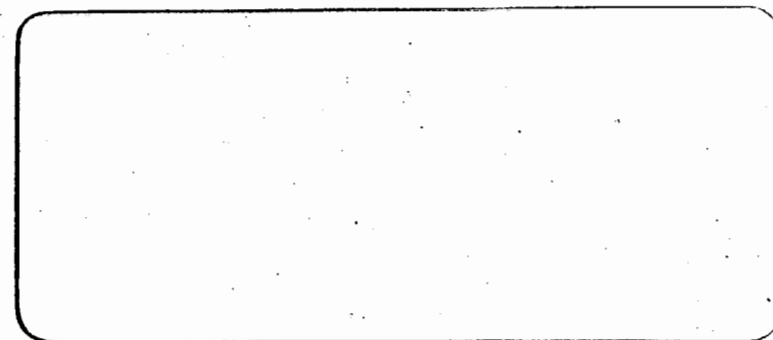


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ADVANCE



PUSH BUTTON
SIGNAL GENERATOR C2H

INSTRUCTION MANUAL

ADVANCE ELECTRONICS LIMITED

INSTRUMENT DIVISION

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TELEPHONE: 01-500 1000 TELEGRAMS: ATTENUATE ILFORD

**GUARANTEE AND SERVICE
FACILITIES****SECTION 6**

This instrument is guaranteed for a period of one year from its delivery to the purchaser, covering the replacement of defective parts other than valves, semiconductors and fuses. Valves and semiconductors are subject to the manufacturers' guarantee.

We maintain comprehensive after sales facilities and the instrument can, if necessary, be returned to our factory for servicing. The type and serial number of the instrument should always be quoted, together with full details of any fault and the service required. The Service Department can also provide maintenance and repair information by telephone or letter.

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 put in hand without delay and charged unless other instructions are received.

**OUR SALES, SERVICE AND ENGINEERING DEPARTMENTS ARE
READY TO ASSIST YOU AT ALL TIMES.**

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MISCELLANEOUS

<i>Ref.</i>	<i>Value</i>	<i>Description</i>	<i>Part No.</i>
V1	ECC91		7034
V2	EF80		7439
V3	12AU7		11683
V4	6x5GT		3150
V5	EF80		7439
V6	90C1		431
M1	Meter 0 - 100 μ A		
MR1	CG46H	AEI	5871
N1	Neon indicator	125V	1165
L1	Choke (smoothing h.t.)		C54
L2	Choke (heater)		C95
L3	Choke (heater)		C15
L4	Choke (supply filter)		C83
L5	Coil (equalising)		RF629
LT	Tuning inductor		-
T1	Autotransformer (modulation)		MT349
T2	Transformer (supply)		MT378
S1	12 position push-button switch		13527
S2	Mod/CW Switch S.P.S.T.		332
S3	ON/OFF switch S.P.S.T.		332
TP1D			
R1	270	1% $\frac{1}{4}$ W Welwyn C20 H.S.	6896
R2	100	1% $\frac{1}{4}$ W Welwyn C20 H.S.	6106
R3	11	1% $\frac{1}{4}$ W Welwyn C20 H.S.	6414
R4	390	10% RMA9	612
C1	200pF	10% Mica	5110
L1	20 μ H		RF369

COMPONENTS LIST AND
CIRCUIT DIAGRAMS

SECTION 6

CAPACITORS
(20% 400V Hunts W99, unless specified)

Ref.	Value	Description	Part No.
C1	0.005		8780
C2	0.005		8780
C3	100p	5% 200V Lemco 1106R	11675
C4	5p	20% ceramic pearl	5849
C5	500p	10% 600V	8284
C6	0.01		7568
C7	0.1	350V Tub. TCC CP46S	5184
C8	0.04	150V	7485
C9	0.01		7568
C10	30p	10% Ceramic TCC SCD5	10603
C11	0.01		7568
C12	0.1	350V Tub. TCC CP46S	584
C13	0.01		7568
C14)	16	350V Electrolytic	7014
C15)			
C16)	16	350V Electrolytic	7014
C17)			
C18	0.005		8780
C19	0.005		8780
C20	0.004	20% 300V Hunts W99A	10486
C21	0.004	20% 300V Hunts W99A	10486
C22	0.5	20% 150V Hunts W48	10488
C23	0.002		8589
C24	0.1	20% 150V Hunts W48	325
C25	0.1	20% 150V Hunts W48	325
CT	Tuning capacitor		-

INTRODUCTION

SECTION 1

This instrument has been designed to meet laboratory and test needs for the immediate selection of predetermined frequencies. It is particularly suitable for production alignment and testing of receivers in the low and medium frequency bands where the requirement is for rapid selection of spot frequencies.

The C2H provides a highly versatile and mobile source which may be set up to give any 12 spot frequencies in the range 30 kHz to 40 MHz as specified when ordering. The middle four of the frequencies may be set in the range 30 to 40 MHz, the full range being covered by selections from eight standard coils and 15 capacitors. Provision is made for each specified frequency over a total range of 20% by removing the cover plate on the front panel, and by setting the permeability tuned oscillator coils with a screwdriver as required.

A Hartley oscillator is employed in this signal generator with 12 tuned circuits which can be selected as required by means of the appropriate push button. The R.F. output is obtained from an accurate attenuator system, the input level being maintained constant and monitored on a meter. A buffer stage between the oscillator and attenuator virtually eliminates the effect of attenuator reaction on frequency. Amplitude modulation of the output signal is available at a frequency of 400 Hz to a depth of 30%.

SPECIFICATION

SECTION 2

FREQUENCY RANGE

30 kHz to 40 MHz.

Any 12 frequencies within this range may be specified when ordering. The frequency selected by each button is set to within $\pm\frac{1}{2}\%$ and may be varied approximately 20% overall. The 30 MHz to 40 MHz range must be confined to the middle 4 positions.

RF OUTPUT

Continuously variable up to 100mV.

Accuracy

$\pm 1\text{dB} \pm 1\mu\text{V}$ up to 10 MHz.

$\pm 2\text{dB} \pm 2\mu\text{V}$ above 10 MHz.

RF LEVEL

Less than $\pm 3\%$ with change of frequency.

LEVEL STABILITY

Less than $\pm 3\%$ with supply variations of $\pm 10\%$.

LEAKAGE

Less than $1\mu\text{V}$ in a single loop coil positioned close to the instrument.

OUTPUT IMPEDANCE

75Ω

MODULATION

Internal sinewave amplitude modulation.

Frequency

400 Hz $\pm 5\%$

Depth

30% $\pm 5\%$

SECTION 5

COMPONENTS LIST AND
CIRCUIT DIAGRAM

RESISTORS (Erie 9 10%, unless specified)

Ref.	Value	Description	Part No.
R1	82		10893
R2	1K		1175
R3	6.8K	5% RRC 5SCD4	2053
R4	15K		1177
R5	220K		6703
R6	100		1273
R7	2.7K	10% Erie 8	11096
R8	1K		1175
R9	470		1671
R10-12	Not used		
R13	743	1% $\frac{1}{4}\text{W}$ Welwyn C20	6249
R14	743	1% $\frac{1}{4}\text{W}$ Welwyn C20	6249
R15	743	1% $\frac{1}{4}\text{W}$ Welwyn C20	6249
R16	743	1% $\frac{1}{4}\text{W}$ Welwyn C20	6249
R17	92	1% $\frac{1}{4}\text{W}$ Welwyn C20	6250
R18	92	1% $\frac{1}{4}\text{W}$ Welwyn C20	6250
R19	92	1% $\frac{1}{4}\text{W}$ Welwyn C20	6250
R20	82.5	1% $\frac{1}{4}\text{W}$ Welwyn C20	6251
R21	1M		1171
R22	Not used		
R23	100K		1270
R24	Not used		1671
R25	470		1816
R26	470K		
R27	33K	10% Erie 8	1274
R28	1.5K	10% Erie 8	11097
R29	6.8K	5% RRC 5SCD4	2053
R30	27K		868
R31	470		1671
R32	1M		1171
R33	470		1671
R34	Not used		
R35	470		1671
RV1	10K	Linear	468
RV2	100	Linear	10374
RV3	470K	Preset	11301
RV4	10K		7267
RV5	4.7K	Egen 174	906

MAINTENANCE**SECTION 4****4.1 REMOVAL OF INSTRUMENT CASE**

To remove the generator from its case, place the instrument on its back and unscrew the 14 screws around the edge of the panel. The generator can now be withdrawn.

4.2 INCREASED ACCESS TO OSCILLATOR

The oscillator screen can be removed by unscrewing the 12 self-tapping screws around its edges. This gives access to the tuned circuits and to the oscillator and buffer valves. Valves V2, V4, V5, and V6 can be renewed with negligible effect on performance, but replacement of V1 and V3 may cause very slight changes in carrier frequency and modulation depth, respectively.

4.3 ADJUSTMENT OF CARRIER FREQUENCY AND MODULATION DEPTH

Change of carrier frequency can be corrected by slight adjustments to the tuning cores. Modulation depth is controlled by the pre-set slider resistor RV3, which is mounted on a tag board near V3. It is strongly recommended that the setting of RV3 is not disturbed unless proper equipment for measuring modulation depth is available.

4.4 RECALIBRATION OF OUTPUT VOLTAGE

If, after long use, the accuracy of the r.f. output voltage becomes suspect, it can be corrected by adjustment of the pre-set potentiometer RV1. This is situated on the chassis immediately behind the meter. With the controls set to give 100mV, connect the r.f. output to a crystal voltmeter having an input impedance of 75Ω and calibrated at 100mV. Adjust the SET CARRIER control until an output of 100mV is indicated by the calibrating meter. Adjust RV1 so that the pointer of the carrier level meter deflects to the red line. In case of doubt or difficulty, the instrument should be returned to the factory for repair or adjustments, as detailed in Section 6.

SPECIFICATION**SECTION 2****ACCESSORIES**

One termination pad type TP1D.
One 75Ω connector type PL5B.
Instruction manual part no. 443.

POWER SUPPLY

110V, 210V, 230V, 250V ±5%, 45–100 Hz.

Consumption
25W approx.

DIMENSIONS

12¼ in. high x 13¼ in. wide x 10 in. deep
(31 cm x 34 cm x 26 cm)

WEIGHT

28 lb (12.5 kg)

FINISH

Blue case and light grey front panel.

OPERATION**SECTION 3****3.1 SUPPLY VOLTAGE**

The instrument is despatched from the factory with the supply tapping set for operation at 250V. For operation on supplies of lower voltage the following procedure must be carried out. First, ensure that the instrument is disconnected from the supply, then remove the cover plate at the rear of the instrument. Unsolder the lead connecting the end tags from the upper tag and reconnect this lead to the tag labelled with the appropriate voltage. It should be noted that the instrument is suitable for a.c. supplies only, and the supply frequencies must lie within the range 45 to 100 Hz.

3.2 FREQUENCY SELECTION

The push-button switch on the front panel selects any one of twelve permeability-tuned circuits. These circuits are selected from a range of eight coils (RF620–RF627) and 15 capacitors (Part No. 11663–11677) which enable any frequency in the range 30 kHz–40 MHz to be obtained. Any twelve frequencies in this range are provided according to customers' requirements and are set to an accuracy of $\pm 1\%$. All frequencies are adjustable by means of trimmer screws which are exposed when the front cover-plate is removed. Rotation of these screws gives a frequency variation from minimum to maximum of approximately 30% on all coils except the highest frequency coil (RF627), where the variation is approximately 20%. After setting up, the locknuts should be tightened. The frequency given by each button is marked on the card on the cover plate and covered by a perspex window.

3.3 R.F. OUTPUT

The SET CARRIER control should be adjusted so that the pointer of the carrier level meter is deflected to the red line. This ensures that the r.f. input to the attenuator net work is correct at any frequency setting.

The required output voltage can be obtained by means of the coarse and fine attenuators. These consist of a continuously variable section cali-

SECTION 3**OPERATION**

brated 1 to 10 followed by a multiplier calibrated in 10:1 (20dB) steps: X1, X10, X100 μ V and X1, X10mV. The r.f. output appears at the socket marked R.F.

For 75 Ω loads the instrument should be connected direct to the load via the 75 Ω cable PL5B.

For high impedance loads, e.g., the grid of a valve, the line must be terminated in 75 Ω by means of the termination pad TP1D. Three alternative outputs are provided, as follows:

(i) 37 Ω

The output voltage is that indicated by the attenuators; the output impedance is 37 Ω .

(ii) 10 Ω

The output voltage is 1/10 (20dB down) of that indicated by the attenuators; the output impedance is 10 Ω .

(iii) D.A.

The output voltage is 1/10 (20dB down) of that indicated by the attenuators; the output impedance is that of a standard dummy aerial.

In all cases the output cable is correctly terminated.

Short connections should be employed between the pad and the receiver under test. This becomes increasingly important at high frequencies.

Where measurements are to be made on a.c./d.c. receivers with live chassis it is essential that blocking capacitors of suitable rating are included in both leads from the termination pad.

3.4 MODULATION

To obtain modulated r.f. output the CW/MOD switch should be set to MOD. The signal will then be amplitude modulated to a depth of 30% \pm 5%. The modulation frequency is 400 Hz \pm 5%. The modulation envelope is substantially symmetrical and sinusoidal.