Wide Band Signal Generator SG62 A.

Instruction Manual

ADVANCE ELECTRONICS LIMITED

INSTRUMENT DIVISION

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TELEPHONE HAINAULT 4444 TELEGRAMS: ATTENUATE ILFORD

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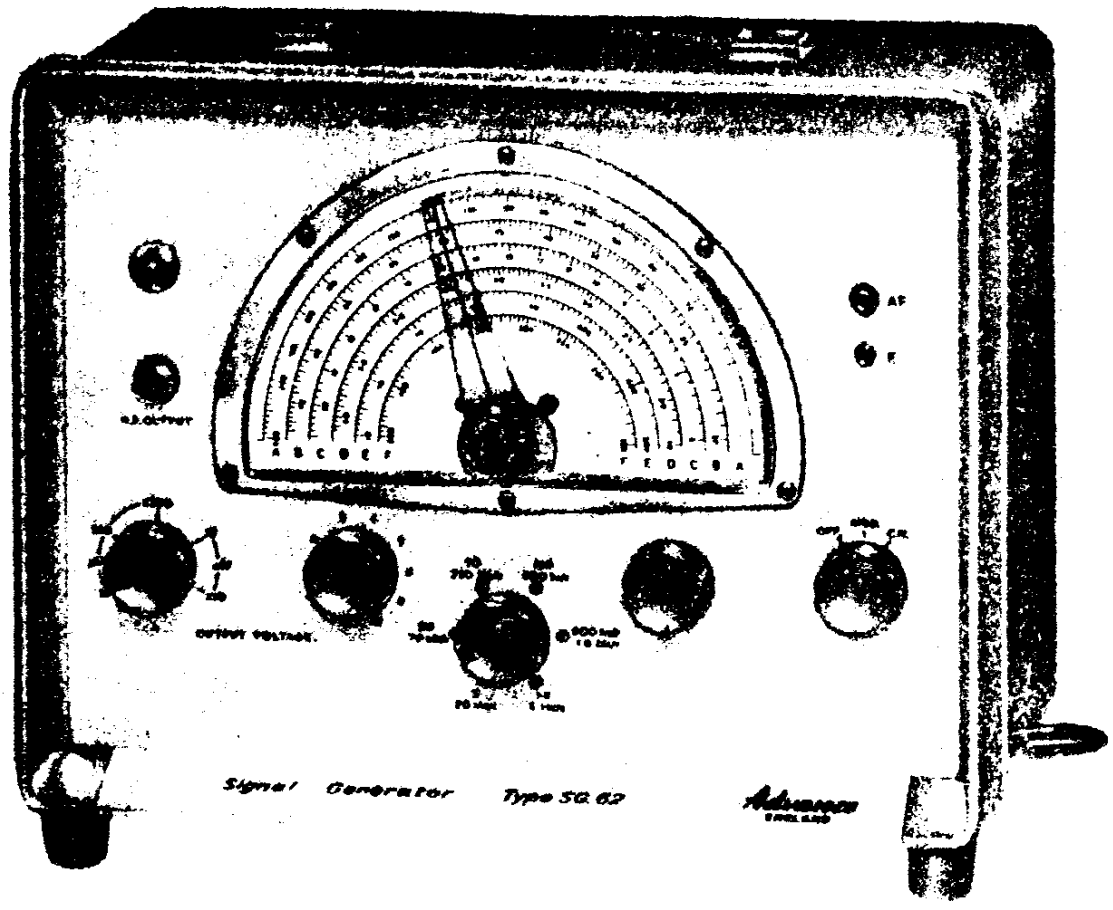
1 Introduction

The Wide Band Signal Generator SG62 provides r.f. signals over the frequency range 150kc/s to 220Mc/s, thus covering most radio and television bands. The instrument employs a Colpitts oscillator with six ranges that are displayed on a calibrated dial ~~having a total length of 50 inches~~. A band spreading device maintains an open scale at the high frequency end of each range.

An overall frequency accuracy of ±1% is achieved ~~and an adjustable cursor provides means of obtaining greater accuracy when checked against standard frequencies, such as a broadcast carrier signal or crystal calibrator~~.

The output signal is available as a continuous sine wave or may be amplitude modulated 30% at 400c/s, when an audio frequency signal is also available at separate terminals. The output level is controlled by an accurate attenuator system which permits repeatable measurements with signal levels as low as ~~1pV~~ microvolts.



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2 Specification

Frequency Ranges

150kc/s — 500kc/s
500kc/s — 1·8Mc/s
1·8Mc/s — 6Mc/s
6Mc/s — 20Mc/s
20Mc/s — 70Mc/s
70Mc/s — 220Mc/s

Accuracy ± 1% ~~with cursor in central position.~~

R.F. Output

The output is fed through a 75Ω cable, which should be terminated either by termination unit, type TP2B, or any other load of 75 Ω. The voltage into the terminating load is adjustable from 1μV to 100mV by means of a five position attenuator and a continuously variable control.

Accuracy of maximum output ± 3 dB. at nominal supply voltages only, i.e at 120V, 150V and 240V.

Accuracy of step attenuator ± (3 dB + 3μV).

Output Impedance

The output impedance at the end of the output cable is 75Ω when it is not terminated, except at the X10mV position of the step attenuator when it varies from 60 to 85Ω. When terminated the impedance becomes 37·5Ω.

Modulation

The r.f. signal is available as either a continuous wave or modulated 30% ± 3 dB at 400c/s ± 10%.

Audio Frequency

An audio frequency signal of 400c/s at approximately 10V is available into a high impedance when the oscillator is modulated.

Valves and Accessories

1 Valve, type 12AT7.
1 Neon Pilot Lamp, 100-125V.
1 75Ω Termination Pad, type TP2B.
1 Connector Cable R.F., type PL28.

Power Supply

The standard model is operated from power supplies of 105 to 125V, 140 to 160V, 210 to 250V, 40 to 100 c/s. Consumption approximately 20W.

Weight

~~10 lb (4·5 kg).~~
10½ lb (4·7 kg)

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Dimensions 7 3/8 × 11 1/8 × 9 5/8 (18·7 × 28·3 × 24·4) cm.
~~12 in × 9 in × 6 in~~. (30·5 cm × 22·9 cm × 15·2 cm).

Finish Dark blue metal case complete with leather carrying handle. Light grey front panel with medium grey surround. Knobs medium grey. Colours to B.S. 2660. Case tint No. 7-086, front panel tint No. 9-093, front panel surround tint No. 9-095.

3 Operation

3.1 Supply Voltage

When the instrument is first received it should be checked to ensure that it is set to the correct supply voltage. First remove the instrument case, para. 4.1. Adjust the supply transformer voltage tap to the nominal voltage of the local supply and replace the case, para. 4.2.

3.2 Frequency Selection

A signal frequency in the range from 150kc/s to 220Mc/s may be selected using the range switch and the calibrated scale. The slow motion drive facilitates fine tuning. Frequency accuracy is ± 1% and for increased accuracy a cursor is provided. This is adjustable over a small angle by means of a screw head on the axis of rotation of the pointer. The scale reading may be adjusted to the exact value by checking the output from the SG62 against the sound carrier of a television signal, or the unmodulated carrier of an F.M. transmission, for example, using a receiver tuned to the correct frequency.

3.3 R.F. Output

The output voltage is obtained at the end of a terminated 75Ω cable. The voltage is controlled by two attenuators marked OUTPUT VOLTAGE, a fine control calibrated 0-10 and a step attenuator calibrated: X1, X10, X100 μV and X1, X10 mV. By multiplying the indication of the controls the output may be set from 1μV up to 100mV.

3.4 Output Termination

The termination pad type TP2B is provided to terminate the r.f. connector cable correctly and to prevent standing waves. This pad incorporates a 75Ω resistor and the output signal may be taken from it to the instrument under test, keeping the leads as short as possible. Alternatively, the output may be fed directly to a load of 75Ω.

3.5 Modulation and CW

When the MOD CW switch is in the MOD position the r.f. signal is modulated at 400c/s (± 10%), to a depth of 30% (± 3 dB).

When the switch is in the CW position the r.f. signal is unmodulated.

3.6 Audio Frequency Output

An output of 400c/s at approximately 10V into a high impedance is obtainable from the A.F. output socket, when the MOD/CW switch is in the MOD position.

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3.7 Connections to Points of High Potential

As the generator has an output with a low resistance path to earth, it is necessary to use a blocking capacitor (e.g. 0·05μF at 150 kc/s) if a signal is to be injected at a point of high potential.

If the chassis of the instrument under test is 'live', as found on an a.c./d.c. receiver, capacitors should be fitted in both the output and earth connecting leads.

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4 Maintenance

4.1 Removal of Instrument Case

(1) Remove the four screws at the rear.

(2) Lay the instrument on its back and carefully lift the chassis and front panel clear of the surrounding case.

4.2 Replacement of Instrument Case

When reassembling, ensure that the case is correctly located in the groove at the rear of the front panel surround before replacing the four retaining screws.

4.3 Valve Replacement

The oscillator valve 12AT7 is contained in the internal screening box which may be seen when the instrument case has been removed (para 4.1). The cover of the screening box may be screwed off, exposing the valve and oscillator assembly.

Changing the oscillator valve should not appreciably affect the frequency calibration, providing that the trimmer and coil assembly are not disturbed.

When replacing the oscillator cover, ensure that it is screwed on firmly without excessive tightening which will cause difficulty if the cover is subsequently removed.

→ (2) Remove the wraparound case by pulling rearwards away from the front panel. The left hand side panel (viewed from the front) can be removed following the withdrawal of four screws. The right hand panel can only be removed when the supply lead connections to the instrument are unsoldered, in addition to removing four screws.

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5 Components List and Circuit Diagram

RESISTORS

Ref.	*Description*	*Tol.*	*Rating*	*Part No*
R 1	560Ω Carbon	10%	¼W	9236
R 2	100KΩ Carbon	10%	¼W	127(
R 3	27KΩ Carbon	10%	¼W	868
R 4	33KΩ Carbon	10%	¼W	10476
R 5	22KΩ Carbon	10%	¼W	1271
R 6	22KΩ Carbon	10%	Morgan "T"	10375
R 7	39Ω Carbon	10%	½W	12469
R 8	750Ω Carbon	5%	¼W	3386
R 9	91Ω Carbon	5%	¼W	3388
R10	750Ω Carbon	5%	¼W	3386
R11	91Ω Carbon	5%	¼W	3388
R12	750Ω Carbon	5%	¼W	3386
R13	91Ω Carbon	5%	¼W	3388
R14	750Ω Carbon	5%	¼W	3386
R15	82Ω Carbon	5%	¼W	3387
R16	Selected on Test			
R17	470Ω Carbon	5%	¼W	1671
R18	1KΩ Carbon	5%	¼W	1175
R19	56KΩ Carbon	5%	¼W	4406
R20	1KΩ Carbon	5%	¼W	1175
R21	Pot. 100Ω			10374
R22	120KΩ	5%	¼W	4407
R23	47Ω	5%	½W	10917
R24	22Ω	5%	½W	11755

CAPACITORS

C 1	Wire Trimmer			10681
C 2	Wire Trimmer			10681
C 3	Wire Trimmer			10681
C 4	Wire Trimmer			10681
C 5	Wire Trimmer			10681
C 6	Wire Trimmer			10681
C 7	Var. 532 + 532pF ...			10555
C 8	50pF Ceramic	10%		3699
C 9	·04μF Hunts W99 ...	20%	150V D.C.	7485
C10	300pF Lead Through ...			7099
C11	·04μF Hunts W99 ...	20%	150V D.C.	7485
C12	300pF Lead Through ...			7099
C13	·04μF Hunts W99 ...	20%	150V D.C.	7485
C14	·04μF Hunts W99 ...	20%	150V D.C.	7485
C15	300pF Lead Through ...			7099
C16	·04μF Hunts W99 ...	20%	150V D.C.	7485
C17	·04μF Hunts W99 ...	20%	150V D.C.	7485
C18	·04μF Hunts W99 ...	20%	150V D.C.	7485

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CAPACITORS

Ref.	*Description*	*Tol.*	*Rating*	*Part No.*
C19	·04μF Hunts W99 ...	20%	150V D.C.	7485
C20 }	Elect. 16 + 16μF ...	}	350V D.C.	7014
C21 }	Hunts JE.413	}		
C22	·005μF W99	20%	400V D.C.	8780
C23	·005μF W99	20%	400V D.C.	8780
C24	·04μF Hunts W99 ...	20%	150V D.C.	7485
C25	Wire Trimmer			10681

INDUCTORS

Ref.	*Description*	*Part No.*
L 1	Band "F" Tuning	RF.594
L 1A	Band "F" Coupling	RF.594
L 2	Band "E" Tuning	RF.595
L 2A	Band "E" Coupling	RF.595
L 3	Band "D" Tuning	RF.596
L 3A	Band "D" Coupling	RF.596
L 4	Band "C" Tuning	RF.597
L 4A	Band "C" Coupling	RF.597
L 5	Band "B" Tuning	RF.598
L 5A	Band "B" Coupling	RF.598
L 6 }	Band "A" Tuning	S/Plate
L 7 }	Band "A" Tuning	Strip
L 8	Band "A" Coupling	Part of Wiring
L 9	Heater Choke	C.95
L10	R.F. Choke	C.16
L11	R.F. Choke	C.16
L12	Heater Choke	C.95
L13	A.C. Supply Filter Choke ...	C.96
L14	A.C. Supply Filter Choke ...	C.96
L15	Choke, Dubilier Type 666 ...	11212

MISCELLANEOUS

T1	Transformer, Modulation ...	MT.348
T2	Transformer, Power	MT.345/B
MR1	Rectifier	8388
LP1	Pilot Lamp	879
V1	Valve 12AT7	7106
SW1 } SW1A } SW1B }	Range Switch	10364
SW2 } SW2A }	Supply Switch ... ... } CW/MOD Switch ... ... }	10376
	75Ω Termination Pad ...	TP2B
	R.F. Connector Cable ...	PL28
	Step Attenuator complete (less knob)	A78
	Instruction Manual	10632

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6 Factory Service

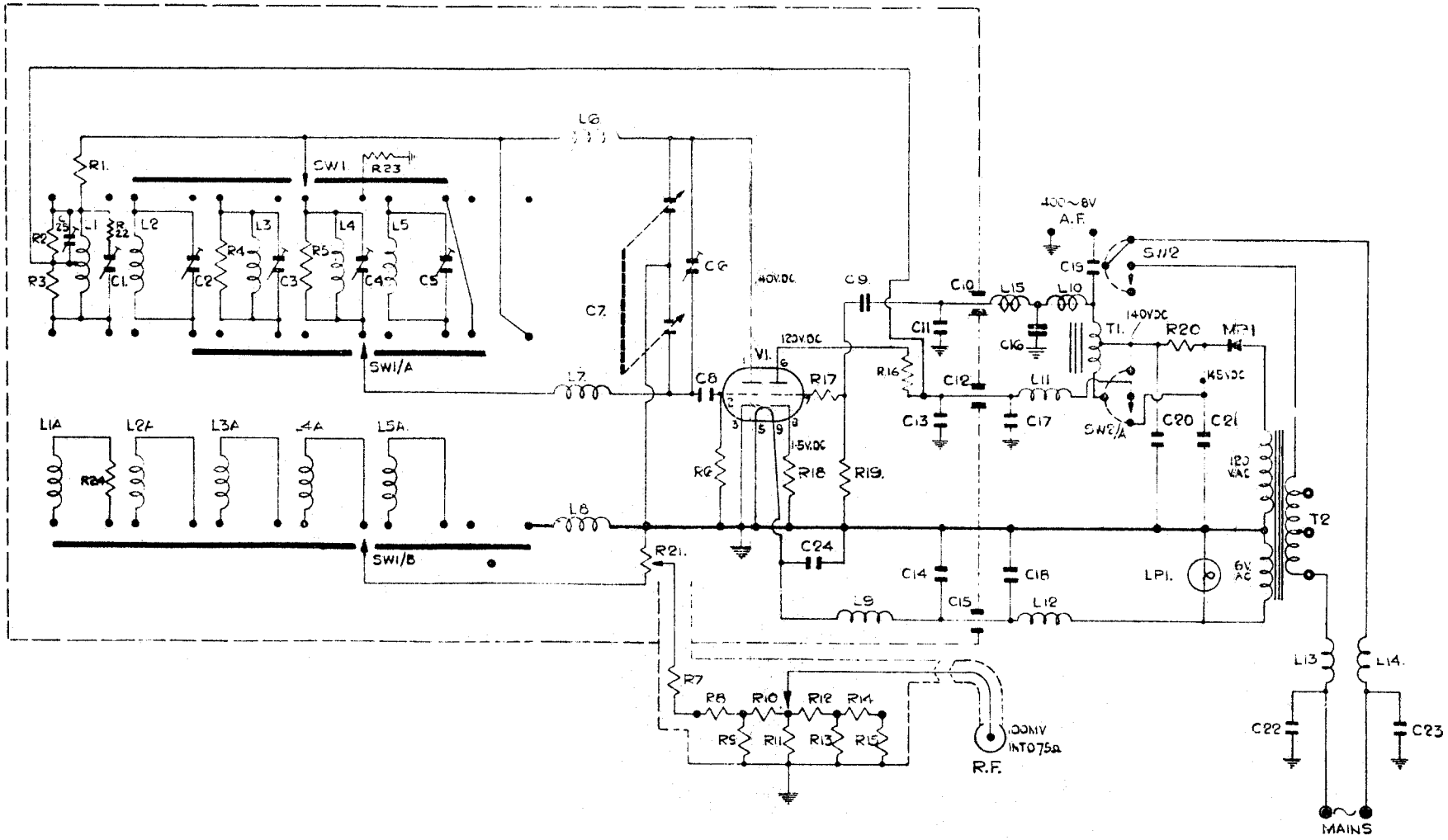
Our factory Service Department is at your disposal should you wish to obtain further repair information by telephone or letter. The Type and Serial Number of the instrument should always be quoted. We maintain an efficient Service facility and the instrument can, if necessary, be returned to our factory for repair.

The instrument is guaranteed for a period of one year from its delivery to the purchaser for the replacement of defective parts, other than valves, semi-conductors and fuses.

Valves and semi-conductors are subject to the manufacturer's guarantee.

Equipment returned to us for servicing must be adequately packed, preferably in the special box supplied, and shipped with transportation charges prepaid. We can accept no responsibility for instruments arriving damaged. Should the cause of failure during the guarantee period be due to misuse or abuse of the instrument, or if the guarantee has expired, the repair will be charged and put in hand without delay unless other instructions are received.

OUR SALES, SERVICE AND ENGINEERING DEPARTMENTS ARE AT YOUR SERVICE AT ALL TIMES



NOTES

All readings taken with generator set to 1 M/cs and modulation switched on.
All D.C. readings taken on Avometer Model 8 (20,000 ohms per volt).
All A.C. readings taken on Advance 'Advac' A.C. valve millivoltmeter.
RF Output measured on Crystal millivoltmeter

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Every attempt is made to keep this circuit up to date, but the right is reserved to alter the values or amend the circuit without notice.

Fig. 1 SG62 Circuit diagram.