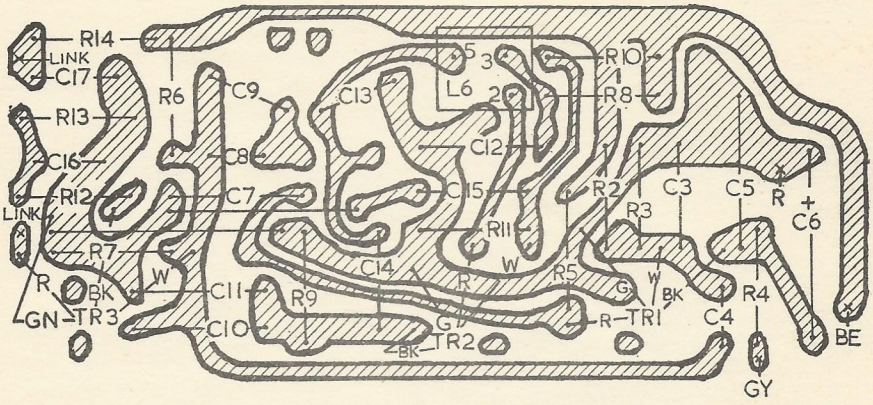
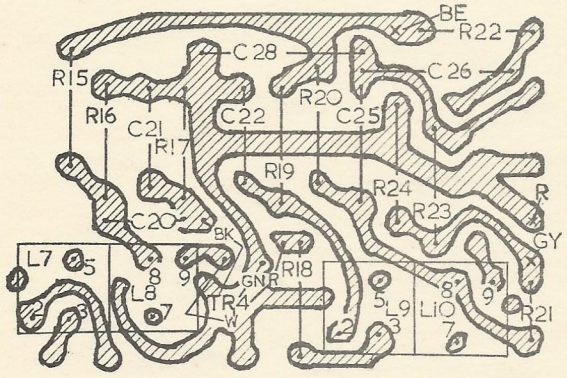
PHILIPS Service notes

MODEL 880 PRINTED BOARDS



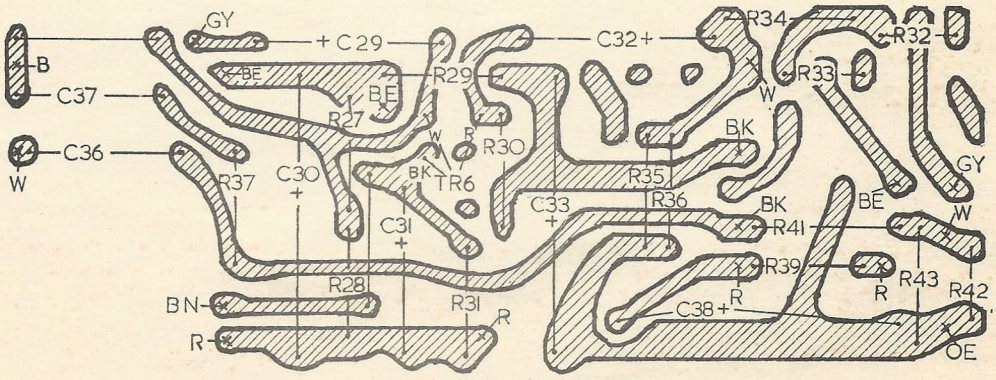
R.F. BOARD



I.F. BOARD

COLOUR LEGEND

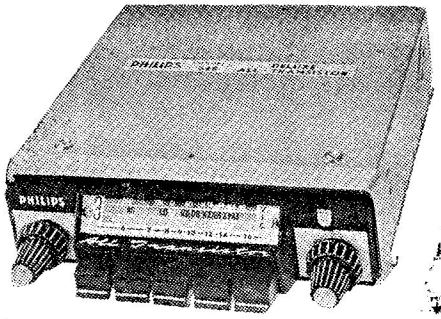
BE	=	Blue
BK	=	Black
BN	=	Brown
GN	=	Green
GY	=	Grey
OE	=	Orange
R	=	Red
W	=	White



AUDIO BOARD

PHILIPS Service notes

Model 880



SPECIFICATIONS

(Subject to alteration without notice.)

Power Supply	6V or 12V battery.
Tuning Range	535 - 1615 k c/s.
Intermediate Frequency	455 k c/s. (see "I.F. Alignment").
Battery Consumption	1.34A (6V), 0.725A (12V).
Aerial	Top mount, type M548. Side mount, type M549.

TRANSISTOR EQUIPMENT AND VOLTAGE/CURRENT ANALYSIS

Transistor Function	No.	Type	Collector		Base	Emitter
			Volts	mA	Volts	Volts
R.F. Amplifier	TR1	OC170	2.9	0.42	1.3	1.1
Oscillator	TR2	OC170	5.6	0.34	1.0	0.8
Mixer	TR3	OC169	4.8	0.9	2.3	2.1
I.F. Amplifier	TR4	OC169	5.5	1.2	1.1	0.8
2nd Detector	TR5	OC169	5.7	0.42	1.4	1.2
Audio Amplifier	TR6	OC75	3.3	1.8	1.6	1.5
Driver	TR7	OC74	3.8	21	0.8	0.55
Power Amplifier	TR8	OC26	13.5	600	0.45	0
Power Amplifier	TR8	(7.2V)	6.3	1.2A	0.37	0
Dial Lamp	V11	7994N	7.2V	0.1A round, single contact bayonet.		

The above figures were taken with a V.T.V.M., a supply voltage of 14.4V. Receiver in a "no signal" condition and measured from the positive supply line.

ALIGNMENT PROCEDURE.

Refer to inset to circuit diagram drawing for positions of various trimming points.

I.F. ALIGNMENT.

Set volume control at maximum volume, tone control at maximum treble and tuner at H.F. end. Connect signal generator to aerial terminal. Detune both secondaries by screwing out cores about half a turn. Peak cores in the following order at the quoted frequencies (correct peak occurs with core in lower position)—

2nd I.F.T. Primary (L9) — 454 k c/s.
1st I.F.T. Primary (L7) — 453 k c/s.
2nd I.F.T. Secondary (L10) — 456 k c/s.
1st I.F.T. Secondary (L8) — 458 k c/s.

R.F. ALIGNMENT.

Put volume control at maximum volume and tone control at maximum treble. Ensure that the cursor stops approximately the same distance from the ends of the dial scale as the tuner is placed in full in and full out positions respectively. Use a dummy aerial of 60pF shunted across the aerial socket and 15pF in series with the generator lead. Set all trimmers at about centre adjustment. The aerial trimmer is combined with the aerial socket.

With the tuner set fully in, peak the core of the oscillator shunt coil (L6) at 535 k c/s. Turn the tuner fully out and peak the oscillator trimmer (C13) at 1615 k c/s. Repeat the above two steps. Tune the receiver to 1200 k c/s. and peak the R.F. (C9) and aerial (C1) trimmers.

When the receiver is installed in position in the car and the aerial is connected, repeak the aerial trimmer (C1) at 1200 k c/s.

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Sydney, Melbourne, Adelaide, Brisbane, Perth, Hobart, Newcastle, Canberra, Wollongong.

PHILIPS DE LUXE ALL TRANSISTOR CAR RADIO MODEL 880

UNIVERSAL INSTALLATION KIT WITH BAFFLE

This kit is for use when installing the Philips Model 880 All Transistor Car Radio under dash or in a flat surface and provision exists for in-dash speaker mounting.

Some cars which fall into the above category are:—
1960/61 Austin A/40
1960/61 Ford Prefect (De Luxe)
F.J. Holden

INSTALLATION INSTRUCTIONS

N.B.—Before proceeding with the installation, remove leads from car battery.

RECEIVER VOLTAGE ADJUSTMENT.

The receiver is delivered from the factory adjusted for 12 volts positive to earth. The voltage and polarity to which the receiver is adjusted is always visible through apertures on the underside of the case. A reversible plug system enables operation on 6 or 12 volts, positive or negative to earth.

To alter either voltage or polarity, first remove the bottom case cover by undoing one screw and withdrawing the case retaining pins. Next, reverse the plug/s and replace case cover.

N.B.—Before installing the receiver check the connections of the car battery and adjust the reversible plugs accordingly.

DAMAGE TO THE RECEIVER WILL RESULT IF THE PLUGS ARE INCORRECTLY ADJUSTED.

RECEIVER MOUNTING.

The following diagrams indicate the various methods of mounting the receiver. Select the most appropriate one for the particular car and follow the instructions.

1. Under Instrument Panel or Parcel Shelf (Fig. 1).

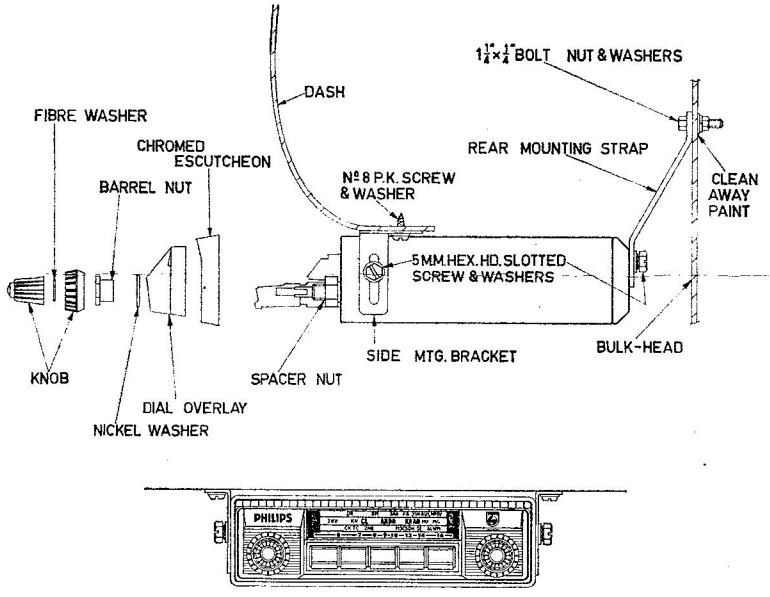

FIG. 1

Screw spacer nuts firmly on spindles. Fit chromed escutcheon over control spindles followed by the plastic dial overlay. Fit barrel nuts and nickel washers over spindles and tighten, taking care to ensure that the overlay and escutcheon are centrally located. Push the tuning knob assembly on the left-hand spindle. The large diameter rear knob (Tone) fits over the barrel nut on to the right-hand spindle followed by the small fibre washer and outer knob (Off-On and Volume).

Referring to the diagram (Fig. 1) fit the two slotted side mounting brackets to the receiver.

Hold the receiver in the desired position under the instrument panel or parcel shelf and mark the position of the side mounting bracket slots on the lip of the panel or shelf. Drill one $\frac{1}{8}$" diameter hole at each of these marks. Fit the slotted end of the rear mounting strap to the rear of the receiver by means of the 5 mm. x $\frac{3}{8}$" screw and washers supplied (See diagram). Again hold the receiver in position and bend the rear support bracket to reach the bulkhead or rear of the parcel shelf and mark a suitable position for the mounting point. Ensure that the bulkhead is clear on the engine side and drill a $\frac{9}{32}$" diameter hole at this point.

Clean off any paint on the engine side to ensure a good earth connection. Mount the receiver in position using the two No. 8 self-tapping screws supplied for the front mounting brackets and the $\frac{1}{4}$" bolt, nut and washer for attachment of the rear support strap to the bulkhead or parcel shelf.

2. Behind Instrument Panel or Cover Plate (Fig. 2).

Place the chromed escutcheon in the desired position on the instrument panel or cover plate and mark the spindle holes. Refer to the dial cut-out diagram and mark out the position of the dial aperture and dial lamp hole in relation to the two spindle holes. Neatly cut out dial opening, then drill two $\frac{13}{32}$" diameter holes for the spindles and a $\frac{1}{4}$" diameter hole for the dial lamp.

Mount the receiver as shown in the diagram (Fig. 2).

LOUDSPEAKER MOUNTING.

Where provision exists behind the dash for mounting the 7" x 5" speaker directly by means of studs, it is not necessary to use the baffle supplied. The baffle is to be used if studs do not match the speaker mounting holes or the grille opening is larger than the speaker.

The speaker is attached to the baffle using the four $\frac{5}{32}$"W x $\frac{1}{2}$"L screws, nuts and washers supplied.

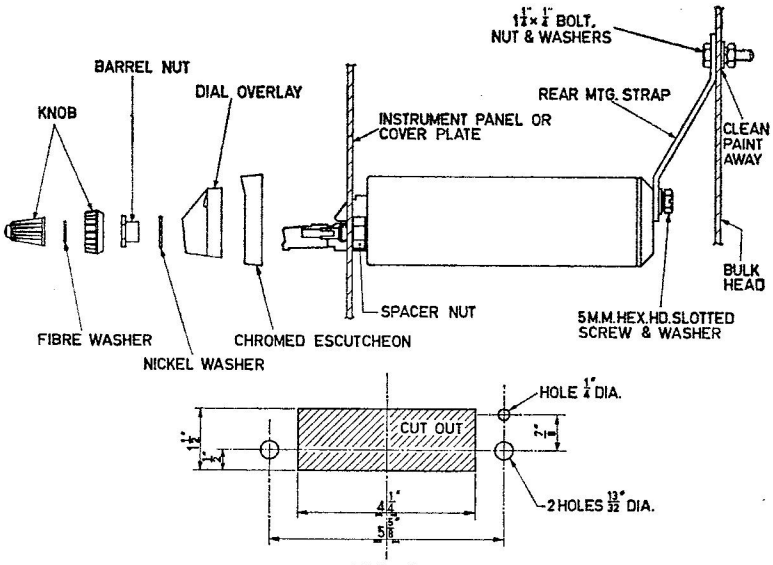

FIG. 2

SPEAKER LEAD.

Plug speaker lead into socket in receiver speaker lead.

BATTERY LEAD.

Connect battery lead, cut to correct length, to one of the following points:—
(1) Either the battery or A1 or A2 terminal on the voltage regulator.
(2) The ammeter terminal or equivalent which connects to the "A" terminal on the voltage regulator.
Insert 3 Amp. fuse in fuse holder and connect to receiver.

AERIAL.

Mount the aerial in accordance with the instructions contained in the aerial pack.
Plug the aerial cable into the connector socket in the receiver aerial lead.

INTERFERENCE SUPPRESSION.

★Distributor: Cut the centre lead about one inch from the distributor and screw the two ends into the suppression resistor supplied.
Note: A number of modern cars have built-in suppressors, in which case the above mentioned suppression resistor will not be required. An ohmmeter can be used as a quick check, and if a suppression resistor is incorporated, a reading of 5,000-10,000 ohms will be obtained.

★Ignition Coil: Mount one of the suppression capacitors under a coil mounting screw. Connect the capacitor lead to the low tension terminal of the coil which connects to the ignition switch (not the terminal connected to the distributor).

★Generator: Mount the second suppression capacitor under one of the generator mounting bolts. Connect the lead to the "A" (armature) terminal — never to the "F" (field) terminal. The armature terminal is usually larger than the field terminal.

Additional Notes on Interference: Ensure that the receiver battery lead does not run near any high tension leads.
Where the engine is rubber mounted it may be necessary to connect the engine block to the chassis by means of a short length of copper braid.

AERIAL CIRCUIT TRIMMING.

To complete the installation the aerial should be matched to the receiver. Proceed as follows:—
Replace battery leads on car battery and, with aerial fully extended, switch receiver on and tune to a weak station near 1200 kc/s. (figure "12" on the dial). Rotate the knurled section of the combined aerial trimmer and connector (end nearest receiver) for maximum sound.

CONTENTS OF KIT.

Chromed Escutcheon	CS 430.087.1	Battery Lead Assembly	CZ 360.459.1
Plastic Dial Overlay	CR 520.010	3 Amp. Fuse	
Spacer Nut, 2 off	CS 213.911	Suppression Capacitor, 2 off	CZ 040.004
Nickel Washer, 2 off	CS 467.182	Suppression Resistor	CZ 040.005
Barrel Nut, 2 off	CS 274.422.1	3/16" Flat Washer, 3 off	
Knob Tuning Assembly	CR 523.535	3/16" S.P. Washer, 3 off	
Rear Knob Assembly	CR 523.536	5 mm. x 3/8" Hex. Hd. Screw, 3 off	
Front Knob Assembly	CR 523.516.3	No. 8 x ½" P.K. Screw, 2 off	
Fibre Washer	CH 671.125	1¼" x ¼" Whit. Bolt	
Front Mounting Bracket R.H.	CS 233.022	¼" Spring Washer	
Front Mounting Bracket L.H.	CS 233.023	¼" Flat Washer	
Rear Mounting Strap	CS 241.549.1	¼" Whit. Nut	
Speaker, Rola 7-5L, Cone F48		5/32 x ½" Whit. Screw, 4 off	
Speaker Lead Assembly	CZ 360.686.1	5/32" S.P. Washer, 4 off	
Speaker Baffle	CS 008.253.3	5/32" Flat Washer, 6 off	
		5/32" Whit. Nut, 4 off	

PHILIPS ELECTRICAL INDUSTRIES PTY. LIMITED

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CS.444.206

SERVICE NOTES

ELECTRICAL PARTS LISTS

CAPACITORS

C. No.	Description.	Type or Code No.
1	60 pF trimmer (part of aerial socket)	49.002.52
2	120 pF ceramic, 2½%, N750 .	C.T.R., style B.
3	820 pF Styroseal, 600V, 2½%	D.F.B. 611
4	2.2 pF ceramic ± .25 pF, N.P.O.	C.D.S., style A
5	0.04 µF paper, 200V, 20% ...	A.E.E. type W99
6	100 µF electrolytic, 4VW	Philips C.425.AL/B100
7	270 pF Styroseal, 600V, 5% ..	D.F.B. 605
8	47 pF ceramic, 2½%, N750 ...	C.T.R., style A
9	60 pF trimmer	908/60E
10	270 pF Styroseal, 600V, 5% ..	D.F.B. 605
11	0.0022 µF Styroseal, 100V., 10%	D.F.C. 116
12	0.04 µF paper, 200V, 20% ...	A.E.E. type W99
13	60 pF trimmer	908/60E
14	68 pF ceramic, 2½%, N330 ...	C.T.R., style B
15	0.001 µF Styroseal, 100V, 10%	D.F.C. 112
16	0.047 µF ceramic, +80%—20%, 33V Hi-K	C.P.T., style DZ
17	0.047 µF ceramic, +80%—20%, 33V Hi-K	C.P.T., style DZ
18	500 pF Styroflex, 5%	Part of 1st I.F.T.
19	500 pF Styroflex, 5%	
20	0.022 µF ceramic, +80%—20%, 33V, Hi-K	C.P.T., style BZ
21	0.047 µF ceramic, +80%—20%, 33V, Hi-K	C.P.T., style DZ
22	0.047 µF ceramic, +80%—20%, 33V, Hi-K	C.P.T., style DZ
23	500 pF Styroflex, 5%	Part of 2nd I.F.T.
24	500 pF Styroflex, 5%	
25	0.001 µF Styroseal, 100V, 10%	D.F.C. 112
26	0.04 µF paper, 200V, 20% ...	A.E.E., type W99
27	10 µF electrolytic, 6VW	ES 603
28	0.04 µF paper, 200V, 20% ...	A.E.E., type W99
29	10 µF electrolytic, 6VW	ES 603
30	250 µF electrolytic, 10VW ...	Philips C.435.AL/D250
31	100 µF electrolytic, 4VW	Philips C.425.AL/B100
32	10 µF electrolytic, 6VW	ES 603
33	250 µF electrolytic, 10VW	Philips C.435.AL/D250
34	0.047 µF ceramic +80%—20%, 25V, Hi-K	C.D.R., style B
35	0.02 µF paper, 200V, 20%	A.E.E., type W99
36	0.04 µF paper, 200V, 20% ...	A.E.E., type W99
37	0.04 µF paper, 200V, 20% ...	A.E.E., type W99
38	250 µF electrolytic, 10VW ...	Philips C.435.AL/D250
39	0.1 µF ceramic, +80%—20%, 33V, Hi-K	C.P.T., style E
40	400 µF electrolytic, 16VW ...	Philips C.435.AL/E400
41	400 µF electrolytic, 16VW ...	Philips C.435.AL/E400
42	820 pF ceramic, +100%—20%, feed thru	Philips C.309.BB/R820E
43	0.5 µF paper, 200V, 20% ...	A.E.E., type W48
44	0.5 µF 200V, 20%, suppressor	Ducon PNT 380
45	0.5 µF 200V, 20%, suppressor	Ducon PNT 380

RESISTORS

R. No.	Description.	Type or Code No.
1	680,000 Ω carbon, ½W	BTS
2	39,000 Ω carbon, ½W, 5% ...	BTS
3	12,000 Ω carbon, ½W, 5% ...	BTS
4	220 Ω carbon, ½W	BTS
5	6,800 Ω carbon, ½W	BTS
6	56,000 Ω carbon, ½W	BTS
7	47,000 Ω carbon, ½W	BTS
8	470 Ω carbon, ½W	BTS
9	2,200 Ω carbon, ½W	BTS
10	47,000 Ω carbon, ½W	BTS
11	10,000 Ω carbon, ½W	BTS
12	carbon, ½W chosen from 47, 68 or 82 Ω	BTS
13	2,200 Ω carbon, ½W	BTS
14	1,000 Ω carbon, ½W	BTS
15	33,000 Ω carbon, ½W	BTS
16	8,200 Ω carbon, ½W	BTS
17	680 Ω carbon, ½W	BTS
18	220 Ω carbon, ½W	BTS
19	220 Ω carbon, ½W	BTS
20	33,000 Ω carbon, ½W	BTS
21	3,300 Ω carbon, ½W	BTS
22	220 Ω carbon, ½W	BTS
23	470 Ω carbon, ½W	BTS
24	1,000 Ω carbon, ½W	BTS
25-26	Dual concentric potentiometer— rear, 250,000 Ω taper E (volume) with S.P.S.T.	Type Q
	front, 100,000 Ω taper C (tone)	CZ.032.034
27	12,000 Ω carbon, ½W	BTS
28	4,700 Ω carbon, ½W	BTS
29	56 Ω carbon, ½W	BTS
30	1,500 Ω carbon, ½W	BTS
31	820 Ω carbon, ½W	BTS
32	Pre-set potentiometer, 20,000 Ω (bias adj. 12V)	Philips E.097.AC/20K
33	Pre-set potentiometer, 10,000 Ω (bias adj. 6V)	Philips E.097.AC/10K
34	3,300 Ω carbon, ½W	BTS
35	4,700 Ω carbon, ½W	BTS
36	4,700 Ω N.T.C., 0.6W, 20% ..	Philips B8.320.07P/4K7
37	12,000 Ω carbon, ½W	BTS
38	120 Ω carbon, ½W	BTS
39	56 Ω carbon, ½W	BTS
40	100 Ω carbon, ½W	BTS
41	4.7 Ω W/W, ½W	BW½
42	500 Ω N.T.C., 1W	Philips B8.320.01A/500E
43	470 Ω carbon, ½W	BTS
44	68 Ω carbon, ½W	BTS
45	1,200 Ω carbon, ½W	BTS
46	82 Ω carbon, 1W	BTA
47	15,000 Ω suppressor	Morganite C1
48	220 Ω carbon, ½W	BTS

ALL TOLERANCES ARE 10% UNLESS OTHERWISE NOTED.

INDUCTORS

L. No.	D.C. Resistance (Ohms) ± 10%	Description	Type or Code No.
1	4.37	Aerial choke 4.7 μH	CZ.122.707 I.R.C., type CLA
2	12.6	Permeability tuner	CZ.109.013
3	12.8		
4	7.5		
5	4.37	Osc. series coil, 4.7 μH	CZ.122.707 I.R.C., type CLA
6	4.8	Osc. shunt coil	CZ.330.621
7	4.3	1st I.F.T.	CZ.320.483
8	4.3		
9	4.3	2nd I.F.T.	CZ.320.468
10	4.3		
11		Output Transformer	CZ.345.077
12			Rola WTR63
13			
14	<0.5	Filter choke	CZ.122.709
15		Speaker	Holden FB 6x9L,F69 Holden FE/FC 6x9L,F69 Volkswagen 5x7L,F48 Univ.w/baffle 5x7L,F48 Univ.w/box 5x7L,F48

UNCASING THE RECEIVER.

Remove the two case parts fixing pins, remove the two screws at the front of the case top and the hexagonal head screw at the rear of the case bottom. The case should now come away in two parts, the top lifting off and the bottom sliding over the control spindles.

Recasing of the receiver is a reversal of the above.

TO SET PUSH BUTTONS.

Setting of the push buttons to any station can be done with the receiver installed in the car.

Pull out a push button as far as it will go.

Tune to the station desired to be set up, with the normal tuning.

Push in the button to its fullest extent. The station is now set to that button.

PRE-SET BIAS ADJUSTMENT.

Two separae trim potentiometers are provided for adjustment of bias of T R 8 (O C 26) — one for 12 volts (R 32) and the other for 6 volts (R 33). With the receiver in its case, allow a period of one hour running before checking this adjustment.

With the voltage change-over plug showing "6 volts" and with a supply voltage of 7.2V adjust R 33 for a collector current in T R 8 of 1200 mA. For "12 volts" use a supply voltage of 14.4V and adjust R 32 for a current of 600 mA. Alternatively, if power supplies of these voltages are unavailable, adjust currents to 1040 mA and 520 mA with voltages of 6.0V and 12.0V respectively.

Accurate voltages are essential for this operation, and the receiver must be kept in its case during the one hour period. These adjustments should be made with the volume control at minimum.

TO SET VOLTAGE AND POLARITY.

Remove the bottom of the case to gain access to both plugs. Remove both plugs from their sockets and reinsert them putting the appropriate markings for the new adjustment against the arrowhead stamped into the metal chassis.

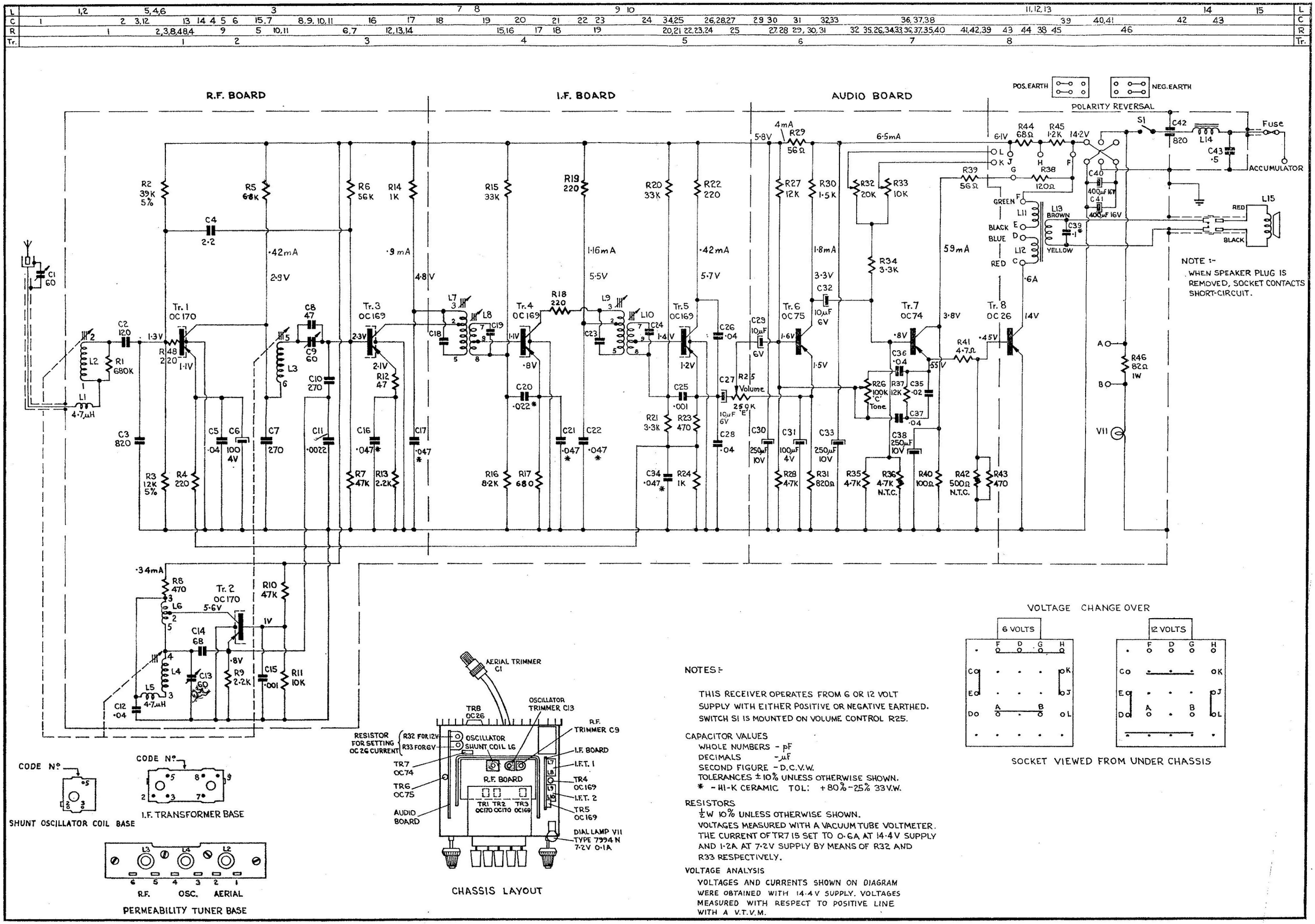
The voltage and polarity settings are indicated through two small circular apertures in the case bottom.

The receiver is set at the factory to 12V positive earth.

MISCELLANEOUS COMPONENTS

Description.	Code. No.
Accumulator filter bracket assembly ...	CR.262.481
Accumulator filter cover	CS.462.740
Aerial lead assembly (incl. socket and trimmer assembly)	CZ.360.534
Aerial socket and trimmer	49.002.52
Audio bracket assembly	CR.262.477
Barrel nut, 2x (dial overlay mtg.)	CS.274.422
Battery lead assembly (attached to receiver)	CZ.360.538
Bottom trim (Holden FB)	CS.430.715
Case bottom assembly	CR.572.177
Case top assembly	CR.572.192
Clamp, lead (on heat sink)	A3.464.49
Clip, mounting, 2x (RF. board)	A3.464.43
Clip, mounting, 2x (audio board)	CS.282.492
Clip, transistor (OC71)	A3.647.56
Clip, transistor (OC170)	A3.647.72
Cooling fin (OC74)	VC.201.1F/629
Cursor assembly	CR.480.678
Dial background (plastic)	CS.218.270
Dial escutcheon plate (chrome plated behind dial overlay assembly)	CS.430.087
Dial escutcheon plate (chrome plated behind dial overlay assembly) — Volkswagen	CS.430.099
Dial lamp holder	CZ.367.720
Dial overlay assembly — Holden FB ...	CR.520.011
Dial overlay assembly — all others ...	CR.520.010
Dial scale (packet 6 scales)	CR.483.042
Fish beads, ceramic No. 3 (OC26 leads)	CS.111.247
Fixing pin, 2x (top to bottom case-skewer)	A3.836.23
Fuse holder assembly (M.S.P. 36546) ...	CZ.371.116
Heat sink, OC26	A3.822.39
Knob assembly, tuning	CR.523.535
Knob, tone	CR.523.536
Knob, volume	CR.523.516

Description.	Code. No.
Knob, push button, 5x	CR.523.789
Mounting bar, Holden FE/FC	CS.365.649
Mounting bracket, R.H. side (Universal packs)	CS.233.022
Mounting bracket, L.H. side (Universal packs)	CS.233.023
Mounting bracket, Holden FE/FC	CS.230.823
Mounting bracket, rear (Holden FB) ...	CS.233.021
Mounting plate assembly, Volkswagen ..	CR.280.639
Mounting bracket, rear (Volkswagen) ..	CS.233.037
Mounting strip, rear (Universal packs and Holden FE/FC)	CS.241.549
Plug, speaker	CZ.365.048
Polarity changeover plug assembly	A3.230.65
Screw, decorative, 2x (dial scale mtg.) ..	CS.261.818
Screw, 5 m.m., slotted (receiver mtg.) .	B.058.ED.5x8
Shield, dial lamp	CS.050.204
Socket, aerial and trimmer	49.002.52
Spacer nut, 2x (between escutcheon plate and case)	CS.213.911
Speaker baffle, Universal kit with baffle	CS.008.253
Speaker baffle, Volkswagen	CS.008.256
Speaker box, Universal kit with speaker box	CR.571.833
Speaker lead assembly, incl. plug assembly (attached to receiver)	CZ.360.704
Speaker plug	CZ.365.048
Speaker socket	CZ.369.936
Spring (tuning and volume knobs)	CS.281.857
Spring (tone knob)	CS.281.855
Transistor cover (OC26)	P7.060.63
Tuner mounting front plate	CS.242.214
Tuning spindle assembly (incl. driver disc)	CR.371.341
Voltage changeover plug assembly	A3.230.97
Washer, decorative, 2x (dial overlay mtg.)	CS.467.182
Washer, fibre (between volume and tone knobs)	C/CH.671.125



PERMEABILITY TUNER BASE

CHASSIS LAYOUT

NOTES :-

THIS RECEIVER OPERATES FROM 6 OR 12 VOLT SUPPLY WITH EITHER POSITIVE OR NEGATIVE EARTHED. SWITCH S1 IS MOUNTED ON VOLUME CONTROL R25.

CAPACITOR VALUES
WHOLE NUMBERS - pF
DECIMALS - µF
SECOND FIGURE - D.C.V.W.
TOLERANCES ± 10% UNLESS OTHERWISE SHOWN.
* - HI-K CERAMIC TOL: +80%-25% 33V.W.

RESISTORS
½W 10% UNLESS OTHERWISE SHOWN.
VOLTAGES MEASURED WITH A VACUUM TUBE VOLTMETER.
THE CURRENT OF TR7 IS SET TO 0·6A AT 14·4V SUPPLY AND 1·2A AT 7·2V SUPPLY BY MEANS OF R32 AND R33 RESPECTIVELY.

VOLTAGE ANALYSIS
VOLTAGES AND CURRENTS SHOWN ON DIAGRAM WERE OBTAINED WITH 14·4V SUPPLY. VOLTAGES MEASURED WITH RESPECT TO POSITIVE LINE WITH A V.T.V.M.

VOLTAGE CHANGE OVER

SOCKET VIEWED FROM UNDER CHASSIS