

"TRADER" SERVICE SHEET

900

EKCO A52

Band-spread and Pre-set Station Superhet

similar chassis is employed in the console C87. Release dates and original prices: A52, October 1947, £28 7s; C87, December 1948, £33 13s 2d + P.T.

CIRCUIT DESCRIPTION

On M.W. and L.W. aerial input is via coupling coils L4 (M.W.) and L5 (L.W.) to single-tuned circuits L8 (M.W.) and L9 (L.W.), tuned manually by C56. For automatic tuning in these circuits, C56 is replaced by one of the pre-set trimmer-type capacitors C62-C66, selected via S33-S42. I.F. filtering is by L1, C1.

On S.W., where the aerial is inductively coupled by L2, L3, band-spreading is achieved by connecting the tuning capacitor to the appropriate coil via a combination of series and shunt capacitors which limit the tuning range. On S.W.1, C56 is connected to L6 via C4, C5 and S2, S9; on S.W.2 via C7-C9 and S5, S10, and on S.W.3 to L7 via C10, C11 and S11.

First valve (V1, Mullard metallized ECH35) is a triode-hexode operating as frequency changer with internal coupling. Triode oscillator anode coils L16 (M.W.) and L17 (L.W.) are tuned manually by C61, with parallel trimming by C59 (M.W.), C18, C60 (L.W.) and series tracking by C28 (M.W.), C29 (L.W.). For automatic tuning all the foregoing circuits are disconnected and replaced by one of the pre-set iron-dust cored Colpitts oscillator coils L18-L22, selected via S43-S62.

For S.W. operation band-spread tuning is again obtained by the series and shunt capacitor method. On S.W.1, C61 is connected to L14 via C23, C24, C25, C58 and S19, S21, S25; on S.W.2 via C19, C20, C21, C22, C57 and S20, S22, S26; and on S.W.3 to L15 via C26, C27 and S28. Inductive reaction coupling, by L10-L13, is employed on all bands, with additional coupling on S.W.1 and S.W.2 due to the common impedance of trackers C25, C58 (S.W.1) and C22 (S.W.2) in grid and anode circuits.

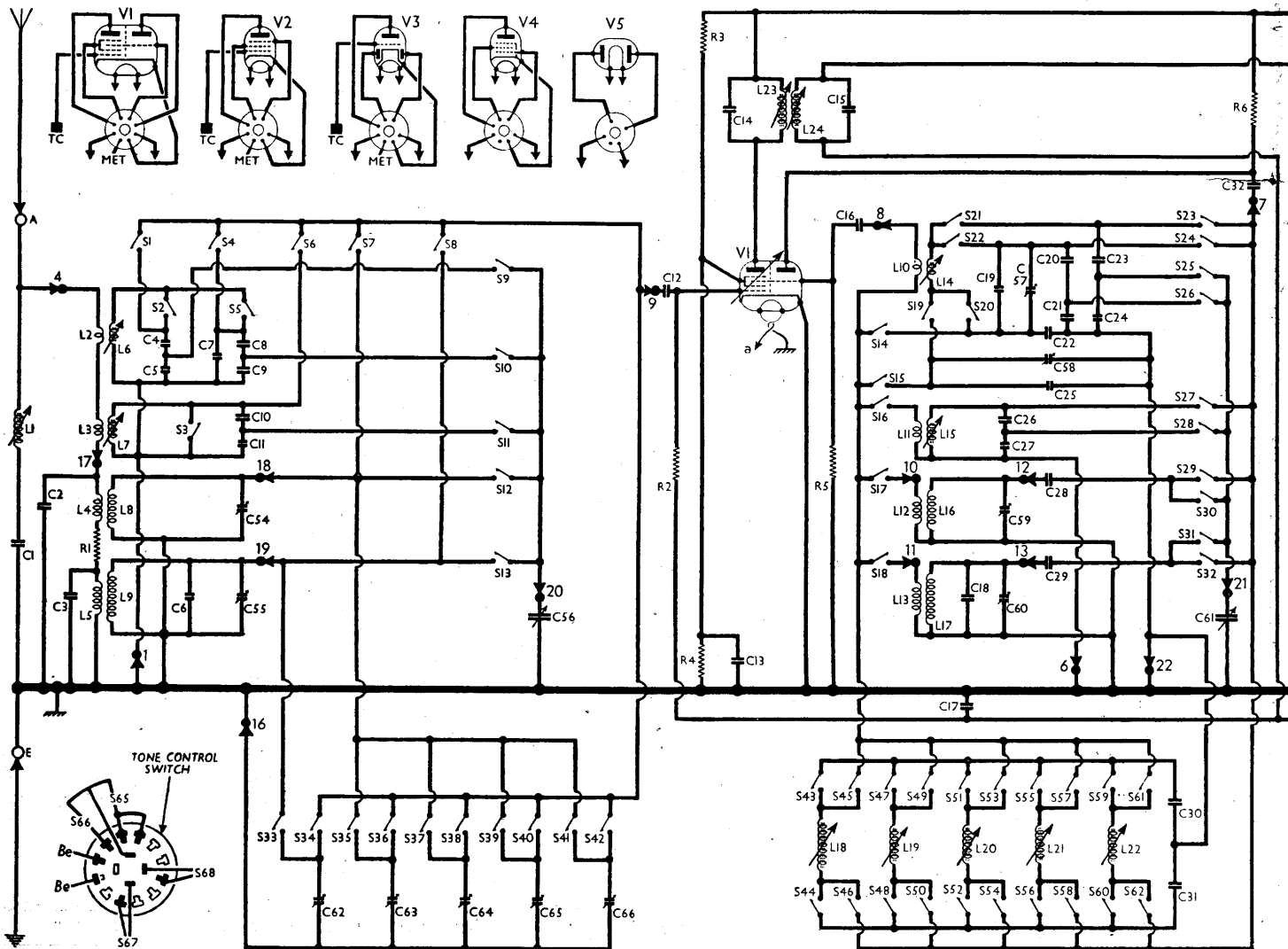
Second valve (V2, Mullard metallized EF39) is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned-transformer couplings.

Intermediate frequency 460 kc/s.

Diode second detector is part of double diode triode valve (V3, Mullard metallized EBC33), the second diode of which provides A.G.C. voltage. Provision is also made for the connection of a gramophone pick-up across the volume control R12, via S64, radio reception being muted by biasing back V2, due to the inclusion of R8 in its cathode circuit. This resistor is normally short-circuited by S63.

Resistance-capacitance coupling by R16, R23, C45, R22, via grid stopper R27, between V3 triode and pentode output valve (V4, Mullard EL33). A three-position voltage negative feedback circuit is provided for tone control purposes, with fixed tone correction by C51.

THREE band-spread S.W. ranges are provided in the Ekco A52, in addition to M.W. and L.W. The waveband ranges are 11.32-13.95 m. (S.W.1), 16.2-20 m. (S.W.2), 24.6-51.7 m. (S.W.3), 200-550 m. (M.W.) and 1,000-2,000 m. (L.W.). Also, there are four M.W. and one L.W. pre-set station circuits. Selection of these circuits is controlled by a 12-position switch unit, gram operation being provided at two settings. The receiver operates from A.C. mains of 200-250V, 40-100 c/s. A



COMPONENTS AND VALUES

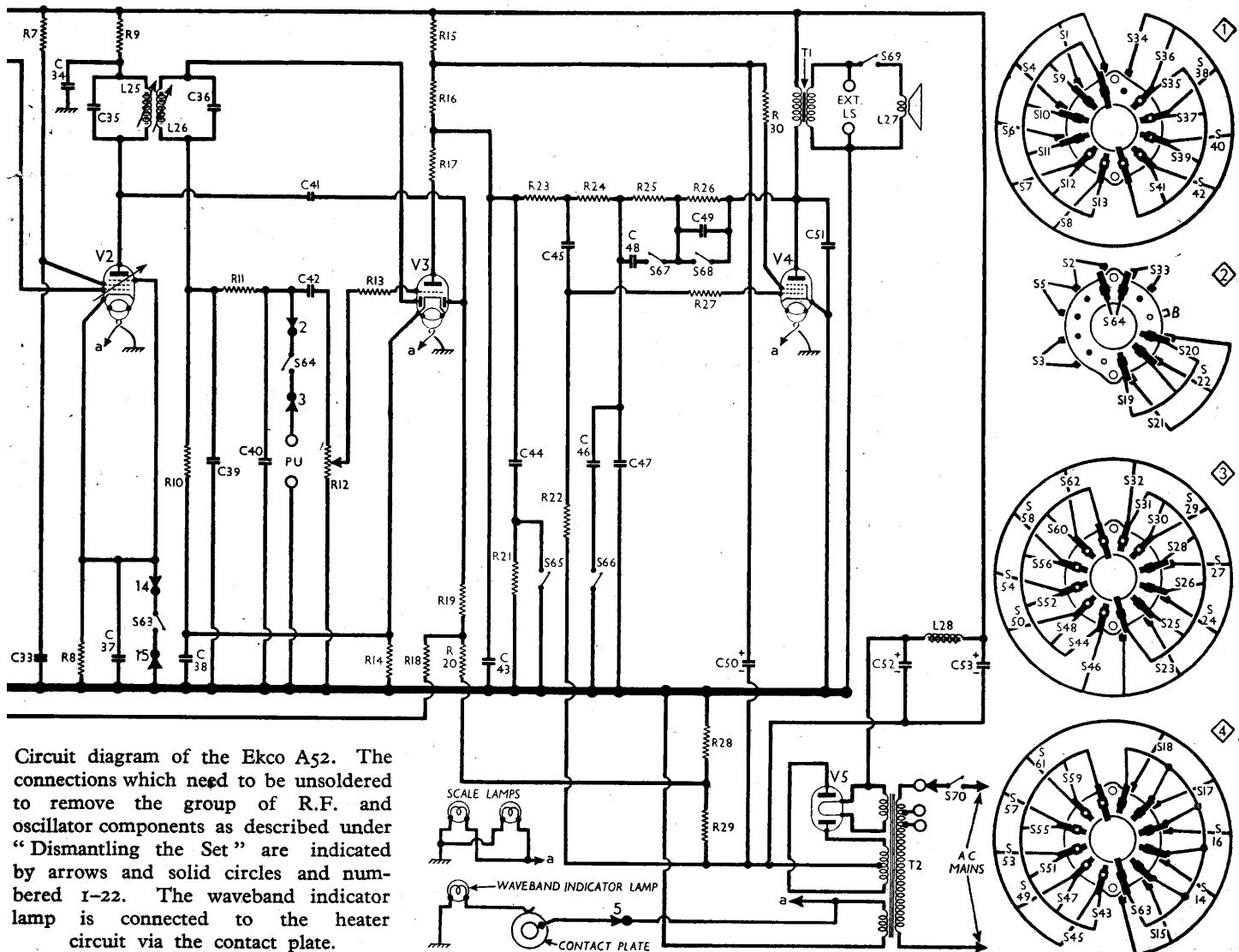
| RESISTORS | | Values (ohms) | Loca- tions |
|-----------|---|------------------|----------------|
| R1 | Aerial series ... | 330 | A1 |
| R2 | V1 hex. C.G. ... | 680,000 | L4 |
| R3 | V1 S.G. H.T. poten- tial divider ... | 33,000 | L5 |
| R4 | V1 osc. C.G. ... | 33,000 | L5 |
| R5 | V1 osc. C.G. ... | 47,000 | L5 |
| R6 | Osc. anode load ... | 22,000 | L5 |
| R7 | V2 S.G. feed ... | 100,000 | M7 |
| R8 | V2 cath. resistor ... | 47,000 | M7 |
| R9 | V2 H.T. decoupling ... | 2,200 | M7 |
| R10 | Sig. diode load ... | 470,000 | N7 |
| R11 | I.F. stopper ... | 47,000 | N7 |
| R12 | Volume control ... | 1,000,000 | G3 |
| R13 | V3 grid stopper ... | 220,000 | C2 |
| R14 | V3 G.B., part A.G.C. delay ... | 1,000 | N7 |
| R15 | H.T. feed resistor ... | 10,000 | G5 |
| R16 | V3 triode anode load resistors ... | 47,000 | G6 |
| R17 | A.G.C. decoupling ... | 22,000 | G6 |
| R18 | A.G.C. diode load ... | 1,500,000 | N7 |
| R19 | A.G.C. diode load ... | 470,000 | N7 |
| R20 | resistors ... | 1,000,000 | N7 |
| R21 | Part tone control ... | 470,000 | E4 |
| R22 | V4 C.G. resistor ... | 470,000 | G5 |
| R23 | Parts of tone con- trol circuit ... | 22,000 | G6 |
| R24 | Parts of tone con- trol circuit ... | 470,000 | G5 |
| R25 | Parts of tone con- trol circuit ... | 470,000 | H5 |
| R26 | Parts of tone con- trol circuit ... | 1,000,000 | H5 |
| R27 | V4 C.G. stopper ... | 470 | G5 |
| R28 | V1, V2, V4 fixed ... | 33 | G5 |
| R29 | G.B., part A.G.C. delay, resistors ... | 68 | G5 |
| R30 | V4 S.G. stopper ... | 100 | G5 |

| CAPACITORS | | Values (μF) | Loca- tions |
|------------|--|----------------|----------------|
| C1 | I.F. filter tuning ... | 0-00015 | L6 |
| C2 | Aerial M.W. shunt ... | 0-00047 | A1 |
| C3 | Aerial L.W. shunt ... | 0-00082 | A1 |
| C4 | Aerial S.W.1. band- spread capacitors ... | 0-000056 | J4 |
| C5 | Aerial L.W. trim ... | 0-000039 | H4 |
| C6 | Aerial L.W. trim ... | 0-000047 | A2 |
| C7 | Aerial S.W.2. band- spread capacitors ... | 0-000047 | H4 |
| C8 | Aerial S.W.2. band- spread capacitors ... | 0-00015 | J4 |
| C9 | Aerial S.W.2. band- spread capacitors ... | 0-0001 | H4 |
| C10 | Aerial S.W.3. band- spread capacitors ... | 0-0012 | J4 |
| C11 | V1 S.G. decoupling ... | 0-000068 | H4 |
| C12 | V1 hex. C.G. ... | 0-0003 | L4 |
| C13 | V1 S.G. decoupling ... | 0-1 | L5 |
| C14 | 1st I.F. transformer tuning ... | 0-00015 | A2 |
| C15 | 1st I.F. transformer tuning ... | 0-00015 | A2 |
| C16 | V1 osc. C.G. ... | 0-000047 | L5 |
| C17 | A.G.C. decoupling ... | 0-1 | M7 |
| C18 | Osc. L.W. trim ... | 0-00027 | K5 |
| C19 | Oscillator S.W.2. band-spread cap- acitors ... | 0-000017 | H4 |
| C20 | Oscillator S.W.2. band-spread cap- acitors ... | 0-0003 | K4 |
| C21 | Oscillator S.W.2. band-spread cap- acitors ... | 0-0001 | J5 |
| C22 | Oscillator S.W.2. band-spread cap- acitors ... | 0-00027 | H4 |
| C23 | Oscillator S.W.1. band-spread cap- acitors ... | 0-00024 | J4 |
| C24 | Oscillator S.W.1. band-spread cap- acitors ... | 0-000068 | J4 |
| C25 | Oscillator S.W.1. band-spread cap- acitors ... | 0-000082 | H4 |
| C26 | Oscillator S.W.3. band-spread cap- acitors ... | 0-001 | K5 |
| C27 | Oscillator S.W.3. band-spread cap- acitors ... | 0-000068 | K4 |
| C28 | Osc. M.W. tracker ... | 0-00057 | K5 |
| C29 | Osc. L.W. tracker ... | 0-00047 | J5 |
| C30 | Osc. pre-set tuning reaction ... | 0-00082 | H4 |
| C31 | Osc. pre-set tuning reaction ... | 0-00033 | H4 |
| C32 | Osc. anode coup. ... | 0-00047 | L4 |
| C33 | V2 S.G. decoupling ... | 0-1 | N7 |

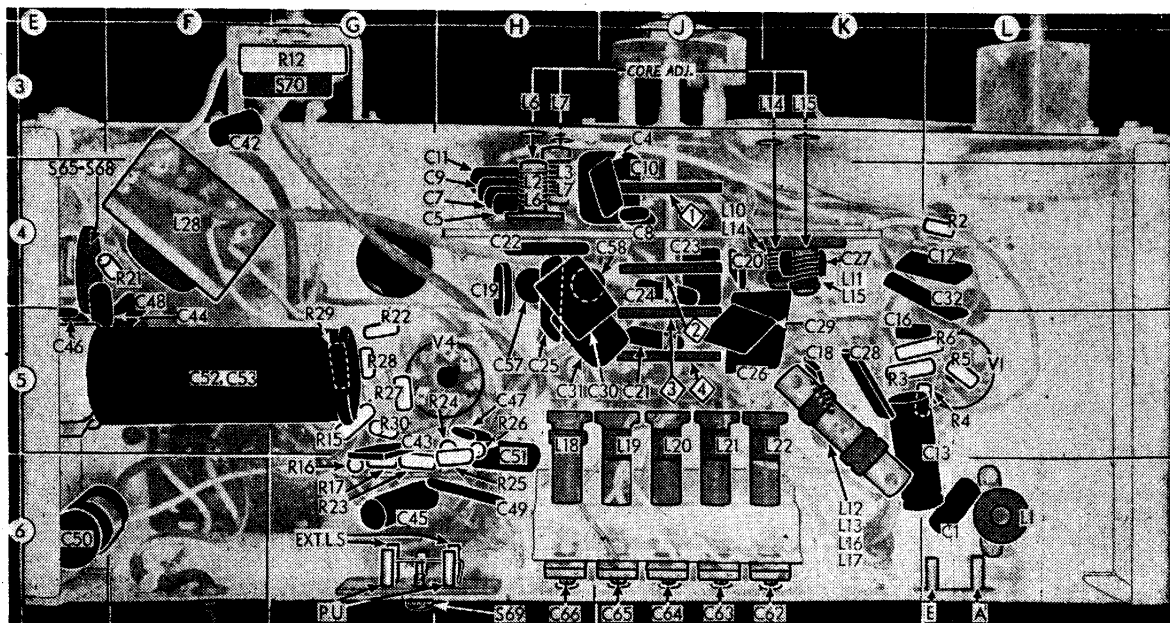
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| CAPACITORS (continued) | | Values (μF) | Loca- tions |
|---------------------------|--|----------------|----------------|
| C34 | V2 anode decoupling ... | 0-1 | N7 |
| C35 | 2nd I.F. transform- er tuning ... | 0-00015 | B2 |
| C36 | 2nd I.F. transform- er tuning ... | 0-00015 | B2 |
| C37 | V2 cath. by-pass ... | 0-005 | M7 |
| C38 | V3 cath. by-pass ... | 0-5 | N7 |
| C39 | I.F. by-passes ... | 0-0001 | N7 |
| C40 | I.F. by-passes ... | 0-0001 | N7 |
| C41 | A.G.C. coupling ... | 0-000015 | N7 |
| C42 | A.F. coupling ... | 0-005 | F3 |
| C43 | I.F. by-pass ... | 0-0025 | G5 |
| C44 | Part tone control ... | 0-005 | E4 |
| C45 | A.F. coupling ... | 0-01 | G6 |
| C46 | Parts of tone con- trol circuit ... | 0-00016 | E5 |
| C47 | Parts of tone con- trol circuit ... | 0-00016 | H5 |
| C48 | Parts of tone con- trol circuit ... | 0-00027 | E4 |
| C49 | Parts of tone con- trol circuit ... | 0-002 | H6 |
| C50* | H.T. feed decoupling ... | 4-0 | E6 |
| C51 | Tone corrector ... | 0-0025 | H5 |
| C52* | H.T. smoothing ... | 8-0 | F5 |
| C53* | capacitors ... | 16-0 | F5 |
| C54† | Aerial M.W. trim ... | — | A1 |
| C55† | Aerial L.W. trim ... | — | A2 |
| C56† | Aerial tuning ... | — | B1 |
| C57† | Osc. S.W.2. trim ... | 0-00003 | H4 |
| C58† | Osc. S.W.1. track ... | 0-00003 | H4 |
| C59† | Osc. M.W. trim ... | — | A2 |
| C60† | Osc. L.W. trim ... | — | B2 |
| C61† | Oscillator tuning ... | — | B1 |
| C62† | Aerial M.W. and L.W. pre-set tun- ing capacitors ... | — | K6 |
| C63† | Aerial M.W. and L.W. pre-set tun- ing capacitors ... | — | J6 |
| C64† | Aerial M.W. and L.W. pre-set tun- ing capacitors ... | — | J6 |
| C65† | Aerial M.W. and L.W. pre-set tun- ing capacitors ... | — | J6 |
| C66† | Aerial M.W. and L.W. pre-set tun- ing capacitors ... | — | H6 |

*Electrolytic. † Variable. ‡Pre-set.



Circuit diagram of the Ekco A52. The connections which need to be unsoldered to remove the group of R.F. and oscillator components as described under "Dismantling the Set" are indicated by arrows and solid circles and numbered 1-22. The waveband indicator lamp is connected to the heater circuit via the contact plate.



Under-chassis view. Most of the RF and oscillator circuit components are tightly grouped around the waveband switches, and access to them can be gained only by removing the whole group. This entails unsoldering 22 leads as described under "Dismantling the Set." Diagrams of the waveband switches are inset on the right of the circuit diagram overleaf.

| OTHER COMPONENTS | | Approx. Values (ohms) | Locations |
|------------------|--|-----------------------|-----------|
| L1 | I.F. filter coil ... | 8-5 | L6 |
| L2 | Aerial coupling coils ... | Very low | H4 |
| L3 | | Very low | H4 |
| L4 | | 13-5 | A1 |
| L5 | | 38-0 | A1 |
| L6 | Aerial tuning coils | Very low | H4 |
| L7 | | Very low | H4 |
| L8 | | 5-0 | A1 |
| L9 | Oscillator reaction coils ... | 31-0 | A1 |
| L10 | | Very low | K4 |
| L11 | | Very low | K4 |
| L12 | Oscillator tuning coils ... | 1-2 | K5 |
| L13 | | 2-0 | K5 |
| L14 | | Very low | K4 |
| L15 | Oscillator M.W. and L.W. pre-set tuning coils ... | Very low | K4 |
| L16 | | 3-0 | K5 |
| L17 | | 6-5 | K5 |
| L18 | 1st I.F. trans. { Pri. Sec. } | 3-7 | H5 |
| L19 | | 4-0 | J5 |
| L20 | | 3-5 | J5 |
| L21 | 2nd I.F. trans. { Pri. Sec. } | 2-0 | J5 |
| L22 | | 1-8 | K5 |
| L23 | | 9-0 | A2 |
| L24 | Speech coil ... | 9-0 | A2 |
| L25 | | 9-0 | B2 |
| L26 | | 9-0 | B2 |
| L27 | Smoothing choke ... | 2-7 | — |
| L28 | Waveband, gram and pre-set tuning switches ... | 540-0 | F4 |
| S1-S64 | — | — | J4 |
| S65-S68 | Tone control switches | — | E4 |
| S69 | Int. spkr. switch ... | — | G6 |
| S70 | Mains sw., g'd R12 | — | G3 |
| T1 | Output trans. { Pri. Sec. } | 485-0 | B2 |
| T2 | Mains trans. { Pri., total Heat. sec. Rect. heat. sec., ... H.T. sec., total ... } | 0-4 | B2 |
| | | 45-0 | D2 |
| | | Very low | D2 |
| | | 615-0 | D2 |

DISMANTLING THE SET

The cabinet is fitted with a detachable plywood bottom cover, upon removal of which (six countersunk-head wood screws) access may be gained to most of the under-chassis components.

Removing Chassis.—Remove the four control knobs (recessed grub screws); from the rear of the cabinet remove the two cheese-head screws securing the scale backing plate, and the two round-head wood-screws retaining the ends of the cursor guide rail; remove the four cheese-head screws (with metal washers) securing the chassis to the base of the cabinet, and slide out the chassis to the extent of the speaker leads.

Removing Speaker.—Loosen the fixing nuts of the four speaker retaining clamps, swivel the clamps aside, and lift out the speaker.

Removing Tuning Assembly.—In the following instructions each lead has been allocated a number which is repeated in the circuit diagram, where its point of connection is indicated.

Viewing the underside of the chassis from the rear, unsolder the following leads: 1, yellow lead from chassis at the tag at the left-hand side of the paxolin panel; 2, screened lead from C42 at one tag of S64 on wave-band switch wafer 2; 3, screened lead from P.U. socket at one tag of S64 on switch wafer 2; 4, white lead from A socket at tag at right-hand side of paxolin panel; 5, green lead from wave-band indicator lamp at pin 2 on V1; 6, blue sleeved wire from right-hand bracket of paxolin panel at an adjacent chassis tag; 7, red/white lead at its junction with C32; 8, brown lead at its junction with C16; 9, brown lead at its junction with C12; 10, green lead from switch wafer 4 at a tag on L12; 11, red lead from switch wafer 4 at a tag on L13; 12, lead from C28 at a tag on L16; 13, lead from C29 at a tag on L17; 14, red/blue lead at S63 (bottom tag on switch wafer 4); 15, white lead at S63 (next tag on switch wafer 4); 16, sleeving covered wire from C62-C66 at an adjacent chassis tag.

Viewing the chassis deck from the rear, unsolder: 17, white lead at front tag on L4; 18, green lead at front left-hand tag on L4; 19, red lead at rear left-hand tag on L5; 20, brown lead from S9-S13 at front section (C56) of gang; 21, brown lead from

ballast resistor is inserted in the "a" lead to the scale and indicator lamps.

DRIVE CORD REPLACEMENT

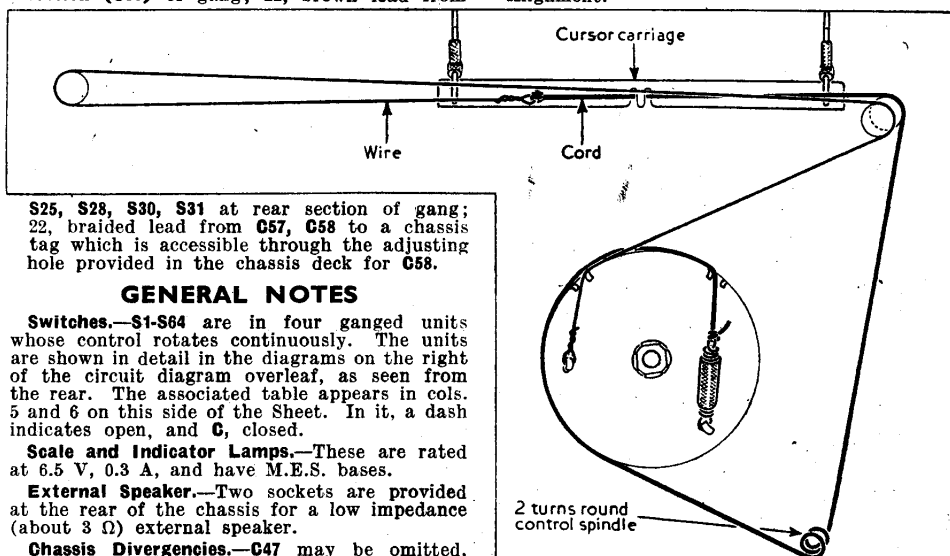
The drive cord consists of 33in of stranded steel wire (obtainable, ready looped, from the manufacturers under Part No. B33563) and about 36in of cord. The sketch below shows the course taken by this combination, as seen when viewed from the front when the gang is at maximum capacitance.

Tie one end of the cord to one of the looped ends of the steel wire, pass the free loop at the other end of the wire through the left-hand slot in the gang drive drum flange, and hook it to the anchor, as shown in the sketch.

The drive wire should then be run at shown, passing in an anti-clockwise direction over the front right-hand pulley, anti-clockwise over the left-hand pulley; the cord section, continuing the run, should then pass clockwise over the rear right-hand pulley, down to the control spindle, and twice round it clockwise.

Finally, the cord must pass clockwise round the gang drum groove, its free end being fed through the right-hand slot and tied to the tension spring. The spring should expand by about half an inch when hooked to its anchor.

The cursor carriage engages the drive cord in a slot, which may be located approximately in the first instance just above the gang spindle, final adjustment being made when the chassis is in the cabinet, as explained under "Circuit Alignment."



S25, S28, S30, S31 at rear section of gang; 22, braided lead from C57, C58 to a chassis tag which is accessible through the adjusting hole provided in the chassis deck for C58.

GENERAL NOTES

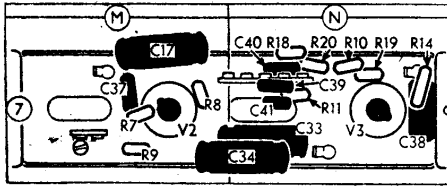
Switches.—S1-S64 are in four ganged units whose control rotates continuously. The units are shown in detail in the diagrams on the right of the circuit diagram overleaf, as seen from the rear. The associated table appears in cols. 5 and 6 on this side of the Sheet. In it, a dash indicates open, and C, closed.

Scale and Indicator Lamps.—These are rated at 6.5 V, 0.3 A, and have M.E.S. bases.

External Speaker.—Two sockets are provided at the rear of the chassis for a low impedance (about 3 Ω) external speaker.

Chassis Divergencies.—C47 may be omitted, and R30 may be omitted, as may also R27. R26 may be 3,300,000 Ω or 20,000,000 Ω, and C49 may be 0.00056 μF. There may be a 50 μF electrolytic across R28, R29, and C50 would then be returned to chassis. Sometimes a 0.9 Ω

Sketch showing the tuning drive system, as seen from the front with the gang at maximum.



Components beneath the I.F. sub-assembly, as seen when it is freed and turned over on its leads.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those quoted by the manufacturers. Their receiver was operating from 230 V mains, using the 220-230 V tapping on the mains transformer, and was tuned to 500 m. Voltages were measured with a 1,000 Ω per volt meter, chassis being the negative connection.

| Valve | Anode Voltage (V) | Anode Current (mA) | Screen Voltage (V) | Screen Current (mA) |
|----------|--------------------------|--------------------|--------------------|---------------------|
| V1 ECH35 | 255 115 Oscillator | 1.95 5.0 | 78 | 2.45 |
| V2 EF39 | 235 | 4.2 | 97 | 2.0 |
| V3 EBC33 | 92 | 1.9 | — | — |
| V4 EL33 | 241 | 29.0 | 210 | 3.0 |
| V5 AZ31 | 290† | — | — | — |

† Each anode, A.C.

CIRCUIT ALIGNMENT

I.F. Stages.—Switch set to M.W. turn gang and volume control to maximum, connect signal generator, via an 0.1 μ F in the "live" lead, to control grid (top cap) of V1 and the E socket, feed in a 460 kc/s (652.1 m) signal, and adjust the cores of L26, L25, L24 and L23 (location references B2, A2) for maximum output. When correctly aligned an input signal of 100 μ V should produce 50 mW power output.

R.F. and Oscillator Stages.—With the gang at maximum capacitance the cursors should coincide with the high wavelength ends of their respective scales. Errors may be corrected by sliding the cursor carriage along the drive cord. For S.W. alignment a crystal controlled signal generator is desirable, and the receiver should finally be checked against broadcast stations of known wavelength. Transfer "live" signal generator lead to A socket, via a suitable dummy aerial.

M.W.—With set still switched to M.W., tune to 250 m on scale, feed in a 250 m (1,200 kc/s) signal, and adjust C59 (A2) and C54 (A1) for maximum output. To gain access to the former capacitor it will be necessary to remove the paxolin cover (three machine screws) at the side of V2, V3 sub-assembly.

L.W.—Switch set to L.W., tune to 1,111 m on scale, feed in a 1,111 m (270 kc/s) signal, and adjust C60 (B2) and C55 (A2) for maximum output.

S.W.3.—Switch set to S.W.3, tune to 42.87 m on scale, feed in a 42.87 m (7 Mc/s) signal, and adjust the cores of L15 (K3) and L7 (H3) for maximum output.

S.W.2.—Switch set to S.W.2, tune to 20 m on scale, feed in a 20 m (15 Mc/s) signal, and adjust the core of L14 (K3) for maximum output. Tune to 16.67 m on scale, feed in a 16.67 m (18 Mc/s) signal, and adjust C57 (C1) and the core of L6 (H3) for maximum output. Repeat these adjustments until no improvement results and note that any error on this band will be repeated on S.W.1.

S.W.1.—Switch set to S.W.1, tune to 13.96 m on scale, feed in a 13.96 m (21.5 Mc/s) signal, and adjust C58 (B1) for maximum output.

I.F. Filter.—Switch set to M.W., tune to 500 m on scale, feed in a strong 460 kc/s signal, and adjust the core of L1 (A2) for minimum output.

Pre-set Tuning

The pre-set tuning circuits should be reset after alignment, but this should be carried out at the customer's address on broadcast stations. The tuning range is shown above each plunger, on the rear chassis flange.

| Switch | S.W.1 | S.W.2 | S.W.3 | M.W. | L.W. | Gram. | P.S.1 | P.S.2 | P.S.3 | P.S.4 | P.S.5 | Gram. |
|--------|-------|-------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|
| S1 | o | — | — | — | — | — | — | — | — | — | — | — |
| S2 | o | — | — | — | — | — | — | — | — | — | — | — |
| S3 | — | — | — | — | — | — | — | — | — | — | — | — |
| S4 | — | — | — | — | — | — | — | — | — | — | — | — |
| S5 | — | — | — | — | — | — | — | — | — | — | — | — |
| S6 | — | — | — | — | — | — | — | — | — | — | — | — |
| S7 | — | — | — | — | — | — | — | — | — | — | — | — |
| S8 | — | — | — | — | — | — | — | — | — | — | — | — |
| S9 | — | — | — | — | — | — | — | — | — | — | — | — |
| S10 | — | — | — | — | — | — | — | — | — | — | — | — |
| S11 | — | — | — | — | — | — | — | — | — | — | — | — |
| S12 | — | — | — | — | — | — | — | — | — | — | — | — |
| S13 | — | — | — | — | — | — | — | — | — | — | — | — |
| S14 | — | — | — | — | — | — | — | — | — | — | — | — |
| S15 | — | — | — | — | — | — | — | — | — | — | — | — |
| S16 | — | — | — | — | — | — | — | — | — | — | — | — |
| S17 | — | — | — | — | — | — | — | — | — | — | — | — |
| S18 | — | — | — | — | — | — | — | — | — | — | — | — |
| S19 | — | — | — | — | — | — | — | — | — | — | — | — |
| S20 | — | — | — | — | — | — | — | — | — | — | — | — |
| S21 | — | — | — | — | — | — | — | — | — | — | — | — |
| S22 | — | — | — | — | — | — | — | — | — | — | — | — |
| S23 | — | — | — | — | — | — | — | — | — | — | — | — |
| S24 | — | — | — | — | — | — | — | — | — | — | — | — |
| S25 | — | — | — | — | — | — | — | — | — | — | — | — |
| S26 | — | — | — | — | — | — | — | — | — | — | — | — |
| S27 | — | — | — | — | — | — | — | — | — | — | — | — |
| S28 | — | — | — | — | — | — | — | — | — | — | — | — |
| S29 | — | — | — | — | — | — | — | — | — | — | — | — |
| S30 | — | — | — | — | — | — | — | — | — | — | — | — |
| S31 | — | — | — | — | — | — | — | — | — | — | — | — |
| S32 | — | — | — | — | — | — | — | — | — | — | — | — |
| S33 | — | — | — | — | — | — | — | — | — | — | — | — |
| S34 | — | — | — | — | — | — | — | — | — | — | — | — |
| S35 | — | — | — | — | — | — | — | — | — | — | — | — |
| S36 | — | — | — | — | — | — | — | — | — | — | — | — |
| S37 | — | — | — | — | — | — | — | — | — | — | — | — |
| S38 | — | — | — | — | — | — | — | — | — | — | — | — |
| S39 | — | — | — | — | — | — | — | — | — | — | — | — |
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