Advance

Type **D1P/2**

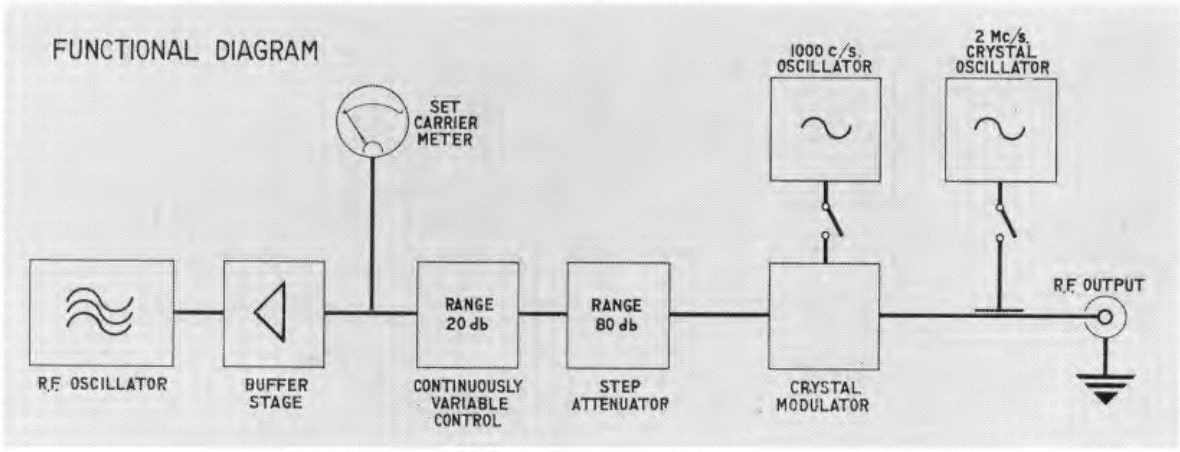
V.H.F. SIGNAL GENERATOR

range 2 Mc/s to 190 Mc/s

THE Type D1P/2 is a special version of our standard V.H.F. Signal Generator Model D1/D which has been produced with frequency ranges and performance most suitable for the alignment of narrow band communication receivers. A Colpitts type oscillator is employed with a variable capacitance driven by a slow motion drive with a 50 : 1 reduction. The frequency calibration is displayed on a 6 in. diameter dial and a linear scale and vernier are provided to ensure maximum resetting accuracy. The attenuator system consists of a continuously variable control and a five position step attenuator. To eliminate attenuator reaction on the oscillator frequency a buffer stage separates the oscillator from the attenuator. The output signal may be amplitude modulated 30% at 1,000 c/s using a crystal modulator at the output, thus preventing incidental frequency modulation. To provide an accurate check of the frequency calibration, a 2 Mc/s crystal oscillator is incorporated which when in use ejects a 2 Mc/s signal with the R.F. output providing marker signals at multiples of 2 Mc/s, which can be detected by the receiver under test.

from the comprehensive range of 'Advance' instruments and equipment

The instrument is mounted on a thick aluminium panel enamelled grey and fitted in a grey enamelled steel case with a lid to protect the controls in transit. All accessories are housed in the back of the case.



SPECIFICATION . . . TYPE DIP/2

Frequency

Directly calibrated in six ranges:—

2 Mc/s to 3.4 Mc/s.	30 Mc/s to 55 Mc/s.
3.4 Mc/s to 5 Mc/s.	55 Mc/s to 105 Mc/s.
10 Mc/s to 18 Mc/s.	100 Mc/s to 190 Mc/s.

Accuracy ± 1%.

A linear scale and vernier are provided for accurate resetting.

Crystal Oscillator

A 2 Mc/s crystal oscillator provides signals ejected with the R.F. output to give frequency checks at 2 Mc/s intervals when fed to a receiver.

Accuracy ± 0·01%.

R.F. Output

The output voltage is obtained from the end of a terminated 75 ohm cable. The level is continuously variable from 0·1 μV to 10 mV by means of a continuously variable control and a five position decade multiplier.

Accuracy ± (3 db + 1μV).

Output Impedance

The output impedance at the end of the transmission line is 75 ohms when unterminated, and when terminated is 37½ ohms.

Modulation

Modulated 30% (± 2 db) at 1,000 c/s (± 10%). Due to the use of a crystal modulator, incidental frequency modulation is negligible.

R.F. Leakage

The oscillator section is triple shielded and external stray magnetic and electric fields are negligible.

Valves and Accessories

1 Valve type 12 AT7; 2 Valves type 6J5G; 1 Valve type 5Z4G; 1 2 Mc/s Crystal type Q193; 1 Pilot Lamp 6·5 volts 11 mm.; 1 R.F. lead PL5; 1 Termination Pad TP2; 1 Mains lead type PL15.

Power Supply

110-125 volts, 140-160 volts, 200-220 volts, 230-250 volts, 40-100 c/s. Consumption approximately 25VA.

Dimensions

14¼ ins. wide × 12¾ ins. high × 8 ins. deep overall (36.2 cm. × 32·4 cm. × 20·3 cm.).

Weight

34 lb. nett (15·4 kg.).

Finish

Standard Pye plugs and sockets are used for R.F. output. The instrument is mounted on a thick aluminium panel enamelled grey, and fitted in a grey enamelled steel case, provided with a completely detachable lid to protect the controls when the instrument is not in use. The lid carries the instruction manual, whilst the leads and termination unit are housed in a box at the back of the case.

GUARANTEE. This instrument is of British design and construction and is fully guaranteed against defective material and faulty manufacture for a period of twelve months from date of purchase. We undertake to repair or replace any component, if after examination it is proved defective. No liability can be accepted by us in respect of the valves supplied with this instrument.

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Printed in England *ABS 5M/856*

Leaflet No. S.37

Advance

Type **B4**

R.F. SIGNAL GENERATOR

range: 100 kc/s to 80 Mc/s (MODEL 'A')
range: 30 kc/s to 30 Mc/s (MODEL 'B')

THIS instrument is an R.F. Signal Generator and is available in two models, differing only in their frequency range. The model 'A' covers from 100 kc/s to 80 Mc/s, and the model 'B' from 30 kc/s to 30 Mc/s. A Hartley oscillator is employed with six switched inductors and a variable capacitance. The frequency range of both models is consequently covered in six bands and directly calibrated with an overall accuracy of $\pm$ 1%. To facilitate resetting, a vernier scale is provided. The R.F. output is continuously variable between 1μV and 100 mV by means of a non-inductively wound potentiometer and a resistive step attenuator, and can be accurately set by means of a crystal voltmeter that monitors the level after the potentiometer. The output signal may be internally modulated at 400 c/s with a variable modulation depth of 0-80%. An external modulating source also may be used. Both internal and external modulation

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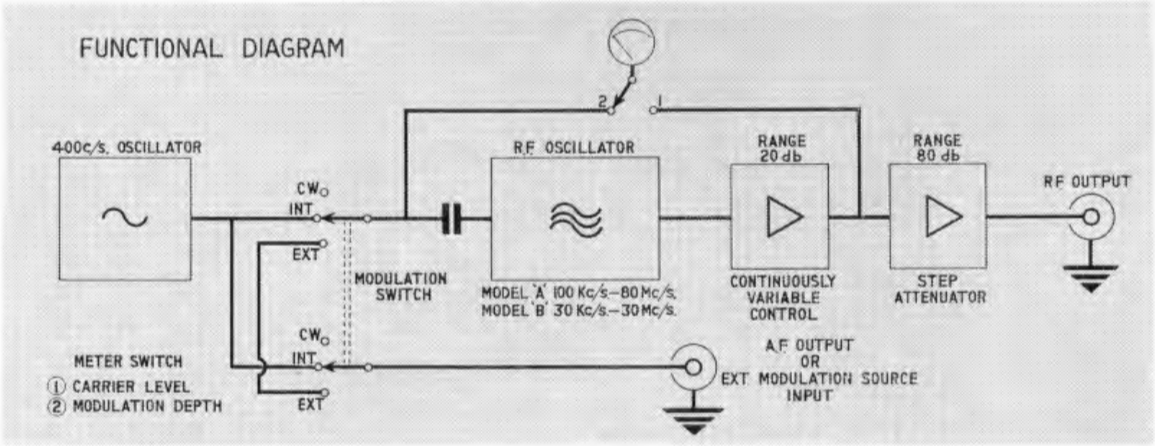
depths are monitored. An audio frequency output at 400 c/s is available when the internal modulation oscillator is in use. All oscillating circuits are well screened and stray radiation is less than 1μV.



SPECIFICATION...TYPE B4

Frequency

Model 'A' 100 kc/s to 80 Mc/s.

Range A	100– 300 kc/s.	Range D	3–10 Mc/s.
Range B	300–1,000 kc/s.	Range E	10–30 Mc/s.
Range C	1–3 Mc/s.	Range F	30–80 Mc/s.

Calibration accuracy ± 1%.

Model 'B' 30 kc/s to 30 Mc/s.

Range A	30– 100 kc/s.	Range D	1–3 Mc/s.
Range B	100– 300 kc/s.	Range E	3–10 Mc/s.
Range C	300–1,000 kc/s.	Range F	10–30 Mc/s.

Calibration accuracy ± 1%.

R.F. Output

The output voltage from the 75 ohm attenuator is fed into a 75 ohm transmission line terminated with a 75 ohm dummy aerial pad. The voltage available from the pad is that indicated on the instrument. The output is continuously variable from 1μV to 100mV by means of a four-step decade multiplier and continuously variable attenuator, and is monitored after the continuous attenuator, to ensure accuracy at high frequencies.

Accuracy ± (1 db + 2% F.S.D.)

Output Impedance

The output impedance at the end of the transmission line, when unterminated, is 75 ohms. When terminated by the Termination Pad Type TP1A, supplied with the instrument, three impedance values are available:—37 ohms, 10 ohms, and standard dummy aerial.

Internal Modulation

Frequency 400 c/s ± 10%; Modulation Depth, 0–80%; Accuracy ± 10% of reading.

GUARANTEE. This instrument is of British design and construction and is fully guaranteed against defective material and faulty manufacture for a period of twelve months from date of purchase. We undertake to repair or replace any component, if after examination it is proved defective. No liability can be accepted by us in respect of the valves supplied with this instrument.

External Modulation

Model 'A'. 10 c/s–30 kc/s, 0–80% for frequencies less than 1/30th of the carrier frequency.

Model 'B'. 10 c/s–10 kc/s, 0–80% for frequencies less than 1/30th of the carrier frequency.

Approximately 10% modulation depth per volt into high impedance is obtained. The modulation depth is monitored.

Accuracy is ± 10% of reading.

A.F. Output

This is obtained from the internal modulation oscillator at 400 c/s ± 10%. Output is approximately 0–10 volts into 600 ohms.

R.F. Leakage

Exceptionally good screening and filtering have reduced stray radiation to less than 1μV.

Valves

1 ECC91 (6J6); 1 6SN7GT; 1 6X5GT.

Accessories

1 Pilot Lamp, Type MES 11 mm. 6.5 volt; 1 Termination Pad and Dummy Aerial, Type TP1A; 1 Shielded R.F. feeder complete with plugs Type PL5; 1 Shielded A.F. lead complete with plug and crocodile clips, Type PL18; 1 Mains Lead, Type PL24.

Power Supply

110, 210, 230, 250 volts, 40–100 c/s. Consumption approximately 25 watts.

Dimensions

13 in. wide × 12⅜ in. high × 7¼ in. deep (33.0 cm. × 31.4 cm. × 18.4 cm.).

Weight

25 lb. (11.4 kg.) approximately.

Finish

The instrument is mounted on a thick aluminium panel, enamelled grey and fitted in a grey steel case. A leather carrying handle is provided.

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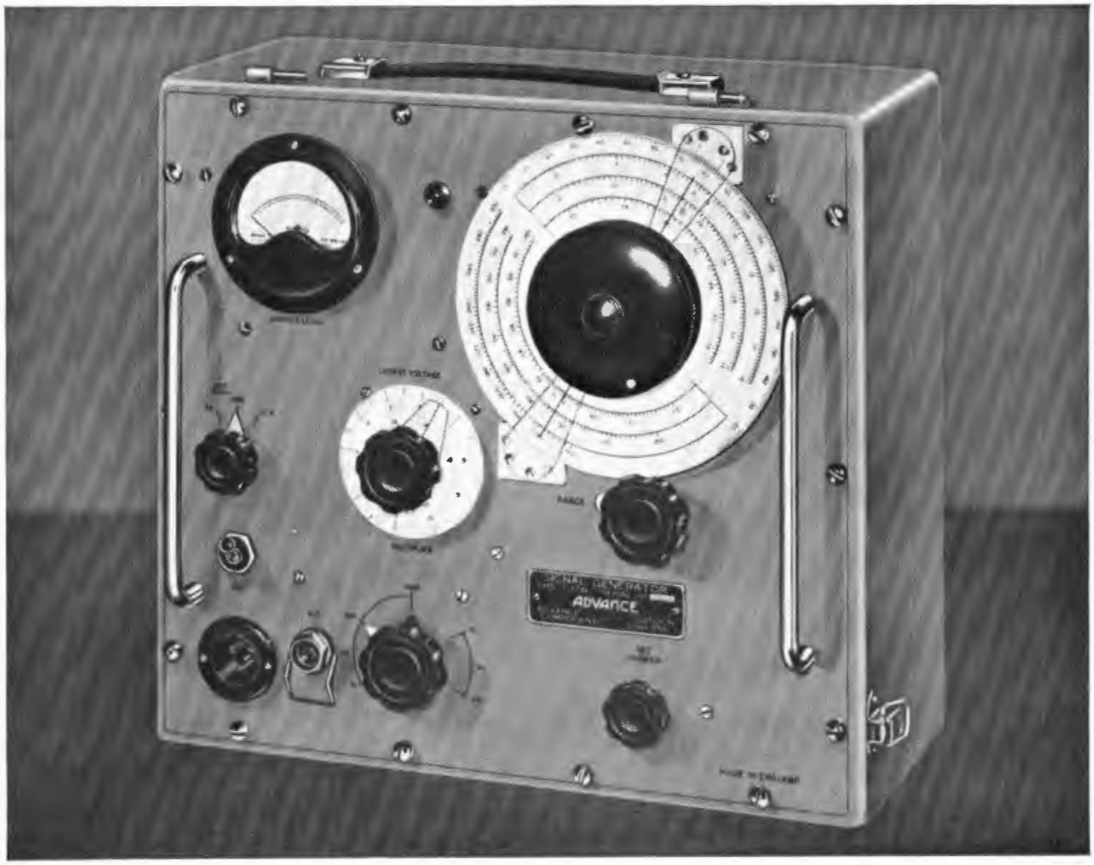
Leaflet No. S.38

Advance

Type **D1/D**

V.H.F. SIGNAL GENERATOR

range: 10 Mc/s to 300 M/cs



BASICALLY similar to the famous 'Advance' type D1 (an instrument long regarded as premier in its sphere) the type D1/D differs, however, in that its frequency dial is directly calibrated.

Maximum resetting accuracy is ensured by a linear scale and vernier, whilst its slow motion drive with 50 : 1 ratio, simplifies frequency setting when testing narrow-band receivers.

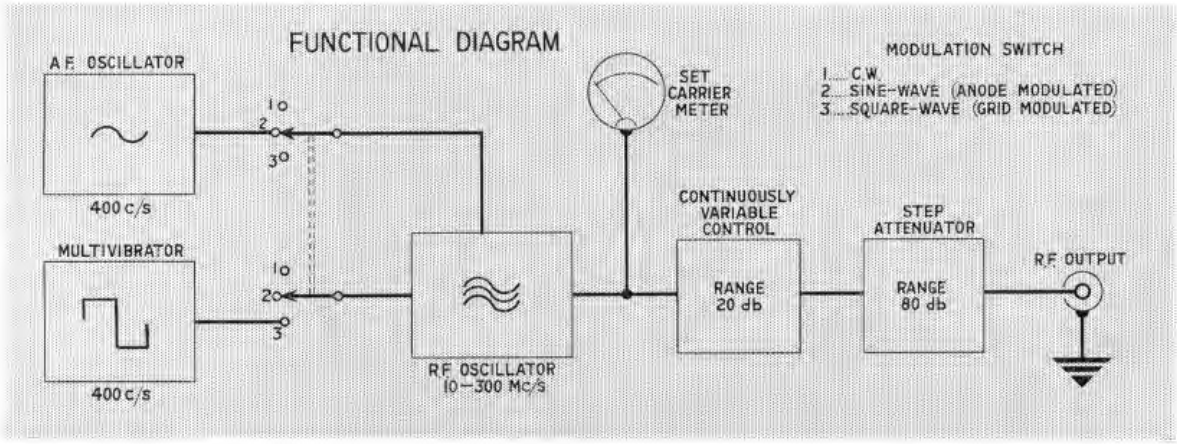
A Colpitts oscillator is employed which may be anode-modulated by a 1,000 c/s sine-wave, or grid-modulated by a 50/50 square-wave. Both types of modulation are internal, and are selected by a switch. (No provision is made for external modulation.) A special design of coil turret in conjunction with appropriate switching enables simple selection of the six ranges. The output from the R.F. oscillator is fed to an inductive slide wire, where it is monitored. The oscillator is triple shielded and external stray magnetic and electrostatic fields are negligible. The slide wire feeds

For details of type DIP/2 (2-190 Mc/s with post-attenuator modulation) see leaflet No. S.37.

from the comprehensive range of 'Advance' laboratory instruments and equipment

a 75 ohm four-step resistive decade attenuator. The output voltage is taken from the end of a 75 ohm matched transmission line.

The instrument is mounted on a thick aluminium panel enamelled grey and fitted in a grey enamelled case with a cover to protect the controls in transit. All accessories are housed in the back of the case.



SPECIFICATION...TYPE D1/D

Frequency

Directly calibrated in six ranges:—

10 Mc/s to 18 Mc/s.	55 Mc/s. to 105 Mc/s.
18 Mc/s. to 32 Mc/s.	100 Mc/s. to 190 Mc/s.
30 Mc/s. to 56 Mc/s.	170 Mc/s. to 300 Mc/s.

Accuracy ±1%.

A linear scale and vernier are provided for accurate setting.

R.F. Output

The output voltage is obtained from the end of a 75 ohm matched transmission line. The output is continuously variable from 1 micro-volt to 100 millivolts by means of a five-position decade multiplier and a continuously variable control, calibrated in microvolts and db.

Accuracy: 10 Mc/s. to 150 Mc/s. ±3 db ±1μV.
150 Mc/s. to 300 Mc/s. ±4 db ±2μV.

The output impedance at the end of the transmission line is 75 ohms when unterminated, and when terminated is 37½ ohms. A standard Pye plug and socket is used for output.

Modulation

(*a*) C.W.
(*b*) Modulated 30(±3)% sine-wave at 1,000 c/s (±100 c/s).
(*c*) Modulated approximately 50/50 square-wave at 1,000 c/s (±100 c/s).

R.F. Leakage

The oscillator section is triple shielded and external stray magnetic and electrostatic fields are negligible.

Valves

One 12AT7; two 6J5G; one 5Z4G (not used in Model D1/DNA); one MES, 11 mm. 6.5 V pilot lamp.

Accessories

One 75 ohm connector type PL5; one 75 ohm termination pad type TP2; one mains lead type PL15.

Power Supply

110-125, 140-160, 200-220, 230-250 volts, 40-100 c/s (a.c. only). Consumption approximately 25 watts.

For special models see below.

Dimensions

14¼ in. wide × 12¾ in. high × 8 in. deep overall (36.2 cm. × 32.4 cm. × 20.3 cm.).

Weight

34 lb. (15.4 kg.).

Case

The instrument is mounted on a thick aluminium panel enamelled grey and fitted in a grey enamelled steel case, provided with a completely detachable cover to protect the controls when the instrument is not in use. The cover carries the instruction manual. The leads and termination unit are housed in a box at the back of the case.

Special models available as follows:—

Model D1/DE, 110-125, 130-140, 160, 220 *volts*, 40-2,000 *c/s* (*a.c. only*).

Model D1/DNA, 117 *volts*, 25-60 *c/s* (*a.c. only*).

Model D1/DH, 80, 110, 220, 250 *volts*, 40-2,000 *c/s* (*a.c. only*).

GUARANTEE. This instrument is of British design and construction and is fully guaranteed against defective material and faulty manufacture for a period of twelve months from date of purchase. We undertake to repair or replace any component, if after examination it is proved defective. (No liability can be accepted by us in respect of the valves supplied with this instrument. These are normally subject to Makers' guarantee.)

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Leaflet No. S.43

Advance

Type E2

SIGNAL GENERATOR

range: 100 k/cs to 100 M/cs

THE most widely used instrument in its sphere, the type E2, which operates entirely on *fundamental* frequencies, is characterised by its exceptionally low R.F. leakage, which even at 100 Mc/s, is less than three microvolts. In addition to internal modulation at 400 c/s, 30%, it may be modulated from an external source to give 0-80% modulation up to 4 kc/s, and 0-40% modulation up to 10 kc/s. The input impedence is 50 k ohms so that little power is required for modulation.

It incorporates a reliable attenuator system which embodies a non-inductive slide wire followed by a 5 decade 75 ohm ladder network. The use of a 75 ohm cable which is correctly terminated by an 'Advance' Type TPIB Pad ensures that there are no reflections due to mis-match, and that the output level at the dummy aerial is substantially that indicated by the setting of the attenuators.

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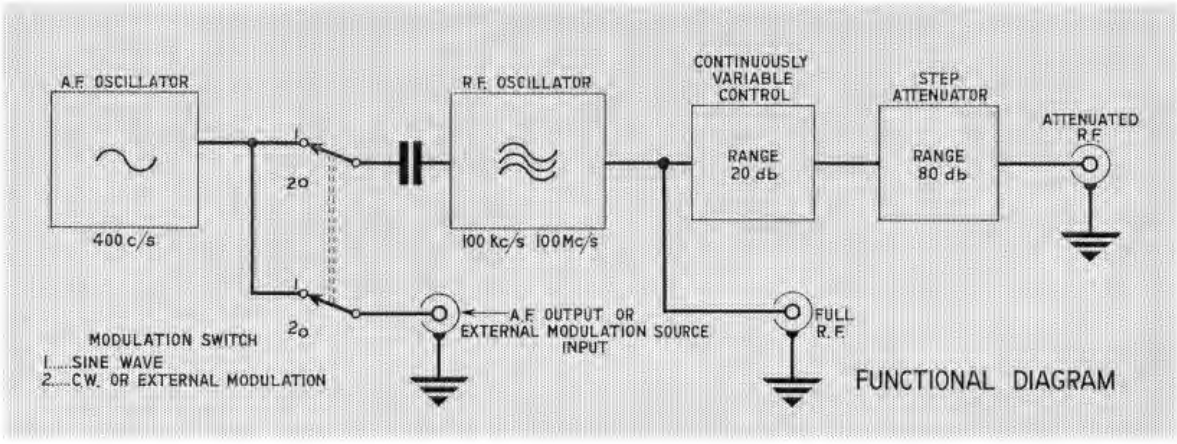
The directly calibrated illuminated dial has a total scale length of over 30 inches. Accuracy of setting is assured by means of a 10 : 1 ratio slow motion drive.



SPECIFICATION...TYPE E2

Frequency

Directly calibrated in six ranges:—

Range A	30–100 Mc/s.	Range D	1–3 Mc/s.
Range B	10–30 Mc/s.	Range E	300–1,000 kc/s.
Range C	3–10 Mc/s.	Range F	100–300 kc/s.

Accuracy ±1%.

Output Voltage

Obtained at the end of the 75 ohm matched transmission line.

Continuously variable from 1μV to 100 mV±6db +3μV.

Output Impedance

At the end of unterminated transmission line, 75 ohms.

When terminated by TPIB Pad, three values are available: 37 ohms, 10 ohms or 10 ohms through the standard all-wave dummy aerial.

One Volt Output Socket

Provides steady 1 volt. Impedance 50 ohms.

Internal Modulation

30% (±5%) at 400 c/s (±10%).

External Modulation

0 to 80% at 10 c/s to 40 kc/s, falling to 40% at 10 kc/s.

Input impedance is 50 k ohms.

A.F. Output

Approximately 0-50 V, 400 c/s at high impedance.

R.F. Leakage

Less than 3μV.

Valves

One ECC91 (6J6); one 6SN7GT; one 6X5GT; one 11 mm. 6.5V pilot lamp.

Accessories

One termination pad and dummy aerial, Type TPIB; one shielded R.F. lead with plug and socket, Type PL27; one A.F. lead with plugs and crocodile clips, Type PL28.

Power Supply

105-125 and 210-250 volts, 40-100 c/s (a.c. only). Consumption approximately 20 watts.

For special model see below.

Dimensions

13 in. wide × 10¼ in. high × 8 in. deep (33.0 cm. × 26.0 cm. × 20.3 cm.).

Weight

17½ lb. (8 kg.).

Case

The instrument is in an attractive steel case, the panel and case being sprayed a durable cream enamel A plastic carrying handle is provided.

Special Model, E2/NA, 117 volts, 25-40 *c/s (a.c. only).*

GUARANTEE. This instrument is of British design and construction and is fully guaranteed against defective material and faulty manufacture for a period of twelve months from the date of purchase. We undertake to repair or replace any component, if after examination it is proved defective. (No liability can be accepted by us in respect of the valves supplied with this instrument. These are normally subject to Makers' guarantee.)

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Leaflet No. S.42

Advance

Type **H1** ✓

AUDIO SIGNAL GENERATOR

range: 15 c/s to 50 kc/s

THIS instrument, which has long received world-wide acclamation, completely covers an audio range of between 15 c/s and 50 kc/s with very low distortion. Level output is maintained over its full range.

The coverage is achieved by using a bridge type resistance-capacity oscillator with three switched ranges. It incorporates a stabilizing circuit followed by two stages of amplification with heavy negative feedback. This maintains stability of frequency and output level with negligible distortion.

The total scale length of 18 inches is visible over a large sector.

Both sine and square wave outputs are available and are selected by a switch.

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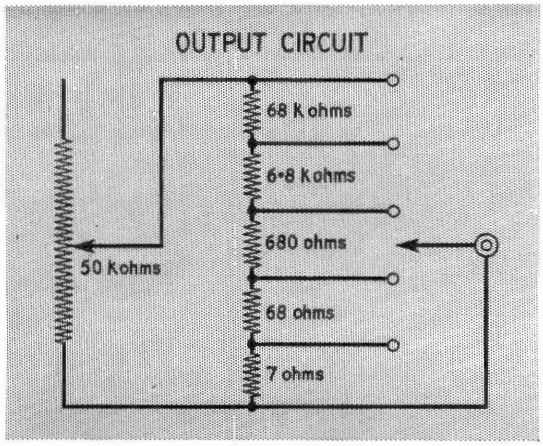
The maximum sine-wave output is maintained within limits of plus/minus 1 db. and the attenuated output may be varied between 200 microvolts and 20 volts with an overall accuracy of plus/minus 2 db. The square-wave output is approximately 800 microvolts to 80 volts peak-to-peak.



SPECIFICATION...TYPE H1

Frequency

Range A 4 kc/s to 50 kc/s.
Range B 300 c/s to 4 kc/s.
Range C 15 c/s to 300 c/s.
Accuracy ±1%+1 c/s on sine-wave.

Output

Sine-wave: 200 microvolts to 20 volts r.m.s. ±2 db. high impedance.
Square-wave: Approximately 800 microvolts to 80 volts peak-to-peak.

Measured Distortion

Less than 1% at 1,000 c/s.

Square Wave Rise-time

Less than 3 microseconds (10% to 90% of peak value).

Valves

Two 6SN7GT; one 6X5G; one MES, 11 mm. 6.5V pilot lamp.

Accessories

One A.F. lead with plug and crocodile clips, Type PL29.

Power Supply

105-125, 210-250 volts, 40-100 c/s (a.c. only). Consumption approximately 30 watts.

Dimensions

13¼ in. wide × 10¼ in. high × 8 in. deep (33.7 cm. × 26.0 cm. × 20.3 cm.).

Weight

14 lb. (6.4 kg.).

Finish

The instrument is in an attractive steel case, the panel and case being sprayed with a durable grey enamel. A plastic carrying handle is provided.

GUARANTEE. This instrument is of British design and construction and is fully guaranteed against defective material and faulty manufacture for a period of twelve months from the date of purchase. We undertake to repair or replace any component, if after examination it is proved defective. (No liability can be accepted by us in respect of the valves supplied with this instrument. These are normally subject to Makers' guarantee.)

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Printed in England *ABS 5M/258*
Leaflet No. S.41

Advance

Type
A64

L. F. ATTENUATOR

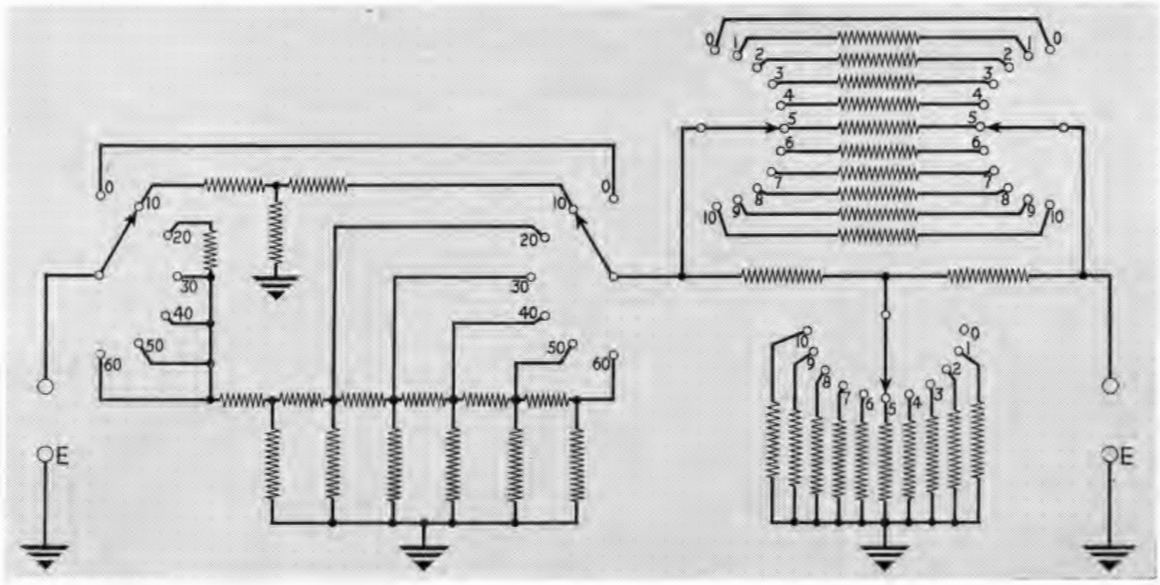
range: 0-70 db in 1 db steps

THE type A64 is a variable attenuator with a constant input and output impedance of 600 ohms. It has been designed essentially for use with audio frequency apparatus, but since the errors are still quite small at frequencies at least up to 1 Mc/s, it also has many applications in the telecommunications field. This model is particularly suitable for use with the 'Advance' Audio Signal Generator types J1 and J2.

The A64 covers a range of 70 db and consists of a section with six steps

from the comprehensive range of 'Advance' instruments and equipment

of 10 db followed by a fine control of ten 1 db steps. As will be seen from the functional diagram below, the single steps of 1 db and the first step of 10 db are each independent of all other positions. The remaining 10 db steps are part of a ladder network compensated to maintain constant impedance. The attenuator is reversible and a zero loss position is provided. Termination to the instrument may be made either with spade terminals or plugs.



SPECIFICATION . . . TYPE A64

Attenuation

Range: 0-70 db in 6 steps of 10 db
10 steps of 1 db.

Accuracy: ± (1%+0.1 db).

Frequency Response: Frequency errors are negligible up to 200 kc/s and do not exceed 2.5 db at 1 Mc/s at high attenuation.

Impedance

The input and output impedance is 600 ohms ±1% unbalanced, at any dial setting.

GUARANTEE. This instrument carries the 'Advance' 12 months' warranty. Any component, if after examination within this period, is proved defective, will be replaced or repaired.

Maximum Loading

1 watt.

Dimensions

Length: 8¼ in. (20.9 cm).
Width: 4¾ in. (12.1 cm).
Depth: 7¼ in. (18.4 cm) including features on front panel.

Weight

5½ lb. (2.5 kg).

Finish

The attenuator is mounted on a thick aluminium panel enamelled grey and fitted in a grey enamelled steel case.

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