CATHODE - RAY OSCILLOSCOPES

AND AUXILIARY INSTRUMENTS

INCLUDING NEW INSTRUMENTS

SHORT FORM CATALOG

AUGUST 1956

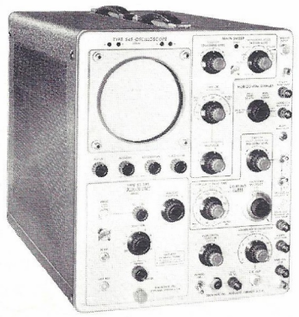
TYPE 530-SERIES and TYPE 540-SERIES CONVERTIBLE OSCILLOSCOPES

Abundant Versatility Provided by Plug-In Preamplifiers

Type 530-Series and Type 540-Series Oscilloscopes are quickly and easily converted to any of a wide variety of applications by plugging in the appropriate vertical preamplifier. Characteristics available in the various plug-in units provide each oscilloscope with the capabilities of several . . . at less cost, and with easier handling and lower space requirements.

DC-TO-30 MC OSCILLOSCOPES

NEW MECHANICAL DESIGN — Redesigned mechanically for easier access to the interior of the instrument, the Type 541, 545, 531, and 535 Oscilloscopes now have a more streamlined appearance. Cabinet sides are held in place by quick-opening fasteners; removal and replacement of either side takes just seconds.



Type 545 Oscilloscope, in combination with the new Type 53/54K Fast-Rise Plug-In Unit, opens the way to quicker, easier analyses of fast-rising waveforms . . . providing faithful displays and accurate measurement facilities well beyond the range of previous oscilloscopes of its size and cost. Risetime of the Type 545-Type 53/54K combination is 12 millimicroseconds. Passband is dc to approximately 30 mc. (Response is down 3 db ±½ db at 30 mc, 6 db at approximately 41 mc, 12 db at approximately 55 mc.) Sensitivity—0.05 v/cm to 20 v/cm in 9 calibrated steps. Full 4 cm linear vertical deflection; 0.2-μsec vertical-signal delay. Convertibility to most laboratory applications is provided by Type 53/54 Plug-In Units. Two P410 probes are furnished. All other characteristics of the Type 545 Oscilloscope are the same as those of the Type 535 described below, including delayed sweeps. Weight 65 pounds. Price, without plug-in units, $1450.

Type 541 Oscilloscope has the same general characteristics as the Type 545, but is without provision for delayed sweeps. Weight 61½ lbs. Price, without plug-in units, $1145.

DC-TO-10 MC OSCILLOSCOPES

Type 535 Oscilloscope has a wide-band main amplifier with a risetime of 0.03 μsec, designed to work with all Type 53 and Type 53/54 Plug-In Units. It offers a wide range of sweep delay, 1 μsec to 0.1 sec, in 12 calibrated ranges, accurate within 1%. (Longer delay available at slight extra cost.) Sweep delay is continuously variable, with incremental accuracy within 0.2% of full scale. Delay circuitry has two operating modes—conventional, with jitter less than 1 part in 20,000—and triggered, providing jitter-free displays even in the presence of jitter in the signal. Delay circuitry provides a continuously variable trigger-rate source, 10 cycles to 40 kc. Other features of the Type 535 are:

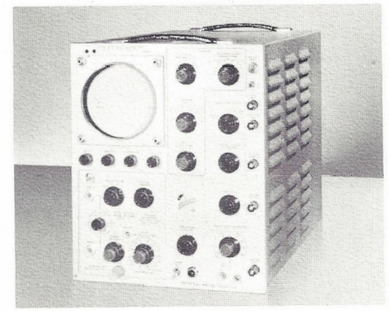
Wide-range sweep circuit—0.02 μsec/cm to 12 sec/cm continuously variable with 24 calibrated steps from 0.1 μsec/cm to 5 sec/cm, accurate 5x magnification on all ranges providing an additional 24 calibrated sweeps; trigger amplitude selection or automatic triggering; dc-coupled unblanking, 10-kv accelerating potential. New metallized crt, manufactured by Tektronix, Inc., provides full 6x10-cm viewing area; horizontal input amplifier sensitivity 0.2 v/cm to 20 v/cm continuously variable; 0.25-μsec vertical signal delay; square-wave amplitude calibrator — 0.2 mv to 100 v; electronically-regulated power supply; beam-position indicators. Weight 65 lbs. Price, without plug-in units, $1300.

Type 531 Oscilloscope has the same general characteristics as the Type 535, but is without provision for delayed sweeps. Weight 61½ lbs. Price, without plug-in units, $995.

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

DC-TO-5 MC OSCILLOSCOPE

Type 532 Oscilloscope offers the advantages of all Type 53 and Type 53/54 Plug-In Units, with only the wide-band units being limited to a passband of DC to 5 mc and risetime of 0.07 μsec by the characteristics of its main amplifier. The Type 532 is designed for users who do not need the high-speed sweeps, high writing rate, and wide passband of the Type 531. Simplified circuitry eases vacuum-tube loading; lower accelerating potential reduces possibility of screen damage at very-slow sweep speeds and makes possible greater linear vertical deflection. Sweep range—0.2 μsec/cm to 12 sec/cm continuously variable, with 21 calibrated steps from 1 μsec/cm to 5 sec/cm, accurate within 3%. Accurate 5x magnifier provides 21 additional calibrated sweeps. Versatile trigger circuitry includes automatic triggering. 4-kv accelerating potential. New precision crt, manufactured by Tektronix, Inc., provides 8 cm vertical deflection. Horizontal input amplifier sensitivity 0.2 v/cm to 20 v/cm; square-wave amplitude calibrator, 0.2 mv to 100 v in 18 steps, accurate within 3%. DC-coupled unblanking, electronically-regulated power supply, vertical beam-position indicators. Wt. 52 lbs. Price, without plug-in units, $825.

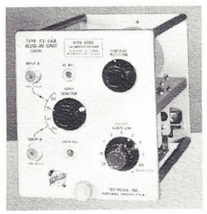


PLUG-IN PREAMPLIFIERS

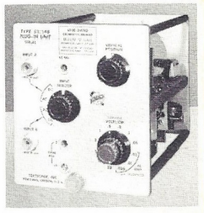
(Frequency response down 3 db ± ½ db at limits quoted.)

NEW INSTRUMENTS

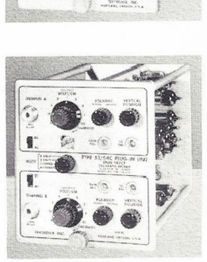
Type 53/54A Wide-Band DC-Coupled Unit—dc to 20 mc, 0.018-μsec risetime with Types 541 and 545 . . . dc to 10 mc, 0.035-μsec risetime with Types 531 and 535 . . . dc to 5 mc, 0.07-μsec risetime with Type 532. Sensitivity 0.05 to 50 v/cm, ac or dc, continuously variable, with 9 calibrated steps from 0.05 to 20 v/cm. 60-db isolation between two input connectors. Weight 3½ lbs. Price $85.



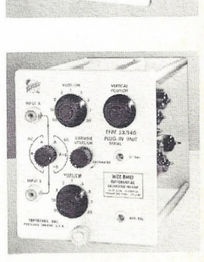
Type 53/54B Wide-Band High-Gain Unit—same as the Type 53/54A with the addition of an ac-coupled input stage providing sensitivity of 5 mv/cm to 0.05 v/cm continuously variable, with 3 calibrated steps . . . at 2 cycles to 12 mc, 0.03-μsec risetime with Types 541 and 545 . . . 2 cycles to 9 mc, 0.04-μsec risetime with Types 531 and 535 . . . 2 cycles to 5 mc, 0.07-μsec risetime with Type 532. Weight 3½ lbs. Price $125.



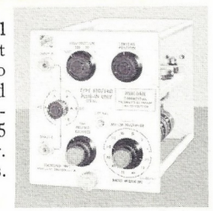
Type 53/54C Dual-Trace DC Unit—two identical amplifier channels, each with passband and risetime of . . . dc to 24 mc, 0.015 μsec with Types 541 and 545 . . . dc to 10 mc, 0.035 μsec with Types 531 and 535 . . . dc to 5 mc, 0.07 μsec with Type 532. Sensitivity 0.05 to 50 v/cm continuously variable, with 9 calibrated steps from 0.05 to 20 v/cm. Electronic switching triggered by sweep, or free-running at about 100 kc. Weight 5½ lbs. Price $275.



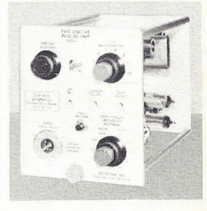
Type 53/54G Wide-Band Differential DC Unit—dc to 20 mc, 0.018-μsec risetime with Types 541 and 545 . . . dc to 10 mc, 0.035-μsec risetime with Types 531 and 535 . . . dc to 5 mc, 0.07-μsec risetime with Type 532. Sensitivity 0.05 to 50 v/cm continuously variable, with 9 calibrated steps from 0.05 to 20 v/cm. Separate step attenuators for both inputs. Rejection is better than 100 to 1 at full gain for the entire passband, 300 to 1 at 60 cycles. Weight 4½ lbs. Price $175.



Type 53/54D High-Gain Differential DC Unit—passband dc to 350 kc at 1 mv/cm sensitivity, increasing to dc to 2 mc at 50 mv/cm sensitivity. Calibrated sensitivity from 1 mv/cm to 50 v/cm, continuously variable from 1 mv/cm to 125 v/cm. Normal drift less than 1.5 mv/hr. High rejection ratio. Weight 4 pounds. Price $145.



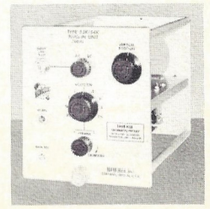
Type 53/54E Low-Level Differential AC Unit—sensitivity 50 microvolts/cm to 10 millivolts/cm in eight calibrated steps. Frequency response 0.06 cycles to 30 kc at full gain, increasing to 60 kc at 0.5 mv/cm. Differential input—50,000 to 1 rejection ratio at full gain for in-phase signals of ±2 v or less. Maximum combined noise and hum is 5 μv, rms, with input grids grounded. Weight 4½ lbs. Price $165.



Type 53/54K Fast-Rise Unit—With Type 545 and Type 541—risetime 12 millimicroseconds, passband dc to approximately 30 mc. (Response is down 3 db ±½ db at 30 mc, 6 db at approximately 41 mc, 12 db at approximately 55 mc.) 0.05 v/cm to 20 v/cm sensitivity in 9 calibrated steps. Input impedance direct—20 μμf, 1 megohm; with P410 probe—8 μμf, 10 megohms. Characteristics, with Type 535 and Type 531—risetime 0.031 μsec, passband dc to 11 mc. Weight 3½ pounds. Price $125.

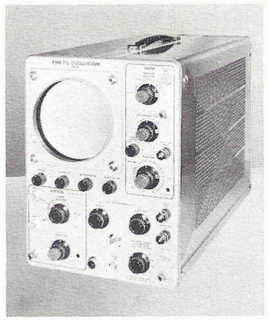
Low Input Capacitance With Accessory Probes for Type 53/54C and 53/54K Units

Probe	Input Impedance	Max. Sens.	Price
P405	12 μμf, 5 megohms	0.25 v/cm	$10.50
P410	8 μμf, 10 megohms	0.5 v/cm	10.50
P420	5.5 μμf, 10 megohms	1 v/cm	10.50
P450-L	2.5 μμf, ±10%, 10 m	2.5 v/cm	12.50
P4100	2.5 μμf, ±10%, 10 m	5 v/cm	12.50

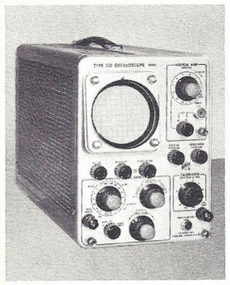


Prices f.o.b. Portland (Beaverton), Oregon

CATHODE-RAY INSTRUMENTS

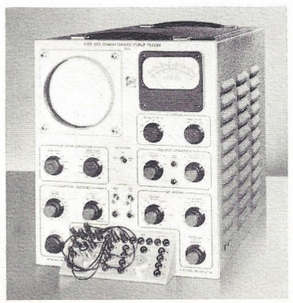


Type 515 Oscilloscope is a 5″ general-purpose laboratory instrument of reduced size (9¾″ w, 13½″ h, 21½″ d). Passband is dc to 15 mc, with 0.023-μsec risetime; sensitivity is calibrated in 9 steps from 0.1 v/cm to 50 v/cm, continuously variable from 0.1 v/cm to 125 v/cm; 0.25-μsec balanced delay network. Twenty-two calibrated sweeps from 0.2 μsec/cm to 2 sec/cm are accurate within 3%, 5x magnifier is accurate on all ranges providing an additional 22 calibrated sweeps, full sweep range is 0.04 μsec/cm to 6 sec/cm continuously variable; trigger amplitude-level selection or automatic triggering. Accelerating potential is 4 kv on new precision Tektronix crt. Power supply is electronically regulated. Square-wave calibrator has 11 steps from 0.05 v to 100 v accurate within 3%, frequency about 1 kc. Weight 40 lbs. Price $750.



Type 310 Oscilloscope is a dc-to-4 mc portable precision instrument, designed for both field and laboratory applications. With its small size...10″ h by 6¾″ w by 17″ d...and its light weight, only 23½ lbs...the Type 310 handles easily and fits into tight spots, yet it is fully capable of performing much of your laboratory work. Features include: Wide-range sweep circuit—0.5 μsec/div to 0.6 sec/div continuously variable with 18 calibrated steps from 0.5 μsec/div to 0.2 sec/div, accuracy within 3%; 5x magnifier, accurate on all ranges; trigger amplitude selection or automatic triggering; dc-coupled unblanking. Vertical-amplifier risetime 0.09 μsec; accurately calibrated sensitivity from 0.1 v/div to 50 v/div in 9 steps at dc to 4 mc, with 3 additional steps from 0.01 v/div to 0.05 v/div at 2 cycles to 3.5 mc; sensitivity continuously variable from 0.01 v/div to 150 v/div. Square-wave voltage calibrator; 1.85-kv accelerating potential on 3″ crt; regulated power supply; hinged chassis for easy accessibility. Weight 23½ lbs. Price $595 (105-125 volts, 60 to 800 cycles only).

Type 310-S1—Has heavier transformer for operation on 105-125 v or 210-250 v, 50 to 800 cycles. Weight 25½ lbs. Price $595.

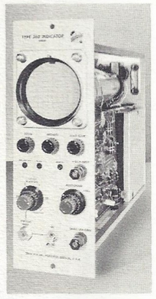


Type 570 Characteristic-Curve Tracer presents an accurate graphic analysis of vacuum-tube characteristics under almost any conceivable operating conditions. It displays families of characteristic curves on the face of a cathode-ray tube, calibrated to permit accurate current and voltage readings directly from the screen. Features include: Curves per family adjustable from 4 to 12; plots 6 different characteristic curves: Ep-Ip, Eg-Ip, Ep-Ig_2, Eg-Ig_2, Ep-Ig, and Eg-Ig; 9 voltage ranges from 0.1 v/div to 50 v/div; 11 current ranges from 0.02 ma/div to 50 ma/div; 8 plate-supply sweep voltages from 5 to 500 v peak; 11 series-load resistors from 300 ohms to 1 megohm; 7 grid-step values from 0.1v/step to 10 v/step; starting point of family adjustable—up to 12 negative-bias curves and up to 8 positive-bias curves can be displayed; 17 different heater voltages, variable approximately ±20%; 5 fixed +dc voltages from 20 to 300 v, with variable control to cover between steps; negative dc voltage continuously variable between 0 and 100 v; heater, +dc, —dc voltages measured on a front-panel meter; overload conditions can be momentarily displayed; quick comparisons of two tubes by manual switching; various socket-adapter plates and patch-cord connectors accommodate practically all receiving-type tubes. Regulated power supply. Weight 67 pounds. Price $925.

Type 315D Portable 3″ precision laboratory oscilloscope has the following features: Wide-range sweep circuit — 0.1 μsec/div to 10 sec/div continuously variable with 24 calibrated steps from 0.1 μsec/div to 5 sec/div, accurate 5x magnifier (slightly less than 5x at sweep times less than 0.1 μsec/div); trigger amplitude discriminator; dc-coupled unblanking; vertical-amplifier risetime less than 0.07 μsec; calibrated sensitivity, dc to 5 mc—0.1 v/div to 50 v/div...5 cycles to 5 mc—0.01 v/div to 50 v/div... (¼″ divisions); 0.25-μsec signal delay; square-wave voltage calibrator; 1.8-kv accelerating potential. Size, 12⅜″ high, 8⅝″ wide, 18¼″ deep. Weight 36 pounds. Price $770 (50-60 cycle supply only).

Type 315D-S1—For supply frequencies 50 to 800 cycles. Price $785.

Type 315D-S2—For use with specific PTM systems. Price $790.

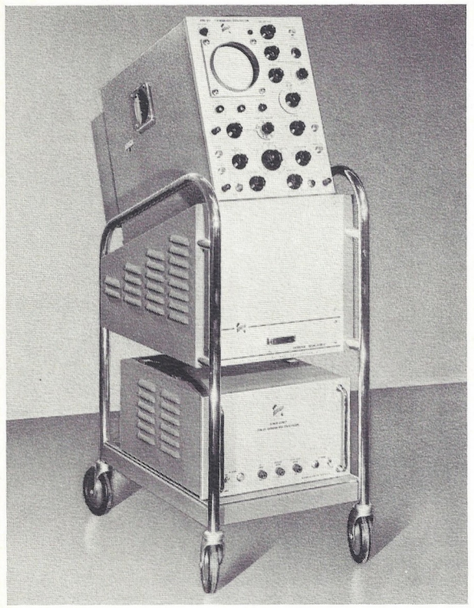


Type 360 Indicator contains a 3″ flat-faced crt, accelerating-voltage supply, vertical amplifier with a sensitivity of 0.05 v/div and a calibrated vertical attenuator. It is designed to be powered by a Tektronix Type 160 or 160A Power Supply and to receive its sweep and unblanking voltages from a Tektronix Type 162 Waveform Generator or from any Tektronix oscilloscope; but can be operated from any source of the proper voltages and waveforms. A Type 360 can take the place of a bulkier oscilloscope in single monitoring applications; or several can be used along with Tektronix Type 160 Units as building blocks in a complex sequence-control and monitoring system. Several Type 360 Indicators can be driven by a single Type 162 Unit, and a simple Type 161-Type 162 hookup provides calibrated sweep delay. For low-level applications a Tektronix Type 122 Preamplifier provides increased sensitivity to 50 microvolts/div. A single Type 160A can supply power to five Type 360 Units. Three Type 360 Units can be powered by a Type 160 Power Supply. Features include: DC to 500 kc vertical-amplifier passband; four calibrated sensitivities from 50 mv/div to 50 v/div with a 10-to-1 attenuator for continuously variable sensitivity from 50 mv/div to 500 v/div. Required input waveforms—a sawtooth waveform of either polarity with an overall amplitude from 110 v to 150 v with extreme voltage limits at —90 v and +170 v, and a 50-v positive gate. Horizontal gain control permits sweep calibration. Adapted to rack mounting. Weight 9 lbs. Price $195.

NEW

Type 126 Power Supply provides the required voltages and currents necessary to power one Type 360 Indicator or any one of the Type 160-Series Waveform Generators. The Type 126 includes a cabinet to house both the Type 126 and the powered unit. This power supply combined with a Type 360 Indicator makes a practical, compact slave unit for any Tektronix oscilloscope. Weight 10½ lbs. Price $100.

CATHODE-RAY INSTRUMENTS

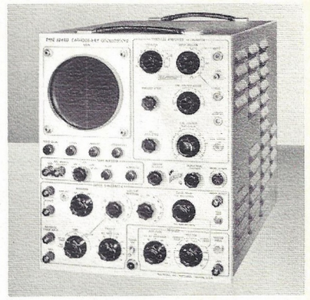


Type 517A High-Speed Oscilloscope is designed primarily for the observation and photography of very-fast transients. It consists of two units, indicator and power supply, mounted on a scope-mobile to make up a convenient, mobile instrument. Features include: full 4x8-cm deflection; high writing rate, obtained by 24-kv accelerating potential on a metallized T54P11H crt; eleven calibrated sweeps from 0.01 μsec/cm to 20 μsec/cm, accurate within 2%; sweep triggered by observed signals of 2 mm or greater amplitude; signal delay to permit observation of front of pulse; distributed vertical amplifier with 0.007-μsec risetime and 0.05-v/cm sensitivity; cathode-follower input probe with capacitance attenuators; pulse-type amplitude calibrator with 6 ranges, full-scale accuracy within 4%; trigger-rate generator variable from 15 to 15,000 cycles; panel switch to reduce accelerating potential to 12 kv giving twice above sensitivities and sweep rates. Standard accessories: scope-mobile, cathode-follower probe and attenuators, 170-ohm step attenuator, bezel, viewing hood. Total weight 190 pounds. Price $3500.

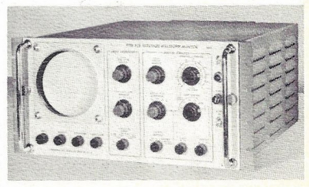
OSCILLOSCOPE FEATURES

Individually adjusted for optimum transient response • Flat-faced cathode-ray tubes • Single, triggered or recurrent sweeps • Direct-reading time and amplitude controls • Positive or negative internal and external triggering • Sawtooth and gate available on front panel • Electronically regulated power supplies • Electrically welded all-aluminum construction—low weight.

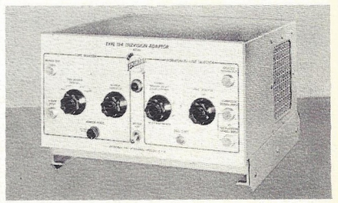
Television Instruments



Type 524AD Television Oscilloscope is designed for TV transmitter and studio use for both monochrome and color, and has the following features: 0.1-μsec/cm to 0.01-sec/cm sweeps, with zero to 25 milliseconds delay, a line at a time, on all sweeps; 3x and 10x magnification, accurate within 2% except at sweep times less than 0.1 μsec/cm; field selector for switching to either field of a frame; built-in sync separator; 60-cycle sine-wave sweep with amplitude and phase control; time-mark generator with phasing control — 0.005 H, 0.025 H, 1 μsec, 0.1 μsec, and 0.05 μsec intensity markers. Vertical amplifier passband dc to 10 mc, risetime 0.035 μsec, 0.25 μsec signal delay. Passband control provides 60-cycle to 5-mc response flat within 1%, and limited response to IRE recommendation for level measurements. Sensitivity ac-coupled, 0.015 v/cm; dc-coupled, 0.15 v/cm; 6 cm undistorted deflection. Variable duty cycle square-wave calibrator, full scale accuracy within 3%, control linear within 1%. 4-kv accelerating potential. Weight 61 lbs. Price $1180.



Type 525 Television Waveform Monitor displays the television-signal waveform with the precision required for all television broadcasting, including color. Features include four frequency response characteristics—FLAT, within 1% between 60 cycles and 5 mc; LOW PASS, passes stair steps, eliminates high frequencies; HIGH PASS, passes high frequencies, eliminating stair steps; IRE, meets IRE standards for level measurements. Vertical amplifier basic sensitivity is 0.015 v/cm; 3-step attenuator, 1x, 2x, 5x, and variable gain control; gain stability within 1% over a ten-hour period; excellent linearity; keyed clamp-type dc restorer; differential input; two pairs of input connectors at rear of instrument, either pair can bridge the video circuit or terminate it. Sweep circuit—sync separator circuit; automatic sweep synchronization at line or field rates, front-panel or remote selection of sweep frequency. Variable horizontal gain control, 1x, 5x, or 25x sweep magnifier. Pulse-type amplitude calibrator, continuously variable from 0.015 to 1.5 volts, peak-to-peak; 4-kv accelerating potential on Tektronix Type T52P1 precision 5″ flat-faced crt. Regulated power supply. Cabinet designed for rack mount with chassis attached on slide-out mounting, permitting tilting for easy access. Weight 54 lbs. Price $1050.

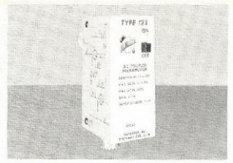


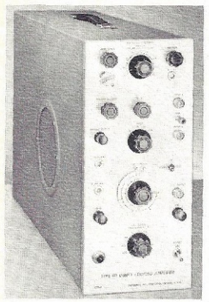
Type 124 Television Adaptor adapts any wide-band triggered oscilloscope to the observation of the television composite video wave. Sync separator and delay-trigger generator permit triggering the oscilloscope at any selected line of a field. Field Shift button provides instant shift to corresponding line or lines in opposite field. Output trigger amplitude, 2 v; trigger delay, 0 to 25 milliseconds; gated time markers, 1 μsec, 0.1 μsec, 0.05 μsec, and 200 pips per television line. Regulated power supply. Weight 21 pounds. Price $295.

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

AUXILIARY INSTRUMENTS

Type 123 Miniature Low-Level Preamplifier is battery powered, providing a voltage gain of 100 without additional hum signal. Passband is within 3 db from 3 cycles to 25 kc, within 2% from 15 cycles to 6 kc. Maximum input signal is 0.1 v peak-to-peak; output dc level is +15 v; input impedance is 10 megohms; effective output impedance is 31 kilohms. Coaxial connectors permit mounting on oscilloscope or other instrument, or to a cable for use as a probe. Dimensions are 3⅝" h, 1½" w, 2-3/16" d, not including connectors. Weight only 10 ounces. Price, including batteries, $50.



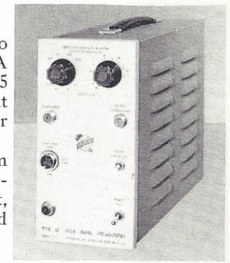


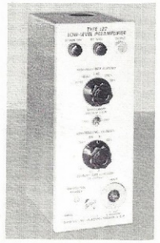
Type 112 DC-Coupled Differential Amplifier provides a voltage gain of 0.5 to 5000, continuously variable. Frequency response is dc to 2 mc for gains of 166 or less, and dc to 1 mc for gains of 166 to 5000. Output voltage is 150 v at high impedance, 75 v at 8000 ohms. Calibrator has range of 5 mv to 50 v continuously variable; full scale accuracy within 3%, control linear within 1%. A time-marker input and trigger output are provided.

The Type 112 is especially adapted for use with Tektronix Type 511, 512, 514, and 524 Oscilloscopes. The necessary connections at the access panel and trigger input of the oscilloscope are easy to make. It combines with the Type 512 Oscilloscope to provide identical characteristics in both horizontal and vertical axes. Weight 32 lbs. Price $495.

Type 121 Preamplifier was designed primarily to augment the vertical amplifier of the Type 511A Oscilloscope, providing an overall sensitivity of 1.25 mv/cm while preserving the passband and transient response. Can be used with other oscilloscopes or wide-band equipment.

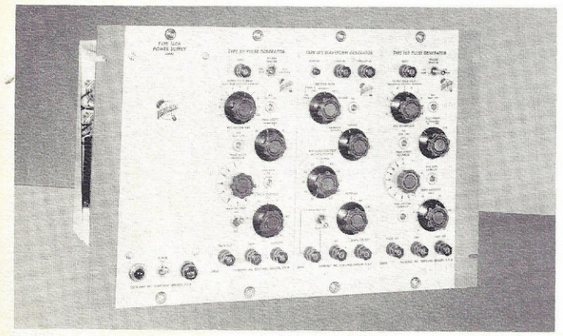
Voltage gain, 100; input impedance, 1 megohm paralleled by 20 $\mu\mu$f; output ±3 v, 93 ohms; passband 5 cycles to 12 mc; front-panel supply socket, 6.3 v dc and 20 to 100 v dc; self-contained regulated power supply. Weight 18 lbs. Price $265.





Type 122 Preamplifier for low-level applications provides a voltage gain of 1000 with a maximum noise level of 4 μv rms. Frequency response is 1/6 cycle to 40 kc, with separate controls for limiting both ends of the passband. Use of the differential input gives a rejection ratio of 80 to 100 db for in-phase signals. Front-panel switch reduces gain to 100. A maximum of 20 v peak-to-peak is available at the cathode-follower output. Input impedance is 10 megohms paralleled by approximately 50 $\mu\mu$f. Battery operated for minimum noise level. Weight 5½ lbs. Price $85.

SPECIAL WAVEFORM GENERATORS



Type 160-Series Waveform Generators includes the Type 163 Fast-Rise Pulse Generator, Type 162 Waveform Generator, Type 161 Pulse Generator, and Type 160A Power Supply. Many combinations of pulses and many special waveforms are obtained by combining these generators in various hook-ups.

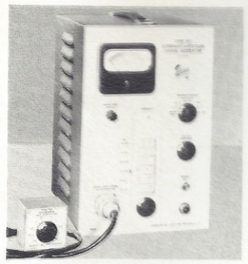
Type 163 Pulse Generator, when triggered, produces a calibrated positive pulse, 0 to 25 v amplitude, and a gate of 25 v fixed amplitude, both with a risetime of 0.2 μsec. Duration is from 1 to 10,000 μsec, calibrated. Calibrated delay 0 to 100% of triggering sawtooth duration. Can be triggered by a positive pulse or negative-going sawtooth. Direct-reading dials. Weight 5 pounds. Price $95.

Type 162 Waveform Generator produces a linear sawtooth with a 130-v negative-going excursion from +150 to +20 v amplitude, calibrated duration of 100 μsec to 10 sec, calibrated rep rate 0.1 cycle to 10 kc for recurrent operation,—a positive gate of 50 v, same duration, or a positive pulse of 50 v, calibrated duration of 10 μsec to 0.2 sec. Can be triggered externally or by a front-panel button. Direct-reading dials. Weight 5 lbs. Price $95.

Type 161 Pulse Generator, when triggered, produces a calibrated positive or negative pulse of 0 to 50 v, calibrated duration of 10 μsec to 0.1 sec, risetime of 0.5 μsec; and a positive gate of 50 v amplitude, same duration. Calibrated delay 0 to 100% of triggering sawtooth duration. Can be triggered by a positive pulse or negative-going sawtooth. Direct-reading dials. Weight 5 lbs. Price $95.

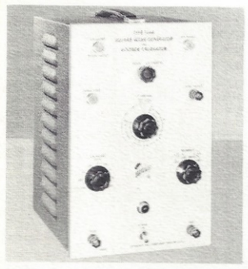
Type 160A Power Supply produces the ac voltage and regulated dc voltages necessary to operate a Type 360 Indicator Unit with a combination of from four to six Types 161, 162, 163 units. Weight 21 lbs. Price $140.

AUXILIARY INSTRUMENTS



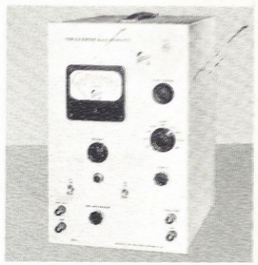
Type 190 Constant-Amplitude Signal Generator is ideal for checking amplifier high-frequency response. It generates sine waves over the range of 350 kc to 50 mc, continuously variable. Output amplitude at the cable termination varies less than 2% from 350 kc to 30 mc; less than 4% to 50 mc. Amplitude is continuously variable from 4 mv to 10 v peak-to-peak in 10 ranges, with amplitude indication accurate within 10%. Frequency indication is accurate within 2%. Output impedance is 52 ohms. Attenuator unit has 36" connecting cable. Weight 24 lbs. Price $275.

Type 130 L,C Meter is a direct-reading meter for small values of L and C in components and circuits. Five ranges: 0 to 3, 10, 30, 100, and 300 μh or $\mu\mu$f, accurate within 3% of full scale. Guard circuit lets you measure an unknown capacitance while eliminating the effects of other capacitances from the measurements. Coarse and fine zero-adjust controls, illuminated 4" meter. Designed for the development engineer, the Type 130 provides quick readings of L and C values while circuit changes are being made. It is also convenient for component testing, sorting, and color-code checking on a production basis. Weight 9 pounds. Price $195.

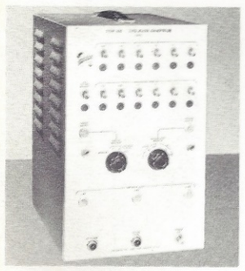


Type 104A Square-Wave Generator is a low-cost source of square waves for testing wide-band amplifiers, filter networks, and attenuator circuits in the laboratory or on the production line. The Type 104A generates four fixed frequencies: 50 cycles, 1 kc, 100 kc and 1 mc. Risetime of the two high frequencies is 0.02 μsec; the two low frequencies, 3 μsec. Amplitude of both low-frequency outputs is continuously variable from 0 to 50 v and accurate within 3%—a convenient calibrating-voltage source. The two high frequencies are available through a matched cable terminated by a continuously variable attenuator, providing an output of 0 to 5 v. Selected frequencies available on special order. Weight 22 lbs. Price $195.

Type 105 Square-Wave Generator is continuously variable over the frequency range of 25 cycles to 1 mc. Risetime is 13 millimicroseconds into a 52-ohm cable terminated at both ends. Direct-reading frequency meter is accurate within 3% of full scale. Output amplitude—0 to 100 v maximum, 0 to 15 v across 93 ohms. Sync amplitude control permits sync input amplitude of 3 v to 50 v. A 5-v sync signal is present at the sync output terminal.



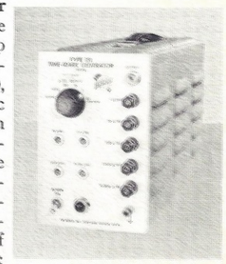
Used with an oscilloscope, the Type 105 provides an immediate picture of transient response, bandwidth, and phase shift in equipment with frequency response up to 20 mc. The Type 105 is a time-saving device to the telecaster as well as the research and development engineer. Weight 35 lbs. Price $395.



Type 180 Time-Mark Generator is a source of time markers, sine waves, and trigger impulses. Time markers of 1, 5, 10, 50, 100, 500 microseconds—1, 5, 10, 50, 100, 500 milliseconds—1 second, are available separately and simultaneously through pin jacks at 15 to 30 v, or mixed in any combination through uhf connector at 1 to 3 v. Sine waves of 5 mc, 10 mc, 50 mc at approximately 3 v, and trigger impulses of 1, 10, 100 cycles—1, 10, 100 kc at from 3 to 9 v are also available. A crystal-controlled oscillator operating at 1 mc controls all outputs. The 1-mc frequency is accurate within 0.03%. Weight 35 lbs. Price $575.

Type 180-S1—with temperature-stabilized precision crystal providing stability over 24-hour period within 2 ppm, $625.

Type 181 Time-Mark Generator provides accurate markers that can be displayed on an oscilloscope for sweep calibration or comparison time measurements. Time markers of 1, 10, 100, 1000, and 10,000 μsec, and 10-mc sine wave are available at a common coax connector through use of a selector switch, markers also available at front-panel binding posts, all outputs derived from 1-mc crystal-controlled oscillator with frequency tolerance within 0.03%, amplitude of markers and sine wave is at least 2 v; dc voltages electronically regulated. Wt. 17½ lbs. Price $225.



Greater stability, 2 ppm over 24-hour period, can be achieved through use of an accessory crystal mounted in a temperature-controlled oven, interchangeable with standard crystal.

Type CO181—$27.

Type 181-S1 (Type CO181 Crystal-Oven installed)—$245.

For complete information on any Tektronix Instruments or for demonstrations, please call your Tektronix field engineer or representative. You'll find him listed on the back cover.

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