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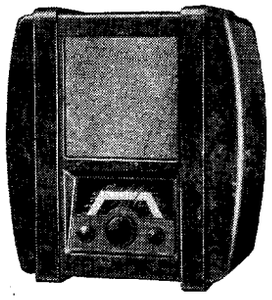
EKCO
SERVICE INFORMATION



MODEL B37
CONSOLETTE RECEIVER

GENERAL DESCRIPTION.

The model B37 is a straight three valve battery receiver consisting of a variable mu. H.F. Pentode valve **(Mullard VP2).** H.F. pentode leaky-grid detector valve **(Mullard SP2)** and pentode output valve **(Mullard PM22D).** Iron cored coils giving a high degree of selectivity are used, while the receiver incorporates pre-set condensers both for reaction and aerial matching purposes.

A switch is provided to prevent distortion on local or powerful stations, while a further switch in the form of an insulated screw at the back of the receiver may be used to silence the set speaker in favour of an external loudspeaker when desired.

CIRCUIT DETAILS.

On the medium wave band (green spot uppermost), the aerial is coupled through C5 and via the auto-transformer L2 to the H.F. pentode valve V1, while on the long wave band the coupling is through C5 and the inductively coupled transformer L1, L2, L3.

After amplification by V1, the signal passes through the inductively coupled iron cored R.F. transformer L4-7 via C11 to the grid of the detector valve V2. The M.W. secondary L7 is tapped down to improve selectivity.

The detector valve is resistance capacity coupled by R4 and C13 to the output valve V3, which is automatically biassed by the voltage drop across R6 in the common H.T. negative line.

An output transformer T1 feeding a permanent magnet moving coil loudspeaker is mounted on the underside of the receiver chassis.

Volume is controlled by varying the bias applied to the variable-mu H.F. pentode valve V1 by means of the potentiometer VR1 connected across the bias battery.

SPECIAL FEATURES.

"LOCAL-DISTANT" SWITCH.

This is mounted on the right hand side of the cabinet, and switches a 1,500 ohm resistance across the aerial circuit when necessary. Unless noticeable overloading of the detector valve takes place when the receiver is tuned to strong transmissions, the switch should be left at the "distant" position, as this will tend to economise H.T.

LOUDSPEAKER SILENCING SCREW.

This is at the back of the receiver (see Fig. 1) and, when unscrewed, breaks the speech coil circuit of the set speaker. The latter should not be silenced in this way however, unless a permanent magnet moving coil speaker, with a speech coil impedance of 2-4 ohms is connected across the Ext. L.S. sockets. This speaker will not require an output transformer.

AERIAL EQUALISING CONDENSER.

A proportion of the aerial capacity will always be transferred to the tuned circuit L2, C1 on the M.W. band and L2, L3, C1 and C6 on the L.W. band. It will be apparent that unless a method is provided of varying this capacity within suitable limits, the circuits mentioned may be thrown out of adjustment with the corresponding circuits C2, L6, L7. The desired variation is obtained by means of the pre-set condenser C5 (see Fig. 1) which, once adjusted for a particular aerial, should not be touched. Readjustment will, however, be necessary if the receiver is used on a different aerial.

A refinement of this device is that the aerial coil is so designed that by operation of the switch contacts S1, S2 the same capacity is transferred from the aerial to the coils in the grid circuit of V1 when the wave change switch is turned either to the M.W. or L.W. positions. This ensures accurate ganging on both wave bands, and also that once the aerial equalising condenser has been set for the medium wave band, it will not require further adjustment for the long wave band.

To adjust Aerial Equalising Condenser.

Tune the receiver to a weak station at about 220 metres. With the volume control at a fairly low setting, turn the aerial equaliser one way or the other until maximum volume is obtained. Re-tune the receiver accurately to the same station with the station selector and re-adjust the aerial equaliser.

PRE-SET REACTION CONDENSER.

Reaction is used to improve both sensitivity and selectivity and is provided by the pre-set condenser C7 connected between the anodes of the H.F. and detector valves.

Due to the low H.F. resistance of the iron cored coils employed, it has been possible to ensure that reaction is constant practically throughout both wave-bands.

The pre-set reaction condenser may be used to advantage to compensate for the decline in sensitivity which accompanies deterioration of the H.T. battery. It may require adjustment if V1 or V2 is replaced.

Adjustment of the pre-set Reaction Condenser.

Tune the receiver to a programme on about 300 metres, preferably to one which necessitates advancing the volume control nearly to maximum.

Screw the pre-set reaction condenser slowly in a clockwise direction until the receiver is just short of oscillating point, meanwhile rocking the tuning condenser slightly.

If the receiver is now tuned to a station on a lower wavelength (about 250 metres), it should oscillate. (Prevented in actual use by reducing volume.) If it does not oscillate, the reaction condenser must be screwed in a little more.

L.W. REACTION EQUALISING CONDENSER.

A small pre-set condenser (C8) incorporated in the H.F. transformer can is used to provide a small degree of anti-reaction on the L.W. band.

It should be emphasized that this condenser is carefully adjusted before the receiver leaves the factory, and only in exceptional circumstances, such as replacement of the H.F. transformer, will further adjustment prove necessary. If the receiver oscillates at about 1,300 metres after the reaction condenser (C7) has been correctly adjusted, however, the L.W. reaction equalising condenser should be reset as described below.

The trimming tool required for this purpose must not be more than three inches in length, and sufficiently thin to be inserted through the hole in the coil can. (It will be noted that the hole is obliquely set to the plane in which C8 is mounted, thus restricting the effective size of the hole).

Adjustment of the L.W. Reaction Equalising Condenser.

After the reaction condenser C7 has been correctly set for the M.W. band, tune the receiver to the point on the L.W. band (generally about 1,300 metres) where self-oscillation has been encountered. Now turn C8 slowly in an anti-clockwise direction until the receiver just stops oscillating.

The reverse procedure should be adopted if the receiver seems insensitive on 1,300 metres.

A new H.T. battery must be used when adjusting C7 and C8, while the accumulator should be freshly charged.

Note. It is often necessary to re-gang the receiver on the L.W. band after adjusting C8. For procedure see page 3.

RE-CALIBRATING AND RE-GANGING MODEL B37.

Note.—It is unnecessary to remove the chassis from the cabinet when carrying out these procedures.

RE-CALIBRATING.

When the gang condenser is turned to its *electrical* maximum in a clockwise direction, the station pointer should cover the green line corresponding with about 570 metres.

If this is not the case the tuning knob should be removed in order to gain access to the inner end of the indicator arm. A small screw engaging with a slot in the flat end of the arm will be observed, and if this screw is loosened, the arm may be pivoted on the gang condenser spindle to the correct point.

RE-GANGING.

Note: It cannot be too strongly emphasised that *re-ganging should only be attempted if the circuits are distinctly out of balance.* Ensure that the modulated service oscillator used is as described below, and follow the instructions very carefully.

1. Connect a modulated service oscillator (having a dummy aerial of .0002 mfd. capacity) to aerial and earth sockets of the receiver.

2. Screw the aerial equalising condenser hard in, then slack it off exactly 1¼ turns. It is most important that this procedure be closely followed in order to ensure that the receiver is re-ganged under average working conditions.

3. Set oscillator and receiver tuning indicators to 1,200 kc/s (250 metres) (green dot uppermost on receiver wave-change switch).

4. Connect a suitable output meter (Range 0-5 volts) to the "Ext. L.S." sockets. (Remember that these are connected across the speech coil winding of the output transformer.)

5. Adjust the trimmer C4 (see Fig. 1) on the H.F. transformer section of the gang condenser for maximum reading on the output meter.

6. Adjust the trimmer (C3) on the aerial section of the gang condenser for maximum output meter reading.

Note: Upon reconnecting the receiver to the customer's aerial and earth, do not forget to re-adjust the aerial equaliser (C5).

LONG WAVE GANGING.

1. Set the oscillator to give an output on 1,600 metres.

2. Turn the receiver wave-change switch to the "Long Wave" position and tune the receiver to the oscillator signal.

3. Adjust the long wave ganging condenser C6 for maximum output meanwhile "rocking" the tuning condenser slightly. C6 is mounted inside the aerial coil can (see Fig. 1).

The special trimming tool mentioned on page 2 under the heading "L.W. reaction equalising condenser" may also be used to adjust the L.W. aerial trimmer C6.

TO REMOVE CHASSIS FROM CABINET.

1. Remove accumulator and cabinet back.
2. Disconnect and remove H.T. and G.B. batteries.
3. Remove control knobs by loosening grub screws.
4. Unsolder leads to speaker and remove "Local-distant" switch.
5. Remove the four cheese-headed screws in the base of the cabinet.
6. The chassis may now be withdrawn from the cabinet.

Notes: Do not operate the chassis unless the speaker or a low resistance load has been connected to the two leads from the secondary of the output transformer. If this precaution is not taken, the insulation of the transformer may break down due to development of high peak voltages across the primary.

When carrying out tests, ensure that the "Local-distant" switch is at the "Distant" setting.

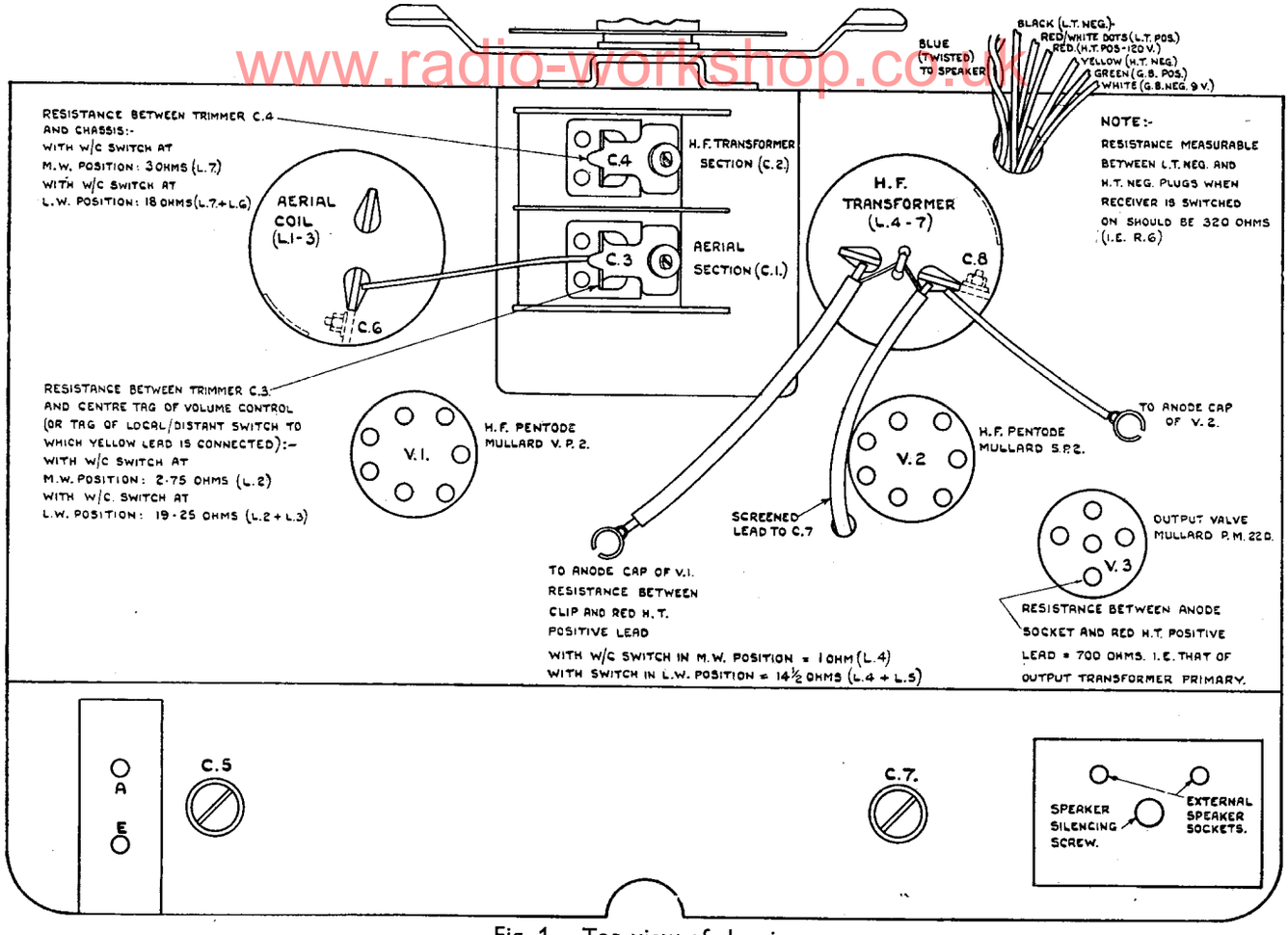


Fig. 1. Top view of chassis.

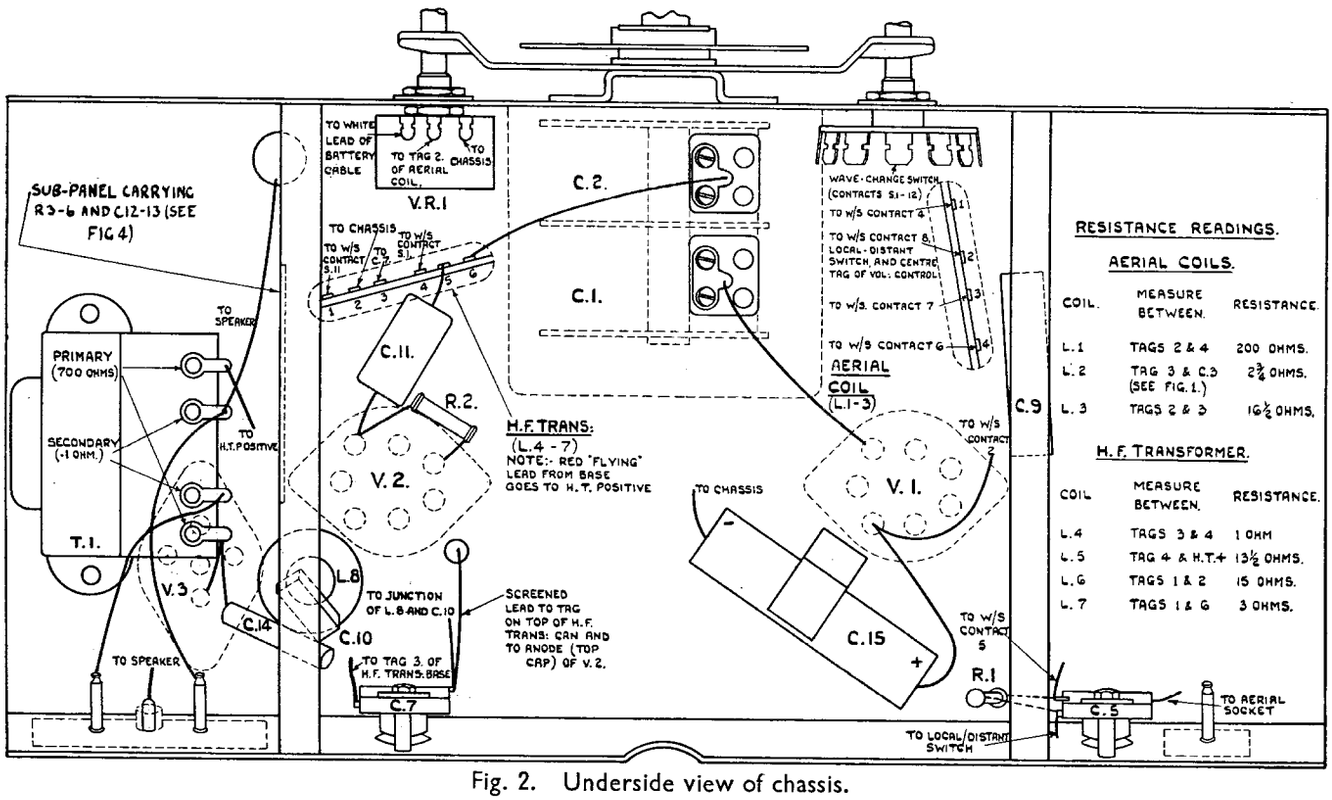


Fig. 2. Underside view of chassis.

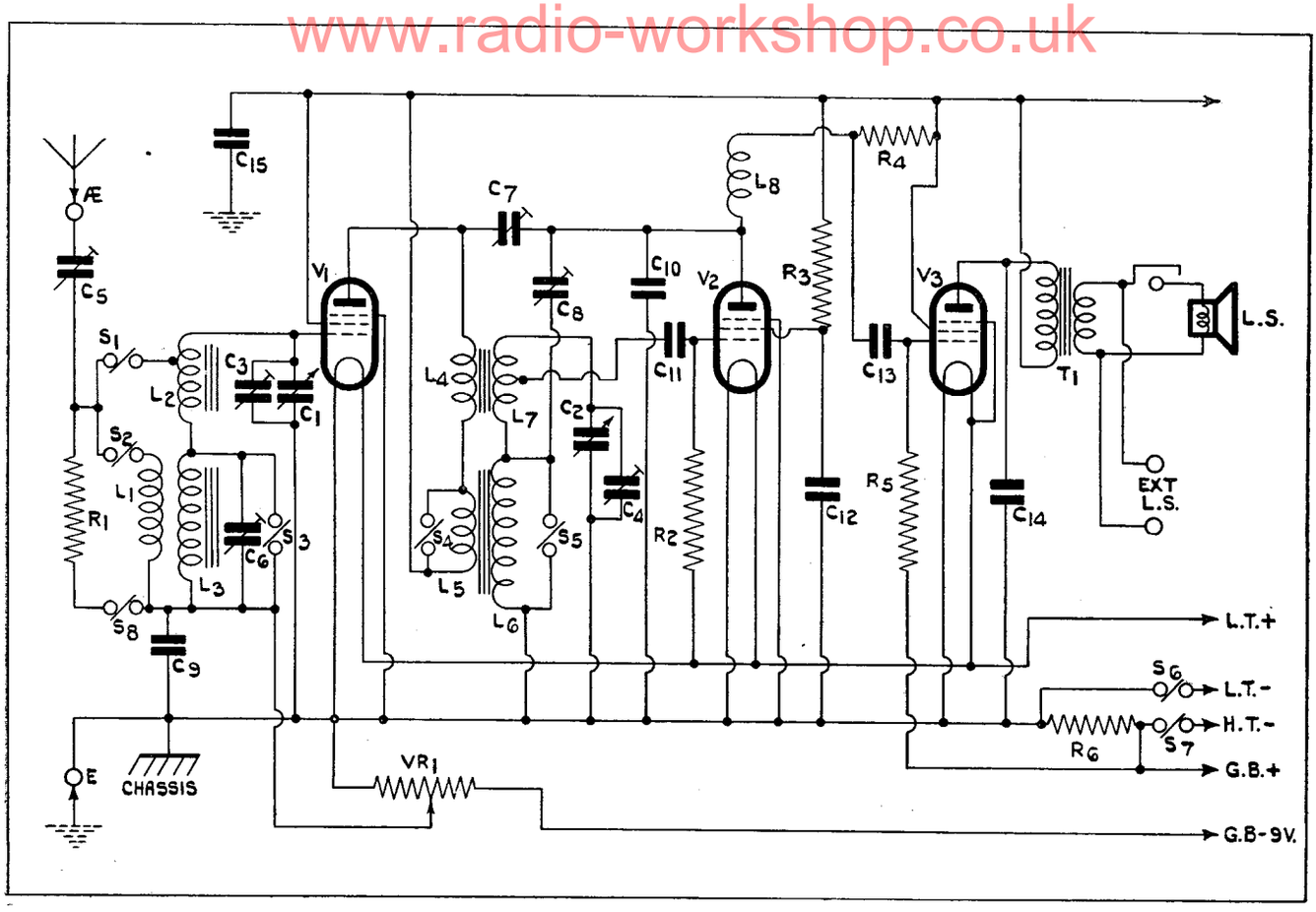


Fig. 3. Circuit diagram.

CIRCUIT KEY AND PRICE LIST.

Ref.	Description.	Part No.	Retail Price.
L1* L2* L3*	L.W. aerial coil M.W. grid coil L.W. grid coil	Aerial coil assembly (including C6)	SA134	6/6
L4* L5* L6* L7*	M.W. primary L.W. primary L.W. secondary M.W. secondary	H.F. transformer assembly (including C8)	SA136	7/6
L8	H.F. choke (280 ohms)	DP623	1/6
C1 C2 C3 C4	Aerial section H.F. transformer section Aerial section trimmer H.F. trans. section trimmer	Gang condenser	C5932	10/-
C5	Pre-set aerial equalising condenser .	DP927	1/-
C6	L.W. grid coil trimmer	—	—
C7	Pre-set reaction condenser	DP928	1/-
C8	Pre-set L.W. reaction equalising condenser	—	—
C9	.1 mfd. condenser	A5996	9d.

Ref.	Description.	Part No.	Retail Price.
C10	.0001 mfd. condenser	A3840	9d.
C11	.0001 „ „	A3840	9d.
C12	.1 „ „	A3844	9d.
C13	.02 „ „	A4147	9d.
C14	.004 „ „	A3457	9d.
C15	10 „ „ (electrolytic) ...	A6016	1/6
R1	1,500 ohm. resistance	A4881	9d.
R2	2 meg ohm „	P2071	9d.
R3	500,000 ohm „	A3263	9d.
R4	150,000 ohm „	A3263	9d.
R5	1 meg ohm „	A4444	9d.
R6	320 ohm „	A4705	9d.
VR1	500,000 ohm volume control (incorporating S6-7)	B6001	5/6
T1	Output transformer { primary 700 ohms secondary .2 ohms }	DP654	10/6
S1-5	Wave-change switch	B3935	2/6
S8	Local-distant switch	P1538	2/-

** For resistances see Fig. 2.*

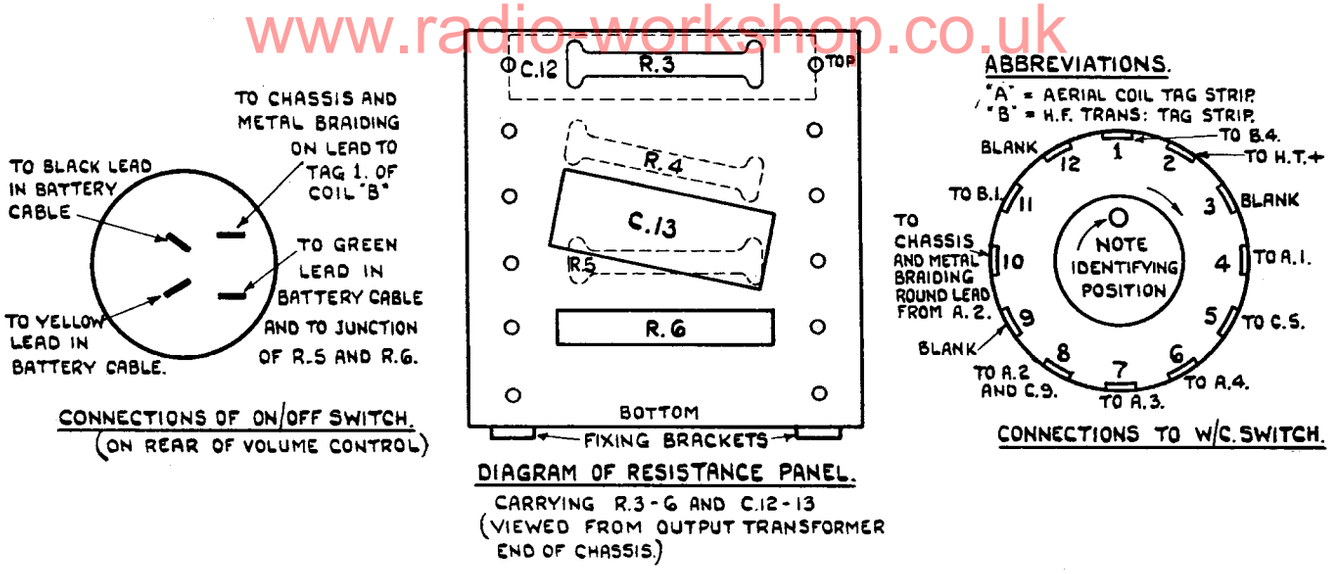


Fig. 4. Diagrams of "On/off" and wave-change switches, and of sub-panel carrying R3, R4, R5, R6, C12 and C13.

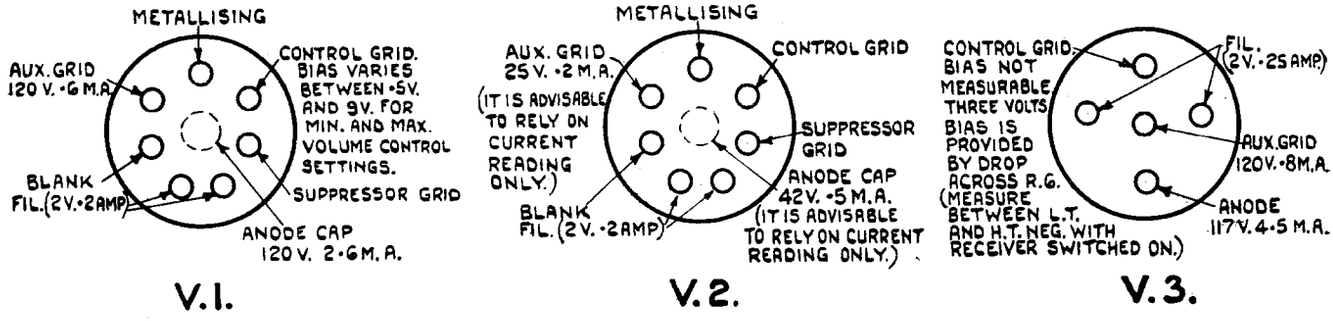


Fig. 5. Underside view of valve holders. Voltages are to chassis, and measured with a meter having a resistance of 1,000 ohms per volt.

PRICES OF PARTS NOT GIVEN IN CIRCUIT KEY.

Description.	Part No.	Retail Price.
Cabinet (black)	DP925	35/-
„ (walnut)	DP924	27/6
Tuning knob (walnut)	C5916	1/6
„ „ (ivory)	C5916	2/-
Volume control knob (walnut)	C5917	9d.
„ „ „ (ivory)	C5917	1/-
W/C switch knob (walnut)	B5946	9d.
„ „ „ (ivory)	B5946	1/-
Back cover	DP940	3/-

Description.	Part No.	Retail Price.
Scale	D6010	2/6
Scale clamp	B6009	3d.
Reflector plate (white)	B5955	6d.
Loudspeaker	D5240	30/-
Loudspeaker baffle	D5914	1/-
Valve screen (tubular section)	B5919	6d.
Valve screen (cap section)	B5920	3d.
Plug (red or black)	A3654	2d.

All prices given in this manual are subject to alteration without notice.

FAULT TRACING.

Abbreviations: S.C., short circuited; O.C., open circuited.

If the receiver ceases to operate first ensure that the loudspeaker silencing screw is screwed well in, that the plugs in the H.T. battery are making good contact, and that the L.T. spade terminals are making effective connection with the accumulator terminals. It is always advisable to clean the contacting surfaces and to apply vaseline to prevent acidic corrosion.

Should these points be in order and test of all valves by substitution of others fail to reveal the cause of the trouble, a check up of the voltage and current readings will probably provide a clue to the fault. It should be noted, however, that the presence of the high resistances in the anode and auxiliary grid circuits of V2 will appreciably affect the accuracy of the relative voltage readings, and for this valve it is advisable to rely on the current readings only.

No H.T. on valve anodes.

In the case of V1, this will be due to a break in L4 or L5 (if L5 is O.C. H.T. will be absent only when wave-change switch is at L.W. position). In the case of V2, an O.C. L8 or R4 will deprive the anode of H.T., while a break in the primary of the output transformer will prevent H.T. from reaching V3 anode.

Little or no anode current to valves.

A break in the biassing resistance R6 will deprive the receiver of H.T. current, although normal voltages will be measurable between H.T. negative and the valve anodes. If the auxiliary grid of V1, V2 or V3 is not receiving H.T., the current through the valve concerned will be zero. Poor contact of the pins of a valve in the relative sockets may reduce the current through that valve, while low or zero anode current in V2 could also be accounted for by a break in R3 or an S.C. C12.

Excessive H.T. consumption.

The total consumption of the B37 should be about 9 milliamps with the volume control at maximum. If this figure is appreciably exceeded ascertain whether there is a measurable voltage between H.T. and L.T. negative. Normally the voltage between these points should be about 2½ volts. If zero voltage, the biassing resistance R6 is probably short circuited. Alternatively, the negative socket of the H.T. battery may have been connected to the negative terminal of the accumulator instead of to the H.T. negative (yellow) lead, thus cutting R6 out of circuit.

If these points are in order, check up the consumption of individual valves. This may be ascertained by connecting a milliammeter in the H.T. positive lead, turning the volume control to maximum, and removing the valves, one at a time, starting with V3. Upon removal of the latter the total current should fall by about 5 m.a. to approximately 4 m.a. If the drop is greater than 6 m.a., V3 may be defective or R5 may be O.C. When V2 is removed there should be further drop of .75 m.a.

With V1 only in circuit, the total current should be about 3.2 m.a. and .25 m.a. for maximum and minimum positions respectively of the volume control. If the current is not reduced as the volume control is turned towards minimum, the control itself may be defective or L2 or L3 O.C. Alternatively, the bias battery may be of negligible voltage or internally disconnected.

It should be noted that with all valves removed there will still be a slight current represented by that passing through the electrolytic condenser C15. This current should be less than .1 m.a. If exceeded, C15 is defective and should be replaced.

Microphony. This will almost invariably be due to a defective SP2 valve.

Volume control inoperative. This may be due to a break inside the grid bias battery, an exhausted battery or use of one of insufficient voltage (a nine volt type is recommended). An S.C. C9 will also render the volume control inoperative.

Excessive L.T. consumption. The normal L.T. consumption is .65 amp. If an ammeter test shows this figure to be exceeded, ascertain the consumption of the individual valves by removing them one at a time and noting the decrease in current reading. (With V3 removed current should be .4 amp. With V3 and V2 removed current should be .2 amp.).

Apparently excessive L.T. consumption is almost invariably caused by use of an unsuitable accumulator. A cell having two "mass" plates, as distinct from a multi-plate type, is not recommended.

Distortion. Defective valve (probably V3), exhausted H.T. battery, O.C. R5 or S.C. R6. It is very unlikely that the speaker will cause distortion with normal usage. If it is proved to be responsible for distorted reproduction its return for replacement is recommended.

General insensitivity. Assuming valves and batteries are in order, the most probable cause of insensitivity is mal-adjustment of circuits. For re-ganging procedure see page 3. *Note*: Removal of the earth lead affects the sensitivity of the B37 by reducing the capacity across the aerial circuit. When carrying out any tests involving a check of the sensitivity, therefore, always ensure that the earth lead is connected and that the aerial equalising condenser (C1) is correctly adjusted.

RETURN OF PRODUCTS.

Before consigning a receiver to any Ekco service depot, *make quite certain that the trouble is not due to a faulty valve* or other very minor defect, otherwise a minimum charge of 7/6 will be made for expenses in testing, handling, packing and carriage.

Should it prove necessary to return a receiver or component part *the customer's guarantee registration card must be enclosed.* Free repair cannot be effected if the guarantee has expired or the instrument has not been registered by the customer.

Stock receivers returned for repair *must* include the instruction book and blank guarantee card.

Delivery of products "Carriage Forward" will not be accepted.

Do not return separately parts of complete components such as wave-change switches, coils, gang condensers, speakers and volume controls.

If a new iron cored coil is required, indicate clearly whether it is an aerial (part No. SA134) or detector type (part No. SA136). Orders for replacement knobs should indicate the colour and state whether a tuning, volume control or wave-change switch type is required.

Always forward service correspondence, orders or receivers to your nearest Ekco service depot (see addresses below).

When ordering instruction booklets (for which a charge of 6d. will be made) do not fail to indicate the serial number of the receiver.

FAILURE TO OBSERVE THE ABOVE WILL RESULT IN DELAY.

SERVICE, E. K. COLE LTD., EKCO WORKS, SOUTHEND-ON-SEA. Telephone: Southend 49491.

Scottish Service Depot: 27 Cadogan Street, Glasgow, C.1. Telephone: Central 5357/8.

Manchester Service Depot: Bombay House, 59 Whitworth Street, Manchester. Telephone: Central 6711/2. (Goods address: 7 Bombay Street, Manchester.)

Bristol Service Depot: 14 Redcross Street, Bristol. Telephone: Bristol 22269.