

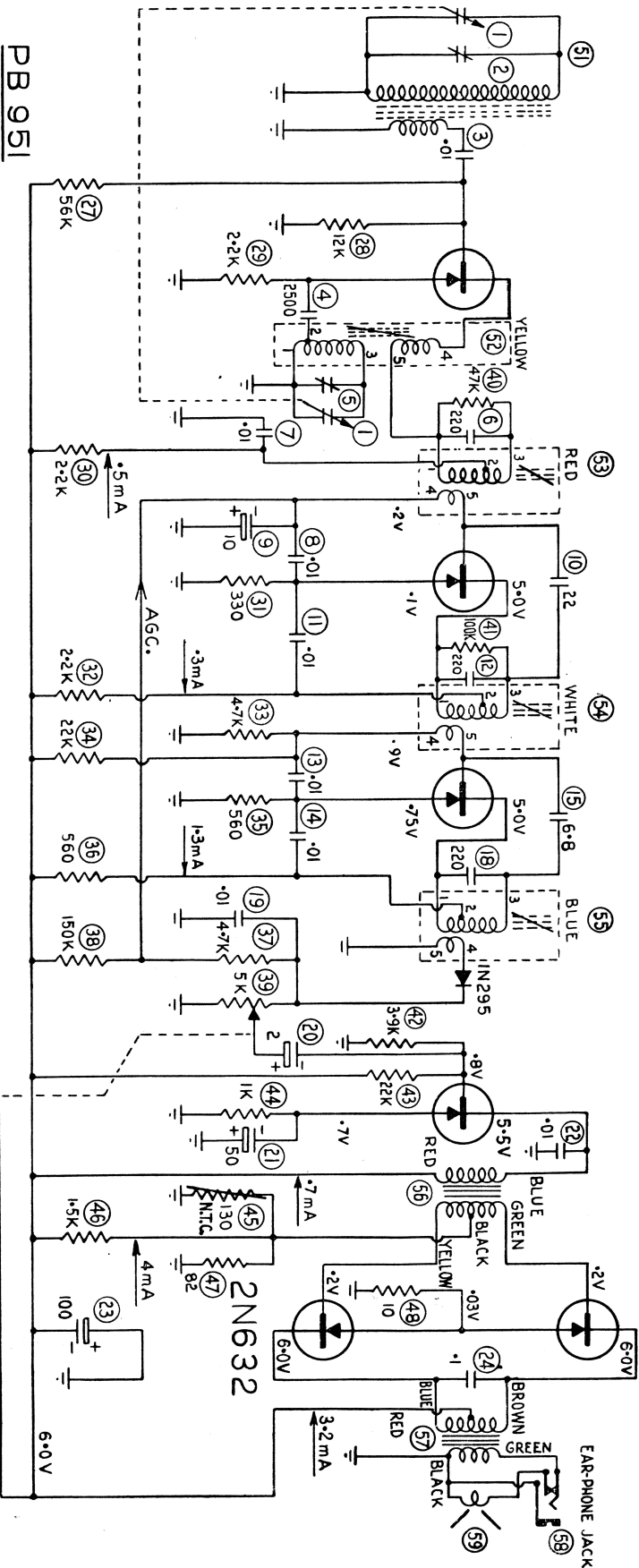
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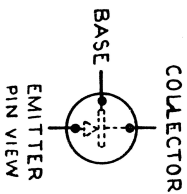
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ALL VOLTAGES MEASURED BETWEEN POINTS INDICATED AND COMMON POSITIVE WITH A DC. VACUUM TUBE VOLTMETER. (NO SIGNAL).

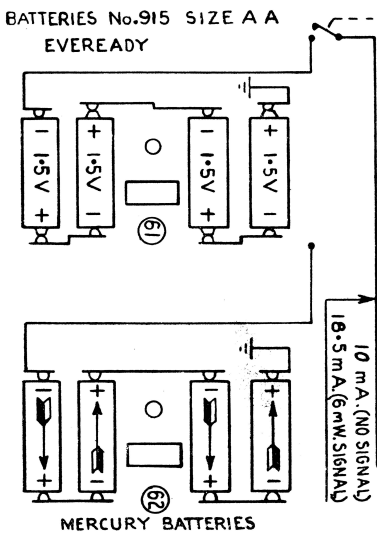


1.F. & OSCL.
TRANSFORMER
BASES -PIN VIEW.

CURRENTS INDICATED ARE MEASURED WITH AVO MULTIMETER - MODEL 8.

MODEL-CPN
ISSUE 7

1.F. 455K c/s.





RADIO CORPORATION PTY. LTD.

DIVISION OF ELECTRONIC INDUSTRIES LTD.

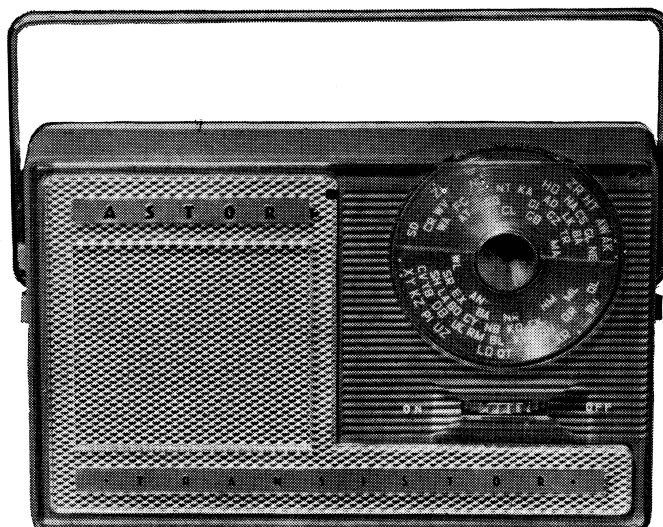
126-130 GRANT STREET, SOUTH MELBOURNE, S.C.4.

TECHNICAL BULLETIN

File: Receivers
Portable.
BULLETIN: CPN-1.
Date: 12-11-58.
Page: 1.

ASTOR MODEL "CPN"

6 TRANSISTOR MIDGET PORTABLE RECEIVER



THIS BULLETIN CONTAINS:

1. Alignment Instructions.
2. Circuit Diagram.
3. Component Parts List.
4. IF. & RF. Trans. Connections.
5. Transistor Placement Diagram.
6. Battery Replacement Instructions and Diagram.
7. Instruction for Removing Chassis from Plastic Case.
8. Receiver Serial Number.
9. Receiver Servicing Precautions.
10. Instructions for Replacing Dial.

TO REMOVE RECEIVER CHASSIS FROM
MOULDED PLASTIC CASE

NOTE: When removing receiver chassis from plastic case exercise extreme care to avoid breaking ferrite slab aerial leads which connect to the receiver.. Lead connections to receiver are shown on the concluding pages of this bulletin.

1. Unscrew and remove two screws located about the centre of the back.
2. Prise back section off body section by inserting a knife blade between the two sections.
3. Place receiver front face downward then remove batteries by pulling ends of tape protruding from beneath batteries.
4. Unscrew and remove a screw from each of the lower cavities in the battery holder.
5. Unscrew and remove hexagonal bush located between vol. control and tuning condenser gang.
6. Loosen ends of slab aerial from mount positions by easing the ends out of the mount cushions.
7. Place left hand of operator over exposed rear of receiver then turn complete receiver over and retain it gripped in palm of operators left hand so that when receiver chassis is released from the plastic case as detailed in the following paragraphs it falls into operators left hand.
8. With operators right hand unscrew and remove gold coloured boss in centre of dial tuning disc by turning the boss anti-clockwise.
9. Retain receiver in palm of operators left hand with front face of receiver uppermost.
10. Place rear edge of dial end of receiver plastic case on to the edge of a table or bench.
11. Hold receiver firm then with the blunt end of a rod ($\frac{1}{4}$ " dia. approx.) press dial centre bush through dial disc, so that receiver chassis falls into palm of operators left hand.

TO REFIT CHASSIS TO MOULDED PLASTIC CASE.

1. In palm of operators left hand place receiver chassis so that speaker is toward wrist and uppermost.
2. Place plastic bush onto tuning condenser shaft. Turn bush until flats inside bush fit flats on shaft then press bush firmly on to shaft.
3. Place chassis into plastic case by entering first the battery end then tuning cond. end.
4. Press rear end of tuning cond. spindle so that plastic bush on cond. shaft fully enters hole in tuning indicator disc (Do not press trim. condensers on rear of tuning cond. from their adjusted positions).
5. Fit ends of slab aerial into sockets at ends of plastic case.
6. Refit hexagonal spacer (finger tight) on to screw protruding through chassis between vol. control and tuning condenser.
7. Refit gold coloured boss into front of bush on cond. shaft. Turn boss clockwise to tighten.
8. Tighten hexagonal spacer between vol. control and tuning condenser then refit two screws which fasten battery box to plastic case.
9. Place tapes across battery box cavities then refit batteries, refer battery replacement diagram, for correct polarity.
10. Switch receiver "ON" and check station logging. Should adjustment be required loosen gold coloured boss by turning it anti-clockwise. Adjust disc the required distance then retighten the boss. The dial disc is to be adjusted for optimum logging.
11. Two screws and locknuts are provided in the tuning cond. mount bracket for clearance adjustment of the dial disc between the escutcheon and the plastic case.
12. Refit rear section of plastic case and fasten in position with two screws previously removed.

TO REMOVE DIAL READING AND TO REFIT NEW DIAL READING.

NOTE: When a new dial reading is fitted the transparent plastic escutcheon on front of receiver case must also be replaced. Part numbers are shown in the parts list of this bulletin.

1. Remove receiver chassis from plastic case as detailed in para. "To remove receiver chassis from moulded plastic case".
2. From rear of plastic case drill out six heat sealed spigots fastening escutcheon to case. ($\frac{1}{8}$ " dia. drill.)

3. Prise escutcheon off by inserting a knife blade between escutcheon and front of case near dial edge.
4. Locate printed side of new dial reading onto new escutcheon. Use warm tip of soldering iron on two small spigots at edge of centre hole to heat seal dial to escutcheon.
5. Place grille then rubber gasket onto escutcheon spigots.
6. Place dial disc, pointer side down, onto dial on escutcheon.
7. Place receiver plastic case onto escutcheon spigots so that spigots locate through holes in plastic case.
8. Use a warm iron tip on the six spigots to heat seal escutcheon to case. When sealing the parts together press firmly with a screwdriver about $\frac{1}{4}$ " from spigots.
9. Refit receiver chassis to plastic case as detailed in para. "To refit chassis to moulded plastic case".

PRECAUTIONS WHEN TESTING TRANSISTOR RECEIVERS.

1. A transistor is extremely sensitive to heat. When a defective component is being replaced use a soldering iron which supplies just the required heat for unsoldering the connections. If the soldering iron is to be used close to a transistor, remove the transistor from its socket before applying the iron. The short wires protruding from the transistors must not be heated to make direct connections.
2. 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 voltages.
3. 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 existence of voltage or signal clicks will result in permanent damage to the transistors and components.

Speaker input transformer part No. T217 code No. TR33 is being used in place of speaker input transformer part No. T200 code No. TR22 until transformer T200 is available.

DRIVER TRANSFORMER

Driver transformer part No. T218 code No. DR33 is being used in place of driver transformer part No. T199 code No. DR22 until transformer T199 is available.

CIRCUIT NO. 4.

Until 2500 MMF cond. Part No. C340 are available a 1500 MMF disc ceramicon cond. tol. plus or minus 20% 500V DCW K2000 part No. C340-1 is being used.

CIRCUIT NO. 10.

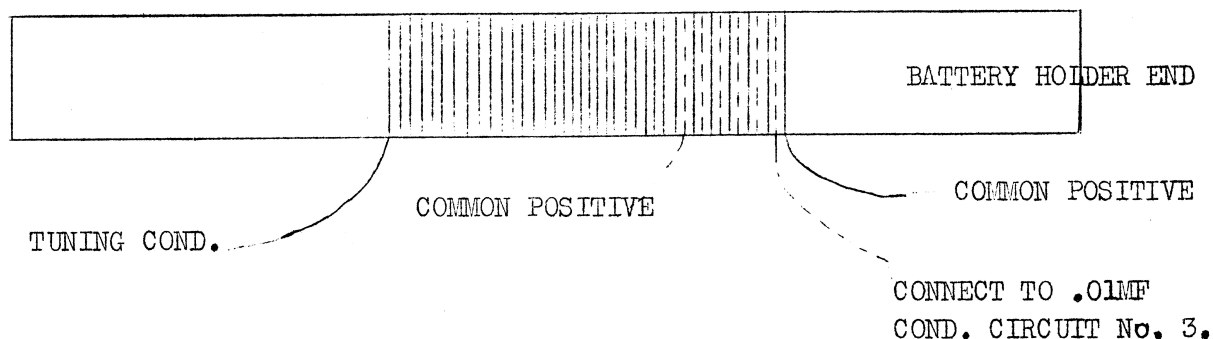
Until 22 MMF cond. part No. C352 are available a 25 MMF disc ceramicon cond. tol. plus or minus 5% 500V DCW N750 part No. C352-1 is being used.

IF. INSTABILITY

A 33,000 Ohm 10% $\frac{1}{2}$ W carbon resistor part No. R3332 is being used in place of the 47,000 Ohm resistor(circuit No. 40) on some receivers to prevent IF. instability.

OSCILLATOR AND IF. TRANS. CONNECTIONS.

Ocil Oscillator and IF. transformer connections and a numbered pin view of the transformer bases are shown on the circuit diagram.

FERRITE SLAB AERIAL CONNECTIONSRECEIVER PRESENTATION BOX

Base Section - (recessed sections for receiver
and earphone assembly Part No. 1/856
Cover Section - " " 2/856

MODEL "CPN"

6 TRANSISTOR MIDGET PORTABLE RECEIVER

FOR OPERATION FROM: 6 Volts DC. (four 1.5 volt batteries in series)

CURRENT CONSUMPTION: 10 mA. (no signal)
18.5 mA. (6 mW. signal)

POWER OUTPUT: 100 Milliwatts

INTERMEDIATE FREQUENCY: 455 Kc/s.

TUNING RANGE: 535 ~ 1610 Kc/s.
560.7 - 186.3 Metres.

ALIGNMENT PROCEDUREEQUIPMENTALIGNMENT CONDITIONS

Signal Generator:
Output Meter :
Plug : Part No. M502 for fitting to output meter leads.
Mica. Capacitor : .01MF type PC145 for I.F.T. alignment.
Alignment Tool : Type PM581 for adjustment of RF. trimmers.
Alignment Tool : Type M501 for I.F.T. core and oscil. coil core adjustment

Output Meter: Connect output meter leads to plug part No. M502 then insert plug into earphone socket on receiver. Insertion of the plug disconnects the speaker voice coil. No audible note will be present, the output signal is only by indication on the meter.

Output Meter :
Load Impedance: 15 ohms.
Output Level : 6 Milliwatts. (voice coil open)
Vol. Control : Max. vol. (full on)
IF. Frequency : 455 Kc/s.
Battery : 6 Volts (four 1.5 volt batteries in series.)

IF. TRANSFORMER ALIGNMENT

NOTE: 1. Two peaks may be obtained when adjusting the iron core in the IF. transformers. The correct peak is when the core is screwed furthest toward top of transformer.

2. The receiver does not have to be removed from the moulded case for alignment purposes.

It is only necessary to remove the rear section of the moulded case from the front section.

Unscrew the two screws at the rear of the case then gently prise off the rear section.

3. The connection point on the receiver for the generator IF. signal is the converter transistor 2N486 socket base lug and is accessible as detailed below.

Alongside the oscillator transformer (colour coded yellow) are two resistors mounted vertically.

Connect IF. generator attenuator active lead to the top end (pigtail lead) of the resistor (12,000 ohms) which is the resistor nearest to the oscillator transformer.

Connect other lead of IF. generator attenuator to cond. gang frame.

Oper. No.	Generator Connection	Generator Frequency	Dummy Antenna	Instructions
1.	Refer para. 3.	455 Kc/s.	0.01 MF mica. cond. in series with generator	Turn tuning cond. gang plates fully out of mesh. Peak 3rd IF. trans. iron core for max. output. (refer note 1.)
2.	"	"	"	Peak 2nd IF. trans. iron core for max. output.
3.	"	"	"	Peak 1st IF. trans. iron core for max. output.
4.	"	"	"	Repeak operations 1 and 2 and 3.

NOTE: 1st I.F.T. colour coded - red
 2nd I.F.T. " " - white
 3rd I.F.T. " " - blue
 Osci. trans. " " - yellow

BROADCAST ALIGNMENT

- A. To inject a signal into the receiver ferrite strip aerial, connect to the active terminal of the signal generator attenuator approximately 2 ft. of aerial wire, then fashion the wire to a vertical position.
- B. Place receiver so that ferrite strip aerial is uppermost and horizontal and so that volume control end of moulded case is nearest to the 2 ft. of vertical aerial wire.
A distance of not less than one foot is to be between the two feet of vertical aerial wire and the end of the receiver.

Oper. No.	Generator Connection	Generator Frequency	DjDummy Antenna	Instructions
1.	Refer para. A and B	525 Kc/s.	Refer para. A and B	Fully mesh cond. gang plates then peak osc. coil (colour coded yellow) iron core.
2.	" "	1615 Kc/s.	" "	Cond. gang plates fully out of mesh, peak osc. trimmer condenser. (trim. nearest 1st I.F.T.)
3.	" "	1470 Kc/s.	" "	Tune receiver accurately to 1470 Kc/s. generator signal and adjust aerial and osc. trimmer conds. for max. output. Do not rock cond. gang to and fro through the signal while adjusting the trimmers.
4.	" "	600 Kc/s.	" "	Repeak osc. coil iron core for max. output. Rock cond. gang to and fro through the signal while adjusting the iron core.
5.	" "	1470 Kc/s.	" "	Repeat operations No. 3 and 4
6.	Tuning range after alignment 535 - 1610 Kc/s. (minimum).			

TUNING INDICATOR DISC. SETTING.

Loosen the locking screw in the centre of the tuning indicator disc. Rotate the disc for optimum logging of the local stations, then retighten the locking screw. To loosen the locking screw, hold the tuning disc securely then turn the locking screw anti-clockwise.

Circuit No.	Description	Tol ⁺	Rating	Part No.
1.	2 Gang variable condenser			C295
2.	Aerial trimmer condenser - part of circuit No.1.			
3.	.01 MF Disc ceramicon condenser	+50%-25%	100V DCW	C326
+ 4.	Disc. ceramicon condenser 2500 MMF	GMV	500V DCW	C340
5.	Osc. trimmer condenser - part of circuit No.1.			
6.	220 MMF Silvered mica condenser	2 $\frac{1}{2}$ %	500V DCW	C324
7.	.01 MF Disc. ceramicon condenser	+50%-25%	100V DCW	C326
8.	.01 MF Disc. ceramicon condenser	+50%-25%	100V DCW	C326
9.	10 MF Electrolytic condenser	+250%-10%	6VW	C322
+ 10.	22 MMF Disc. ceramicon NPO	5%	500V DCW	C352
11.	.01 MF Disc ceramicon condenser	+50%-25%	100V DCW	C326
12.	220 MMF Silvered mica condenser	2 $\frac{1}{2}$ %	500V DCW	C324
13.	.01 MF Disc. ceramicon condenser	+50%-25%	100V DCW	C326
14.	.01 MF Disc. ceramicon condenser	+50%-25%	100V DCW	C326
15.	6,8 MMF Disc. ceramicon condenser NPO	5%	500V DCW	C344
16.				
17.				
18.	220 MMF Silvered mica condenser	2 $\frac{1}{2}$ %	500V DCW	C324
19.	.01 MF Disc. ceramicon condenser	+50%-25%	100V DCW	C326
20.	2 MF Electrolytic condenser	+250%-10%	12VW	C323
21.	50 MF Electrolytic condenser	+250%-10%	3VW	C307
22.	.01 MF Disc. ceramicon condenser	+50%-25%	100V DCW	C326
23.	100 MF Electrolytic condenser	+250%-10%	6VW	C321
24.	.1 MF Disc. ceramicon condenser	+50%-25%	100V DCW	C325
25.				
26.				
27.	56,000 ohm carbon resistor	10%	$\frac{1}{2}$ watt	R5632
28.	12,000 ohm carbon resistor	10%	$\frac{1}{2}$ watt	R1232
29.	2,200 ohm carbon resistor	10%	$\frac{1}{2}$ watt	R2222
30.	2,200 ohm carbon resistor	10%	$\frac{1}{2}$ watt	R2222
31.	330 ohm carbon resistor	10%	$\frac{1}{2}$ watt	R3312
32.	2,200 ohm carbon resistor	10%	$\frac{1}{2}$ watt	R2222
33.	4,700 ohm carbon resistor	10%	$\frac{1}{2}$ watt	R4722
34.	22,000 ohm carbon resistor	10%	$\frac{1}{2}$ watt	R2232
35.	560 ohm carbon resistor	10%	$\frac{1}{2}$ watt	R5612
36.	560 ohm carbon resistor	10%	$\frac{1}{2}$ watt	R5612
37.	4,700 ohm carbon resistor	10%	$\frac{1}{2}$ watt	R4722
38.	150,000 ohm carbon resistor	10%	$\frac{1}{2}$ watt	R1542
39.	5,000 ohm potentiometer SP.ST. switch attached			R262
+ 40.	47,000 ohm carbon resistor	10%	$\frac{1}{2}$ watt	R4732
41.	100,000 ohm carbon resistor	10%	$\frac{1}{2}$ watt	R1042
42.	3,900 ohm carbon resistor	10%	$\frac{1}{2}$ watt	R3922
43.	22,000 ohm carbon resistor	10%	$\frac{1}{2}$ watt	R2232
44.	1,000 ohm carbon resistor	10%	$\frac{1}{2}$ watt	R1022
45.	130 ohm disc. type NEG. TEMP. coefficient resistor	10%	1 watt	R167

46	1,500 Ohm carbon resistor	10%	$\frac{1}{2}$ watt	R1522
47	82 Ohm wire wound resistor	10%	$\frac{1}{2}$ watt	R157
48	10 Ohm wire wound resistor	10%	$\frac{1}{2}$ watt	PR553
49				
50				
51	Ferrite slab aerial - slab width $\frac{5}{8}$ "			L380
52	Oscillator coil (yellow spot)			L358
53	1st IF. transformer (red spot)			L360
54	2nd IF. transformer (white spot)			L361
55	3rd IF. transformer (blue spot)			L362
56	Driver transformer 4,500 : 1100 ohms impd. centre tapped sec. type DR22			T199
57	Speaker transformer 320 CT. : 15 ohms impd. type TR22			T200
58	Earphone jack socket			A127/250
59	Speaker - $2\frac{3}{4}$ " dia. permag type 'C' 15 ohm V.C. impd.			K218
60				
61	1.5 Volt battery (4) Eveready type 915			M491

+ Circuit No.4. Until 2500 MMF cond. part No. C340 are available a 1500 MMF disc ceramicon cond. tol. plus or minus 20% 500V DCW K2000 part No. C340-1 is being used.

+ Circuit No.10. Until 22 MMF cond. part No. C352 are available a 25 MMF disc ceramicon cond. tol. plus or minus 5% 500V DCW N750 part No. C352-1 is being used.

+ Circuit No. 40. A 33,000 Ohm 10% $\frac{1}{2}$ W carbon resistor part No. R3332 is being used in place of the 47,000 Ohm resistor on some receivers to prevent IF. instability.

Earphone Lead & Plug.	M485	Battery Holder	536/81
Tuning cond. mt. bracket	22/849	Contact (2) single-	
Spacer - fastens receiver		battery holder	19/849
to moulded case	32/849	Contact (2) double-	
Speaker clip ring.	21/849	battery holder	20/849
Transistor socket (6)	A101/849		

MOULDED PLASTIC CASE STYLING LIST

PLASTIC CASE FRONT SECTION ASSY. (includes escutcheon, "ASTOR" and "TRANSISTOR" name strips, grille, dial reading, tuning indicator disc, disc centre bush, washer, grille rubber gasket and mount screw.

PLASTIC CASE FRONT SECTION ASSY.

Part No.

Blossom Pink	-	fitted with N.S.W. dial reading	A104/849-21
Coral	-	" " " " " "	A104/849-22
Cherry Red	-	" " " " " "	A104/849-23
Chinese Red	-	" " " " " "	A104/849-24
Dark Green	-	" " " " " "	A104/849-25
Grey	-	" " " " " "	A104/849-26
Black	-	" " " " " "	A104/849-27
Lime	-	" " " " " "	A104/849-28
Tan	-	" " " " " "	A104/849-29
Lawn Green	-	" " " " " "	A104/849-210
Charcoal	-	" " " " " "	A104/849-211
Blossom Pink	-	fitted with VIC/TAS dial reading	A104/849-31
Coral	-	" " " " " "	A104/849-32
Cherry Red	-	" " " " " "	A104/849-33
Chinese Red	-	" " " " " "	A104/849-34
Dark Green	-	" " " " " "	A104/849-35
Grey	-	" " " " " "	A104/849-36
Black	-	" " " " " "	A104/849-37
Lime	-	" " " " " "	A104/849-38
Tan	-	" " " " " "	A104/849-39
Lawn Green	-	" " " " " "	A104/849-310
Charcoal	-	" " " " " "	A104/849-311
Blossom Pink	-	fitted with QLD dial reading	A104/849-41
Coral	-	" " " " " "	A104/849-42
Cherry Red	-	" " " " " "	A104/849-43
Chinese Red	-	" " " " " "	A104/849-44
Dark Green	-	" " " " " "	A104/849-45
Grey	-	" " " " " "	A104/849-46
Black	-	" " " " " "	A104/849-47
Lime	-	" " " " " "	A104/849-48
Tan	-	" " " " " "	A104/849-49
Lawn Green	-	" " " " " "	A104/849-410
Charcoal	-	" " " " " "	A104/849-411
Blossom Pink	-	fitted with SA/WA dial reading	A104/849-51
Coral	-	" " " " " "	A104/849-52
Cherry Red	-	" " " " " "	A104/849-53
Chinese Red	-	" " " " " "	A104/849-54
Dark Green	-	" " " " " "	A104/849-55
Grey	-	" " " " " "	A104/849-56
Black	-	" " " " " "	A104/849-57
Lime	-	" " " " " "	A104/849-58
Tan	-	" " " " " "	A104/849-59
Lawn Green	-	" " " " " "	A104/849-510
Charcoal	-	" " " " " "	A104/849-511

Escutcheon Assy. - includes	"ASTOR" and "TRANSISTOR" name strips	A107/849
	"ASTOR" name strip	27/849
	"TRANSISTOR" name strip	26/849
Speaker Grille.		24/849
Grille Gasket - rubber		40/849
Dial Reading - N.S.W.		36/849-2
" " - VIC/TAS.		36/849-3
" " - QLD		36/849-4
" " - SA/WA		36/849-5
Tuning Indicator Disc.		554/81
Centre Bush - tuning disc.		571/81
Washer - front of tuning disc.		
Felt Washer - rear of tuning disc.		
Mount screw - fastens receiver assy. to moulded case		236/415

Handle	31/849	Moulded case back	
Screw (2) fastens back section		section - white	545/81
to front section	236/415	Foam Styrene pad -	
Dial disc locking screw -		slab aerial mt.	44/849
gold plate	25/849		

To view the serial number fully mesh condenser gang plates then unscrew the two screws fastening the centre of the moulded back to the front section. Prise the sections apart.

To restore the lustre of the moulded case wipe with a soft cloth dampened with water and lightly polish with a neutral wax.

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 partially 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.

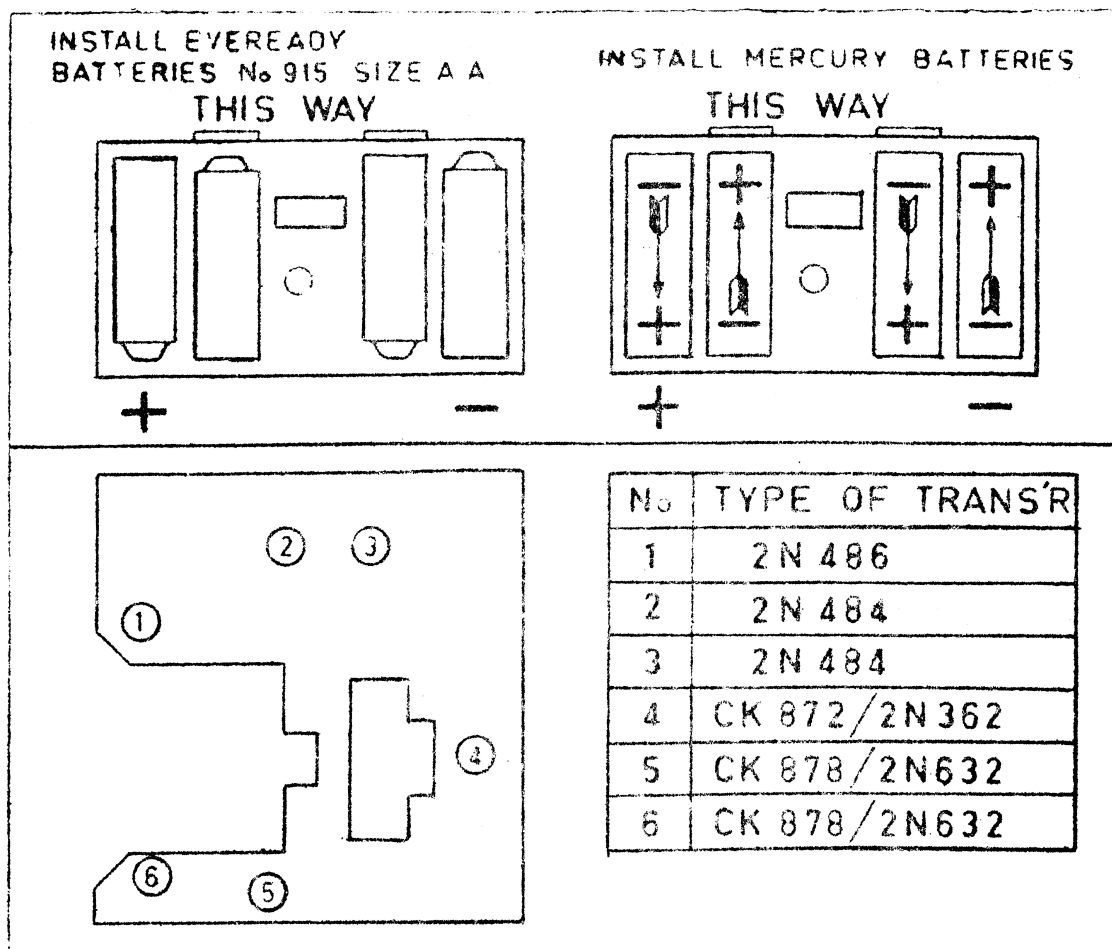
BATTERY REPLACEMENT

About the centre of the back of the moulded case are two screws. Unscrew and remove these two screws then prise off rear section of case. Replacement type batteries are detailed in the parts list.

NOTE: It is most important that the batteries be installed with their polarity as shown in the diagram below

BATTERY CONNECTIONS OF INCORRECT POLARITY
WILL DAMAGE THE RECEIVER

Two tapes are provided for ease of battery removal. Before fitting new batteries lay the tapes into the cavities of the battery holder.



SERVICE DEPARTMENT REPORT

Model _____

Serial No. _____

Date _____

FROM _____

ADDRESS _____

SERVICE DEPARTMENT SUGGESTIONS

Service Department Personnel may materially assist our Design Engineers in the development of new designs or in the improvement of existing models.

As new models are returned for service, we invite your comments on items such as :-

Is the product accessible for servicing ?

Is there any advice or help we may offer regarding Service Equipment or Methods of Servicing ?

Is any component known to be troublesome ?

Is the packaging adequate to ensure the product is delivered in first class condition ?

Is the product performance satisfactory ?

Is the service data supplied sufficient ?

Is the service data supplied in the best form for your use ?

On the attached sheets write us your suggestions or problems and forward the sheets to :-

The Field Liaison Section,
Design Department,
126 Grant Street,
SOUTH MELBOURNE. VICTORIA

Your suggestions will, at all times, receive full consideration.
You will be advised of what action is taken in regard to same.

REMEMBER - YOUR PROBLEMS ARE OUR PROBLEMS