



The worlds finest low cost oscilloscopes

Telequipment was founded as a company in 1953 by a small group of dedicated engineers, determined to bring some original ideas to the development of the oscilloscope, then still in its infancy.

During the ensuing years the Company concentrated its efforts on the low cost area of the market with considerable success, incorporating into its products many of the technical features previously found only in the most expensive instruments. By 1966 it had become the largest U.K. oscilloscope manufacturer and the world leader in the low cost oscilloscope field.

At this point in its history, Telequipment became part of the renowned Tektronix group, a unique combination of engineering and marketing expertise which led to the present product line of products with exceptional performance and versatility. Telequipment products have maintained their separate and individual identity, continuing the policy of providing the advanced technical features of the more costly laboratory instruments yet at prices low enough to bring them within the reach of the most modest budget.

Telequipment products continue to find wide and growing acceptance in every field of application. In Education, the combination of large screen and simple controls provides the student, and lecturer, with an easy-to-use instrument particularly well suited to their needs.

For the Service Engineer there are a number of portable, rugged oscilloscopes from a simple single trace, battery operated instrument small enough to be carried in the brief case, to a sophisticated 50MHz dual trace dual sweep oscilloscope which will meet the exacting demands of computer servicing. Between these extremes there is a range of general purpose instruments for research departments, production testing, mechanical engineering, etc. In every case Telequipment oscilloscopes can be relied upon to provide the high quality and value demanded by today's technology.

All Telequipment products have a warranty covering parts and workmanship for a period of one year, and as part of the Tektronix group, are supported by a world-wide sales and service organisation. There are fully equipped service centres staffed with highly qualified engineers in more than 50 countries, a fact which has contributed substantially to the Company's rapid growth and acceptance by more than 75,000 customers around the world.

The choice is yours...



Oscilloscope	Special Features	Bandwidth	Vertical Sensitivity	No. of traces	Rise Time (approx.)	Sweep range and accuracy	Bandwidth X input	Viewing Area (approx.)	Accelerating potential	Page
S22	Battery/Mains portable	5 MHz 1 MHz	10 mV/div-5 V/div 1 mV/div-0.5 V/div	1	70 ns	$300 \text{ ms/div-1 } \mu\text{s/div}$ $\pm 5\%$ (to 100 ns/div at $\pm 10\%$)	_	$6 \times 10 \text{ div}$ (1 div=0.6 cm)	1.25 kV	12
D1010 D1011	Mains portable	10 MHz	5 mV/div-20 V/div. 1 mV/div at 4 MHz.		35 ns	$0.2 \mathrm{s/div}$ to $200 \mathrm{ns/div}$ $\pm 5 \%$ (to $40 \mathrm{ns/div}$ at $\pm 7 \%$)	2 MHz	$8 \times 10 \text{div}$ (1 div=1 cm)	1.8 kV	6
D32	Battery/Mains portable	10 MHz	$10 \mathrm{mV/div}$ -5 V/div	1 or 2	35 ns	0.5 s/div-500 ns/div ±5% (to 100 ns/div at ±10%)		$8 \times 10 \text{ div}$ (1 div=0.7 cm)	3 kV	10
DM64	Dual trace storage oscilloscope	10 MHz 8 MHz	10 mV/div-50 V/div 1 mV/div-5 V/div	1 or 2	35 ns	2 s/div-100 ns/div $\pm 5 \%$ (to 100 ns/div at $\pm 8 \%$)	1 MHz	$8 \times 10 \text{ div}$ (1 div = 1 cm)	3.5 kV	18
D1015 D1016	Mains portable	15 MHz	$5 \mathrm{mV/div}$ - $20 \mathrm{V/div}$. $1 \mathrm{mV/div}$ at $4 \mathrm{MHz}$.		24 ns	$0.2 \mathrm{s/div}$ to $200 \mathrm{ns/div}$ $\pm 5\%$ (to $40 \mathrm{ns/div}$ at $\pm 7\%$)	2 MHz	$8 \times 10 \text{ div}$ (1 div=1 cm)	1.8 kV	4
D34	Battery/Mains portable	15 MHz	2 mV/div- 5 V/div	1 or 2	24 ns	$0.2 \mathrm{s/div}$ -500 ns/div $\pm 5 \%$ (to 40 ns/div at $\pm 10 \%$)		$8 \times 10 \text{ div} $ (1 div=0.65 cm)	9.5 kV	8
D63/DM63	Dual beam, with plug-in amplifiers Storage on DM63	15 MHz 12 MHz	$5 \mathrm{mV/div}$ - $20 \mathrm{V/div}$ $1 \mathrm{mV/div}$ - $4 \mathrm{V/div}$	1, 2, 3 or 4	24 ns	$1 ext{ s/div-200 ns/div} \ \pm 3\% \ (ext{to 40 ns/div at } \pm 5\%)$	l MHz	$8 \times 10 \text{ div}$ (1 div=0.9 cm)	8 kV	20
D66A	Dual trace	25 MHz 15 MHz	10 mV/div-50 V/div 1 mV/div-5 V/div	1 or 2	14 ns 24 ns	$2 \mathrm{s/div}$ -100 ns/div $\pm 5 \%$ (to 20 ns/div at $\pm 7 \%$)	1 MHz	$8 \times 10 \text{ div}$ $(1 \text{ div} = 1 \text{ cm})$	$10\mathrm{kV}$	16
D67A	Dual trace, dual time base	25 MHz 15 MHz	10 mV/div-50 V/div 1 mV/div-5 V/div	1 or 2	14 ns	$2 \mathrm{s/div}$ -200 ns/div $\pm 3 \%$ (to 40 ns/div at $\pm 5 \%$)	l MHz	$8 \times 10 \text{ div}$ $(1 \text{ div} = 1 \text{ cm})$	10 kV	14
D75	Dual trace, dual time base, portable	50 MHz e 15 MHz	5 mV/div-20 V/div 1 mV/div-4 V/div	1 or 2	7 ns 24 ns	$2 \mathrm{s/div}$ -100 ns/div $\pm 3 \%$ (to 10 ns/div at $\pm 6 \%$)	1 MHz	$8 \times 10 \mathrm{div}$ $(1 \mathrm{div} = 1 \mathrm{cm})$	15 kV	22
D83	Mainframe, for use with plug-in amplifiers and time bases	50 MHz 15 MHz	5 mV/div-20 V/div 1 mV/div-4 V/div	1 or 2	7 ns 24 ns	$2 \text{ s/div-100 ns/div } \pm 3\%$ (to 10 ns/div at $\pm 6\%$)	1 MHz	$8 \times 10 \text{ div}$ (1 div=1.22 cm)	15 kV	24
Plug-in Units for D63/DM63 and D83			Vertical amplifiers – Television amplifier Timebases – S1A , S	-TV1	7					26–29
CT71	Semiconductor curve tracer									30
Optional Accessories	curve tracer	5			· ·					32

The company reserves the right to depart from specifications in the light of continuing development.

D1015/D1016

15MHz Dual-trace

Oscilloscopes

The Telequipment 1000 series represents a logical step in the evolution of low-cost oscilloscopes. Extensive engineering and marketing research have culminated in a completely new design which allows a basic configuration of modules to cover the wide range of performances needed in general purpose instruments.

The D1015 covers the DC to 15 MHz bandwidth in single and dual-trace modes, the D1016 has additional vertical and horizontal features.



GENERAL DESCRIPTION

The D1015 is a dual-trace 15MHz oscilloscope with a single time base, for use on A.C. mains. The D1016 has the same basic specification, with the addition of Channel 2 Invert, Algebraic Add, X-Y mode and X5 vertical gain (at 4MHz bandwidth) in the vertical system, and an uncalibrated variable sweep speed control on the time base.

Shown in red. The additional specification for the 1016.

VERTICAL SYSTEM

Two input channels

Bandwidth:

DC coupled DC to $15 \mathrm{MHz}$ ($-3 \mathrm{dB}$) AC coupled $8 \mathrm{Hz}$ to $15 \mathrm{MHz}$ ($-3 \mathrm{dB}$) Rise time: $24 \mathrm{ns}$

Deflection Factors:

5 mV/div to 20 V/div in 12 calibrated steps.

(1-2-5 sequence)

 $A \times 5$ gain switch extends each amplifier sensitivity to 1mV | div at a bandwidth of DC to 4MHz (-3dB)

Maximum Scan:

Amplitude 8 divs (6 divs at 15MHz)

Voltage Measurement Accuracy: $\pm 5\%$

Input Impedance:

 $1M\Omega + 45pF$ (approx.)

Input Conditions:

Switched choice of DC, AC or ground. The third position grounds the input of the attenuator but not the signal input.

Maximum Input Voltage:

500V DC or AC peak

Operating Modes:

Channel 2 only. Channels 1 and 2 chopped or alternated.

The Alternate/Chop mode is selected by the Secs/div switch.

(Chop mode from 0.2s/div to 2ms/div and alternate from 1ms/div to 0.2 µs/div)

ADD CH1 and CH2 are algebraically added and an invert switch is available for CH2

X-YCH2 is the vertical input and CH1 becomes the horizontal input.

Bandwidth is DC to 2MHz (—3dB)

Phase error less than 3° at 100kHz.

HORIZONTAL SYSTEM

Sweep Speeds:

0.2s/div to $0.2\mu s/div$ in 19 calibrated steps.

(1-2-5 sequence)

 $A \times 5$ magnifier provides maximum sweep speeds of 40 ns/div.

A variable uncalibrated control provides continuous coverage between stepped ranges extending the slowest sweep range to 0.5s/div.

Time Measurement Accuracy:

Normal $\pm 5\%$ $\times 5 \pm 7\%$ (approx.)

TRIGGERING

Bandwidth:

15MHz on both Auto and Normal positions.

TV Triggers at field rate from 0.2s/div to $100 \mu s/div$ and line rate from $50 \mu s/div$ to $0.2 \mu s/div$.

Sources:

Internal channel 2
External
Line

Sensitivity:

Internal 0.5 div External 0.5 V (approx.)

Polarity:

Positive or negative

Trigger Level:

Variable control selects virtually any point of the positive or negative slope of the input signal. This control is inoperative in the TV position.

EXTERNAL X

Bandwidth:

DC coupled DC to 2MHz (-3dB) AC coupled 10Hz to 2MHz (-3dB)

Sensitivity: 1V/div (approx.)

Input Impedance:

 $280 \text{k}\Omega + 30 \text{pF} \text{ (approx.)}$

C.R.T.

Display Area:

 $8 \text{ divs} \times 10 \text{ divs} (1 \text{ div} = 1 \text{cm})$

Phosphor: P31

Accelerating Potential: 1.8kV

Z Modulation:

 $15\mathrm{V}$ amplitude, DC coupled

CALIBRATOR

Output Voltage:

250mV peak to peak

Wave Shape:

A vertical step at the screen centre

Frequency:

At sweep repetition rate.

Accuracy: $\pm 2\%$

POWER REQUIREMENTS

Mains Voltages:

100-125 Volts or 200-250 Volts

Frequency: $48\text{-}440\mathrm{Hz}$

Consumption: 60VA (approx.)

DIMENSIONS AND WEIGHT

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Height	160mm	(6.3 in)
Width	300mm	(11.82 in)
Depth	420mm	(16.56 in)
Weight	8.0 kg	(17.63 lb)

D1010/D1011 10 MHz Dual-trace Oscilloscopes

Easy to use, easy to carry, robust and reliable – these are just some of the outstanding qualities of Telequipment's new 1000 series oscilloscopes. Controls have been reduced in number without sacrificing versatility, and the adoption of the latest manufacturing techniques and materials ensures very high standards of construction and dependable trouble-free performance. Maintenance is simplified by the unique hingedchassis design and the extensive use of readily available commercial components. The D1010 is the standard dual trace 10 MHz oscilloscope in the range, the D1011 incorporates extra vertical and horizontal facilities around the same specification.



GENERAL DESCRIPTION

The D1010 is a dual-trace 10MHz oscilloscope with a single time base, for use on A.C. mains.

The D1011 has the same basic specification, with the addition of Channel 2 Invert, Algebraic Add, X-Y mode, and X5 vertical gain (at 4MHz bandwidth) in the vertical system, and an uncalibrated variable sweep speed control on the time base.

Shown in red. The additional specification for the 1011.

VERTICAL SYSTEM

Two input channels.

Bandwidth:

DC coupled DC to 10MHz (-3dB) AC coupled 8Hz to 10MHz (-3dB) Rise time: 35ns

Deflection Factors:

5mV/div to 20V/div in 12 calibrated (1-2-5 sequence).

A imes 5 gain switch extends each amplifier sensitivity to 1mV/div at a bandwidth of DC to 4MHz (-3dB)

Maximum Scan:

Amplitude 8 divs (6 divs at 10MHz)

Voltage measurement accuracy:

Input impedance:

 $1M\Omega + 45pF$ (approx)

Input conditions:

Switched choice of DC, AC or ground. The third position grounds the input of the attenuator but not the signal input.

Maximum input voltage: 500V DC or AC peak.

Operating Modes:

Channel 2 only.

Channels 1 and 2 chopped or

The Alternate/Chop mode is selected by the Secs/div switch.

(Chop mode from 0.2s/div to 2ms/div and alternate from 1ms/div to 0.2 µs/

ADD CH1 and CH2 are algebraically added and an invert switch is available for

X-YCH2 is the vertical input and CH1 becomes the horizontal input. Bandwidth is DC to 2MHz (-3dB) Phase error less than 3° at 100kHz.

HORIZONTAL SYSTEM Sweep Speeds:

0.2s/div to $0.2\,\mu s/div$ in 19 calibrated steps (1-2-5 sequence). A ×5 magnifier provides maximum sweep speeds of 40ns/div.

A variable uncalibrated control provides continuous coverage between stepped ranges extending the slowest sweep range of 0.5s/div.

Time Measurement Accuracy:

Normal $\pm 5\%$ $\times 5 \pm 7\%$ (approx.)

TRIGGERING

Bandwidth:

10MHz on both Auto and Normal

TV Triggers at field rate from 0.2s/div to 100 µs/div and line rate from 50 µs/ div to 0.2 µs/div.

Sources:

Internal channel 2 External Line

Sensitivity:

Internal 0.5 div External 0.5V (approx.)

Polarity:

Positive or negative

Trigger Level:

Variable control selects virtually any point of the positive or negative slope of the input signal. This control is inoperative in the TV position.

EXTERNAL X

Bandwidth:

DC coupled DC to 2MHz (-3dB) AC coupled 10Hz to 2MHz (-3dB)

Sensitivity: 1V/div (approx.)

Input Impedance:

 $280 \text{k}\Omega + 30 \text{pF} \text{ (approx.)}$

Display Area:

 $8 \text{ divs} \times 10 \text{ divs} (1 \text{ div} = 1 \text{ cm})$

Phosphor: P31

Accelerating Potential: 1.8kV

Z Modulation:

15V amplitude, DC coupled

CALIBRATOR

Output Voltage: 250mV peak to peak

Wave Shape:

A vertical step at the screen centre

Frequency:

At sweep repetition rate.

Accuracy: $\pm 2\%$

POWER REQUIREMENTS Mains voltages:

100-125 Volts or 200-250 Volts

Frequency: 48-440Hz

Consumption: 50VA (approx.)

DIMENSIONS AND WEIGHT

Height	160mm	(6.3 in)
Width	300mm	(11.82 in)
Depth	420mm	(16.56 in)
Weight	8.0kg	(17.63 lb)

D34

15MHz Portable Oscilloscope

Battery/Mains operation

A battery/mains dual trace portable oscilloscope with all the features of the D32 but with even greater bandwidth and higher sensitivity. Maximum deflection sensitivity is raised to 2mV per division right up to 15MHz. To match this increased performance, maximum sweep speed extends to 0.2µs per division. The observation of fast leading edges is facilitated by the inclusion of vertical signal delay.



GENERAL DESCRIPTION

The D34 is a dual channel 15MHz portable oscilloscope with a single time base, for use on internal rechargeable batteries or AC mains.

VERTICAL SYSTEM

Two identical input channels **Bandwidth:** (approx.)

DC Coupled DC to 15MHz (—3dB)

AC Coupled 3Hz to 15MHz (—3dB)

Signal Delay:Adequate to display leading edge of

Adequate to display leading edge of a signal **Rise Time:** 24ns (approx.)

Deflection Factors: 2mV/div to 5V/div in 11 calibrated

steps (1-2-5 sequence)
Voltage Measuring Accuracy: ±5%
Input Impedance:

 $1M\Omega + 32pF$ Input Conditions:

Switched choice of a.c. or d.c. coupling via standard BNC connector.

Maximum Input Voltages: 250V peak

Operating Modes:

Channel 1 only
Channel 1 and 2 chopped or
alternate sweep, automatically
selected on time/div switch.
(Chopped at sweep rates up to
2ms/div, Alternate from 1ms/div to
0.2µs/div.)
Chop rate: 100kHz

HORIZONTAL SYSTEM

Sweep Speeds:

500ms/div to 0.2µs/div in 20 calibrated steps (1-2-5 sequence). X5 magnifier operates on all time base ranges, increasing fastest sweep speed to 40ns/div.

Time Measuring Accuracy:

Normal $\pm 5\%$

 $\times 5 - 100$ ms/div to 200ns/div $\pm 7\%$ $\times 5 - 200$ ns/div to 40ns/div $\pm 10\%$

TRIGGERING

Fully variable level control, operates over 8 vertical divisions on all waveforms. Auto trigger on symmetrical waveforms over 2 divisions amplitude with restricted level control. Bright line in the absence of a trigger signal in Auto. Selectable AC or TV mode. On TV, will automatically lock on TV frame at sweep speeds up to 0.1ms/div, and on TV line at higher sweep speeds. Trigger level control inoperative in TV mode.

Sources:

Internal Channel 1 or Channel 2, and External

Sensitivity:

Internal 0.3 div, 40Hz-2MHz
1.0 div, 2MHz-15MHz
External 100mV (approx.)
40Hz-5MHz

300mV (approx.) 5MHz-15MHz

Polarity:

Positive or Negative

C.R.T.

Display Area:

8 × 10 div, each division nominally 0.65cm

Phosphor:

P31 supplied as standard
Accelerating Potential:
9.5kV

CALIBRATOR

Output Voltage: +500 mVOutput Impedance: 600Ω Wave Shape: Square, Positive going vertical edge at approx. screen centre. Accuracy: $\pm 1\%$

POWER REQUIREMENTS

Mains voltages: 100V-112V,

112V-125V, 200V-224V,

225V-250V

Frequency: 50 to 400Hz Consumption: 17VA mains

(approx.) 8VA battery

(approx.)

Internal rechargeable batteries: $6 \times 1.25 V$ "D" cells

Running time on fully charged batteries:

4 hours (approx.)

Recharge time: 14 hours

Trickle Charger: Operates when instrument used on AC mains.

External DC:

Rear socket accepts input from external DC supply of 12 to 30V.

DIMENSIONS AND WEIGHT

 Height
 105mm
 (4in)

 Width
 230mm
 (9in)

 Depth
 335mm
 (13¼in)

 Weight
 5.5kg
 (12lb)

The D34 is supplied complete with a protective front cover.

D32

10MHz Portable Oscilloscope

Battery/Mains operation

A dual trace battery/mains portable oscilloscope with a performance far bigger than its diminutive outline and low cost suggests. In a case measuring only 4 x 9 x 11 inches, the D32 packs a full size specification - two identical 10MHz vertical amplifiers with sensitivities up to 10mV, a 19 range time base with x5 magnifier, variable, automatic and TV triggering, internal rechargeable batteries - all in a unit weighing no more than 10 lbs. With its emphasis on simplicity of controls, rugged construction and a relatively large screen, the D32 is equally at home at the top of a ladder, on a catwalk in a processing plant, in the cockpit of a light aircraft or in service at a remote outdoor location.



GENERAL DESCRIPTION

The D32 is a dual channel 10MHz portable oscilloscope with a single time base, for use on internal rechargeable batteries or AC mains.

VERTICAL SYSTEM

Two identical input channels **Bandwidth:** (approx.) DC Coupled DC to 10MHz (-3dB) AC Coupled 3Hz to 10MHz(-3dB)

Rise Time: 35ns

Deflection Factors:

10mV/div to 5V/div in 9 calibrated steps (1-2-5 sequence) Voltage, Measuring Accuracy: $\pm 5\%$

Input Impedance: $1 \, \mathrm{M}\Omega + 32 \mathrm{pF}$

Input Conditions:

Switched choice of a.c. or d.c. coupling via standard BNC connector.

Maximum Input Voltages: $\pm 250 \mathrm{V}$ peak

Operating Modes:

Channel 1 only Channel 1 and 2 chopped or alternate sweep, automatically selected on time/div switch. (Chopped 500ms/div to 2ms/div, alternate 1ms/div to 500ns/div.) Chop rate 100kHz approx.

HORIZONTAL SYSTEM

Sweep Speeds:

500 ms/div to $0.5 \mu \text{s/div}$ in 19 calibrated steps (1-2-5 sequence). X5 magnifier operates on all time base ranges, increasing fastest sweep speed to 100ns/div.

Time Measuring Accuracy:

Normal \pm 5%

 $\times 5 - 100 \text{ms/div}$ to $200 \text{ns/div} \pm 7\%$ $\times 5 - 200$ ns/div to 100ns/div $\pm 10\%$

TRIGGERING

Fully variable level control, operates over 8 vertical divisions on all waveforms. Selectable Auto Mode. Bright line in the absence of a trigger signal in Auto.

Selectable AC or TV mode. On TV, will automatically lock on TV frame at sweep speeds up to 0.1ms/div, and on TV line at higher sweep speeds.

Sources:

Internal Channel 1 or Channel 2 External

Sensitivity:

Internal 0.3 div, 40Hz-2MHz 1.0 div, 2MHz-10MHz External 500mV (approx.)

40Hz-5MHz 1V (approx.)

5MHz-10MHz Polarity:

Positive or Negative

C.R.T.

Display Area:

 8×10 div, each division nominally 0.7cm

Phosphor:

P31 supplied as standard **Accelerating Potential:**

CALIBRATOR

Output Voltage: +300 mVOutput Impedance: 600 Q Wave Shape: Square, positive going vertical edge at approx. screen centre. Accuracy: $\pm 1\%$

POWER REQUIREMENTS

Mains voltages: 100V-112V, 112V-125V,

200V-224V, 225V-250V

Frequency: 50 to 400Hz Consumption: 14VA (mains) 7VA (battery)

Internal rechargeable batteries: 6×1.25 "D" cells

Running time on fully charged batteries: 4 hours

Recharge time: 14 hours Trickle Charger: Operates when instrument used on AC mains.

External DC:

Rear socket accepts input from external DC supply of 12 to 30V.

DIMENSIONS AND WEIGHT

Height 105mm (4in) Width 230mm (9in) 288mm Depth (11in)Weight 4.5kg (10lb)

The D32 is supplied complete with a protective front cover.

S22

5MHz Portable Oscilloscope

Battery/Mains operation

The smallest in Telequipment's range of solidstate instruments. The \$22 is a single trace battery/mains portable oscilloscope with a bandwidth of 5MHz. Normal sensitivity of the vertical amplifier is 10mV per division but a x10 magnifier increases this to 1mV up to a bandwidth of 1MHz. The comprehensive triggering arrangements include special features to simplify the observation of television line and field waveforms.

The built-in batteries give up to four hours continuous use and can be recharged by plugging the instrument into a mains socket overnight.

Small size, low weight and sturdy dependability make the S22 particularly well suited to the executive engineer who needs a personal, high performance oscilloscope in his briefcase.



GENERAL DESCRIPTION

The S22 is a single channel 5MHz portable oscilloscope with a single time base, for use on internal rechargeable batteries or AC mains.

VERTICAL SYSTEM

Bandwidth: (approx.) DC Coupled DC to 5MHz (-3dB) AC Coupled 3Hz to 5MHz (-3dB)

Rise Time: 70ns **Deflection Factors:**

10mV/div to 5V/div in 9 calibrated steps (1-2-5 sequence). A \times 10 gain switch extends the amplifier sensitivity to 1mV/div at a bandwidth of DC to 1MHz (-3dB) approx. Voltage Measuring Accuracy: +5%

Input Impedance: $1M\Omega \pm 45pF$

Input Conditions:

Switched choice of a.c. or d.c. coupling via standard BNC connector.

Maximum Input Voltage: $\pm 250 \mathrm{V}$ peak.

HORIZONTAL SYSTEM

Sweep Speeds:

300 ms/div to 1.0 $\mu \text{s/div}$ in 12 calibrated steps (1-3-10 sequence). A ×10 magnifier operates over all time base ranges, increasing the fastest sweep speed to approx. 100ns/div.

Time Measuring Accuracy:

Normal ±5% $\times 10 \pm 10\%$

TRIGGERING

Fully variable level control, operates over 6 vertical divisions on all waveforms. Selectable Auto mode. Bright line in the absence of a trigger signal in Auto.

Selectable AC or TV mode. On TV, will automatically lock on TV frame at sweep speeds up to 0.1ms/div, and on TV line at higher sweep speeds.

Sources:

Internal or external

Sensitivity:

1.0 div 2MHz-5MHz External 500mV (approx.) 40HzPolarity:

Positive or Negative

C.R.T.

Display Area:

 6×10 divisions, each division nominally 0.6cm.

Phosphor:

P31 supplied as standard **Accelerating Potential:**

 $1.25 \mathrm{kV}$

CALIBRATOR

Output Voltage: +500mV Output Impedance: $1k\Omega$ approx.

Wave Shape: Square, positive going vertical edge at approx. screen centre.

Accuracy: $\pm 1\%$

POWER REQUIREMENTS

Mains voltages: 100V-112V, 112V-125V,

200V-224V, 225V-250V

Frequency: 50 to 400Hz

Consumption: 14VA (mains)

7VA (battery)

Internal rechargeable batteries:

 6×1.25 "D" cells

Running time on fully charged batteries: 4 hours Recharge time: 14 hours

Trickle Charger: Operates when instrument used on AC mains.

External DC

Rear socket accepts input from external DC supply of 12 to 30V.

DIMENSIONS AND WEIGHT

Height 77mm (3in)Width 211mm (8in) Depth 263mm (10in)4.3kg Weight (10lb)

The S22 is supplied complete with a protective front cover.

D67A

25MHz Versatile dual-trace Oscilloscope

The D67A is a highly versatile dual-trace 25MHz oscilloscope with an impressive specification in all performance areas.

The dual trace vertical system displays either channel separately, adds channels algebraically, alternates between channels or chops between channels. The use of F.E.T.'s in the input circuits ensures minimum initial drift and rapid stabilisation, allowing full exploitation of the normal 10mV per division sensitivity up to 25MHz and 1mV sensitivity to 15MHz.

Its two independent time bases can be used to provide delayed, intensified or mixed sweep operation, particularly useful for the detailed examination of complex waveforms and the accurate measurement of time jitter. Comprehensive trigger facilities are included and

the observation of fast-rise pulses is aided by the use of signal delay in the vertical system. Regulated power supplies, all solid state construction techniques and advanced Telequipment design combine to give this oscilloscope a measurement accuracy of $\pm 3\%$ in both axes.



GENERAL DESCRIPTION

The D67A is a dual channel 25MHz Oscilloscope with dual time bases, for use on AC mains.

VERTICAL SYSTEM

Two identical input channels. Bandwidth: (approx.) DC coupled DC to 25MHz (—3dB) AC coupled 2Hz to 25 MHz (-3dB) Signal Delay: 200ns

Rise Time: 14ns

Deflection Factors:

10mV/div to 50V/div in 12 calibrated steps (1-2-5 sequence). A X10 gain switch on each vertical amplifier extends sensitivity to 1mV/div-5V/div, at a maximum bandwidth of 15MHz. A variable uncalibrated control provides continuous coverage between stepped ranges, extending

125V/div. Voltage Measuring Accuracy:

the low sensitivity range to

Input Impedance: $1M\Omega+40pF$ **Input Conditions:**

Switched choice of ac or dc coupling. A third switch position earths the input of the attenuator but not the input socket.

Maximum Input Voltage: 400V DC+peak AC

Operating Modes: Channel 1 Channel 2 Channels 1 and 2 Alternate sweep Channels 1 and 2 Chopped (at 150kHz approx.) Channels 1 and 2 added

HORIZONTAL SYSTEM

Channel 2 Inverted

Main Sweep "A" (also used as delaying sweep)

Sweep Speeds:

2s/div to 200ns/div in 22 calibrated steps (1-2-5 sequence). Avariable uncalibrated control provides continuous coverage between stepped ranges, extending slowest sweep speed to approximately 5s/div, A x5 horizontal magnifier, common to both time bases, increases the fastest sweep speed to 40ns/div.

Time Measuring Accuracy: $x1\pm3\%$

$x5\pm5\%$ **Triggering**

Push-button selection of the following trigger modes: Auto - 50Hz to 25MHz (Bright line in the absence of a trigger signal)

AC-50Hz to 25MHz HF reject - Limits trigger bandwidth to approximately 50kHz

TV Triggering:

Field or Line triggering automatically selected by the "A" sweep time/div switch. The changeover occurs at 0.1ms/div.

Sources:

Internal, from either channel or alternately Channel 1 and Channel 2. External, via front panel BNC socket.

Sensitivity:

Internal 0.2 div to 15 MHz, 1.0 div at 25MHz External 250mV to 15V

Polarity:

Switched choice of + or—.

Trigger Level:

Variable level control on all input signals.

Single Shot:

A single shot facility with lock-out is provided. A neon indicates when the time base is armed.

Delayed Sweep "B"

Sweep Speeds:

2s/div to 200ns/div in 22 calibrated steps (1-2-5 sequence). A variable uncalibrated control provides continuous coverage between stepped ranges, extending slowest sweep speed to approximately 5s/div. A x5 magnifier, common to both time bases, increases the fastest sweep speed to 40ns/div.

Time Measuring Accuracy:

 $x 1 \pm 3\%$ $x5\pm5\%$

Triggering

Polarity: Push-button selection of + or -.

50Hz to 25MHz (Bright line in the absence of a trigger signal)

Trigger Level:

Variable level control on all input signals.

Sources:

Internal, from either channel or alternately Channel 1 and Channel 2. External, via front panel BNC socket.

Delayed triggering:

B sweep triggered by delayed pick-off from A sweep, via a 10 turn helical delay control. "B" sweep can also be gated by this pick-off.

Sweep Modes

Push-button selection of the following sweep modes: "A" only. "A" intensified by "B" "B" delayed by "A" "A" and "B" mixed

EXTERNAL X

Bandwidth:

DC – 1MHz (—3dB approx.) Input Impedance: $1M\Omega + 30pF$ Sensitivity:

3V/div (approx.) on Xl 600mV/div (approx.) on X5 Input via front panel pin-connector socket.

OUTPUT SIGNALS

Pin connector sockets provide the following outputs from "A" sweep at sweep repetition rates:

Gate Out:

5V peak output, DC coupled. From A or B sweep.

Sawtooth Out:

36V amplitude (approx.), DC coupled. From A sweep.

C.R.T.

Display Area:

 8×10 div, each division nominally

Phosphor: P31 supplied as standard.

Graticule:

External, with variable illumination control on rear panel.

Accelerating Potential: 10kV Z Modulation:

Max peak to peak input 25V

CALIBRATOR

Output Voltage: 500mV peak to peak

Waveshape: Square Frequency: As power line

Accuracy: $\pm 2\%$

POWER REQUIREMENTS

Mains Voltages:

100V-125V in 5V steps 200V-250V in 10V steps

Frequency: 48-400Hz

Consumption: 50VA (approx.)

DIMENSIONS AND WEIGHT

Height 240mm 210mm $(8\frac{1}{4}in)$ Width 440mm Depth $(17\frac{1}{2}in)$ Weight 11.5kg (25lb)

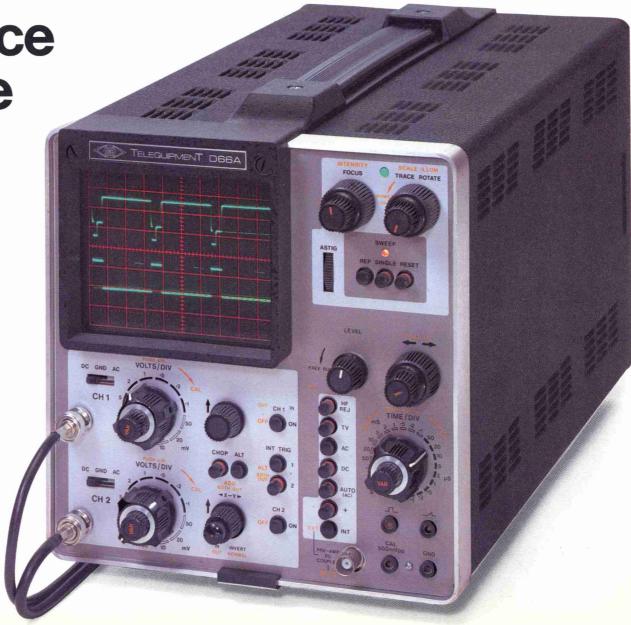
15

D66A

25MHz Dual-trace general purpose

Oscilloscope

The D66A is a general purpose dual trace oscilloscope, ideal for use in the laboratory, maintenance work and in television applications. The dual vertical amplifiers cover a bandwidth of DC to 25MHz with a measurement accuracy of \pm 5%, supported by a wide-range time base equipped with matching triggering facilities. Sweep speeds range up to 100ns/div (20ns/div with the x5 magnifier). The inclusion of special features in the triggering circuit to reject HF interference results in improved display stability at low frequencies.



GENERAL DESCRIPTION

The D66A is a dual-trace mains operated oscilloscope equipped with two vertical amplifiers and a single wide-range time base.

VERTICAL SYSTEM

Two identical input channels.

Bandwidth:

DC Coupled DC to 25MHz (-3dB approx.).

AC Coupled 2Hz to 25MHz (-3dB approx.).

Rise Time: 14ns.

Signal Delay: 200ns. **Deflection Factors:**

10 mV/div to 50 V/div in 12 calibrated steps (1-2-5 sequence). A ×10 gain switch extends the amplifier sensitivity to 1mV/div at a bandwidth of DC to 15MHz (—3dB). A variable uncalibrated control provides continuous

coverage between stepped ranges, extending the low sensitivity range

Maximum Amplitude: 8 div (7 div at 25MHz). Voltage Measuring Accuracy:

Input Impedance:

 $1M\Omega + 47pF$ approx.

Input Conditions:

Switched choice of d.c. or a.c. coupling via standard BNC connectors. A third switch position grounds the input of the attenuator but not the input socket.

Maximum Input Voltage:

400V DC or AC peak.

Operating Modes: Channel 1.

Channel 2.

Channels 1 and 2 Chopped or Alternate (chop rate 150kHz approx.).

Channels 1 and 2 added algebraically.

Channel 2 inverted.

X-Y. Via Channel 1 with Channel 2 input selected as horizontal amplifier on time base switch. Bandwidth DC to 1MHz (-3dB). Phase error less than 1° at 25kHz.

HORIZONTAL SYSTEM

Sweep Speeds:

2s/div to 100ns/div in 23 calibrated steps (1-2-5 sequence). A $\times 5$ magnifier provides maximum sweep speeds of 20ns/div. A variable uncalibrated control provides continuous coverage between stepped ranges, extending the slowest sweep speed to 5s/div.

Time Measuring Accuracy:

Normal $\pm 5\%$. $\pm 7\%$ approx. TRIGGERING

AC Coupled - 10Hz to 25MHz. DC Coupled – DC to 25MHz. Auto $(\hat{AC}) - 40Hz$ to 25MHz. HF Reject - Provides sync from 10Hz to 50kHz

TV - Triggers at field rate from 2s/div to 100 µs/div, and at line rate from 50 µs/div to 100ns/div.

Sources:

Internal, from either channel or alternate.

External.

Sensitivity:

Internal, 0.5 div to 15MHz (1.0 div in alternate). 1.0 div to 25MHz (1.0 div in alternate).

External, 250mV approx.

Polarity:

Positive or Negative.

Trigger Level:

Variable control selects virtually any point of leading edge of input signal slope, plus free-run facility.

Single Sweep:

Single shot facility with lockout is incorporated. A neon indicates when the time base is armed.

EXTERNAL X

Bandwidth: DC to 1MHz (—3dB). Sensitivity:

200mV/div or 1V/div. Input Impedance:

100kΩ and 30pF (approx.) Input via front panel BNC connector.

OUTPUT SIGNALS

Gate Out:

500mV peak to peak, DC Coupled. Sawtooth Out:

10 volt peak to peak, DC coupled.

Single gun, with mesh P.D.A.

Display area:

 8×10 div, each div nominally 1cm.

Phosphor:

P31 supplied as standard.

Graticule:

External, with variable illumination control on front panel.

Accelerating Potential:

Z Modulation:

AC coupled to C.R.T. grid. 15V for perceptible modulation, 50V maximum.

CALIBRATOR

Output Voltage:

500mV square wave at power line frequency.

Accuracy: $\pm 2\%$.

POWER REQUIREMENTS

Mains Voltages: 100 to 125V in 5 volt steps. 200 to 250V in

10 volt steps.

Frequency: 48 to 400Hz.

Consumption: 50VA approx.

DIMENSIONS AND WEIGHT

Height 240mm $(9\frac{1}{2}in)$ Width 210mm $(8\frac{1}{8}in)$ 440mm $(17\frac{3}{8}in)$ Depth Weight 11.5kg $(25\frac{1}{2}lb)$

DM64

10MHz Dual-trace

storage Oscilloscope

The DM64 is a 10MHz dual trace oscilloscope with storage facilities. Incorporating the well proven bistable CRT pioneered and developed by Tektronix, the DM64 offers all the advantages of a storage oscilloscope plus the features of a conventional non-storage instrument. The normal stored writing speed is at least 25cm/ms but this can be increased to at least 250cm/ms by using the Enhanced mode of operation. The viewing time of stored displays is up to one hour, but if required, the oscilloscope can be operated in an auto-erase mode, permitting automatic erasure of the stored trace at the end of each sweep. The contrast ratio and brightness of the stored displays are constant and independent of viewing time, writing and sweep rates or signal repetition rates. The DM64 is probably the least expensive bistable storage oscilloscope available anywhere and meets the demand for an instrument which considerably eases the problem of observing single events, low repetition rate signals and fast-rise wave-forms for extended periods of time.



GENERAL DESCRIPTION

The DM64 is a dual trace 10MHz oscilloscope with storage facilities. It is equipped with two vertical amplifiers and a single wide range time base.

VERTICAL SYSTEM

Two identical input channels **Bandwidth:**DC Coupled DC to 10MHz (-3dB)

AC Coupled 2Hz to 10MHz (-3dB) **Rise Time:** 35ns

Deflection Factors:

10mV/div to 50V/div in 12 calibrated steps (1-2-5 sequence). A $\,$ X10 gain switch extends the amplifier

sensitivity to 1mV/div-5V/div at a bandwidth of DC to 8MHz.

A variable uncalibrated control provides continuous coverage between stepped ranges, extending the low sensitivity range to 125V/div

Voltage Measuring Accuracy: $\pm 5\%$

Input Impedance: $1M\Omega + 47pF$ approx.

Input Conditions:

Switched choice of dc.or ac coupling via standard BNC connectors. A third switch position grounds the input of the attenuator but not the input socket.

Maximum Input Voltage: 400V DC or AC peak

Operating Modes:

Channel 1
Channel 2
Channels 1 and 2 Chopped or alternate sweep (chop rate 150kHz approx.)
Channels 1 and 2 added algebraically Channel 2 inverted
X-Y. Via Channel 1 with Channel 2 input selected as horizontal amplifier on time base switch.
Bandwidth DC to 1 MHz. Phase error less than 1° at 10kHz.

HORIZONTAL SYSTEM

Sweep Speeds:

2s/div to 100ns/div in 23 calibrated steps (1-2-5 sequence). A \times 5 magnifier operates on sweep rates up to $0.5\mu s/div$ (i.e. a maximum magnified sweep of 100ns/div). A variable uncalibrated control provides continuous coverage between stepped ranges, extending slowest sweep speed to 5s/div approximately.

Time Measuring Accuracy:

Normal ±5% x5 ±8%

TRIGGERING

Push button selection of the following trigger modes:—
AC Coupled
DC Coupled
HF Sync – Provides sync from 1MHz to 10MHz

TV Line – Triggers at line rate

TV Field - Triggers at field rate

Source:

Internal, from either channel External

Sensitivity:

Internal 0.25 div 40Hz to 1MHz rising to 0.5 div at 5MHz

External 250mV

Polarity:

Positive or Negative

Trigger Level:

Variable control selects virtually any point of leading edge of input signal slope.

Single Sweep:

Single shot facility with lockout is incorporated.

A neon indicates when the time base is armed.

EXTERNAL X
Bandwidth: DC to 1MHz
Sensitivity:
200mV/div to 1V/div

Input Impedance: $100k\Omega$ and 30pF approx.

OUTPUT SIGNALS

Gate Out: 500mV peak to peak amplitude, DC Coupled. Sawtooth Out: 10V peak to peak

amplitude, DC Coupled.

C.R.T.

Display Area:

 8×10 division, each division nominally 1.0cm

Overall Accelerating Potential: $3.5 \mathrm{kV}$

Z Modulation:

internal graticule.

Input for perceptible modulation at average brightness, 20V approximately. AC Coupled. C.R.T. Type Flat-faced bistable storage with Storage Characteristics:

Viewing Time: Up to 1 hour Erase Time: 0.25s approximately

Auto Erase: At end of each sweep when required Writing Rate: 25 div/ms

Enhanced Writing Rate: 250 div/ms Variable Enhancement:

25 to 250 div/ms

Integrate Mode:

Increases effective writing speed on repetitive signals.

Non Store Characteristics: Approximately equivalent to P31 phosphor

CALIBRATOR

Output Voltage: 500mV Wave Shape: Square Frequency: As power line Accuracy: $\pm 2\%$

POWER REQUIREMENTS

Mains voltages: 100 – 125V in 5 volt steps 200 – 250V in

200 – 250V in 10 volt steps

Frequency: 48 to 400Hz Consumption: 100VA approximately

DIMENSIONS AND WEIGHT

221122210	2211221102011012112		
Height	240mm	$(9\frac{1}{2}in)$	
Width	210mm	$(8\frac{1}{8}in)$	
Depth	370mm	$(14\frac{5}{8}in)$	
Weight	12 97kg	(2831b)	

D63/DM63

15MHz Dual-beam Oscilloscopes

with optional storage

Telequipment's 63 series of dual-beam oscilloscopes is a 15MHz system based on two mainfrances with integral time bases and a number of alternative plug-in vertical amplifier units. One of the mainframes, the D63, is fitted with a conventional CRT. The other, the DM63, is equipped with a variable persistence storage CRT, providing up to 4 traces with full storage facilities.

The choice between two mainframes, together with the plug-in units available, enables the 63 series to cover a wide range of measurement needs. Full details of the plug-in units are shown on pages 26 to 29.



GENERAL DESCRIPTION

The D63 is a mainframe containing a dual beam conventional CRT, a wide-range time base, power pack, calibrator, and two receptacles for accommodating units from the range of plug-in units described on pages 26 to 29 of this brochure. The maximum bandwidth available is 15MHz. The DM63 has the same basic features as the D63 with the exception that it is fitted with a dual beam direct viewing storage CRT.

VERTICAL SYSTEM

(Abridged specification only – see under appropriate plug-in for full details).

V1 – Single Trace 15MHz amplifier Deflection Factors:

 $\begin{array}{c} 5m\bar{V}/div~at~15MHz\\ 1mV/div~at~12MHz \end{array}$

V3 – Single Trace, High Gain, Differential amplifier Bandwidth:

150kHz at $50\mu V/div$, rising to 2MHz from 2mV/div to 10V/div

Deflection Factors: $50\mu V/div$ to 10V/div

V4 – Dual Trace 15MHz amplifier (2 identical channels)

Bandwidth:

DC to 15MHz

DC to 12MHz with ×5 gain in use **V5** – **Same as V1** but with 200ns delay line and deletion of ×5 gain control.

TV1 – **Television Line Amplifier** for 625 line systems

Bandwidth:

DC to 5MHz ± 0.25 dB DC to 10MHz ± 0.5 dB Special line selector features.

HORIZONTAL SYSTEM

Sweep Speeds:

1s/div to 200ns/div in 21 calibrated steps (1-2-5 sequence). A ×5 magnifier increases fastest sweep speed to 40ns/div. A variable uncalibrated control provides continuous coverage between stepped ranges, reducing slowest sweep speed to 2.5s/div.

Time Measuring Accuracy: Normal $\pm 3\%$

TRIGGERING

Push-button selection of the following trigger modes:— Auto 10Hz to 15MHz.

 $\pm 5\%$

Bright line in the absence of a trigger signal.

DC Coupled DC to 15MHz AC Coupled 10Hz to 15MHz

Sources:

Internal from either channel External or AC power line

Sensitivity:

Trigger Level and Polarity: Single knob control determines level

and polarity of trigger function.

Sweep Modes:

Repetitive or Single-shot. (A neon indicates when time base is armed in single-shot mode)

EXTERNAL X

Bandwidth: DC to 1MHz (-3dB) **Sensitivity:** 1V/div (approx.) on $\times 1$ 0.2V/div (approx.) on $\times 5$

X-Y MODE

Via left and right hand plug-in units. **Trace Locate:**

Push button to place trace on screen

C.R.T. – D63

Display Area: 8 × 10 division, each division 1.0cm

Phosphor:

P31 supplied as standard
Overall Accelerating Potential:

8kV **Z Modulation:**

Bandwidth DC to 3MHz approx. Input for full modulation at max. intensity +20V, DC coupled into $10k\Omega$ and 20pF approx.

C.R.T. - DM63 STORAGE

Display Area:

8×10 division, each division 0.9cm **Overall Accelerating Potential:** 8kV **Operating Modes:**

Non Storage, Variable Persistence, Storage.

Z Modulation: Same as D63 CRT **Storage Characteristics:**

Minimum Writing Speed: In stored condition: 0.05div/µs

In Max. Enhancement mode: 1.0div/µs

Storage Time:

In stored condition: 4 min In Variable persistence mode: 0.2s to 0.5min (average) In Max. Enhancement mode: 0.5 min

Hold Time:

In stored condition: 50 min In Max. Enhancement mode: 5 min

CALIBRATOR

Output Voltages:

30mV and 300mV peak to peak
Wave Shape: Square

Frequency: 1kHz (approx.)
Current: 3mA between 30mV output and 300mV output
Accuracy: ± 1% voltage and current

POWER REQUIREMENTS

Mains voltages:

100 to 125 Volts in 5V steps 200 to 250 Volts in 10V steps Frequency: 48 to 400Hz Consumption: 85VA (depending on choice of plug-in units)

DIMENSIONS AND WEIGHT

 $\begin{array}{lll} \mbox{Height} & 290\mbox{mm} & (11\frac{1}{2}\mbox{in}) \\ \mbox{Width} & 215\mbox{mm} & (8\frac{1}{2}\mbox{in}) \\ \mbox{Depth} & 520\mbox{mm} & (20\frac{1}{2}\mbox{in}) \\ \mbox{Weight} & 9.5\mbox{kg to } 14\mbox{kg depending} \\ \mbox{on plug-in units}. \end{array}$

D75 50MHz Portable Oscilloscope

Light, compact and convenient to carry, this portable dual trace 50MHz oscilloscope carries laboratory standards of performance into the field with ruggedness and reliability. Its 8 x 10cm CRT operates at 15kV, providing a bright, sharp display, and, with the \$2A unit fitted, offers wide-range dual time bases incorporating mixed sweep, sweep intensifying and delayed modes of operation. Measuring accuracy is $\pm 3\%$. The D75 is a portable version of the D83 oscilloscope using the V4 and S2A plug-in units in a monolithic form of construction. Alternative plug-ins for the D83 can be supplied as factory fitted options in the D75, details of these options are included in this section. It is also possible to change vertical amplifiers and time bases in the field, involving no more than minor dismantling and reassembly of the instrument. The characteristics of the vertical amplifier and timebase units are given on pages 26 to 29.



GENERAL DESCRIPTION

The D75 is a dual-trace 50MHz portable oscilloscope designed for operation on AC mains supplies. It has two identical vertical amplifiers and is equipped with a Main Time Base and a Delayed Time Base. The instrument is factory assembled from units of the 83 range. The specification of the standard D75 is given below. The construction of the D75 mainframe does not permit full plug-in flexibility, but it is relatively easy to instal other plug-in units if required. The characteristics of the vertical amplifier and timebase units are given on pages 26 to 29.

VERTICAL SYSTEM

(Abridged specification only - see V4 plug-in for complete details) Two identical input channels

Bandwidth:

DC Coupled DC to 50MHz (-3dB) AC Coupled 2Hz to 50MHz (-3dB)

Deflection Factors:

5mV/div to 20V/div in 12 calibrated steps (1-2-5 sequence)

HORIZONTAL SYSTEMS

(Abridged specification only – see S2A plug-in for complete details)

Timebase A:

Sweep Speeds:

2s/div to 100ns/div in 23 calibrated steps (1-2-5 sequence)

Timebase B:

Sweep Speeds:

ls/div to 100ns/div in 22 calibrated steps (1-2-5 sequence)

Operating Modes - Timebases A and B

A only, A intensified by B, B delayed by A, A and B mixed, Delayed B variable or triggered. Repetitive or Single Shot.

TRIGGERING

(Timebase A) Modes - Auto, DC, AC HF reject

TRIGGERING

(Timebase B) Modes - Auto, AC C.R.T.

Display Area:

8cm × 10cm on rectangular faced C.R.T.

Phosphor:

P31 supplied as standard **Accelerating Potential:**

15kVZ Modulation:

Bandwidth DC – 5MHz, +20V for full modulation.

DC coupled into $10k\Omega + 15pF$

CALIBRATOR

Output Voltage:

30mV and 300mV peak to peak Wave Shape: Square

Frequency: 1kHz approx. Output Current: 3mA between 30mV output and 300mV output

Accuracy: $\pm 1\%$, voltage and current.

POWER REQUIREMENTS

Mains voltages: 100V-125V in

5 volt steps 200V-250V in 10 volt steps

Frequency: 40 to 400Hz Consumption: 105VA

DIMENSIONS AND WEIGHT

Height	136mm	$(5\frac{3}{8}in)$
Width	380mm	(15in)
Depth	470mm	$(18\frac{3}{4}in)$
Weight	11.4kg	$(25\frac{1}{2}lb)$

Optional versions of the D75 Oscilloscope

The D75 mainframe is not fitted with the means to facilitate the insertion and removal of alternative vertical and horizontal plug-ins. Factory assembled versions are available, however, based on the following combinations:-

D751 Specifications

With 50MHz dual-channel vertical amplifiers, characteristics the same as V4 unit.

Single time base, characteristics the

same as S1A unit. **D752 Specifications**

With single channel differential vertical amplifier, characteristics as V3 unit, and with main and delayed time bases as S2A unit.

D753 Specifications

With single channel differential vertical amplifier, as V3 unit, and with single time base, as S1 unit.

The standard and optional versions of the D75 are supplied complete with a protective front cover.

D83 50MHz High frequency plug-in Oscilloscope

The D83 is a dual trace 50MHz oscilloscope which sets high standards of performance, versatility and value.

Designed around a large CRT, the mainframe accepts one vertical and one horizontal plug-in unit, offering a choice between 5mV sensitivity at maximum bandwidth and 50µV differential operation with a very high degree of commonmode signal rejection, whilst, for precision measurements on television signals, there is a special-purpose plug-in unit available. The wide-range dual time-base plug-in incorporates sweep intensifying, delaying and single shot facilities. A simpler, single time base plug-in is included in the range of units, offering the addition of X-Y capabilities. Full details of the plug-in units are shown on pages 26 to 29.



GENERAL DESCRIPTION

The D83 is a mainframe containing a 6½ in C.R.T., a power pack, and two receptacles for accommodating units from the range of plug-in vertical amplifiers and timebases described on pages 26-29 of this brochure. The vertical and horizontal channel characteristics will be determined by the plug-in used. The maximum bandwidth is 50MHz and the mainframe includes vertical signal delay line.

VERTICAL SYSTEM

(Abridged specification only - see under appropriate plug-in for full

V1 - Single Trace 35MHz amplifier

Deflection Factors: 5mV/div at

35MHz 1mV/div at

15MHzV3 - Single Trace, High Gain,

Differential amplifier **Bandwidth:** 150kHz at $50\mu V/div$

rising to 2MHz from 2mV/div to 10V/div

Deflection Factors: $50\mu V/div$ to 10V/div

V4 - Dual Trace 50MHz amplifier

(2 identical channels) Bandwidth: DC to 50MHz

DC to 15MHz with ×5

gain in use

Deflection Factors: 5mV to 20V/div

TV1 - Television line amplifier for

625 line systems

Bandwidth: DC to $5 MHz \pm 0.25 dB$

DC to 10MHz +0.5dB

Special line selector features. V5 – Same as V1 but with 200ns delay line and deletion of X5 gain

HORIZONTAL SYSTEMS

S1A - Single Timebase:

Sweep Speeds: 2s/div to 100ns/div

S2A – Dual Timebase:

Sweep Speeds:

(Timebase A) – 2s/div to 100ns/div Sweep Speeds:

(Timebase B) – ls/div to 100ns/div

C.R.T.

Display Area:

 8×10 div, each division 1.22cm

Phosphor:

P31 supplied as standard. Internal Graticule with variable illumination **Accelerating Potential:**

15kV

Z Modulation:

Bandwidth: DC to 5MHz, +20V for full modulation. DC coupled into

 $100k\Omega + 15pF$

CALIBRATOR

Output Voltage:

30mV and 300mV peak to peak

Wave Shape: Square Frequency: 1kHz approx. Current: 3mA between 30mV

output and 300mV output. **Accuracy:** $\pm 1\%$, voltage and

POWER REQUIREMENTS

Mains voltages: 100V - 125V in 5V steps

200V to 250V in

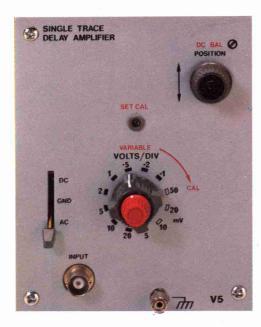
10V steps Frequency: 50 - 400 HzConsumption: 80VA

DIMENSIONS AND WEIGHT

Height	286mm	$(11\frac{1}{4}in)$
Width	216mm	$(8\frac{1}{2}in)$
Depth	514mm	$(20\frac{1}{4}in)$
Weight	14.25kg	$(31\frac{1}{2}lb)$

D63/DM63 and D83

Plug-in units



GENERAL DESCRIPTION

The V5 is a 15MHz single channel amplifier for use in Telequipment oscilloscopes D83, D63 and DM63. Its specification is the same as the V1 plug-in unit, except that the V5 includes a 200ns signal delay line and does not include a $\times 5$ gain



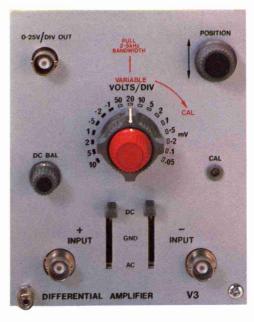
GENERAL DESCRIPTION

The V1 is a 15MHz single channel amplifier for use in Telequipment oscilloscopes D83, D63, and

BANDWIDTH (D63 AND DM63 ONLY): DC Coupled DC to 15MHz (—3dB) AC Coupled 2Hz to 15MHz (—3dB)

Rise Time: 23ns

BANDWIDTH (D83 ONLY): DC Coupled DC to 35MHz (—3dB) AC Coupled 2Hz to 35MHz (—3dB) Rise Time: 10ns Max bandwidth 5V/div to 20V/div; 20MHz (—3dB)



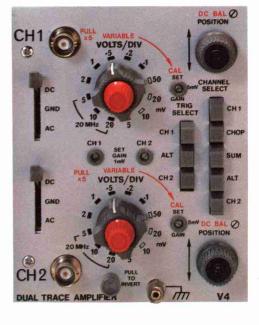
GENERAL DESCRIPTION

The V3 is a single channel dual input differential amplifier with a maximum sensitivity of $50\mu V/$

It is intended for use in Telequipment oscilloscopes D83, D63, DM63 and also in factory assembled versions of the D75.

BANDWIDTH:

150 kHz at $50 \mu V/div$ rising to 2MHz from 2mV/div to 10V/div. Maximum bandwidth can be reduced to 2.5kHz by operating push-pull switch mounted concentrically with Volts/div control.



GENERAL DESCRIPTION

The V4 is a dual channel wide band amplifier designed to provide dual trace operation in Telequipment D83, D63, and DM63 oscilloscopes, and also in factory assembled versions of the D75. When used in the D83 and D75 the maximum bandwidth is 50MHz. In the D63 and DM63 the maximum bandwidth available is 15MHz.

BANDWIDTH (D83 AND D75 ONLY): DC coupled DC to 50MHz (—3dB) AC Coupled 2Hz to 50MHz (—3dB)

Rise Time: 7ns

BANDWIDTH (D63 AND DM63 ONLY):

DC Coupled DC to 15MHz (—3dB) AC Coupled 2Hz to 15MHz (—3dB) Rise Time: 23ns

DEFLECTION FACTORS: 5mV to 20V/div in 12 calibrated steps (1-2-5 sequence). A × 5 gain switch extends the sensitivity to 1mV/div with a maximum bandwidth, in the D83, of 15MHz and, in the D63 and DM63, of 12MHz. A variable uncalibrated control provides continuous coverage between stepped ranges, extending low sensitivity range to $50\mathrm{V/div}$.

VOLTAGE MEASURING ACCURACY:

INPUT IMPEDANCE:

 $1M\Omega + 29pF$ approx. INPUT CONDITIONS:

Switched choice of DC or AC coupling via standard BNC connector. A third switch position earths the attenuator input but not the

MAXIMUM INPUT VOLTAGE: 400V DC+AC peak

DEFLECTION FACTORS:

 $50\mu V/\text{div}$ to 10/div in 17 calibrated steps (1-2-5 sequence). A variable uncalibrated control provides continuous coverage between stepped ranges, extending low sensitivity range to 25V/div.

VOLTAGE MEASURING ACCURACY:

INPUT IMPEDANCE: $1M\Omega+35\mathrm{pF}$ at each input socket. Common input resistance may be increased to $100M\Omega$ at

INPUT CONDITIONS:

Switched choice of DC or AC coupling at each input socket via standard BNC connector. A third switch position earths the attenuator input but not the input socket.

INPUT LIMITS:

 $\label{eq:local_control_control_control} \begin{tabular}{ll} INPUT LIMITS: \\ Differential (Common Mode) \\ 50\mu V/div to $10mV/div-\pm12V$ \\ 20mV/div to $1.1V/div-\pm120$ V$ \\ 0.2V/div to $10V/div-\pm400V$ \\ Single ended, all ranges $-\pm400V$ \\ Common Mode Rejection Ratio: $100,000:1$ (0.05mV to 0.5mV at DC to 5kHz) \\ Signal output (via front panel BNC connector): $0.25V/div approx., direct coupled. \end{tabular}$

DEFLECTION FACTORS: 5mV to 20V/div in 12 calibrated steps (1-2-5 sequence) A \times 5 gain switch extends the sensitivity on both channels to 1mV/div. Maximum bandwidth in \times 5 in D83 and D75 is 15 MHz, and in D63 and DM63, 12MHz. A variable uncalibrated control provides continuous coverage between stepped ranges, extending the low sensitivity range to $50\mathrm{V}/\mathrm{div}$.

VOLTAGE MEASURING ACCURACY:

INPUT IMPEDANCE:

 $1M\Omega + 33pF$ INPUT CONDITIONS:

Switched choice of DC or AC coupling via standard BNC connectors. A third switch position earths the input to the attenuator but not the input socket.

MAXIMUM INPUT VOLTAGE: 400V DC+AC peak

OPERATING MODES:

Channel 1 only; Channel 2 only; Channel 1/2 in Alternate or Chopped sweep mode (chop rate 350kHz approx.); Channel 1 and 2 added; Channel 2 inverted.

TRIGGER SOURCES:

Channel 1 only; Channel 2 only; Alternate (from displayed signal).

Plug-in units continued



(SINGLE SWEEP



GENERAL DESCRIPTION

The TV1 plug-in is designed for the display and measurement of 625 line television signals when used as the vertical amplifier in Telequipment D83, D63 and DM63 oscilloscopes. Its frequency response is virtually flat to 10MHz and the unit incorporates field and line selector facilities, black level clamping circuitry and DC offset

BANDWIDTH:

Not Gaussian but maintained within the

AC coupled: DC to 5MHz (±0.25dB)
DC to 10MHz (±0.5dB)
AC coupled: 10Hz to 5MHz
(±0.25dB)

8Hz to 10MHz $(\pm 0.5 dB)$

GENERAL DESCRIPTION

The SIA is a plug-in single time base for use in Telequipment oscilloscope D83, and also in factory-assembled versions of the D75.

 $2s/\mathrm{div}$ to $100\mathrm{ns}/\mathrm{div}$ in 23 calibrated steps (1-2-5 sequence). A $\times10$ magnifier operates on all time base ranges, increasing fastest sweep speed to 10ns/div. A variable uncalibrated control provides continuous coverage between stepped ranges, reducing slowest sweep speed to 5s/div.

TIME MEASURING ACCURACY:

Normal:

GENERAL DESCRIPTION
The S2A is a plug-in dual time base for use in
Telequipment oscilloscope D83 and in factory
assembled versions of the D75.

TIME BASE A (MAIN AND DELAYING SWEEP): SWEEP SPEEDS: 2s/div to 100ns/div in 23 calibrated steps (1-2-5

sequence). A \times 10 magnifier operates on all time base ranges, increasing fastest sweep speed to 10ns/div. A variable uncalibrated control provides continuous coverage between stepped ranges, reducing slowest sweep speed to 5s/div.

TIME MEASURING ACCURACY:

Normal:

EXTERNAL X:

Input via standard BNC connector Bandwidth DC to 1MHz approx. $400 \text{mV/div approx. on} \times 1$ $40 \text{mV/div approx. on} \times 10$ Sensitivity:

OUTPUT SIGNALS:

Pin connector sockets provide the following outputs at sweep repetition rates (from A sweep): Sawtooth Out

DEFLECTION FACTORS:

5mV/div to 0.5V/div in 7 calibrated steps

(1-2-5 sequence) A variable uncalibrated control provides continuous coverage between stepped ranges, extending low sensitivity range to 1.25V/div.

VOLTAGE MEASURING ACCURACY:

INPUT IMPEDANCE:

Switched choice of – $1M\Omega$ ($\pm 1\%$) + $27 \mathrm{pF}$ or, 75Ω DC ($\pm 1\%$)+ $26 \mathrm{pF}$

INPUT CONDITIONS:

There are two BNC Input connectors, an input selector switch selects the one to be used and open-circuits the other. There is a switched choice between AC and DC coupling at $1M\Omega$ input impedance. On 75Ω input impedance, a 75 ohm resistor is always connected to ground across the selected input socket, followed by AC or DC coupling to the amplifier input.

MAXIMUM INPUT VOLTAGES: 6 200V DC or peak AC on $1M\Omega$ input impedance. 6V DC or AC on 75Ω DC input impedance

DC OFFSET LEVEL:

Greater than +1.5V when selected.

DYNAMIC INPUT RANGE:

(min.): DC±4V. AC 8V.

A.C. CLAMPING:

Clamp at black level from a 75Ω source.

Dynamic range +4V to -1V relative to clamped base line. Clamps approximately 8µs after sunc -ve edge. Clamp width approximately 1µs.

Sunc Separator: Minimum internal trigger amplitude, 0.3 div. Offset range, ± 35 divisions relative to black

TRIGGER MODES: Triggers from display. Normal: TV Line Triggers at line frequency. Field 1 or Field 2:

Triggers at frame rate starting on selected line.

Field 1 and Field 2:

Triggers at field frequency.

(Line selector inoperative). Line Selector: Selects lines 12 to 22, or 325 to 335.

Line Delay:

For examination of portion of line at high sweep speeds. Norm-Invert: Selects for use on positive modulation with negative sync or

the reverse.

TRIGGERING:

Push-button selection of the following trigger

modes: 40Hz to 50MHz. Sweep free-runs Auto:

in the absence of an input signal.

DC Coupled: DC to 50MHz AC Coupled: 10Hz to 50MHz

10Hz to 2MHz (—3dB) Internal, External or AC power HF reject: Sources:

Internal, 0.2 div to 20MHz, falling to 1.0 div at 50MHz. Sensitivity: External, 300mV to 20MHz, falling to 500mV at 50MHz. Switched choice of + or -

Polarity: Trigger level: Variable level control on all input

SWEEP MODES:

Push-button selection of the following sweep modes:

Normal repetitive operation. Repetitive: A single sweep facility with lock-out is provided. A neon Single Shot:

indicates when time base is armed. Via Channel 1 and Channel 2

when used in conjunction with V4 amplifier. External ×: Input via standard BNC

connector. Bandwidth - DC to 200kHz (—3dB). Sensitivity – 400 mV (approx.) on $\times 1$, 40 mV (approx.) on $\times 10$.

OUTPUT SIGNALS:

Pin connector sockets provide the following output at sweep repetition rates: Gate Out Sawtooth Out

TRIGGERING: Push-button selection of the following trigger

modes: 40Hz to 50MHz. Sweep free-runs Auto:

in the absence of an input signal. DC Coupled: DC to 50MHz

AC Coupled: 10Hz to 50MHz HF reject: 10kHz to 2MHz (—3dB) Sources: Internal, External, or AC power

Internal 0.4 div (min) to 10MHz, falling to 1.0 div at 50MHz. Sensitivity:

External 500mV to 10MHz, falling to 1V at 50MHz. Switched choice of + or —

TIME BASE Z (DELAYED SWEEP):

SWEEP SPEEDS:

Polarity:

1s/div to 100ns/div in 22 calibrated steps (1-2-5 sequence) A \times 10 magnifier operates on all sweep ranges, increasing the fastest sweep speed to 10ns/div. A variable uncalibrated control provides continuous coverage between stepped ranges, reducing slowest sweep speed to 2.5s/div.

TIME MEASURING ACCURACY: Normal:

 $\pm 3\% \\ \pm 6\%$ $\times 10$:

TRIGGERING:

Push-button selection of the following trigger modes:

10Hz to 10MHz (Sweep free-runs Auto: in the absence of an input signal). 10Hz to 10MHz AC: Internal or Extern

Internal 0.4 div (min) falling to 1.0 div at 10MHz External 500mV to 10MHz, falling to 1V at 50MHz.

Polarity: Switched choice of + or —
Trigger level: Variable level control on all input signals.

DELAY TIME:

Range, 10µs to 20s, calibrated and continuously variable by 10 turn helical multiplier.

Jitter, less than 10,000:1 of maximum available delay time.

SWEEP MODES:

Push-button selection of the following sweep modes: "A" only

"A" only
"A" intensified by "B"
"B" delayed by "A"
"A" and "B" mixed
Delayed "B" variable or triggered Repetitive or single-shot. (A neon indicates when time base is armed in single-shot mode.)

CT71

Semi-conductor curve-tracer

The CT71 curve tracer is a dynamic semi-conductor tester for the display and measurement of the characteristics of transistors, F.E.T.'s and diodes. Two different transistor characteristics may be displayed, including the collector family in the common emitter configuration.

In addition to transistor curves, the CT71 can be used to show the dynamic characteristics of a wide range of semi-conductor devices, including those of diodes with forward currents up to 2 Amps, reverse currents down to 5nAmps, and reverse voltages up to 1kV.

The instrument is fitted with a front panel socket which accepts one of two available Test Fixtures, each containing pairs of sockets for all generally available transistor types. A manually operated switch is used to select the transistor to be tested, allowing rapid comparisons between transistors of the same type.



GENERAL DESCRIPTION

The CT71 is a semiconductor curve tracer for the dynamic testing of transistors, FETs, diodes and similar solid-state devices. Input sockets for all commonly used semiconductors are arranged in pairs, a front panel switch selects the device to be tested and permits rapid comparison of characteristics.

VERTICAL SYSTEM

The Vertical Amplifier displays collector currents only. Current ranges are 5nA/div to 200mA/div in 24 calibrated steps (1-2-5 sequence). **Accuracy:** ±5%

HORIZONTAL SYSTEM

The Horizontal Amplifier displays collector volts or base volts. Voltage ranges are 0.1V/div to 100V/div in 10 calibrated steps (1-2-5 sequence). **Accuracy:** $\pm 5\%$

Collector Supply:

The Collector Supply provides sweep voltages that drive the collector of the transistor under test between zero and a peak value selected by the front panel controls. The peak value is either positive or negative depending on the setting of the polarity switch to allow the collector voltages to sweep between zero and positive values or zero and negative values. The repetition rate of the sweep is twice the line frequency; thus the collector voltage sweeps between zero and the peak value at least once for each step applied to the transistor base. The peak voltage is continuously adjustable from zero to 1,000V. Peak current available is 2A. Maximum power available 15W. The collector series resistances available are: $0, 2.5\Omega, 10\Omega, 65\Omega,$ 250Ω , $1k\Omega$, $6.5k\Omega$, $25k\Omega$, $85k\Omega$, $500k\Omega$ and $1.7M\Omega$ all within 5%The peak power settings are 0.1, 0.5, 2 and 10 watts.

Base Step Generator:

The Step Generator develops current or voltage steps to drive the base of the transistor under test. The steps are adjustable from 1 to 10 and move in a positive or negative direction depending on the polarity switch setting. A continuously variable offset with a range of ± 1 step is provided. Steps and offset are only available on collector current ranges greater than $10\mu\text{A}/\text{div}$.

Each step has a rise that is selected as either a value of voltage or current. The value of each step rise in the voltage ranges is 0.1V to 2V per step and is selected from 5 values in a 1-2-5 sequence. The value of each step rise in the current ranges is 0.2µA to 20mA per step and is selected from 16 values in a 1-2-5 sequence.

Accuracy: $\pm 5\%$ Transistor Test Fixtures:

Two test fixtures are provided, which plug into the front of the CT71, providing a means of connecting the Collector Supply output, the Step Generator output and the display amplifiers to the device to be tested. One fixture has the following features: 1 pair of TO18 sockets in a source-drain-gate configuration, 1 pair of TO18 sockets in the emitter-base-collector configuration, 1 pair of TO5 sockets in the emitter-base-collector configuration, and 2 sets of 3 terminals in the emitter-basecollector configuration. The other comprises:

2 TÔ66 and 2 TO3 sockets.

Safety Interlock:

The protective cover cannot be opened until the supplies to the test fixtures are disconnected.

C.R.T.

Display Area:

 10×10 div, each division nominally 1cm.

Overall Accelerating Potential: 2.5kV

Phosphor:

P31 supplied as standard

Graticule:

External, with variable illumination control on front panel.

POWER REQUIREMENTS

Main voltages: 100V-125V in 5V

steps

200V-250V in 10V

steps

Frequency: 48-63Hz Consumption: 37.5VA (approx.)

DIMENSIONS AND WEIGHT

 Height
 265 mm $(10\frac{1}{2}\text{in})$

 Width
 240 mm (9in)

 Depth
 482 mm (19in)

 Weight
 12.9 kg $(28\frac{1}{2}\text{lb})$

Accessories



Carrying Cases

(Executive-style brief cases)
For S22
Part No. 016-0373-00
For D32
Part No. 016-0374-00
For D34
Part No. 016-0619-00

Shoulder Carrying Cases

For S22 Part No. 016-0372-00 For D32 Part No. 016-0601-00 For D34 Part No. 016-0499-00

Protective Covers

Front cover (fibreglass) for DM64, D65, D54
(also fits rear of instrument)
Part No. 016-0513-01
Only fits instruments with two chrome bands

Note – To use front cover,

Part No. 016-0513-01,

new side panels with clamp fasteners are required

Side Panel, with clamp fasteners, for DM64, D65, D54

(two panels required per instrument)

Front Cover for S22

Part No. 016-0360-00

Front Cover for D75

Part No. 016-0564-01

Front Cover for D66A/D67A

Part No. 016-341-00

(Slip-over covers with access to instrument handle)
For D75 series
Part No. 016-0590-00
For D63, DM63, D83

Viewing Hoods

Part No. 016-0544-00

Rubber, 3 in depth, for D54

Part No. 016-0293-01

Rubber, 3 in depth, for DM64, D65

Part No. 016-0294-01

Plastic, 5½ in depth, folding, for D83

Part No. 016-0260-00

Plastic, 10 in depth, for D83

Part No. 016-0154-00

Viewing Hood Extension

Rubber, 7 in depth, extends hoods 016-0293-01 and 016-0294-01 to approximately 10 in depth *Part No. 016-0292-00*

Coaxial Adaptors

BNG female to double 4 mm plug Part No. 103-0128-00 UHF female to double 4 mm plug Part No. 103-0129-00 BNG female to UHF male $50\,\Omega$ Part No. 103-0015-00 BNC female to UHF male $75\,\Omega$ Part No. 103-0145-00

Transistor Test Adaptors

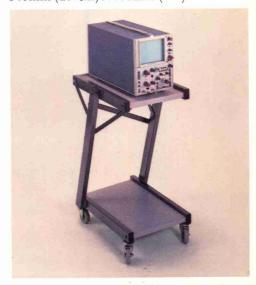
(For CT71), T03 and T066 Part No. 013-0119-00 (For CT71), T05 and T018 Part No. 013-0120-00

Power Cords

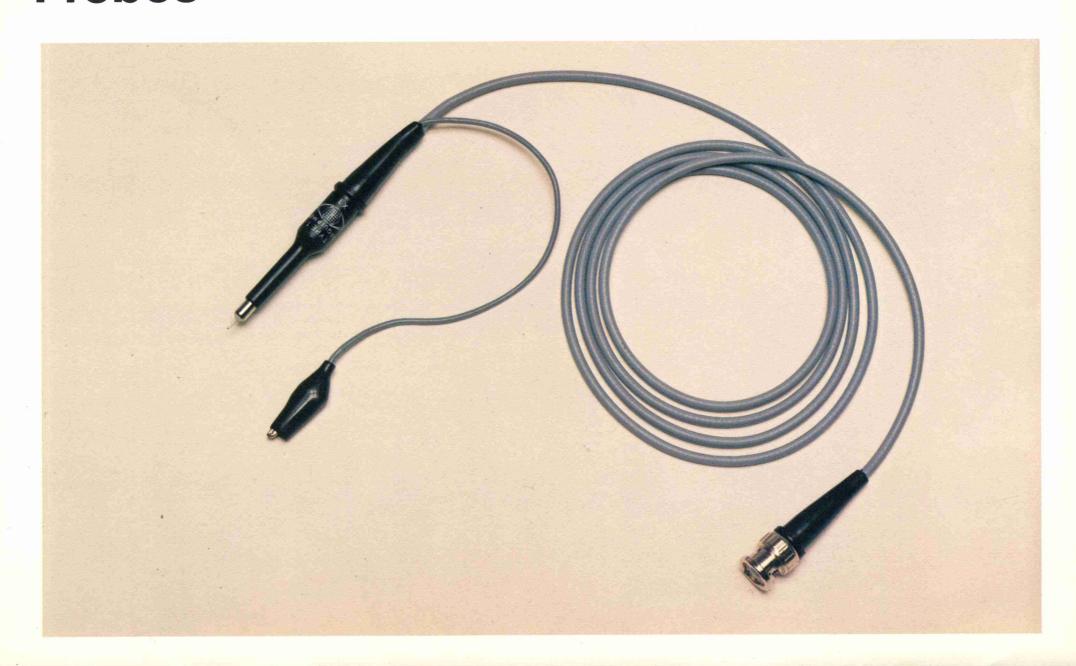
For DM64, D65, D67A
Part No. 161-0084-00
For D54, D54R
Part No. 161-0051-00
For D75
Part No. 161-0085-01
For D63, DM63 and D83
Part No. 161-0084-00
For S22, D32 and D34
Part No. 161-0113-01

Oscilloscope and General Purpose Trolley TT3

A compact trolley designed especially for Telequipment oscilloscopes. Construction is both rigid and pleasing in appearance. The frame is constructed of rectangular-section steel tubing with a nylon dip-coated finish. The castors are 3in diameter, mounted on ball-race bearings. The trolley, which is finished in two shades of grey, is capable of supporting a distributed load of 100kg (220lb). The upper shelf has internal dimensions of $502 mm \times 305 mm$ $(12in \times 19\frac{3}{4}in)$ and is adjustable to four positions - sloping angles of 8°, 16° and 24°, and a level position. Overall dimensions of the assembled trolley are - height 778mm (30¾in), width 410mm (161/4in), and depth 520mm (20½in). The weight is 13kg (28¾lb). For storage the TT3 packs flat into a package measuring 710mm (28in × 540mm $(21\frac{1}{4}$ in) $\times 100$ mm (4in).



Probes



The TP series of Telequipment probes are miniature devices comprising a probe body with a permanently attached ground lead, a retractable hook tip, cable and connector. An integrated circuit test adaptor is fitted to protect the tip and is useful for probing leads on a flat-pack type I.C. The adaptor is removable to facilitate the attachment of other tip adaptors. All probes listed are fitted with a standard BNC connector.

Probe	Attenuation	Cable Length	Input Ω	Input C (see note 4)	Bandwidth	Max. Input V (see note 3)	Probe Package Part Number
TP1	$\times 1$	1.3 m (4.5 ft)	1 ΜΩ	$40\mathrm{pf}(1)$	20 MHz	500	010-0291-00
TP2	$\times 10 \pm 3\%$	1.3 m (4.5 ft)	$10\mathrm{M}\Omega\pm2\%$	11.5 pf	70 MHz	500	010-0292-00
TP2	$ imes 10 \pm 3\%$	1.8 m (6 ft)	$10M\Omega\pm\!2\%$	11.5 pf	70 MHz	500	010-0292-02
TP2	$\times 10 \; {\pm} 3\%$	3.0 m (9.8 ft)	$10\text{M}\Omega\pm\!2\%$	11.5 pf	70 MHz	500	010-0292-03
TP3	$\times 100 \pm 3\%$	1.3 m (4.5 ft)	$9M\Omega\pm\!2\%$	4 pf	60 MHz	1500	010-0293-00
TP4 Detector Probe	(See notes 5, 6 and 7)	1.3 m (4.5 ft)	(See notes 5, 6 and 7)	4 pf	$100\mathrm{kHz} ext{-}300\mathrm{MHz} ext{ }\pm1\mathrm{dB}$	30 V (RMS)	010-0294-00
TP5	Switchable $\times 1/\times 10$ (See note 2)	1.3 m (4.5 ft)	$\begin{array}{l} \times11\;M\Omega\;(1)\\ \times1010\;M\Omega \end{array}$	40 pf (1) 11.5 pf	14 MHz 80 MHz	500	010-0295-00
TP5	Switchable $\times 1/\times 10$ (See note 2)	3.0 m (9.8 ft)	$\begin{array}{l} \times11\;\mathrm{M}\Omega\;(1)\\ \times1010\;\mathrm{M}\Omega \end{array}$	40 pf (1) 11.5 pf	15 MHz 80 MHz	500	010-0295-01
Spare Probe Tip			(Fits all TP Ser	ies Probes)		015-0328-00

- (1) Dependent upon oscilloscope input conditions.
- $\left(2\right)$ Switch on TP5 include a ground reference position.
- (3) Max input volts figure is DC plus peak AC.
- $(4)\times 10$ probes includes adjustable capacitance compensation for optimum response.
- (5) Turn-on voltage 40 mV.
- (6) Isolation voltage 100 V.
- (7) Output polarity, +ve to ground.

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Guld/Adv

TELEQUIPMENT PRICE LIST

				i.e.:
	Model	Description	FST Exempt	FST Incl.
		10MHz Oscilloscope	\$ 620.00	\$ 665.00
	D1010	10MHz Oscilloscope	685.00	735.00
	D1011	15MHz Oscilloscope	790.00	850.00
	D1015	15MHz Oscilloscope	910.00	975.00
	D1016	5MHz Oscilloscope	820.00	′880.00
	S22 *	10MHz Dual Trace Oscilloscope	1,190.00	1,280.00
	D32 *	15MHz Portable Oscilloscope	1,510.00	1,620.00
	D34 *	15MHz Portable Oscilloscope	1,380.00	1,480.00
	D66A	25MHz Dual Trace Oscilloscope 25MHz Dual Trace Oscilloscope	1,655.00	1,775.00
	D67A	25MHZ Dual Trace Oscilloscope	2,410.00	2,590.00
	D75	50MHz Portable Oscilloscope	1,350.00	1,450.00
	D63	Dual Beam Oscilloscope		2,720.00
	DM63	Dual Beam Storage Oscilloscope	1,515.00	1,625.00
	D83	Mainframe Oscilloscope	655.00	700.00
	S2A	Dual Time Base Plug In	225.00	240.00
	Vl	Amplifier Plug In		510.00
	V3	Differential Amplifier Plug In	520.00	560.00
	V4	Amplifier Plug In	1,995.00	2,144.00
	DM64	Storage Oscilloscope	1,565.00	1,685.00
	CT71	Curve Tracer	230.00	250.00
	V5	Amplifier Plug In	200.00	210.00
	TT3	Trolley		
		*includes probes	e a co	
				Ŧ.
		a a f Cl. Durche	35.30	38.20
	010-0291-00	TPl xl 4.5 ft. Probe	38.50	41.60
	010-0292-00	TP2 x10 4.5 ft. Probe	39.75	43.00
	010-0292-02	TP2 x10 6 ft. Probe	40.10	43.30
	010-0292-03	TP2 x10 9.8 ft. Probe	60.70	65.60
	010-0294-00	TP4 4.9 ft. Probe	48.50	52.40
	010-0295-00	TP5 xlxl0 4.5 ft. Probe	48.90	52.85
	010-0295-01	" 9.5 ft. Probe	44.10	47.15
	010-0293-00	TP3 x100 4.9 ft. Probe		
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