



RADIO CORPORATION PTY. LTD.

DIVISION OF ELECTRONIC INDUSTRIES LTD.

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

BULLETIN: NP-1.

File: Receivers
Portable

Date: 20-12-51.

Page: 1.

TECHNICAL BULLETIN

MODEL "NP" BANDSPREAD PORTABLE

5 Tube Superheterodyne Four Band Portable Receiver
Incorporating Bandspreading of the
31 Metre, 25 Metre and 19 Metre Shortwave Bands

For operation from:

1.5 volts "A" Battery

and

90 volts "B" Battery (two 45 volt "B" Batteries in series)

Current Consumption:

"A" Battery 300 milliamps

"B" Battery 12.5 milliamps (no signal)

Power Output:

250 Milliwatts - max.

100 Milliwatts - undistorted.

Intermediate Frequency: 455 Kc/s.

TUNING RANGES

RECEIVER COVERAGE (approx.)

Broadcast Band 535 - 1610 Kc/s.

560.7 - 186.33 Metres

31 Metre Band 9.5 - 9.9 Mc/s. - Bandspread

31.57 30.30 Metres

25 Metre Band 11.6 - 12.2 Mc/s. - Bandspread

25.86 - 24.59 Metres

19 Metre Band 14.9 - 15.7 Mc/s. - Bandspread

20.13 - 19.10 Metres

This Bulletin Contains:

- 1 Technical Specifications
- 2 Alignment Procedure
- 3 Circuit Diagram
- 4 Component Parts List
- 5 Connections for IF and RF Transformers
- 6 Valve Placement Diagram
- 7 Dial Drive Cording Diagram
- 8 Battery Replacement Diagram
- 9 Instructions for Connecting External Batteries

ALIGNMENT INSTRUCTIONS

Equipment:--

Signal Generator:
 Output Meter:
 Alignment Tools: Type M195 & PM581
 Mica Capacitor: 0.01MFD for IF.
 Trans. Alignment.
 Dummy Antenna: 200MMFD mica capacitor.
 Dummy Antenna: 400 Ohm non-inductive
 resistor.
 Alignment Template: Type PB617.

Alignment Conditions:--

Load Impedance: 10,000 Ohms
 Output Level: 25 Milliwatts
 "A" Battery: 1.5 Volts
 "B" Battery: 90 Volts
 Volume Control: Max. Volume (fully
 clockwise)
 Intermediate Frequency: 455Kc/s.

TO REMOVE CHASSIS FROM CABINET: Pull control knobs straight upward. Remove cabinet base by unscrewing the screws around the base of the cabinet. Remove cardboard battery packers and then the batteries. From the top of the cabinet unscrew the screws fastening the dial, then unscrew and withdraw four screws on top of the cabinet. The chassis will then slide out of the cabinet. Do not remove the screws fastening the handle brackets to the cabinet. Refitting the chassis to the cabinet is the exact reverse procedure to removing it.

Operation No.	Generator Connection	Generator Frequency	Dummy Antenna	Instructions
1.				Fasten the dial reading off the cabinet on to the cardboard alignment template PB617 with $\frac{1}{8}$ " x $\frac{1}{8}$ " screws and nuts, then fit the alignment template in position on top of the chassis with the four screws which hold the chassis to the cabinet. Fit control knobs to their spindles.
2.				Remove speaker and loop antenna from their mounting supports.
3.	To control grid of 1T4 IF. valve (pin No. 6)	455Kc/s.	0.01MFD. mica capacitor in series with generator.	Leave grid wire attached to valve socket. Peak 2nd IF. trans. pri. and sec. for max. output.
4.	To control grid of DK32/1A7GT valve	455Kc/s.	0.01MFD. mica capacitor in series with generator.	Leave grid cap on valve. Turn gang plates fully out of mesh. Peak 1st IF. trans. pri. and sec. for max. output.
5.				Refit speaker and loop antenna to their mount supports.
6.				DIAL POINTER SETTING: With the cond. gang plates fully meshed set centre of dial pointer on end of travel spot on dial reading near 540Kc/s.
7.				Lay the receiver chassis, speaker downwards and with the control knobs to the left of the operator. Place the batteries in their respective positions around the chassis. This is to provide the same amount of mass around the loop antenna as exists when fitted into the cabinet.
8.	To AVC. end of loop (outside turn of sec.)	600Kc/s.	200MMFD. mica capacitor in series with generator.	Turn cond. gang and dial pointer until pointer is on 600Kc/s. Through hole in loop former adjust B/cast osc. coil ind. trim. (iron core) and the B/cast RF. trans. ind. trim. (iron core from base of trans.) for max. output. Rock cond. gang to and fro through the signal while adjusting.

Operation No.	Generator Connection	Generator Frequency	Dummy Antenna	Instructions
9.	To AVC. end of loop (outside turn of sec.)	1400Kc/s.	200MMFD. mica capacitor in series with generator.	Turn cond. gang and dial pointer until pointer is on 1400Kc/s. Adjust B/cast oscl. trimmer cond. for logging and peak B/cast RF. and loop antenna trimmer condensers for max. output. Rock cond. gang to and fro through the signal when peaking the RF. and loop trimmer conds.
10.	Repeat operations Nos. 8 and 9.			
11.	Turn wave-change switch to 31 metre band. This band must be aligned before the 25 and 19 metre bands.			
12.	To receiver loop external aerial and earth sockets	9.6Mc/s.	400 Ohm non-inductive resistor in series with generator.	Turn dial pointer and gang to 9.6 Mc/s. Adjust 31 metre band oscl. coil ind. trim (iron core) for logging, then peak 31 metre antenna and RF. trans. ind. trimmers (iron cores) for max. output. Rock cond. gang to and fro through the signal when peaking the ind. trimmers.
13.	To receiver loop external aerial and earth sockets	11.8Mc/s.	400 Ohm non-inductive resistor in series with generator.	Turn dial pointer and gang to 11.8 Mc/s. Adjust 25 metre band oscl. coil ind. trim (iron core) for logging, then peak 25 metre antenna and RF. trans. ind. trimmers (iron cores) for max. output. Rock cond. gang to and fro through the signal when peaking the ind. trimmers.
14.	To receiver loop external aerial and earth sockets	15.2Mc/s.	400 Ohm non-inductive resistor in series with generator.	Turn dial pointer and gang to 15.2 Mc/s. Adjust 19 Metre band oscl. coil ind. trim. (iron core) for logging, then peak 19 metre antenna and RF. trans. ind. trimmers (iron cores) for max. output. Rock cond. gang to and fro through the signal when peaking the ind. trimmers.
15.	Remove control knobs and alignment template from the chassis, then refit the chassis to the cabinet.			

NOTE 1: 31 Metre spreadband coil, RED spot on iron core end of former.
 25 " " " WHITE " " " " " " "
 19 " " " BLUE " " " " " " "

NOTE 2: Pin No. 5 on the external battery lead socket connects to the output valve plate. The output meter may be connected between this pin and the chassis.

NOTE 3: Check the logging of the shortwave bands on some well known shortwave stations. If a crystal calibrator is available, check the logging at each 100 Kc/s. mark on the dial.

NOTE 4: If the dial pointer does not log correctly after re-fitting the chassis to the cabinet: Remove the dial reading from the cabinet and hold the tuning spindle with one hand; with the other hand slide the base end of the pointer the required distance. Refit dial reading and re-check logging.

Circuit No.	Description	Tol ±	Rating	Part No.
1	.1MF Paper condenser	20%	200V.DCW	PC218
2	.05MF " "	20%	200V.DCW	PC102
3	.05MF " "	20%	200V.DCW	PC102
4	.05MF " "	20%	200V.DCW	PC102
5	.02MF " "	20%	400V.DCW	PC111
6	.005MF " "	10%	600V.DCW	PC700
7	.002MF " "	20%	600V.DCW	PC112
8	.004MF " "	20%	600V.DCW	PC221
9	.001MF Mica condenser	10%	1000VT	PC108
10	.0005MF " "	10%	1000VT	PC144
11	.00045MF " "	2½%	1000VT	PC727
12	.0001MF " "	10%	1000VT	PC110
13	100MMF Silvered mica condenser	2½%	1000VT	PC797
14	100MMF " " "	2½%	1000VT	PC797
15	85MMF " " "	2½%	1000VT	PC809
	(6MMFD silvered mica cond. part No. PC814 (added in parallel with 85MMFD circuit No. 15			
16	70MMF Silvered mica condenser	2½%	1000VT	PC799
17	50MMF " " "	2½%	1000VT	PC801
18	35MMF " " "	2½%	1000VT	PC829
19	35MMF " " "	2½%	1000VT	PC829
20	25MMF " " "	1MMF	1000VT	PC802
21	15MMF " " "	1MMF	1000VT	PC811
22	4MMF Ceramicon condenser	+ 1MMF-0	500V.DCW	PC830
23	16MF Electrolytic "	20%	350PV	PC283
24	3 Gang variable condenser			PC701
25	2-30MMF coaxial trimmer cond.			PC417
26	1.5-18MMF trimmer cond.			PC250
27	1.5-18MMF trimmer cond.			PC250
28	20MMF cond. part of RF. trans. circuit No. 48			—
29				
30	10 Megohm carbon resistor	10%	1 watt	PR236
31	1.75 Megohm " "	10%	½ watt	PR248
32	1.75 Megohm " "	10%	½ watt	PR248
33	1.75 Megohm " "	10%	½ watt	PR248
34	.5 Megohm " "	10%	½ watt	PR245
35	250,000 Ohm " "	10%	1 watt	PR496
36	200,000 Ohm " "	10%	½ watt	PR255
37	50,000 Ohm " "	10%	½ watt	PR160
38	50,000 Ohm " "	10%	½ watt	PR160
39	50,000 Ohm " "	10%	½ watt	PR160
40	25,000 Ohm " "	10%	1 watt	PR116
41	20,000 Ohm " "	10%	1 watt	PR171
42	20,000 Ohm " "	10%	1 watt	PR171
43	500 Ohm " "	10%	1 watt	PR289
44	1 Megohm carbon potentiometer with DP.ST switch attached	20%		PR713
45				
46	1st IF. transformer			PT864
47	2nd IF. transformer			PT864
48	RF. transformer			PT890
49	Loop antenna			PT944
50	Input transformer 10,000 - 2 ohms impd.			PT816
51	Oscillator coil - B/cast			PT860
52	31 metre bandsread coil (red spot on former)			PT912
53	25 metre bandsread coil (white spot on former)			PT913
54	19 metre bandsread coil (blue spot on former)			PT914

Circuit No.	Description	Tol±	Rating	Part No.
55	Loading coil (part of loop antenna, circuit No. 49)			PT942
56	Switch-wave change			S178
57	Speaker - 8" permag. no input trans.			K119
58	External battery lead complete with socket and plugs			PA407
59	2 pin "A" battery plug			336/30C
60	3 pin "B" battery plug			335/30C
61	(8 pin plug on ext. battery lead (8 pin plug metal cover			FM350
62	8 pin socket on lead from receiver for ext. battery			216/224
63	Shorting plug			FM216
64	45 volt "B" battery. Eveready type 482 or Gen. Dry type MP-45			A148/30C
65	1.5 volt "A" battery. Eveready type 745 or Gen. Dry type P-1.5L			M130
	Dial background			M129
	Dial reading			20/759
	Dial drum			173/81-3
	Dial cord 3 ft. 6 ins.			A104/685
	Dial cord spring			7/282
	Clips IF. trans. mounting			8/613
	Spacer for speaker mounting			7/670
	Valve socket, 7 pin - flange mount			3/681
	Valve socket, 7 pin - rubber mount			A104/58
	Valve socket, 8 pin - DK32/1A7GT valve			A104/58-1
	Rubber bases for valve sockets			FM532
	Rivets for rubber bases			2/681
	Spacer for loop mounting			9/681
	Dial pointer assy.			7/681
	Dial pullies			A107/759
	Dial pulley studs			13/613
	Drive spindle			18/87
	Drive spindle bush			17/759
	Nut for drive spindle mounting			13/246-1
	Input trans. mount strip, paper			41/161
	" " " " bakelite			348/64
	Valve shield			347/64
	Switch link			38/635
	Switch actuating arm			5/759
	Vol. control link			6/759
	Sleeve nut for volume control			8/627-1
	Wave change knob			16/759
	Volume control knob			26/759
	Tuning control knob			27/759
	Circlip for volume and tuning knobs			196/81
	Circlip for wave change knob			22/755
	Cabinet weave in front of speaker			15/759
	Cabinet (covered, no fittings)			37/759
	Cabinet base assy.			218/221-1
	Cabinet base rubber feet			A106/759
	Handle assy. complete			28/658
	Handle mount bracket			A102/635-1
	Handle bracket mount nut			24/765
	Dial pointer track			55/759
	Handle mount bracket clamp			47/759
	Cabinet lid catch			36/759
	Cabinet lid hinges			282/250
				283/250

Circuit No.	Description	Part No.
	Rubber plug for external battery lead hole	38/261
	Plugs for ext. aerial and earth sockets	11/252
	Transfer - Aerial "A"	30/245
	Transfer - Earth "E"	29/245
	Rubber Grommets for gang mounting	64/30A
	Brass Bush for gang mounting	93/53
	1st Production Run-	
	Speed nuts - on chassis legs, for cab. to chassis screws	86/E200
	Screws - cabinet to chassis $\frac{1}{4}$ " x No. 8 oval csk. H.D.	37/560-26
	Screws - base mount, $\frac{1}{4}$ " x No. 4 csk. HD.	47/560-94
	Eyelets for base mount screws	18/291-2
	2nd Production Run-	
	Screws - cabinet to chassis mount $\frac{3}{4}$ " x $\frac{5}{32}$ " csk. HD.	17/560-41
	Eyelets for cab. to chassis mount screws	18/291-2
	Screws - base mount $\frac{5}{8}$ " x $\frac{5}{32}$ " Whit. csk. HD.	17/560-38
	Screws - base mount $\frac{1}{2}$ " x $\frac{5}{32}$ " Whit. csk. HD.	17/560-34
	Cup washer for base mount screws	269/250-1

EXTERNAL AERIAL

Broadcast Band Reception - For normal reception an external aerial and earth are not required when operating on the broadcast band; but, should the receiver be required to operate in localities where the signal pick-up by the loop aerial is not sufficient to provide reasonable volume, an external aerial and earth may be connected to the receiver to increase the signal pick-up.

Shortwave Spreadband Reception - An external aerial and earth must be connected to the receiver when operating on the shortwave spreadbands.

External Aerial and Earth Connections to the Receiver - On the rear of the receiver cabinet, about the centre, are two holes marked "A" for aerial and "E" for earth. Insert the end of the aerial lead into the hole marked "A" and the end of the earth lead into the hole marked "E".

Two small plugs are supplied with each receiver. These plugs when connected (soldered) to the end of the aerial and earth leads provide an easy and mechanically sound connection to the sockets for the external aerial and earth.

An aerial lead approx. 50 ft. long, raised as high as possible from the ground, is recommended.

An earth lead is essential to obtain maximum results from the external aerial.

Should an earth connection not be obtainable, place the receiver close to the ground and connect to the earth socket approx. 50 ft. of wire laid along the ground and directly beneath the aerial lead.

EXTERNAL AERIAL AND EARTH SOCKETS

Viewing the receiver from the rear with the handle uppermost, the socket at the right is for the aerial and the socket at the left for the earth connection.

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.

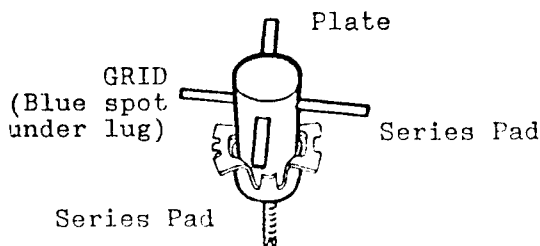
LOOP AERIAL

Primary (3 turns) Outside Turn - AERIAL LOADING COIL.
 Inside Turn - EARTH SOCKET AND CHASSIS.

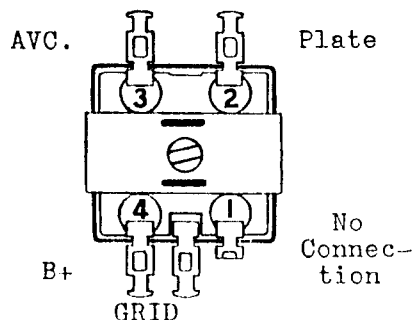
Secondary Outside Turn - AVC.
 Inside Turn - GRID.

Aerial socket on loop former - Connect to WAVE CHANGE SWITCH.

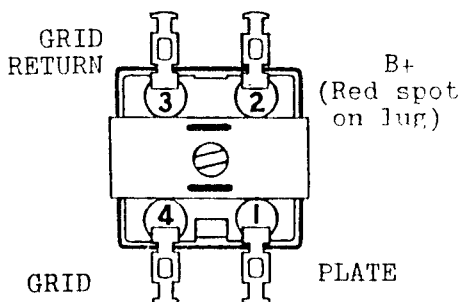
B/CAST. OSCL. COIL



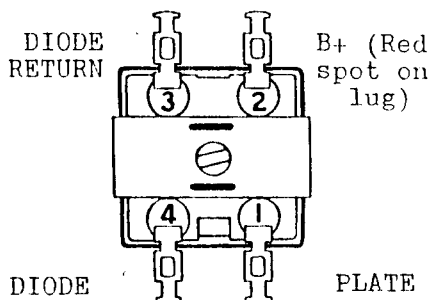
B/CAST. RF. TRANS.



No. 1 IF. TRANS.



No. 2 IF. TRANS.



31, 25, 19, METRE ANT. TRANS.

31, 25, 19 METRE RF. TRANS.

Lead from top lug (iron core end):
 GRID

Lead from bottom lug (mounting end):
 AVC

Lead from top lug (iron core end):
 GRID

Lead from bottom lug (mounting end):
 CHASSIS

31, 25, 19 METRE OSCL. COIL

Lead from top lug (iron core end):
 GRID

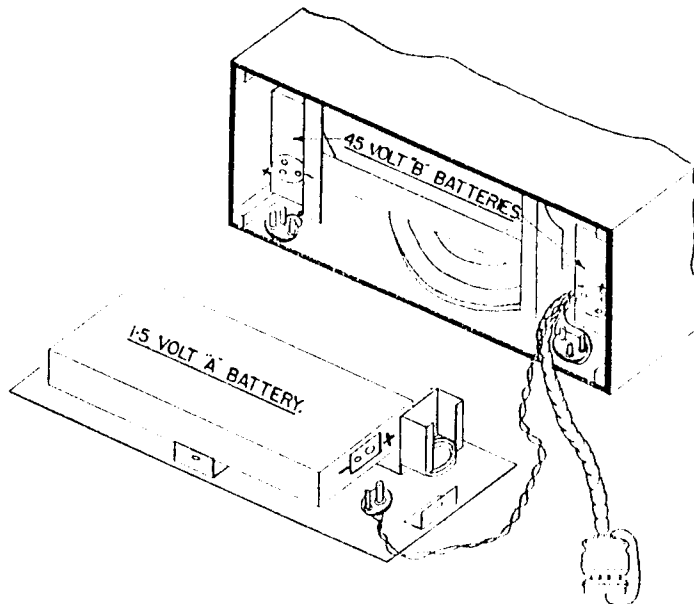
Lead from bottom lug (mounting end):
 PLATE

BATTERY REPLACEMENT (Refer Diagram)

The internal batteries used with this receiver are: One 1.5 volt "A" battery and two 45 volt "B" batteries.

These batteries are not re-chargeable and when worn out must be replaced with new ones. When connecting new batteries, follow the instructions exactly, because if you make a mistake you are liable to blow out all the valves.

1. Make sure the receiver is switched off.
2. Lay the receiver, speaker grille downwards, on a flat surface.
3. Unscrew and withdraw the four screws around the base of the cabinet, then remove the cabinet base plate, which will allow easy access to the batteries.
4. Withdraw the small plugs from the batteries, then replace the batteries, using strips of cardboard as packers to overcome any looseness.
5. Refit the small plugs to the sockets of the new batteries, then refit the cardboard packer, base-plate and screws.



OPERATION FROM EXTERNAL BATTERIES

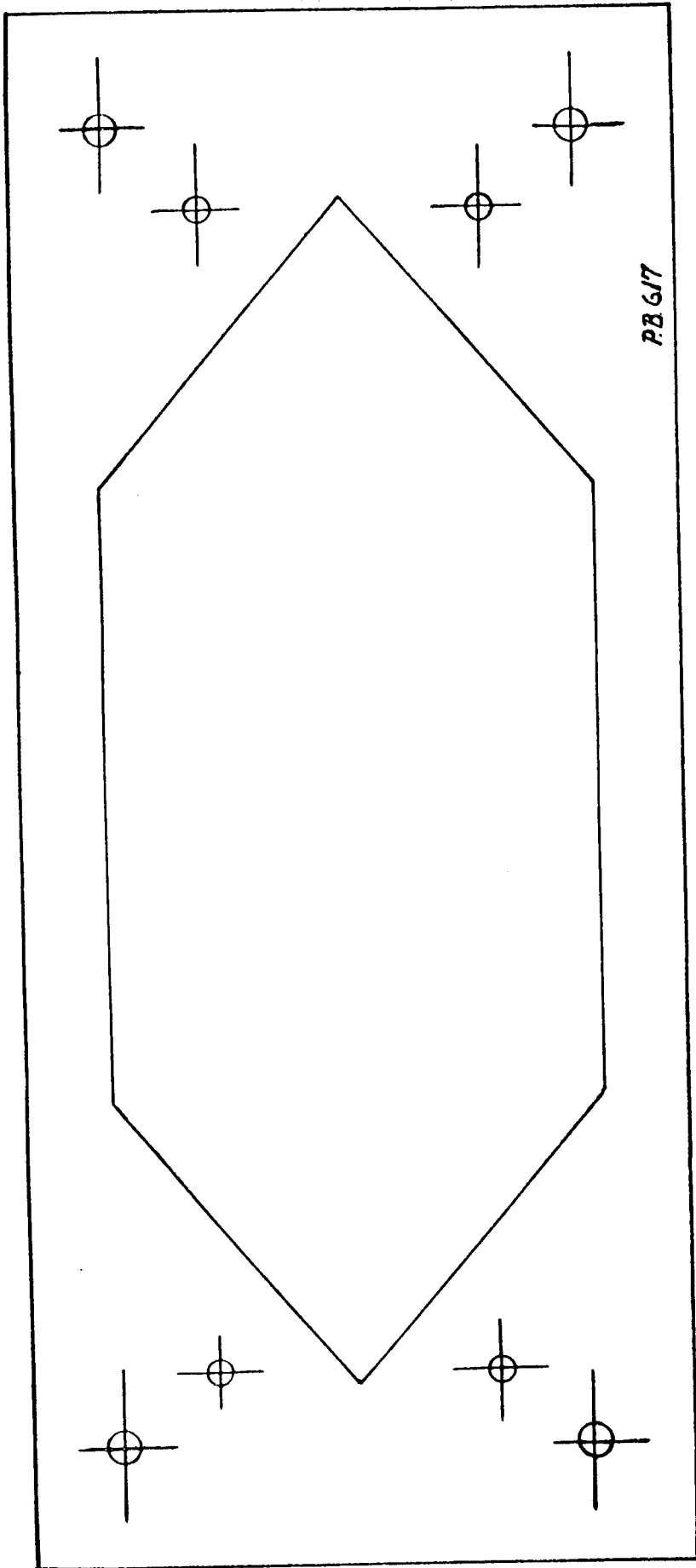
When the receiver is required to operate for long periods, heavy-duty, long-life external batteries may be connected to the receiver as follows:-

1. Switch the receiver off, then remove the rubber cover from the hole in the base of the cabinet.
2. Inside the hole is a short lead with a plug and socket attached. Pull this lead out of the hole and remove the small shorting plug from the socket.
3. Obtainable from the factory is a 3ft. extension lead - Part No. PA407. The small plugs on this lead are plugged into their respective sockets on the heavy-duty batteries. The 8-pin plug is inserted into the socket on receiver lead from which the shorting plug was removed. The 8-Pin plug has a centre guide pin for correctly locating the plug into the receiver socket. The receiver may now be switched on, and operates from the external batteries. The external batteries required are: One 1.5 volt heavy-duty long-life "A" battery and two 45 volt heavy-duty long-life "B" batteries. When operating from external batteries, current is not being consumed from the internal batteries.
4. When the receiver is again required for portable operation, first switch the receiver off, then remove the 8-pin plug from the socket and refit the shorting plug. Refit the short lead with the plug and socket attached into its hole, and refit the rubber cover into the hole in the cabinet base.

The alignment template part No. PB617 supplied with this Service Bulletin is a thin strip of cardboard on which is printed the diagram shown on this page.

For alignment purposes the dial from the receiver cabinet is mounted to the alignment template and then the template is mounted on the receiver chassis as detailed in para. 1 of the alignment procedure on page 2.

Should the alignment template be lost a new one can be made from the diagram on this page. The centre hexagonal shape of the template has to be cut out to allow the pointer to be seen through the dial.

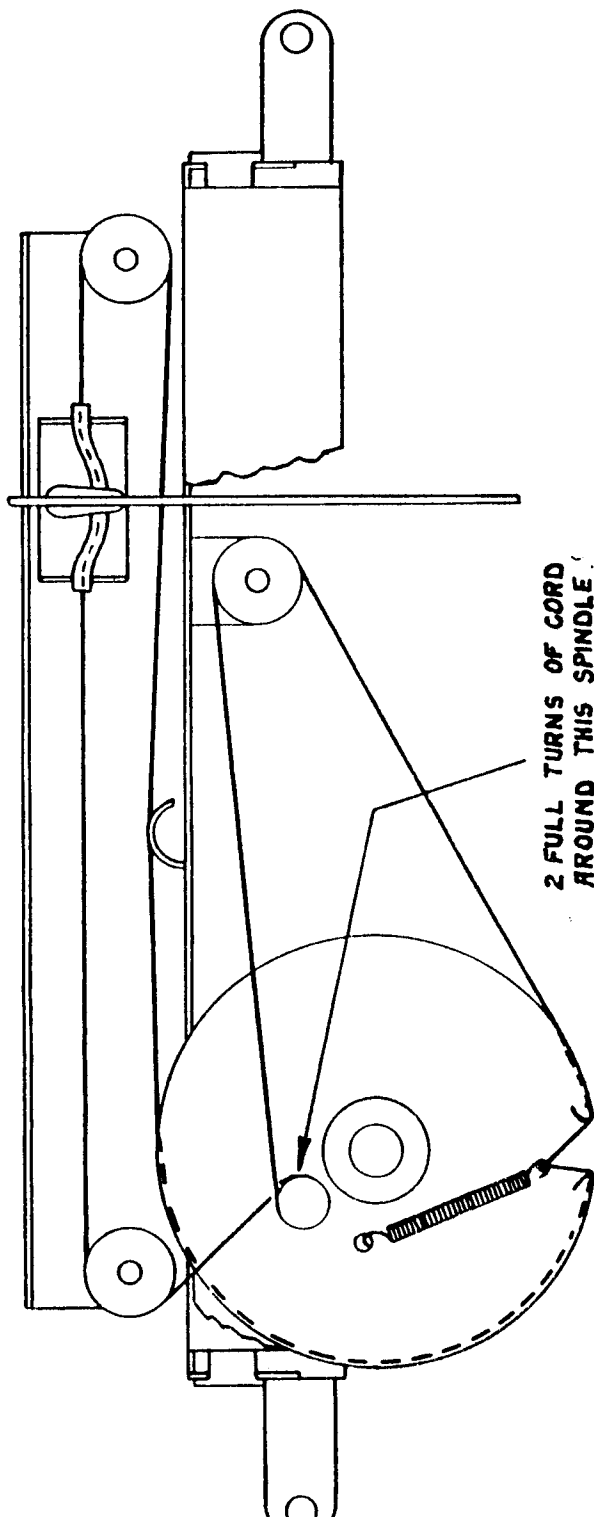


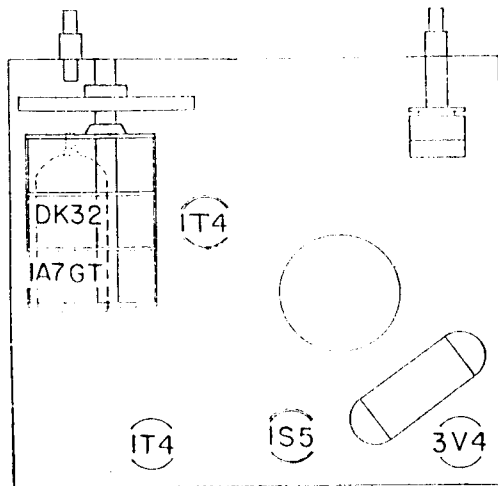
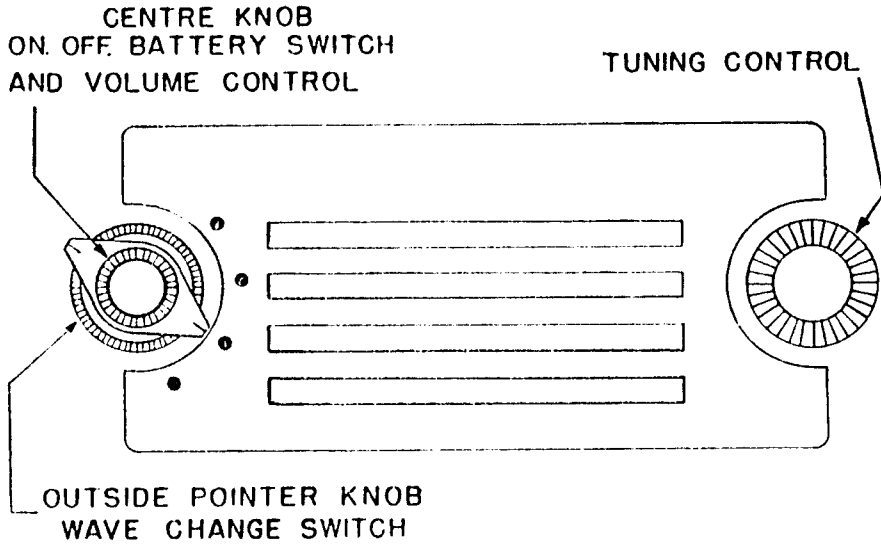
CORDING OF DIAL DRIVE

The length of cord required is 4 ft. 3 in., which includes about 8 in. to spare for tying to the tension spring.

Cord, Part No. 7/282.

Spring, Part No. 8/613.





VALVE PLACEMENT DIAGRAM
789/279