1965 ABRIDGED CATALOG

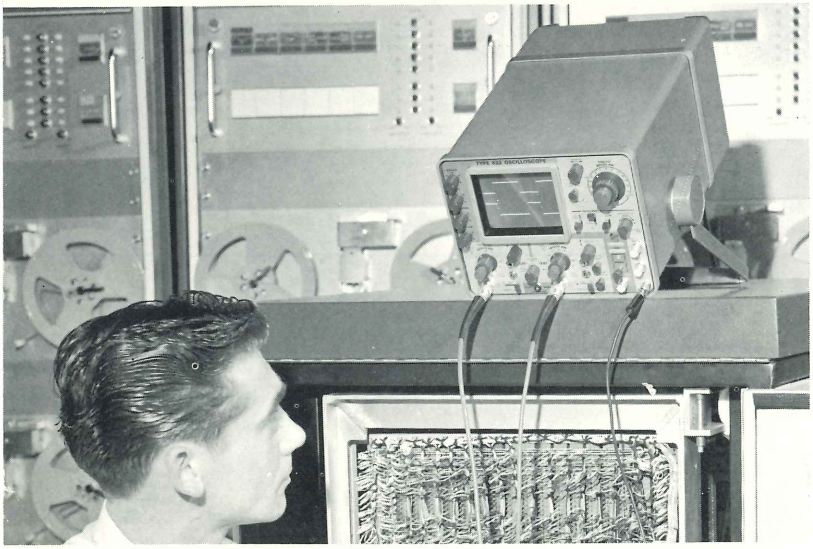
TEKTRONIX®

TYPE 422 HIGH-PERFORMANCE PORTABLE OSCILLOSCOPE

The new Type 422 is a rugged dc-to-15 Mc oscilloscope designed for servicing and maintaining electronic equipment in the field.

Fully transistorized, the Type 422 offers large-oscilloscope performance in an extremely compact instrument. Its features include a dual-trace vertical amplifier with a 150-nanosecond delay line. A new rectangular crt with internal graticule assures bright displays under high ambient light conditions. The electronically-regulated power supply of the Type 422 operates on 115 v or 230 v line, 50 to 400 cps.

The Type 422 weighs less than 21 pounds. Rugged construction allows it to withstand rough handling, while the compact light-weight design makes it easy to transport from one job to the next. The carrying handle can be locked in any one of sixteen positions, serving as a versatile tilt-up stand. Storage space is provided in the panel cover for accessories.



FEATURES

• DUAL-TRACE OPERATION — two input channels provide either chopped or alternate switching, algebraic addition or separate operation • SENSITIVITY — 10 mv/div to 20 v/div with variable control extending to 50 v/div. Channel 2 has X10 gain switch extending sensitivity to 1 mv/div (ac coupled only) • PASSBAND — less than 3 db down, dc-to-15 Mc. 5 cps-to-5 Mc with X10 gain • SIGNAL DELAY — 150-nsec delay line, does not require adjustment • CALIBRATED TIME BASE — 0.5 sec/div to 0.5 μsec/div with variable control extending slowest sweep rate to ≈1.5 sec/div • X10 SWEEP MAGNIFIER — extends calibrated sweep rate to 50 nsec/div • VERSATILE TRIGGERING — internal, external, ac, dc, low-frequency reject, and automatic • BRIGHT 8 x 10 DIV DISPLAY — no-parallax internal graticule, variable illumination • POWER SUPPLY — electronically regulated, operates on 115 v or 230 v ac, 50-400 cps • TRANSISTORIZED — uses silicone transistors throughout • CONVECTION COOLED — no fan needed • COMPACT — overall dimensions are 6 3/4" high by 10" wide by 17 4/5" deep. Weighs less than 21 pounds • TYPE 422, complete with probes — $1325 •

ENVIRONMENTAL CAPABILITIES

TEMPERATURE	Operating: −15°C to +55°C Non-Operating: −55°C to +75°C
ALTITUDE	Operating: 15,000 feet Non-Operating: 50,000 feet
VIBRATION	Operating: 0.025", 10-55 cps, 1 minute cycles for 15 minutes, 3 axis
SHOCK	Non-Operating: 60 G's, ½ sine, 11 msec duration, each direction on each axis for a total of 6 shocks. Within electrical specification after test.
RFI	Meets Mil-1-6181D

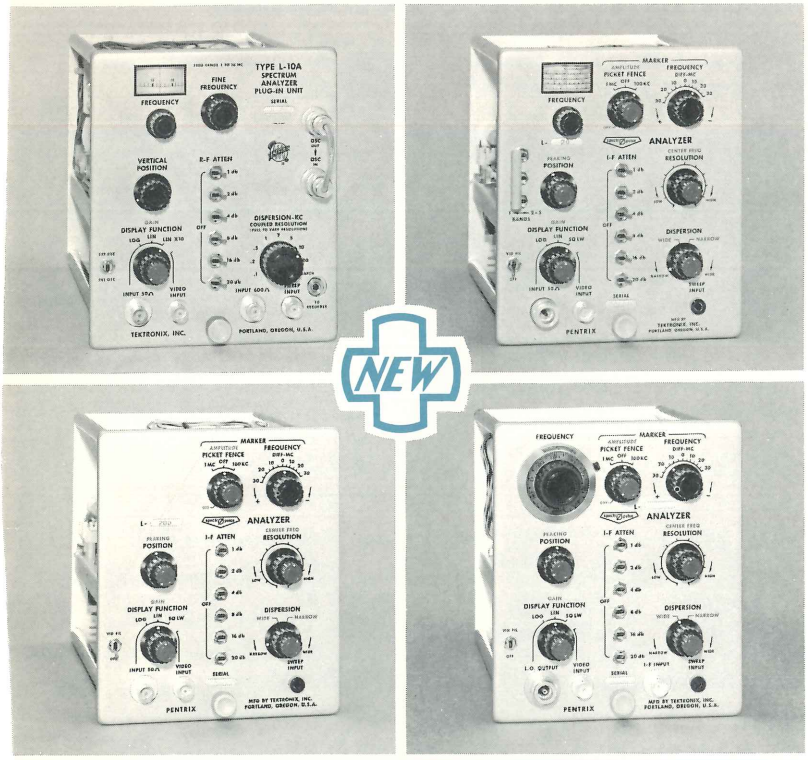
BATTERY POWERED TYPE 422

Same as standard version, but operates on ac, dc or battery power with internal charger. Uses rechargeable batteries capable of four hours continuous operation. Weight with batteries is less than 30 pounds. Measures 20 3/5" deep. TYPE 422, complete with batteries—~~$1775~~ • $1750

ON THE COVER

The Type 422 checking out the Tally Mark 45 Data Processing/Code Conversion System. Waveforms displayed are the perforator and reader coil drive-pulses. *Photo courtesy of Tally Corporation, Seattle, Washington.*

SPECTRUM ANALYZER UNITS FOR TEKTRONIX OSCILLOSCOPES



Eleven new Spectrum Analyzer Plug-In Units for extending the capabilities of Tektronix 530, 540, 550 and 580*-Series Oscilloscopes into the area of spectrum analysis. Simply plug the analyzer in and the oscilloscope is instantly converted to a frequency-based spectrum analyzer.

This plug-in unit/oscilloscope combination offers distinct advantages over ordinary spectrum analyzers. The oscilloscope's calibrated time base and versatile triggering allow direct measurement of pulse repetition rate and provide stable displays even in the presence of interference. Frequency or time-domain displays are available at the flick of a switch.

By placing all analyzer circuits in the plug-in unit, the oscilloscope main frame can serve two functions: it operates in its normal time-based mode using Letter-Series or 1-Series Plug-In Units (or using the analyzer's Video input), then instantly converts to spectrum analysis with any one of the eleven analyzer units.

The plug-in spectrum analyzer is the economical approach to spectrum analysis . . . no need to purchase and maintain an oscilloscope and a separate analyzer. For more information about these and other new plug-in analyzers, consult your Tektronix Field Office (or Distributor).

*Type 81 Adapter required.

	HIGH FREQUENCY GENERAL PURPOSE	FIXED FREQUENCY	MULTI-BAND GENERAL PURPOSE		NARROW BAND HIGH PERFORMANCE						
CHARACTERISTICS	L-10A	L-200	L-20	L-30	L-1927	L-2434	L-3042	L-3852	L-4862	L-3852/3	L-4862/3
FREQUENCY COVERAGE (Mc)	1-36	200 MC Fixed Center Frequency	10-4000	1000-10400	1950-2300 2350-2700 4100-5200	2400-3400 5000-6600	3000-4200 6200-8200	3800-5200 7800-10200	4800-6200 9800-12200	11800-15200	14800-18200
SENSITIVITY (dbm)	—100	—125	—110 to —90	—105 to —75	—105 —100*					—90**	
DISPERSION	100 cps to 20 kc Calibrated plus uncal. Search	(Narrow) (Wide)	15 kc to 5 Mc 100 kc to 60 Mc		Oscilloscope 5X Magnifier usable to 3 kc; up to 100X Magnifier on some oscilloscopes						
DISPLAY FLATNESS	± 1 db	± 3 db (over 60 Mc Dispersion)									
RESOLUTION BANDWIDTH	10 cps to 1 kc Coupled to Dispersion	1 kc to 100 kc, continuously variable									
INCIDENTAL FM	IF 5 cps LO 26-61 cycles	500 cps Max.	800 cps to 1800 cps at local oscillator fundamental								
SWEEP RATE (Provided by Oscilloscope)	As low as 0.02 cps (5 sec/cm) to beyond practical analyzer range, flexible triggering										
ATTENUATOR (1-db Step)	(RF) 51 db ± 0.1 db per db	(IF) 51 db ± 0.1 db per db									
IF GAIN CONTROL	60 db (Variable)	50 db (Variable)									
MARKERS	NA	Single or picket fence, continuously variable ± 30 Mc. Picket fence — 100 kc and 1 Mc spacing									
DISPLAY — Log	50 db	40 db	6-cm vertical display								
DISPLAY — Linear	26 db	26 db	6-cm vertical display								
DISPLAY — Square Law	NA	13 db	6-cm vertical display								
DISPLAY — Video	100 mv/cm (var.) 10 cps to oscilloscope vert. bandwidth. 50 Ω input resistance.	100 mv/cm (variable) 10 cps to oscilloscope vertical bandwidth. 100 Ω input resistance									
INSTRUMENT PRICE	L-10A $1200	L-200 $895	L-20 $1995	L-30 $1995	L-1927 $1595	L-2434 $1595	L-3042 $1595	L-3852 $1595	L-4862 $1595	L-3852/3 $2095	L-4862/3 $2095

*Second Harmonic
**Third Harmonic

U.S. Sales Prices f.o.b. Beaverton, Oregon

This reference section is designed to give you a quick indication of major features and characteristics of Tektronix Oscilloscopes and companion instruments.

Pictures and other features follow this reference section on pages indicated. For additional information, contact your nearest Tektronix Field Office.

TEKTRONIX OSCILLOSCOPES
(According to Passband Capabilities)

Oscilloscope	Vertical‡ Passband	Risetime	Calibrated Sensitivity	Vertical Signal Delay	Calibrated Sweep Delay	Calibrated Sweep Range	Magnifier Max. Calib. Sweep Rate	Accel. Potential	Price	Page
Type 661 Ⓐ	Equivalent to DC to 3500 MC	0.1 nsec	2 mv/cm to 200 mv/cm	No	through full time base	1 nsec/cm to 100 μsec/cm	2, 5, 10, 20, 50, 100X 10 psec/cm	3 kv	$1150†	20
Type 661 Ⓑ	Equivalent to DC to 1000 MC	0.35 nsec	2 mv/cm to 200 mv/cm	Yes	through full time base	1 nsec/cm to 100 μsec/cm	2, 5, 10, 20, 50, 100 X 10 psec/cm	3 kv	$1150†	20
Type 519	DC to 1000 MC	0.35 nsec	less than 10 v/cm	Yes	0 to 35 nsec	2 nsec/cm to 1 μsec/cm	None	24 kv	$3900	15
***Type 561A Ⓒ**	Equivalent to DC to 875 MC	0.4 nsec	2 mv/cm to 200 mv/cm	Yes	through 100 nsec	0.2 nsec/cm to 10 μsec/cm	10X 20 psec/cm	3.5 kv	$ 500†	18
***Type 564 Ⓒ Storage**		0.4 nsec	Same features as Type 561A (above) plus SPLIT-SCREEN STORAGE of signal information.						$ 950†	18
***Type 567 Ⓒ Readout**		0.4 nsec	Same features as Type 561A (above) plus DIGITAL READOUT of pulse risetime, pulse width, time differences (with Type 6R1A Digital Unit).						$ 700†	18
Type 581A Ⓓ	DC to 85 Mc	4 nsec	100 mv/cm to 50 v/cm	Yes	None	50 nsec/cm to 2 sec/cm	5X 10 nsec/cm	10 kv	$1425†	19
***Type 585A Ⓓ**		4 nsec	100 mv/cm to 50 v/cm	Yes	2 μsec to 10 sec	50 nsec/cm to 2 sec/cm	5X 10 nsec/cm	10 kv	$1725†	19
Type 517A High-Speed		7 nsec	>50 mv/cm at 24 kv	Yes	None	5 nsec/cm to 20 μsec/cm	None	12 kv or 24 kv	$3400	14
***Type 544 Ⓔ**	DC to 50 MC	7 nsec	50 mv/cm to 20 v/cm	Yes	None	0.1 μsec/cm to 5 sec/cm	2, 5, 10 20, 50, 100X 10 nsec/cm	10 kv	$1550†	17
***Type 546 Ⓔ**		7 nsec	50 mv/cm to 20 v/cm	Yes	0.1 μsec to 50 sec	0.1 μsec/cm to 5 sec/cm	2, 5, 10X 10 nsec/cm	10 kv	$1750†	17
***Type 547 Ⓔ Display-Switching**		7 nsec	50 mv/cm to 20 v/cm	Yes	0.1 μsec to 50 sec	0.1 μsec/cm to 5 sec/cm	2, 5, 10X 10 nsec/cm	10 kv	$1875†	17
***Type 647 Ⓕ Environ-mentalized**		7 nsec	10 mv/cm to 20 v/cm	Yes	1 μsec to 50 sec	0.1 μsec/cm to 5 sec/cm	10X 10 nsec/cm	14 kv	$1225†	19
***Type 541A Ⓖ**	DC to 33 MC	10.5 nsec	50 mv/cm to 20 v/cm	Yes	None	0.1 μsec/cm to 5 sec/cm	5X 20 nsec/cm	10 kv	$1225†	16
***Type 543B Ⓖ**		10.5 nsec	50 mv/cm to 20 v/cm	Yes	None	0.1 μsec/cm to 5 sec/cm	2, 5, 10, 20, 50, 100 X 20 nsec/cm	10 kv	$1300†	16
***Type 545B Ⓖ**		10.5 nsec	50 mv/cm to 20 v/cm	Yes	2 μsec to 10 sec	0.1 μsec/cm to 5 sec/cm	5X 20 nsec/cm	10 kv	$1550†	16
Type 555 Ⓗ Dual-Beam		10.5 nsec	50 mv/cm to 20 v/cm	Yes	0.1 μsec to 50 sec	0.1 μsec/cm to 5 sec/cm	5X 20 nsec/cm	10 kv	$2650†	17

‡ Frequency Specifications are at 3-db down.
† Price does not include Plug-In Units.
* Rack-Mount models are available.
Ⓐ When used with Types 4S2 and 5T1A Sampling Plug-In Units.
Ⓑ When used with Types 4S1 and 5T1A Sampling Plug-In Units.
Ⓒ When used with Types 3S76 and 3T77 Sampling Plug-In Units.
Ⓓ When used with Type 82 or 86 Plug-In Units. 10 mv/cm at dc to 80 Mc.
Ⓔ When used with Type 1A1 Plug-In Preamplifier. 5 mv/cm at dc to 28 Mc.
Ⓕ When used with Type 10A2 Amplifier and Type 11B2 Time Base Unit.
Ⓖ When used with Type 1A1 Plug-In Preamplifier. 5 mv/cm at dc to 23 Mc.
Ⓗ When used with Type 1A1 Plug-In Preamplifier. 5 mv/cm at dc to 23 Mc. Type 555 is designed for 2 Plug-In Preamplifiers.

Pictures and additional features on pages 13—23

TEKTRONIX OSCILLOSCOPES
(According to Passband Capabilities)

Oscilloscope	Vertical ‡ Passband	Risetime	Calibrated Sensitivity	Vertical Signal Delay	Calibrated Sweep Delay	Calibrated Sweep Range	Magnifier Max. Calib. Sweep Rate	Accel. Potential	Price	Page
Type 551 Ⓘ Dual-Beam	DC to 27 MC	13 nsec	50 mv/cm to 20 v/cm	Yes	None	0.1 μsec/cm to 5 sec/cm	5X 20 nsec/cm	10 kv	$1850†	17
Type 506 Ⓙ	DC to 23 MC	15 nsec	10 mv/cm to 10 v/cm	Yes	0.5 μsec to 10 sec	0.5 μsec/cm to 1 sec/cm	5X 0.1 μsec/cm	3.5 kv	$ 525†	14
***Type 515A**	DC to 15 MC	23 nsec	50 mv/cm to 20 v/cm	Yes	None	0.2 μsec/cm to 2 sec/cm	5X 40 nsec/cm	4 kv	$ 875	14
Type 516 Dual-Trace		23 nsec	50 mv/cm to 20 v/cm	Yes	None	0.2 μsec/cm to 2 sec/cm	5X 40 nsec/cm	4 kv	$1070	14
***Type 531 Ⓚ**		23 nsec	50 mv/cm to 20 v/cm	Yes	None	0.1 μsec/cm to 5 sec/cm	5X 20 nsec/cm	10 kv	$ 995†	16
***Type 533A Ⓚ**		23 nsec	50 mv/cm to 20 v/cm	Yes	None	0.1 μsec/cm to 5 sec/cm	2, 5, 10, 20, 50, 100 X 20 nsec/cm	10 kv	$1125†	16
***Type 535A Ⓚ**		23 nsec	50 mv/cm to 20 v/cm	Yes	2 μsec to 10 sec	0.1 μsec/cm to 5 sec/cm	5X 20 nsec/cm	10 kv	$1400†	16
Type 422 Dual-Trace Portable	DC to 15 Mc 5 cps to 5 Mc	23 nsec 70 nsec	10 mv/div to 20 v/div 1 mv/div	Yes	None	0.5 μsec/div to 0.5 sec/div	10X 50 nsec/div	6 kv	$1325	2
Type 536 Ⓛ X-Y Curve Tracer	DC to 11 MC	31 nsec	50 mv/div to 20 v/div	No	None	0.2 μsec/div to 2 sec/div	5X 40 nsec/div	4 kv	$1085†	16
***Type 317 Daylight 3" Portable**	DC to 10 MC	35 nsec	10 mv/div to 50 v/div	Yes	None	0.2 μsec/div to 2 sec/div	5X 40 nsec/div	9 kv	$ 875	13
***Type 561A Ⓜ**		35 nsec	10 mv/cm to 10 v/cm	Yes	0.5 μsec to 10 sec	0.5 μsec/cm to 1 sec/cm	5X 0.1 μsec/cm	3.5 kv	$ 500†	18
***Type 564 Ⓜ Storage**		Same features as Type 561A (above) plus SPLIT-SCREEN STORAGE of signal information.							$ 950†	18
***Type 565 Ⓝ Dual-Beam**		35 nsec	10 mv/cm to 10 v/cm	No	1 μsec to 50 sec	1 μsec/cm to 5 sec/cm	10X 0.1 μsec/cm	4 kv	$1400†	18
Type 321A Transistorized 3" Portable	DC to 6 MC	58 nsec	10 mv/div to 20 v/div	No	None	0.5 μsec/div to 0.5 sec/div	5X 0.1 μsec/div	4 kv	$ 900	13
Type 310A 3" Portable	DC to 4 MC	0.1 μsec 90 nsec	10 mv/div to 0.1 v/div 0.1 v/div to 50 v/div	No	None	0.5 μsec/div to 0.2 sec/div	5X 0.1 μsec/div	1.8 kv	$ 675	13
***Type 503 Differential and X-Y**	DC to 450 KC	0.75 μsec	1 mv/cm to 20 v/cm	No	None	1 μsec/cm to 5 sec/cm	2, 5, 10, 20, and 50X 0.1 μsec/cm	3 kv	$ 640	13
***Type 504**		0.75 μsec	5 mv/cm to 20 v/cm	No	None	1 μsec/cm to 0.5 sec/cm	None	3 kv	$ 540	13
***Type 502A Dual-Beam and X-Y**	DC to 50 KC increasing to DC to 1 MC		100 μv/cm to 20 v/cm	No	None	1 μsec/cm to 5 sec/cm	2, 5, 10, and 20X 1 μsec/cm	3 kv	$1050	13

‡ Frequency Specifications are at 3-db down.

† Price does not include Plug-In Units.

* Rack-Mount models are available.

Ⓘ When used with Type 1A1 Plug-In Preamplifier, 5 mv/cm at dc to 21 Mc. Type 551 is designed for 2 Plug-In Preamplifiers.

Ⓙ When used with Type 9A2 Plug-In Amplifier and Type 3B3 Plug-In Time Base.

Ⓚ When used with Type 1A1 Plug-In Preamplifier, 5 mv/cm at dc to 14 Mc.

Ⓛ When used with Type 1A1 Plug-In Preamplifier and Type T Plug-In Time Base.

Ⓜ When used with Type 3A6 Plug-In Amplifier and Type 3B3 Plug-In Time Base.

Ⓝ When used with Type 3A1 Plug-In Amplifier. Type 565 is designed for 2 Plug-In Amplifiers.

PLUG-IN UNIT TYPE		PRICE	CALIBRATED SENSITIVITY	* Type 531A General Purpose Oscilloscope	* Type 533A General Purpose Oscilloscope	* Type 535A Sweep Delay Oscilloscope	Type 536 X-Y Curve Tracer Oscilloscope	* Type 541A Fast-Rise Oscilloscope	* Type 543B Fast-Rise Oscilloscope	* Type 545B Sweep Delay Oscilloscope	* Type 544 Fast-Rise Oscilloscope
				RISETIME AND PASSBAND OF OSCILLOSCOPE AND PLUG-IN UNIT							
1A1	Wide-Band High-Gain Dual-Trace Unit	$600	≈500 μv/cm	35 nsec 2 cps to 10 Mc			44 nsec 2 cps to 8 Mc	25 nsec 2 cps to 14 Mc			
			5 mv/cm	25 nsec dc to 14 Mc			33 nsec dc to 10.5 Mc	15 nsec dc to 23 Mc			
			50 mv/cm to 20 v/cm	23 nsec dc to 15 Mc			31 nsec dc to 11 Mc	10.5 nsec dc to 33 Mc			
1A2	Wide-Band Dual-Trace Unit	$325	50 mv/cm to 20 v/cm	23 nsec dc to 15 Mc			31 nsec dc to 11 Mc	10.5 nsec dc to 33 Mc			
1S1	Sampling Unit	$1100	2 mv/cm to 200 mv/cm	350-psec risetime (corresponding to an equivalent frequency response of 1 Gc), equivalent sweep rates of 100 psec/cm to 50 μsec/cm, 50-Ω input.							
B	High-Gain Unit	$145	5 mv/cm to 20 mv/cm	35 nsec 2 cps to 10 Mc			40 nsec 2 cps to 9 Mc	30 nsec 2 cps to 12 Mc			
			50 mv/cm to 20 v/cm	25 nsec dc to 14 Mc			35 nsec dc to 10 Mc	18 nsec dc to 20 Mc			
C-A	Dual-Trace DC Unit	$260	50 mv/cm to 20 v/cm	26 nsec dc to 13.5 Mc			35 nsec dc to 10 Mc	15 nsec dc to 24 Mc			
D	High-Gain DC Differential	$170	1 mv/cm to 50 v/cm	0.18 μsec dc to 300 kc, increasing to 2 Mc							
E	Low-Level AC Differential	$190	50 μv/cm to 10 mv/cm	6 μsec 0.06 cps to 20 kc, increasing to 60 kc							
G	Wide-Band DC Differential	$190	50 mv/cm to 20 v/cm	25 nsec dc to 14 Mc			35 nsec dc to 10 Mc	18 nsec dc to 20 Mc			
H	Wide-Band High-Gain DC Unit	$185	5 mv/cm to 20 v/cm	31 nsec dc to 11 Mc			37 nsec dc to 9.5 Mc	23 nsec dc to 15 Mc			
K	Fast-Rise DC Unit	$145	50 mv/cm to 20 v/cm	23 nsec dc to 15 Mc			31 nsec dc to 11 Mc	12 nsec dc to 30 Mc			
L	Fast-Rise High-Gain Unit	$210	5 mv/cm to 2 v/cm	23 nsec 3 cps to 15 Mc			35 nsec 3 cps to 10 Mc	15 nsec 3 cps to 24 Mc			
			50 mv/cm to 20 v/cm	23 nsec dc to 15 Mc			31 nsec dc to 11 Mc	12 nsec dc to 30 Mc			
M	Four-Trace Unit	$525	20 mv/cm to 10 v/cm	25 nsec dc to 14 Mc			35 nsec dc to 10 Mc	17 nsec dc to 20 Mc			
O	Operational Amplifier Unit	$525	50 mv/cm to 20 v/cm	25 nsec dc to 14 Mc			35 nsec dc to 10 Mc	14 nsec dc to 25 Mc			
				Performs precise operations of integration, differentiation, function generation, and linear or nonlinear amplification.							
Q	Strain Gage Unit	$325	10 μstrain/div to 10,000 μstrain/div	60 μsec risetime, dc to 6 kc. Measures force, displacement, acceleration, strain . . . any mechanical quantity that can be converted to a change in resistance, capacitance, or inductance.							
R	Transistor Risetime Unit	$325	0.5 ma/cm to 100 ma/cm	Supplies 5-nsec risetime pulse, 400-ma collector supply, 100-ma bias supply, risetime and passband same as with K Unit.							
S	Semiconductor Diode-Recovery Unit	$260	50 mv/cm and 0.5 v/cm	1 to 20 ma forward current, 0 to 2 ma reverse current, risetime and passband same as with K Unit.							
T	Time-Base Generator Unit	$240		Generates 22 calibrated sweep rates from 0.2 μsec/div to 2 sec/div plus 5X magnifier. Triggering facilities include Manual, Automatic, H. F. Sync and Line, either ac or dc coupled.							
W	High-Gain Differential Comparator Unit	$575	1 mv/cm to 50 v/cm	50 nsec dc to 7 Mc			54 nsec dc to 6.5 Mc	44 nsec dc to 8 Mc			
				26 nsec dc to 13.5 Mc			34 nsec dc to 10.5 Mc	15 nsec dc to 23 Mc			
				Calibrated continuously variable (0 to ±1.1 v or 0 to ±11 v) dc comparison voltage. ±11,000 cm effective scale length at maximum sensitivity. 0.001% maximum resolution. 20,000 to 1 common mode rejection ratio at dc.							
Z	Differential-Comparator Unit	$525	50 mv/cm to 25 v/cm	35 nsec dc to 10 Mc			40 nsec dc to 9 Mc	27 nsec dc to 13 Mc			
				Vertical "magnification" up to 500 times. Calibrated continuously variable (0 to ± 100 v) dc comparison voltages. ± 2000 cm effective scale length. 0.005% maximum resolution. 40,000 to 1 common-mode rejection ratio.							

* Rack-Mount Models are available.

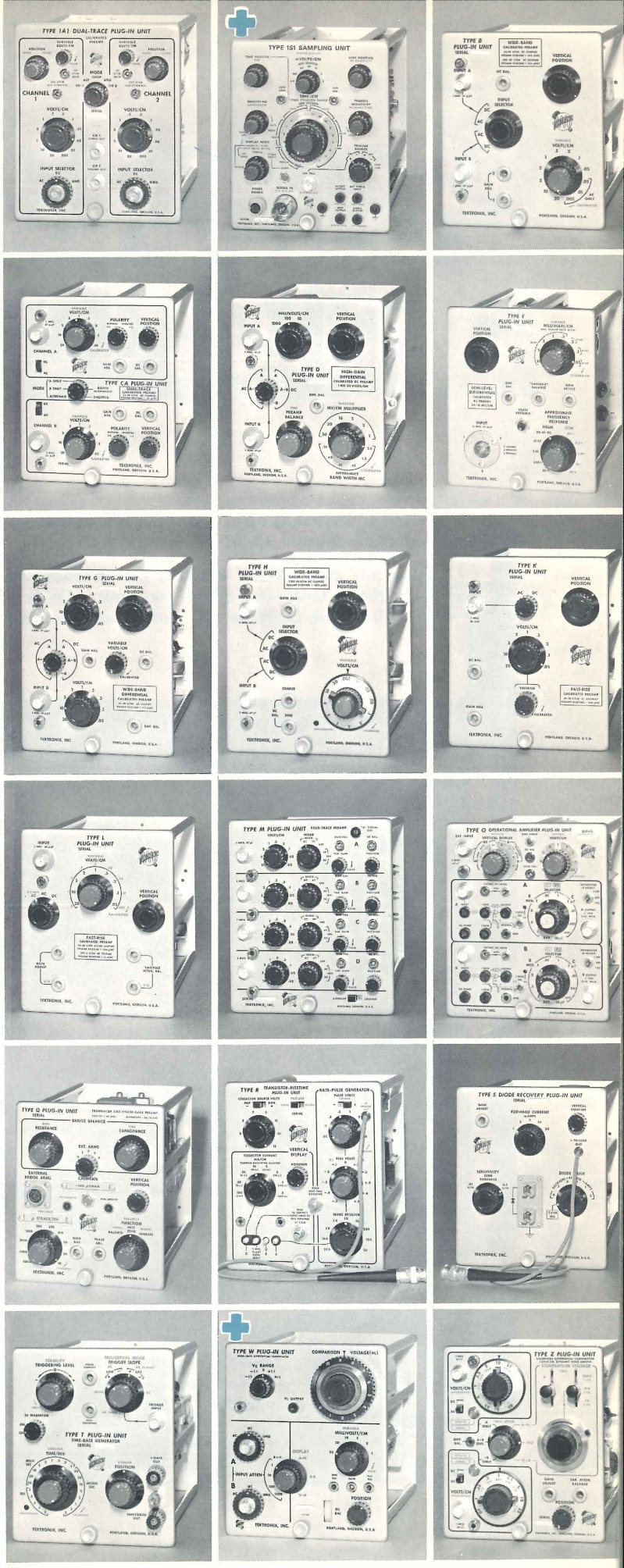
Pictures and additional features on pages 13—23

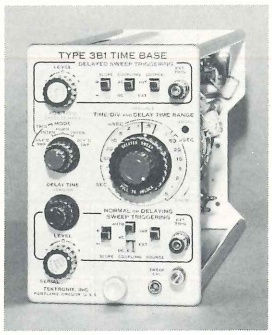
NEW

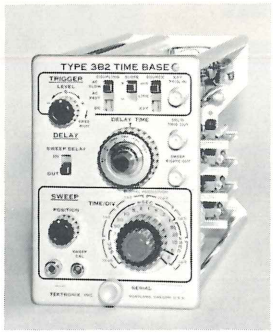
WITH '1' SERIES AND LETTER SERIES PLUG-IN PREAMPLIFIERS

* Type 546 Sweep Delay Oscilloscope	* Type 547 Display Switching Oscilloscope	Type 551 Dual-Beam Oscilloscope	Type 555 Dual-Beam Oscilloscope	† Type 581A Fast-Rise Oscilloscope	† * Type 585A Sweep Delay Oscilloscope
RISETIME AND PASSBAND OF OSCILLOSCOPE AND PLUG-IN UNIT					
23 nsec 2 cps to 15 Mc		26 nsec 2 cps to 13 Mc	25 nsec 2 cps to 14 Mc		
12.5 nsec dc to 28 Mc		16.5 nsec dc to 21 Mc	15 nsec dc to 23 Mc		
7 nsec dc to 50 Mc		13 nsec dc to 27 Mc	10.5 nsec dc to 33 Mc		
7 nsec dc to 50 Mc		13 nsec dc to 27 Mc	10.5 nsec dc to 33 Mc		
350-psec risetime (corresponding to an equivalent frequency response of 1 Gc), equivalent sweep rates of 100 psec/cm to 50 μsec/cm, 50-Ω input.					
		30 nsec 2 cps to 12 Mc	30 nsec 2 cps to 12 Mc		
		20 nsec dc to 18 Mc	18 nsec dc to 20 Mc		
		16 nsec dc to 22 Mc	15 nsec dc to 24 Mc		
0.18 μsec dc to 300 kc, increasing to 2 Mc					
6 μsec 0.06 cps to 20 kc, increasing to 60 kc					
		20 nsec dc to 18 Mc	18 nsec dc to 20 Mc		
		25 nsec dc to 14 Mc	23 nsec dc to 15 Mc		
		14 nsec dc to 25 Mc	12 nsec dc to 30 Mc		
		16 nsec 3 cps to 22 Mc	15 nsec 3 cps to 24 Mc		
		14 nsec dc to 25 Mc	12 nsec dc to 30 Mc		
		18 nsec dc to 19 Mc	17 nsec dc to 20 Mc		
		16 nsec dc to 22 Mc	14 nsec dc to 25 Mc		
Performs precise operations of integration, differentiation, function generation, and linear or nonlinear amplification.					
60 μsec risetime, dc to 6 kc. Measures force, displacement, acceleration, strain . . . any mechanical quantity that can be converted to a change in resistance, capacitance, or inductance.					
Supplies 5-nsec risetime pulse, 400-ma collector supply, 100-ma bias supply, risetime and passband same as with K Unit.					
1 to 20 ma forward current, 0 to 2 ma reverse current, risetime and passband same as with K Unit.					
Generates 22 calibrated sweep rates from 0.2 μsec/div to 2 sec/div plus 5X magnifier. Triggering facilities include Manual, Automatic, H. F. Sync and Line, either ac or dc coupled.					
		44 nsec dc to 8 Mc	44 nsec dc to 8 Mc		
		17 nsec dc to 20.5 Mc	15 nsec dc to 23 Mc		
Calibrated continuously variable (0 to ±1.1 v or 0 to ±11 v) dc comparison voltage. ±11,000 cm effective scale length at maximum sensitivity. 0.001% maximum resolution. 20,000 to 1 common mode rejection ratio at dc.					
Vertical "magnification" up to 500 times. Calibrated continuously variable (0 to ± 100 v) dc comparison voltages. ± 2000 cm effective scale length. 0.005% maximum resolution. 40,000 to 1 common-mode rejection ratio.					

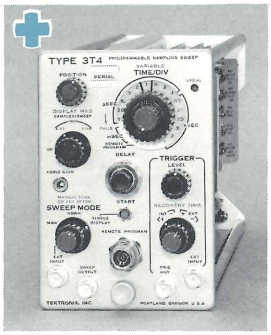
† Uses '1' Series and Letter-Series Plug-In Units with Type 81 Adapter.

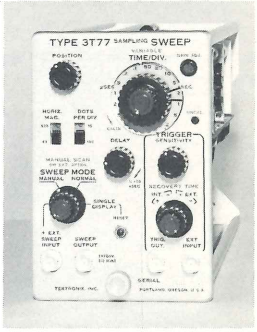






NEW





Type 561A, RM561A, 564, and RM564 Oscilloscopes use any of these Plug-In Units.

Type 567 and RM567 Readout Oscilloscopes use Digital and these units for digital readout. Other Amplifier and Time Base Units can be used without digital readout.

TIME-BASE UNITS

Plug-In Type	*Sweep Rate **	*Magnifier*	*Triggering*	*Price*
2B67 Single Sweep	1 μsec/cm to 5 sec/cm, 1-2-5 sequence.	5X	Internal, External, Line; amplitude-level selection; ac or dc-coupled; automatic or free run; ± slope.	$ 210
3B1 Sweep Delay	0.5 μsec/cm to 1 sec/cm, 1-2-5 sequence (for both normal and delayed sweeps).	5X	Internal, External; amplitude-level selection; ac or dc-coupled; automatic (normal sweep only) or free-run; ± slope.	$ 535
3B2 Calibrated Sweep Delay	2 μsec/cm to 1 sec/cm, 1-2-5 sequence. Continuously variable calibrated delay from 5 μsec to 10.5 sec.	No	Internal, External, Line; Amplitude-level selection; ac or dc coupled; ± slope.	$ 650
3B3 Calibrated Sweep Delay Single Sweep	0.5 μsec/cm to 1 sec/cm, 1-2-5 sequence (for both normal and delayed sweeps). Continuously variable calibrated delay from 0.5 μsec to 10 sec.	5X	Internal, External; amplitude-level selection, ac or dc coupled, ± slope. Normal sweep has in addition: automatic and line plus single sweep.	$ 585
3B4 Direct-Reading Magnifier Single Sweep	0.2 μsec/cm to 5 sec/cm, 1-2-5 sequence. Magnifier reads sweep rate directly up to 50 nsec/cm.	up to 50X	Internal, External, External ÷10, Line; amplitude level selection; ac, ac low-frequency reject or dc coupling; free-run, automatic, or normal modes; ± slope.	$ 400
3T4 Programmable Sampling Sweep (use with 3S3 or 3S76)	Equivalent sweep rates 1 nsec/cm to 200 μsec/cm, 1-2-5 sequence, Programmable through front-panel connector.	10X	Internal or External, ±slope.	$1300
3T77 Sampling Sweep (use with 3S3 or 3S76)	Equivalent sweep rates 0.2 nsec/cm to 10 μsec/cm, 1-2-5 sequence.	10X	Internal or External, ± slope.	$ 650

* Variable between steps, uncalibrated.

Type 561A, RM561A, 564, and RM564 Oscilloscopes use any of these Plug-In Units.

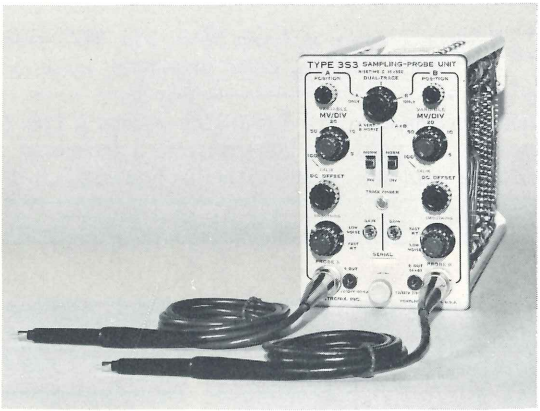
Type 565 and RM565 Oscilloscopes use Plug-In Units for vertical deflection only.

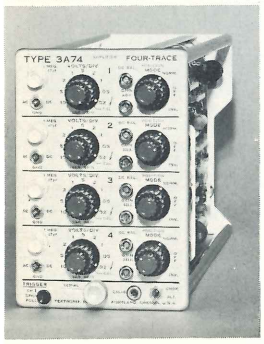
Type 567 and RM567 Readout Oscilloscopes use Digital and these units for digital readout. Other Amplifier and Time Base Units can be used without digital readout.

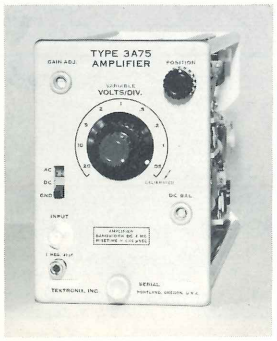
AMPLIFIER UNITS

Plug-In Type	Passband (3-db down)	Calibrated Sensitivity *	Input (ac or dc coupled)	Price
2A60	dc — 1 Mc.	50 mv/cm—50 v/cm in 4 steps.	1 megohm shunted by 47 pf, 600 volts max.	$ 105
2A61 Low-Level Differential	0.06 cps—300 kc	10 μv/cm—20 mv/cm, 1-2-5 sequence.	10 meg—50 pf; ±5 v (ac—coupled only)	$ 385
2A63 Differential 50:1 rejection ratio	dc — 300 kc.	1 mv/cm—20 v/cm, 1-2-5 sequence.	1 megohm shunted by 47 pf, 600 volts max.	$ 150
3A1 Dual-Trace (Identical Channels)	dc — 10 Mc.	10 mv/cm—20 v/cm, 1-2-5 sequence.		$ 450
3A2 Dual-Trace (Identical Channels)	dc—500 kc	10 mv/cm—10 v/cm, 1-2-5 sequence.		$ 500
3A3 Dual-Trace Differential	Selectable dc—5 kc or dc—500 kc	100 μv/cm—10 v/cm, 1-2-5 sequence.		$ 790
3A6 Dual-Trace (Identical Channels)	dc—10 Mc.	Identical to Type 3A1 above but with internal delay line.		$ 540
3A72 Dual-Trace (Identical Channels)	dc — 650 kc	10 mv/cm—20 v/cm, 1-2-5 sequence.		$ 275
3A74 Four-Trace (Identical Channels)	dc — 2 Mc.	20 mv/cm—10 v/cm, 1-2-5 sequence.		$ 590
3A75	dc — 4 Mc.	50 mv/cm—20 v/cm, 1-2-5 sequence.		$ 175
3C66 Strain Gage	dc—5 kc	10 μstrain/div—10,000 μstrain/div, 1-2-5 sequence.	120 Ω strain gage bridge	$ 400
3S3 Dual-Trace Sampling (Use with 3T77)	dc to equivalent 1 Gc. (0.35 nsec risetime)	5 mv/cm—100 mv/cm, 1-2-5 sequence.	100 k, 2 pf ±3 v max	$1500 (with probes)
3S76 Dual-Trace Sampling (use with 3T77)	dc to equivalent 875 Mc (0.4 nsec risetime)	2 mv/cm—200 mv/cm, 1-2-5 sequence.	50 Ω, 2 volts pk-to-pk. max. dc-coupled	$1100

*Variable between steps, uncalibrated.

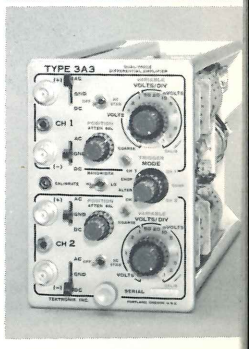






POWER SUPPLY

2-Series and 3-Series Plug-In Units can be operated separately from the oscilloscope in which they are normally used. See the Type 129 on page 21.



DIGITAL READOUT SYSTEMS

Digital plus analog displays are simultaneously presented on the Type 567 Oscilloscope and Type 6R1A Digital Unit. A Digital Readout System consists of a Type 567/6R1A and any of 5 combinations of vertical and horizontal Plug-In Units: Type 3S3/3T77, 3S76/3T77, 3A2/3B2, 3S3/3T4, or 3S76/3T4. Other 2-Series and 3-Series Plug-In Units can be used for normal crt display, but do not provide digital readout. See the Type 262 Programmer for these systems on page 18.

X & Y Plug-Ins	Risetime	Calibrated Sensitivity	Input Impedance	Calibrated Sweep Range	Sweep Delay	Digital Resolution	Trigger	System Price
3S3/3T77*	0.35 nsec	5 mv/cm to 100 mv/cm	100 k, 2 pf	equiv. 0.2 nsec/cm to 10 μsec/cm plus 10X magnifier	Through approx. 100 nsec	10 or 100 dots per cm	External	$5450 (includes 2 probes)
3S76/3T77*	0.4 nsec	2 mv/cm to 200 mv/cm	50 Ω				Internal or External	$5050
3A2/3B2	0.7 μsec	10 mv/cm to 10 v/cm	1 Meg, 47 pf	2 μsec/cm to 1 sec/cm	5 μsec to 10.5 sec	1 μsec to 10 msec clock rate in decades		$4450

***The Type 3T4** Programmable Sampling Sweep can be programmed through a front-panel connector. Programmable functions include sweep rates (1 nsec/cm to 200 μsec/cm), 3 calibrated sweep delay ranges (1 μsec to 1 msec), samples per sweep (100 or 1000), and single display for real-time measurements. Type 3T4 — $1300.

SAMPLING SYSTEMS FOR TYPE 560-SERIES OSCILLOSCOPES

Instrument	Input Impedance	Risetime	Calibrated Sensitivity	Signal Delay	Sweep Delay	Equivalent Sweep Time	Samples Per Centimeter	Trigger	System Price	Page
***Type 561A** with Types 3S76 and 3T77 Units	50 Ω	0.4 nsec	2-200 mv/cm 1-2-5 sequence	Yes	Through 100 nsec	0.2 nsec/cm to 10 μsec/cm plus 10X mag.	10 or 100	Internal or External	$2250	18
***Types 561A** with Types 3S3 and 3T77 Units	100 k, 2 pf	0.35 nsec	5-100 mv/cm 1-2-5 sequence	No				External	$2650 (with probes)	18
***Type 564** with Types 3S76 and 3T77 Units	50 Ω	0.4 nsec	Same features as Types 561A, 3S76, 3T77 (above) plus SPLIT-SCREEN STORAGE of signal information.						$2700	18
***Type 564** with Types 3S3 and 3T77 Units	100 k, 2 pf	0.35 nsec	Same features as Types 561A, 3S3, 3T77 (above) plus SPLIT-SCREEN STORAGE of signal information.						$3100 (with probes)	18
***Type 567** with Types 3S76, 3T77, and 6R1A Units	50 Ω	0.4 nsec	Same features as Types 561A, 3S76, 3T77 (above) plus DIGITAL READ-OUT of pulse risetime, pulse amplitude, pulse width, time differences.						$5050	18
***Type 567** with Types 3S3, 3T77, and 6R1A Units	100 k, 2 pf	0.35 nsec	Same features as Types 561A, 3S3, 3T77 (above) plus DIGITAL READOUT of pulse risetime, pulse amplitude, pulse width, time differences.						$5450 (with probes)	18

The Type 3T4 Programmable Sampling Sweep is similar to the Type 3T77 except it can be programmed through a front-panel connector. Programmable functions include sweep rate (1 nsec/cm to 200 μsec/cm), 3 calibrated sweep delay ranges (1 μsec to 1 msec), samples per sweep (100 or 1000), and single display for real-time measurements. Type 3T4 — $1300.

* Rack Mount models are available

SAMPLING SYSTEMS FOR TYPE 661 OSCILLOSCOPES

Plug-In	Input Impedance	Risetime	Calibrated Sensitivity	Signal Delay	Trigger	Price
4S2	50 Ω	0.1 nsec	2-200 mv/cm 1-2-5 sequence	No	External	$1600
4S1	50 Ω	0.35 nsec		Yes	Internal or External	$1430
4S3	100 k, 2 pf	0.35 nsec		No	External	$1600

Plug-In	Sweep Delay	Equivalent Sweep Time	Samples per Centimeter	Price
5T1A	Through full time base	1 nsec/cm to 100 μsec/cm plus magnifier	5, 10, 20, 50, 100 or 1000	$750
5T3*	Through 20 nsec	10 nsec/cm to 100 μsec/cm		$900

*Also real-time sampling from 0.2 nsec/cm to 5 sec/cm.

Pictures and additional features on pages 13—23

SAMPLING SYSTEM ACCESSORIES

Instrument	Description	Price	Page
Type 280 Trigger Countdown	Allows timing systems to be synced up to 5 Gc. Output repetition rate variable from 15 to 45 Mc.	$ 265	22
Type 290 Transistor Switching-Time Tester	Measures fast transistors, short duty cycle measurements of delay time, risetime, storage time, and fall time.	$ 290	22
Type 291 Diode Switching-Time Tester	Measures fast-switching diodes, forward and reverse recovery. Response better than 0.35 nsec.	$ 185	22
Type 292 Semiconductor Tester and Power Supply	Furnishes dc power and provides sub-nanosecond environments for reading out time and charge information about fast semiconductor diodes and transistors.	$325	22

CHARACTERISTIC-CURVE TRACERS

Instrument	Vertical Axis	Horizontal Axis	Variable Drive Parameters	Accel. Potential	A-B Comparison	Price	Page
Type 570 presents an accurate graphic analysis of electron-tube characteristics under almost any conceivable operating condition.	20 μa/div to 50 ma/div 1-2-5 sequence	1 v/div to 50 v/div 1-2-5 sequence	Plate, screen, or grid current vs. plate or grid voltage.	4 kv	Yes	$1100	19
Type 575 traces characteristic curves for both PNP and NPN transistors and diodes on the face of a crt.	1 μa/div to 2 a/div 10 mv/div to 0.5 v/div	10 mv/div to 20 v/div 10 mv/div to 0.5 v/div	Collector current & voltage, Base current & voltage.	4 kv	Yes	$1075	19

Instrument	Collector Supply	Base Supply	Calibrated Display	A-B Comparison	Price	Page
Type 175 adapts the Type 575 to measurement of high power (NPN and PNP) transistors and diodes. Specifications apply ONLY when used with Type 575 Curve Tracer.	0 to 20 v or 0 to 100 v, or 0 to 100 v with 300-Ω series load resistor.	± stepping, 4 to 12 steps per family, either repetitive or single family. 10 current positions—1 ma to 1 amp/step; 5 voltage positions — 0.02 to 0.5 v/step	Vertical Axis— Collector Current Horizontal Axis— Collector Voltage Base Voltage	Yes	$1475	19

HIGH-VOLTAGE SURGE-TEST OSCILLOSCOPES

Oscilloscope	Risetime	Calibrated Sensitivity	Signal Delay	Sweep Delay	Calibrated Sweep Range	Sweep Magnifier	Accel. Potential	Price	Page
Type 507	10 nsec	Approximately 50 v/cm to 500 v/cm	No	None	20 nsec/cm to 50 μsec/cm	None	24 kv	$2900	14

TELEVISION OSCILLOSCOPES

Instrument	Risetime	Calibrated Sensitivity	Signal Delay	Vertical Response	Calibrated Sweep Range	Sweep Magnifier	Accel. Potential	Price	Page
Type 524AD Oscilloscope	35 nsec	15 mv/cm to 50 v/cm	Yes	Normal, Flat, IRE	0.1 μsec/cm to 0.01 sec/cm	3 and 10X	4 kv	$1300	15
Type 525 Waveform Monitor		15 mv/cm with 1X, 2X, 5X step attenuator	No	Flat, Low-Pass, High-Pass, IRE	Field and Line Rates	5 and 25X	4 kv	$1140	15
Type 526 Vectorscope	Dual Channel displays, with either vector or linear-sweep presentation of demodulated chroma signal.						4 kv	$1665	15
***Type 527 Waveform Monitor**		0.25 v to 1.6 v for 7 cm	No	Flat, IRE	Field and Line Rates	5 and 25X	4 kv	$ 925	15
Type RM529 Waveform Monitor		120 mv to 1.5 v for 6 cm	No	Flat, IRE, Low-Pass, Chroma	0.25 H/cm, 0.125 H/cm, Field and Line Rates	5 and 25X	5.5 kv	$1100	15

* Rack Mount models are available

PULSE GENERATORS

Instrument	Frequency	Main Pulse Width	Risetime	Delay	Output Amplitude	Output Impedance	Trigger Req.	Price	Page
Type 109	275 to 700 cps	0.5 nsec to 300 nsec	<0.25 nsec	None	0 to 50 v	50 Ω	None	$360	20
Type 111	0 to 100 kc	2 nsec to 0.1 μsec	0.5 nsec	30 to 250 nsec	±5 v	50 Ω	+5 v	$365	20
Type 114	1 μsec to 10 msec	Square Wave and 100 nsec to 1 msec	≤10 nsec	None	±1 v to ±10 v	16—84 Ω	+2 v to +20 v	$350	20
† Type 161	0 to 50 kc	10 μsec to 0.1 sec	0.5 μsec	Variable	0 to ±50 v	1—5 kΩ	+3 v	$130	13
† Type 162	0 to 10 kc	100 μsec to 10 sec	1 μsec	None	50 v	1 kΩ	+15 v	$130	13
† Type 163	0 to 500 kc	1 μsec to 10 msec	0.2 μsec	Variable	0 to +25 v	100 Ω—3.5 kΩ	+2 v	$130	13

† Type 160A Power Supply provides power for up to 7 Type 161 or 162 Generators, 5 Type 163 Generators, or 5 Type 360 Indicators. $190

TIME-MARK GENERATORS

Instrument	Time-Mark Interval	Sine-Wave Frequency	Accuracy	Stability††	Price	Page
Type 180A	2 per decade from 1 μsec to 5 sec, separately or in timing combination.	5 Mc, 10 Mc or 50 Mc	within 0.001%	3 parts per million for 24 hr. period	$ 625	21
***Type 181**	1 per decade from 1 μsec to 10 msec.	10 Mc	about 0.03%	0.005% per hour	$ 265	21

* Rack-Mount models are available.

†† All outputs are derived from a 1 Mc crystal-controlled oscillator. Type 180A uses temperature-stabilized oven which is also available as accessory for the Type 181, or as MOD110 installed in the instrument. This provides stability of 3 parts per million.

CONSTANT AMPLITUDE SINE-WAVE GENERATOR

Instrument	Output Frequency	Output Amplitude	Harmonic Content	Output Impedance	Price	Page
Type 190B	Continuously variable from 350 kc to 50 Mc.	Continuously variable from 40 mv to 10 volts, pk-to-pk.	Typically less than 5%.	Nominally 25 Ω	$ 330	21

AMPLIFIERS

Instrument	Gain	Frequency Response‡	Noise Level	Differential Input	Input Impedance	Output Impedance	Price	Page
***Type 122**	100X or 1000X	0.2 cps to 40 kc	1-5 μv, rms, grounded	Yes	10 megohms, 50 pf.	1000 ohms	$ 135	21
Type 123	100X	3 cps to 25 kc	7.5 μv, rms, or less grounded	No	10 megohms	31 kilohms	$ 75	21
Type 1121	100X	5 cps to 17 Mc 21-nsec risetime	50 μv or less pk-to-pk, grounded	No	1 megohm, 22 pf.	93 ohms	$ 465	21

‡ Frequency Specifications are at 3-db down. * Rack-Mount models are available.

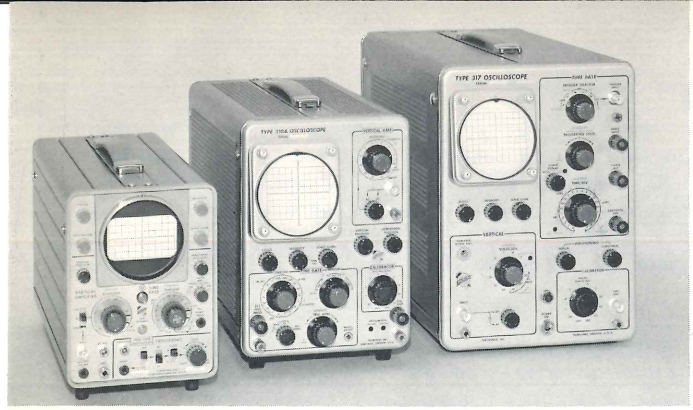
INDUCTANCE AND CAPACITANCE METER

Instrument	Ranges	Accuracy	Guard Voltage	Price	Page
Type 130	0 to 3, 10, 30, 100, 300 μh 0 to 3, 10, 30, 100, 300 μμf	within 3% of full scale	Permits measuring an unknown capacitance while eliminating effects of other capacitances.	$ 225	21

SQUARE-WAVE GENERATORS

Instrument	Risetime	Frequency Range	Output Voltage	Price	Page
Type 105	13 nsec	25 cps to 1 Mc	10 v to 100 v across the internal 600-Ω load	$ 435	20
Type 107	3 nsec	400 kc to 1 Mc	0.1 v to 0.5 v with 52-Ω termination	$ 190	20

Pictures and additional features on pages 13—23



TYPE 317 DC-to-10 MC DAYLIGHT PORTABLE

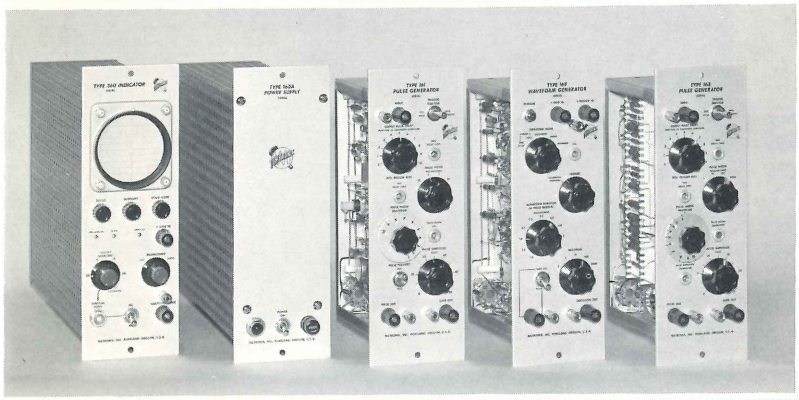
• BRILLIANT TRACE — 9-kv accelerating potential • ACCURATE — 3% time and amplitude • TRIGGER — internal, external, line . . . ac or dc-coupled . . . automatic or high-frequency sync • VIEWING AREA — 8 by 10 (1/4") divisions • AMPLITUDE CALIBRATOR • POWER SUPPLY — electronically regulated • RACK MODEL — mounts on slide-out tracks to 19" rack • TYPE 317 — $875 • TYPE RM17 — $950 •

TYPE 321A DC-to-6 MC TRANSISTORIZED PORTABLE

• VERSATILE — ac, dc or battery powered (with internal charger) • ACCURATE — 3% time and amplitude • VERTICAL SENSITIVITY — 0.01 to 20 v/div in 1, 2, 5, sequence • TRIGGER — internal or external . . . ac or dc-coupled and automatic • VIEWING AREA — 6 by 10 (1/4") divisions • POWER SUPPLY — electronically regulated from 11.5 to 35 v dc, 103.5 to 126.5 or 210 to 250 v rms, 50 to 800 cps • BATTERY OPERATION — 10 rechargeable NiCd cells provide approx. 5-hr. operation; order 10 (part no. 146-0005-00) at $7.00 each • TYPE 321A — $900 •

TYPE 310A DC-to-4 MC PORTABLE

• COMPACT — only 23 pounds • ACCURATE — 3% time and amplitude • VERSATILE — 50 to 800 cps operation • TRIGGER — internal, external, line . . . ac or dc-coupled and automatic • VIEWING AREA — 8 by 10 (1/4") divisions • AMPLITUDE CALIBRATOR • POWER SUPPLY — electronically regulated • TYPE 310A — $675 •



TYPE 360 INDICATOR

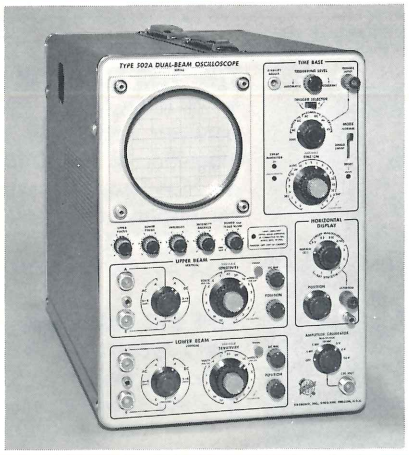
• COMPACT — contains horizontal and vertical amplifiers, calibrated vertical attenuator (50 mv/div to 50 v/div), and accelerating-voltage supply • VIEWING AREA — 8 by 10 (1/4") divisions • VERTICAL RESPONSE — dc to 500 kc • HORIZONTAL RESPONSE — dc to 100 kc • REQUIREMENTS — sweep, unblanking, and Type 160A Power Supply • TYPE 360 — $270 •

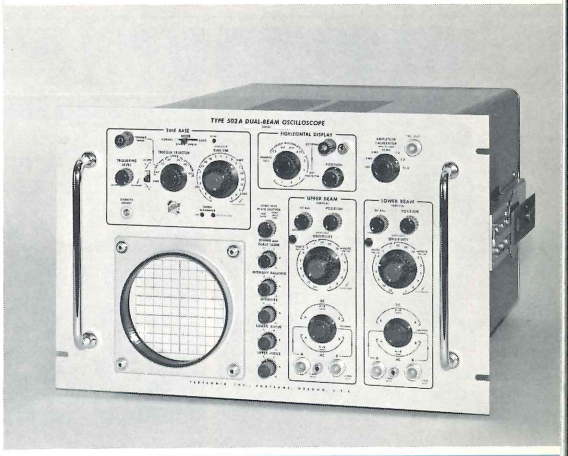
SEQUENCE CONTROL SYSTEM—160A, 161, 162, 163

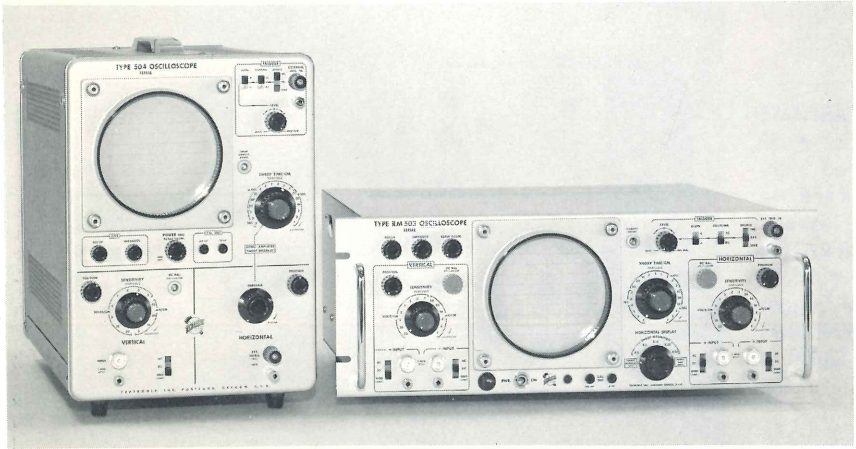
• GENERATES COMPLEX WAVEFORMS — accurate timed pulses of adjustable amplitude, duration, and repetition rate • APPLICATIONS — nerve stimulation, circuit testing, flaw detection, among others • See specifications on facing page •

TYPE 502A DUAL-BEAM OSCILLOSCOPE

• 100 μV/CM SENSITIVITY — differential or single-ended input •COMMON-MODE REJECTION — up to 40,000:1 • X-Y CURVE TRACING — 1 or both beams • TRIGGER — internal from either amplifier, external, (ac or dc coupled) or line; recurrent or automatic • VIEWING AREA — 8 by 10 cm per beam, 6-cm overlap • OTHER FEATURES — single sweep, amplitude calibrator, electronically regulated power supply • RACK-MOUNT MODEL, TYPE RM502A — mounts on slide-out tracks to 19" rack • TYPE 502A — $1050 • TYPE RM502A — $1150 •







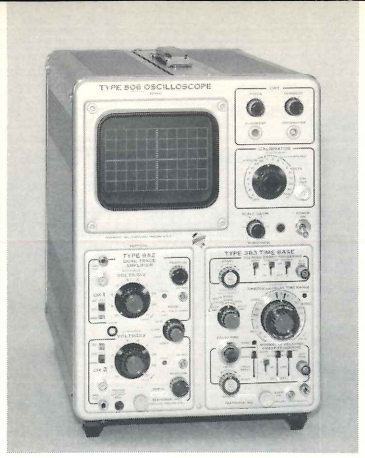
TYPE 503 DC-to-450 KC OSCILLOSCOPE

• DIFFERENTIAL OR SINGLE-ENDED INPUT — at all sensitivities to 1 mv/cm • X-Y CURVE TRACING — 2 identical amplifiers • TRIGGER — internal, external, line . . . ac or dc-coupled and automatic • VIEWING AREA — 8 by 10 cm • AMPLITUDE CALIBRATOR • POWER SUPPLY — electronically regulated • RACK MODEL — bolts to 19" rack • TYPE 503 — $640 • TYPE RM503 — $655 •

TYPE 504 DC-to-450 KC OSCILLOSCOPE

• SINGLE-ENDED INPUT — sensitivity to 5 mv/cm • TRIGGER — internal, external, line; ac or dc-coupled and automatic • VIEWING AREA — 8 by 10 cm • AMPLITUDE CALIBRATOR • POWER SUPPLY — electronically regulated • RACK MODEL — bolts to 19" rack • TYPE 504 — $540 • TYPE RM504 — $550 •

506
507
515A
516
517A



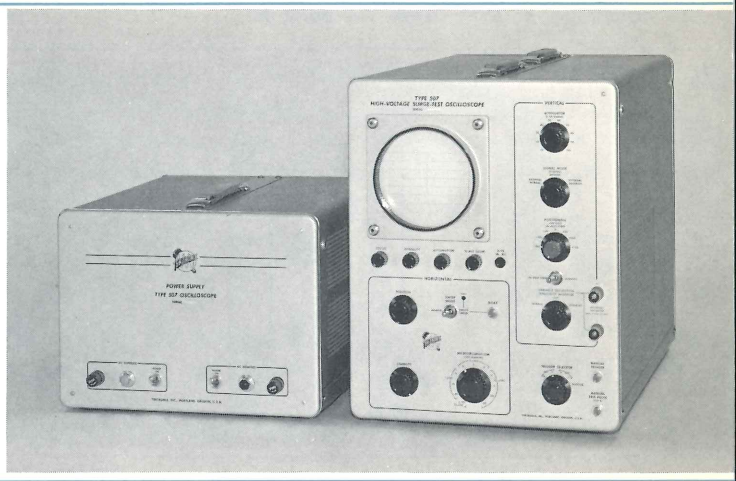
TYPE 506 DC-to-20 MC OSCILLOSCOPE
• WIDE-BAND PERFORMANCE — uses 9A-series vertical amplifier plug-in units offering wide-band dual-trace operation with vertical sensitivities to 10 mv/div • COMPACT — measures only 14½" high by 10" wide by 21⅛" deep • ACCURATE — parallax-free internal 6 x 10 centimeter graticule with variable edge lighting • VERSATILE — Z-axis input, 50 to 400 cps operation • STABLE — electronically-regulated power supply • OTHER FEATURES — new rectangular crt, 0.2 mv to 100 v amplitude calibrator • TYPE 506, less plug-in units — $525 •

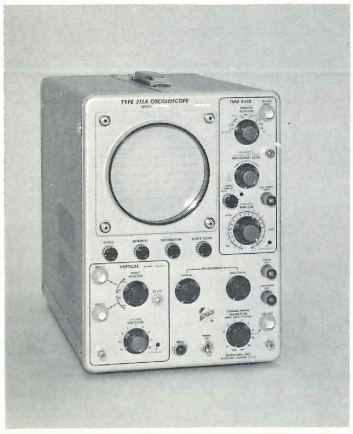
TYPE 9A2 DUAL-TRACE AMPLIFIER — 5 DISPLAY MODES — Channel 1 only, Channel 2 only, Dual-Trace, Chopped, and Added Algeb. • SIGNAL DELAY — delays the signal approx. 260 nsec for viewing the leading edge of the signal displayed • SENSITIVITY — 10 mv/div to 10 v/div, variable between steps • PASSBAND is dc-to-20 Mc • TYPE 9A2 — $550 •

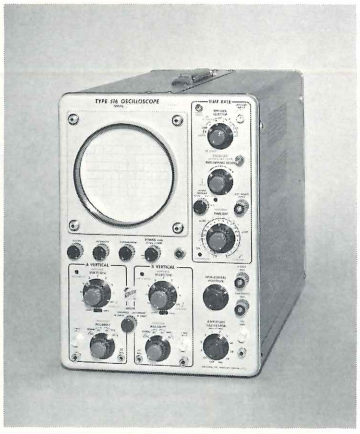
TYPE 9A1 DUAL-TRACE AMPLIFIER — same as Type 9A2 but without signal delay • PASSBAND is dc-to-23 Mc • TYPE 9A1 — $475 •

TYPE 3B3 AND 3B4 TIME-BASE UNITS — recommended for use with the Type 506 Oscilloscope. See page 8 for details.

TYPE 507 SURGE-TEST OSCILLOSCOPE
• DESIGN AND TEST — power transformers, high-voltage insulators, lightning arresters . . . • SINGLE-SWEEP APPLICATIONS — 24-kv accelerating potential • RISETIME — 10 nsec • CALIBRATED VERTICAL POSITIONING — 50 v steps from —150 v to +150 v • TRIGGER — internal, external, or manual • VIEWING AREA — 6 x 10 cm • POWER SUPPLY — separate, electronically regulated • TYPE 507 — $2900 •



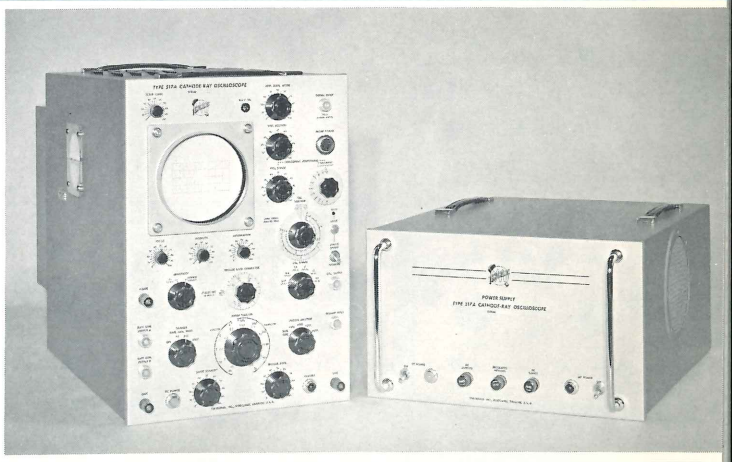




TYPE 515A DC-to-15 MC OSCILLOSCOPE
• *50 MV/CM to 20 V/CM CALIBRATED SENSITIVITY* — variable between steps • *40 NSEC/CM CALIBRATED SWEEP SPEED* — with 5X magnifier • *TRIGGER VERSATILITY* — internal, external, line . . . ac, dc, high-frequency sync, and automatic • *OTHER FEATURES* — 6 by 10-cm display, amplitude calibrator, electronically-regulated power supply • *RACK MODEL* — mounts on slide-out tracks to 19" rack • *TYPE 515A* — $875 • *TYPE RM15* — $950 •

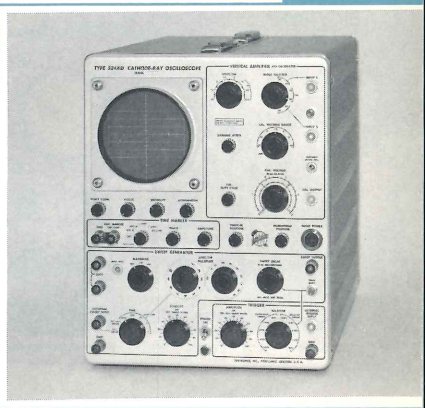
TYPE 516 DUAL-TRACE DC-to-15 MC OSCILLOSCOPE
TWO IDENTICAL VERTICAL INPUT CHANNELS — chopped or alternate switching plus A or B only • *OTHER FEATURES* — same as Type 515A plus AC low-frequency reject triggering • *TYPE 516* — $1070 •

TYPE 517A HIGH-SPEED OSCILLOSCOPE
• *OBSERVE* and *PHOTOGRAPH LOW DUTY CYCLE FAST-RISE WAVE-FORMS* — 7 nsec risetime, 24 kv accelerating potential • *50 MV/CM to 400 V/CM SENSITIVITY* (at 24 kv) — with supplied cathode follower probe • *5 NSEC/CM CALIBRATED SWEEP RATE* — extends to 20 μsec/cm • *SINGLE-SWEEP OPERATION* — lockout-reset circuitry for one-shot recording • *TRIGGER-RATE GENERATOR* — 15 cps to 15 kc, continuously variable, 0.15 μsec risetime • *TRIGGER SELECTION* — displayed waveform, external, or internal Trigger Generator • *VIEWING AREA* — 4 by 8 centimeters • *POWER SUPPLY* — separate, electronically regulated • *TYPE 517A* — $3400 •

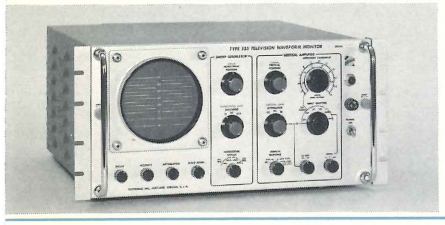


TYPE 519 DC-to-1 GIGACYCLE OSCILLOSCOPE
• *MEASURE AND RECORD SUB-NANOSECOND RISETIMES* — less than 0.35-nsec rise-time, 24-kv accelerating potential • *VERTICAL SENSITIVITY* — *less than 10 v/cm* • *2 NSEC/CM CALIBRATED SWEEP RATE* — extends to 1 μsec/cm • *SINGLE-SWEEP OPERATION* — lockout-reset circuitry for one-shot recording • *RATE GENERATOR* — 3 cps to 30 kc, continuously variable, less than 0.8 nsec risetime • *CALIBRATION-STEP GENERATOR* — drives device under test or checks sensitivity of Type 519 • *TRIGGER SELECTION* — displayed waveform, external waveform, Calibration-Step Generator, Rate Generator . . . high-frequency sync to over 1 gigacycle • *OTHER CHARACTERISTICS* — 2 by 6-cm display, electronically-regulated power supply • *TYPE 519* — $3900 •

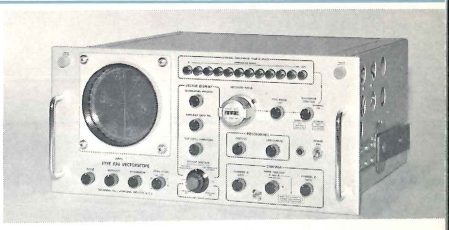
TELEVISION OSCILLOSCOPES



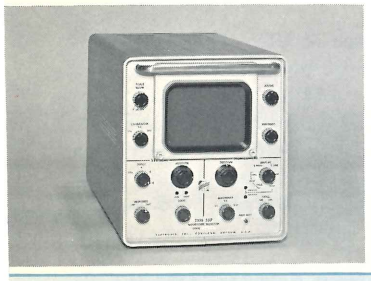
TYPE 524AD for maintenance of transmitter and studio equipment • 3 *RESPONSE CHARACTERISTICS* — Normal: dc to 10 Mc from 150 mv/cm to 50 v/cm, 2 cps to 10 Mc from 15 mv/cm to 50 v/cm, Flat: within 1% from 60 cps to 5 Mc, IRE: new standard #23S-1 • *RISETIME* — 35 nsec • *CONTINUOUSLY VARIABLE SWEEP RATE* — 0.1 μsec/cm to 10 msec/cm • *INTERNAL TIME MARKERS* — 50 nsec, 0.1 μsec 1.0 μsec, 40 or 200 pips per line • *SWEEP DELAY* — continuous from 0 to 25 msec • *AMPLITUDE CALIBRATOR* — variable duty cycle, 0 to 50 v • *TYPE 524AD* — $1300 •



TYPE 525 for display of composite video waveforms • *4 RESPONSE CHARACTERISTICS* — Flat: within 1% from 60 cps to 5 Mc, Low Pass: passes stair steps, High Pass: eliminates stair steps, IRE: new standard #23S-1 • *SENSITIVITY* — 15 mv/cm, 2 or 5X attenuation • *GAIN STABILITY* — within 1% • *FIELD and LINE SPEEDS* — automatic sync at sweep frequencies of 7875 and 30 cycles • *RACK MOUNTING* — withdraws on slide-out tracks from cabinet that mounts to 19" rack. • *TYPE 525* — $1140 •



TYPE 526 for measurement of phase and amplitude of NTSC color signal • *PHASE & SATURATION MEASUREMENTS* — ±1° and ±2% on graticule • *PHASE RESOLUTION* — 0.1° at 3.58 Mc • *DUAL DISPLAYS* — electronic switching between channels • *INTERFIELD SIGNAL KEY* — displays test signals during vertical blanking time • *BURST BRIGHTENING* — for positive identification of burst pulse • *RACK MOUNTING* — mounts on slide-out tracks to 19" rack • *TYPE 526* — $1665 •

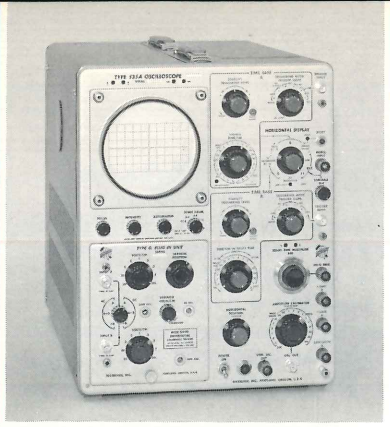


TYPE 527 for measurement of linearity, signal level, and bandwidth of black-and-white and color TV waveforms • 2 *RESPONSE CHARACTERISTICS* — Flat: within 1% from 60 cps to 5 Mc, IRE: new standard #23S-1 • *SENSITIVITY* — variable, 0.25 v to 1.6 v for 140 IRE units (7 cm) • *CALIBRATED SWEEP* — 0.125 H/cm, 0.025 H/cm, or 0.005 H/cm; no need for time-markers • *HORIZONTAL DISPLAY* — 2 line, 2 field, VIT, 0.125 H/cm, RGB line and RGB line and RGB field • *DC RESTORATION* — eliminates dc drift, base-line shift due to color burst • *VOLTAGE CALIBRATOR* — 0.174 v or 1.00 v, pk-to-pk • *COMPACT* — 2 Type 527's or RM527's mount in 10½" rack height, Type RM527 mounts on slide-out tracks to 19" rack • *TYPE 527* — $925 • *TYPE RM527* — $1000 •

N E W

TYPE RM529 for complete TV waveform analysis including VIT and sine-squared testing • TRANSISTORIZED — no fan for clean, quiet operation . . . power consumption is only 80 watts • 4 RESPONSE CHARACTERISTICS — Flat: within 1% from 60 cps (DC Restorer off) to 5 Mc, within 3% to 8 Mc. IRE: new standard #23S-1, —20 db down at 3.58 Mc. LOW PASS: 500 kc response, at least —12 db down. CHROMA: 3.58-Mc center frequency, 30% down at ±400 kc • SENSITIVITY — variable, 120 mv to 1.5 v with provision for 1 v full scale calibration (6 cm) • CALIBRATED SWEEP RATES — 0.250 H/cm or 0.125 H/cm, with sweep magnifier for X5 or X25 expansion; no need for time-markers • UNCALIBRATED SWEEP RATES — 2-Line or 2-Field displays • LINE SELECTOR — variable delay over entire field with output provision for intensifying the line or lines on an associated picture monitor • DC RESTORATION — front-panel switch for turning the circuit off for viewing signals other than video • FIELD SHIFT — positive acting field selection; random noise bursts will not shift the field • VOLTAGE CALIBRATOR — internally coupled, .714 v or 1.00 v full scale, 1% accuracy • COMPACT — fits in standard 19" rack or console, requiring only 5¼" of vertical rack space; mounts on slide-out tracks • TYPE RM529 — $1100 •

531A
533A
535A
536
541A
543B
545B

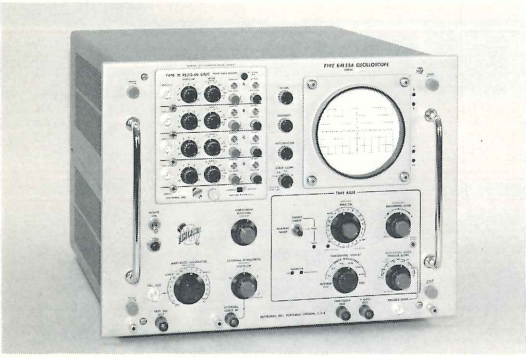


530-SERIES DC-to-15 MC OSCILLOSCOPES

TYPE 535A FEATURES — calibrated sweep delay, 2 μsec to 10 sec • *USES 19 MULTI-PURPOSE PLUG-IN UNITS* — for differential input, multi-trace, wide-band, operational amplifier, other applications • *SINGLE-SWEEP OPERATION* — lockout-reset circuitry for one-shot recording • *20 NSEC/CM CALIBRATED SWEEP SPEED* — with 5X magnifier • *TRIGGER VERSATILITY* — internal, external, line . . . ac, dc, low-frequency reject, high-frequency sync, and automatic • *OTHER CHARACTERISTICS* — 6 by 10-cm display, amplitude calibrator, electronically-regulated power supply • *TYPE 535A* — less plug-in units . . . $1400 •

• **TYPE 533A FEATURES** — sweep magnification to 100X • *OTHER CHARACTERISTICS* — similar to Type 535A, except no sweep delay • *TYPE 533A* — less plug-in units . . . $1125 •

• **TYPE 531A FEATURES** — same characteristics as Type 535A, except no sweep delay or single-sweep • *TYPE 531A* — less plug-in units . . . $995 •



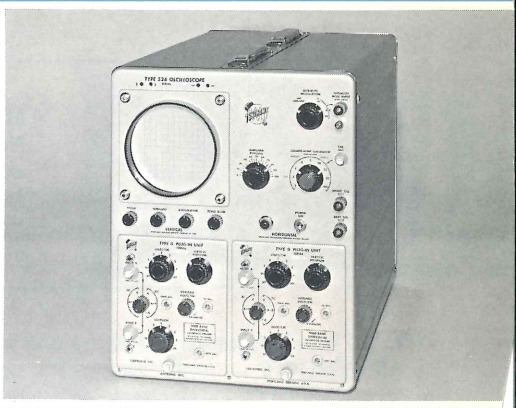
RACK-MOUNTING OSCILLOSCOPES

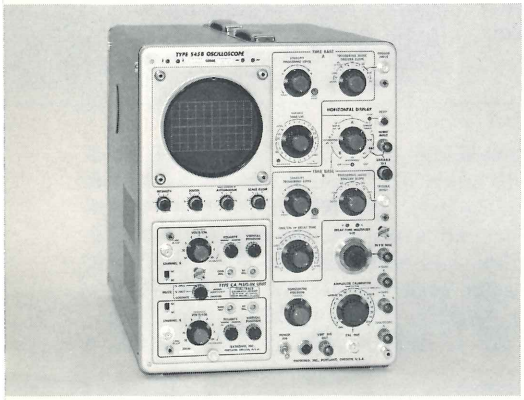
• *CONVENIENT MOUNTING* — chassis withdraws from cabinet on slideout tracks, can be tilted and locked in any of 7 positions • *PROVEN CIRCUITRY* — electrically identical to corresponding cabinet model.

- *TYPE RM31A* — less plug-in units . . . $1095
- *TYPE RM33A* — less plug-in units . . . $1225
- *TYPE RM35A* — less plug-in unts . . . $1500

TYPE 536 "X-Y" OSCILLOSCOPE

• *IDENTICAL HORIZONTAL AND VERTICAL DEFLECTION SYSTEMS* — with 2 identical plug-in units • *AMPLIFIER PHASE BALANCE TO OVER 25 MC* — with 2 identical wide-band units • *USES ANY OF 17 PLUG-IN UNITS* — for vertical and horizontal-deflection • *CONVENTIONAL OPERATION* — with Type T Time Base • *OTHER CHARACTERISTICS* — 10 by 10-div display, regulated power supply • *TYPE 536* — less plug-in units . . $1085 •



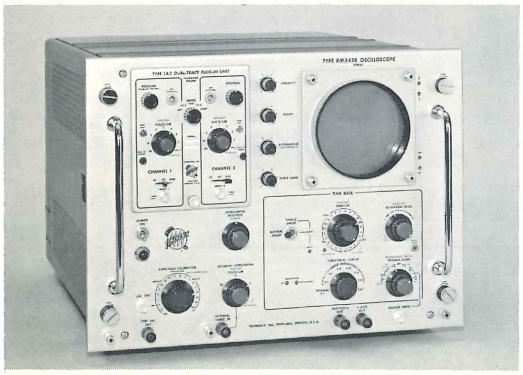


540-SERIES DC-to-33 MC OSCILLOSCOPES

TYPE 545B FEATURES — calibrated sweep delay, 1 μsec to 10 sec • USES 19 MULTI-PURPOSE PLUG-IN UNITS — for differential input, multi-trace, wide-band, operational amplifier, other applications • *SINGLE-SWEEP OPERATION* — lockout-reset circuitry for one-shot recording • *20 NSEC/CM CALIBRATED SWEEP SPEED* — with 5X magnifier • *TRIGGER VERSATILITY* — internal, external, line . . . ac, dc, low-frequency reject, and automatic • *OTHER CHARACTERISTICS* — internal graticule, 6 by 10-cm uniform focus display; amplitude calibrator, electronically-regulated power supply • *TYPE 545B* — less plug-in units . . . $1550 •

• **TYPE 543B FEATURES** — sweep magnification to 100X • *OTHER CHARACTERISTICS* — similar to Type 545B, except no sweep delay • *TYPE 543B* — less plug-in units . . . $1300 •

• **TYPE 541A FEATURES** — same characteristics as Type 531A but with 4 by 10-cm display and dc to 33 Mc passband • *TYPE 541A* — less plug-in units . . . . . $1225 •

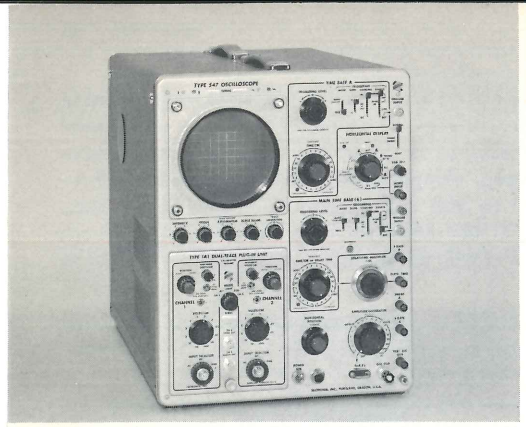


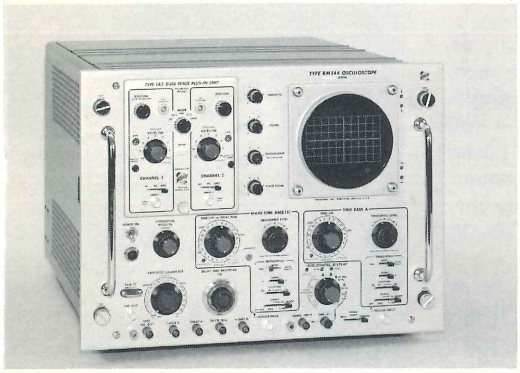
RACK-MOUNTING OSCILLOSCOPES

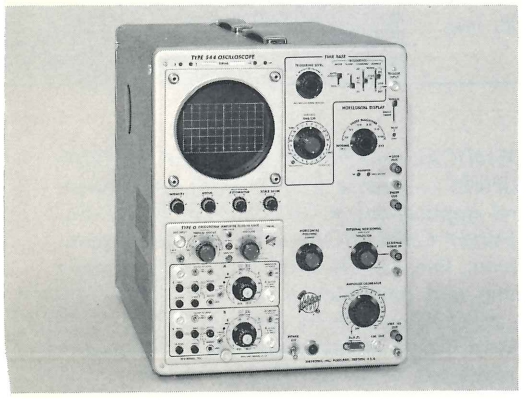
• *CONVENIENT MOUNTING* — chassis withdraws from cabinet on slideout tracks, can be tilted and locked in any of 7 positions • *PROVEN CIRCUITRY* — electrically identical to corresponding cabinet model.

- *TYPE RM41A* — less plug-in units . . . $1325
- *TYPE RM543B* — less plug-in units . . . $1400
- *TYPE RM545B* — less plug-in units . . . $1650

For instrument comparison, see reference section







TYPE 547 OSCILLOSCOPE — features AUTOMATIC DISPLAY SWITCHING — electronic switching between the 2 wide-range time bases in the Type 547 allows alternate presentation of the same signal at 2 different sweep rates. When a dual-trace plug-in unit is used, such as the Type 1A1 or 1A2, Channel 1 can be locked to Time Base A and Channel 2 can be locked to Time Base B. In many applications this provides the equivalent of 2 oscilloscopes, at a considerable savings in price.

When the 2 time bases are used for delayed-sweep operation, an easy-to-use, continuously-variable and calibrated delay is available from 0.1 μsec to 50 sec. Automatic Display Switching, used with the delayed sweep, allows an alternate presentation of a waveform brightened over a selected portion, and the selected portion expanded to fill 10 cm. • *DC-to-50 MC PASSBAND* — with Type 1A1 Dual-Trace Unit, dc-to-28 Mc at 5 mv/cm • *USE WITH PRESENT LETTER-SERIES VERTICAL PLUG-INS* — passband same as Letter-Series Plug-Ins used with Type 545B Oscilloscope, see chart on pages 6-7 • *UNIFORM-FOCUS 6 x 10 CM DISPLAY* — no-parallax internal graticule, variable illumination, small spot size • *IDENTICAL TIME BASES* — 0.1 μsec/cm to 5 sec/cm • *UP TO 10X SWEEP MAGNIFICATION* — extends calibrated sweep rate to 10 nsec/cm • *SINGLE-SWEEP OPERATION* — lockout-reset circuitry permits single-shot use of calibrated delay features • *TRIGGERING TO 50 MC* — independent controls for each time base, internal trigger can be picked off directly from Channel 1 of the Type 1A1, bright reference trace regardless of sweep rate • *TYPE 547*, less plug-in units, with two 10X probes — $1875 •

• **TYPE 546 OSCILLOSCOPE** — 2 time bases for calibrated sweep delay, all features of the Type 547 except Automatic Display Switching and associated circuitry • *TYPE 546*, less plug-in units, with two 10X probes — $1750 •

• **TYPE 544 OSCILLOSCOPE** — same vertical characteristics as the Type 546 and 547, but 1 time base (0.1 μsec/cm to 5 sec/cm) featuring 2, 5, 10, 50 and 100X sweep magnification • *TYPE 544*, less plug-in units, with two 10X probes — $1550 •

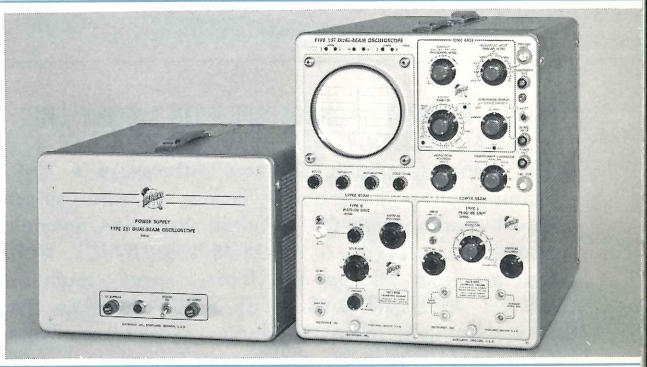
RACK-MOUNTING OSCILLOSCOPES

• *CONVENIENT MOUNTING* — chassis withdraws from cabinet on slideout tracks, can be tilted and locked in any of 7 positions • *PROVEN CIRCUITRY* — electrically identical to corresponding cabinet model.

- *TYPE RM544* — less plug-in units . . . $1650
- *TYPE RM546* — less plug-in unit . . . $1850
- *TYPE RM547* — less plug-in units . . . $1975

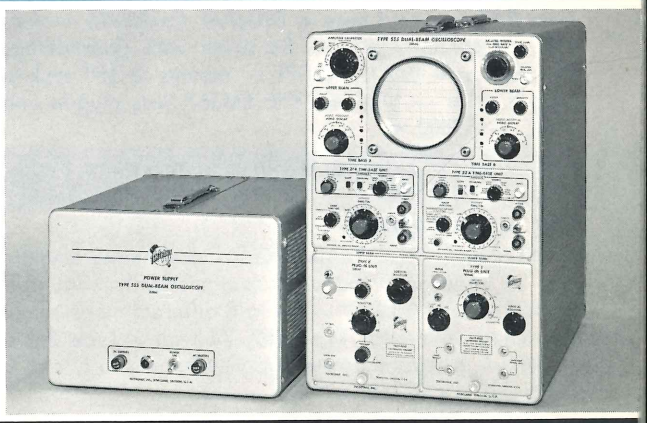
TYPE 551 DUAL-BEAM OSCILLOSCOPE

• *COMMON X, INDEPENDENT Y DEFLECTION* — upper and lower beam use any of 19 plug-in units for differential input, multi-trace, wide-band, operational amplifier, other applications • DC-to-27 MC — with Type 1A1 or 1A2 Plug-In Unit • *SINGLE-SWEEP OPERATION* — lockout-reset circuitry for one-shot recording • *20 NSEC/CM CALIBRATED SWEEP SPEED* — with 5X magnifier • *TRIGGER VERSATILITY* — internal from lower or upper beam, external, line . . . ac, dc, low-frequency reject, high-frequency sync, and automatic • *OTHER CHARACTERISTICS* — 4 by 10-cm display with 2-cm vertical overlap (each beam), 6-cm total vertical scan, amplitude calibrator, separate electronically-regulated power supply • *TYPE 551* — less plug-in units . . . $1850 •



TYPE 555 DUAL-BEAM SWEEP DELAY OSCILLOSCOPE

• *2 INDEPENDENT VERTICAL DEFLECTION SYSTEMS* — upper and lower beams use any of 19 plug-in units for differential input, multi-trace, wide-band, operational amplifier, other applications • *DC-to-33 MC* — with Type 1A1 or 1A2 Plug-In Unit • *2 INDEPENDENT PLUG-IN TIME BASES* — deflect either or both beams with either time base • *CALIBRATED SWEEP DELAY* — 0.1 μsec to 50 sec • *SINGLE-SWEEP OPERATION* — lockout-reset circuitry for one-shot recording • *20 NSEC/CM CALIBRATED SWEEP SPEED* — with 5X magnifier • *TRIGGER VERSATILITY* — internal from lower or upper beam, external, line . . . ac or dc coupled and automatic • *OTHER CHARACTERISTICS* — 4 by 10-cm display with 2-cm overlap (each beam), 6-cm total vertical scan; no-parallax internal graticule, amplitude calibrator, separate electronically-regulated power supply • *TYPE 555* — with plug-in time bases, without plug-in preamplifiers . . . $2650 •



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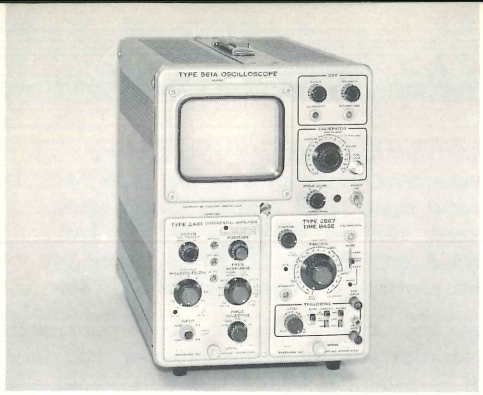


TYPE 561A OSCILLOSCOPE

• *ACCURATE* — parallax-free internal 8 by 10 centimeter graticule with variable edge lighting • *ADAPTABLE* — accepts any of 13 amplifier units for differential input, multi-trace, wide-band, high-sensitivity, or sampling applications; 7 time-base units for single shot, delaying sweep, sampling applications • *VERSATILE* — multiple X-Y displays, Z-axis input, 50 to 400 cps operation • *STABLE* — electronically-regulated power supply • *OTHER FEATURES* — new rectangular crt, 0.2 mv to 100 v amplitude calibrator • *TYPE 561A*, less plug-in units — $500 •

TYPE RM561A OSCILLOSCOPE

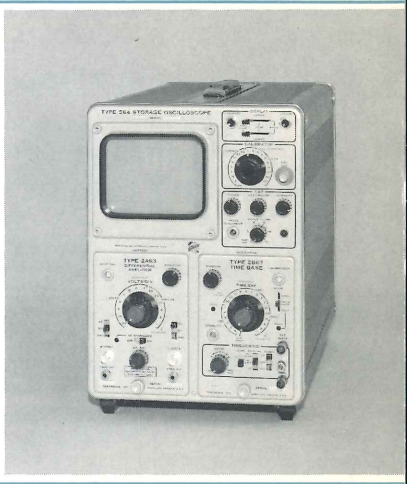
• *COMPACT* — only 7" high • *FEATURES* — same as Type 561A except 1 mv to 100 v calibrator; 50 to 60 cps operation • *MOUNTING* — bolts to 19" rack (slide-out tracks available) • *TYPE RM561A*, less plug-in units — $550 •

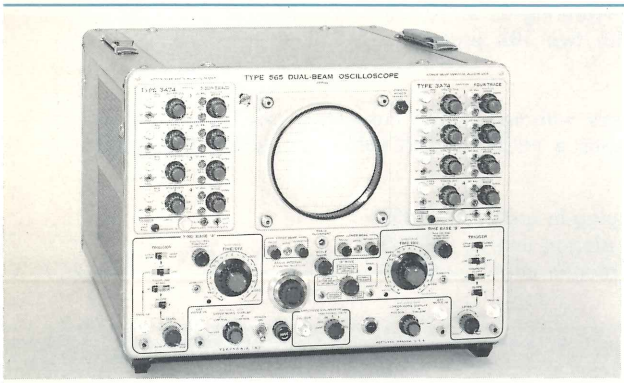
TYPE 564 GENERAL-PURPOSE OSCILLOSCOPE

• *SPLIT-SCREEN DISPLAYS* — non-storage or bi-stable storage on either or both halves of crt, selective erase • *SIMPLE OPERATION* — separate controls for upper and lower halves of crt, monitor vertical positioning without storing • *ENHANCED WRITING FEATURE* — 25 cm/msec single-shot writing speed (10X faster with full-screen enhancement) • *OTHER STORAGE FEATURES* — fast 250-msec erase, up to 1-hour storage • *SPECIAL CRT* — Mod 08 incorporates a special crt (lower brightness) with single-shot writing speed of 100 cm/msec (5X faster with full-screen enhancement) • *VERSATILITY* — electrical performance identical to Type 561A (except crt), uses any of twenty 2-Series and 3-Series Plug-In Units • *TYPE 564*, less plug-in units — $950 • *TYPE 564 MOD 08*, less plug-in units — $950 •

TYPE RM564 GENERAL-PURPOSE STORAGE OSCILLOSCOPE

• *REMOVE ERASE* — jack at rear for erase of upper and lower halves of crt • *OTHER FEATURES* — writing enhancement and other characteristics identical to the Type 564, except 1 mv to 100 v calibrator, 50 to 60 cps operation • *COMPACT* — requires only 7" panel height, bolts to 19" rack (slide-out tracks available) • *TYPE RM564*, less plug-in units — $1035 • *TYPE RM564 MOD 08*, less plug-in units — $1035 •



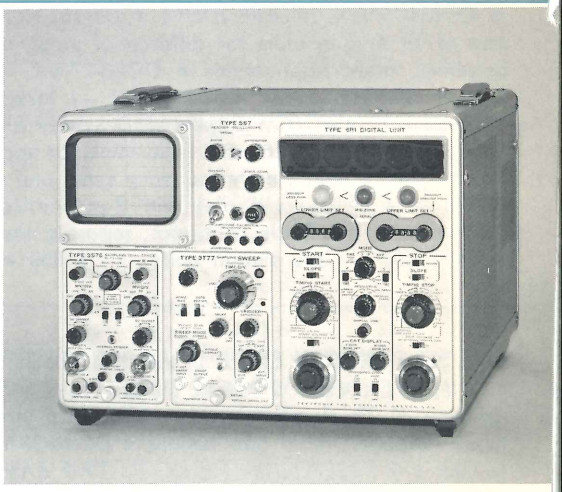


TYPE 565 DUAL-BEAM OSCILLOSCOPE

• *2 INDEPENDENT BEAMS* • *2 IDENTICAL INDEPENDENT SWEEP SYSTEMS* • *USES 2 PLUG-IN VERTICAL AMPLIFIERS* — choose from 11 units for differential input, multi-trace, and wide-band applications • *CALIBRATED SWEEP DELAY* — 1 μsec to 50 sec • *SINGLE SWEEP OPERATION* — for one-shot recording • *TRIGGERING* — internal, external, line; ac fast, or dc-coupled; automatic triggering • *3% ACCURACY* — time and amplitude • *VIEWING AREA* — 10 by 10 cm, 6-cm vertical overlap; no-parallax internal graticule • *OUTPUTS* — vertical horizontal, + gate, delayed trigger • *AMPLITUDE CALIBRATOR* • *POWER SUPPLY* — electronically regulated • *RACK MODEL* — mounts on slide-out tracks to 19" rack • *TYPE 565*, less plug-in units — $1400 • *TYPE RM565*, less plug-in units — $1500 •

TYPE 567 READOUT OSCILLOSCOPE/6R1A DIGITAL UNIT

• *DIGITAL READOUT PLUS ANALOG DISPLAYS* — direct readout on the 6R1A Unit of pulse risetimes, amplitudes, time differences • *LIMIT COMPARATORS* — front-panel indicators for readings above, below, or within selected limits • *ACCURATE READOUT* —direct reading with up to 4-digit resolution minimizes operator error, speeds up measuring time • *LOW & MEDIUM-FREQUENCY APPLICATIONS* — 3A2/3B2 for time difference from 20 μsec to 10 sec, 1-μsec resolution, 10 mv amplitude • *HIGH-FREQUENCY APPLICATIONS* — 3S76/3T77 for time differences from 20 psec to 100 μsec, 0.4-nsec risetime, pulse amplitudes as small as 2 mv, pk-pk • *LOW-NOISE APPLICATIONS* — 3S3/3T77 for direct sampling at probe, 100 k/2 pf input, selectable risetime from 0.35 nsec to 1 nsec • *DIGITAL OUTPUTS* — for printers, summary punches, etc. • *CRT VIEWING AREA* — 8 x 10 cm with parallax-free internal graticule, edge lighted illumination • *RACK MODEL* — mounts to 19" rack on slide-out tracks • *TYPE 567*, less plug-in units — $700 • *TYPE RM567*, less plug-in units — $800 • *TYPE 6R1A DIGITAL UNIT* — $2600 •

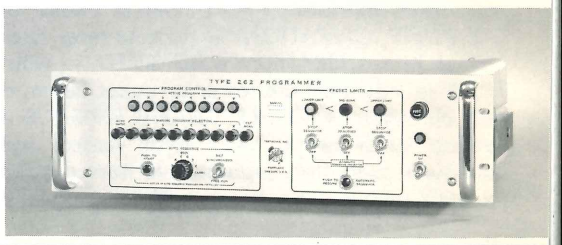


NEW

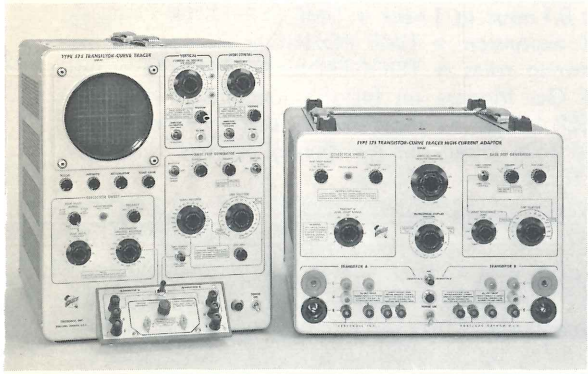
TYPE 3T4 SAMPLING SWEEP UNIT — similar to the Type 3T77 but externally programmable. See page 10 for details.

TYPE 262 PROGRAMMER

• *EXTERNAL PROGRAMMING* — any measurement possible with the Type 567/6R1A can be sequenced manually (automatically with option) from the 262 or remotely • *PROGRAM FLEXIBILITY* — up to 8 different measurement programs (with adjustable readout limits) with each Type 262, 24 with 3 Type 262's • *CONTROL EXTERNAL EQUIPMENT* — program power supplies, generators, etc. concurrently with test programs • *TYPE 262* — $1350 •



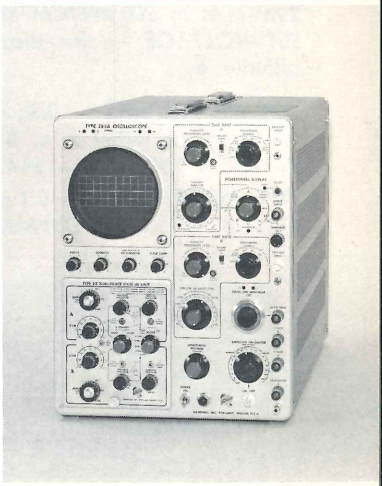
TYPE 570 ELECTRON-TUBE CURVE-TRACER
• *PLOTS TUBE CHARACTERISTICS* — simulates operating conditions • *CALIBRATED VERTICAL DISPLAYS* — plate, screen, or grid current; 20 μa/div to 50 ma/div in 11 steps • *CALIBRATED HORIZONTAL DISPLAYS* — plate or grid voltage; 0.1 v/div to 50 v/div in 9 steps • *OTHER VARIABLES* — 11 series load resistors from 300 Ω to 1 megohm, 7 grid-step values from 0.1 v/step to 10 v/step • *VOLTMETER* — monitors all dc voltages and ac heater supply • *DISPLAYS FAMILY OF CURVES* — 4 to 12 characteristic curves per family • *TYPE 570* — $1100 •

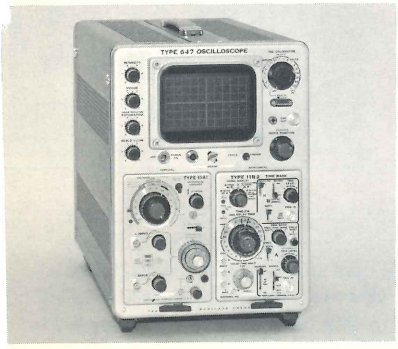


TYPE 575 TRANSISTOR-CURVE TRACER
• *PLOTS PNP, NPN, AND DIODE CURVES* — simulates operating conditions • *CALIBRATED VERTICAL DISPLAYS* — collector or base current, base or base source voltage • *CALIBRATED HORIZONTAL DISPLAYS* — base current, collector, base or base source voltage • *20-AMPERE COLLECTOR DISPLAYS* — ± collector sweep, 0 to 20 v, 10 amp; 0 to 200 v, 1 amp • ± *BASE STEPPING* — 4 to 12 steps/family, repetitive or single family display, 2.4-ampere base supply • *TYPE 575* — $1075 •

TYPE 175 HIGH-CURRENT ADAPTER *(For use with TYPE 575 only)*
• *200-AMPERE COLLECTOR DISPLAY* — 12-ampere base supply • ± *COLLECTOR SWEEP* — 0 to 20 v, 0 to 100 v, or 0 to 100 v with 300-Ω series load resistor • ± *BASE STEPPING* — 4 to 12 steps/family, repetitive or single family display • *CALIBRATED DISPLAYS* — collector current (vertical), collector or base voltage (horizontal) • *TYPE 175* — $1475 •

580A SERIES FAST-RISE OSCILLOSCOPES
• **TYPE 585A FEATURES** — tunnel diode triggering to beyond 150 Mc, synchronization to 250 Mc • *CALIBRATED SWEEP DELAY* — continuously variable from 2 μsec to 10 sec • *10 NSEC/CM SWEEP RATE* — for recording fast transients • *SINGLE-SWEEP OPERATION* — lockout-reset circuitry for one-shot recording • *HIGH RESOLUTION* — small spot size, P31 phosphor • *VIEWING AREA* — 4 x 8 cm with internal graticule for parallax-free viewing • *VERSATILITY* — 2 fast-rise vertical plug-ins, 18 other multi-purpose plug-ins (with Type 81 Adapter) • *RACK MODEL* — withdraws on slideout tracks from cabinet that mounts in 19″ rack • *TYPE 585A*, less plug-in units — $1725 • *TYPE RM585A*, less plug-in units — $1825 •
• **TYPE 581A** — as above, but without delayed-sweep • *TYPE 581A*, less plug-in units — $1425 •
• **TYPE 82 DUAL-TRACE PLUG-IN UNIT** — approx. 4-nsec rise time at 100 mv/cm; approx. 4.3 nsec at 10 mv/cm • *CALIBRATED STEP ATTENUATION* — 10 mv/cm to 50 v/cm; variable to 100 v/cm • *CHOPPED OR ALTERNATE SWITCHING* — plus A or B only • *10X PASSIVE PROBES* — small size, 4.5-nsec total risetime at 100 mv/cm • *TYPE 82* — $650 •
• **TYPE 86 PLUG-IN UNIT** — same as Type 82, except single channel — $350 •
• **TYPE 81 ADAPTER** — use with Letter-Series Plug-Ins — $135 •





TYPE 647 SOLID-STATE OSCILLOSCOPE
• HIGH PERFORMANCE — designed for accurate measurements under extreme operating conditions • PASSBAND — dc to 50 Mc with Type 10A2 Dual-Trace Unit • ENVIRONMENTAL CAPABILITIES — operates at temperatures from −30° C to +65° C; operates to 15,000 feet. Rugged construction assures reliable operation in applications involving vibration or shock •BRIGHT 6 x 10 CM DISPLAY — no parallax internal graticule, variable illumination • CRYSTAL-CONTROLLED CALIBRATOR — 1-kc square wave, 0.2 mv to 100 v, plus current probe calibration loop • REGULATED POWER SUPPLY — operates on 100 to 130 v ac or 200 to 260 v ac line, 45 to 440 cps • CONVECTION COOLING — no fan needed (cabinet model only) • RACK MODEL — similar to cabinet version but operates on 50-60 cycle line, utilizes fan for cooling. Mounts in standard 19″ rack. A modified version is available for 50 through 400 cycle operation • TYPE 647, less plug-in units and probes — $1225 • STANDARD TYPE RM647, less plug-in units and probes — $1425 •

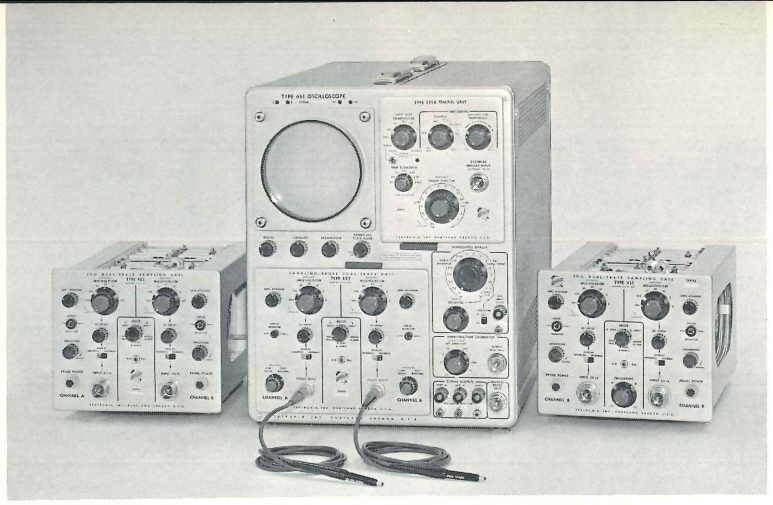
NEW

TYPE 10A1 HIGH-GAIN DIFFERENTIAL AMPLIFIER — combines high-gain dc, differential, wide-band and calibrated-comparator features in one plug-in unit • CALIBRATED SENSITIVITY — from 1 mv/cm to 20 v/cm • PASSBAND — dc to 45 MC at 5 mv/cm, dc to 35 Mc at 1 mv/cm • COMMON-MODE REJECTION RATIO — 20,000:1 dc-to-100 kc, 10,000:1 100 kc-to-1 Mc; 1,000:1 at 10 Mc • COMPARISON VOLTAGE RANGE — three equivalent V_c ranges of 6 v, 60 v and 600 v. ACCURACY: 6 v range is ±(0.1% + 5 mv); 60 v range is ±(0.225% + 50 mv); 600 v range is ±(0.35% + 0.5 v) • TYPE 10A1, less probes — $850 •

TYPE 10A2 DUAL-TRACE AMPLIFIER — dc to 50 Mc passband • CALIBRATED SENSITIVITY — from 10 mv/cm to 20 v/cm • 5 OPERATIVE MODES — Channel 1 only, Channel 2 only, Alternate, Chopped, or Added Algebraically • CHANNEL 2 OUTPUT — available at the front panel for driving or triggering other equipment • TYPE 10A2, less probes — $675 •

TYPE 11B1 TIME-BASE UNIT — wide sweep range, from 0.1 μsec/cm to 2 sec/cm • DIRECT-READING MAGNIFIER — up to 50X • TRIGGER CAPABILITY — stable triggering to 50 Mc • TYPE 11B1 — $625 •

TYPE 11B2 TIME-BASE UNIT — features NORMAL AND DELAYED SWEEPS from 0.1 μsec/cm to 5 sec/cm • CALIBRATED SWEEP DELAY — from 1 μsec to 50 sec continuously variable • 10X SWEEP MAGNIFIER — extends sweep rate to 10 nsec/cm • TRIGGER CAPABILITY — stable triggering to 50 Mc • TYPE 11B2 — $825 •



TYPE 661 SAMPLING OSCILLOSCOPE
• *PLUG-IN VERSATILITY* — uses 4-Series and 5-Series Sampling Units • *FAST or SLOW MANUAL SCAN* — drives external recorders • *AMPLITUDE/TIME CALIBRATOR* — checks vertical and sweep calibration • *OUTPUTS* — delayed pulse, A and B vertical, and horizontal • *HIGH RESOLUTION* — 8 x 10-cm viewing area • *TYPE 661* — less sampling plug-in units . . . $1150 •

DUAL-TRACE SAMPLING UNITS • *5 DISPLAY MODES* — A only, B only, Dual-Trace, Added Algeb. and (for X-Y displays) A vertical, B horizontal • *2 MV/CM to 200 MV/CM SENSITIVITY* — variable between steps • *DC OFF-SET VOLTAGE* — for displaying portions of signals having off-screen amplitudes •

TYPE 4S1 FEATURES — 0.35 nsec risetime • *SEPARATE INTERNAL DELAY LINES* — trigger on either A or B input signals or externally • *2 VOLTS DYNAMIC RANGE* • *TYPE 4S1* — $1430 •

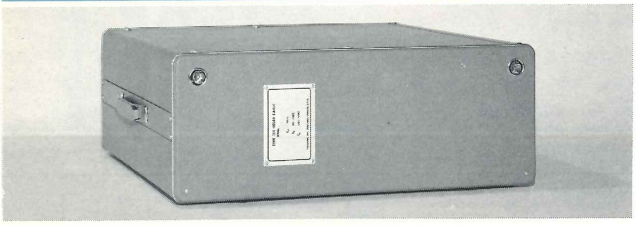
TYPE 4S2 FEATURES — 0.1 nsec risetime • *EXTERNAL TRIGGER* — with Type 5T1A • *±1 VOLT DYNAMIC RANGE* • *TYPE 4S2* — $1600 •

• **TYPE 4S3 FEATURES** — miniature direct sampling probes with 100 k, 2 pf input impedance • *LOW NOISE* — less than 300 μv (smoothed) • *RISETIME/NOISE SELECTION* — 0.35-nsec risetime with 1 mv noise, 0.5-nsec risetime with 0.5 mv noise • *±2 VOLTS DYNAMIC RANGE* • *EXTERNAL TRIGGER* • *TYPE 4S3*, with probes — $1600 •

TYPE 5T1A TIMING UNIT • HIGH RESOLUTION — 5 to 1000 dots/cm • EQUIVALENT SWEEP RATES — from 0.1 msec to 1 nsec • TIME EXPANDER — up to 100X expansion • TIME POSITION — operates on all sweep rates • TRIGGERING CAPABILITY — up to 1 Gc; triggers on fast-rise low-energy pulses • SWEEP MODE — repetitive or single displays, plus timed scan (5 sec/cm) for driving external recorders • TYPE 5T1A — $750 •

TYPE 5T3 TIMING UNIT • WIDE RANGE PERFORMANCE — provides real-time and equivalent-time sampling • REAL-TIME SWEEP RATES — from 5 sec to 0.2 msec • EQUIVALENT-TIME SWEEP RATES — from 100 μsec to 10 psec • EQUIVALENT-TIME MAGNIFIER — up to 100X with direct sweep time/cm readout • TRIGGER CAPABILITY — Schmitt logic with sine-wave or pulse triggering from dc through 5 Gc at millivolt input levels. 50-ohm and 1-megohm inputs are provided for external triggering • TIME POSITION — gives delay equivalent to at least one screen diameter in equivalent-time sampling • SWEEP MODE — repetitive or single displays plus timed scan for driving external recorders • TYPE 5T3 — $900 •

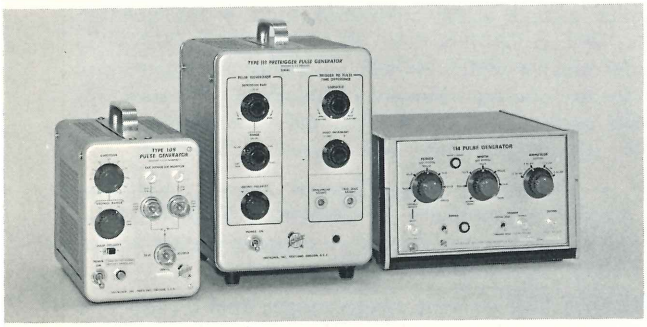
NEW



TYPE 113 DELAY CABLE
• *TIME DELAY* — 60 nsec • *RISETIME* — 0.1 nsec • *LOSS* — 1.5 db per 100 feet at 1000 Mc • *TYPE 113* — for sampling applications using Type 4S2 or Type N Plug-In Units — $250 •

SQUARE WAVE GENERATORS
TYPE 105 FEATURES — 25 cps to 1 Mc range, continuously variable • *RISETIME* — 13 nsec with 52-ohm termination; less than 20 nsec with 93-ohm termination • *OUTPUT AMPLITUDE* — 10 v to 100 v across internal 600-ohm load • *FREQUENCY METER* — accurate within 3% of full scale • *TYPE 105* — $435 •

TYPE 107 FEATURES — risetime less than 3 nsec into terminated 52-ohm cable • *FREQUENCY RANGE* — 400 kc to 1 Mc, uncalibrated • *OUTPUT AMPLITUDE* — 0.1 v to 0.5 v, with 52-ohm termination • *TYPE 107* — $190 •



50 OHM PULSE GENERATORS
TYPE 109 • *RISETIME* — <0.25 nsec • *PULSE WIDTH* — 0.5 nsec to 40 nsec at full rep rate, 300 nsec at ½ rep rate • *VARIABLE CALIBRATED AMPLITUDE* — 0 to ±50 v • *2 CHARGE LINES* — for equal or unequal alternate pulse durations • *TYPE 109* — $360 •

TYPE 111 • *OUTPUT PULSE RISETIME* — 0.5 nsec for positive, slightly longer for negative pulse • *REPETITION RATE* — continuously adjustable from 100 pps to 100 kc • *DURATION* — 2 nsec minimum, 100 nsec maximum • *AMPLITUDE* — over ±5 v • *PRETRIGGER PULSE* — 10 v, 250 nsec duration, 4-nsec rise-time (½ amplitude) • *TIME DIFFERENCE* — 30 to 250 nsec between Pretrigger and Output pulses • *TYPE 111* — $365 •

TYPE 114 PULSE GENERATOR
•RISETIME—≤10 nsec • PULSE PERIOD—five ranges from 1 μsec to 10 msec; continuously variable from 1 μsec to 100 msec. Provisions for external triggering • PULSE WIDTH—five ranges from 100 nsec to 1 msec; continuously variable from 100 nsec to 10 msec. Switch position provided for square-wave output for any period setting • WIDTH > PERIOD LIGHT—for indicating scaling when the pulse width exceeds the pulse period • OUTPUT AMPLITUDE—either positive or negative polarity with variable ranges of 1 to 3 v and 3 to 10 v into 50-Ω load • FLEXIBLE—two Type 114's can be used together with one serving as a delay generator • COMPACT—completely transistorized, measures only 9"wide, 12½"deep and 6" high • TYPE 114—$350 •

NEW

U.S. Sales Prices f.o.b. Beaverton, Oregon

AMPLIFIERS

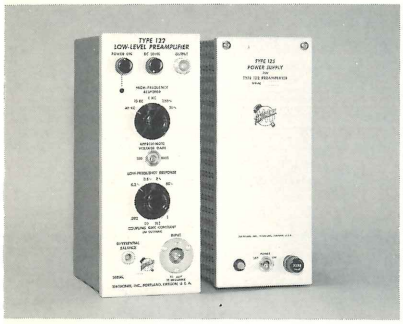
TYPE 122 • *FREQUENCY RESPONSE* — variable from 0.2 cps to 40 kc • *5 UPPER 3-DB POINTS* — 50 cps to 40 kc • *4 LOWER 3-DB POINTS* — 0.2 to 80 cps • *GAIN* — 100 or 1000X • *REJECTION RATIO* — 80 to 100 db • *SIGNAL OUT* — 20 v, pk-to-pk maximum, 1000-Ω impedance • *POWER SOURCE* — external batteries or *TYPE 125* Power Supply (below) • *TYPE 122* — $135 • *TYPE 125 POWER SUPPLY* — powers up to 4 Type 122 Amplifiers . . . $285 •

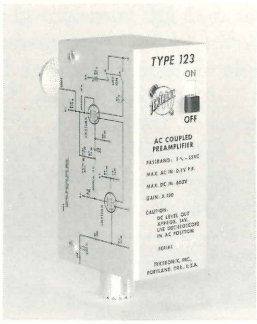
TYPE 123 • *FREQUENCY RESPONSE* — within 3 db from 3 cps to 25 kc • *GAIN* — 100X • *MAXIMUM INPUT SIGNAL* — 0.1 v, 10 megohm impedance • *HUM FREE* — powered by miniature batteries (included) • *COMPACT* — 4¼" by 1½" by 3⅞", weighs only 10 oz • *TYPE 123* — $75 •

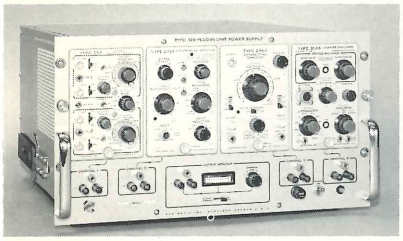
TYPE 1121 • *FREQUENCY RESPONSE* — 5 cps to 17 Mc (3-db down) • *GAIN* — 100X • *CALIBRATED ATTENUATION* — 1 to 500X in 9 steps • *GAIN STABILITY* — within ± 1% over 24-hour period • *SIGNAL OUT* — ± *1 v terminated in* 93-ohm cable • *TYPE 1121* — $465 •

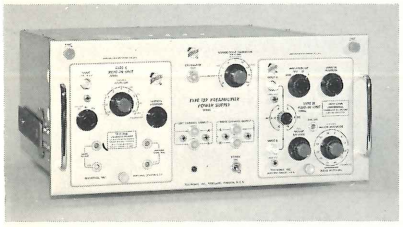
TYPE 130 L-C METER

• *MICROHENRY SCALE* — 0 to 3, 10, 30, 100, and 300 • *PICO-FARAD SCALE* — 0 to 3, 10, 30, 100, and 300 • *ACCURACY* — within 3% • *GUARD VOLTAGE* — for measuring an unknown capacitance, eliminates effects of other capacitances • *TYPE 130* — $225 •









POWER SUPPLY FOR 2 and 3-SERIES PLUG-IN UNITS

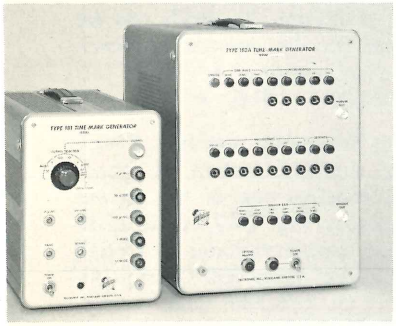
TYPE 129 • *POWER* — for up to four units • *OUTPUTS* — via cathode-follower (dc to approx. 1 Mc) or passive plug-in boards (dc to approx. 100 kc) • *GAIN* — 2×10^5 (push-pull) or 10^5 (single-ended) using CF output board and Type 2A61 ac-coupled plug-in; 2×10^4 (push-pull) or 10^4 (single-ended) using CF output board and Type 3A3 dc-coupled plug-in • *OUTPUT MONITOR* — front-panel meter for balance or level indication • *RACK MODEL* — mounts on slide-out tracks to 19" rack • *CF OUTPUT BOARD*, Part No. 018-0001-00 — $40 • *PASSIVE OUTPUT BOARD*, Part No. 018-0002-00 — $10 • *TYPE 129* — $650 •

POWER SUPPLIES FOR LETTER-SERIES AND 1-SERIES PLUG-IN UNITS

TYPE 127 • *POWER* — for combinations of 2 Plug-In Units • *FREQUENCY RESPONSE* — dc to 19 Mc with Type L Unit • *GAIN* — unity (push-pull) or ½ (single-ended) • *OUTPUT* — ±0.3 v into 170-ohm termination • *AMPLITUDE CALIBRATOR* — 0.2 mv to 100 v • *RACK MODEL* — mounts on slide-out tracks to 19" rack • *TYPE 127* — $650 •

TYPE 132 • *SYSTEM GAIN* — 10X or greater (93-Ω termination); up to 20,000X gain with Type G Unit (no termination) • *PASSBAND* — (with Type L Unit) dc-to-500 kc (no termination), dc-to-14 Mc (93-Ω termination), dc-to-16 Mc (double 93-Ω termination) • *OUTPUT* — ±100 v push-pull or ±50 v single-ended with high-Z load; ±1 v with 93-Ω load • *TYPE 132* — $460 •

TYPE 133 • *SOURCE IMPEDANCE* — 2-Ω (for driving recorders, speakers, etc.) • *FREQUENCY RESPONSE* — dc to 100 kc • *SYSTEM GAIN* — *10X* or greater single-ended • *OUTPUT* — ±5 v (high-Z load), 1.5 amp (short circuit) • *MONITOR* — drive recorder and oscilloscope simultaneously • *TYPE 133* — $440 •



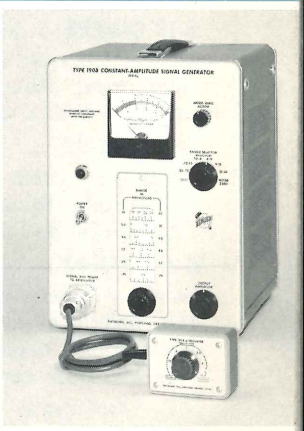
TIME-MARK GENERATORS

TYPE 180A • *ACCURACY* — within 0.001%, stability of 3 parts per million over a 24-hour period • *14 TIME-MARK INTERVALS* — 2 per decade from 1 μsec to 5 sec, separately or in combination • *3 SINE-WAVE FREQUENCIES* — 5, 10, and 50 Mc • 6 TRIGGER-RATE FREQUENCIES — 1, 10 or 100 cps, 1, 10 or 100 kc • *TYPE 180A* — $625 •

TYPE 181 • *5 TIME-MARK INTERVALS* — 1 to 10,000 μsec in decade steps, plus 10-Mc sine wave • *RACK MODEL* — bolts to 19" rack • *TYPE 181* — $265 • *TYPE RM181* — $290 •

TYPE 190B CONSTANT AMPLITUDE SINE-WAVE GENERATOR

• *OUTPUT FREQUENCY* — 350 kc to 50 Mc, continuously variable, plus 50 kc variable over a narrow band • *AMPLITUDE VARIATION* — less than ±2% from 50 kc to 30 Mc; less than ± 5% from 30 Mc to 50 Mc • *OUTPUT AMPLITUDE*— 40 mv to 10 v pk-to-pk, continuously variable • *OUTPUT IMPEDANCE* — nominally 25 ohms • TYPE 190B — $330 •.



SAMPLING ACCESSORIES

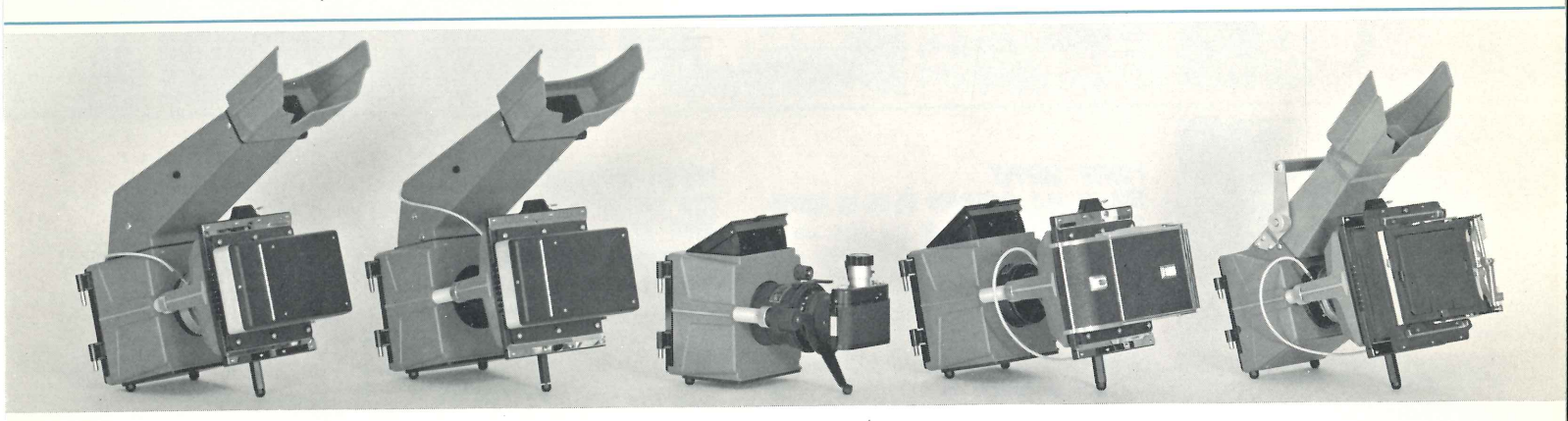
TYPE 280 TRIGGER COUNTDOWN UNIT — synchronizes on 30 Mc to 5 gigacycles, output continuously variable from 15 to 45 Mc • 2 *OUTPUTS* — 150 mv at <0.4-nsec risetime, and 1.5 v at <4-nsec risetime • *INPUT SENSITIVITY* — 50 mv to 4 v, pk-to-pk • *INPUT IMPEDANCE* — approx. 50 Ω • *TYPE 280* — $265 •

TYPE 290 TRANSISTOR SWITCHING-TIME TESTER — measures fast transistors, short duty cycle measurements of delay time, risetime, storage time, and fall time (with Fast-Rise Pulser and Sampling Oscilloscope) • *MONITOR* — input or collector output separately or (with dual-trace system) simultaneously • *HIGH-LOW COLLECTOR VOLTAGES* — continuously variable from 0 to 30 v and 0 to 100 v (2 transistor sockets) • *CONTINUOUSLY VARIABLE BASE SUPPLY* — 0 to ±10 v through 10 kilohms • *50-Ω OUTPUTS* — allow remote location • *TYPE 290* — $290 •

TYPE 291 DIODE SWITCHING-TIME TESTER — measures fast-switching diodes, forward and reverse recovery (with Fast-Rise Pulser and Sampling Oscilloscope) • *CONSTANT CURRENT SUPPLY* — 1 to 100 ma in 7 steps, variable between steps • *0.35-NSEC RISETIME* — with either Test Fixture • *TYPE 291*, less Test Fixture — $185 •

TEST FIXTURES — separate from the Type 291 for remote operation • *EASY OPERATION* — diodes magnetically held in test fixture • *TEST JIG, V-shaped contacts*, part no. 013-0080-00 — $40 • *ADAPTER*, for above test jig, part no. 017-0075-00 — $55 • TEST FIXTURE, strip-line environment, part no. 017-0072-00 — $65 •

TYPE 292 SEMICONDUCTOR TESTER POWER SUPPLY—used in conjunction with a sub-nanosecond pulse generator and sampling oscilloscope, the Type 292 furnishes dc power and sub-nanosecond environment for measuring time and charge characteristics of fast semiconductor diodes and transistors • TEST VOLTS SUPPLY—dc voltage ranges of 1, 2, 5, 10 or 20 volts • BIAS CURRENT SUPPLY—11 dc current ranges from 0.1 ma to 200 ma • TYPE 292 with unwired transistor test fixture — $325 • optional *DIODE TEST JIG* with a TEST JIG ADAPTER is available for testing axial-lead diodes — DIODE TEST JIG (part no. 013-0080-00) — $40, TEST JIG ADAPTER (part no. 016-0059-00) — $21 •



TRACE-RECORDING CAMERAS

• FUNCTIONAL DESIGN — one-hand portability, lift-on mounting, swing-away hinging, comfortable viewing with or without glasses, 9 positive-lock detents for multiple exposures, locking focus control • *STANDARD CAMERA ASSEMBLIES* — C-12, C-13 and C-27 for general-purpose-trace recording; C-19 for high-speed pulse recording • SPECIAL COMBINATIONS — Camera Frames, optional Lenses and Film Backs as individual components, or assembled as a complete unit . . . consult your Tektronix Field Office (or Distributor) •

C-12 CAMERA — on-axis binocular viewing with beam-splitting mirror, f/1.9 lens with 1:0.9 object-to-image ratio, focus plate and Polaroid* Land 3¼ x 4¼ *PACK-FILM BACK* • *C-12 CAMERA*, less mounting bezel — $450 •

C-13 CAMERA — hinged viewing aperture, maximum light transmission from crt to film, f/4.5 lens with 1:0.7 object-to-image ratio, focus plate, and Polaroid* Land 3¼ x 4¼ *PACK-FILM BACK* • *C-13 CAMERA*, less mounting bezel — $360 •

C-19 CAMERA — low-angle binocular viewing, maximum light transmission from crt to film, f/1.9 lens with 1:0.5 object-to-image ratio, focus plate, and Polaroid* Land 3¼ x 4¼ *PACK-FILM BACK* • *C-19 CAMERA*, less mounting bezel — $500 •

C-27 CAMERA — direct binocular viewing, removable viewing tunnel. Camera frame can be rotated for viewing from the top, bottom or either side. Features up to 10 x 10-cm picture-taking area, depending on mounting bezel. Compact design plus fold-back carrying handle allows stacking cameras on 7" rackmount oscilloscopes. Supplied with f/1.9 lens with 1:0.85 object-to-image ratio, focus plate and Polaroid* Land 3¼ x 4¼ PACK-FILM BACK • C-27 CAMERA, less mounting bezel — $420 •

Camera Mounting Bezels are available separately.

35-MM ATTACHMENT FOR ALL TEKTRONIX CAMERAS

• *AUTOMATIC ADVANCE* — spring-wound motor • *SIMPLE MOUNTING* — easily attached to C-12, C-13, C-19 or C-27 Camera Frame • *SHUTTER/LENS* — integral with back, f/1.9 lens with 1:0.2 object-to-image ratio • *FILM ECONOMY* — 30 or 55 exposures per roll, 23.2 x 23.6 mm frame size • *TYPE 350 ATTACHMENT* — $400 •

PROJECTED GRATICULE for TYPE C-12 — eliminates parallax, provides up to 8 x 10-cm projection, a portion of which can be used for write-in data. Color filter can be inserted to match or contrast the projection with the crt phosphor • PROJECTED GRATICULE, part number 016-0204-00 — $160 •

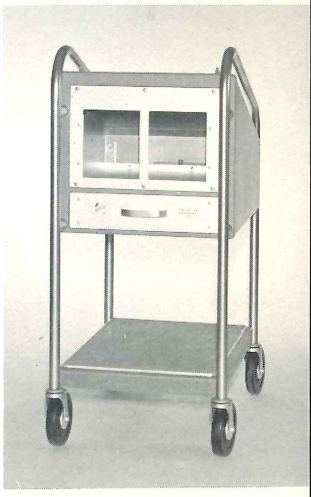
SHUTTER ACTUATOR — for actuating the shutter remotely. Rotary solenoid-operated release closely simulates action of hand-operated cable release. Actuator requires one of two power supplies. The built-in supply replaces the C-12, C-13, C-19 or C-27 rear frame. The external supply includes a hinged bracket that permits mounting on the Type 350 35-mm Attachment, Polaroid* Pack Film Back or Roll Film Back regardless of camera used. SHUTTER ACTUATOR, part number 016-0218-00 — $75 • BUILT-IN POWER SUPPLY, part number 016-0231-00 — $125 • SEPARATE POWER SUPPLY, part number 016-0230-00 — $85 •

* Registered by Polaroid Corporation

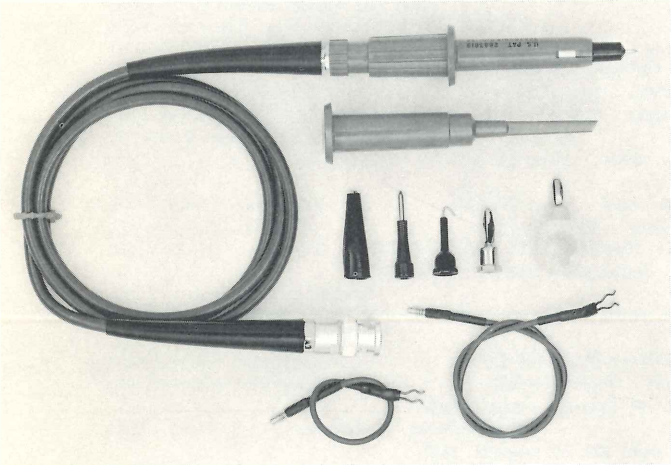
SCOPE-MOBILE® CARTS — mobile support for oscilloscopes and other instruments. Each cart has 5" wheels, front-wheel brakes, and a storage drawer.

TYPE	FITS THESE INSTRUMENTS	TRAY	PLUG-IN CARRIER	PRICE
201-1	503, 504, 506, 515A, 516, 561A, 564, 647	Tilting tray locks in nine 4½° steps	No	$120
201-2			For 2 and 3-Series or 10 & 11-Series	130
202-1	502A (w/adapter), 507, 517A, 524, 530/40/50/70/80 - Series, 661		No	120
202-2			For Letter - Series or 80-Series	130
205-1	565, 567, all RMs		No	135
500A	Accepts instruments up to 13" in width	Fixed 20°	No	99.50
500/53A			For Letter - Series or 80-Series	110

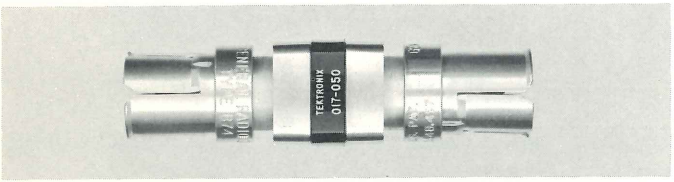
® Registered Trademark



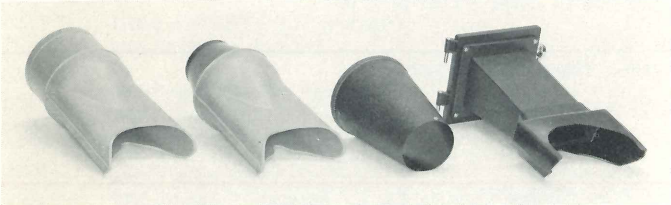
Tektronix manufactures and supplies a variety of items for expanding the operation of Tektronix oscilloscopes. Other items are used to calibrate and maintain Tektronix instruments. Some of these are shown below. For more information, consult your Tektronix Field Office (or Distributor).



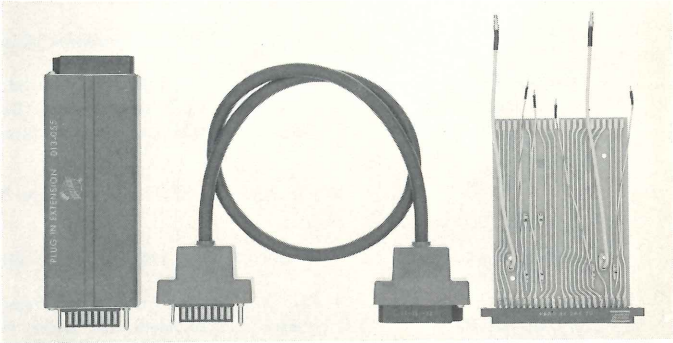
PROBES—general and special-purpose types, including sampling.



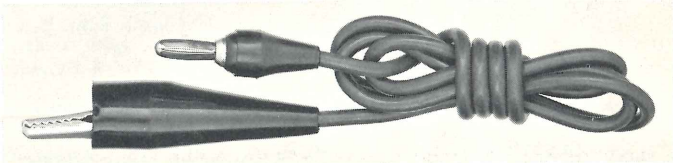
INPUT ATTENUATORS AND TERMINATIONS—available in a wide range of impedances and connectors to match instrument requirements.



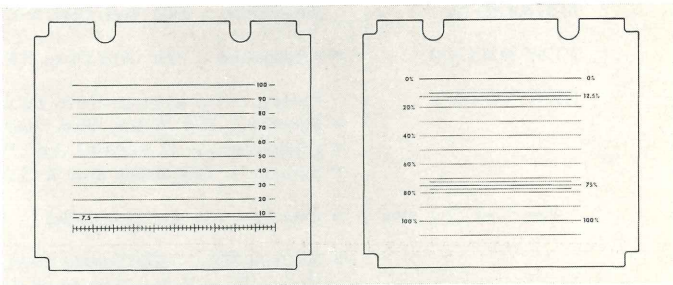
VIEWING ACCESSORIES—including polarized viewers, viewing hoods, camera mounting adapters and bezels for most Tektronix oscilloscopes.



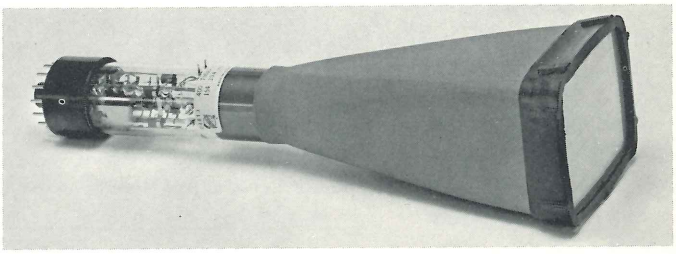
PLUG-IN EXTENSIONS—for operating plug-in units outside the oscilloscope.



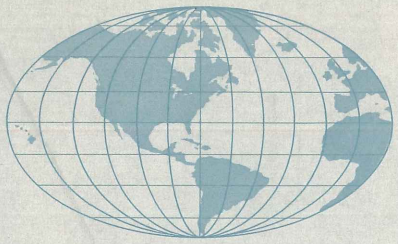
CORDS AND CABLES—including power cords and signal cables for all Tektronix instruments.



GRATICULES AND LIGHT FILTERS—special-purpose graticules and blank graticules to satisfy customer's individual needs.



CATHODE-RAY TUBES—Tektronix manufactures crt's in a wide variety of tube types and phosphors for use in regular production and field replacement.



UNITED STATES FIELD ENGINEERING OFFICES

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Tektronix, Inc., an Oregon Corporation, Home Office & Factory, P. O. Box 500, Beaverton, Oregon 97005

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