

# Wireless World

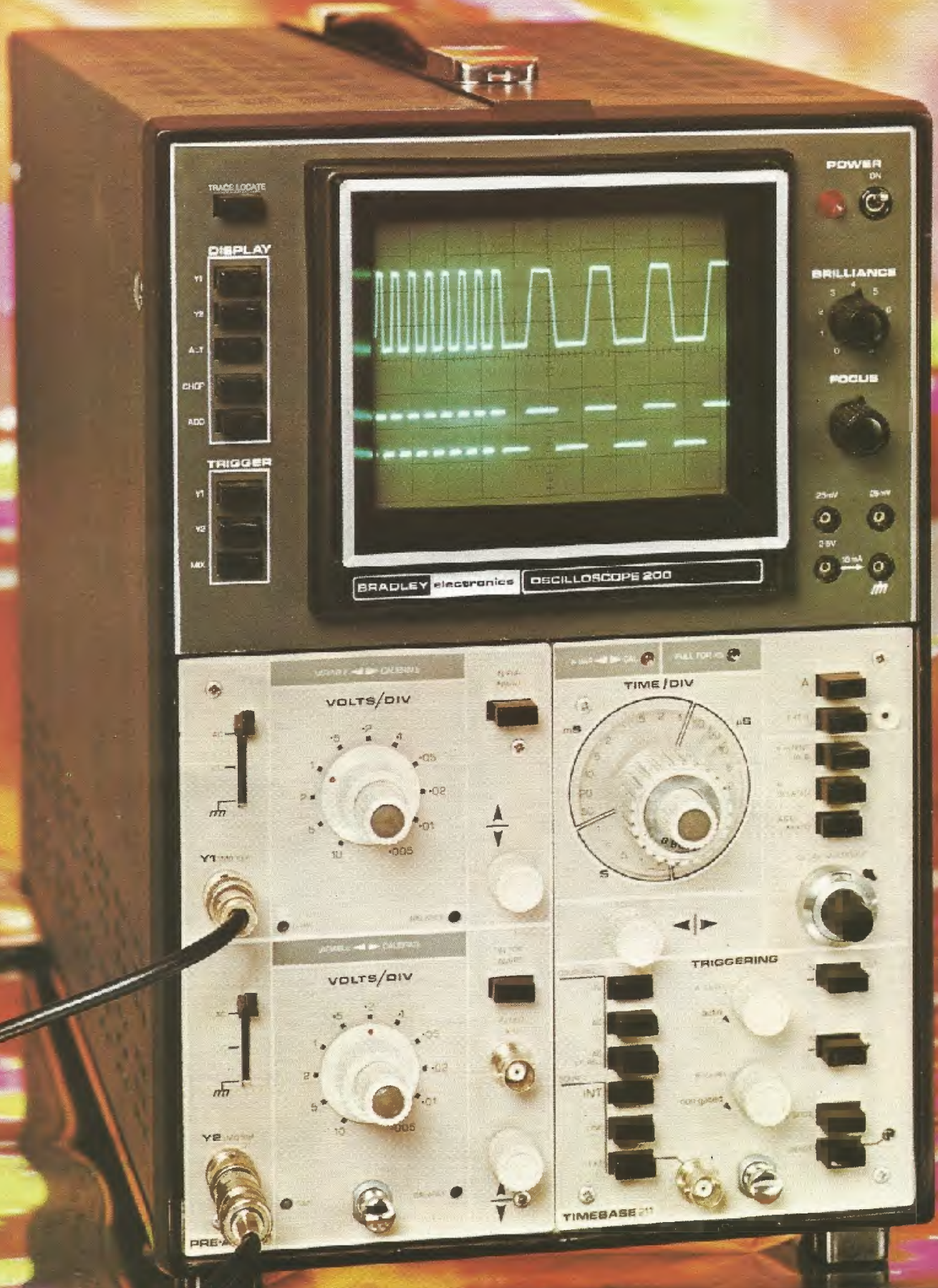
July 1973

20p

Howl suppressor

A.C. voltage regulators

Australia 70 cents  
Belgium Fr. 41.00  
Canada 90 cents  
Denmark Kr. 8.00  
Finland Fmk. 4.30  
Germany Dm. 3.50  
Holland Dfl. 3.25  
Israel I£. 2.50  
Italy L 600  
Malaysia M\$ 2.30  
New Zealand 65 cents  
Nigeria 55k  
Norway Kr. 6.50 inkl. Moms  
Rhodesia 70 cents  
South Africa 65 cents  
Spain Ptas. 55.00  
Sweden Kr. 4.25 inkl. moms  
Switzerland Fr. 4.30  
U.S.A. \$ 1.00



# The new Bradley 200 is a quality 100 MHz general purpose oscilloscope it costs just £595\*

That's remarkable value for money.

Considerably less than you could pay for the same performance, accuracy, sensitivity and versatility.

Not that we set out to undercut the competition.

All we wanted to do was to produce the best 100MHz general purpose oscilloscope on the market. But because we started from scratch, we were able to use the latest engineering techniques and advanced circuitry (including many i.c.'s). And this meant we could price the 200 very competitively.

The 200 incorporates all the features you would expect in a first-class modular instrument, plus several new ideas.

To find out about these, please telephone Ashley Stokes on 01-450 7811, Extension 113. Or write to him at the address below.

*\*UK Price quoted does not include VAT*



# ANDERS MEANS METERS...

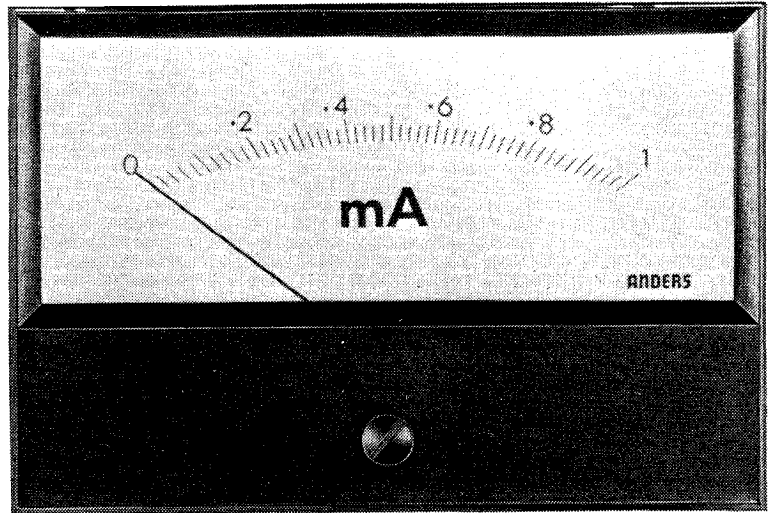
## REGAL RANGE

- New 100° arc high quality meters at low prices.
- Rugged taut band construction  
— pivot and jewel available to order
- Sensitivities to 10  $\mu$ A
- Very competitively priced for OEM quantities
- Modern styled meters in matt black plastic cases with flattened arc giving long scale.

### TWO MODELS

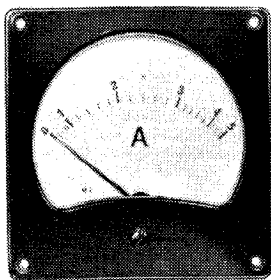
R55 2.5in (63.5mm) Scale length

R65 3.2in (81.3mm) Scale length

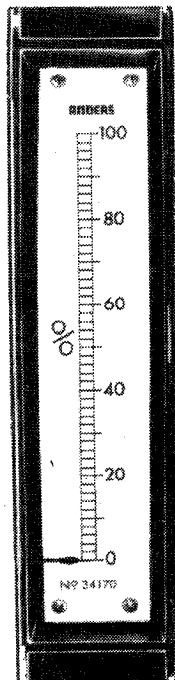


Anders provide what is probably the largest range of meters available from a single source in Europe: MC/MI, dynamometer, vibrating reed, electrostatic, etc. in over 100 case styles and sizes, a few of which are shown below.

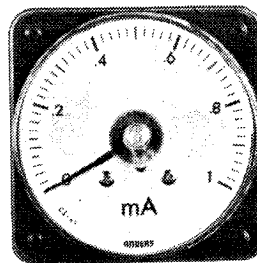
Popular models and ranges are stocked in depth while a specially equipped instrument department enables swift production of non-standard ranges and scales, to suit individual customer requirements, in large or small quantities.



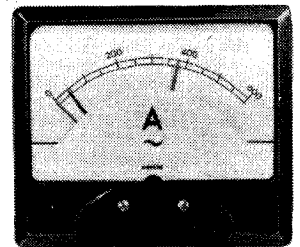
Vulcan Moving Iron. 4 models, 1.5", 1.8", 2.7", 3.7" scales. Voltmeters, ammeters and motor starting meters.



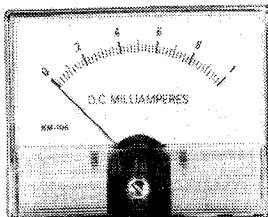
Profile 350 edgewise 4.3" scale. DC moving coil and AC moving coil rectified. Horizontal or vertical mounting.



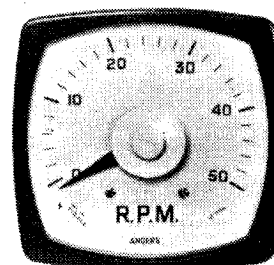
Oxford Long Scale 240°. 2 models, 5.5", 8" scales. DC moving coil and AC moving coil rectified.



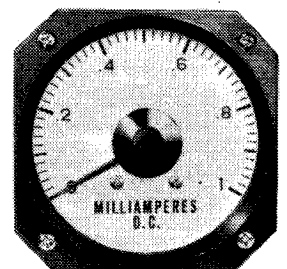
Solicontroller Moving Coil Relay. DC moving coil and AC moving coil rectified. 1 or 2 adjustable alarm controls.



Kestrel Clear Front. 7 models, 1.3"—5.25" scales. DC moving coil, AC moving coil rectified, AC moving iron.



Stafford Long Scale 240° 6 models, 3.5"—11.5" scales. DC moving coil, AC moving coil rectified, AC moving iron. Also 98° scale.



Lancaster Long Scale 240°. 2 models, 4", 5.5" scales. DC moving coil and AC moving coil rectified.

Send for fully illustrated catalogue.

**ANDERS ELECTRONICS LIMITED** 48/56 Bayham Place, Bayham Street, London, N.W.1. Telephone 01-387 9092.

Manufacturers and distributors of Electrical Measuring Instruments. Sole U.K. distributors of FRAHM Resonant Reed Frequency Meters and Tachometers. Manufacturers of purpose built electrical and electronic equipment to customers requirements.

WW—005 FOR FURTHER DETAILS



# ARROW

## CT series subminiatures low cost... high standard

In subminiature switching, low cost *needn't* mean low quality! That's the message that British-made Arrow CT series carries round the world—gaining ready acceptance wherever it goes. Those rugged little lever switches pack maximum performance into minimum size and weight. Single and double pole versions with 2, or 3 way action, give a choice of levers in bright chrome or seven-colours. They meet ratings up to 2A at 250V ac, and with their C.S.A. and U.L. approvals they'll help you show the flag.

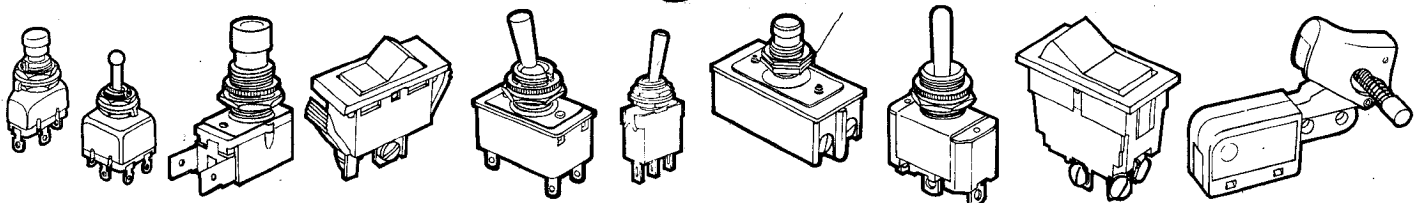
Get the full data on hardy, home-grown Arrow CT sub-mins.



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## Arrow switches *right* across the panel



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WW—006 FOR FURTHER DETAILS

# Vortexion

**50/70 WATT ALL SILICON AMPLIFIER  
WITH BUILT-IN 4-WAY MIXER USING F.E.T.s.**

This is a high fidelity amplifier (0.3% intermodulation distortion) using the circuit of our 100% reliable 100 Watt Amplifier with its elaborate protection against short and overload, etc. To this is allied our latest development of F.E.T. Mixer Amplifier, again fully protected against overload and completely free from radio breakthrough.

The mixer is arranged for 2-30/60 $\Omega$  balanced line microphones, 1-HiZ gram input and 1-auxiliary input followed by bass and treble controls. 100 volt balanced line output or 5/15 $\Omega$  and 100 volt line.

## 50/70 WATT ALL SILICON AMPLIFIER WITH BUILT-IN 5-WAY MIXER USING F.E.T.s.

This is similar to the 4-way version but with 5 inputs and bass cut controls on each of the three low impedance balanced line microphone stages, and a high impedance (10 meg) gram stage with bass and treble controls plus the usual line or tape input. All the input stages are protected against overload by back to back low self capacity diodes and all use F.E.T.'s for low noise, low intermodulation distortion and freedom from radio breakthrough. A voltage stabilised supply is used for the pre-amplifiers making it independent of mains supply fluctuations and other stabilised supply for the driver stages is arranged to cut off when the output is overloaded or over temperature. The output is 75% efficient and 100V balanced line or 8/16 $\Omega$  output are selected by means of a rear panel switch which has a locking plate indicating the output impedance selected. The mixer section has an additional emitter follower output for driving a slave amplifier, phones or tape recorder, output .3V out on 600 ohms upwards.

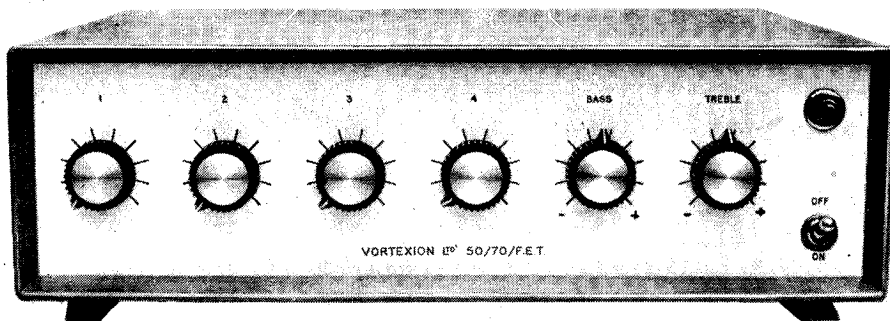
**100 WATT ALL SILICON AMPLIFIER.** A high quality amplifier with 8 ohms-15 ohms or 100 volt line output for A.C. Mains. Protection is given for short and open circuit output over driving and over temperature. Input 0.4 V on 100K ohms.

**THE 100 WATT MIXER AMPLIFIER** with specification as above is here combined with a 4 channel F.E.T. mixer, 2-30/60 $\Omega$  balanced microphone inputs, 1-HiZ gram input and 1-auxiliary input with tone controls and mounted in a standard robust stove enamelled steel case. A stabilised voltage supply feeds the tone controls and pre amps, compensating for a mains voltage drop of over 25% and the output transistor biasing compensates for a wide range of voltage and temperature. Also available in rack panel form.

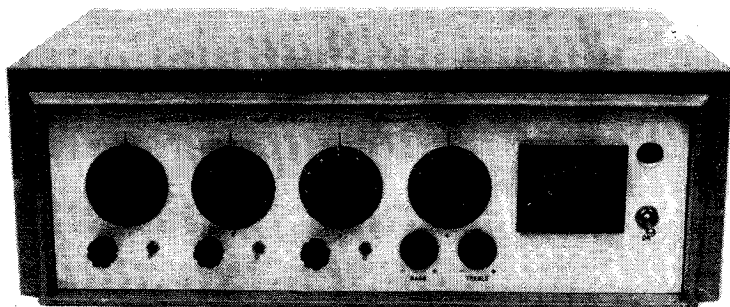
**CP50 AMPLIFIER.** An all silicon transistor 50 watt amplifier for mains and 12 volt battery operation, charging its own battery and automatically going to battery if mains fail. Protected inputs, and overload and short circuit protected outputs for 8 ohms-15 ohms and 100 volt line. Bass and treble controls fitted.

Models available with 1 gram and 2 low mic. inputs, 1 gram and 3 low mic. inputs or 4 low mic. inputs.

**200 WATT AMPLIFIER.** Can deliver its full audio power at any frequency in the range of 30 c/s-20 Kc/s  $\pm$  1 dB. Less than 0.2% distortion at 1 Kc/s. Can be used to drive mechanical devices for which power is over 120 watt on continuous sine wave. Input 1 mW 600 ohms. Output 100-120 V or 200-240 V. Additional matching transformers for other impedances are available.



## F.E.T. MIXERS and PPMs.



Since we have been supplying professional mixers for 25 years we have delayed the introduction of solid state units until they were at least as good as their valve counterparts. (Which will continue where required.)

The various sections of the FET mixers and BBC type PPM's have been performing successfully for several years in other equipments with complete reliability. The PPM also uses an FET in its time constant circuit so that polyester capacitors can be used. The response from the 600 $\Omega$  output (25 $\Omega$  source impedance) is level 20 Hz to over 30 kHz with very low intermodulation distortion to zero level + 12dB. The input signal voltage range is over twice that of the valve unit and the noise at least halved.

**VORTEXION LIMITED,**  
Telephone: 01-542 2814 and 01-542 6242/3/4

**257-263 The Broadway, Wimbledon, S.W.19**  
Telegrams: "Vortexion, London S.W.19"

# LOW COST RC OSCILLATORS 1Hz TO 1MHz

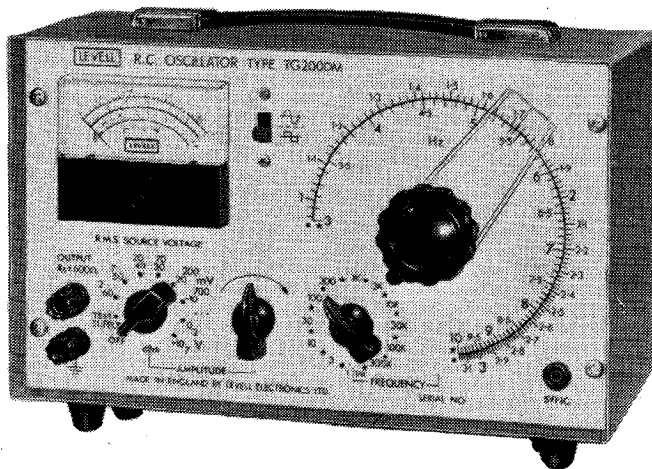


## LEVELL

### PORTABLE INSTRUMENTS

VISIT US ON STAND D24 AT THE  
LEEDS ELECTRONICS EXHIBITION JULY 3-5

NOTE: All prices subject to V.A.T.



## ANALOGUE

**FREQUENCY** 1Hz to 1MHz in 12 ranges. Acc.  $\pm 2\%$   
 $\pm 0.03\text{Hz}$ .

**SINE OUTPUT** 7V r.m.s. down to  $<200\mu\text{V}$  with  $R_s = 600\Omega$

**DISTORTION**  $<0.1\%$  to 5V,  $<0.2\%$  at 7V from 10Hz to 100kHz.

**SQUARE OUTPUT** 7V peak down to  $<200\mu\text{V}$ . Rise time  $<150\text{nS}$ .

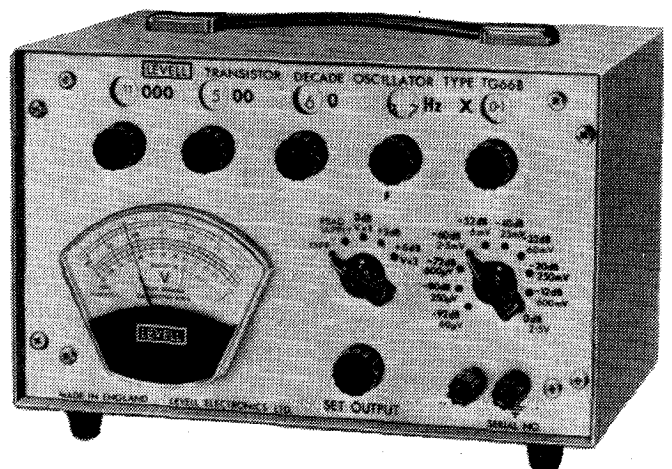
**SYNC. OUTPUT**  $>1\text{V}$  r.m.s. sine in phase with output.

**SYNC. INPUT**  $\pm 1\%$  freq. lock range per volt r.m.s. input.

**METER SCALES** 0/2V, 0/7V &  $-14/+6\text{dBm}$ . on TG200M & DM only.

**SIZE & WEIGHT** 7" high x  $10\frac{1}{2}$ " x  $5\frac{1}{2}$ " deep. 10 lbs.

TG200	TG200D	TG200M	TG200DM
<b>£42</b>	<b>£45</b>	<b>£52</b>	<b>£55</b>
Sine O/P	Sine & Sq. O/P.	Sine O/P + meter.	Sine & Sq. O/P + meter.



## DIGITAL

**FREQUENCY** 0.2Hz to 1.22MHz on four decade controls.

**ACCURACY**  $\pm 0.02\text{Hz}$  below 6Hz  
 $\pm 0.3\%$  from 6Hz to 100kHz  
 $\pm 1\%$  from 100kHz to 300kHz  
 $\pm 3\%$  above 300kHz.

**SINE OUTPUT** 5V r.m.s. down to  $30\mu\text{V}$  with  $R_s = 600\Omega$

**DISTORTION**  $<0.15\%$  from 15Hz to 15kHz.  
 $<0.5\%$  at 1.5Hz and 150kHz.

**METER SCALES** 2 Expanded voltage &  $-2/+4\text{dBm}$ .

**SIZE & WEIGHT** 7" high x  $10\frac{1}{2}$ " wide x 7" deep. 12 lbs.

TG66B  
**£120**  
Batteries only.

TG66A  
**£150**  
Mains unit & batteries incl.

Prices include batteries with 400 hour life.  
Mains power units £10 extra. Leather cases £6 extra.

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