

LOW FREQUENCY SIGNAL GENERATOR

TYPE SG81A

THE type SG81A is a wide range l.f. oscillator providing a maximum output of 1 watt into 600 ohms over a frequency range of 15 c/s to 200 kc/s.

The oscillator consists of a 12BH7 and an EF91 used in a capacitive-resistive Wien bridge network. The oscillator is stabilized by a thermistor in the anode circuit, and a second thermistor provides temperature compensation of the oscillatory output voltage. Thus a very constant output level is obtained.

The frequency is varied by means of a ganged variable capacitor and the frequency reading is calibrated on a drum scale of eight inches in length; a logging scale with fitted vernier is used in conjunction with the main scale.

The oscillatory voltage from the Wien bridge oscillator is fed via the SET LEVEL potentiometer to the control grid of a two stage buffer amplifier. The unit attenuator, tapped in one dB steps, is connected between the buffer amplifier and the output stage, and the output level meter, which consists of a moving coil meter and a rectifier bridge network, is connected across the whole of this attenuator. The amplified output of the buffer stage is resistance capacity coupled to the final output amplifier.

The application of negative feedback in the amplifier and output stages, together with stabilization in the oscillator, ensures a constant level with change of frequency. The output voltage is controlled by means of the unit and decade attenuators used together with the SET LEVEL control. The outstanding feature of this instrument is the excellent arrangement of the output terminations and the very convenient mode of attenuator switching. The decade attenuators are balanced pi networks providing full output either balanced or unbalanced, connected to or isolated from earth.

SPECIFICATION

FREQUENCY RANGE:

15 c/s to 200 kc/s in 4 bands.

FREQUENCY CALIBRATION ACCURACY:

Ranges A, B and C $\pm (1\% + 1 \text{ c/s})$; range D $\pm 2\%$ with logging scale and vernier.

FREQUENCY STABILITY:

Better than 0.1% at 1 kc/s after warm-up period. With mains voltage variation of $\pm 10\%$, drift is less than 0.04% at 1 kc/s.

DISTORTION:

Total harmonic and hum content compared with fundamental above 100 c/s:

- (1) better than 40 dB down (1%) with meter set at 1 mW reference level;
- (2) better than 34 dB down (2%) with meter set at +5 dB (maximum output).

There is a slight increase in distortion below 100 c/s and when the output terminals feed into a high impedance on the +20 dB position of the decade attenuator.

HUM LEVEL:

Hum and noise content is less than 0.25% of maximum output.

OUTPUT:

Calibrated in volts and watts, balanced or unbalanced.

SPECIFICATION

VOLTAGE:

20 mV to 25 V r.m.s. into 600 ohms in six ranges indicated by the calibrated meter scales and 10 dB attenuator.

POWER:

0 to 1 watt into 600 ohms, indicated with reference to 1 mW level by 1 dB and 10 dB step attenuators from -35 dB to +25 dB; plus 5 dB above reference level on the meter.

AMPLITUDE ACCURACY:

± 1 dB over complete frequency range.

OUTPUT IMPEDANCE:

- (1) 600 ohms centre tapped, balanced or unbalanced terminations with respect to earth.
- (2) 300 ohms unbalanced.

There is a rise in output impedance on the ± 20 dB position of the decade attenuator at the high frequency end of the 50-200 kc/s band.

ATTENUATOR ACCURACY (at normal "set" level):

Decade Attenuator: $\pm 1.5\%$ of attenuator reading.

Units Attenuator: $\pm 1\%$ of attenuator reading ± 0.15 dB 20 c/s to 200 kc/s.

WEIGHT:

27½ lb (12.5 kg).

DIMENSIONS:

11¼ in. (28.5 cm) wide; 15 in. (37.2 cm) high; 8½ in. (21.6 cm) deep.

CIRCUIT CODE

RESISTORS					
REF	DESCRIPTION			CIRC REF.	P. No.
R.1	13M	H.S. WELWYN	1% C25 2W	A4	6700
R.2	1M	H.S. WELWYN	1% C23 1W	A5	6701
R.3	70K	H.S. WELWYN	1% C22 1W	B4	6702
R.4	5-35K	H.S. WELWYN	1% C22 2W	B5	9080
R.5	13M	H.S. WELWYN	1% C25 2W	B2	6700
R.6	1M	H.S. WELWYN	1% C22 1W	B2	6701
R.7	70K	H.S. WELWYN	1% C22 2W	B2	6702
R.8	5-35K	H.S. WELWYN	1% C22 2W	B2	9080
R.9	150K	H.S. WELWYN	1% C21 1W	B6	12183
R.10	680	ERIE 9	10% 1W	C5	7597
R.11	270	ERIE 9	5% 1W	C4	1843
R.12	10K	ERIE 9	10% 1W	C2	434
R.13	1M	ERIE 9	10% 1W	C4	1171
R.14	2-2K	ERIE 9	10% 1W	C4	867
R.15	100K	ERIE 9	10% 1W	C2	1270
R.16	220K	ERIE 9	10% 1W	D2	6703
R.17	THERMISTOR S.T.C. TYPE A1522			D3	6719
R.18	33	ERIE 9	10% 1W	D5	11979
R.19	22K	ERIE	10% 1W	D4	1271
R.20	THERMISTOR S.T.C. TYPE A1451			D4	7811
R.21	15K	ERIE 9	10% 1W	D2	1177
R.22	3-3K	ERIE 9	10% 1W	D4	2736
R.23	47K	ERIE 9	10% 1W	D5	2933
R.24	10K	ERIE 9	10% 1W	D6	671
R.25	22K	ERIE 9	10% 1W	D3	1271
R.26	1M	ERIE 9	10% 1W	E4	1171
R.27	15K	ERIE 9	10% 1W	E2	1177
R.28	3-3K	ERIE 9	10% 1W	E4	2736
R.29	2-72K	ERIE 109	1% 1W	E4	11901
R.30	2-42K	ERIE 109	1% 1W	E4	11902
R.31	2-16K	ERIE 109	1% 1W	E5	11903
R.32	1-93K	ERIE 109	1% 1W	E5	11904
R.33	1-72K	ERIE 109	1% 1W	E5	11905
R.34	1-55K	ERIE 109	1% 1W	F5	11906
R.35	1-34K	ERIE 109	1% 1W	F5	11907
R.36	1-19K	ERIE 109	1% 1W	F5	11908
R.37	1-09K	ERIE 109	1% 1W	F4	11909
R.38	980	ERIE 109	1% 1W	F4	11910
R.39	47K	ERIE 9	10% 1W	F4	2933
R.40	100K	ERIE 9	10% 1W	F6	1270
R.41	7-9K	ERIE 109	1% 1W	F6	11911
R.42	680K	ERIE 9	10% 1W	F1	5024
R.43	22K	ERIE 9	10% 1W	F1	1271
R.44	3-3K	ERIE 9	10% 1W	F5	2736
R.45	62K	ERIE 9	5% 1W	F4	11758
R.46	2-2K	ERIE 9	5% 1W	F1	867
R.47	18K	ERIE 9	5% 1W	G2	12185
R.48	1M	ERIE 9	10% 1W	G4	1171
R.49	330	ERIE 9	10% 1W	G4	7678
R.50	150	ERIE 9	5% 1W	H1	11929
R.51	150	ERIE 9	5% 1W	G2	11929
R.52	577	ERIE 109	1% 1W	G5	11865
R.53	427	ERIE 109	1% 1W	H4	11864
R.54	577	ERIE 109	1% 1W	H5	11865
R.55	367	ERIE 109	1% 1W	H5	11867
R.56	1-485K	ERIE 109	1% 1W	H4	11866
R.57	367	ERIE 109	1% 1W	I5	11867
R.58	367	ERIE 108	1% 1W	I5	11868
R.59	1-485K	ERIE 109	1% 1W	I4	11866
R.60	367	ERIE 109	1% 1W	I5	11867
R.61	577	ERIE 109	1% 1W	G5	11865
R.62	427	ERIE 109	1% 1W	H6	11864
R.63	577	ERIE 109	1% 1W	H5	11865
R.64	367	ERIE 109	1% 1W	H5	11867
R.65	1-485K	ERIE 109	1% 1W	H6	11866

REF.	DESCRIPTION				CIRC. REF.	P. No.
R.66	367	ERIE 109	1%	1W	15	11867
R.67	367	ERIE 108	1%	1W	15	11868
R.68	1-485K	ERIE 109	1%	1W	16	11866
R.69	367	ERIE 109	1%	1W	15	11867
R.70	22	ERIE 9	10%	1W	13	4419
R.71	22	ERIE 9	10%	1W	13	4419
R.72	500	BIRCH W/WOUND		2W	11	11759
R.73	22K	ERIE 9	10%	1W	F4	1271

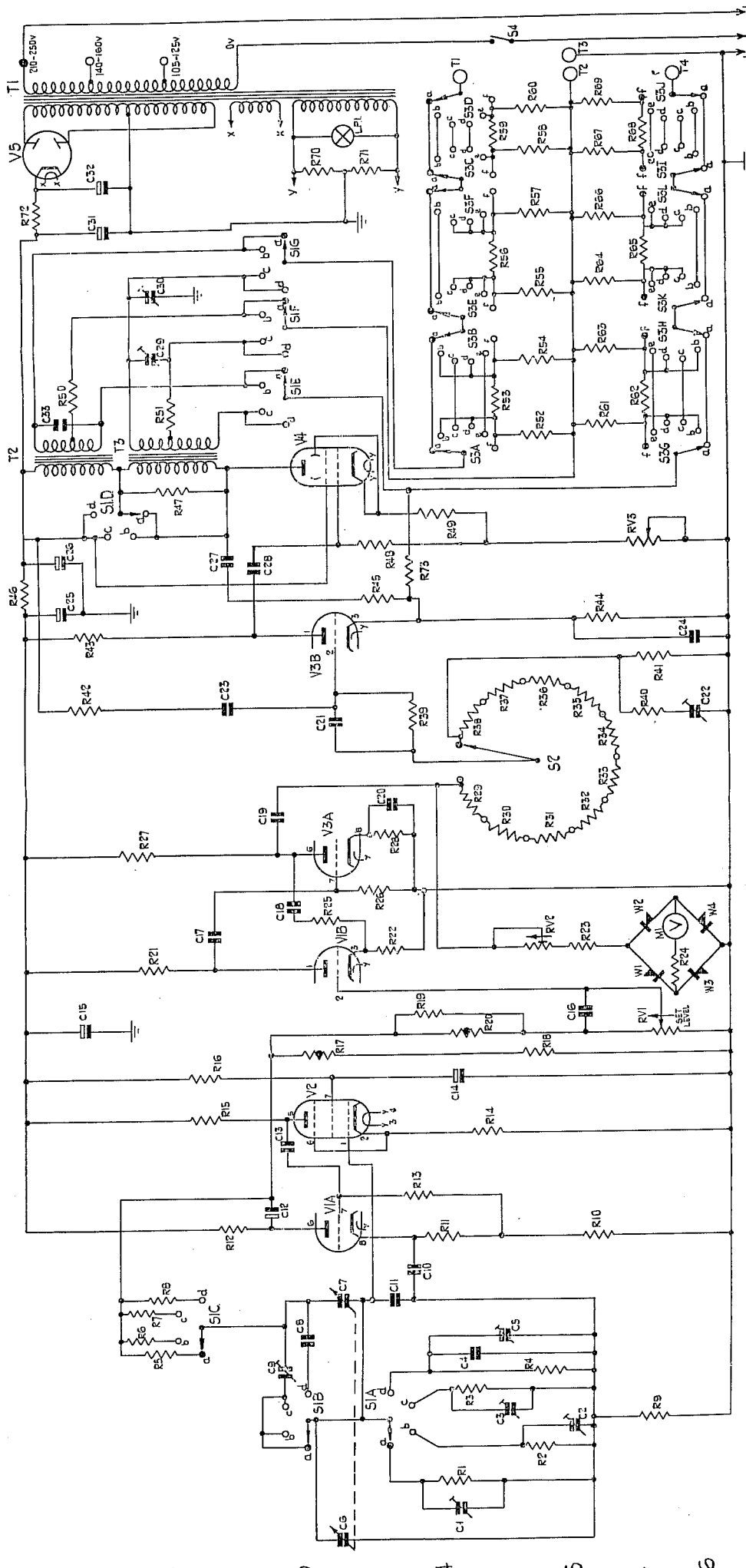
CAPACITORS

C.1	WIRE TRIMMER				A4	10177
C.2	WIRE TRIMMER				A5	10177
C.3	WIRE TRIMMER				B4	10177
C.4	47pF	SILVER MICA LEMCO 1106R	1%		B4	685
C.5	4-60pF	CONCENTRIC TRIMMER—MULLARD			B5	353
C.6	532pF	2 GANG POLAR E24 TYPE C16 } —02/342 }			A3	11859
C.7	532pF				B3	
C.8	75pF	SILVER MICA LEMCO 1510	1%		B3	12187
C.9	3-30pF	CONCENTRIC TRIMMER—MULLARD			B3	1620
C.10	1	PLESSEAL	5%		B4	12188
C.11	15pF	1% SILVER MICA			B4	12191
C.12	30	PLESSEY CE1619	WIRE ENDS 250v WKG.		C3	12189
C.13	1	PLESSEAL	20%		C3	11860
C.14	30	PLESSEY CE1619	WIRE ENDS 250v. WKG.		D4	12189
C.15	16+	16 HUNTS JE413	ELECT. 350v. D.C. WKG.		D1	7014
C.16	3pF	PEARL TYPE CERAMIC			D5	4843
C.17	1	PLESSEAL	20% 350v. D.C. WKG.		D2	11860
C.18	25	PLESSEAL	20% 350v. D.C. WKG.		E3	11861
C.19	5	PLESSEAL	20% 350v. D.C. WKG.		E3	12096
C.20	200pF	LEMCO 1106	INSUL. 5% 350v. D.C. Wkg.		E4	11931
C.21	200 pF	LEMCO 1106	INSUL. 5% 350v. D.C. Wkg.		F3	11931
C.22	3-30pF	CONCENTRIC TRIMMER—MULLARD			F6	1620
C.23	1	PLESSEAL	20% 350v. D.C. Wkg.		F2	11860
C.24	75pF	SILVER MICA LEMCO 1510	1%		F6	12187
C.25	16	PLESSEY CE6003			F1	11863
C.26	16	ELECT. 350v. WKG.			G1	
C.27	25	PLESSEAL	20% 350v. D.C. WKG.		G2	11861
C.28	1	PLESSEAL	20% 350v. D.C. WKG.		G3	11860
C.29	450pF	TRIMMER CYLDRON 26			H2	12686
C.30	3-30pF	CONCENTRIC TRIMMER—MULLARD			H2	1620
C.31	16	PLESSEY CE6003			I1	11863
C.32	16	ELECT. 350v. WKG.			I1	
C.33	04	HUNTS W99 (ADJUST ON TEST)			G1	7485

MISCELLANEOUS

RV1	25K COLVERN CLR 3001/11	POT.	D6	11858
RV2	25K COLVERN CLR 901	POT.	D5	6814
S.1	FREQUENCY RANGE SELECTOR			A11694
S.2	ATTENUATOR UNITS			A11696
S.3	ATTENUATOR DECADE			A11695
S.4	MAINS-ARCO-ELECTRIC 8040/BT/13 On/Off			12180
RV3	1K COLVERN CLR901			7699
W1	CRYSTAL B.T.H.—CG6E			5871
W4				
V.1	12BH7			12802
V.2	EF91-6AM6			7312
V.3	12AU7			11683
V.4	6BW6			8251
V.5	EZ80			11986
T.1	MAINS TRANSFORMER			MT.355
T.2	L.F. O/P TRANSFORMER			MT.354
T.3	H.F. O/P TRANSFORMER			MT.353
M.1	METER 100uA E.T.1 325			11937
L.P1	LAMP FLASHLIGHT 6-5v. .3A			879

A B C D E F G H I



DRAWING No. C 13558

EVERY EFFORT IS MADE TO KEEP THIS CIRCUIT UP-TO-DATE BUT THE RIGHT IS RESERVED TO ADJUST THE VALUES OR AMEND THE CIRCUIT WITHOUT NOTICE