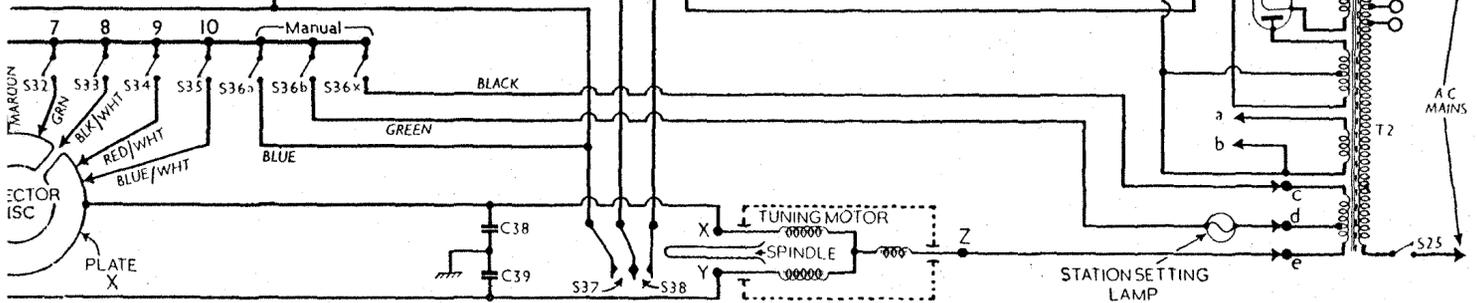
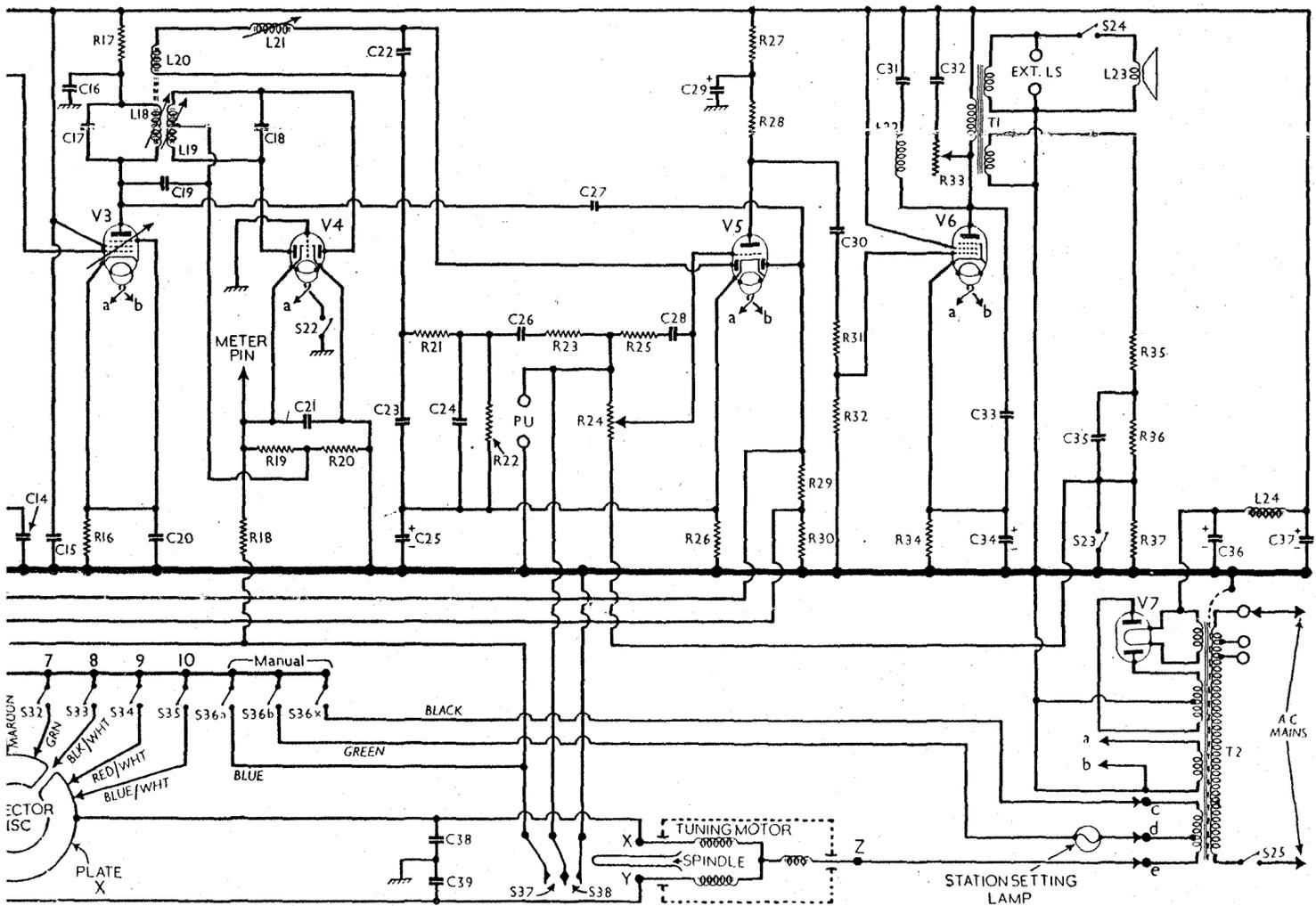
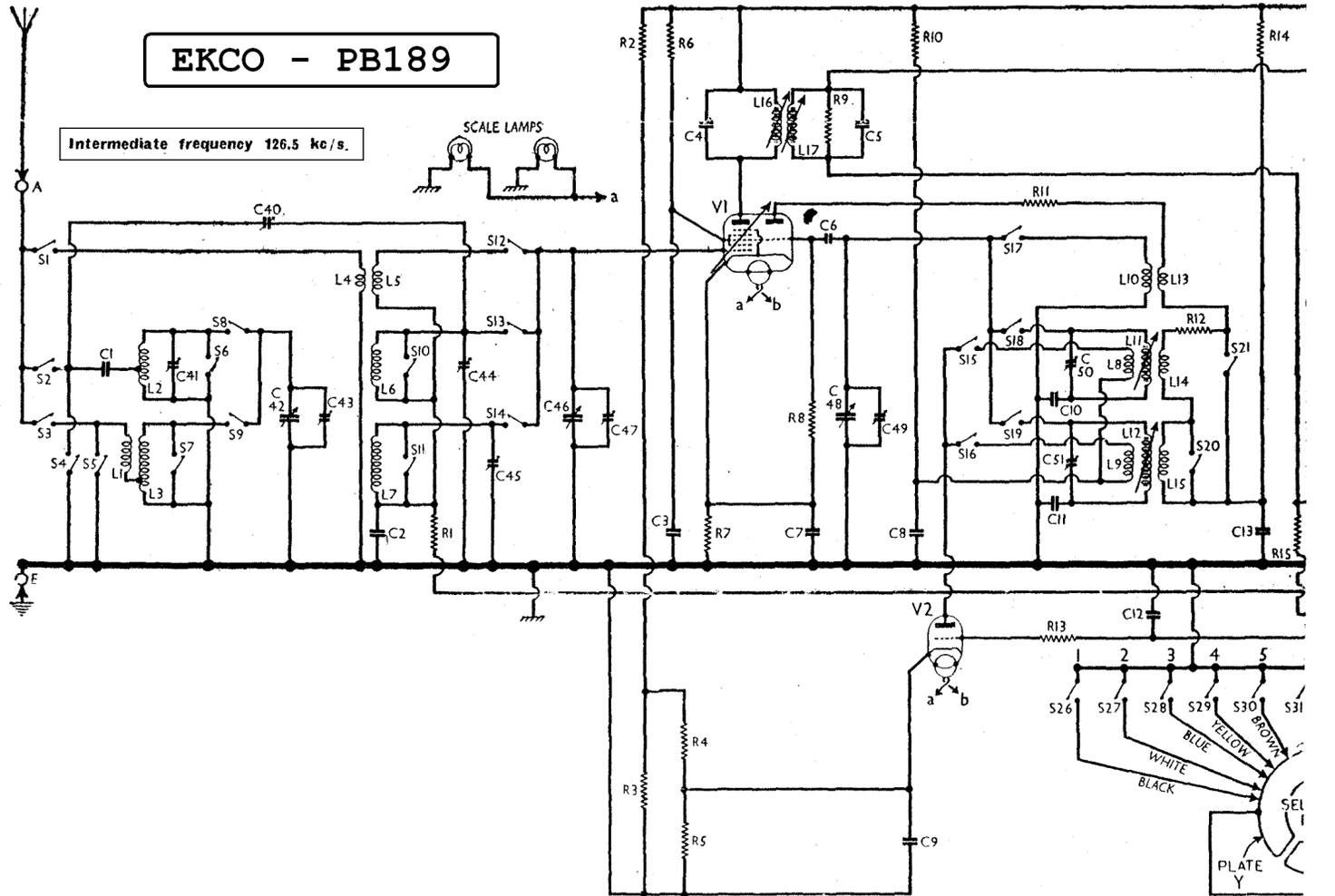


# EKCO - PB189

Intermediate frequency 126.5 kc/s.



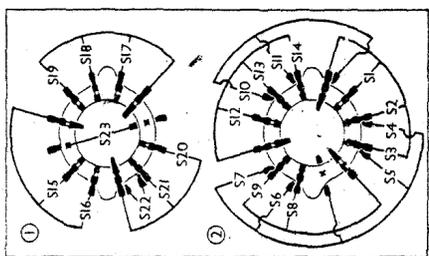
RESISTORS		Values (ohms)
R1	V1 hept. C. G. decoupling	1,000,000
R2		25,000
R3	V2 G.B. potential divider resistors	25,000
R4		15,000
R5		1,200
R6	V1 S.G. H.T. feed	30,000
R7	V1 fixed G.B. resistor	200
R8	V1 osc. C. G. resistor	100,000
R9	I.F. trans. sec. shunt	500,000
R10	V2 anode H.T. feed	15,000
R11	Oscillator reaction stabilisers	200
R12		3,000
R13	V2 C.G. decoupling	250,000
R14	V1 osc. anode H.T. feed	20,000
R15	V3 C.G. decoupling	1,000,000
R16	V3 fixed G.B. resistor	300
R17	V3 anode H.T. feed	1,000
R18	Discriminator load decoupling	100,000
R19	V4 discriminator load resistors	500,000
R20		500,000
R21	I.F. stopper	100,000
R22	V5 signal diode load	100,000
R23	A.F. feed resistor	50,000
R24	Manual volume control	1,000,000
R25	Part of tone compensator	500,000
R26	V5 triode G.B.; A.V.C. delay	1,000
R27	V5 triode anode decoupling	10,000
R28	V5 triode anode load	50,000
R29	V5 A.V.C. diode load resistor	500,000
R30		750,000
R31		100,000
R32	V6 C.G. potential divider	250,000
R33	Variable tone control	60,000
R34	V6 G.B. resistor	120
R35	Negative feed-back potential divider	15,000
R36		15,000
R37		500

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial L.W. coupling coil	50-0†
L2		2.5
L3	Band-pass primary coils	25-0
L4	Aerial S.W. coupling coil	0.2
L5	Aerial S.W. tuning coil	Very low
L6	Band-pass secondary coils	2.5
L7		25.0
L8	Osc. M.W. A.F.C. coil	19.0
L9	Osc. L.W. A.F.C. coil	90.0
L10	Osc. S.W. tuning coil	Very low
L11	Osc. L.W. tuning coil	2.0
L12	Osc. S.W. tuning coil	9.0
L13	Osc. L.W. reaction coil	Very low
L14	Osc. S.W. reaction coil	1.0
L15	Osc. M.W. reaction coil	2.3
L16	Osc. L.W. reaction coil	45.0
L17	1st I.F. trans. { Pri. ...	45.0
L18	{ Sec. ...	45.0
L19	2nd I.F. trans. { Pri. ...	45.0
L20	{ Disc. sec., total	45.0
L21	{ Coupling coil	2.0
L22	{ Signal sec.	45.0
L23	Whistle filter coil	80.0
L24	Speaker speech coil	2.3
	H.T. smoothing choke	650.0
T1	Output trans. { Pri. ...	350.0
	{ Speech sec.	0.5
	{ F.-B. sec.	38.0
	{ Pri., total	33.0
	{ Heater, sec.	Very low
T2	Mains trans. { Rect. heat. sec.	Very low
	{ Motor sec., total	2.5
	{ H.T. sec., total	460.0
Motor	Tuning motor windings	6.3*
S1-S23	Waveband switches	—
S24	Int. speaker switch	—
S25	Mains switch, ganged R33	—
S26-S36	Press-button switches	—
S37	Tuning motor muting switches	—
S38		—

† Including the lower end of L3.  
\* Either winding. Measured between X and Z or Y and Z with press-buttons out.

CAPACITORS		Values (µF)
C1	Aerial M.W. coupling	0.001
C2	V1 hept. C.G. decoupling	0.1
C3	V1 S.G. decoupling	0.1
C4	1st I.F. transformer tuning capacitors	0.00014
C5		0.00014
C6	V1 osc. C.G. capacitor	0.000025
C7	V1 cathode by-pass	0.1
C8	V2 anode decoupling	0.1
C9	V2 cathode by-pass	0.1
C10	Osc. circ. M.W. tracker	0.00168
C11	Osc. circ. L.W. tracker	0.0008
C12	V2 C.G. decoupling	0.04
C13	V1 osc. anode decoupling	0.1
C14	V3 C.G. decoupling	0.04
C15	H.T. circuit R.F. by-pass	0.1
C16	V3 anode decoupling	0.02
C17	2nd I.F. transformer tuning capacitors	0.00014
C18		0.00014
C19	Phasing capacitor	0.0001
C20	V3 cathode by-pass	0.1
C21	V4 output reservoir	0.1
C22	2nd I.F. trans. signal sec. tuning	0.00014
C23		0.0002
C24	I.F. by pass capacitors	0.0002
C25*	V5 cathode by-pass	25.0
C26	A.F. coupling to V5 triode	0.01
C27	A.V.C. diode coupling	0.000015
C28	Part of tone compensator	0.0001
C29*	V3 triode anode decoupling	2.0
C30	A.F. coupling to V6	0.1
C31	Whistle filter tuning	0.005
C32	Part variable tone control	0.1
C33	Fixed tone corrector	0.0025
C34*	V6 cathode by-pass	50.0
C35	Part of feed-back circuit	0.2
C36		8.0
C37	H.T. smoothing capacitors	16.0
C38	Tuning motor shunt capacitors	0.02
C39		0.02
C40	Image suppressor	—
C41†	B.-P. pri. M.W. trimmer	—
C42†	Band-pass pri. tuning	—
C43†	B.-P. pri. L.W. trimmer	—
C44†	B.-P. sec. M.W. trimmer	—
C45†	B.-P. sec. L.W. trimmer	—
C46†	B.-P. sec. and S.W. tuning	—
C47†	Aerial circ. S.W. trimmer	—
C48†	Oscillator circuit tuning	—
C49†	Osc. circ. S.W. trimmer	—
C50†	Osc. circ. M.W. trimmer	—
C51†	Osc. circ. L.W. trimmer	—

\* Electrolytic; † Variable; ‡ Pre-set.



Diagrams of the waveband switch units.

Reverse the meter leads, getting a positive reading again, and continue the adjustment until maximum is again reached, but in reverse polarity. The two maximum readings should be compared, and they should be equal; the actual value each time with 10 mV input to V1 should be about 5 V. If a centre-zero meter is available the lead-reversing process can be avoided.

Should the two readings not be similar, something is wrong with the discriminator circuit, possibly unequal emission of the two sections of V4 or unequal values for R19 and R20. When it has been established that the readings are equal, readjust L19 core for zero reading precisely. This adjustment is very critical, and it is important that it should be exact.

**R.F. and Oscillator Stages.**—Transfer signal generator leads to A and E sockets via a suitable dummy aerial. With the gang at maximum, the pointer should cover the calibration mark on the outside (S.W.) scale line at the long-wave end of the scale.

**S.W.**—Switch set to S.W., tune to 18 Mc/s or 16.6 m on scale, feed in an 18 Mc/s signal, and adjust C49. Tune to 17 Mc/s or 17.6 m on scale, feed in at 17 Mc/s signal, and adjust C47 for maximum output. Calibrations should now be checked at 6 Mc/s (50 m) where it should be found to be correct if previous adjustments were effected accurately.

**M.W.**—Switch set to M.W., tune to 200 m on scale, feed in a 200 m (1,500 kc/s) signal, and adjust C50 for maximum output. Tune to 250 m on scale, feed in a 250 m (1,200 kc/s) signal, and adjust C44 and C41 for maximum output. Tune to 500 m on scale, feed in a 500 m (600 kc/s) signal, and adjust the core of L11 for maximum sensitivity and accurate calibration, keeping the core-piece on the far side of the coil centre when viewed from the trimming end. Repeat the 200 m and 500 m adjustments until no improvement results.

**L.W.**—Switch set to L.W., tune to 1,300 m on scale, feed in a 1,300 m (230 kc/s) signal, and adjust C51 for maximum output, then adjust C43. Tune to 1,700 m on scale, feed in a 1,700 m (176.5 kc/s) signal, and adjust the core of L12 for maximum output, keeping the core-piece on the far side of the coil centre when viewed from the trimming end. Repeat the 1,300 m and 1,700 m adjustments until no improvement results.

**Image Rejector.**—If image trouble is experienced, the image rejector C40 may be adjusted on the image until it is at a minimum. This adjustment is always mounted on the L1-L7 coil assembly, where we show it, but in some cases it may be adjusted from the front, and in others from the rear.

**Station Setting.**—For setting the contact clips correctly on their carrier rails, the station setting lamp is used as an indicator.

First press the white button, and tune in the required station by hand. Then holding down the white button, press the button whose clip it is desired to set, when the setting lamp will light. Now free the appropriate clip (it bears the same number as its button) by slackening its screw and slide it along the rail to a position where its contact point lies on the gap between the commutator plates, when the light will go out. In this position the clip is correctly set.

If two clips are set to adjacent stations, they may be accommodated on opposite carrier rails. When changing a clip over from one rail to another, the clip must be inverted. Finally, check each newly set button by motor tuning, and fit an appropriate station-name card in the adjoining aperture.

Switch	L.W.	M.W.	S.W.
S1	—	—	0
S2	—	0	—
S3	0	—	—
S4	—	—	0
S5	—	0	—
S6	—	—	0
S7	—	—	0
S8	—	0	—
S9	0	—	—
S10	—	—	0
S11	—	0	—
S12	—	—	0
S13	—	0	—
S14	0	—	—
S15	—	—	0
S16	0	—	—
S17	—	—	0
S18	—	0	—
S19	0	—	—
S20	—	—	0
S21	—	0	—
S22	0	—	—
S23	—	—	0

VALVE ANALYSIS

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 TH4A	250	2.2	90	5.2
	130	5.0	—	—
V2 T41	220	2.0	—	—
V3 VP41	240	10	250	4.0
V4 2D41	—	—	—	—
V5 DT41	110	2.4	—	—
V6 OP42	240	32.5	250	5.0
V7 R41	300†	—	—	—

† Each anode. A.C.

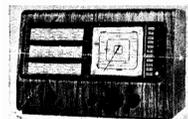
CIRCUIT ALIGNMENT

**IF Stages.**—Switch set to L.W., press the white button (manual), turn the gang to maximum, the tone control to high and the volume control to maximum. Clip the signal generator leads via a 0.02 µF capacitor to the insulation on the top-cap lead to V1 and chassis, connect a 0.5 V A.C. voltmeter to the external speaker sockets, a 100,000 Ω resistor across L16, and another across L18. Feed in a 126.5 kc/s (2.572 m) signal, and adjust the cores of L16, L17, L18 and L21 in that order for maximum output. Very little movement should be necessary, and it is advisable to try half a turn each way to see if any improvement occurs, then continue in the direction that shows an increase. Disconnect output meter and resistors.

**Discriminator Stage.**—The 0.10 V scale of a voltmeter having an internal resistance of not less than 1,000 ohms per volt (10,000 Ω) must be used as an indicator for this adjustment, and its leads are connected (in either direction) to the Meter Pin (indicated in our plan view of the chassis) and chassis. Connect the "live" signal generator lead clip directly to the top-cap connector of V1, feed in 126.5 kc/s signal at about 10 mV, and adjust the discriminator secondary coil L19 core for maximum reading, and note the value; then readjust core so that reading falls to zero, passes it, and backs off the scale.

A.C./D.C. Model PB189U

This receiver is identical with the A.C. version on which this Service Sheet was prepared except that it is fitted with the Philips tubular converter type 7880C or 7881C for D.C. operation, and thus has a special mains transformer. This cannot be covered here.



The Ekco PB189 and PB189U.