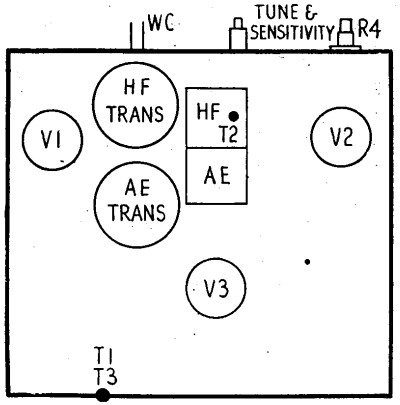
EKCO B39

Three-valve battery-operated receiver with regenerative tuned radio frequency circuit. Moulded upright table cabinet. Made by E. K. Cole, Ltd., Green Park Hotel, Aston Clinton, Bucks.



A simple battery three with reaction, the B39 presents few service problems. Aerial and H.F. circuits can be aligned.

Circuit.—From a series aerial condenser, C1, the input is capacitively coupled by C2 and T1 in series to the top of the grid circuit of V1, the radio-frequency amplifier.

The aerial coupling on L.W. is inductive (L1), and to prevent M.W. breakthrough the junction of C2–T1 is switched to chassis, whereupon T1 becomes the L.W. aerial trimmer.

Across L1 is R1, a 300-ohm resistor, brought in by the local-distance switch. L2, L3 are the tuned grid windings.

Volume is controlled by R4, a potentiometer, across the 9v. G.B. battery. A negative voltage is tapped off and applied via R2, decoupled by C3, to the bottom of V1 grid circuit and to the "earthed" screen of V1.

The screen of V1 is fed through R2, decoupled by C4.

The coupling to V2 is by H.F. transformer, the coupling windings L4, L5 being in the V1 anode path. L6, L7 are the tuned grid windings. C5, R5 are the grid condenser and leak.

V2, the detector, is a pentode, the screen supplied by R6 and decoupled by C6. The anode circuit contains an H.F. choke, L8, with by-pass, C7. Regenerative coupling between V1 and V2 anodes is provided by a variable condenser (the sensitivity control).

R7 is the V2 anode load. C8 provides coupling to an auto-transformer. This is returned to H.T.−, G.B.+, and to R6. The main H.T. flows through R6,

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producing a voltage drop forming the bias between V3 filament and grid.

C9 is a 10 mfd. decoupling the H.T. battery, and C10 is a tone shunt across V3.

Wavebands.—200–560, 1,000–2,000 m.

Batteries.—H.T., 120v.; L.T., 2v.; G.B., 9v. Consumption: H.T., 7.6 ma. (max.); and L.T., .44 amp.

Battery Connections. — Red - white, L.T.+; black, L.T.−; brown, G.B.−9v.; green, G.B.+; red, H.T.+; yellow, H.T.−. The twisted blue leads go to the speaker.

CALIBRATION

The scale pointer should cover the 560 m. mark with gang at maximum. The pointer can be slid round the gang shaft.

Set V.C. to maximum, and sensitivity just short of oscillation. Tune to 250 m.

Inject 1,200 kc. and adjust T2 and T3 for maximum.

Tune to 1,300 m., inject 270 kc., and adjust T1 for maximum.

If a Droitwich filter is fitted, inject 1,500 kc. and adjust filter for minimum.

VALVE READINGS

V.	Type.	Electrode.	Volts.	Ma.
1	VP2B	Anode	116	1.5
		Screen	60	.7
2	SP2	Anode	80	.45
		Screen	50	.15
3	PM22A	Anode	111	4.15
		Screen	116	.65

RESISTANCES

R	Ohms.	R	Ohms.
1	300	5	2 meg.
2	80,000	6	500,000
3	1 meg.	7	75,000
4	1.5 meg.	8	490

CONDENSERS

C	Mfds.	C	Mfds.
1	.00045	6	.1
1	.00045	6	.0002
2	.1	7	.02
3	.1	8	.10
4	15 CMS.	9	.004
5	.1		

WINDINGS

L	Ohms.	L	Ohms.
1	18	5	30
2	2.6	6	2.7
3	27.5	7	20
4	6.2		

CIRCUIT DIAGRAM

E. K. Cole, Ltd., do not permit publication of the circuit diagram of this receiver. However, a particularly full description of the circuit is given above and engineers should have no difficulty in identifying parts and their purposes.

Testing with Substitute Speaker

Loudspeakers can give rise to a number of faults. In fact, some engineers make a substitute test one of the first checks undertaken on every receiver.

It is a good idea to have a speaker with a universal matching transformer mounted over the bench and connected by easily adjusted plugs or switches to two leads and test prods. These can be quickly tapped across the primary of the output transformer in any set.

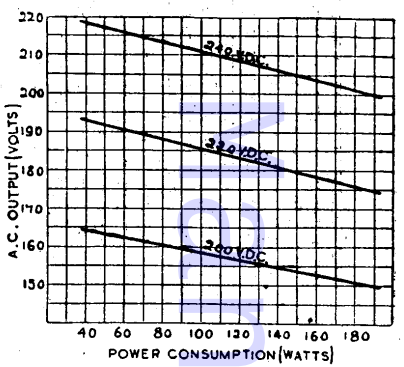
If a silent set gives results on the test speaker it will show that the internal speaker has a disconnection somewhere—it may be in the primary or secondary of the transformer, in the hum coil or speech coil. A point-by-point continuity test will indicate just where the fault is.

The substitute test is also useful where a set operates, but is lacking in volume. It may indicate that the power is being lost in the internal speaker through shorted turns, high-resistance connections, etc.

It must not be overlooked that there is always the remote possibility of a shorted primary. This would, in effect, also short the substitute speaker, which would be no more informative than the internal one.

G.E.C. D.C./A.C. CONVERTER BCS 1535

A D.C. to A.C. converter operating on vibrator principle and suitable for 200, 220 and 240 volt D.C. inputs. Made by the General Electric Co., Ltd., Magnet House, Kingsway, London, W.C.2.



THIS unit converts D.C. mains supply into A.C. current suitable for the operation of A.C. receivers. It can be used on D.C. supplies of 200–250 volts and the A.C. output depends on the D.C. input voltage and the power consumption of the receiver.

The output voltages obtainable at various loads and inputs are obtainable from the graph given here. It will be seen that on 200 and 220 volt D.C. supplies, whatever the power consumption of the set, non-standard A.C. outputs are obtained.

The operation of the unit is quite easy to follow with the aid of the circuit diagram. There are in effect two "overlapping" circuits. One is a D.C. path energising the vibrator and the other is part D.C. and part A.C.

The current flow in the first circuit at one moment is as follows: L1, L5, righthand (in diagram) vibrator reed, electro-magnet, R1, L6, L2.

As soon as the electro-magnet is energised the reeds move (downward in drawing) and break the circuit. The reed then swings back to the original position and the cycle of operations starts again. In this circuit, therefore, the current is interrupted D.C.

Simultaneously, the second circuit is in operation. In the position shown in the drawing current flows *via* L1, L5, through second top contact of righthand reed, to L8, L4, primary of set transformer, L3, L7, lefthand reed, L6, L2.

On the swing of the reeds, current flows in the reverse direction through the set transformer, *i.e.*, via L1, L5, downward through righthand reed, L7, L3, primary, L4, L8, lefthand reed, L6, L2.

R1 is a current control resistance. R2, C5, and all the coils and condensers are for the suppression of interference frequencies set up by the interrupter.

COMPONENTS

C.	Mfds.	C.	Mfds.
1	.2+.2	6	.2+.2
2	.2+.2	7	.2+.2
3	.2+.2	8	.7
4	.2+.2	R1	2,000
5	.05	R2	2,200