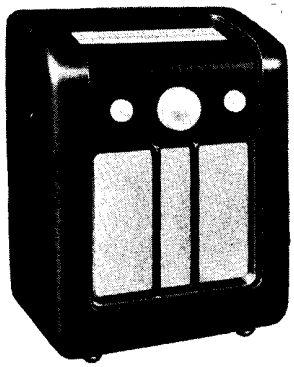
EKCO B67 BATTERY SUPERHET



Housed in this distinctive moulded cabinet, the B67, by E. K. Cole, Ltd., is a five - valve, battery - operated superhet. The cabinet may be walnut finished or in black and chromium.

CIRCUIT.—An inductively coupled band-pass filter couples the aerial to the grid of V1, an H.F. pentode. On medium waves the aerial is connected to a tap on the medium wave coil *via* a small condenser, C4, and an image rejector condenser, C5, is in circuit. On long waves the medium wave aerial coil is not used and the input is direct to the top of the long wave coil.

A separate triode oscillator, V2, injects into the first detector, V1, *via* C11, to the suppressor grid.

Coupling between V1 and V3, which is an H.F. pentode, is through an I.F. transformer tuned to 126.5 kc. V3 is a similar valve to V1, but its suppressor grid is earthed.

A second I.F. transformer couples the signal to V4, a double diode. One diode is used for demodulation and the other to supply A.V.C. bias. The control voltages for the preceding valves are tapped off between R9 and 8 and R8 and 7 in the orthodox manner.

The rectified output of V4 is fed through a resistance and capacity network and an H.F. choke to the output pentode V5.

The volume control, VR1, forms part of the coupling network between V4 and V5, and varies the input to the grid of V5. Pick-up sockets are connected across it.

Tone is controlled by C25 and VR2. These are connected in series and are between the anode of V5 and the chassis in the usual way.

H.T. is obtained from a Drydex type H1083 battery, and L.T. from an Exide type CZH3 2-volt accumulator.

Special Notes.—Terminals on the back of the chassis provide connections for a low-impedance speaker, the speech coil impedance of which should be between two and four ohms.

Provision is also made for disconnecting

VALVE READINGS

No signal. Volume maximum. New batteries.

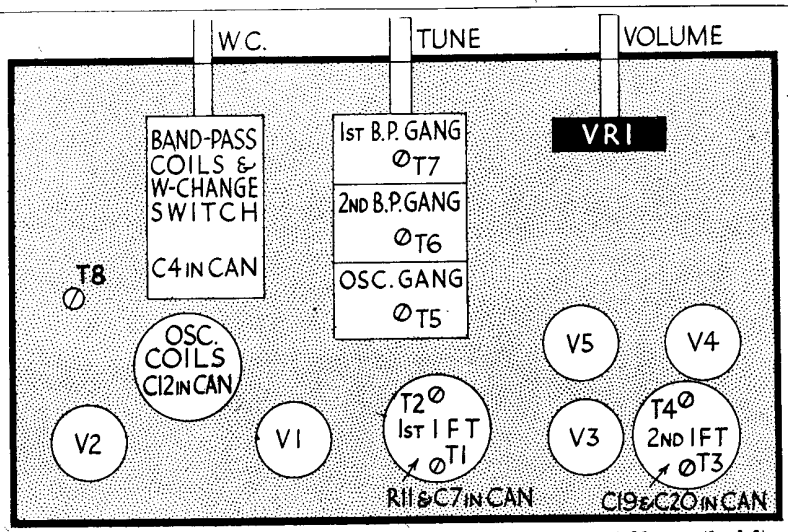
V.	Type.	Electrode.	Volts.	Ma.
	All Mullards.			
1	VP2 met. (7)	Anode ..	130	1.
		Screen ..	100	.5
2	PM1HL met. (4)	Anode ..	40	.7
3	VP2 met. (7)	Anode ..	130	2.8
		Screen ..	130	.8
4	2D2 met. (5) ..	Diode ..	—	—
5	PM22D (5) ..	Anode ..	130	4.3
		Screen ..	130	1.

RESISTANCES

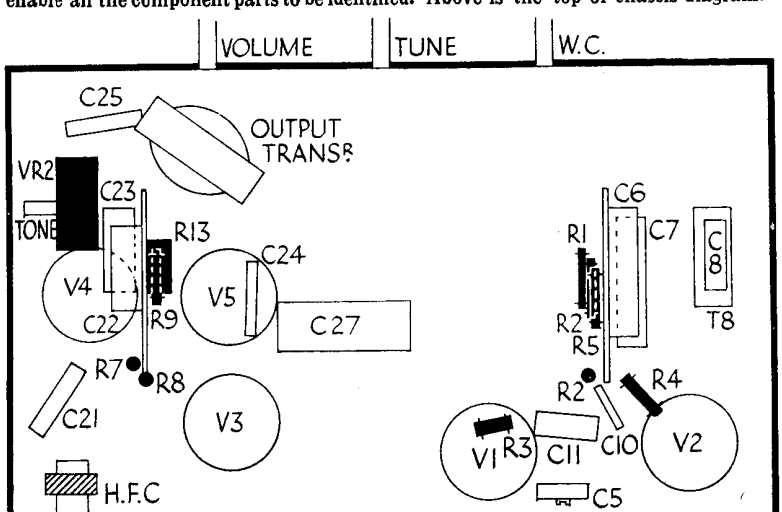
R.	Purpose.	Ohms.
1	V1 screen decoupling ..	40,000
2	V2 anode load	100,000
3	V1 suppressor grid leak ..	½ meg.
4	V2 series grid	2,000
5	V2 grid leak	30,000
6	V1 A.V.C. decoupling ..	¼ meg.
7	A.V.C. diode load (part) ..	¼ meg.
8	A.V.C. diode load (part) ..	½ meg.
9	A.V.C. diode load (part) ..	½ meg.
11	Demodulator diode load ..	½ meg.
13	V5 grid bias	300
VR1	Volume control	1 meg.
VR2	Tone control	¼ meg.

CONDENSERS

C.	Purpose.	Mfds.
4	Aerial coupling	.0007
5	Image rejector	—
6	V1 A.V.C. decoupling ..	.1
7	V1 screen decoupling ..	.1
8	Long wave osc. padding ..	.0008
10	V2 grid	.0005
11	V1 suppressor grid	.0005
12	Oscillator anode coupling ..	.0005
17	A.V.C. diode coupling ..	.00001
19	H.F. filter	.0003
20	H.F. filter	.0001
21	L.F. coupling	.01
22	V1 A.V.C. decoupling ..	.02
23	V3 A.V.C. decoupling ..	.1
24	Pentode compensating ..	.001
25	Tone control	.01
27	H.T. shunt	10



These two diagrams of the Ekco chassis, in conjunction with the tables on the left, enable all the component parts to be identified. Above is the top-of-chassis diagram.



Even underneath the B67 chassis is quite clean and simple. Most of the small parts are suspended in the wiring and thus occupy their "logical" positions.

the internal speaker by means of a screw on the extension speaker panel. Removal of this cuts out the internal speaker.

Removing Chassis.—Take off the four knobs—three from the front and the tone control from the side. They are all fixed by grub screws, that of the tone control being reached from inside the cabinet, between the side of the chassis and the cabinet.

Unscrew the four small chassis fixing bolts. Two of these will be found on the top of the chassis, fixing it to the front of the cabinet, and the other two in the back flange of the chassis.

Unsolder the speaker leads. Reconnection of these is as follows :—

Top tag, blue lead.

Bottom tag, brown lead.

Circuit Alignment Notes

Calibration.—With the gang condenser at maximum capacity the pointer should coincide with the 560 metres index mark on the scale. If it does not, remove the chassis from the cabinet and see that the disc drive is against its stop.

The pointer should be moved along the cord until it is exactly $1\frac{5}{16}$ in. from the edge of the reflector plate.

In some receivers the pointer will be fixed to the cord by a small press clip, and in others by a screw and clamp. Both types can be got at through a hole in the flange of the reflector plate when the gang condenser is at maximum.

I.F. Circuits.—Connect an output meter to read about 1 volt across the external speaker sockets and inject a signal of 126.5 kc. from a modulated oscillator to the chassis and through a .02 mfd. condenser to the cap of V1 (anode), leaving the lead connected.

Adjust T1, T3, T2 and T4 in that order, for maximum reading, on the output meter.

Repeat two or three times until best results are obtained.

Medium Waves.—Tune the receiver to 200 metres and inject a signal of this wavelength to the aerial and earth terminals *via* a dummy aerial.

Fully unscrew T5, then screw it in until maximum reading is obtained on the output meter. The input should be kept at such a level that a reading of not more than .5 volt is obtained on the output meter.

Inject and tune-in a signal of 250 metres and adjust T6 and T7 for maximum output.

Long Waves.—Inject a signal of 1,700 metres and tune the receiver to this point on the dial. Then, while rocking the gang condenser, adjust T8 for maximum.

Image Rejector.—If the receiver is operated in the vicinity of London Regional, West Regional or Radio Normandie, a second channel whistle may be heard on Brussels (483.9 m.), Budapest (549.5 m.) or Strasbourg (349.2 m.) respectively.

A non-metallic screw-driver should be used to adjust the image rejector C5 for minimum whistle.

This condenser is correctly set at the factory, and should not be touched unless a whistle interferes with one of the stations mentioned above.

CIRCUIT DIAGRAM

NO circuit diagram is printed with this review because E. K. Cole, Ltd., do not permit the circuits of their receivers to be published.

The circuit description on the facing page and the component tables, which give the purpose of each component, will enable service men, however, to understand the receiver sufficiently for all ordinary fault-finding. There are no unusual features likely to cause confusion in the absence of a circuit diagram.

Ekco B67 on Test

MODEL B67.—Standard model for battery operation using Drydex type H1083 H.T. battery and an Exide type CZH3 2-volt accumulator. Walnut-finished model—9 gns. With black and chromium cabinet, £9 16s. 6d.

DESCRIPTION. — A two-waveband, five-valve superhet table model. Ultra-modern bakelite cabinet.

FEATURES.—Full-vision straight-line scale with name and wavelength calibration. Large tuning knob with tone control at the side of the cabinet.

LOADING.—H.T., 7.8 ma., L.T., .84 amp.

Sensitivity and Selectivity

MEDIUM WAVES (195-575 metres). —Excellent for valve combination. Comparable with mains receiver. Good background, free from whistles. Sensitivity and selectivity well maintained.

LONG WAVES (750-2,000 metres).—Results very good. Gain well maintained and selectivity sufficient to give Deutschlandsender with little interference.

Acoustic Output

Well balanced, representative of battery pentode set.

Tone control is not too rapid and gives a reasonable amount of regulation.

Replacement Condenser

Replacement parts for this receiver are available from E. K. Cole, Ltd. A suitable 10 mfd. condenser (C27), list number 2824, price 1s. 9d., is specially made by A. H. Hunt, Ltd., of Garratt Lane, Wandsworth, London, S.W.18.

WORKSHOP TIPS AND EXPERIENCES

By Mander Barnett

A SMALL quantity of tinplate sheeting of various gauges should always be on hand in the well-equipped service room. This material has numerous uses in service work, chiefly in making very useful mounting brackets for cardboard electrolytic replacement condensers.

Often enough, where one condenser in a large block blows, it is a better proposition to replace the single condenser by a cardboard unit which must be mounted somewhere on the chassis. Or perhaps a cardboard type condenser has to be used where an exact replacement of a tubular type is not available.

With a pair of hand shears, or even heavy scissors, convenient mounting brackets can be made for every size and shape of condenser. The brackets can either be drilled for small nuts and bolts or soldered into position if the chassis is of suitable metal.

Some care should be taken in the choice of a suitable place for mounting cardboard type condensers.

They should be kept well away from components which develop an amount of heat, and, at the same time, they should be mounted sufficiently rigidly to prevent chaffing of the cardboard container by any movable components, such as wave-change switch spindles.

Do not allow the bracket to grip the condenser too tightly as many of these components seem to expand slightly after they have been in use some time.

In cases where one section of a dual or triple cardboard electrolytic condenser has become o.c. or shorted, it is better to replace the whole block and so prevent risks of internal shorts between sections developing and causing further trouble.

A VERY curious fault developed on a receiver which had to be serviced for H.F. instability.

The frequency changer and I.F. valves in this receiver drew their screen grid volts from a common source, the two elements being connected by a straight wire between the valve socket pins, without any decoupling other than a single by-passing condenser connected between one end of the wire at the valve pin and the chassis. This condenser was tested and proved correct.

Further condensers were connected in parallel at the same point without any effect. Finally, it was found that a fixed condenser connected to the other end of the wire connecting the two valves together, produced complete stability.

SPEAKER speech coils can produce curious effects which are sometimes difficult to trace. In a recent case, where a speaker appeared to have greatly reduced sensitivity and poor reproduction, the trouble was due to shorted turns on the coil, which was wound in two layers.

Without checking the resistance of the coil, one could spend considerable time on the receiver itself in a fruitless effort to trace trouble of this type.

Sometimes where a coil is very slightly out of centre, the enamel insulation may be worn through at the point where the coil is touching the magnet. This is liable to give rise to loud crackling each time the coil makes and breaks contact with the speaker chassis.