price \$750.**



## TYPE 51 5A PORTABLE OSCILLOSCOPE

**Passband**—DC to 15 mc.

**Sensitivity**—0.05 v/cm to 20 v/cm in 9 calibrated steps—continuously variable from 0.05 v/cm to 50 v/cm.

**Risetime**—0.023  $\mu$ sec.

**Sweep Range**—0.2  $\mu$ sec/cm to 6 sec/cm with 22 calibrated steps. Accurate 5x magnifier.

**Balanced 0.25  $\mu$ sec Delay Network.**

**Triggering**—Amplitude-level selection with preset or manual stability control, and automatic triggering.

**Price \$800.**



## TYPE 524AD TELEVISION OSCILLOSCOPE

**Passband**

**Normal**—dc to 10 mc from 0.15 v/cm to 50 v/cm, 2 cycles to 10 mc from 15 mv/cm to 50 v/cm.

**Flat**—Within 1% from 60 cycles to 5 mc.

**IRE**—Meets IRE standards for level measurements.

**Risetime**—0.035  $\mu$ sec.

**Sweep Range**—Continuously variable, 0.1  $\mu$ sec/cm to 0.01 sec/cm.

**Time Markers**—0.05  $\mu$ sec, 0.1  $\mu$ sec, 1.0  $\mu$ sec, 200, and 40 pips per television line.

**Sweep Delay**—0 to 25 milliseconds, continuously variable.

**DC-Coupled Unblinking.**

**3x and 10x Magnifier.**

**Variable-Duty-Cycle Amplitude Calibrator.**

**Price \$1250.**





# CHARACTERISTIC-CURVE TRACERS

## TYPE 575 TRANSISTOR CHARACTERISTIC-CURVE TRACER

10 Ampere collector supply.

2.4 Ampere base supply.

Positive or negative collector sweep—

Collector supply—0 to 20 v, 10 amperes.  
0 to 200 v, 1 ampere.

Positive or negative base stepping

4 to 12 steps/family, repetitive or single family display.  
17 current/step positions, 0.001 ma/step to 200 ma/step.  
5 voltage/step positions, with 24 different driving resistances.

Calibrated display

**Vertical Axis—**

Collector current  
Base voltage  
Base current  
Base source voltage

**Horizontal Axis—**

Collector voltage  
Base voltage  
Base current  
Base source voltage

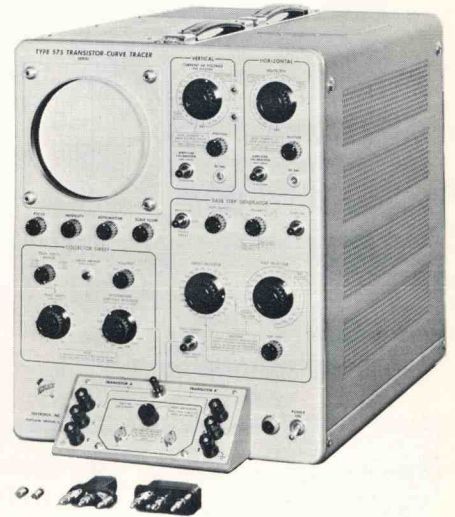
Collector current range is in 16 steps from 0.01 to 1000 ma/div.

Pushbuttons are provided for multiplying each current step by 2 and dividing by 10, increasing the current range to 0.001 to 2000 ma/div.

Base voltage range is from 0.01 v/div to 0.5 v/div in 6 steps.

Collector voltage range is from 0.1 v/div to 20 v/div in 11 steps.

Price \$975.



## TYPE 570 ELECTRON-TUBE CHARACTERISTIC-CURVE TRACER

Displays 4 to 12 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.

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.

Heater voltages available in 17 steps, variable to 20%.

Price \$995.

## TYPE 525 TELEVISION WAVEFORM MONITOR

Frequency Response

Flat—within 1% between 60 cycles and 5 mc.  
Low Pass—passes stair steps, eliminates high frequencies.  
High Pass—passes high frequencies, eliminates stair steps.  
IRE—meets IRE standards for level measurements.

Sensitivity—Deflection factor of the vertical amplifier is 0.015 v/cm.

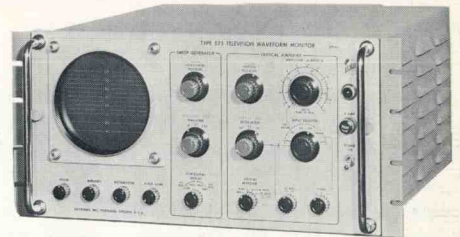
Vertical Attenuator—1x, 2x, and 5x.

Keyed Clamp-Type DC Restorer.

Gain Stability within 1%.

Rack-Mounting—8<sup>3</sup>/<sub>4</sub>" high, 19" wide, 20<sup>3</sup>/<sub>4</sub>" rack depth.

Price \$1100.



**TYPE 525MOD111—Equipped with intensifier for observation of vertical-blanking-interval test signal.**

Price \$1145.

# AUXILIARY INSTRUMENTS



## TYPE 105 SQUARE-WAVE GENERATOR

**Risetime**—13 millimicroseconds, with 52-ohm termination.  
**Frequency Range**—25 cycles to 1 mc, continuously variable.  
**Frequency Meter**—Direct reading, accurate within 3% of full scale.  
**Output Amplitude**—0 to 100 v maximum, 0 to 15 v across 93 ohm load.  
**Price \$395.**

## TYPE 107 SQUARE-WAVE GENERATOR

**Risetime**—3 millimicroseconds, with 52-ohm termination.  
**Frequency Range**—400 kc to 1 mc, uncalibrated.  
**Output Amplitude**—0.1 v to 0.5 v, with 52-ohm termination.  
**Price \$175.**



## TYPE 130 L,C METER

**Guard Voltage**—Permits measuring an unknown capacitance while eliminating the effects of other capacitances from the measurements.  
**Five Ranges**—  
**Microhenries**—0 to 3, 10, 30, 100, 300.  
**Micromicrofarads**—0 to 3, 10, 30, 100, 300.  
**Accuracy**—Within 3% of full scale.  
**Price \$200.**

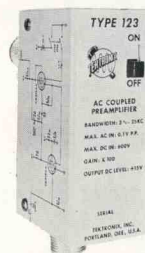


## TYPE 121 WIDE-BAND PREAMPLIFIER

**Voltage Gain**—0.01 to 100, continuously variable.  
**Frequency Response**—5 cycles to 12 mc.  
**Risetime**—less than 0.03  $\mu$ sec.  
**Maximum Output Voltage**—1 v peak to peak in terminated 93-ohm cable.  
**Price \$280.**

## TYPE 122 LOW-LEVEL PREAMPLIFIER

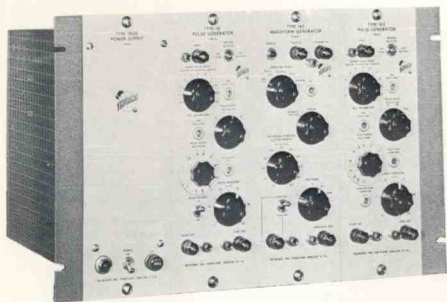
**Voltage Gain**—1000.  
**Frequency Response**—0.16 cycles to 40 kc maximum.  
**Rejection Ratio**—80 to 100 db for in-phase signals.  
**Noise Level**—4  $\mu$ v rms maximum.  
**Output Voltage**—20 v maximum (peak to peak).  
**Input Impedance**—10 megohms paralleled by approximately 50  $\mu$ mf.  
**Battery operated for minimum noise level.**  
**Price, without batteries, \$125.**



## TYPE 123 PREAMPLIFIER

**Frequency Response**—  
 Within 2% from 15 cycles to 6 kc.  
 Within 3 db from 3 cycles to 25 kc.  
**Voltage Gain**—100 times.  
**Hum-Free**—Powered by miniature batteries.  
**Compact**—3 $\frac{5}{8}$ " high, 1 $\frac{1}{2}$ " wide, 2 $\frac{1}{4}$ " deep.  
**Weight**—10 ounces.  
**Price \$50.**

# AUXILIARY INSTRUMENTS



## TYPE 160A POWER SUPPLY

**Large load capacity**—Provides operating power for four to six 161, 162, 163 Units plus a 360 Indicator Unit.

**Electronic voltage regulation.**

**Price \$175.**

## TYPE 163 FAST-RISE PULSE GENERATOR

**Variable-amplitude positive pulse**, 0 to 25 v.

**Fixed-amplitude positive gate**, 25 v.

**Output Characteristics—**

**Risetime**—less than 0.2  $\mu$ sec.

**Duration**—Calibrated, continuously variable, 1  $\mu$ sec to 10,000  $\mu$ sec.

**Delay**—Continuously variable to 100% of triggering sawtooth duration.

**Price \$125.**

## TYPE 161 PULSE GENERATOR

**Variable-amplitude positive or negative pulse from 0 to 50 v.**

**Positive Gate**—50 v amplitude.

**Output Characteristics**

**Duration**—calibrated, continuously variable, 10  $\mu$ sec to 0.1 sec.

**Delay**—continuously variable, 0 to 100% of triggering sawtooth waveform.

**Risetime**—less than 0.5  $\mu$ sec.

**Price \$125.**

## TYPE 162 WAVEFORM GENERATOR

**Output Waveforms** — positive pulse, positive gate, and negative-going sawtooth.

**Output Characteristics—**

**Repetition Rate**—0.1 c to 10 kc for recurrent operation.

**Duration** — pulse 10  $\mu$ sec to 0.05 sec; gate and sawtooth, 100  $\mu$ sec to 10 sec.

**Amplitude** — pulse and gate, 50 v; sawtooth, +150 v to +20 v

**Price \$125.**

## TYPE 360 INDICATOR

**Vertical Passband**—DC to 500 kc.

**Calibrated vertical attenuator**

**Deflection factor**—0.05 v/div.

**Waveform Requirements**—for Horizontal Deflection—50 v positive unblanking pulse, and a sawtooth of either polarity with amplitude from 110 to 150 v and extreme voltage limits at -90 v and +170 v.

**Powered** by a Type 160A, or Type 126 Power Supply.

**Price \$250.**



## TYPE 126 POWER SUPPLY

Provides operating power for one Type 161, 162, 163, or 360.

**Electronic voltage regulation.**

**Price \$100.**

*New*



## TYPE 181 TIME-MARK GENERATOR

**Time-marks**—1, 10, 100, 1000, and 10,000 microseconds, plus 10-mc sine wave.

**1-mc crystal controlled oscillator** is accurate within 0.03%.

**Price \$240.**



## TYPE 180A TIME-MARK GENERATOR

**Time-Marks**—1, 5, 10, 50, 100, 500  $\mu$ sec; 1, 5, 10, 50, 100, 500 msec; 1, 5 seconds.

**Three Sine-Wave Frequencies**—5 mc, 10 mc, and 50 mc.

**Six Trigger-Rate Frequencies**—1, 10, 100, cycles and 1, 10, 100 kc.

**Temperature-stabilized crystal** provides stability of 2 ppm.

**Price \$575.**

## TYPE 190A CONSTANT-AMPLITUDE SIGNAL GENERATOR

**Output Frequency**—350 kc to 50 mc, continuously variable, 50 kc reference signal.

**Output Amplitude**—40 mv to 10 v peak to peak, continuously adjustable.

**Amplitude Variation**—less than  $\pm 2\%$  from 50 kc to 30 mc; less than  $\pm 5\%$  from 30 mc to 50 mc.

**Harmonic Content**—typically less than 5%.

**Price \$300.**

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