

CHASSIS REMOVAL: Remove the back cover and the four control knobs. Unscrew the four 2BA base fixing screws. Chassis can now be drawn clear to the extent of the speaker leads.

DRIVE WIRE REPLACEMENT: Both drive wires can be supplied cut to length and with ready made loops at the ends. The part number for each is given in the diagrams. To replace either wire, remove the light excluder plate (at rear), then the glass scale, by removing the four securing clips, and lastly the scale backing plate. To do this, fully mesh the gang, then remove the four screws at the corners of the plate. Slide down the plate until the pointers disengage at the holes along the top. This will expose both wires sufficiently for replacement to be carried out.

NOTE: It is pointed out that the two drive tension springs are of different lengths, the details being given in the diagrams. Leave the drive spring in question temporarily in position, pass one end of the new wire through the slot in the drum rim and hook over the free end of the spring. With the aid of a pair of tweezers, lay in the wire as shown in the diagrams, taking care to avoid kinks. Keep the wire reasonably taut and pass the other end of the wire through the same slot in the drum. Release the lower end of the spring and ease upward to hook on the second loop with the first. With a pair of thin nosed pliers, grip the spring at the free end and hook over the drum lug. Before finally tightening down the scale after replacement, check the pointer setting to ensure the scale is in correct position.

PRESS-BUTTON UNIT: To remove this, first remove the knob of P.B.5 by heating the stem with a soldering iron to melt the fixing compound. Do not use any form of flame heat. Next unscrew the three 6BA screws and nuts at the outer edges, taking care to salvage the spacers. The unit can then be eased backward, sufficiently clear to disconnect the five flexible leads and unclip the P.B. lampholder. To refit the unit, simply reverse the procedure.

COIL AND SWITCH UNIT: To remove this unit, it will be necessary to unsolder 17 leads, four of which are shown in the unit diagram, while the remainder are part of those shown on the switch wiring diagram. Next remove the paxolin spindle support (two 2BA screws and nuts) then two 4BA screws and nuts at the chassis rear, two more on the chassis deck (near mains switch) then one 6BA screw from the chassis side. Ease the unit edge with the row of coils toward the chassis centre until the centre metal piece clears the chassis rim. Now ease the unit outward until the back edge is clear of chassis. Draw the unit clear to the rear. Only a major repair to the switch itself should render it necessary to remove the whole unit, as all other components should be replacable in situ. Each individual coil assembly (except L8) has been marked with a white spot in order to ensure correct replacement. The spot is located between tags 3 and 4 in each case. To re-position L8, tag 2 connects to the lower end of the winding.

I.F. ALIGNMENT:
(1) Fully mesh the gang, switch to M.W. and connect output meter to the EXT. L.S. sockets. Connect sig/gen E. to E. of chassis.
(2) Inject a modulated 460 Kcs. signal via a 0.1 mfd. condenser to the grid (top cap) of V1.
(3) Adjust for maximum output all four I.F.T. cores in the following order, 2nd I.F.T. upper and lower, 1st I.F.T. upper and lower. Reduce the signal input as necessary during this operation.

I.F. FILTER ADJUSTMENT: Remove the 0.1 mfd. condenser and inject the 460 Kcs. into the A socket. Adjust the core of L1 for maximum rejection—lowest meter reading.

CALIBRATION: Fully mesh the gang and readjust the pointers to the datum lines if necessary then,
SWITCH TO S.W. Tune to and inject 20 metres (15 Mcs.), then adjust C26 (osc.) and C5 (aer.) for correct calibration with maximum sensitivity. Tune to and inject 50 metres (6 Mcs.), then adjust the cores of L1.12 (osc.) and L2.3 (aer.). Repeat these adjustments until there is no further improvement. Note that the images appear at lower frequency (higher metre) positions.

For TELEVISION SOUND, inject 41.5 Mcs. into A and E sockets via a dummy load of 75 ohms. This signal should tune in at 14.62 metres and it is pointed out that the second harmonic of the oscillator is used. Adjust L8 core for maximum response. In cases where the frequency of 41.5 Mcs. cannot be obtained from a generator, tune in the actual Television sound signal and adjust L8.

SWITCH TO M.W. Tune to and inject 250 metres (1200 Kcs.), and adjust C29 (osc.) and C8 (aer.). Tune to and inject 500 metres (600 Kcs.), and adjust L13.14 core and L4.5 core. Repeat until there is no further improvement.

SWITCH TO L.W. Tune to and inject 1000 metres (300 Kcs.), then adjust C31 (osc.) and C7 (aer.). Tune to and inject 1800 metres (166 Kcs.), then adjust the cores of L15.16 and L6.7. Repeat until there is no further improvement.

PRESS-BUTTON SETTING: Switch to P.B. and press the required button, taking note that the station to be selected is within the frequency coverage of the button. Adjust the key (inductance) above the button until the required signal is tuned, then increase the volume by resonating the lower key (capacity). The coverage of each button is:

M.W.	1	200—308 metres	1500—975 Kcs.
	2	283—448 "	1060—570 "
	3	342—560 "	878—540 "
L.W.	4	1160—1580 "	259—190 "
	5	1430—1986 "	210—151 "

NOTE: Complete realignment, including pointer setting, can be carried out without removing the chassis from the cabinet.

MODEL A23 is an A.C. operated 5-valve superheterodyne receiver covering the S.W., M.W. and L.W. bands. Television sound signals, within the accepted range, can be received at the H.F. end of the S.W. band. Five Press Buttons are incorporated to allow for P.B. control of three M.W. and two L.W. stations. The four manual controls fitted are, Wavechange, Tone, Tuning, Volume ON/OFF. Provision is also made for the use of a pick-up, and external speaker connection.

MAINS SUPPLY: 200/250v. R.M.S. 40/80 c.p.s.
CONSUMPTION: Approx. 56 watts.

WAVE RANGES: S.W. 15—50 metres 20.0—6 Mcs.
Television sound 41.5 Mcs.
M.W. 190—560 metres 1526—536 Kcs.
L.W. 850—2100 metres 353—138 Kcs.

VALVES: V1—ECH35 Frequency changer.
V2—EF39 I.F. amplifier.
V3—EBC33 2nd det. A.V.C. L.F. amplifier.
V4—EL33 L.F. power amplifier.
V5—AZ31 Full wave rectifier.

All valves are Mullard and have international octal bases.
PILOT LAMPS: 6.5v. 0.3 amp.
INTERMEDIATE FREQUENCY: 460 Kcs.
SPEECH COIL IMPEDANCE: 3 ohms at 400 c.p.s.

An external speaker, if used, should have a similar impedance. In such cases the speaker in the receiver may be muted by unscrewing a few turns on the screw switch, S15.

PICK-UP: For a satisfactory output level from the loudspeaker, the input to V3 grid from the pick-up should be in the region of 0.3 volts. Any radio breakthrough can be muted by earthing the muting socket under S15. As no switch is incorporated for disconnecting the pick-up, the leads of the latter must be removed from the P.U. sockets, as must the muting, if used, when using "radio."

POINTER SETTING: Fully mesh the gang. Remove the light excluder plate, rear of pointer drive, by unclipping the pilot lamp wire and removing the three 6BA screws. Loosen the two 6BA screws in the centre of the carriage, one turn each is sufficient, then move the pointer carriage up or down on the wire until the three pointers coincide with the small lines terminating the low frequency ends of each scale. Tighten up the carriage screws and replace the rear plate and pilot wiring.

WESTERN SERVICE DEPOT:

14, Redcross Street,
Bristol.

'Phone: Bristol 26311.

NORTHERN SERVICE DEPOT:

55, Whitworth Street,
Manchester.

'Phone: Central 67112.

SCOTTISH SERVICE DEPOT:

25, Cadogan Street,
Glasgow, C.2.

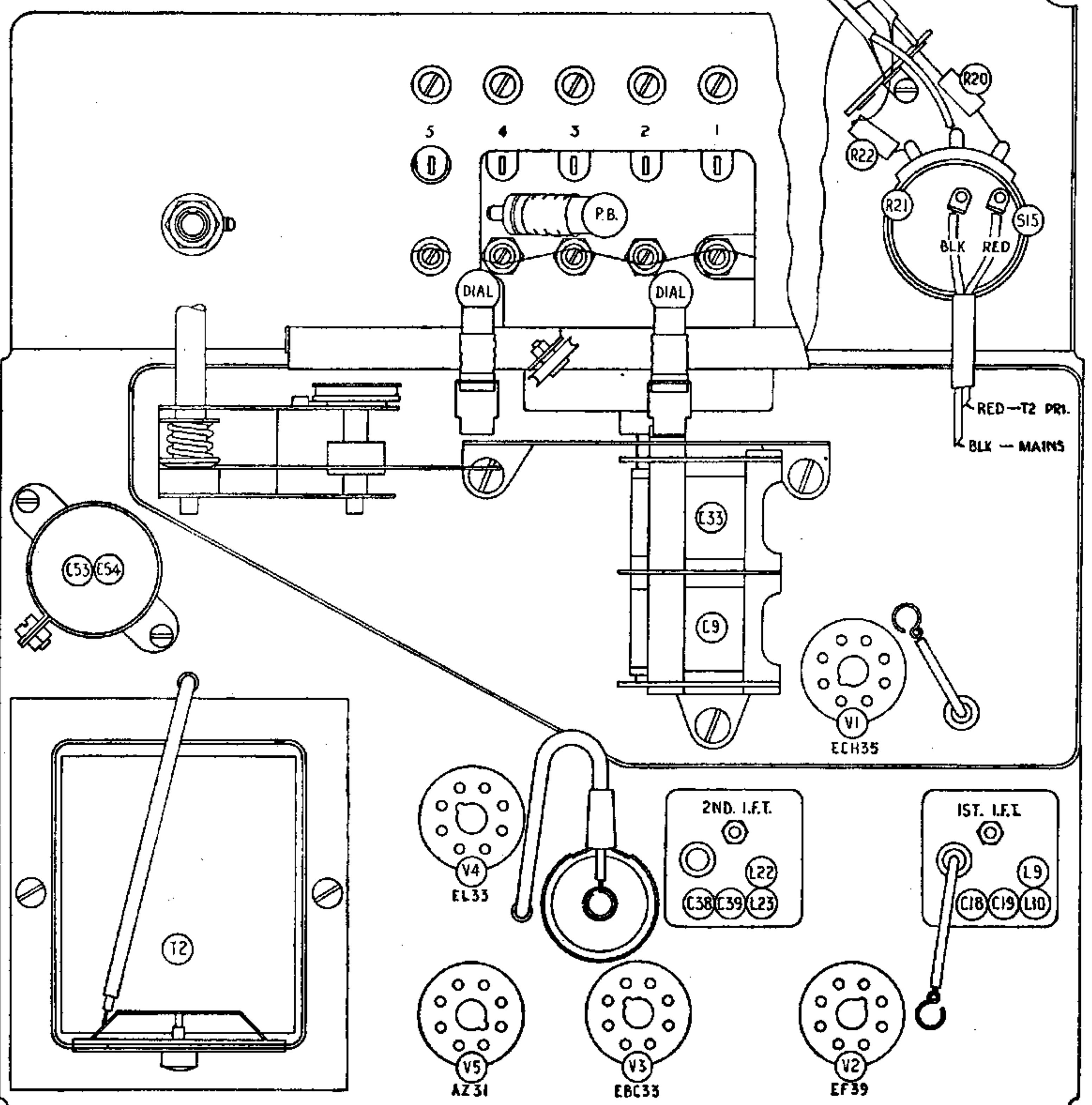
'Phone: Central 5357/8 9.

SERVICE DEPT., E. K. COLE Ltd.,

Somerton Works, Arterial Road,
Southend-on-Sea.

'Phone: Southend 2296
Head Office: Ekco Works, Southend-on-Sea

TAG 3 PANEL B
TOP CAP V3



5 4 3 2 1

P.B.

DIAL

DIAL

C53 C54

C33

C9

V6
ECH35

2ND. I.F.T.

L22

C38 C39 L23

1ST. I.F.T.

L9

C18 C19 L10

T2

V4
EL33

V5
AZ31

V3
EBC33

V2
EF39

BLK RED

RED - T2 PRI.

BLK - MAINS

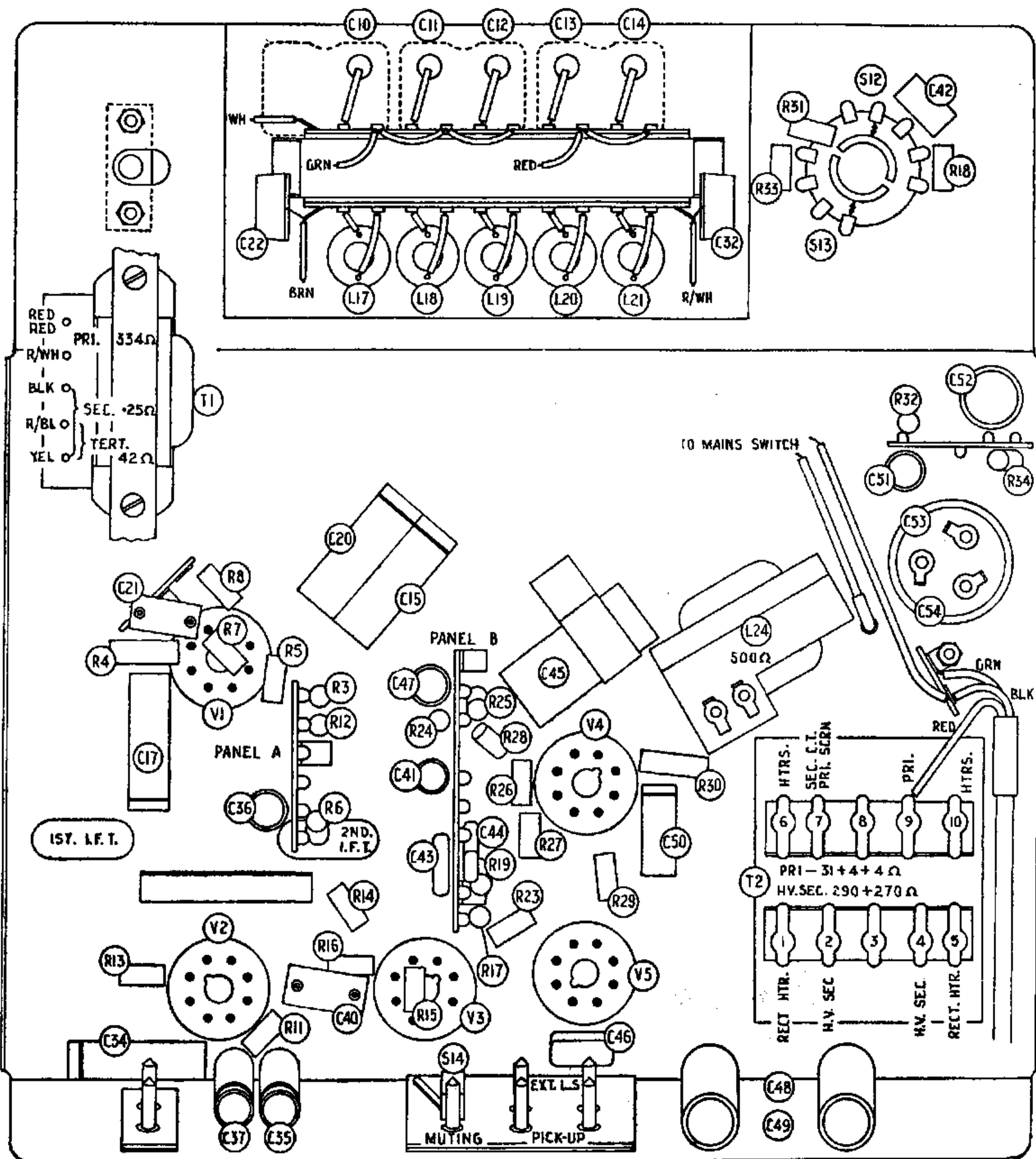
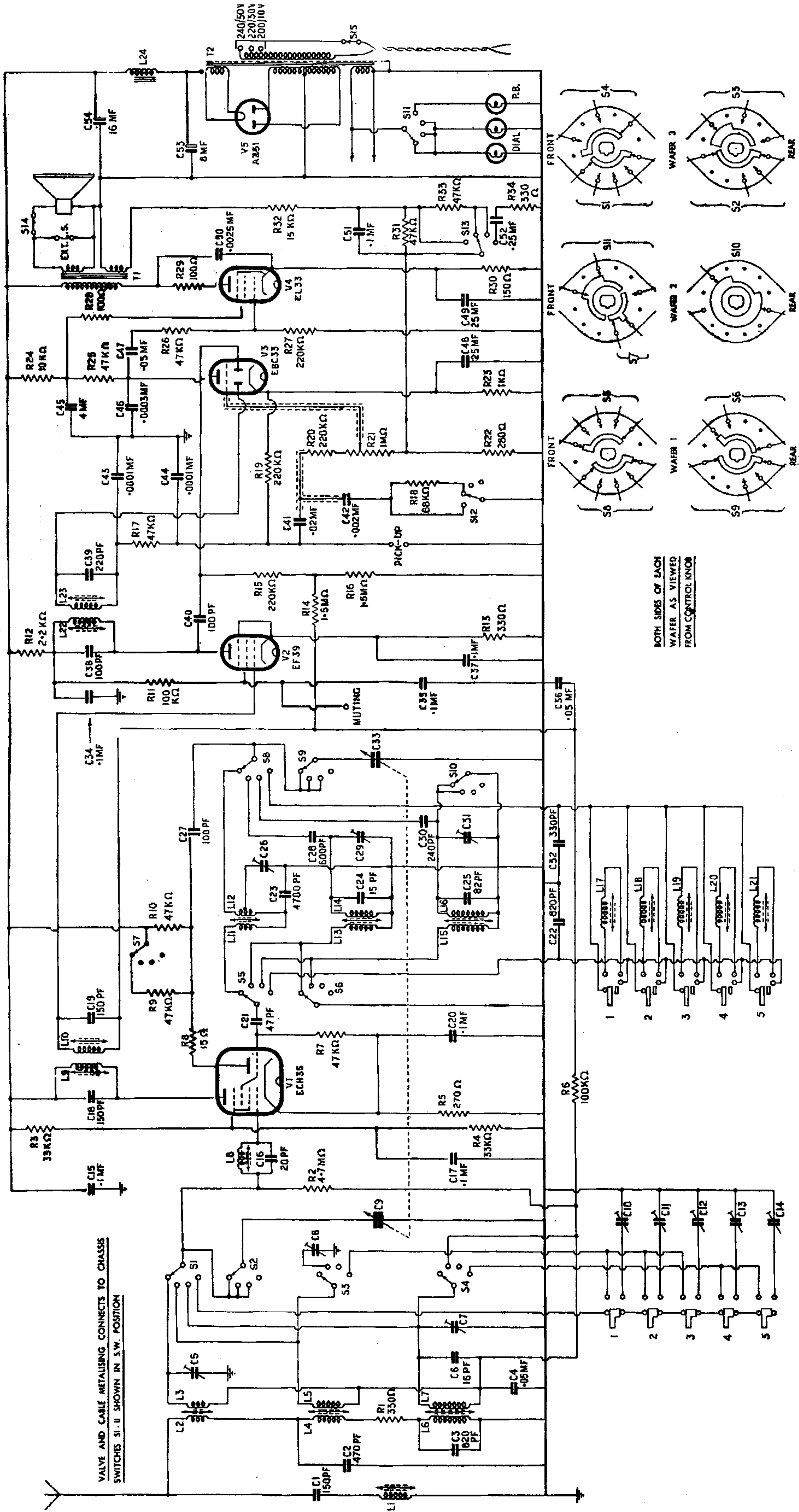


TABLE MODEL A23 & CONSOLE MODEL C36

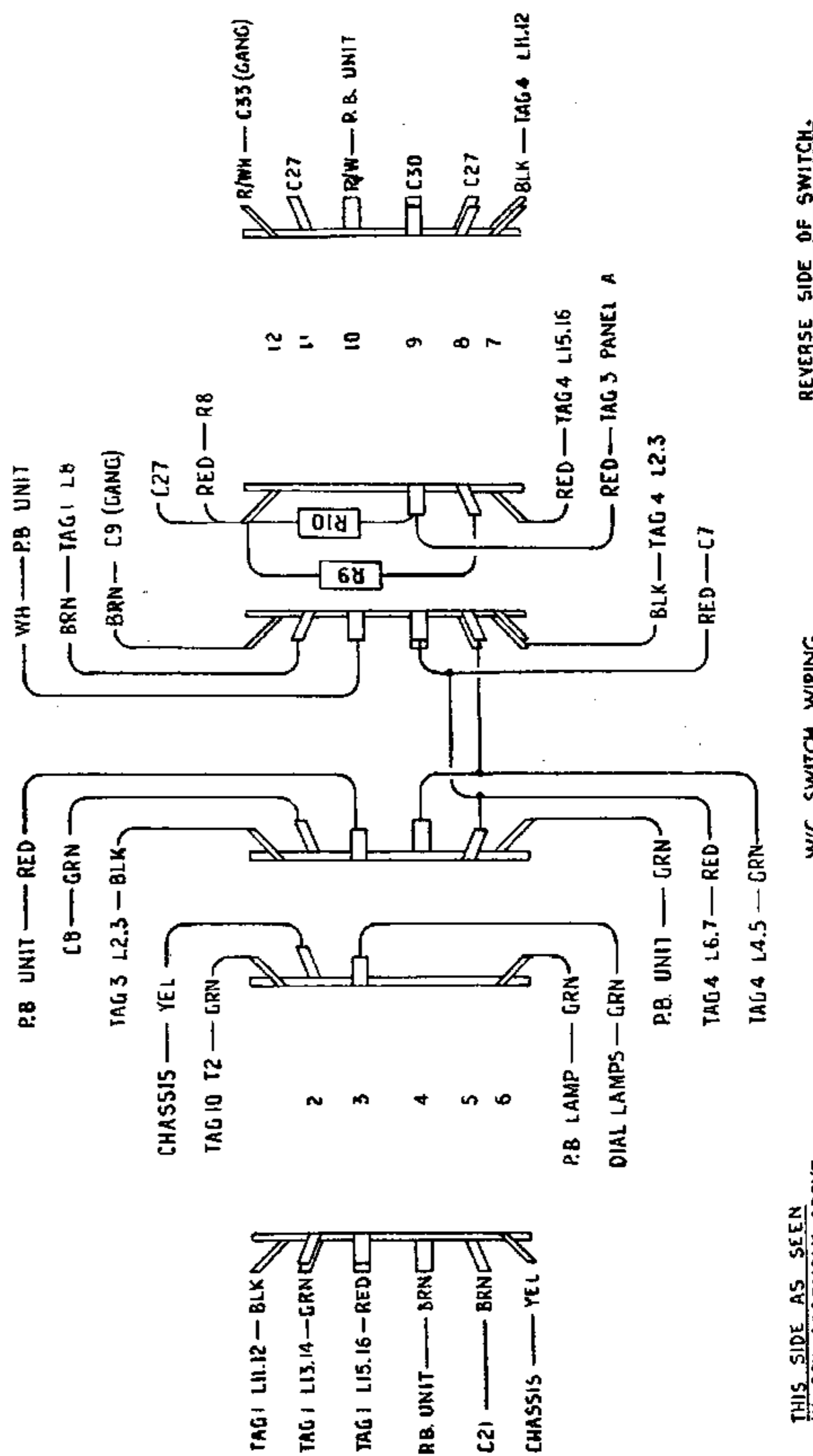
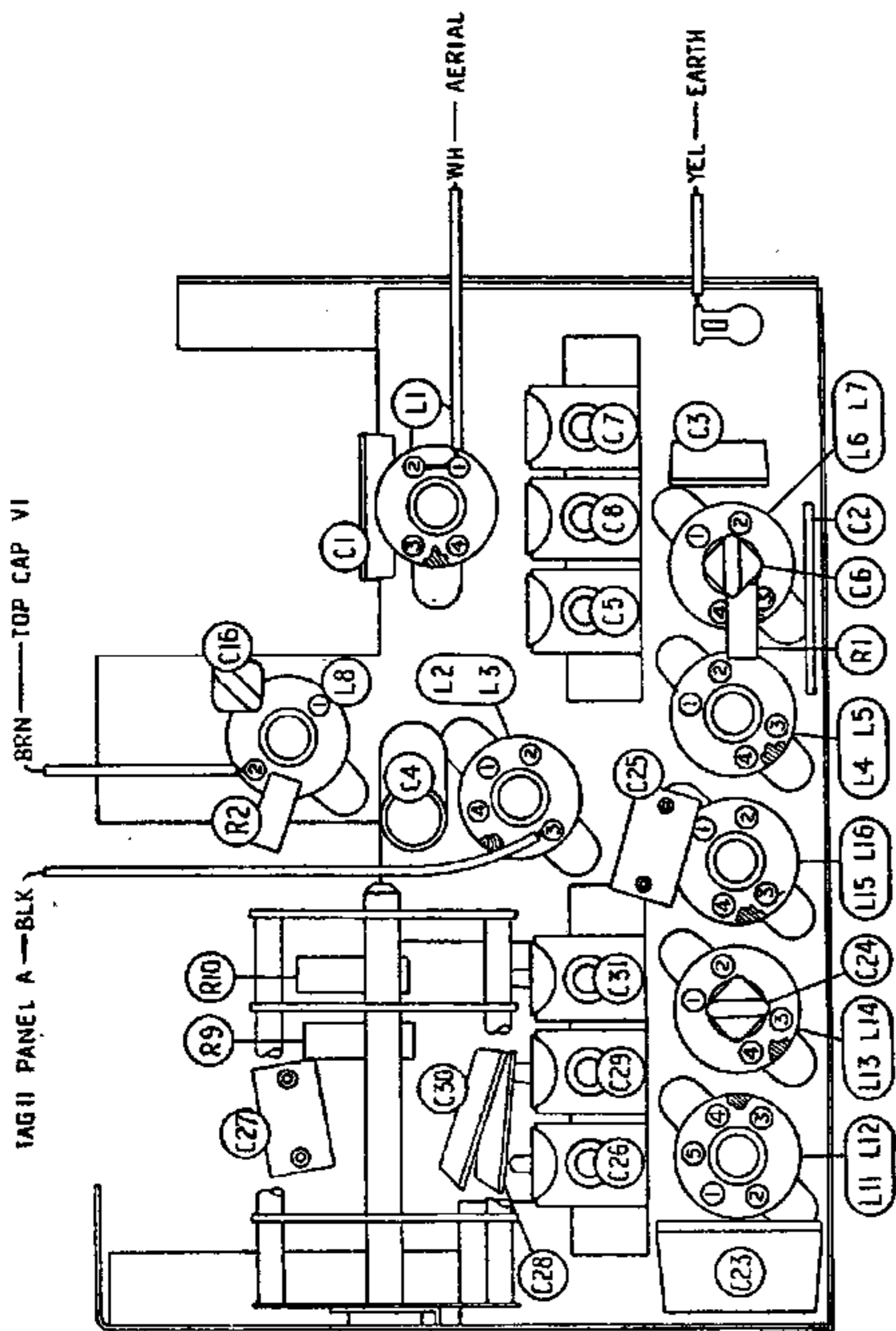


CIRCUIT DIAGRAM

NOTE: C45, 4MFD is now shunted by a 68,000 ohms resistor. E & I of V3 & V4 will be slightly lower than given values. In Model C36, gang connections reversed. C1, L1 reversed. R22 is now 680 ohms.

CORE & TRIMMER ADJUSTMENTS ARE MADE FROM THE REVERSE SIDE.

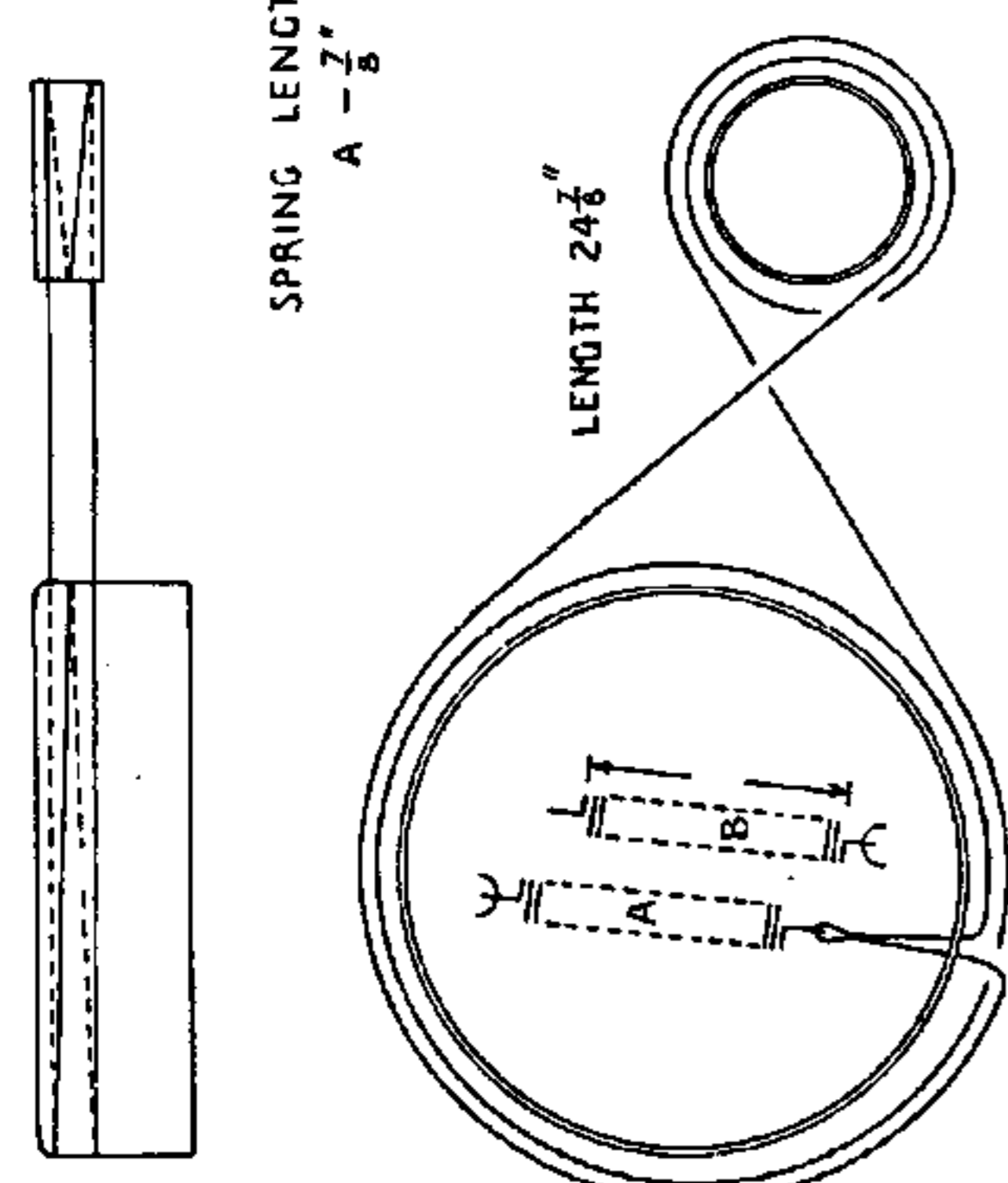
COIL & SWITCH UNIT SA1497



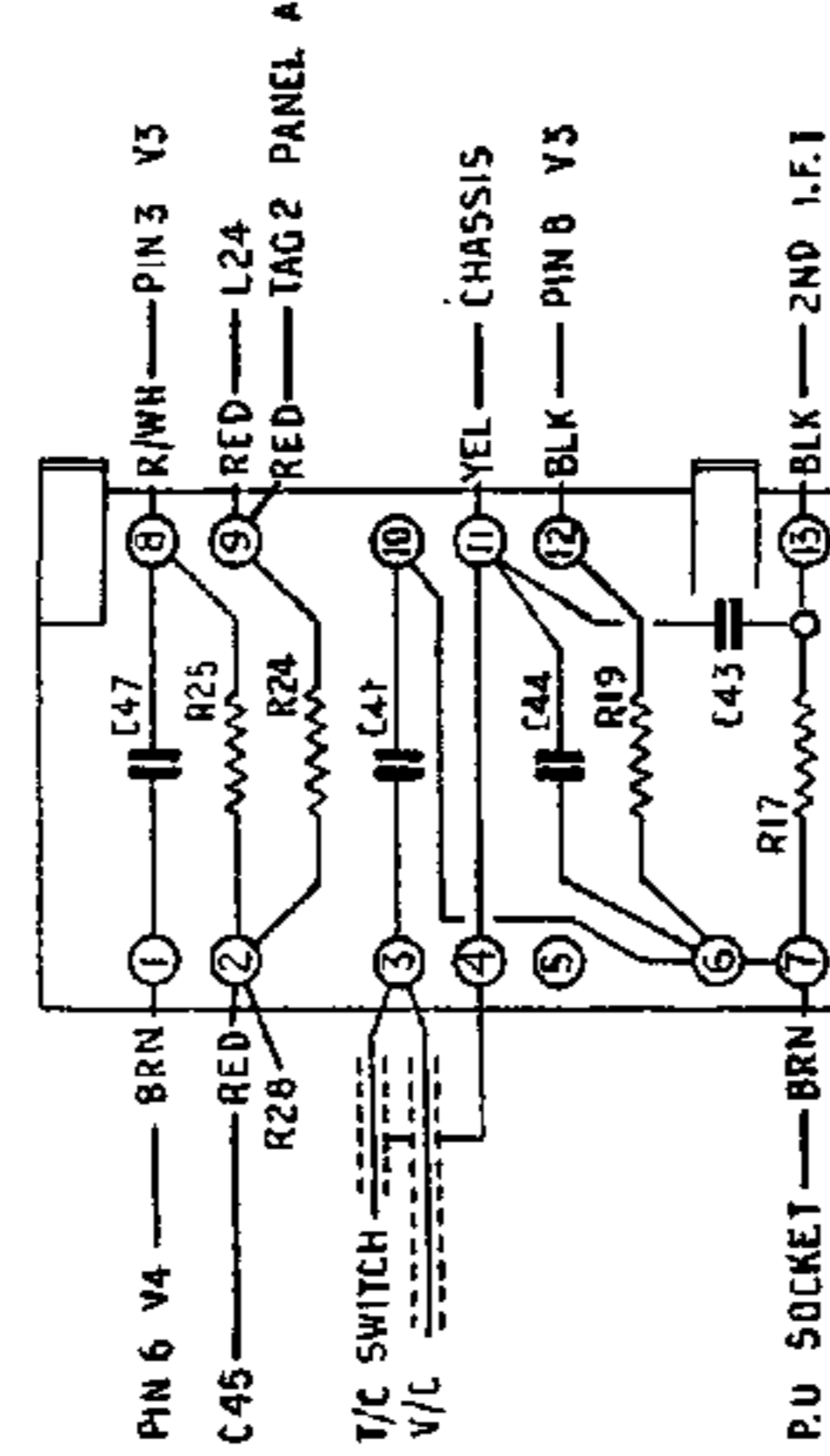
THIS SIDE AS SEEN IN COIL ASSEMBLY ABOVE.

REVERSE SIDE OF SWITCH

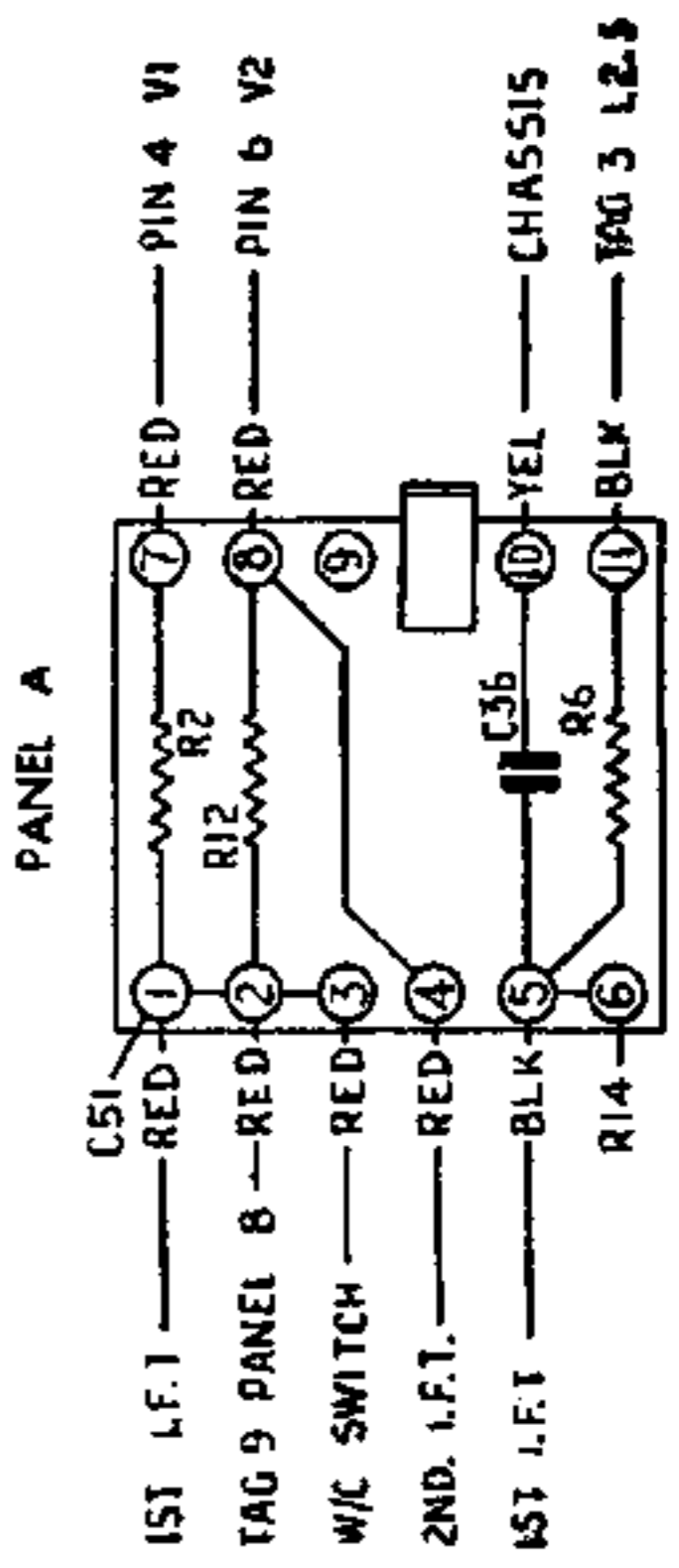
W/C SWITCH WIRING



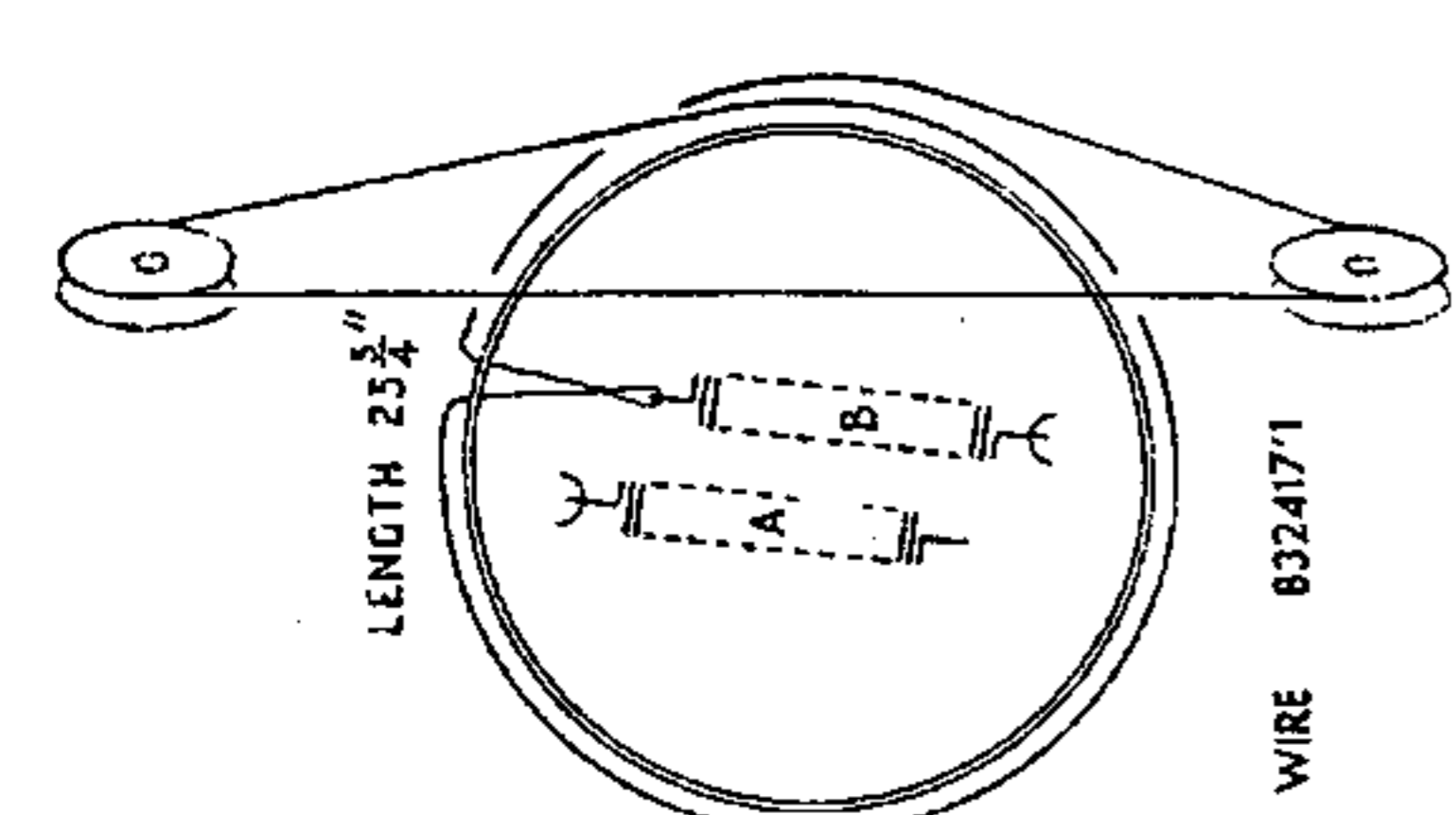
DRIVE WIRE 832417/2



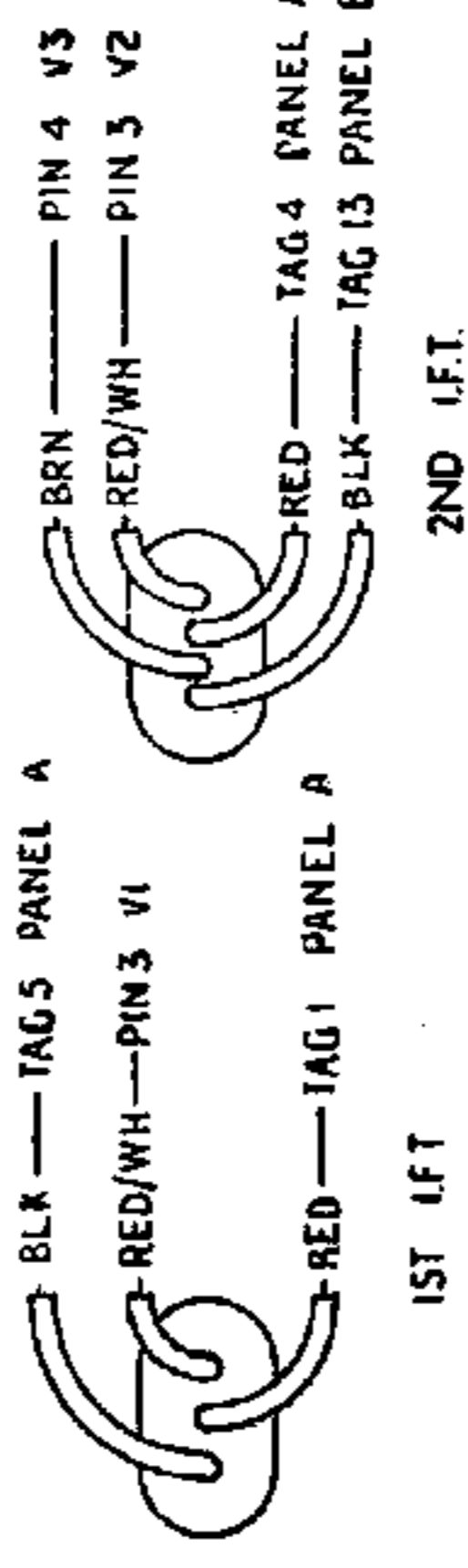
PANEL B



PANEL A



POINTER WIRE 832417/1



1ST L.F.T.

2ND L.F.T.

D.C. RESISTANCE OF TUNED COILS (Average)

L No.	TEST POINTS	OHMS	L. No.	TEST POINTS	OHMS
1	TAGS 3 & 4	7.9	13	TAGS 1 & 2	1.0
2	1 & 2	.14	14	3 & 4	2.4
3	3 & 4	.04	15	TAGS 1 & 2	4.4
4	1 & 2	9.6	16	3 & 4	2.5
5	3 & 4	4.5	17	COIL ENDS	1.7
6	1 & 2	31.0	18	-	3.3
7	3 & 4	23.0	19	-	3.8
8	1 & 2	.03	20	-	3.6
9	RED & R/W LEADS	8.1	21	RED & R/W LEADS	3.6
10	BRN & BLK	8.1	22	BRN & BLK	14.0
11	TAGS 1 & 2	.18	23	-	6.5
12	3 & 4	.05			

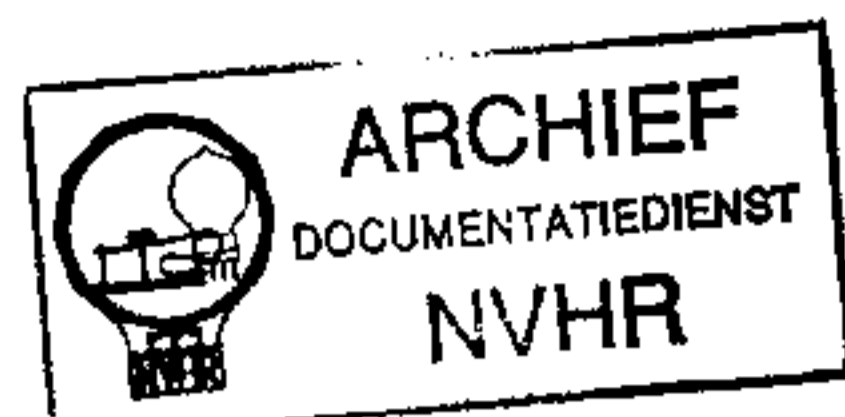
VOLTAGE & CURRENT DATA (Average)

V	PIN	VOILTS & MA	V	PIN	VOILTS & MA
3	3	260 3.0	3	8	115 2.3
4	4	90 1.3	3	8	2.3 2.3
6	6	100 3.4	3	6	258 33
8	8	2 7.7	4	6	220 3.5
3	3	245 5.8	8	8	5.4 36.5
6	6	100 1.5	5	7	300 57
8	8	2.4 7.3	4	6	300 AC

COMPONENT DETAILS

Later models—C1 & L1 reversed. Wiring modified accordingly.

Ned. Ver. v. Historie v/d Radio



EKCO A23

Covering also C36 CONSOLE & RC35

CIRCUIT DESCRIPTION

Aerial input is via coupling coils L2 (S.W.), L3 (M.W.) and L4 (L.W.) to single-tuned circuits L5 (S.W.), L6 (M.W.) and L7 (L.W.), tuned manually by C45.

Provision is made for reception of the television sound channel (T.S.), which is tuned by L8, C6 in the aerial circuit and coupled via L2, L5 to the aerial. A second harmonic is used in the oscillator circuit, the receiver being tuned to 14.62 m.

For automatic tuning, C45 is replaced by pre-set trimmer type capacitors C52, C53, C54 (M.W.) and C50, C51 (L.W.). Selection is achieved by press-button switches S1a, b to S5a, b, x. These switches are coded with suffix letters to indicate their functions, and are arranged in groups. Two groups are controlled by each press-button, one belonging to the aerial circuit and one to the oscillator.

All the switches in the two groups belonging to a given press-button bear the same number, the individual switches in each group being identified by the suffix letter. If the suffix is a, b, c or d, the switch closes when its button is

pressed; if the suffix is x, the switch opens.

First valve (V1, Mullard metallized ECH35) is a triode-hexode operating as frequency changer with internal coupling. For manual operation, triode oscillator anode coils L12 (S.W.), L13 (M.W.) and L14 (L.W.) are tuned by C49. Parallel trimming by C46 (S.W.), C14, C47 (M.W.) and C15, C48 (L.W.); series tracking by C13 (S.W.), C18 (M.W.) and C19 (L.W.).

For automatic tuning, all the foregoing circuits are disconnected and replaced, via S20 and S26, by one of the iron-dust cored pre-set coils L21 to L25, which are tuned by fixed capacitors C16, C17 in series, selection being determined by switches S1c, d to S5c, d as explained previously.

The change-over from manual to automatic tuning is performed at a fourth position on the waveband control, when S11, S15 and S18 in the aerial circuit, and S20, S26 in the oscillator circuit, close, and all other waveband switches open.

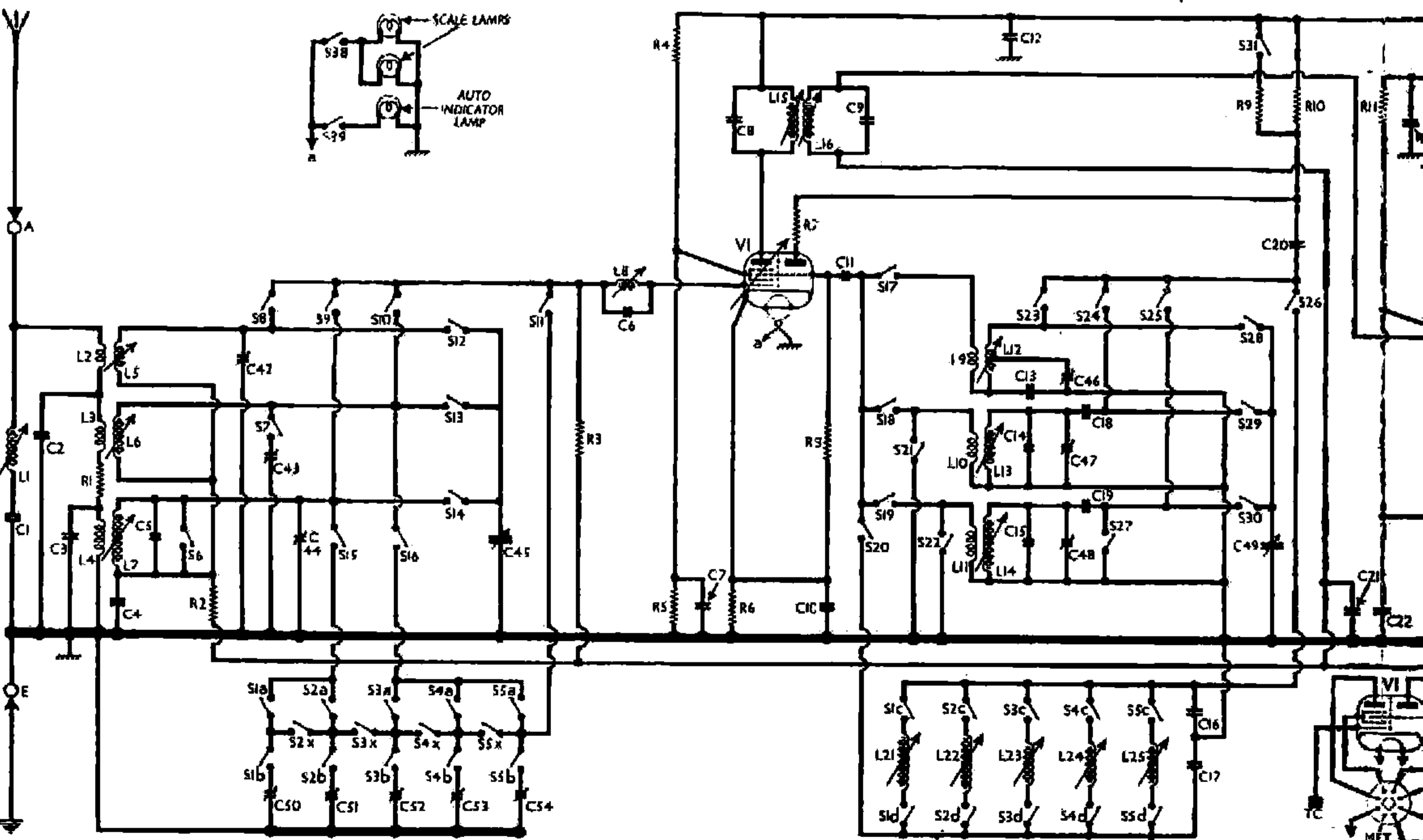
Second valve (V2, Mullard metallized EF39) is a variable- μ R.F. pentode operating as I.F. amplifier.

Intermediate frequency 480 kc/s.

FIVE pre-tuned station press buttons are provided in the Ekco A23, a 4 valve (plus rectifier) 3-band superhet designed for A.C. mains of 200-250 V, 40-80 c/s. The R.W. range is 15-50 m, and a channel for the television sound (T.S.) programme is included.

An identical chassis is fitted in the C36 console, and a slightly modified version is used in the RC35 radiogram.

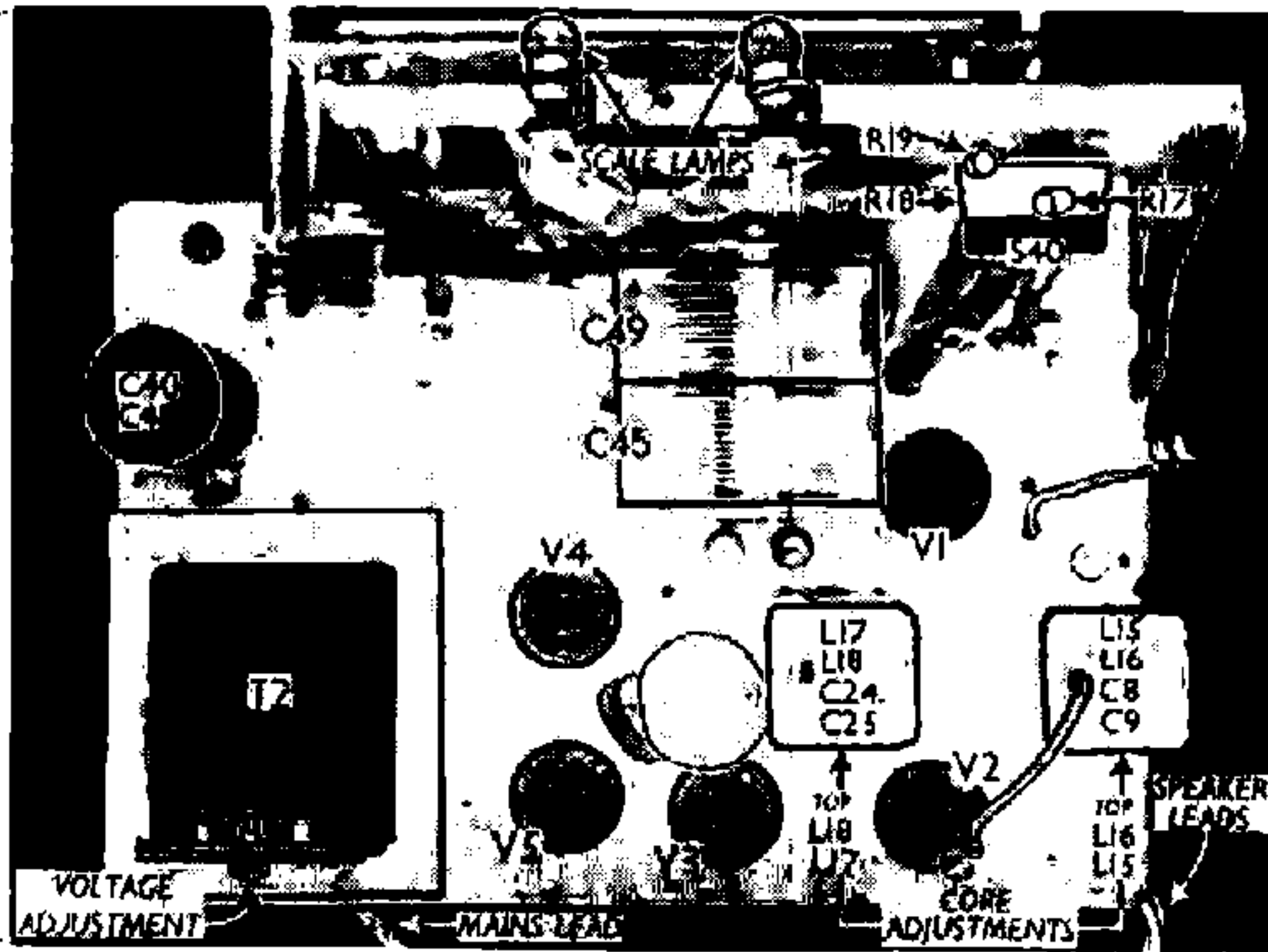
Release dates and original prices - 123, August, 1946, £21, plus £4 10s 4d purchase tax; C36, January, 1947, £31 10s, plus £6 15s 6d p.t.; RC35, January, 1947, £52 10s, plus £11 5s 9d p.t.



Circuit diagram of the Ekco A23 press-button A.C. superhet. The muting socket, by the P.U. sockets, is connected to chassis if desired to

COMPONENTS AND VALUES

Plan view of the chassis. The tuning gang sections C49 and C45 are transposed in the C36 console, and may be so in some table models and the radio-gram RG35.



Diode second detector is part of double diode triode valve (V3, Mullard metallized EBC33). Audio-frequency component in rectified output is developed across load resistor R15 and passed via A.F. coupling capacitor C31 and manual volume control R18 to C.G. of triode section. Provision for connection of a gramophone pick-up across R18.

Second diode of V3, fed from V2 anode via C30, provides D.C. potential which is developed across load resistors R23, R24, giving automatic volume control.

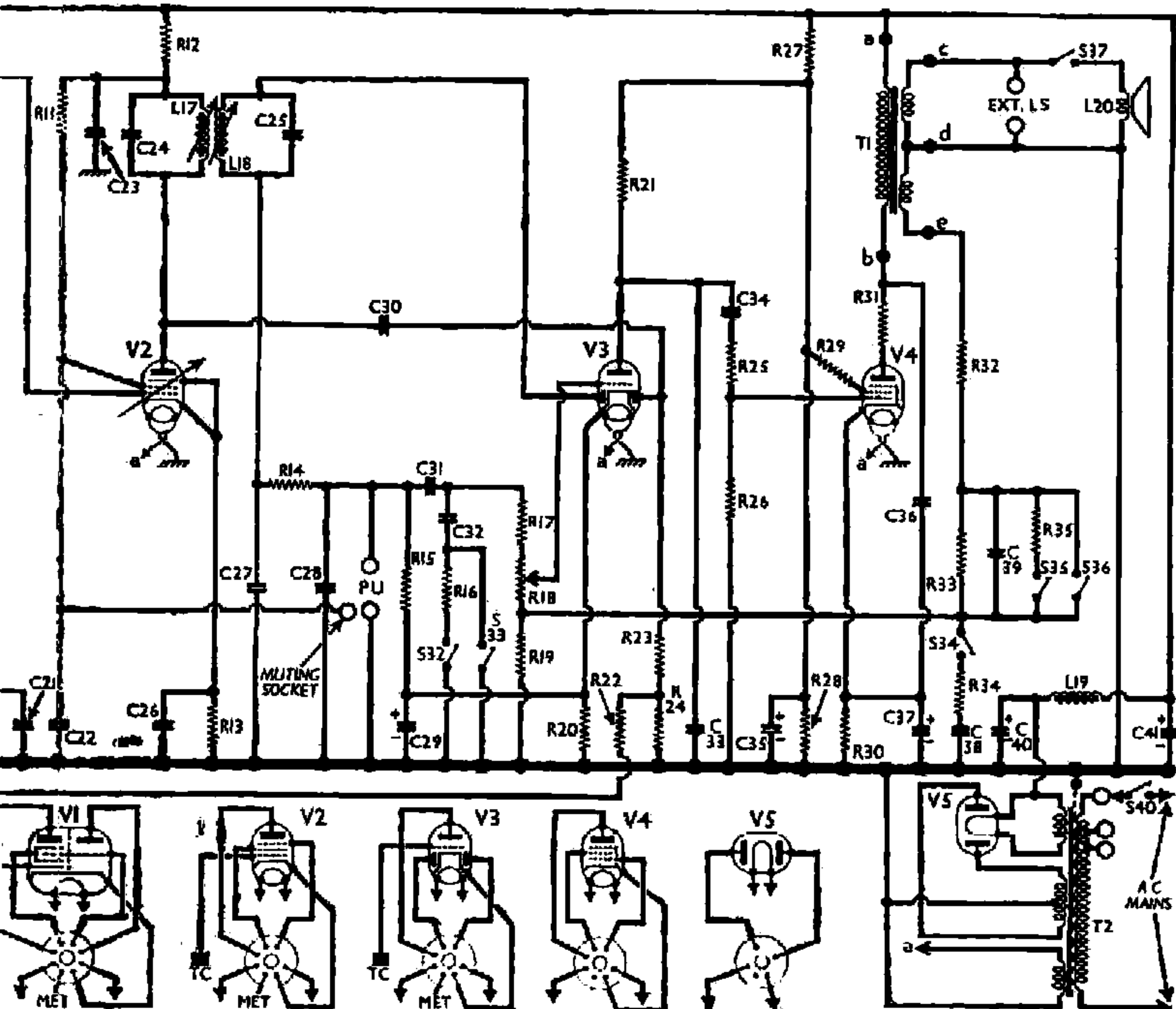
Resistance-capacitance coupling by R21, C34 and R26, via I.F. stopper R25, be-

tween V3 triode and pentode output valve (V4, Mullard EL33). Fixed tone correction in pentode anode circuit by C36, and provision for connection of low impedance external speaker across the speech coil secondary of T1. A further winding on this transformer provides output voltages which are stepped down by the potential divider network R32, R33 and R19, and those appearing across R19 are fed back in negative phase to V3 triode grid circuit.

Four-position tone control by C32, R16 in V3 triode grid circuit, R35, C39 and R34, C38 in the negative feed-back circuit, and switches S32-S36.

RESISTORS		Values (ohms)
R1	Aerial damping	330
R2	V1 hex. C.G. decoupling	100,000
R3	V1 hex. C.G. resistor	4,700,000
R4	V1 S.G. H.T. potential divider	33,000
R5	V1 S.G. H.T. potential divider	33,000
R6	V1 fixed G.B. resistor	270
R7	V1 osc. anode stabiliser	15
R8	V1 osc. C.G. resistor	47,000
R9	V1 osc. anode H.T. feed resistors	47,000
R10	V1 osc. anode H.T. feed resistors	47,000
R11	V2 S.G. H.T. feed	100,000
R12	V2 H.T. decoupling	2,200
R13	V2 fixed G.B. resistor	330
R14	I.F. stopper	47,000
R15	V3 signal diode load	220,000
R16	Tone control resistor	68,000
R17	I.F. stopper	220,000
R18	Manual volume control	1,000,000
R19	Feedback coupling resistor	680
R20	V3 fixed G.B. resistor	1,000
R21	V3 triode anode load	47,000
R22	A.V.C. line decoupling	1,500,000
R23	V3 A.V.C. diode load resistors	220,000
R24	V3 A.V.C. diode load resistors	1,500,000
R25	I.F. stopper	47,000
R26	V4 C.G. resistor	220,000
R27	H.T. feed potential divider	10,000
R28	H.T. feed potential divider	68,000
R29	V4 S.G. stopper	100
R30	V4 G.B. resistor	150
R31	V4 anode stopper	100
R32	Part feed-back potential divider	15,000
R33	Part feed-back potential divider	47,000
R34	Tone control resistors	330
R35	Tone control resistors	47,000

CAPACITORS		Values (µF)
C1	Aerial I.F. filter tuning	0.00015
C2	Aerial M.W. shunt	0.00047
C3	Aerial L.W. shunt	0.00082
C4	V1 hex. C.G. decoupling	0.01
C5	Aerial L.W. fixed trimmer	0.00016
C6	T.S. channel tuning capacitor	0.00002
C7	V1 S.G. decoupling	0.1
C8	1st I.F. transformer fixed tuning capacitors	0.00015
C9	V1 cathode by-pass	0.1
C10	V1 osc. C.G. capacitor	0.000047
C11	H.T. circuit H.F. by-pass	0.1
C12	Osc. circ. S.W. tracker	0.0047
C13	Osc. M.W. fixed trimmer	0.00015
C14	Osc. L.W. fixed trimmer	0.00082
C15	Osc. circuit auto-tuning capacitors	0.00033
C16	Osc. circuit auto-tuning capacitors	0.00082
C17	Osc. circ. M.W. tracker	0.0006
C18	Osc. circ. L.W. tracker	0.00024
C19	V1 osc. anode coupling	0.0001
C20	V2 C.G. decoupling	0.05
C21	V2 S.G. decoupling	0.1
C22	V2 H.T. feed decoupling	0.1
C23	2nd I.F. transformer fixed tuning capacitors	0.0001
C24	2nd I.F. transformer fixed tuning capacitors	0.00022
C25	V2 cathode by-pass	0.1
C26	V2 cathode by-pass	0.0001
C27	I.F. by-pass capacitors	0.0001
C28	I.F. by-pass capacitors	0.0001
C29	V3 cathode by-pass	25.0
C30	V3 A.V.C. diode coupling	0.0001
C31	A.F. coupling to V3 C.G.	0.02
C32	Tone control capacitor	0.002
C33	I.F. by-pass capacitor	0.0002
C34	A.F. coupling to V4 C.G.	0.05
C35	H.T. feed decoupling	4.0
C36	Fixed tone corrector	0.0025
C37	V4 cathode by-pass	25.0
C38	Tone control capacitors	0.25
C39	Tone control capacitors	0.1
C40	Tone control capacitors	8.0
C41	H.T. smoothing capacitors	16.0
C42	Aerial S.W. trimmer	—
C43	Aerial M.W. trimmer	—
C44	Aerial L.W. trimmer	—
C45	Aerial circuit tuning	—
C46	Osc. circ. S.W. trimmer	—
C47	Osc. circ. M.W. trimmer	—
C48	Osc. circ. L.W. trimmer	—
C49	Oscillator circuit tuning	—
C50	Aerial circuit press-button tuning trimmers	0.00055
C51	Aerial circuit press-button tuning trimmers	0.00027
C52	Aerial circuit press-button tuning trimmers	—
C53	Aerial circuit press-button tuning trimmers	—
C54	Aerial circuit press-button tuning trimmers	0.00013



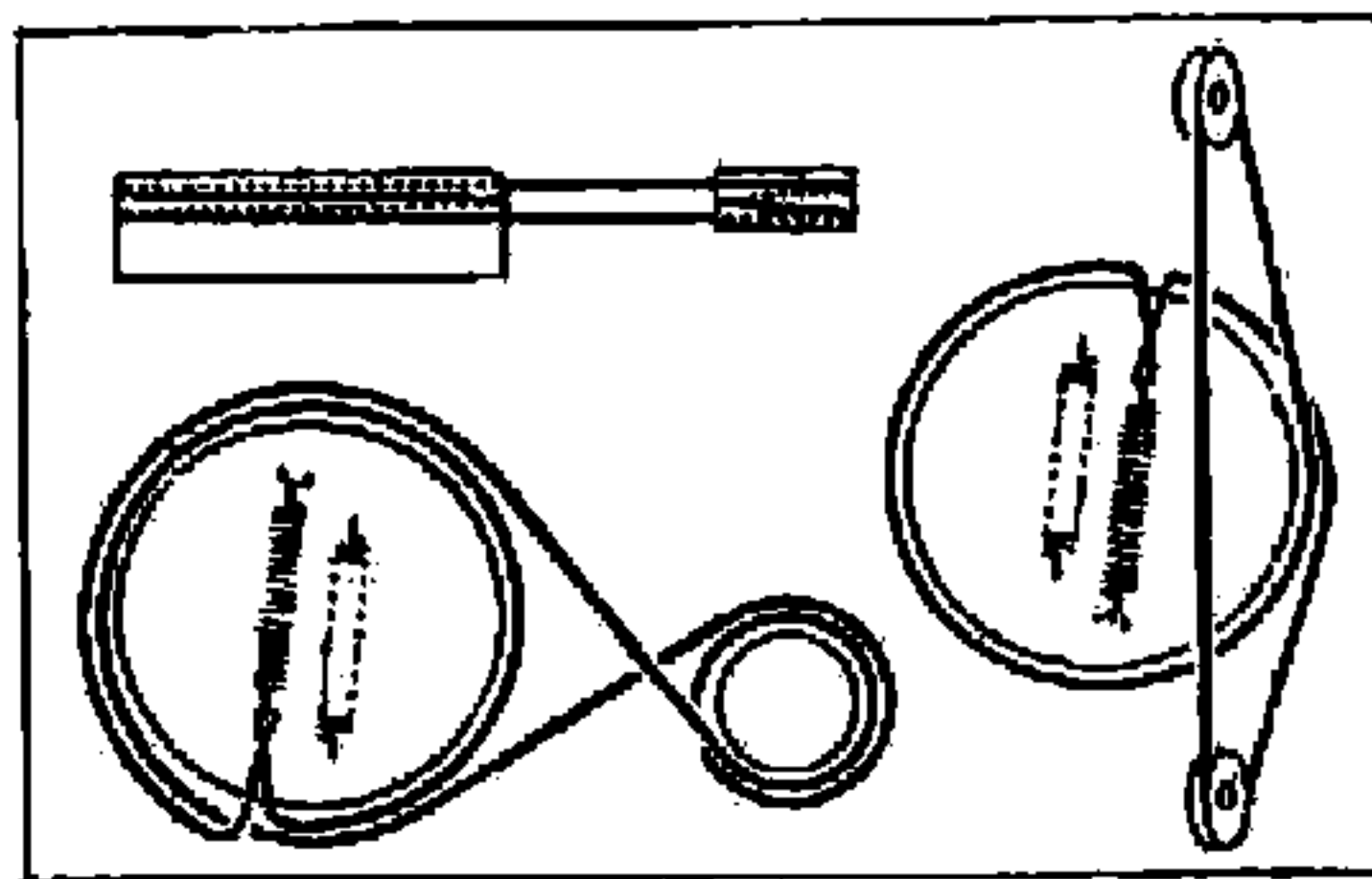
desired to mute radio. The connections to the output transformer T1 are coded a, b, c, d, e.

* Electrolytic. † Variable. ‡ Pre-set.

OTHER COMPONENTS

Approx. Values (ohms)

L1	Aerial I.F. filter coil	7.0
L2	Aerial S.W. coupling coil	0.14
L3	Aerial M.W. coupling coil	0.6
L4	Aerial L.W. coupling coil	31.0
L5	Aerial S.W. tuning coil	0.04
L6	Aerial M.W. tuning coil	4.5
L7	Aerial L.W. tuning coil	23.0
L8	T.S. channel coil	0.03
L9	Osc. S.W. reaction coil	0.18
L10	Osc. M.W. reaction coil	1.0
L11	Osc. L.W. reaction coil	4.4
L12	Osc. S.W. tuning coil	0.05
L13	Osc. M.W. tuning coil	2.4
L14	Osc. L.W. tuning coil	4.5
L15	1st I.F. trans.	Pri. ... 5.1
L16		Sec. ... 5.1
L17	2nd I.F. trans.	Pri. ... 14.0
L18		Sec. ... 6.5
L19	H.T. smoothing choke	550.0
L20	Speaker speech coil	2.6
L21	Oscillator circuit press-button tuning coils	3.6
L22		3.6
L23		3.8
L24		3.3
L25		1.7
T1	Output trans.	350.0
T2	Mains trans.	Pri. ... 0.1
		Spkr. sec. ... 40.0
		P.B. sec. ... 11.0
T2	Mains trans.	Heater sec. ... 0.4
		Rect. heat. sec. ... 0.15
		H.T. sec., total ... 500.0
S1a, b, c, d	Aerial circuit press-button switches	
S1c, d	Oscillator circuit press-button switches	
S5 a, b, c, d	Waveband switches	
S32-S36	Tone control switches	
S37	Int. speaker switch	
S38, S39	Scale lamp switches	
S40	Mains switch, ganged R1x	



Diagrams of the two wire drive systems, as seen from the front. Left, gang drive (with plan view above it); right, pointer drive.

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 218 V, using the 220-230 V tapping on the mains transformer. Voltages were measured on the 400 V scale of a model 7 Universal Avometer, chassis being the negative connection.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 6CH85	250	2.3	87	3.2
V2 6EF30	Oscillator	0.5	72	1.4
	107			
V3 6RC33	100	1.9	-	-
V4 6L6S	240	2.0	173	2.6
V5 AZ31	275	-	-	-

* Each above, A.C.

DISMANTLING THE SET

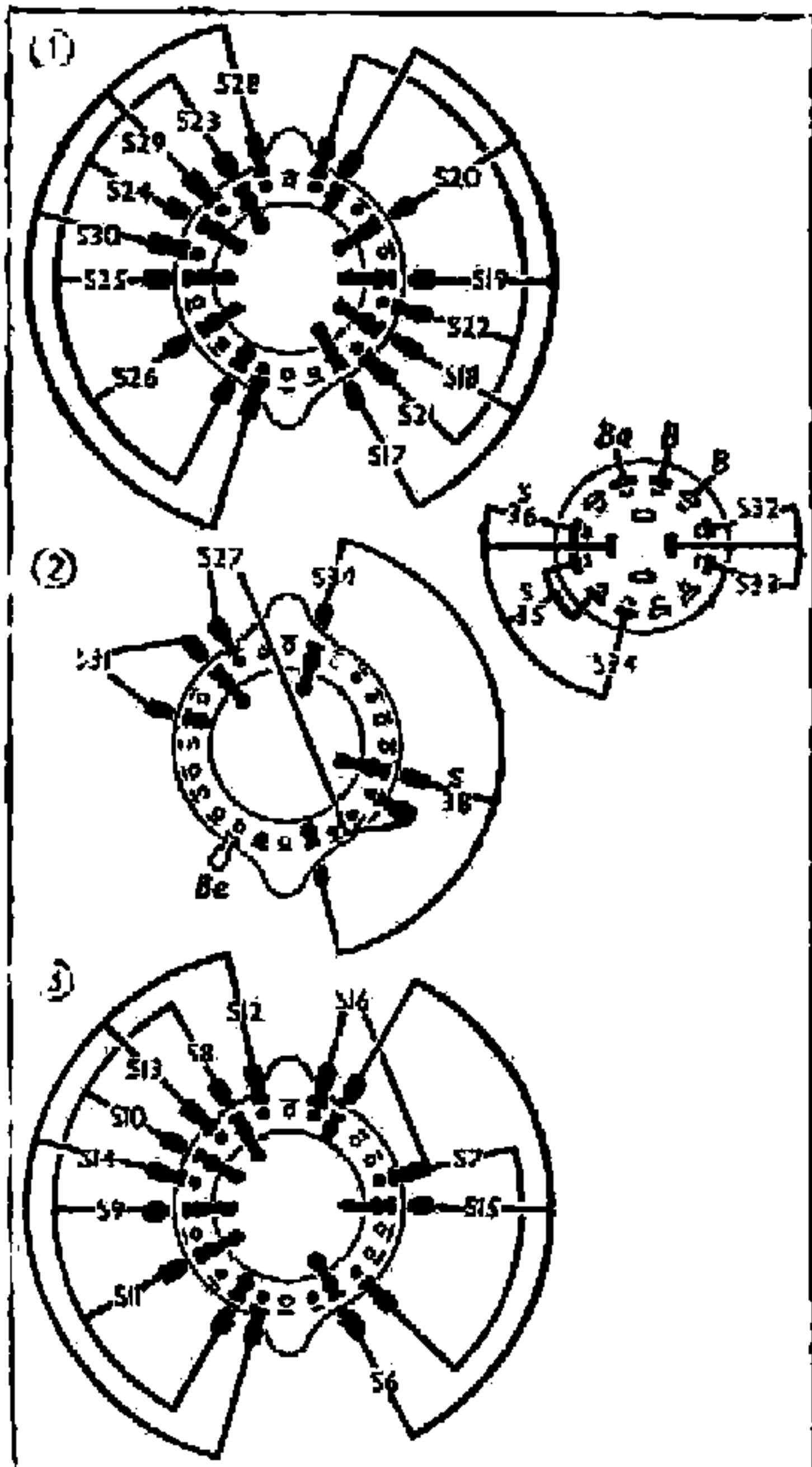
Removing Chassis.—Remove the four control knobs (recessed grub screws); remove the four 2DA cheese-head fixing bolts securing the chassis to the cabinet bottom; the chassis may now be withdrawn to the extent of the speaker leads.

Removing Speaker.—Loosen the four nuts on the speaker-retaining clamps; support the speaker with one hand, and swivel the clamps out of the way with the other. When replacing, the connecting panel should be at the bottom.

GENERAL NOTES

Switches.—S1a, b, c, d to S5a, b, c, d and X are the automatic tuning switches, operated by the five press-buttons. They are on the two sides of the press-button switch unit, which is indicated in our

Switch	S.W.	M.W.	L.W.	Auto.
S6	—	C	—	—
S7	—	C	—	—
S8	o	—	—	—
S9	—	—	C	—
S10	—	o	—	—
S11	—	—	—	C
S12	o	—	—	—
S13	—	C	—	—
S14	—	—	o	—
S15	—	—	—	C
S16	—	—	—	C
S17	o	—	—	—
S18	—	C	—	—
S19	—	—	o	—
S20	—	—	—	C
S21	o	—	—	—
S22	—	C	—	—
S23	o	—	—	—
S24	—	C	—	—
S25	—	—	o	—
S26	—	—	—	o
S27	oo	—	—	—
S28	—	C	—	—
S29	—	—	o	—
S30	—	—	—	—
S31	C	—	—	—



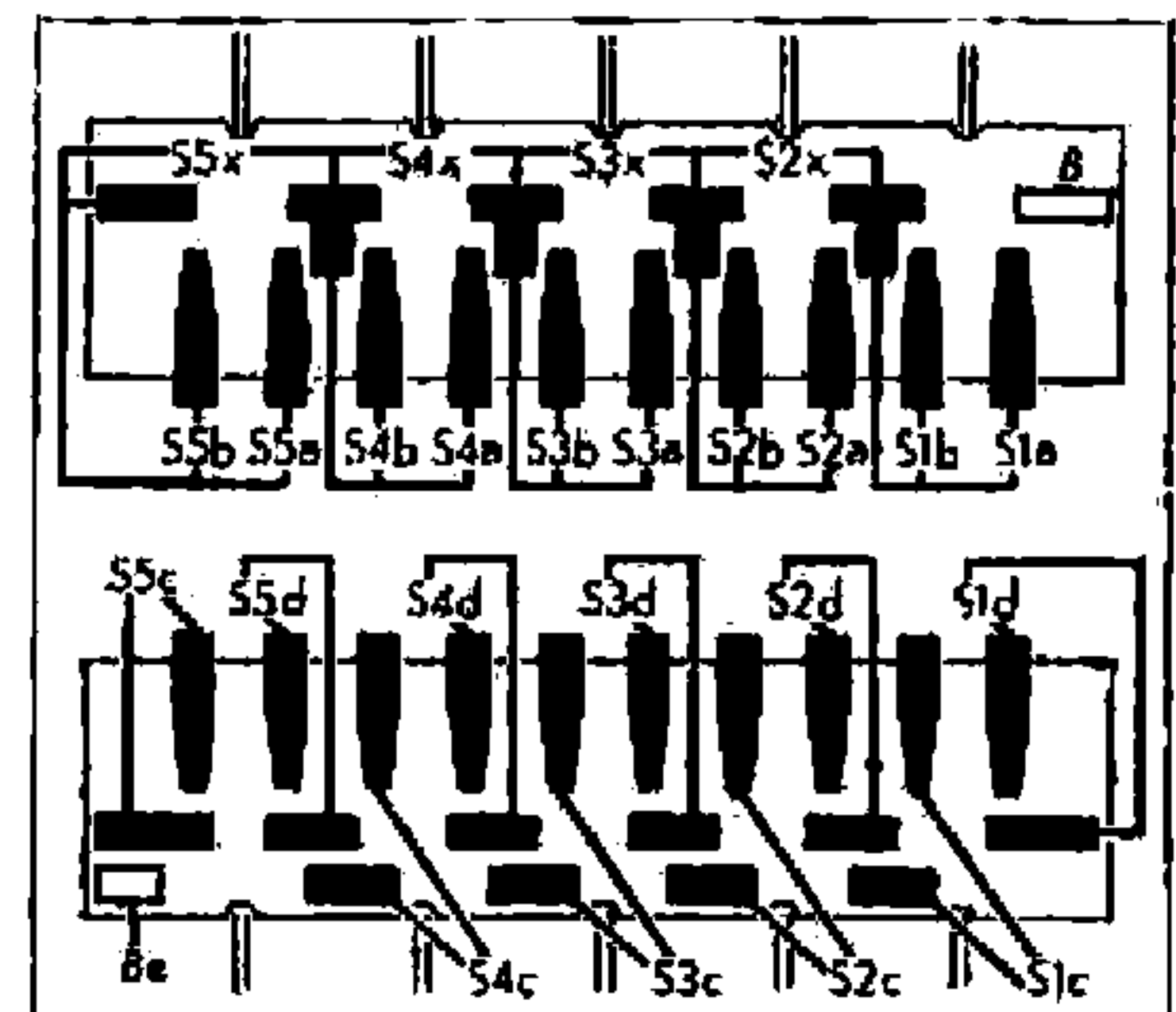
Diagrams of the three waveband (left) and the tone control (right) switch units, as seen from the rear of an inverted chassis. The associated table is on the right (next col.).

under-chassis view and shown in detail in the diagrams below, where the upper diagram shows the side seen in our photograph, and the lower one the other side as it is seen when the unit is freed and turned over on its connecting leads.

The unit is freed by removing the three nuts and bolts (with spacing collars) holding it to the front chassis member, but the outer L.W. press-button knob must be removed (by heating plunger stem with a soldering iron) before the unit can be extracted. The action of the switches is explained under "Circuit Description."

S6-S31 are the waveband and manual/auto change-over switches, and S32, S33 the scale lamp switches, ganged in three rotary units beneath the chassis. These are indicated in our under-chassis view and the separate illustration of the coil assembly, and they are shown in detail in the diagrams in col. 1, where they are drawn as seen from the rear of an inverted chassis. The table (col. 2) gives the switch positions for the four control settings, starting from the fully anti-clockwise position of the control knob. A dash indicates open, and C, closed.

S32-S36 are the tone control switches, ganged in a single rotary four-position



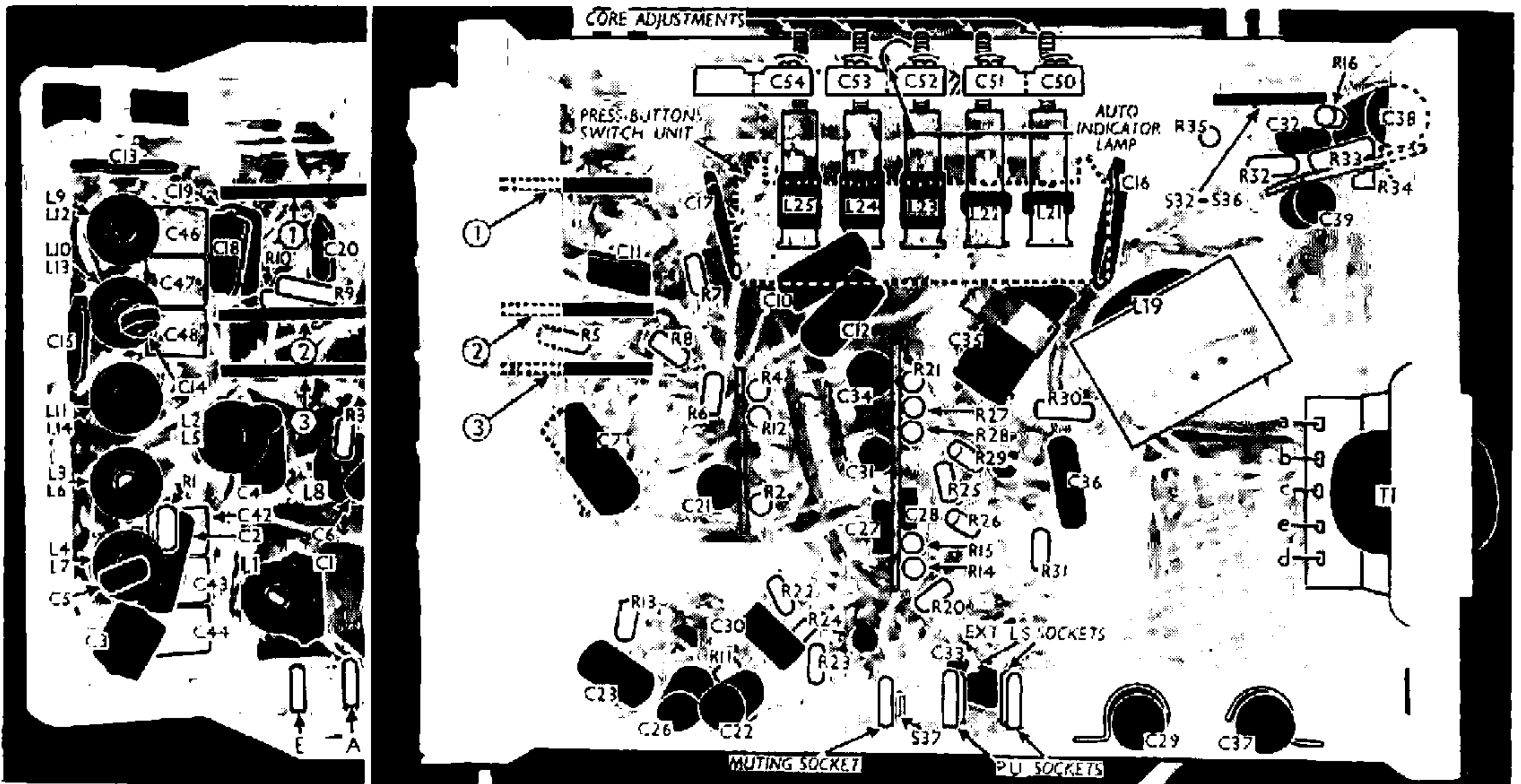
Diagrams showing both sides of the press-button switch unit. Above, as seen in one under-chassis view; below, as seen when the unit is unbolted and turned over on its leads.

unit beneath the chassis, indicated in our under-chassis view and shown in detail in the diagram inset with the waveband switch units in col. 1. This unit also is viewed from the rear of an inverted chassis. In position 1 (fully anti-clockwise, deep tone) S33 and S36 close; in position 2, S32 and S35 close; in position 3, S35 closes; and in position 4, S34 closes. Otherwise they are open.

Coils.—All the R.F. and oscillator tuning coils (L1-L14) for manual tuning are in eight small iron-cored units in a vertical assembly forming one end of the under-chassis compartment, with their trimming capacitors and other associated components.

This assembly is shown in a separate photograph beside our under-chassis illustration, where it takes up approximately the position that it would adopt if it were hinged at the chassis deck and let down like a flap. The assembly can be removed if necessary, but coil replacements can be made without disturbing it.

The oscillator circuit coils L21-L26 for



Under-chassis view, with a separate view (left) of the coil assembly as seen when viewed from the direction of the output transformer Tx. Diagrams of the waveband, press-button and tone control switches (S32-S36) indicated here are shown in detail in cols. 1 and 3. The tags of Tx are lettered to agree with the circuit diagram overleaf.

automatic operation are mounted directly on the press-button switch unit assembly, together with the associated pre-set capacitors. Their adjustments are indicated in our under-chassis view.

Scale and Indicator Lamps.—These are three Osram lamps, with spherical bulbs and M.E.S. bases, rated at 6.5 V, 0.3 A. Two are used to illuminate the scale, or the third to illuminate the auto station indicator.

External Speaker.—Two sockets are provided at the rear of the chassis for a low impedance (about 3Ω) external speaker. A screw-type switch is provided with them to mute the internal speaker.

Radiogram Modifications.—In the RG85, the chassis of the A23 is used, but it is slightly modified. The press-button unit and volume control (with mains switch) are fitted to the front of the cabinet and connected to chassis by cables. A single-pole change-over switch fitted on the motor-board is connected on one side to the upper pick-up socket and on the other to C31; its centre goes to the top of R17.

Drive Wire Replacement

Two wire drives are used in this system: the gang drive, and the pointer drive. The sketches (col. 2) show the course taken by each drive. The length of the gang drive wire is quoted by the makers as 24½ in., and the length of its tension spring ½ in. when contracted; the length of the pointer drive wire is given as 29½ in., and its spring as ½ in. contracted. Replacement wires can be obtained from the makers, part numbers B32417/2 and B32417/1 respectively.

To obtain access to the rear of the drum, remove the light excluding plate (three set-screws), first withdrawing the scale lamps.

To obtain access to the front of the drum, remove the glass scale panel (four phosphor-bronze clamps with rubber liners held by four set-screws); turn the gang to maximum, and remove the four set-screws holding the black sprayed scale backing plate behind the glass, lowering it about an inch so that the scale cursor-bar pointers pass through holes provided for them at the tops of the vertical slots.

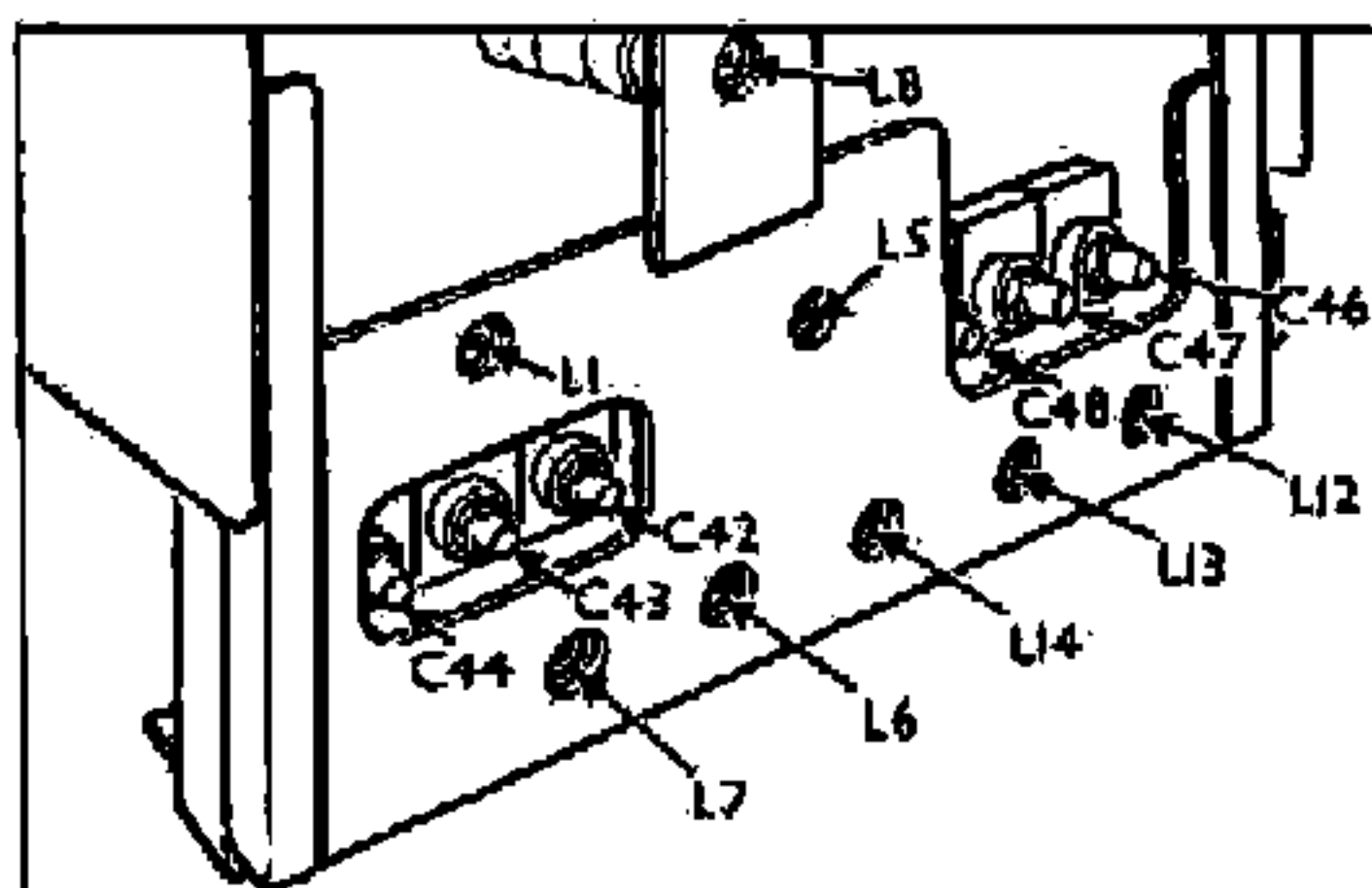
With the gang at maximum, the drum should take up the position shown in the sketches. When fitting the wire, care should be taken not to kink it. When replacing the scale glass, the pointers should coincide with the last calibration marks at the high-wavelength ends of the scales. See that the glass rests squarely on the felt base provided; see that the felt spacers are in position on the backing plate, and that the rubber liners are in position where the clamps grip the edges of the glass.

CIRCUIT ALIGNMENT

I.F. Stages.—Switch set to M.W., turn gang and volume control to maximum, connect signal generator via a 0.1µF capacitor to control grid (top cap) of V1 and chassis, feed in a 400 kc/s (632.1 m) signal, and adjust the cores of L18, L17, L16 and L15 in that order for maximum output.

I.F. Filter.—Transfer signal generator leads to A and E sockets, discarding the 0.1µF capacitor, feed in a 100 kc/s signal, and adjust the core of L1 for minimum output.

R.F. and Oscillator Stages.—With the gang at maximum, the pointers should coincide with top calibration marks at the high wavelength ends of the scales. They may be adjusted by slackening the wire clamp (two set-screws) on the rear of the cursor carrier, and sliding the carrier up or down the drive wire. Access is



Sketch giving the positions of the various trimmers, as seen from the rear of the speaker chamber.

permitted to the carrier if the metal light excluder plate is removed (three set-screws).

All trimmers involved in the following adjustments are grouped on the outer side of the coil assembly which forms one end of the chassis, facing the speaker chamber. These adjustments are identified in the sketch (col. 5), which shows this end of the chassis as seen while in the cabinet, from the rear, after removal of the guard strip.

S.W.—Switch set to S.W., tune to 20 m on scale, feed in a 20 m (15 Mc/s) signal, and adjust C46, then C42, for maximum output. If two positions are found for C46, use that involving the lesser trimmer capacitance. Tune to 50 m on scale, feed in a 60 m (6 Mc/s) signal, and adjust the cores of L12 and L5 for maximum output. Repeat these adjustments until no improvement can be obtained.

T.S.—Tune to 14.62 m on scale, feed in a 41.5 Mc/s (7.23m) signal, and adjust L3 for maximum output. A 75Ω dummy load should be shunted across the signal generator leads. If a suitable signal generator is not available, L3 may be adjusted on the transmitted television sound signal.

M.W.—Switch set to M.W., tune to 250 m on scale, feed in a 250 m (1,200 kc/s) signal, and adjust C47 and C43 for maximum output. Tune to 500 m on scale, feed in a 500 m (600 kc/s) signal, and adjust the cores of L18 and L5 for maximum output. Repeat these adjustments until no improvement can be obtained.

L.W.—Switch set to L.W., tune 1,000 m on scale, feed in a 1,000 m (500 kc/s) signal, and adjust C48 and C44 for maximum output. Tune to 1,800 m on scale, feed in an 1,800 m (166 kc/s) signal, and adjust the cores of L14 and L7 for maximum output. Repeat these adjustments until no improvement can be obtained.

Press-button Setting

Numbering the press-buttons from left to right as seen from the front, the range of each is as follows: 1, 200-308 m; 2, 283-448 m; 3, 342-560 m; 4, 1,160-1,580 m; 5, 1,430-1,956 m.

To set any button, remove the press-button esontheon (two set-screws) from front of cabinet, and switch set to auto. Press the appropriate button, and adjust the upper screw (oscillator coil core), then the lower (aerial) trimmer, preferably using the desired transmission as the signal.