

**RADIO CORPORATION PTY. LTD.**

DIVISION OF ELECTRONIC INDUSTRIES LTD.

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

**TECHNICAL BULLETIN**

File: Receivers  
Portable

BULLETIN: GRQ-1

Date: 16-11-59

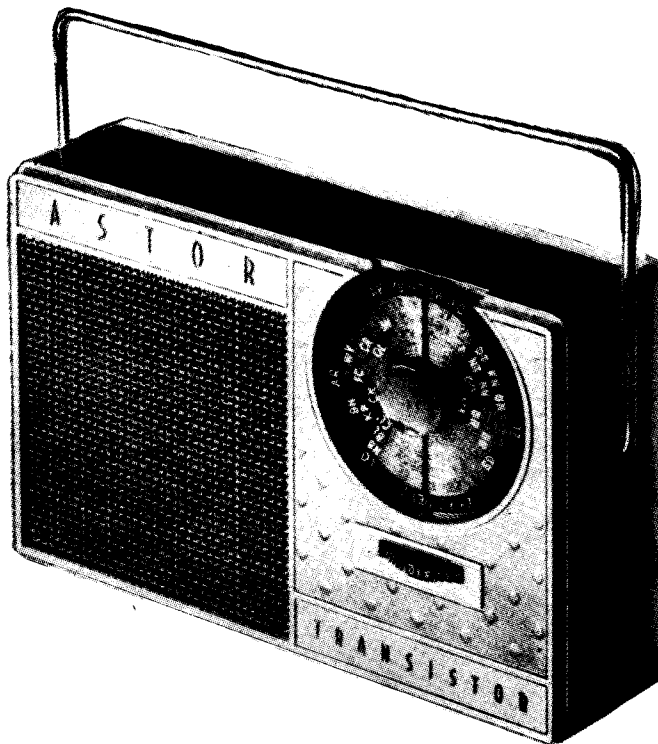
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**ASTOR**

## **ASTOR MODEL "GRQ"**

**6 TRANSISTOR MIDGET PORTABLE RECEIVER**

**IN A LEATHER CARRYING CASE**



**TUNING RANGE:**

535-1610 Kilocycles.

**INTERMEDIATE  
FREQUENCY:**

455 Kilocycles.

**POWER OUTPUT:**

100 Milliwatts.

**BATTERIES:**

6 Volts DC. (four 1.5 Volt batteries connected in series).

**BATTERY**

**CONSUMPTION:**

10 Milliamps (no signal).

18.5 Milliamps (6 milliwatt signal).

**WEIGHT:**

1 lb. 14 ozs. (includes receiver, batteries, leather case, shoulder strap and earphone pouch).

**CARRYING CASE:**

Shoulder strap, earphone pouch and carrying case solid leather.

Length 6 $\frac{3}{8}$ ", height 4 $\frac{3}{8}$ ", width 1 $\frac{7}{8}$ ", excluding case flap fastening clip.

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.

## SERVICE INSTRUCTIONS (MECHANICAL)

RECEIVER SERIAL NUMBER

The receiver serial number is stamped into the metal bracket to which the tuning condenser is mounted.

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.

CLEANING AGENT FOR LEATHER BAG AND MOULDED PLASTIC CASE.

Do not polish the leather bag or the moulded plastic case with an abrasive material motor car polish, boot polish or similar household cleaning fluids as permanent damage may result to the finish of the leather bag or the moulded case.

To restore the lustre of the leather bag and 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.

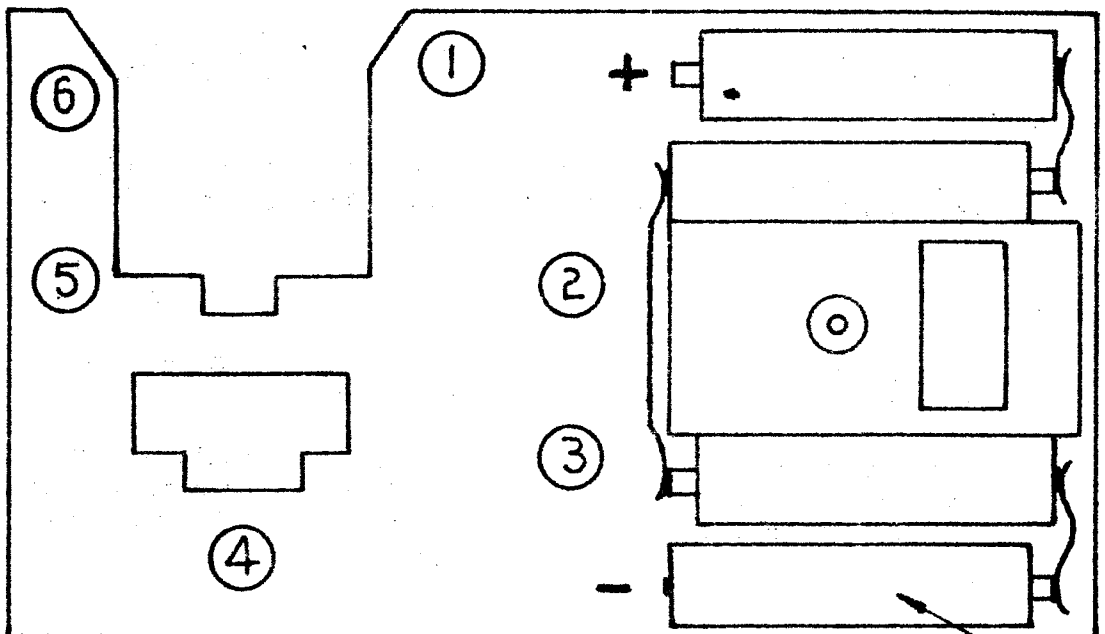
NOTE: It is most important that the batteries be installed with their polarity as shown in the diagram below.

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.

TRANSISTORS

Nº	TYPE	Nº	TYPE
1	2N486	4	2N362
2	2N484	5	2N632
3	2N484	6	2N632



INSTALL FOUR EVEREADY BATTERIES Nº915-SIZE AA-THIS WAY →

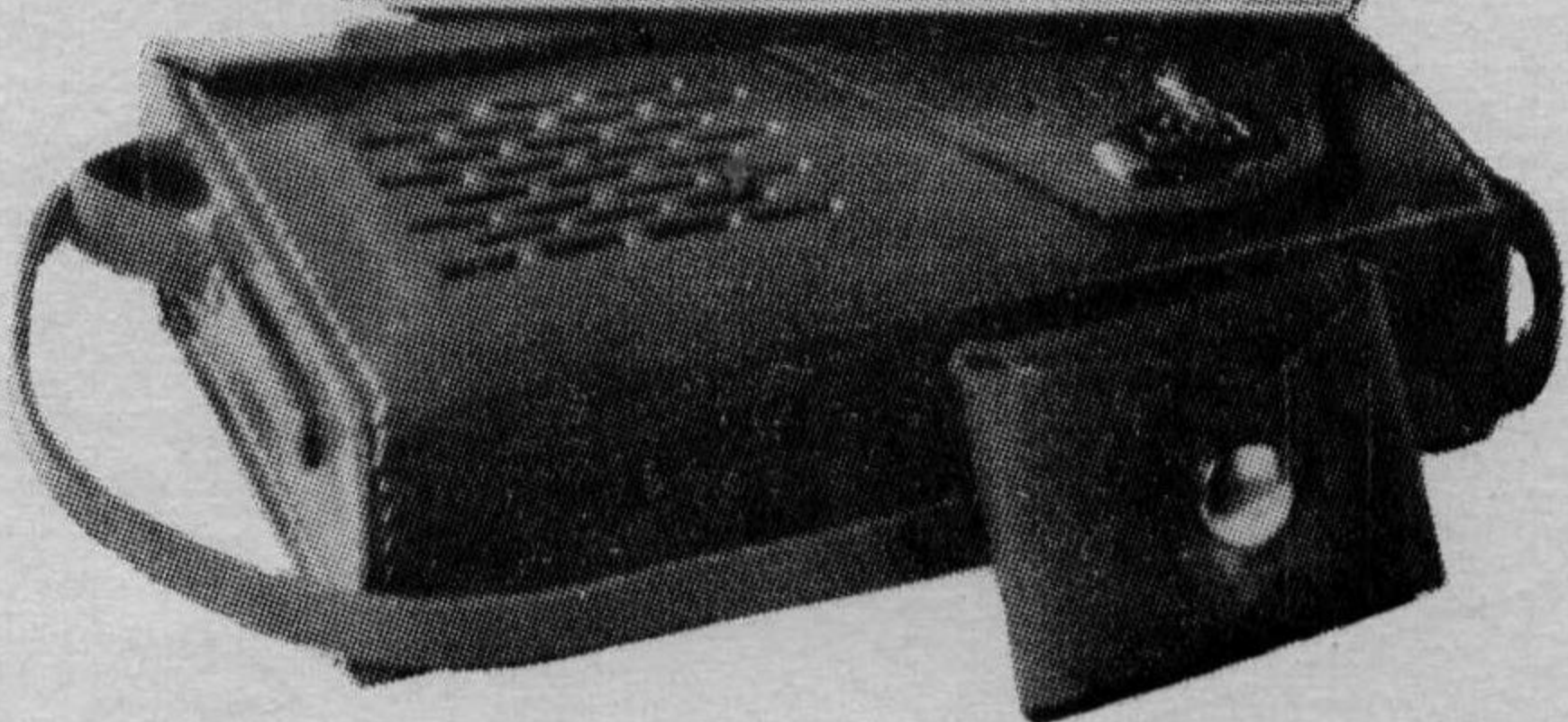
BROADCAST ALIGNMENT

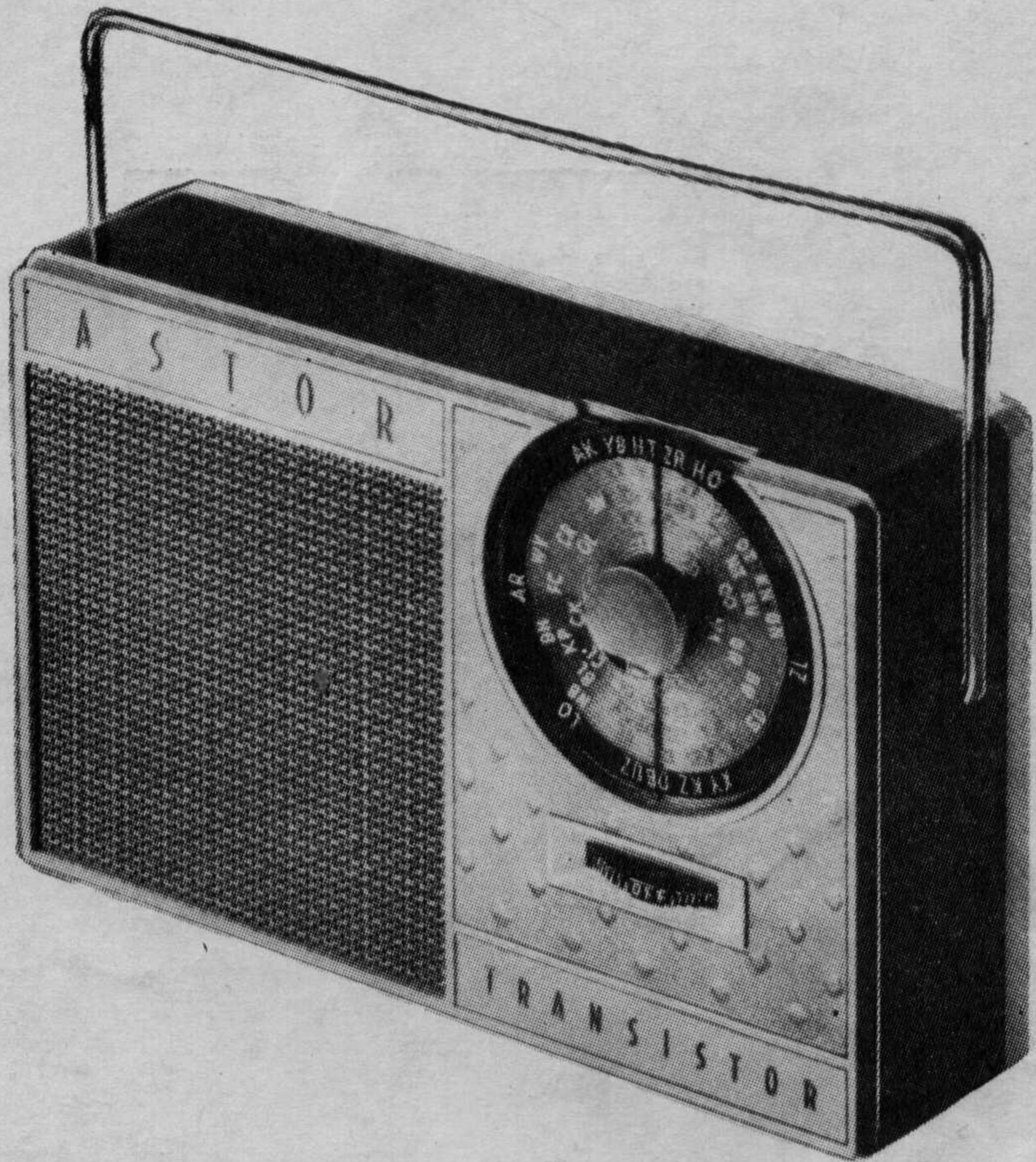
- A. To inject a signal into the receiver ferrite strip aerial, connect to the active terminal of the signal generator attenuator approximately 2 ft. of aerial wire, then fashion the wire to a vertical position.
- B. Place receiver so that ferrite strip aerial is uppermost and horizontal and so that 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	Dummy Antenna	Instructions
1.	Refer para. A and B	525 Kc/s.	Refer para. A and B	Fully mesh cond. gang plates then peak oscl. coil (colour coded green) iron core.
2.	" "	1615 Kc/s.	" "	Cond. gang plates fully out of mesh, peak oscl. 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 oscl. 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 oscl. 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 DIAL DISC SETTING.

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





# MODEL - GRQ

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.

## SERVICE INSTRUCTIONS (ELECTRICAL)

### ALIGNMENT PROCEDURE

#### EQUIPMENT

Signal Generator: Modulated 400 cps.  
Output Meter :  
Plug : Part No. M502 for  
fitting to output  
meter leads.  
Mica. Capacitor : .01MF Part No. PC145  
for I.F.T. align-  
ment.  
Alignment Tool : Part No. PM581 for  
adjustment of RF.  
trimmers.  
Alignment Tool : Part No. M501 for  
I.F.T. core and  
oscl. coil core  
adjustment.

#### ALIGNMENT CONDITIONS

Output Meter: Connect output meter  
leads to plug part  
Connection : 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 out-  
put 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 green) 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.	"	"	"	Repeat operations 1 and 2 and 3.

- NOTE: 1st I.F.T. colour coded - black  
 2nd I.F.T. " " - white  
 3rd I.F.T. " " - brown  
 Oscl. trans. " " - green





Leather carrying bag - tan, complete	730/250-1
includes	
Clip	744/250
Shoulder strap - leather	745/250
Pouch - ear-piece - leather	743/250
Plastic carrying bag - complete, includes plastic shoulder strap and ear-piece pouch, which are not available as separate items	2202/250

MOULDED PLASTIC CASE STYLING

PLASTIC CASE FRONT ASSY - includes moulded escutcheon, Metcal insert,  
tuning indicator insert and mount screw.

TAN	-	A129/849-1	CHERRY RED	-	A129/849-3
CHARCOAL	-	A129/849-4	CHARTREUSE	-	A129/849-5
LIME	-	A129/849-8			

Components of the Plastic case front assy. which are available as separate items.

Metcal insert - silver colour	711/250
Tuning indicator insert - gold colour	689/81

PLASTIC CASE BACK ASSY - WHITE	A130/849
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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 Ceramic condenser	GMV	33V DCW	C391
4	.01 MF Ceramic condenser	GMV	33V DCW	C391
5	Osc. trimmer condenser - part of circuit No. 1.			
6	220 MMF Silvered mica condenser	2½%	500V DCW	C324
7	.01 MF Ceramic condenser	GMV	33V DCW	C391
8	.01 MF Ceramic condenser	GMV	33V DCW	C391
9	10 MF Electrolytic condenser	+250%-10%	6VW	C322
10	22 MMF Disc. ceramicon NPO	5%	500V DCW	C352
11	.01 MF Ceramic Condenser	GMV	33V DCW	C391
12	220 MMF Silvered mica condenser	2½%	500V DCW	C324
13	.01 MF Ceramic condenser	GMV	33V DCW	C391
14	.01 MF Ceramic condenser	GMV	33V DCW	C391
15	18 MMF Disc. ceramicon condenser NPO	5%	500V DCW	C361
16				
17				
18	220 MMF Silvered mica condenser	2½%	500V DCW	C324
19	.01 MF Ceramic condenser	GMV	33V DCW	C391
20	2 MF Electrolytic condenser	+250%-10%	12VW	C323
21	50 MF Electrolytic condenser	+250%-10%	3VW	C307
22	.01 MF Ceramic condenser	GMV	33V DCW	C391
23	100 MF Electrolytic condenser	+250%-10%	6VW	C321
24	.1 MF Ceramic condenser	GMV	33V DCW	C387
25				
26				
27	56,000 ohm carbon resistor	10%	½ watt	R5632
28	12,000 ohm carbon resistor	10%	½ watt	R1232
29	2,200 ohm carbon resistor	10%	½ watt	R2222
30	2,200 ohm carbon resistor	10%	½ watt	R2222
31	300 ohm carbon resistor	110%	½ watt	R3312
32	2,200 ohm carbon resistor	10%	½ watt	R2222
33	4,700 ohm carbon resistor	10%	½ watt	R4722
34	22,000 ohm carbon resistor	10%	½ watt	R2232
35	560 ohm carbon resistor	10%	½ watt	R5612
36	560 ohm carbon resistor	10%	½ watt	R5612
37	3,300 ohm carbon resistor	10%	½ watt	R3322
38	82,000 ohm carbon resistor	10%	½ watt	R8232
39	Volume control and ON/OFF switch consists of: 5000 ohm potentiometer, SP.ST. switch attached			R262
	Mount bracket (2)			R161 29/849
40	47,000 ohm carbon resistor	10%	½ watt	R4732
41				
42	3,900 ohm carbon resistor	10%	½ watt	R3922
43	22,000 ohm carbon resistor	10%	½ watt	R2232
44	1,000 ohm carbon resistor	10%	½ watt	R1022
45	130 ohm disc. type NEG. TEMP. coefficient resistor	10%	1 watt	R167
46	1,500 ohm carbon resistor	10%	½ watt	R1522
47	82 ohm wire wound resistor	10%	½ watt	R157
48	10 ohm wire wound resistor	10%	½ watt	PR553

49		
50		
51	Ferrite slab aerial - slab width $\frac{5}{8}$ "	L380
52	Oscillator coil (green spot)	L425
53	1st IF. transformer (black spot)	L426
54	2nd IF. transformer (white spot)	L361
55	3rd IF. transformer (brown spot)	L427
56	Driver transformer 4,500 : 1100 ohms imped. centre tapped sec. type DR22	T199
57	Speaker transformer 320 CT. : 15 ohms imped. type TR22	T200
58	Earpiece jack socket	A127/250
59	Speaker - $2\frac{3}{4}$ " dia. permag type 'C' 15 ohm V.C. imped.	K218
60	Switch - SP.ST. part of circuit No. 39	
61	1.5 Volt battery (4) Eveready type 915 size: AA	M491

♯ Until .01MF ceramic condensers part No. C391 are available, .01MF +50%-25% 100V DCW disc ceramic condensers part No. C326 are being used.

♯ Until .1MF ceramic condensers part No. C387 are available, .1MF +50%-25% 100V DCW disc ceramic condenser part No. C325 is being used.

Earpiece, lead and plug assy.	M485
Transistor socket (6)	A124/849
Battery holder assy. includes lugs, eyelets and springs	A131/849
Dial tuning disc - N.S.W.	693/81-32
Dial tuning disc - VIC./TAS.	693/81-33
Dial tuning disc - QLD.	693/81-34
Dial tuning disc - SA./WA.	693/81-35
Locking screw - gold colour, dial tuning disc	71/849
Moulded bush - tuning cond. shaft extension	686/81
Washer (2) rubber, moulded bush	68/849
Volume control knob - TAN	688/81-1
Volume control knob - CHERRY RED	688/81-3
Volume control knob - CHARCOAL	688/81-4
Volume control knob - CHARTREUSE	688/81-5
Volume control knob - LIME	688/81-8
Hexagonal spacer - fastens receiver into cabinet	32/849
Screw (2) $\frac{1}{4}$ " x No.4 CSK. HD. self-tapping, fastens battery box to cabinet	41/560-2
Tuning condenser mount bracket	22/849
Spacer (3) tuning condenser mt.	54/849
Speaker clip ring	21/849
Aerial support (2) fastens ferrite slab aerial to receiver assy.	691/81
Handle - gold colour	31/849
Grille - gold colour	710/250
Gasket - neoprene, grille	74/849
Screw (2) fastens back section to front section of plastic case	236/415
Screw (2) $\frac{3}{8}$ " x $\frac{1}{8}$ " Whit. rd. hd. - tuning disc spacing adjust.	10/560-8
Nut (2) $\frac{1}{8}$ " Whit.	3/478-2
Linen tape - $9\frac{1}{2}$ " long, battery removal.	0C082
Organdie - black; cover grille opening in cabinet back.	G0151

8. Two screws and locknuts are provided in the tuning cond. mount bracket for clearance adjustment between the tuning dial disc and dial background.
9. Refit rear section of plastic case and fasten in position with two screws previously removed.

### TO REMOVE TUNING DIAL DISC AND FIT NEW TUNING DIAL DISC

The chassis does not have to be removed from plastic case to perform this operation.

1. Remove the gold coloured locking screw from the centre of the tuning dial disc by turning the screw anticlockwise.
2. Lift off the tuning dial disc, note the position of the rubber washers.
3. Reposition the rubber washers then fit new tuning dial disc.
4. Refit gold coloured locking screw centre of dial disc. Turn clockwise to tighten.
5. Switch receiver "ON" and check station logging. Should adjustment be required loosen locking screw by turning it anti-clockwise. Adjust disc the required distance then retighten the locking screw. The dial disc is to be adjusted for optimum logging.

### COIL AND TRANSFORMER CONNECTIONS

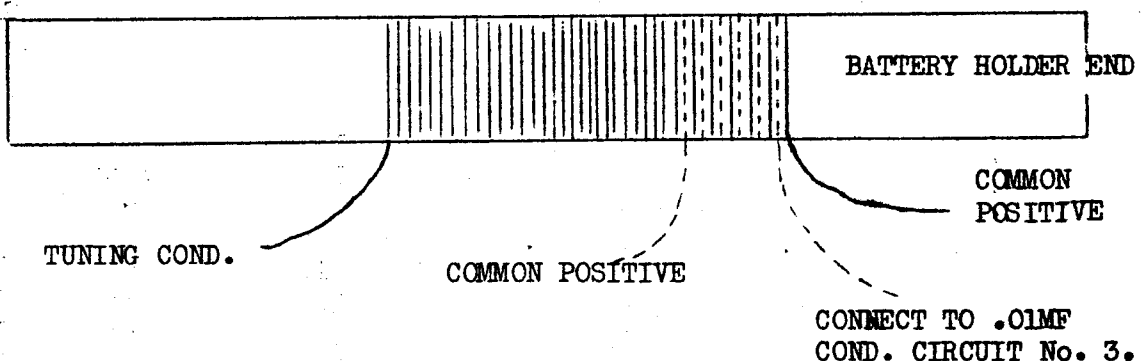
#### DRIVER TRANSFORMER AND OUTPUT TRANSFORMER

Lead colours for connection are shown on the circuit diagram.

#### OSCILLATOR COIL AND IF. TRANSFORMERS.

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

#### FERRITE SLAB AERIAL.



TO REMOVE RECEIVER CHASSIS FROM  
MOULDED PLASTIC CASE

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. Hold the tuning dial disc securely, turn the gold coloured locking screw located in the centre of the dial anticlockwise then remove screw, tuning dial disc, rubber washers and plastic bush from the tuning condenser shaft.
6. Unscrew and remove hexagonal bush located between volume control and tuning condenser gang.
8. Remove the chassis from the plastic case by lifting firstly the end near tuning condenser then the battery end.

TO REFIT CHASSIS TO MOULDED PLASTIC CASE

1. Place chassis into plastic case by entering first the battery end then tuning condenser end.
2. Refit hexagonal spacer (finger tight) on to screw protruding through chassis between volume control and tuning condenser.
3. Place plastic bush on to tuning condenser shaft. Turn bush until flats inside bush fit flats on shaft then press bush firmly on to shaft.
4. Refit rubber washers tuning dial disc and gold coloured locking screw to tuning cond. shaft. Turn locking screw clockwise to tighten.
5. Tighten hexagonal spacer between volume control and tuning condenser then refit two screws which fasten battery box to plastic case.
6. Place tapes across battery box cavities then refit batteries, refer battery replacement diagram for correct polarity.
7. Switch receiver "ON" and check station logging. Should adjustment be required loosen locking screw by turning it anti-clockwise. Adjust disc to the required distance then retighten the locking screw. The dial disc is to be adjusted for optimum logging.