

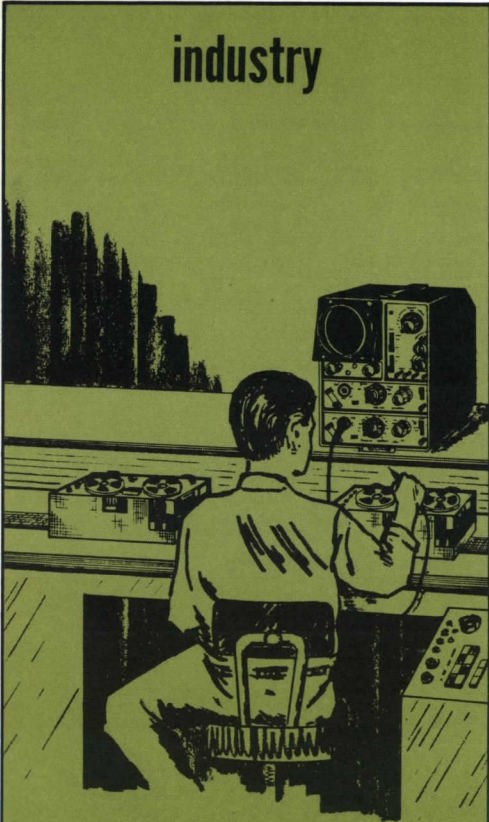
TELEQUIPMENT



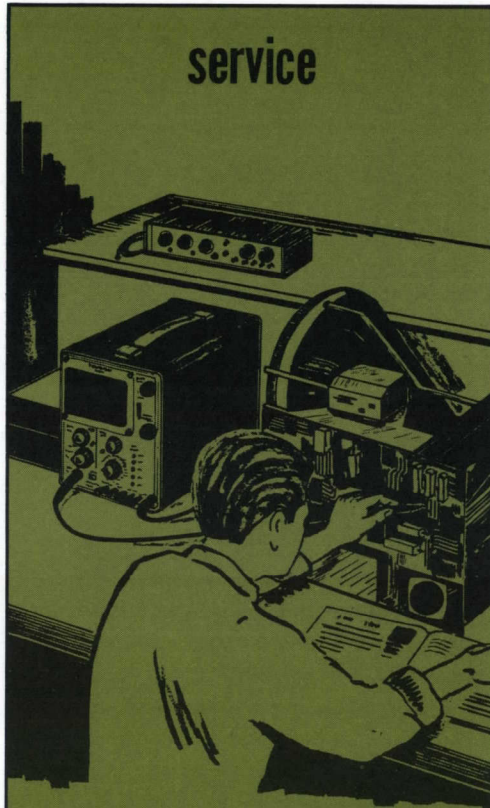
®

CATHODE RAY OSCILLOSCOPES

industry



service



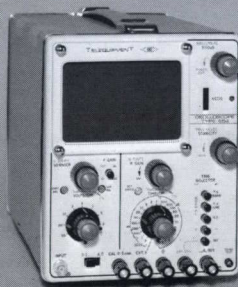
education



D43 T



S54



S51B



CATALOG 2
FEBRUARY 1968



General and Ordering Information

ORDERING

Telequipment products are manufactured in England. They are sold and serviced in the United States by Tektronix, Inc. Tektronix, Inc. maintains a warehouse inventory of Telequipment instruments, accessories and parts in Beaverton, Oregon. Orders should be placed with your Tektronix Field Engineering Office listed on the back page.

TERMS OF SALE

Tektronix, Inc. standard terms of sales are Net 30 days. Other credit terms are available for a customer's particular requirements. Credit accommodations and terms of sale are arranged through your Tektronix Field Engineer.

SHIPMENT

Normally all prices and quotations are FOB Beaverton, Oregon. Unless otherwise specified on your order, shipment will be made via most economical method. If a specific surface carrier is specified, shipment will be made at full valuation unless your order instructs differently. If air shipment is desired, air freight at full evaluation will be the method of shipment unless otherwise specified on the order.

MAINTENANCE

Sections of the manual provided with each Telequipment product describe circuit operation and adjustment. Your Tektronix Field Engineering Office will process all orders for Telequipment

parts. Tektronix has established Field Engineering Offices and service centers in cities listed on the back page. Please include instrument Type number, serial number, and all descriptive information contained in the manual when ordering spare parts. Please do not return instruments or parts before receiving instructions.

WARRANTY

All Telequipment instruments are warranted against defective materials and workmanship for one year. Any questions with respect to the warranty should be discussed with your Tektronix Field Engineer. Field Offices are listed on the back page.

Telequipment Ltd. is a wholly-owned subsidiary of Tektronix, Inc.

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Brief Description of Non Plug-in Oscilloscopes

SINGLE-BEAM OSCILLOSCOPES

TYPE	Vertical Amplifier				Time Base		Horizontal Amplifier	CRT	Power Requirements	Price	Page
	Bandwidth	Min Defl Factor	Attenuation	RC	Range	Trigger					
S51B	DC-3 MHz	100 mV/cm	9 calibrated V/cm positions, freq compen attenuator accuracy $\pm 5\%$	1 M Ω 47 pF	1 μ s/cm to 100 ms/cm in 6 calibrated steps, accuracy $\pm 5\%$, variable between steps	INT EXT TV Auto or Trig Level	DC-500 kHz 100 mV/cm 1 M Ω , 100 pF	8 cm x 10 cm 3 kV P31 Single Beam	Connected for 115 V, can be wired for operation at following voltages 90 120 220 100 130 225 105 200 230 110 210 240 115 215 50-400 Hz 58 VA	\$200.00	6
S51E Educational version						INT \pm Auto or Trig Level					
S52 Equal XY	Equal X and Y Amplifiers		9 calibrated V/cm positions, freq compen attenuator accuracy $\pm 5\%$	1 M Ω 44 pF	1 μ s/cm to 0.5 s/cm in 18 calibrated steps, accuracy $\pm 5\%$, variable between steps	INT EXT TV HF Auto or Trig Level	10 Hz to 400 kHz	10 cm x 10 cm 2.4 kV P31 Single Beam	Connected for 115 V, can be switched for operation at 100 to 125 V in 5-V steps or 200 to 250 V in 10-V steps, 50-400 Hz, 90 VA	\$440.00	8
	DC-3 MHz	100 mV/cm									
S54	DC-10 MHz	100 mV/cm	9 calibrated V/cm positions, freq compen attenuator accuracy $\pm 5\%$, var atten	1 M Ω 47 pF	0.2 μ s/cm to 2 s/cm in 22 calibrated steps, accuracy $\pm 5\%$, variable between steps	INT EXT HF TV Auto or Trig Level	DC-750 kHz 0.6-3 V/cm 1 M Ω , 30 pF 400 V max	6 cm x 10 cm 4 kV P31 Single Beam Edge Lit Graticule	Connected for 115 V, can be switched for operation at 100 to 125 V in 5-V steps or 200-250-V in 10-V steps, 48-440 Hz, 30 VA	\$350.00	9
RS54 5 1/4 in Rack-mount 19 in wide	DC-4 MHz	10 mV/cm								\$400.00	

DOUBLE-BEAM OSCILLOSCOPES

TYPE	Vertical Amplifiers				Time Base		Horizontal Amplifier	CRT	Power Requirements	Price	Page
	Bandwidth	Min Defl Factor	Attenuation	RC	Range	Trigger					
D52	DC-6 MHz	100 mV/cm	9 calibrated V/cm positions, freq compen attenuator accuracy $\pm 5\%$	1 M Ω 44 pF	1 μ s/cm to 0.5 s/cm in 18 calibrated steps, accuracy $\pm 5\%$, variable between steps	INT Y ₁ INT Y ₂ EXT TV HF Auto or Trig Level	10 Hz-400 kHz	6 x 10 cm 3.6 kV P31 Double Beam ¹	Same as S52	\$360.00	10
	DC-1 MHz	10 mV/cm				INT \pm					
D56	DC-15 MHz	100 mV/cm	9 calibrated V/cm positions, freq compen attenuator accuracy $\pm 5\%$, var atten	1 M Ω 40 pF	0.5 μ s/cm to 5 s/cm in 22 calibrated steps, accuracy $\pm 5\%$, variable between steps, sweep delay, single sweep, two identical time bases	INT Y ₁ INT Y ₂ EXT TV HF Auto or Trig Level	DC-500 kHz, 100 mV/cm, 1 M Ω , 100 pF	6 x 10 cm 4 cm overlap 6 kV P31 Dual Beam ² Edge Lit Graticule	Connected for 115 V, can be switched for operation at following voltages 90 130 230 100 200 240 105 210 110 215 115 220 120 225 50-400 Hz 375 VA	\$1075.00	11
	DC-500 kHz	10 mV/cm				INT \pm					

¹Single gun with beam splitter to provide two electron beams that pass through a common set of horizontal plates and separate vertical deflection plates.

²Dual gun & deflection system.



SINGLE-BEAM MAIN FRAMES (Additional Characteristics on Page 12)

TYPE	CRT			Power Requirements	Time Base		Horizontal Amplifier	Price
	Area	KV	Type		Range	Trigger		
S43	6 x 8 cm	3.5 kV	P31 Edge Lit Graticule	Connected for 115 V, can be switched for operation at following voltages 90 200 100 210 105 215 110 220 115 225 120 230 130 240 50 to 400 Hz 100 VA	1 μ s/cm to 0.5 s/cm in 18 calibrated steps, accuracy $\pm 5\%$, vari- able between steps	INT } EXT } \pm TV } HF } Auto or Trig Level	10 Hz - 400 kHz 250 mV/cm - 2.5 V/cm 170 k Ω 30 pF	Order TLS43 \$300.00
S43T					0.5 μ s/cm to 5 s/cm in 22 calibrated steps, accuracy $\pm 5\%$, vari- able between steps	INT } EXT } \pm TV } HF } Auto or Trig Level Single Shot with Lock Out	DC - 500 kHz 100 mV/cm - 1 V/cm 1 M Ω 30 pF	Order TLS43T \$335.00

DOUBLE-BEAM MAIN FRAMES (Additional Characteristics on Pages 13 & 15)

TYPE	CRT			Power Requirements	Time Base		Horizontal Amplifier	Price
	Area	KV	Type		Range	Trigger		
D43	6 x 8 cm 4 cm overlap	4 kV	P31 ¹ Edge Lit Graticule	Connected for 115 V, can be switched for operation at following voltages 90 200 100 210 105 215 110 220 115 225 120 230 130 240 50 to 400 Hz 132 VA	1 μ s/cm to 0.5 s/cm in 18 calibrated steps, accuracy $\pm 5\%$, vari- able between steps	Int Y ₁ } Int Y ₂ } \pm Ext } TV } HF } Auto or Trig Level	10 Hz - 400 kHz 250 mV/cm - 2.5 V/cm 170 k Ω 30 pF	Order TLD43 \$340.00
RD43 7" Rack- mount 19" Wide					0.5 μ s/cm to 5 s/cm in 22 calibrated steps, accuracy $\pm 5\%$, vari- able between steps	Int Y ₁ } Int Y ₂ } \pm Ext } TV } HF } Auto or Trig Level Single Shot with Sweep Lockout	DC - 500 kHz 100 mV/cm - 1 V/cm 1 M Ω 30 pF	Order TLRD43 \$340.00
D43T					0.5 μ s/cm to 5 s/cm in 22 calibrated steps, accuracy $\pm 5\%$, vari- able between steps	Int Y ₁ } Int Y ₂ } \pm Ext } TV } HF } Auto or Trig Level Single Shot with Sweep Lockout	DC - 500 kHz 100 mV/cm - 1 V/cm 1 M Ω 30 pF	Order TLD43T \$375.00
RD43T 7" Rack- mount 19" Wide					0.5 μ s/cm to 5 s/cm in 22 calibrated steps, accuracy $\pm 5\%$, vari- able between steps, sweep delay ranges 250 μ s to 5 ms and 2.5 ms to 50 ms	Int Y ₁ } Int Y ₂ } \pm Ext } TV } HF } DC Line Auto or Trig Level Single Shot	DC - 1 MHz 500 mV/cm - 5 V/cm 1 M Ω 30 pF	Order TLD53 \$640.00

¹Dual gun with common horizontal deflection plates and separate vertical deflection plates.

²Single gun with beam splitter to provide two electron beams that pass through a common set of horizontal plates and separate vertical deflection plates.

PLUG-IN OSCILLOSCOPES

PLUG-IN VERTICAL AMPLIFIERS

One Plug-In Vertical Amplifier used in Single-Beam Main Frames

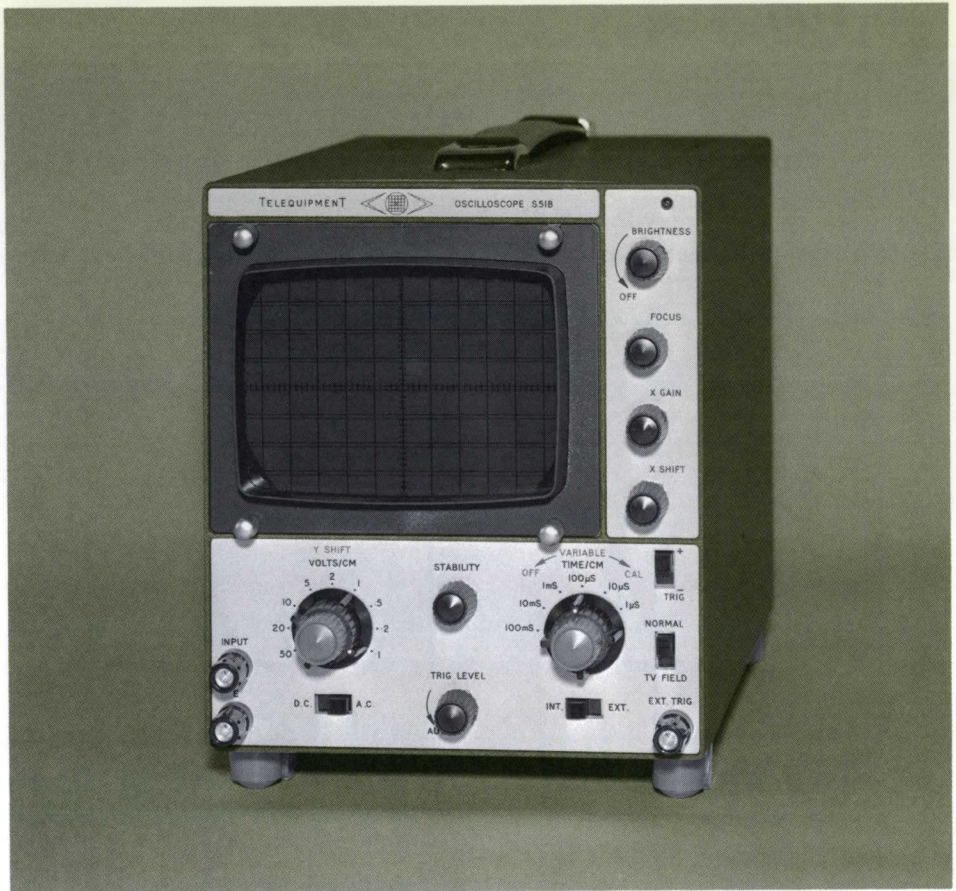
Type A General Purpose	Type B Differential	Type C High Gain	Type G Differential	Type H Wide Band	Type CD High Gain	Type HD-2 Wide Band
↑	↑	↑	↑	↑	↓ Use only with Type D53	↓ Use only with Type D53

Two Plug-In Vertical Amplifiers used in Double-Beam Main Frames

<p>DC to 15 MHz to 100 mV/cm, DC to 800 kHz to 10 mV/cm, 9 calibrated V/cm positions, freq compen attenuator accuracy $\pm 5\%$, 1 MΩ, 40 pF. Order TLA \$75.00 See page 14</p>	<p>DC to 75 kHz to 1 mV/cm, CMRR (1-50 mV/cm) 10,000:1 to 1 kHz to 1,000:1 at 75 kHz, (100 mV/cm—5 V/cm) 1,000:1 to 1 kHz to 100:1 at 10 kHz, 12 calibrated V/cm positions, freq compen attenuator accuracy $\pm 5\%$, 1 MΩ, 40 pF. Order TLB \$120.00 See page 14</p>	<p>DC to 15 MHz to 100 mV/cm, DC to 800 kHz to 10 mV/cm, 3 Hz to 75 kHz to 100 μV/cm, approx 30-μV max hum & noise, 9 calibrated V/cm positions, freq compen attenuator accuracy $\pm 5\%$, 1 MΩ, 40 pF. Order TLC \$100.00 See page 14</p>	<p>DC to 10 MHz to 20 mV/cm, DC to 500 kHz to 2 mV/cm, CMRR—1,000:1 at 1 MHz to 50:1 at 10 MHz, 9 calibrated V/cm positions, freq compen attenuator accuracy $\pm 5\%$, 1 MΩ, 40 pF. Order TLG \$85.00 See page 14</p>	<p>DC to 25 MHz to 100 mV/cm, DC to 5 MHz to 10 mV/cm, 9 calibrated V/cm positions, freq compen attenuator with variable, accuracy $\pm 5\%$, 1 MΩ, 55 pF. Order TLH \$120.00 See page 14</p>	<p>Same as C Unit, 6-cm max deflect, 0.2-μs signal delay automatically connected when unit plugged in. Concentric variable V/cm. Order TLCD \$100.00</p>	<p>Same as H Unit, 0.2-μs signal delay included in plug-in unit. Order TLHD2 \$120.00</p>
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S51B

- DC-3 MHz Bandwidth**
- Versatile Triggering Including TV Frame Sync**
- 8 cm x 10 cm Viewing Area**
- Flat-Face CRT**
- Small Size & Light Weight**
- DC Coupled Horizontal Amplifier**



General Description and Characteristics

Vertical Amplifier

Bandwidth—DC to 3 MHz (approx 3-dB down) with DC coupling, 2 Hz to 3 MHz with AC coupling.

Deflection Factor—100 mV/cm to 50 V/cm in 9 calibrated steps (1-2-5 sequence), attenuators accurate within 5%.

Overshoot—Less than 2%.

Input RC—1 megohm paralleled by approx 47 pF.

Maximum Deflection—8 cm.

Horizontal Amplifier

Deflection Factor—Uncalibrated, continuously variable, approx 100 mV/cm at mid-position, range approx 2:1.

Bandwidth—DC to 500 kHz (approx 3-dB down).

Input RC—1 megohm paralleled by approx 100 pF.

Horizontal Positioning—Positions any portion of expanded trace on screen.

Time Base

Sweep Rates—1 μ s/cm to 100 ms/cm in 6 calibrated steps (1-10 sequence). Uncalibrated, continuously variable between steps and to approx 1 s/cm.

Horizontal Expansion—Approx X2, continuously variable.

Time Measurement Accuracy—Within $\pm 5\%$ over center 8 cm ($\pm 10\%$ over first and last 2 cm in 1 μ s/cm range). DC Coupled Unblanking.

Trigger Circuit

Automatic—Sweep free runs at a slow speed but triggers on any signal up to approx 1 MHz.

Trigger level selection—Triggering occurs at any point on the input waveform.

TV Sync—Triggering occurs from the frame pulses of a composite television signal.

Slope—Plus or minus.

Source—Internal or external.

Sensitivity—5 mm of signal internally, 3 V peak to peak externally.

External Trigger Input Impedance—1 megohm paralleled by approx 30 pF.

Cathode-Ray Tube

5-inch flat-faced CRT operating at 3-kV accelerating potential. Viewing area 8 cm vertical by 10 cm horizontal. P31 phosphor normally supplied, P7 optional. A detachable green filter improves contrast under high ambient light conditions.

Rear Connectors

Sweep Output—Approx 20 V peak to peak at a DC level of approx 30 V.

Horizontal Amplifier Input. Z-axis Modulation to Cathode of CRT (0.01 μ F and 1 megohm).

Power Requirements

Wired for 115-V operation. For best performance, transformer taps should be soldered to the voltage terminals most nearly corresponding to line voltage. Voltage terminals are 90, 100, 105, 110, 115, 120, 130, 200, 210, 215, 220, 225, 230, 240 V. 50 to 400 Hz line frequency range, 58 VA.

Convection Cooling

Dimensions and Weights

Height	8 in
Width	7 in
Depth	15 in
Net weight	16 lb
Shipping weight	22 lb

Included Standard Accessories

Instruction manual (070-0792-00); test leads (012-0129-00).

Type S51B, order TLS51B . \$200

Optional Accessories

10X Passive Probe, UHF, order 010-0234-00	\$ 9.50
Coaxial Adapter, order 103-0085-00	2.25
Viewing Hood, order 016-0251-00	12.75

U.S. Sales Prices FOB Beaverton, Oregon



S51E

- DC-3 MHz Bandwidth**
- Simplified Triggering**
- 8 cm x 10 cm Viewing Area**
- Flat-Face CRT**
- Small Size & Light Weight**
- DC Coupled Horizontal Amplifier**

General Description and Characteristics

Vertical Amplifier

Bandwidth—DC to 3 MHz (approx 3-dB down) with DC coupling, 2 Hz to 3 MHz with AC coupling.

Deflection Factor—100 mV/cm to 50 V/cm in 9 calibrated steps (1-2-5 sequence), attenuators accurate within 5%.

Overshoot—Less than 2%.

Input RC—1 megohm paralleled by approx 47 pF.

Maximum Deflection—8 cm.

Horizontal Amplifier

Deflection Factor—Uncalibrated, continuously variable, approx 100 mV/cm at mid-position, range approx 2:1.

Bandwidth—DC to 500 kHz (approx 3-dB down).

Input RC—1 megohm paralleled by approx 100 pF.

Horizontal Positioning—Positions any portion of expanded trace on screen.

Time Base

Sweep Rates—1 μ s/cm to 100 ms/cm in 6 calibrated steps (1-10 sequence).

Uncalibrated, continuously variable between steps and to approx 1 s/cm.

Horizontal Expansion—Approx X2, continuously variable.

Time Measurement Accuracy—Within $\pm 5\%$ over center 8 cm ($\pm 10\%$ over first and last 2 cm in 1 μ s/cm range). Sweep Output—Approx 20 V peak to peak at a DC level of approx 30 V. DC Coupled Unblanking.

Trigger Circuit

Automatic—Sweep free runs at a slow speed but triggers on any signal up to approx 1 MHz.

Trigger level selection—Triggering occurs at any point on the input waveform.

Slope—Plus or minus.

Source—Internal.

Sensitivity—5 mm of signal internally.

Cathode-Ray Tube

5-inch flat-faced CRT operating at 3-kV accelerating potential. Viewing area 8 cm vertical by 10 cm horizontal. P31 phosphor normally supplied, P7 optional. A detachable green filter improves contrast under high ambient light conditions.

Rear Connectors

Horizontal Amplifier Input.

Z-axis Modulation to Cathode of CRT (0.01 μ F and 1 megohm).

Sawtooth Output Terminal—Approx 20 V peak to peak.

Power Requirements

Wired for 115-V operation. For best performance, transformer taps should be soldered to the voltage terminals most nearly corresponding to line voltage. Voltage terminals are 90, 100, 105, 110, 115, 120, 130, 200, 210, 215, 220, 225, 230, 240 V. 50 to 400 Hz line frequency range, 58 VA.

Convection Cooling

Dimensions and Weights

Height	8 in
Width	7 in
Depth	15 in
Net Weight	16 lb
Shipping weight	22 lb

Included Standard Accessories

Instruction manual (070-0792-00); test leads (012-0129-00).

Type S51E, order TLS51E . \$200

Optional Accessories

10X Passive Probe, UHF, order 010-0234-00 \$ 9.50
Coaxial Adapter, order 103-0085-00 2.25
Viewing Hood, order 016-0251-00 12.75

U.S. Sales Prices FOB Beaverton, Oregon



S52

Matched X and Y Amplifiers

DC-3 MHz Bandwidth

Versatile Triggering Including TV Line and Frame Sync

10 cm x 10 cm Viewing Area

Flat-Face CRT

5% Timing Accuracy



General Description and Characteristics

Vertical and Horizontal Amplifiers

Bandwidth—DC to 3 MHz (approx 3-db down) in 100 mV/cm to 50 V/cm range (X1). DC to 1 MHz (approx 3-db down) in 10 mV/cm to 5 V/cm range (X10). Input can be AC or DC coupled.

Deflection Factor—100 mV/cm to 50 V/cm or 10 mV/cm to 5 V/cm in 9 calibrated steps (1-2-5 sequence), attenuators accurate within 5%. Front panel control selects (X1 or X10) appropriate range.

Overshoot—Less than 2%.

Phase Difference in X-Y Mode— $\leq 1^\circ$ at 2 MHz for 100 mV/cm to 50 V/cm (X1), $\leq 1^\circ$ at 10 kHz for 10 mV/cm to 5 V/cm (X10).

Input RC—1 megohm paralleled by approx 44 pF.

Maximum Deflection—10 cm.

Time Base

Sweep Rates—1 μ s/cm to 500 ms/cm in 18 calibrated steps (1-2-5 sequence), accurate within 5%. Uncalibrated, continuously variable between steps.

Horizontal Expansion—Approx X10, continuously variable. Trace expands symmetrically from center of screen.

Any portion of expanded trace positionable on screen.

Sweep Amplifier Bandwidth—10 Hz to 400 kHz (approx 3-db down).

Triggering

Automatic—Sweep free runs at a low speed in the absence of a signal but triggers on any signal up to approx 1 MHz.

Trigger Level Selection—Triggering occurs at any point on the input waveform.

High Frequency Sync—1 MHz to 10 MHz synchronization.

TV Sync—TV frame or line.

Slope—Plus or minus.

Sources—Internal or external.

Cathode-Ray Tube

5-inch flat-faced CRT operating at 2.4-kV accelerating potential. Viewing area 10 cm vertical by 10 cm horizontal. P31 phosphor normally supplied, P7 optional. A detachable green filter improves contrast under high ambient light conditions.

Voltage Calibrator

Line frequency square wave, 0.5 V \pm 2% peak to peak.

Rear Connectors

Sweep output, Z-axis modulation to CRT, horizontal amplifier input.

Power Requirements

Wired for 115-V operation—For best performance, rear-panel quick-change connections to the transformer taps should be set to the voltage settings most nearly corresponding to the actual line voltage. Voltage settings are 100, 105, 110, 115, 120, 125, 200, 210, 220, 230, 240, 250 V. 50 to 400 Hz line frequency, 90 VA.

Convection Cooling

Dimensions and Weights

Height	9 1/4 in
Width	8 1/2 in
Depth	15 in
Net Weight	24 lb
Shipping weight	31 lb

Included Standard Accessories

Instruction manual (070-0793-00); two coax reducers (102-0001-00); two UHF coax connectors (131-0058-00).

Type S52, order TLS52 .. \$440
Optional Probe

10X Passive Probe, UHF,
order 010-0234-00 \$ 9.50

Viewing Hood,
order 016-0251-00 12.75

U.S. Sales Prices FOB Beaverton, Oregon



S54 & RS54

Solid-State Design

6 cm x 10 cm Viewing Area

Flat-Face Rectangular CRT

Small Size and Light Weight

DC-10 MHz Bandwidth

Versatile Triggering Including TV Line and Frame Sync

DC-Coupled Horizontal Amplifier

5 1/4-inch Rackmount Available



General Description and Characteristics

Vertical Amplifier

Bandwidth and Risetime—DC to 10 MHz (approx 3-dB down), 35-ns risetime, in 100 mV/cm to 50 V/cm range (X1). DC to 4 MHz (approx 3-dB down), 90-ns risetime, in 10 mV/cm to 5 V/cm range (X10). Input can be AC or DC coupled. 2 Hz approx low frequency 3-dB point when AC coupled.

Deflection Factor—100 mV/cm to 50 V/cm or 10 mV/cm to 5 V/cm in 9 calibrated steps (1-2-5 sequence), attenuators accurate within 5%. Uncalibrated, continuously variable between steps to 125 V/cm max. Front panel control selects (X1 or X10) appropriate range.

Maximum Deflection—6 cm up to 5 MHz, decreasing to 3 cm at 10 MHz.

Input RC—1 megohm paralleled by approx 47 pF.

Maximum Input Voltage—400 V DC when AC coupled.

Time Base

Sweep Rates—200 ns/cm to 2 s/cm in 22 calibrated steps (1-2-5 sequence). Uncalibrated, continuously variable between steps and to 5 s/cm.

Horizontal Expansion—Uncalibrated to max of approx X5, increasing sweep rate to approx 40 ns/cm.

Horizontal Amplifier—DC to 750 kHz (approx 3-dB down) 0.6 V/cm to 3 V/cm deflection factor. Input impedance 1 megohm paralleled by approx 30 pF.

Triggering

Automatic—Triggers on any signal over a frequency range of approx 50 Hz to 1 MHz.

Trigger Level Selection—Triggering occurs at any point on the input waveform over a frequency range of approx 10 Hz to 3 MHz.

High Frequency Sync—Synchronizes the sweep over a frequency range of approx 1 MHz to 25 MHz.

TV Sync—Triggers on TV frame or line.

Slope—Plus or minus.

Requirements—Internal, 2 mm deflection; external, 1.5 V peak to peak up to 400 V peak to peak.

Cathode-Ray Tube

5 inch flat-faced rectangular CRT operating at 4 kV accelerating potential. Viewing area 6 cm vertical by 10 cm horizontal. P31 phosphor normally supplied. Z-axis modulation to grid of CRT requires approx 20 V. Variable-intensity illuminated graticule.

Voltage Calibrator

Line-frequency square wave, 0.5 V \pm 2% peak to peak.

Front Panel Connectors

Sawtooth Out—1-35 V DC coupled, 30 k Ω minimum load.

Probe Test—5 V peak to peak.

Power Requirements

Wired for 115-V operation—For best performance rear-panel quick-change connections to the transformer taps should be set to the voltage settings most nearly corresponding to the actual line voltage. Voltage settings are 100, 105, 110, 115, 120, 125, 200, 210, 220, 230, 240, 250 V. 48 to 440 Hz line frequency, 30 VA.

Convection Cooling Dimensions and Weights

Height	9 1/4 in
Width	6 3/4 in
Depth	16 1/4 in
Net Weight	17 lb
Shipping Weight	24 lb

Included Standard Accessories

Instruction manual (070-0794-00); coax BNC connector (131-0125-00).

Type S54, order TLS54 . . \$350

Rack Mount Oscilloscope

The Type RS54 Oscilloscope is a rack mount version of the Type S54. Characteristics of the rack model are the same as those of the cabinet model.

Dimensions and Weights

Height	5 1/4 in
Width	19 in
Depth	17 1/2 in
Net Weight	22 lb
Shipping Weight	30 lb

Type RS54 Rack Mount, order TLRS54 \$400

Optional BNC Probe

10X Passive Probe, BNC, order 010-0233-00 \$9.50

U.S. Sales Prices FOB Beaverton, Oregon



D52

Double Beams

DC-6 MHz Bandwidth

6 cm x 10 cm Viewing Area

Flat-Face CRT

Versatile Triggering Including TV Line and Frame Sync

5% Timing Accuracy

Twin 10 mV (At 1 MHz) Vertical Amplifiers



General Description and Characteristics

Vertical Amplifiers

Bandwidth—DC to 6 MHz (approx 3-dB down) in 100 mV/cm to 50 V/cm range (X1). DC to 1 MHz (approx 3-dB down) in 10 mV/cm to 5 V/cm range (X10). Input can be AC or DC coupled.

Deflection Factor—100 mV/cm to 50 V/cm or 10 mV/cm to 5 V/cm in 9 calibrated steps (1-2-5 sequence), attenuators accurate within 5%. Front panel control selects (X1 or X10) appropriate range.

Overshoot—Less than 2%.

Input RC—1 megohm paralleled by approx 44 pF.

Maximum Deflection—6 cm for each trace.

Time Base

Sweep Rates—1 μ s/cm to 500 ms/cm in 18 calibrated steps (1-2-5 sequence), accurate within 5%. Uncalibrated, continuously variable between steps.

Horizontal Expansion—Approx X10, continuously variable. Trace expands symmetrically from center of screen. Any portion of expanded trace positionable on screen.

Amplifier Bandwidth—10 Hz to 400 kHz (approx 3-dB down).

Triggering

Automatic—Sweep free runs at a low speed in the absence of a signal but triggers on any signal up to approx 1 MHz.

Trigger Level Selection—Triggering occurs at any point on the input waveform.

High Frequency Sync—1 MHz to 10 MHz synchronization.

TV Sync—TV frame or line.

Slope—Plus or minus.

Sources—Internal from either vertical amplifier or external.

Cathode-Ray Tube

5-inch flat-faced CRT operating at 3.6-kV accelerating potential, single gun with beam splitter plate forms 2 electron beams, common horizontal deflection plates, separate vertical deflection plates. Viewing area 6 cm vertical by 10 cm horizontal. P31 phosphor normally supplied, P7 optional. A detachable green filter improves contrast under high ambient light conditions.

Voltage Calibrator

Line frequency square wave, 0.5 V \pm 2%, peak to peak.

Rear Connectors

Sweep output, Z-axis modulation to CRT, horizontal amplifier input.

Power Requirements

Wired for 115-V operation—For best performance, rear-panel quick-change connections to the transformer taps should be set to the voltage settings and most nearly corresponding to the actual line voltage. Voltage settings are 100, 105, 110, 115, 120, 125, 200, 210, 220, 230, 240, 250 V. 50 to 400 Hz line frequency, 90 VA.

Convection Cooling

Dimensions and Weights

Height	9 1/4 in
Width	8 1/2 in
Depth	15 in
Net weight	24 lb
Shipping weight	31 lb

Included Standard Accessories

Instruction manual (070-0793-00); two coax reducers (102-0001-00); two UHF coax connectors (131-0058-00).

Type D52, order TLD52 . . . \$360

Optional Probe

10X Passive Probe, UHF, order 010-0234-00 \$ 9.50
Viewing Hood, order 016-0251-00 12.75

U.S. Sales Prices FOB Beaverton, Oregon



D56

Dual Beam

DC-15 MHz Bandwidth

Two Independent Time Bases

Sweep Delay

Versatile Triggering Including
TV Line and Frame Sync

TV Monitor Line Marker

6 cm x 10 cm Display Area For
Each Beam (4 cm Overlap)

Flat-Face CRT

DC Coupled X Amplifier

ers on upper trace useful for risetime measurements.

Cathode-Ray Tube

5-inch flat-faced dual-gun CRT with separate deflection systems operating at 6 kV accelerating potential. Viewing area is 6 cm by 10 cm per trace, 4 cm overlap. P31 phosphor normally supplied, P7 optional. Variable illumination graticule.

Rear Connectors

Z-axis Input—To upper trace CRT grid. (0.01 μ f and 10 k Ω)

Convection Cooling

Voltage Calibrator

Line-frequency square wave, 0.5 V \pm 2% peak to peak.

Power Requirements

Wired for 115-V operation—For best performance, rear-panel quick-change connections to the transformer taps should be set to the voltage settings most nearly corresponding to the actual line voltage. Voltage settings are 90, 100, 105, 110, 115, 120, 130, 200, 210, 215, 220, 225, 230, 240 V. 48 to 440 Hz line frequency, 375 VA.

Dimensions and Weights

Height	17 in
Width	10 in
Depth	20 in
Net weight	59 lb
Shipping weight	74 lb

Included Standard Accessories

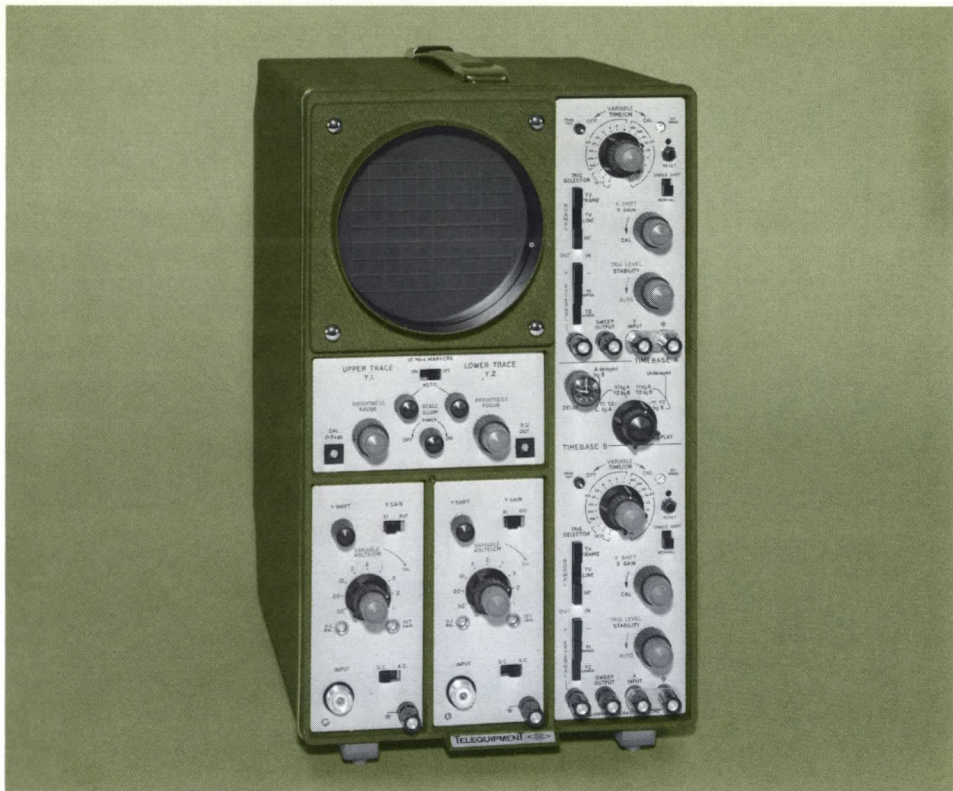
Instruction manual (070-0796-00); two coax reducers (102-0001-00); two UHF coax connectors (131-0058-00); plastic dust cover (016-0252-00).

Type D56, order TLD56 . \$1075

Optional Probe

10X Passive Probe, UHF,
order 010-0234-00 \$9.50

U.S. Sales Prices FOB Beaverton, Oregon



General Description and Characteristics

Vertical Amplifiers

Bandwidth—DC to 15 MHz (3-dB down) in 100 mV/cm to 50 V/cm range (X1). DC to 500 kHz in 10 mV/cm to 5 V/cm range (X10). Input can be AC or DC coupled.

Deflection Factor—100 mV/cm to 50 V/cm or 10 mV/cm to 5 V/cm in 9 calibrated steps (1-2-5 sequence), attenuator accuracy within 5%. Front panel control selects (X1 or X10) appropriate range. Uncalibrated, continuously variable deflection factor between steps.

Overshoot—less than 2%.

Maximum Deflection—6 cm.

Input RC—1 megohm paralleled by approx 40 pF.

Horizontal Amplifiers

Deflection Factor—Uncalibrated, continuously variable from 100 mV/cm to 1 V/cm.

Bandwidth—DC to 500 kHz (approx 3-dB down).

Input RC—1 megohm paralleled by approx 30 pF.

Horizontal Positioning—Positions any portion of expanded trace on screen.

Time Bases

A and B Sweep Rates—0.5 μ s/cm to 5 s/cm in 22 calibrated steps (1-2-5 sequence), accurate within 5%. Uncalibrated, continuously variable between steps.

Horizontal Expansion—Approx X5, continuously variable.

Sweep Outputs—Approx 50 V saw-tooth, AC coupled.

Modes

Undelayed—In position "Y1 Y2 by B" both Y1 and Y2 are swept by Time Base B. In position "Y1 by A, Y2 by B" the upper trace is swept by Time Base A, the lower trace is swept by Time Base B, giving two independent deflection systems.

A Delayed by B—In position "Y1 Y2 by A" two independent but time related signals may be simultaneously viewed with a maximum delay equal to the B sweep. In position "Y1 by A, Y2 by B" with the same signal connected to both Y inputs, Y2 signal will be displayed by B sweep with an intensified portion corresponding to A sweep, starting at a selectable point. Y1 signal will be displayed by A sweep after the delay interval and effectively expanded.

Triggering Amplifiers

Automatic—Triggers on any signal up to approx 1 MHz.

High Frequency Sync—Synchronizes sweep from 1 MHz to 12 MHz.

TV Sync—Triggers from TV line or frame.

Slope—Plus or minus.

Single Sweep

Source—Internal from either trace for both Time Base A and B and external.

Markers

TV Line Marker—A 0.5-V gate output from Time Base A useful for line identification in a video monitor.

Marker Pips—Internal 10-MHz mark-

S43

DC-25 MHz Bandwidth

Plug-In Versatility

6 cm x 8 cm Display Area

Flat-Face CRT

Versatile Triggering Including TV Line and Frame Sync



General Description and Characteristics

Vertical Amplifier

Interchangeable Plug-In Units—Five amplifier units are available for a variety of applications. See page 14.

Horizontal Amplifier

Deflection Factor—Uncalibrated, continuously variable from 250 mV/cm to 2.5 V/cm. 1 to 25 V input voltage.

Bandwidth—10 Hz to 400 kHz (approx 3-dB down).

Input RC—170 kilohm paralleled by approx 30 pF.

Horizontal Expansion—Uncalibrated, continuously variable gain control magnifies horizontal axis up to approx 10 screen diameters, symmetrically about center of screen. Any portion of expanded trace positionable on screen.

Time Base

Sweep Rates—1 μ s/cm to 0.5 s/cm in 18 calibrated steps (1-2-5 sequence), accurate within 5%. Uncalibrated, continuously variable between steps.

Triggering

Automatic—Sweep free runs at approx 40 Hz in absence of an input signal but triggers internal on 5 mm of deflection or 0.5 V external between 50 Hz and 1 MHz.

Trigger Level Selection—Triggering occurs at any level on the waveform.

HF Sync—Synchronizes to input signals from 1 MHz to 12 MHz.

TV Sync—Triggers at TV frame or line rates.

Sources—Internal, external.

Slope—Plus or minus.

Cathode-Ray Tube

4-inch flat-faced CRT operating at 3.5 kV accelerating potential. Viewing area 6 cm vertical by 8 cm horizontal. P31 phosphor normally supplied. Variable illuminated graticule.

Voltage Calibrator

Line Frequency square wave, 1 V \pm 2% peak to peak.

Power Requirements

Wired for 115-V operation. For best performance, rear-panel quick-change connections to the transformer taps should be set to the voltage setting most nearly corresponding to the actual line voltage. Voltage settings are 90, 100, 105, 110, 115, 120, 130, 200, 210, 215, 220, 225, 230, 240 V. 50 to 400 Hz line frequency, 100 VA.

Convection Cooling

Dimensions and Weights

Height	10 1/2 in
Width	8 1/4 in
Depth	19 in
Net weight	28 lb
Shipping weight	31 lb

Included Standard Accessory

Instruction manual (070-0795-00).

Type S43 Oscilloscope with Type TS41 Time Base Unit, order TLS43 \$300

OPTIONAL TIME BASE

An optional time base for the Type S43 Oscilloscope provides wider ranges of sweep rates, improved horizontal amplifier performance, and facilities for single sweeps. All other characteristics remain as described with the standard time base.

Time Base

Sweep Rates—0.5 μ s/cm to 5 s/cm in 22 calibrated steps (1-2-5 sequence), accurate within 5%. Uncalibrated, continuously variable between steps.

Horizontal Amplifier

Deflection Factor—Uncalibrated, continuously variable from 100 mV/cm to 1 V/cm.

Bandwidth—DC to 500 kHz (approx 3-dB down).

Triggering

Same as TS41 with addition of single sweep with sweep lockout and front-panel indicator of armed trigger.

Type S43 Oscilloscope with Type TS42 Time Base unit, order TLS43T \$335

Optional Accessories

10X Passive Probe, UHF, order 010-0234-00 \$ 9.50

Viewing Hood, order 016-0250-00 16.50

Plug-In Extension Cable, order 012-0126-00 14.50

U.S. Sales Prices FOB Beaverton, Oregon



D43 and RD43

Dual Beam

DC-25 MHz Bandwidth

Plug-In Versatility

6 cm x 10 cm Display Area

Flat-Face CRT

Versatile Triggering Including TV Line and Frame Sync



D43T



General Description and Characteristics

The Type D43 Oscilloscope is a dual-beam instrument and has characteristics similar to the Type S43 Oscilloscope. The characteristics different from the Type S43 are indicated.

Vertical Amplifiers

Interchangeable Plug-In Units—Two units are required for oscilloscope operation. See page 14 for complete characteristics.

Triggering

Sources—Internal from either trace and external.

Cathode-Ray Tube

4-inch flat-faced CRT operating at 4 kV accelerating potential. Viewing area 6 cm vertical by 8 cm horizontal, 4-cm overlap. P31 phosphor normally supplied, P7 optional. Variable illuminated graticule.

Power Requirements

Wired for 115-V operation. For best performance, rear-panel quick-change connections to the transformer taps should be set to the voltage setting most nearly corresponding to the actual line voltage. Voltage settings are 90, 100, 105, 110, 115, 120, 130, 200, 210, 215, 220, 225, 230, 240 V. 50 to 400 Hz line frequency, 132 VA.

Dimensions and Weights

Height	13 in
Width	8 1/4 in
Depth	19 in
Net weight	36 lb
Shipping weight	56 lb

Included Standard Accessory

Instruction manual (070-0795-00).

Type D43 Oscilloscope with Type TD41 Time Base Unit, order TLD43 **\$340**

Optional Accessories

10X Passive Probe, UHF, order 010-0234-00	\$ 9.50
Viewing Hood, order 016-0250-00	16.50
Plug-In Extension Cable, order 012-0126-00	14.50

OPTIONAL TIME BASE

An optional time base, Type TD42, for the Type D43 Oscilloscope provides wider ranges of sweep rates, improved horizontal amplifier performance, and facilities for single sweeps. All other characteristics remain the same. See Type S43 description for complete characteristics.

Type D43 Oscilloscope with Type TD42 Time Base Unit, order TLD43T **\$375**

Rack Mount Oscilloscope

The Type RD43 Oscilloscope is a rack mount version of the Type D43 and is available with the standard time base unit or the Type TD42 unit. Characteristics of the rack mount model are the same as those of the cabinet models.

Dimensions and Weights

Height	7 in
Width	19 in
Depth	16 in
Net weight	38 lb
Shipping weight	45 lb

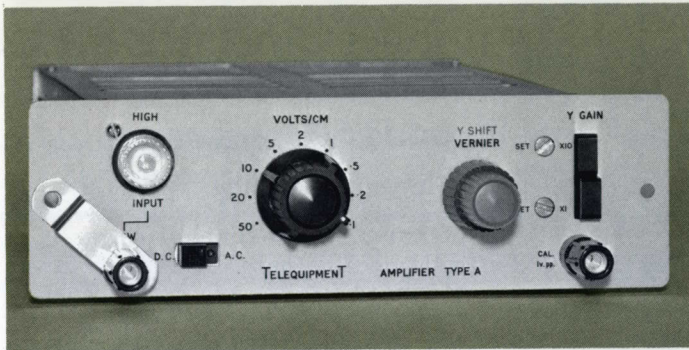
Type RD43 Oscilloscope with TD41 Time Base Unit, order TLRD43 **\$340**

Type RD43 Oscilloscope with TD42 Time Base Unit, order TLRD43T **\$375**

U.S. Sales Prices FOB Beaverton, Oregon

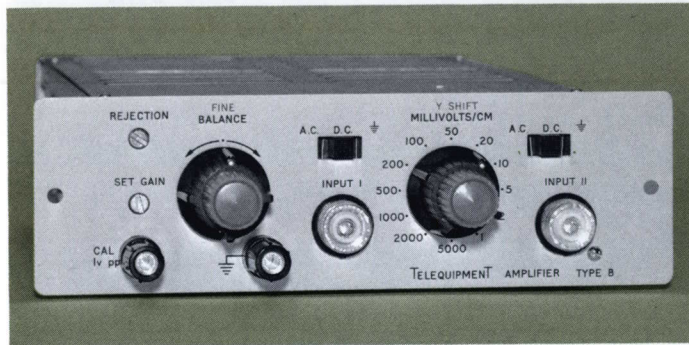
CHARACTERISTICS OF PLUG-IN VERTICAL AMPLIFIERS

For S43, S43T, D43, D43T, RD43, RD43T and D53 MAIN FRAMES



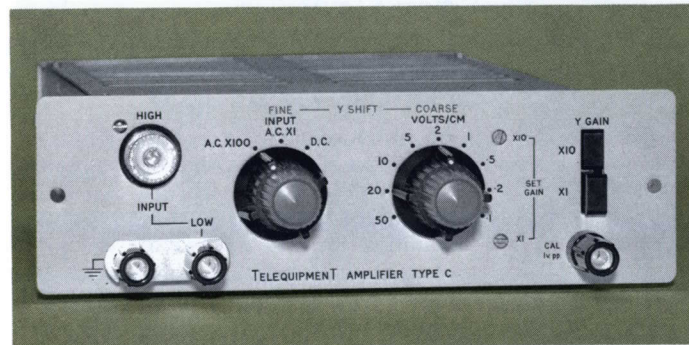
TYPE 'A' General Purpose Amplifier

BANDWIDTH & DEFLECTION FACTOR—DC—15 MHz (approx -3 dB) 100 mV to 50 V/cm.
 DC—0.8 MHz (approx -3 dB) 10 mV/cm to 5 V/cm.
 INPUT RC—1 M Ω in parallel with approx 40 pF.
 ATTENUATOR—Frequency Compensated. Calibrated volts/cm. 9 position 1, 2, 5, sequence. Accuracy $\pm 5\%$.
 NET WEIGHT 3 lb SHIPPING WEIGHT 4 lb
 Type 'A' Amplifier, order TLA \$75



TYPE 'B' Differential Amplifier

BANDWIDTH—DC—75 kHz (approx -3 dB)
 DEFLECTION FACTOR—1 mV/cm—5 V/cm.
 COMMON MODE REJECTION RATIO—10,000:1 from DC to 1 kHz reducing to 1,000:1 at 75 kHz on 1 to 50 mV/cm ranges. On 100 mV/cm—5 V/cm ranges 1,000:1 DC to 1 kHz reducing to 100:1 at 10 kHz.
 MAXIMUM IN-PHASE INPUT—5 V P to P (1—50 mV ranges.)
 STABILITY—Normal drift approximately 5 mV/hour.
 INPUT RC—1 M Ω in parallel with approx 40 pF.
 ATTENUATOR—Frequency Compensated. Calibrated volts/cm. 12 position 1, 2, 5 sequence. Accuracy $\pm 5\%$.
 NET WEIGHT 5 lb SHIPPING WEIGHT 6 lb
 Type 'B' Amplifier, order TLB \$120



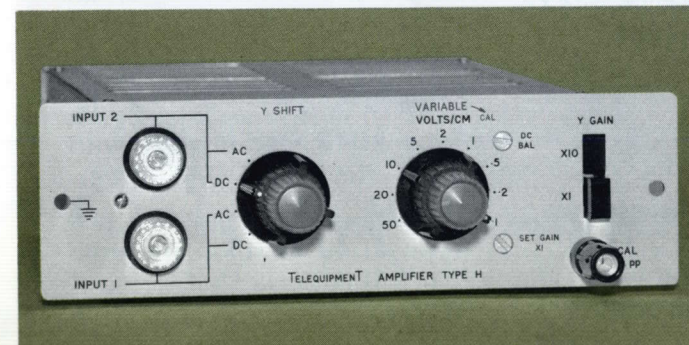
TYPE 'C' Ultra-High Gain Amplifier

BANDWIDTH & DEFLECTION FACTOR—DC—15 MHz (approx -3 dB) 100 mV/cm—50 V/cm.
 DC—0.8 MHz (approx -3 dB) 10 mV/cm—5 V/cm.
 2 Hz—75 kHz (approx -3 dB) 100 μ V/cm—50 mV/cm.
 TOTAL HUM AND NOISE—At max sensitivity, with input short circuited, approximately 30 μ V.
 INPUT RC—1 M Ω in parallel with approx 40 pF.
 ATTENUATOR—Frequency Compensated. Calibrated volts/cm. 9 position 1, 2, 5, sequence. Accuracy $\pm 5\%$.
 NET WEIGHT 4 lb SHIPPING WEIGHT 5 lb
 Type 'C' Amplifier, order TLC \$100



TYPE 'G' General Purpose Differential

BANDWIDTH & DEFLECTION FACTOR—DC—10 MHz (approx -3 dB) from 20 mV/cm to 10 V/cm and DC—500 kHz (approx -3 dB) from 2 mV/cm to 1 V/cm.
 COMMON MODE REJECTION RATIO—1,000:1 frequencies up to 1 MHz falling to 50:1 at 10 MHz (sine wave input).
 MAXIMUM INPUT—5 V P to P in 2 mV/cm and 20 mV/cm positions.
 INPUT RC—1 M Ω in parallel with approx 40 pF.
 ATTENUATOR—Frequency Compensated. Calibrated volts/cm. 9 position 1, 2, 5, sequence. Accuracy $\pm 5\%$.
 NET WEIGHT 3 lb SHIPPING WEIGHT 4 lb
 Type 'G' Amplifier, order TLG \$85



TYPE 'H' Wideband Amplifier

BANDWIDTH & DEFLECTION FACTOR—DC—25 MHz (approx -3 dB) from 100 mV/cm to 50 V/cm.
 DC—5 MHz (approx -3 dB) from 10 mV/cm to 5 V/cm. A control provides continuous variation of gain between fixed step attenuator positions on both ranges.
 INPUT RC—1 M Ω in parallel with approx 40 pF.
 ISOLATION—60-dB between inputs.
 ATTENUATOR—Frequency compensated. Calibrated volts/cm. 9 position 1, 2, 5, sequence. Accuracy $\pm 5\%$.
 NET WEIGHT 4 lb SHIPPING WEIGHT 5 lb
 Type 'H' Amplifier, order TLH \$120

Included Standard Accessories for Types 'A' and 'C': coax reducer (102-0001-00); UHF coax connector (103-0058-00); for Types 'B', 'G', 'H': two each of the above.

U.S. Sales Prices FOB Beaverton, Oregon



D53/CD/HD-2

DC-25 MHz Bandwidth

Double Beams

Sweep Delay

Plug-In Versatility

Signal Delay Lines

8 cm x 10 cm Viewing Area

Flat-Face Rectangular CRT

Versatile Triggering Including
TV Line and Frame Sync

Single Shot

Rear Connectors

Z-axis Input—To upper trace CRT grid.
(0.01 μ f and 10 k Ω)

Power Requirements

Wired for 115-V operation. For best performance, rear-panel quick-change connections to the transformer taps should be set to the voltage setting most nearly corresponding to the actual line voltage. Voltage settings are 100, 105, 110, 115, 120, 125, 200, 210, 220, 230, 240, 250 V. 50 to 400 Hz line frequency, 200 VA.

Convection Cooling Voltage Calibrator

Line frequency square wave, 1 V peak to peak.

Dimensions and Weights

Height	10 $\frac{3}{4}$ in
Width	11 $\frac{3}{8}$ in
Depth	19 in
Net weight	52 lb
Shipping weight	56 lb

Included Standard Accessory

Instruction manual (070-0798-00).

Type D53 Oscilloscope, order TLD53 \$640

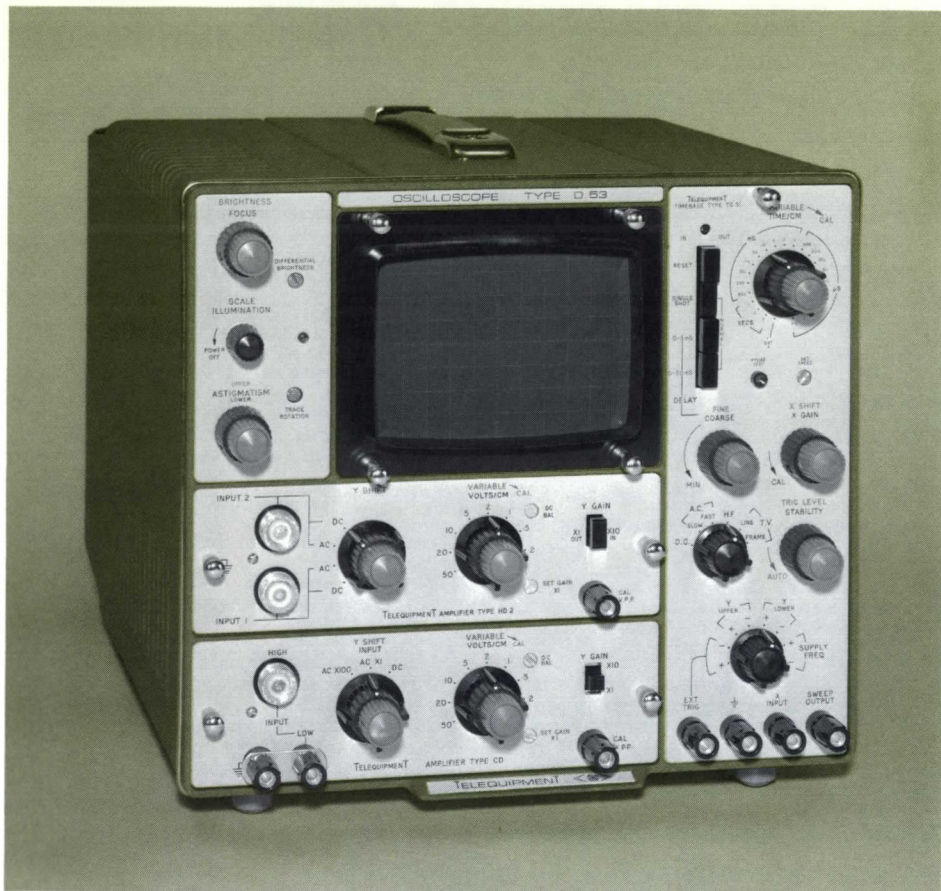
Type CD High-Gain Amplifier, order TLCD \$100

Type HD-2 Wide-Band Amplifier, order TLHD2 \$120

Optional Probe

10X Passive Probe, UHF,
order 010-0234-00 \$ 9.50
Viewing Hood,
order 016-0251-00 12.75

U.S. Sales Prices FOB Beaverton, Oregon



General Description and Characteristics

Vertical Amplifiers

Interchangeable Plug-In Units—The Type D53 accepts the five amplifier units used with the S43 and D43 Oscilloscopes, and accepts two additional amplifier units. The Type CD is the same as the Type C, except signal delay of 0.2 μ s is automatically connected when amplifier is inserted and a variable V/cm control is provided. Maximum vertical deflection is 6 cm. The Type HD-2 is the same as the Type H, except signal delay of 0.2 μ s is incorporated in the amplifier.

Horizontal Amplifier

Deflection Factor—Uncalibrated, continuously variable from 500 mV/cm to 5 V/cm.

Bandwidth—DC to 1 MHz (approx 3-dB down).

Horizontal Expansion—Uncalibrated, continuously variable gain control expands horizontal axis up to approx 10 screen diameters, symmetrically about center of screen. Horizontal positioning any part of trace on screen.

Time Base

Sweep Rates—0.5 μ s/cm to 5 s/cm in 22 calibrated steps (1-2-5 sequence), accurate within 5%. Uncalibrated, continuously variable between steps.

Single-shot facility with sweep lock-out is provided. A light indicates when time base is armed. Delay ranges up to 5 ms or 50 ms, uncalibrated, continuously variable.

Triggering

Automatic—Sweep free runs at approx 40 Hz in absence of an input signal but triggers on 5 mm of deflection or 0.5-V external between 50 Hz and 1 MHz.

Trigger Level Selection—Triggering occurs at any level selected on the input waveform.

HF Sync—Synchronizes to input signals from approx 1 MHz to approx 25 MHz.
DC—Permits triggering from pre-selected DC level.

AC Slow—Removes DC components.
AC Fast—Removes low-frequency components.

TV Sync—Triggers at TV frame or line rates.

Sources—Internal from either trace, external and line.

Slope—Plus or minus.

Cathode-Ray Tube

Rectangular flat-face, mesh CRT operating at 9 kV accelerating potential. Viewing area 8 cm vertical by 10 cm horizontal. P31 phosphor normally supplied. Variable illuminated graticule.

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