ASTOR

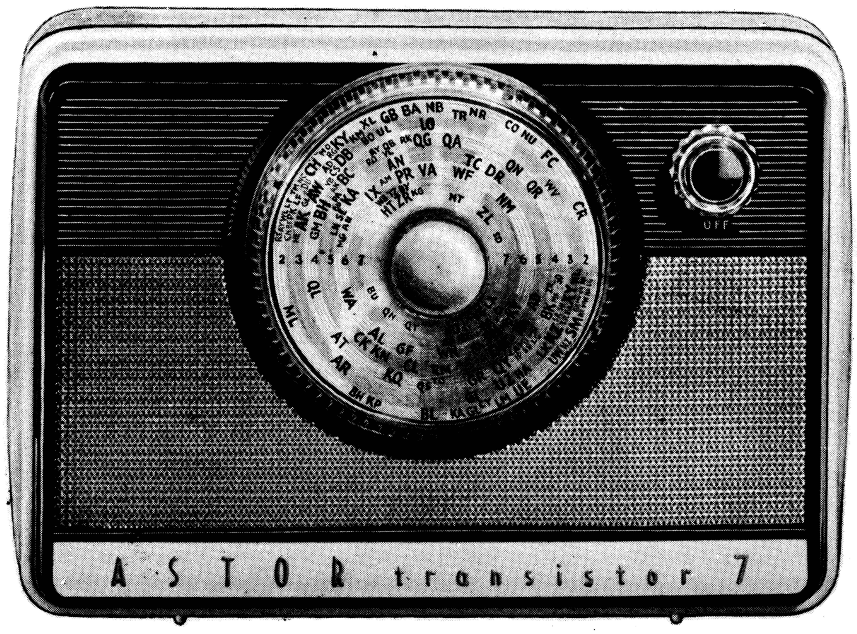
RADIO CORPORATION PTY. LTD.
DIVISION OF ELECTRONIC INDUSTRIES LTD.
Astor House, 161-173 Sturt Street, South Melbourne.

SERVICE DATA

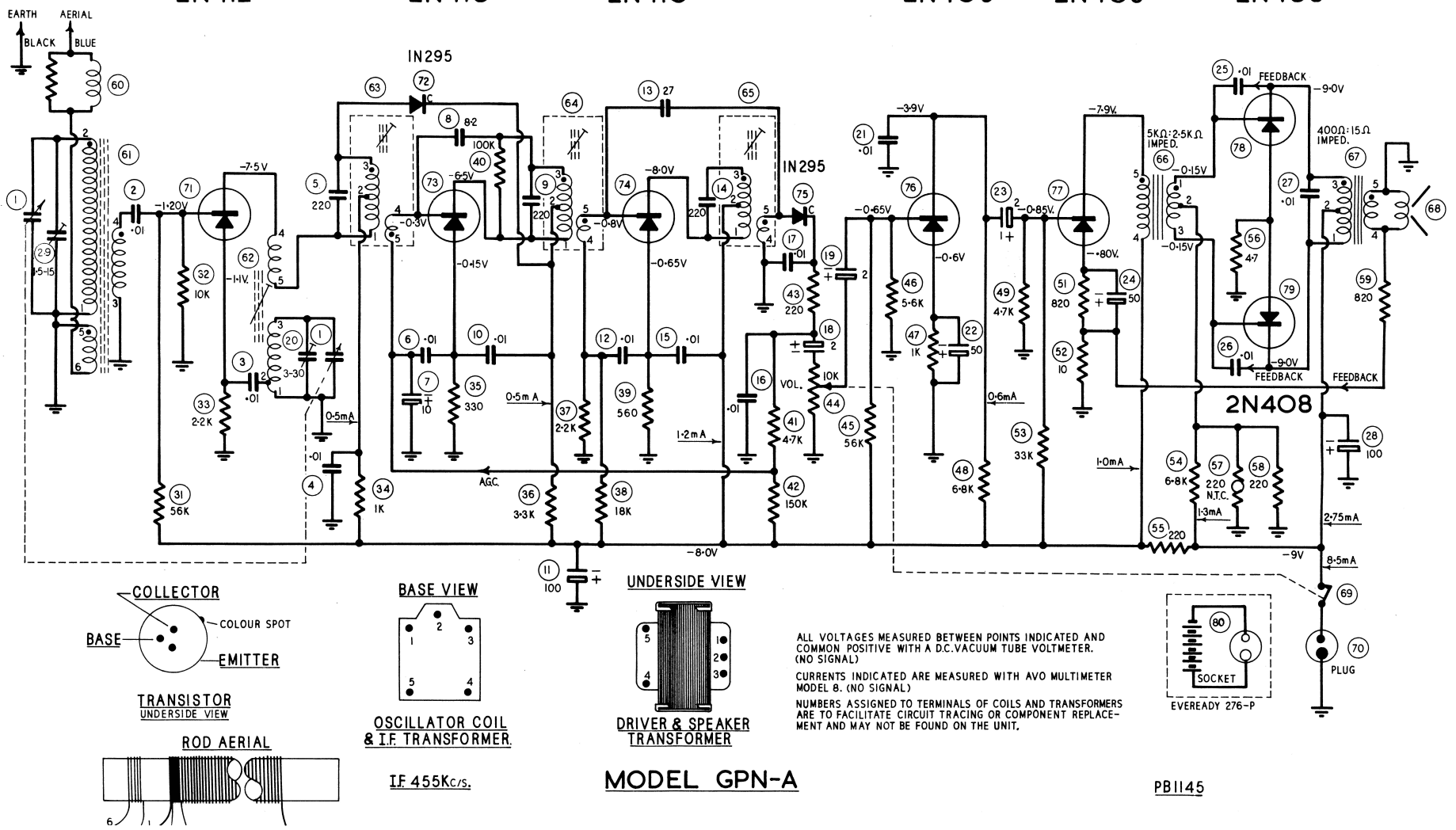
ASTOR MODEL "GPN–A"

PORTABLE

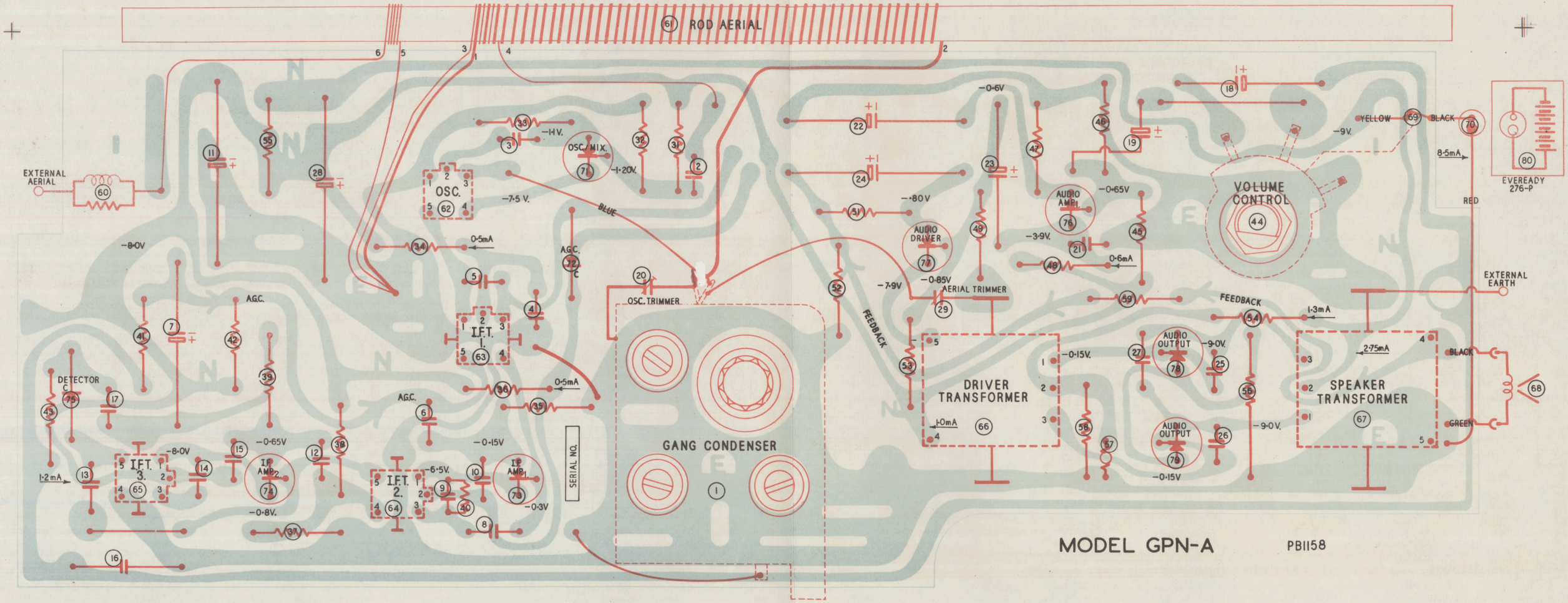
7 TRANSISTOR SUPERHETERODYNE BROADCAST RECEIVER



TUNING RANGE:	530 – 1630 Kilocycles
INTERMEDIATE FREQUENCY:	455 Kilocycles
BATTERY SUPPLY:	9 Volts DC. (internal battery)
BATTERY CONSUMPTION:	8.5 mA. (no signal)
POWER OUTPUT:	.3 Watt (undistorted)
TRANSISTOR COMPLEMENT	2N412 Mixer-Oscillator
	2N410 I.F. Amp. 1.
	2N410 I.F. Amp. 2.
	2N406 Audio Amplifier
	2N406 Audio Driver
	2N408 Audio Output
	2N408 Audio Output
GERMANIUM DIODES:	IN295 AGC.
	IN295 Detector / AGC.


2N412
2N410
2N410
2N406
2N406
2N408
EARTH
AERIAL
BLACK
BLUE
IN295
IN295
FEEDBACK
FEEDBACK
2N408
VOL.
AGC.
0·5mA
1·2mA
0·6mA
1·0mA
2·75mA
8·5mA
-8·0V
-9V
COLLECTOR
BASE
COLOUR SPOT
EMITTER
TRANSISTOR
UNDERSIDE VIEW
ROD AERIAL
BASE VIEW
OSCILLATOR COIL
& I.F. TRANSFORMER
IF 455Kc/s.
UNDERSIDE VIEW
DRIVER & SPEAKER
TRANSFORMER
SOCKET
EVEREADY 276-P
PLUG
ALL VOLTAGES MEASURED BETWEEN POINTS INDICATED AND COMMON POSITIVE WITH A D.C.VACUUM TUBE VOLTMETER. (NO SIGNAL)
CURRENTS INDICATED ARE MEASURED WITH AVO MULTIMETER MODEL 8. (NO SIGNAL)
NUMBERS ASSIGNED TO TERMINALS OF COILS AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT BE FOUND ON THE UNIT.
MODEL GPN-A
PB1145

CIRCUIT BOARD
PRINTED WIRING SIDE



MODEL GPN-A PB1158

SERVICE INSTRUCTIONS—ELECTRICAL

ALIGNMENT EQUIPMENT

Signal Generator - modulated 400 cps.
Output Meter - 15 Ohm impedance.
Series Capacitor - Sig.gen. for I.F.T. alignment .1MF Part No. C113.

Alignment Tools

(a) Flat metal blade each end - Part No. A101/2076 for I.F.T. and osc. coil iron core adjustment.

(b) Chisel point type Part No. M195 for trimmer core adjustment.

ALIGNMENT CONDITIONS

The chassis does not have to be removed from the cabinet for alignment purposes.

Remove the two screws from rear of cabinet; gently press the bottom of the rear section of the cabinet near the centre, then prise the cabinet sections apart commencing at the bottom

Volume Control - maximum volume (fully clockwise)
Output Level - 50 milliwatts, speaker voice coil disconnected.
Output Meter Connection - across secondary of output transformer.
Supply Voltage Source - 9 volt battery

INTERMEDIATE FREQUENCY TRANSFORMER ALIGNMENT

Oper. No.	Generator Connection	Generator Frequency	Dummy Aerial	Instructions
1.	To junction of term.4 of rod aerial and .04 cond.circuit No. 2.	455Kc/s	.1MF cond. in series with generator.	Turn tuning gang cond. to high freq. end stop, plates full open. Peak iron core of 3rd I.F. trans. for max. output.
2.	As oper. 1.	455Kc/s	As oper. 1.	Peak iron core of 2nd I.F. trans. for max. output.
3.	As oper. 1	455Kc/s	As oper. 1.	Peak iron core of 1st I.F. trans. for max. output.
4.	Repeat operations 1, 2 and 3.			

DIAL POINTER SETTING

1. Prise the push-in type metal insert from the centre of the transparent tuning knob.

2. Loosen the three $\frac{1}{4}$" x 3/32" Whit.csk.hd. screws fastening the washer in the centre of the tuning knob.

3. Fully mesh condenser gang plates, then set centre of end of travel spot near 535Kc/s on the dial reading to align with centre of indicator line on the dial background.

4. Securely tighten the three 3/32" screws in centre washer then refit push-in metal insert.

BROADCAST ALIGNMENT

A. To inject a signal into the receiver rod aerial, connect to the active terminal of the signal generator approximately two feet of aerial wire, then fashion the wire into a vertical position.

B. Place receiver chassis so that ferrite rod aerial is uppermost and horizontal and so that the movable winding end of the ferrite rod points to the 2 ft. of aerial wire. A distance of not less than 1 ft. is to be between the end of the ferrite rod and the 2 ft. of vertical aerial wire attached to the signal generator.

Oper. No.	Generator Connection	Generator Frequency	Instructions
1.	Refer para. A & B	600Kc/s	Turn tuning gang until centre of 600Kc/s spot on dial reading aligns with centre of indicator line on dial background. Peak iron core of oscillator coil for max. output while rocking gang to and fro through signal.
2.	As oper. 1.	1400Kc/s	Set dial 1400Kc/s spot on dial to pointer line. Peak oscillator and aerial trimmer condenser for maximum output.
3.	Repeat operation No. 1.		
4.	Repeat operation No. 2. Tuning range after alignment - 530:1630 Kilocycles.		

PRECAUTIONS WHEN TESTING TRANSISTOR RECEIVERS

A. A transistor is extremely sensitive to heat. If a soldering iron is to be used close to a transistor move the transistor or place non-conductive material between the iron and transistor.
When making soldered connections to the leads of the transistors hold the lead which is being soldered between the heat source and transistor body with pliers; excess heat will be dissipated away into the pliers. Use a soldering iron which supplies just the required heat for satisfactory soldering of connections.

B. When checking components, cut the long pigtail of the component in preference to unsoldering from the circuit board. Components checked in this way may be returned into the circuit by pressing the ends of the pigtail together then solder. Faulty components should be removed from the circuit board by cutting through the body of the component leaving two short stubs of wire protruding (approx. $\frac{1}{8}$") above the circuit board. The pigtail leads of the new component are to be soldered to these stubs.

C. A continuity meter must not be applied to the receiver wiring with the transistor in circuit. A transistor must not be checked for continuity with an ohmmeter as the applied voltage and resultant excess current flow may result in permanent damage to the transistor. A voltmeter of at least 20,000 ohms/volt or a high impedance vacuum tube type voltmeter is a safe means of measuring circuit voltage.

D. A screwdriver or similar instrument must not be used to short components together or to the common positive. The use of this method of checking for the existance of voltage or signal clicks may result in permanent damage to the transistors and components.

FAULT LOCATION GUIDE - CLICK TEST

Connect one end of a 6.8K ohm resistor to common positive. Touch the other end on and off the following points and listen for clicks. Volume control at maximum.

CHECK POINT Transistor Base	LOCATION Circuit Numbers at Junction Point	STRENGTH OF CLICK
2N408 Output	No. 25 & Driver secondary	very weak
2N408 Output	No. 26 & Driver secondary	very weak
2N406 Driver	Nos. 49, 53, 23	loud
2N406 First Audio	Nos. 45, 46, 19	loud
2N410 I.F.2	Pin 5 I.F.T. 2	very weak
2N410 I.F.1	Pin 4 I.F.T.1	weak
2N412 Converter	Nos. 31, 32, 2	loud

FAULT LOCATION GUIDE - GENERATOR TEST

Connect generator through a 0.1 mfd capacitor to the following points:-
CAUTION: Always start with low generator output. Strong signals, may, overload the receiver, or cause the AGC to function. Set volume control at maximum.

CHECKPOINT	LOCATION Circuit Nos. at Junction Point	SIGNAL GENERATOR FREQUENCY	SIGNAL STRENGTH
2N408 Output Base	No.25 Driver sec.	Audio	Weak
2N408 Output Base	No.26 & Driver sec.	Audio	Weak
2N406 Driver Base	Nos. 49, 53, 23	Audio	Increased Level
2N406 First Audio Base	Nos. 45, 46, 19	Audio	Further increase
Det.output at vol.cont.	Nos. 18, 44	Audio	Further increase
Turn tuning capacitor fully open.			
Det.output at Diode	Pin 5 I.F.T. 3	455Kc/s	Weak
2N410 I.F.2 Base	Pin 5 I.F.T. 2	455Kc/s	Increased level
2N410 I.F.1 Base	Pin 4 I.F.T. 1	455Kc/s	Further increase
2N412 Converter Base	No. 2 and aerial sec.	455Kc/s	Further increase
Tune receiver to generator at broadcast frequency			
2N412 Converter Base	No. 2 and aerial sec.	Sig. Freq.	Same level as at 455Kc/s.

SERVICE INSTRUCTIONS - MECHANICAL

1. TO REMOVE CIRCUIT BOARD FROM CABINET

A. Remove the metal insert from the centre of the tuning knob.

B. Remove the three 3/32" Whit. screws fastening the metal washer into the centre of the tuning knob.

C. Remove the metal washer and the tuning knob from the condenser gang bush.

D. Remove the push-on type knob from the volume control spindle.

E. Remove the two screws from the rear of the cabinet.

F. Gently press the bottom of rear section of the cabinet near the centre then prise the sections apart, commencing at the bottom.

G. Prise plug out of socket in battery then remove the battery.

H. Remove the six screws fastening circuit board to cabinet.

I. Pull slide connector off speaker terminals.

J. Lift circuit board out of cabinet.

K. Refitting of the circuit board to the cabinet is reverse procedure to removing it.

2. TO CHANGE DIAL READING

A. Remove the tuning dial knob from the condenser gang bush as detailed in paragraphs 1A, B, and C.

B. The dial reading is a press fit into the tuning knob and is located by four spigots.

C. Carefully prise or pull the dial reading out of the knob.

D. Locate the slots in the new dial reading with the spigots of the tuning knob then press the dial reading into the knob.

E. Refit the tuning dial knob to the condenser gang bush then the centre washer and the three 3/32" Whit.screws. Do not tighten the screws.

F. To set the tuning dial knob in the correct position refer to the Broadcast alignment procedure.

3. TO REMOVE THE BATTERY

A. Switch the receiver OFF.

B. Unscrew the two screws from the rear of the cabinet.

C. Gently press the bottom of rear section of the cabinet near the centre then prise the sections apart, commencing at the bottom.

D. Lift the battery upward and disconnect the two pin plug from the battery.

E. Fitting of a new battery is the reverse procedure to removing it.

4. RECEIVER SERIAL NUMBER

A. Remove two screws from the rear of the cabinet.

B. Gently press the bottom of rear section of the cabinet near the centre then prise the section apart, commencing at the bottom.

C. The serial number is stamped into a metal tag located on the board between the tuning gang and the driver transformer.

STORAGE WHEN OUT OF USE

It is not advisable to leave an exhausted battery in the receiver. If the receiver is stored away or not required for long periods, even partly-used batteries should be removed and stored in a dry cool place. This is a precautionary measure against the swelling and corroding action of worn-out batteries, which applies to all battery operated devices, such as torches, etc.

CLEANING AGENT FOR CABINET

Do not polish the moulded case or plastic sections with an abrasive material motor car polish, boot polish, or similar household cleaning fluids as permanent damage may result to the finish of the case and plastic sections. To restore the lustre of the moulded case wipe with a soft cloth dampened with water and lightly polish with a neutral wax.

Circuit No.	Condensers	Tol.	Rating D.C.W.	Part No.
1	Tuning, two gang,			4000-018-01
2	.01 MF Ceramic	+80%-20%	33V	C391
3.	.01 MF Ceramic	+80%-20%	33V	C391
4	.01 MF Ceramic	+80%-20%	33V	C391
5	220 pF Tubular ceramicon	±5%	33V	C392
6	.01 MF Ceramic	+80%-20%	33V	C391
7	10 MF Electrolytic	+250%-10%	6V	C322
8	8.2 pF Disc Ceramicon	±5%	500V	C404
9	220 pF Tubular ceramicon	±5%	33V	C392
10	.01 MF Ceramic	+80%-20%	33V	C391
11	100 MF Electrolytic	+250%-10%	12V	C457
12	.01 MF Ceramic	+80%-20%	33V	C391
13	27 pF Disc ceramicon	±5%	500V	C451
14	220 pF Tubular ceramicon	±5%	33V	C392
15	.01 MF Ceramic	+80%-20%	33V	C391
16	.01 MF Metallised paper	±20%	200V	C459
17	.01 MF Ceramic	+80%-20%	33V	C391
18	2 MF Electrolytic	+250%-10%	6V	C323
19	2 MF Electrolytic	+250%-10%	6V	C323
20	3-30 pF Wire Wound Trimmer			PC663
21	.01 MF Ceramic	+80%-20%	33V	C391
22	50 MF Electrolytic	+250%-10%	3V	C307
23	2 MF Electrolytic	+250%-10%	6V	C323
24	50 MF Electrolytic	+250%-10%	3V	C307
25	.01 MF Ceramic	+80%-20%	33V	C391
26	.01 MF Ceramic	+80%-20%	33V	C391
27	.01 MF Ceramic	+80%-20%	33V	C391
28	100 MF Electrolytic	+250%-10%	12V	C457
29	5-30pF Compression trimmer			4000-023-01
30				

RESISTORS

Circuit No.	Resistors	Tol ±	Rating	Part No.
31	56,000 ohm carbon	10%	½W	R5632
32	10,000 ohm carbon	10%	½W	R1032
33	2,200 ohm carbon	10%	½W	R2222
34	1,000 ohm carbon	10%	½W	R1022
35	330 ohm carbon	10%	½W	R3312
36	3,300 ohm carbon	10%	½W	R3322
37	2,200 ohm carbon	10%	½W	R2222
38	18,000 ohm carbon	10%	½W	R1832
39	560 ohm carbon	10%	½W	R5612
40	100,000 ohm carbon	10%	½W	R1042
41	4,700 ohm carbon	10%	½W	R4722
42	150,000 ohm carbon	10%	½W	R1532
43	220 ohm carbon	10%	½W	R2212
44	Volume Control 10,000 ohm SP.ST. switch attached			4032-007-02
45	6,000 ohm carbon	10%	½W	R5632
46	5,600 ohm carbon	10%	½W	R5622
47	1,000 ohm carbon	10%	½W	R1022
48	6,800 ohm carbon	10%	½W	R6822
49	4,700 ohm carbon	10%	½W	R4722
50				
51	820 ohm carbon	10%	½W	R8212
52	10 ohm carbon	10%	½W	R1002
53	33,000 ohm carbon	10%	½W	R3332
54	6,800 ohm carbon	10%	½W	R6822
55	220 ohm carbon	10%	½W	R2212
56	4.7 ohm wire w.	5%	½W	R194
57	220 ohm disc NTC	20%	1¼W	R441
58	220 ohm carbon	10%	½W	R2212
59	820 ohm carbon	10%	½W	R8212

MISCELLANEOUS

60	Aerial loading coil	PT942
61	Rod aerial coil	L578
62	Oscillator coil	L532
63	No. 1 IF transformer	L574
64	No. 2 IF transformer	L643
65	No. 3 IF transformer	L576
66	Driver transformer - 5000 to 2500 ct. ohms impedance	T283
67	Speaker transformer - 400 ct. to 15 ohms impedance	T291
68	Speaker - 3" permag type 3C 15 ohms voice coil imped.	K250
69	ON/OFF switch - part of volume control circuit No. 44	
70	Plug - 2 pin, battery connection	482/30C
71	Transistor - Mixer/oscillator, type 2N412	4128-011-02
72	Diode - A.G.C., type 1N295	1N295
73	Transistor - I.F. amp. No.1, type 2N410	4128-010-02
74	Transistor - I.F. amp, No. 2 type 2N410	4128-010-02
75	Diode - Detector/A.G.C. type 1N295	1N295
76	Transistor - Audio amp., type 2N406	4128-009-02
77	Transistor-audio driver type 2N406	4128-009-02

Circuit No.	Miscellaneous	Part No.
78	Audio output, type 2N408	4128-008-03
79	Transistor - Audio output type 2N408	4128-008-03
80	9 volt battery - Eveready type 276-P	M470
	Terminal clip (2) speaker lead	7244-001-01
	Mount pillar (2) rod aerial	808/81
	Nut plate (2) mount pillar, $\frac{1}{8}$" whit.	11/685-3
	Spacer (7) transistor mt.	7294-012-01
	Bracket - battery stop	7027-074-01
	Bracket (2) cabinet rear fastening	164/849
	Speednut (2) rear bracket ext. aerial and earth	476/250-26
	Speednut (4) speaker fastening	627/250-1
	Screw (6) $\frac{3}{8}$" x No.6 Phillips pan.hd. self-tapping, circuit board	78/560-14
	Screw (3) $\frac{3}{8}$" x No.4 BA. csk. hd. cond. gang mt.	53/560-6
	Bush (3) cond. gang mt.	10/864
	Grommet (3) cond. gang mt.	5/91
	Nut. - volume control mt.	542/250
	Washer - 7/64" int. shakeproof - vol. cont. mt.	1/562-2
	Bush - tuning spindle	7031-035-03
	Grub screw (2) 3/16" x 5/32" whit. bush	30/560-3
	Dial background	90/349
	Tuning dial knob assy. - gold trim A114/849-1 - chrome trim	A114/849-2
	Centre insert - tuning knob gold 7119-002-02 - chrome	7119-002-03
	Dial reading	7070-009-01
	Volume control knob	302/81-2
	Circlip - vol. knob	22/755
	Washer - centre tuning knob location	30/755
	Screw (3) $\frac{1}{4}$" x 3/32" Whit. csk. hd. - centre tuning knob	7198-125-07
	Screw (2) 7/16" x 4 BA. - special ext. aerial and earth, rear cab. fastening	236/415-6
	Screw (2) $\frac{3}{8}$" x $\frac{1}{8}$" whit. rd. hd. mt. pillar	7198-176-53

STYLING

CABINET ASSY. COMPLETE: Includes cabinet front, organdie, escutcheon, name panel, grille, neoprene, gasket.

Quote whether gold or chrome trim required.

CABINET FRONT	ESCUTCHEON	
GREY	CHERRY RED	A150/849-1
OLD ROSE	CHARCOAL	A150/849-2
CHARCOAL	LIME	A150/849-3
WHITE	CHERRY RED	A150/849-4
CHERRY RED	GREY	A150/849-5
CHARCOAL	OLD ROSE	A150/849-6
LIME	CHARCOAL	A150/849-7
CHERRY RED	WHITE	A150/849-8
CHARTREUSE	CHARCOAL	A150/849-9
CHARCOAL	CHARTREUSE	A150/849-10

ESCUTCHEON ASSY: Includes escutcheon, name panel, grille, neoprene, gasket. Quote whether gold or chrome trim required.

ESCUTCHEON	NAME PANEL	
CHERRY RED	GREY	A148/849-21
CHARCOAL	OLD ROSE	A148/849-22
LIME	CHARCOAL	A148/849-23
CHERRY RED	WHITE	A148/849-9
GREY	CHERRY RED	A148/849-24
OLD ROSE	CHARCOAL	A148/849-25
CHARCOAL	LIME	A148/849-26
WHITE	CHERRY RED	A148/849-3
CHARCOAL	CHARTREUSE	A148/849-27
CHARTREUSE	CHARCOAL	A148/849-28

CABINET BACK ASSEMBLY:

CHERRY RED	A151/849-1
CHARCOAL	A151/849-2
LIME	A151/849-3
GREY	A151/849-5
OLD ROSE	A151/849-6
CHARTREUSE	A15/849-7
WHITE	A151/849-8

CARRY BAG

BROWN BROWN	2210/250	BLACK	2210/250-1

AERIAL TRIMMER CONDENSER CIRCUIT NO. 29

This condenser shown on the circuit diagram has 1.5 - 15pF was changed during the first production run to a 5-30 pF compression trimmer.