



RADIO CORPORATION PTY. LTD.

DIVISION OF ELECTRONIC INDUSTRIES LTD.
126-130 GRANT STREET, SOUTH MELBOURNE, S.C.4.

TECHNICAL BULLETIN

Bulletin APN-1
File: RECEIVERS
PORTABLE
Date: 28.5.58
Page: 1

MODEL — APN 6 TRANSISTOR SUPERHETERODYNE PORTABLE RECEIVER

FOR OPERATION FROM: 9 volt Battery (Two 9 volt batteries in parallel)

CURRENT CONSUMPTION: No signal - 10 mA
250 mW Output - 63 mA

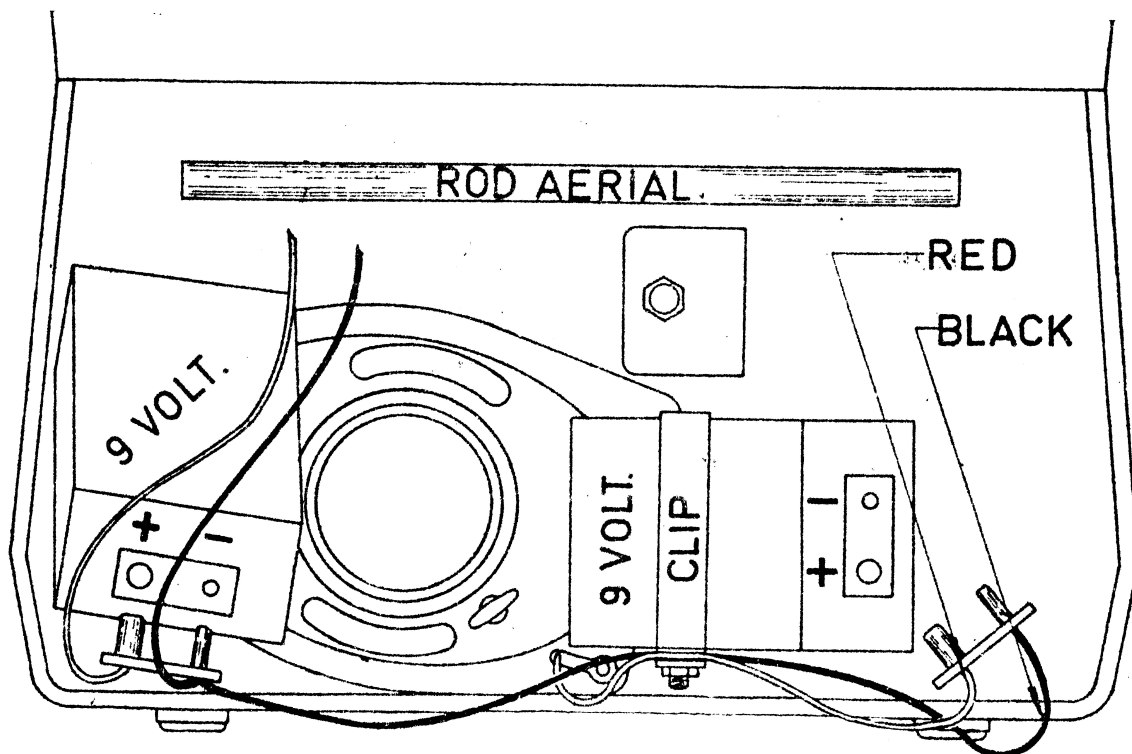
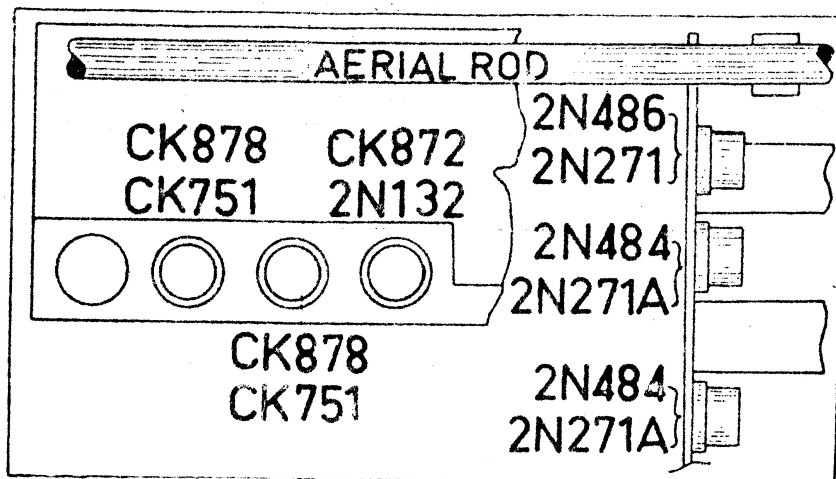
POWER OUTPUT: 250 Milliwatts

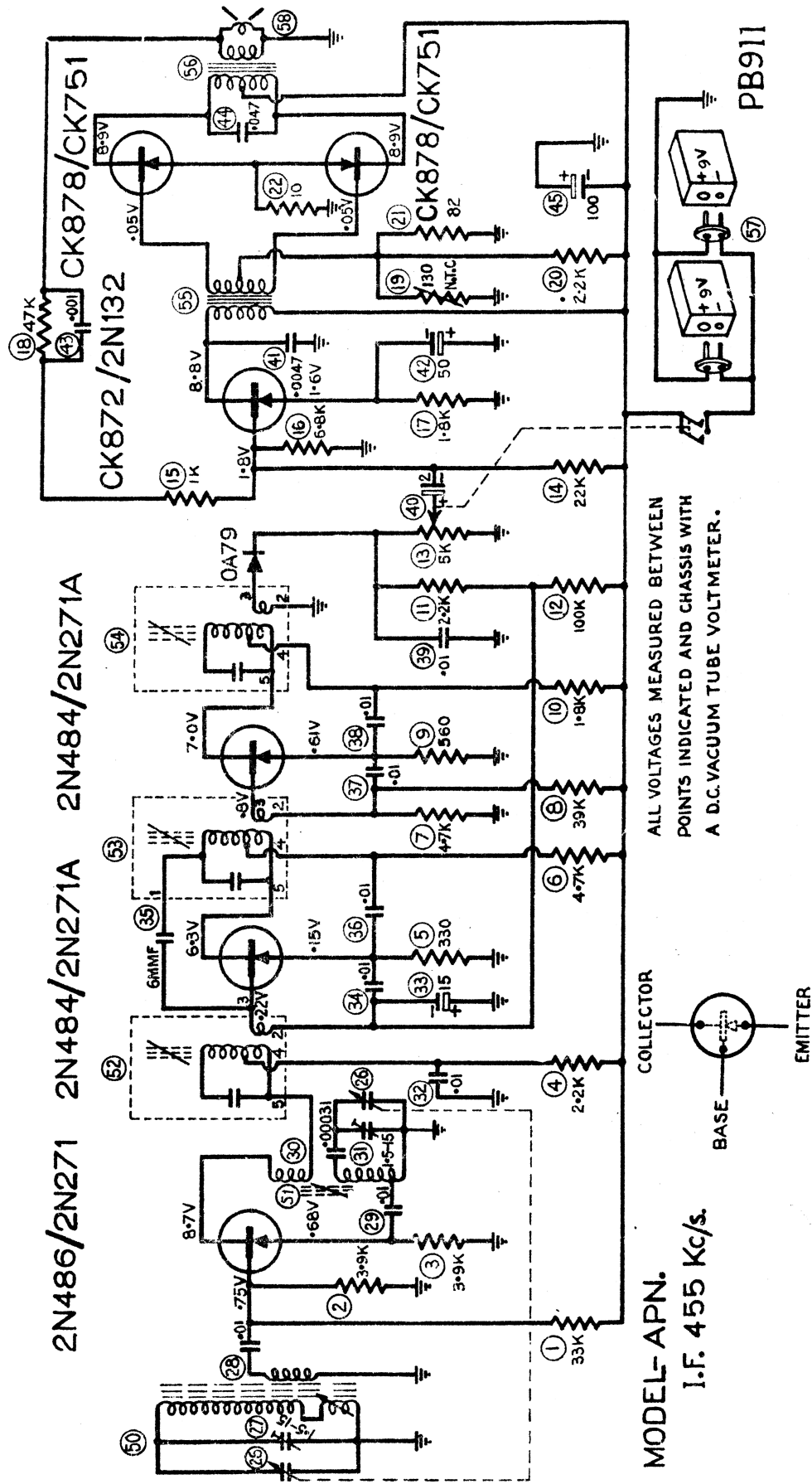
INTERMEDIATE FREQUENCY: 455 Kc/s.

TUNING RANGE: 535 to 1610 Kilocycles
560.7 to 186.3 Metres

THIS BULLETIN CONTAINS:

1. Technical data
2. Alignment procedure
3. Circuit diagram
4. Component parts list
5. I.F. Transformer connections
6. Osc. Coil connections
7. Battery replacement diagram
8. Transistor placement diagram
9. Instructions for removing chassis from leather case
10. Storage when out of use
11. Chassis serial number





ALIGNMENT INSTRUCTIONSEQUIPMENT

Signal Generator;
 Output Meter:
 Mica Capacitor : .01MF type PC145
 for I.F.T. alignment.
 Straight Alignment Tool: type PM581
 for b/cast. trim. adjustment.
 Flexible Alignment Tool : Type 48/712
 for b/cast oscil coil core adj.
 Hexagonal Alignment Tool: type 418/81
 for I.F.T. core adjustment.

ALIGNMENT CONDITIONS

Load Impedance: Sec. load impd. 4
 Ohms (output meter
 connected across speaker trans. secondary.
 Output Level: 6 Milliwatts (voice
 coil open circuit)
 Output Level: 2 Milliwatts (voice
 coil in circuit
 Volume Control: Max. volume (fully-
 clockwise)
 I.F. Frequency: 455 Kc/s.
 Battery: 9 volts.

IF. TRANSFORMER ALIGNMENT.

Note 1. The receiver chassis has to be removed from the leather case to align the IF. Transformers.

Instructions for removing the chassis from the case are detailed on page.7.

Note 2. The iron core in the IF. transformers is the hexagonal bore type.

Note 3. Two peaks may be obtained when adjusting the iron core in the IF transformers. The correct peak is the peak obtained when the core is screwed furthest toward transformer base.

Operation No.	Generator Connection	Generator Frequency	Dummy Antenna	Instructions
1.	To 2N486 converter transistor BASE lead: (junction of circuit No. 28, 1 and 2.)	455 Kc/s.	0.01MF. mica condenser in series with generator	From top of 3rd I.F.T. peak iron core for max. output refer note 2 and 3 above
2.	As operation No. 1.	455 Kc/s.	"	From top of 2nd I.F.T. peak iron core for max. output.
3.	As operation No. 1.	455 Kc/s.	"	From top of 1st. I.F.T. peak iron core for max. output.
4.	Repeat operations No 1, 2 and 3.			

BROADCAST ALIGNMENT

- A. Refit receiver chassis to leather case
- B. Refit tuning knob.
- C. TUNING-KNOB POINTER SETTING: Fully mesh condenser gang plates and set centre of tuning knob pointer on centre of end of travel spot on the escutcheon beneath the numerals "55". The three screws which fasten the front of the condenser gang to the chassis when loosened off allow the cond. gang to be moved to align the dial knob pointer to the end of travel spot. The receiver chassis has to be removed from the leather case to loosen the screws and move the cond. gang.
- D. To inject a signal into the receiver rod aerial, connect to the active terminal of the signal generator approximately 2ft. of aerial wire, then fashion the wire into a vertical position.
- E. Place receiver chassis so that ferrite rod aerial is uppermost and horizontal and so that the fixed winding end of the ferrite rod points to the 2ft. 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. D and E.	600 Kc/s.	Turn cond. gang and tuning knob until centre of tuning knob pointer aligns with centre of 600 Kc/s. spot on dial. Leave cond. gang and tuning knob pointer set in this position, then peak the osc. coil ind. trim (iron core) for max. output. Also peak the movable winding on the ferrite rod for max. output.
2.	Refer par. D and E.	1470 Kc/s.	Turn cond. gang and tuning knob until centre of tuning knob pointer is on 1470 Kc/s. on dial. Adjust osc. trim cond. for logging and peak ferrite rod aerial trimmer cond. for max. output.
3.	Refer para. D and E	600 Kc/s.	Turn cond. gang and tuning knob until centre of tuning knob pointer is on 600 Kc/s. spot on dial. Leave the cond. gang and tuning knob set in this position. Repeat osc. coil ind. trim. (iron core) and the movable winding on the ferrite rod aerial. Do not rock the cond. gang to and fro through the signal while adjusting the trimmers or move the tuning knob pointer off the 600 Kc/s. dial mark until after the trimmers have been adjusted for max. output.

4. Refer para 1470 Kc/s. Turn cond. gang and tuning knob until
D and E centre of tuning knob pointer is on
1470 Kc/s. dial mark. Readjust osc.
coil trim. cond. for logging and peak
ferrite rod aerial trim. condenser for
max. output.

Tuning range after alignment 535 to 1610 Kc/s.

Circuit					
No.	Description	±	Tol.	Rating	Part No.
1	33,000 ohm carbon resistor	10%		$\frac{1}{2}$ W	R3332
2	3,900 Ohm " "	10%		$\frac{1}{2}$ W	R3922
3	3,900 Ohm " "	10%		$\frac{1}{2}$ W	R3922
4	2,200 Ohm " "	10%		$\frac{1}{2}$ W	R2222
5	330 Ohm " "	10%		$\frac{1}{2}$ W	R4722
6	4,700 Ohm " "	10%		$\frac{1}{2}$ W	R4722
7	4,700 Ohm " "	10%		$\frac{1}{2}$ W	R4722
8	39,000 Ohm " "	10%		$\frac{1}{2}$ W	R3932
9	560 Ohm " "	10%		$\frac{1}{2}$ W	R5612
10	1,800 Ohm " "	10%		$\frac{1}{2}$ W	R1822
11	2,200 Ohm " "	10%		$\frac{1}{2}$ W	R2222
12	100,000 Ohm " "	10%		$\frac{1}{2}$ W	R1042
13	5,000 Ohm " potentiometer DP. ST. switch attached				R172
14	22,000 Ohm " resistor	10%		$\frac{1}{2}$ W	R2232
15	1,000 Ohm " "	10%		$\frac{1}{2}$ W	R1022
16	6,800 Ohm " "	10%		$\frac{1}{2}$ W	R6822
17	1,800 Ohm " "	10%		$\frac{1}{2}$ W	R1822
18	47,000 Ohm " "	10%		$\frac{1}{2}$ W	R4732
19	130 Ohm disc type NEG. TEMP. coefficient resistor				R167
20	2,200 Ohm carbon resistor	10%		$\frac{1}{2}$ W	R2222
21	82 Ohm wire wound resistor	10%		$\frac{1}{2}$ W	R157
22	10 Ohm " " "	10%		$\frac{1}{2}$ W	PR553
23					
24					
25					
26	2 gang variable condenser				C101
27	1.5 - 15 MMF. Trimmer Condenser				PC928
28	.01 MF Paper condenser	20%		200V DCW	E1033
29	.01 MF " "	20%		200V DCW	E1033
30	310 MMF Silvered Mica Condenser	2 $\frac{1}{2}$ %		500V DCW	C155
31	1.5 - 15 MMF Trimmer Condenser				PC928
32	.01 MF Paper Condenser	20%		200V DCW	E1033
33	15 MF Electrolytic Condenser	+100%-10%		15V DCW	C282
34	.01 MF Paper Condenser	20%		200V DCW	E1033
35	6 MMF Silvered Mica Condenser	.25 MMF		500V DCW	C288
36	.01 MF Paper Condenser	20%		200V DCW	E1033
37	.01 MF " "	20%		200V DCW	E1033
38	.01 MF " "	20%		200V DCW	E1033
39	.01 MF " "	20%		200V DCW	E1033

40	2 MF Electrolytic Condenser	+100%-10%	150V DCW	C281
41	.0047 Paper Condenser	20%	400V DCW	F4723
42	50 MF Electrolytic Condenser	+100%-10%	3V DCW	C283
43	.001 MF Mica Condenser	10%	500V DCW	PC108
44	.047 MF Paper Condenser	20%	200V DCW	E4733
45	100 MF Electrolytic Condenser	+100%-10%	12V DCW	C284
46				
47				
48				
49				
50	Ferrite Rod Aerial			L330
51	Oscillator Coil			L329
52	No. 1 I.F. Transformer (445 Kc/s.)	red spot on lug 4		L331
53	No. 2. I.F. Transformer (455 Kc/s.)	white spot on lug 4		L332
54	No. 3 I.F. Transformer (455 Kc/s.)	blue spot on lug 4		L333
55	Driver transformer push-pull type DR1	Pri 4300 to Sec 1250 Ohm imped CT.		T183
56	Speaker input transformer type TR4	Pri CT. 270 to 3.5 Ohm imped		T184
57	9 Volt battery (2) Eveready type 276			M470
58	4" x 5" oval shape permag speaker type 4-5C			K205
	Speed nut (2) chassis to cabinet			476/250
	Screw (2) self-tapping $\frac{3}{8}$ " x No.6 bdr. hd., chassis to cabinet			35/560-6
	Hexagonal nut - volume control bush			542/250
	Cup washer - base of cabinet			295/250
	Screw - $\frac{1}{2}$ " x $\frac{1}{8}$ " Whit csk hd. base of cabinet			11/560-8
	Washer - snakeproff, $\frac{1}{8}$ " ext.			2/562-1
	Nut - $\frac{1}{8}$ " Whit.			3/478-2
	Battery retaining spring - formed			7/849
	Aerial Rod mount pillar (2)			278/81
	Spring clip (2) aerial rod retainer			453/250
	Spring clip (3) I.F.T. mount			510/250
	Contact strip - 8 lug			A588/30C
	Contact strip - 2 lug			A599/30C
	Contact strip - 5 lug			A587/30C
	Contact strip - 9 lug			A613/30C
	Battery plug (2) two pin			482/30C
	Back panel - cabinet re-inforcing - inside rear flap of cabinet			569/250

STYLING LIST

Al10/836-1	Dark grey case/light grey handle) Complete leather case consisting of:- Leather case, speaker gasket, grille handle, handle supports, es- cutcheon, press studs and shoulder strap.
Al10/836-2	London tan case / off white handle	
Al10/836-3	Maroon case / light grey handle	
Al10/836-4	Cherry red case / off white handle	
Al10/836-5	Olive green case / off white handle	

LEATHER CASE PARTS SUPPLIED AS SEPARATE ITEMS

A119/814-8	Handle assy. complete - light grey
A119/814-7	Handle assy. complete - off white
34/836-1	Handle retainer (2) - light grey - moulded
34/836-2	Handle retainer (2) - ivory - moulded
535/250-6	Shoulder strap - light grey
535/250-7	Shoulder strap - off white.

KNOB STYLING (knobs are not part of case assy)

356/81-21	Tuning knob - grey - less insert and spring
356/81-22	Tuning knob - ivory " " " "
17/835	Knob insert - gold colour
355/81-33	Volume knob - grey - less spring
355/81-32	Volume knob - ivory - " "
22/755	Spring - vol. and tuning knob

CHASSIS SERIAL NUMBER

The chassis serial number is stamped on the side of a metal bracket at the top right corner of the chassis, viewed from rear of receiver. The rear flap of the leather case has to be unfastened and the moulded re-inforcing panel has to be lifted out to view the serial number.

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.

TO REMOVE CHASSIS FROM LEATHER CASE:

- A. Remove the tuning and volume ON/OFF push on type knobs. (a piece of thin cord in the form of a loop slid under the knob and pulled from the front is a convenient means of removing push-on type knobs.
- B. Unclip five press studs at rear of leather case.
- C. Open rear flap of leather case and remove moulded panel.
- D. Unplug lead plugs connected to socket on battery mounted near centre of receiver.
- E. Open battery clamp clip and remove battery from receiver.
- F. From beneath leather case remove the screw, cupwasher shakeproof washer and nut which fasten chassis bracket to base of leather case.

- G. Remove the self-tapping screws which fasten the chassis brackets to mount brackets at top of leather case.
- H. Lift chassis straight up out of leather case.
- I. Refitting of the chassis to the leather case is the reverse procedure to removing it.

CLEANING AGENT FOR CABINET

Do not polish the leather 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 case and plastic sections, wipe with a soft cloth dampened with water and lightly polish with a neutral leather cleaner.

PRECAUTIONS WHEN TESTING TRANSISTOR RECEIVERS

- A. A transistor is extremely sensitive to heat. When a defective transistor is being replaced, use a soldering iron which supplies just the required heat for unsoldering the connections. The connection leads of the transistor should be held by a pair of long-nosed pliers as close as possible to the point of soldering. In this way excess heat is dissipated away from the internal elements of the transistor.
- B. A continuity meter must not be applied to the receiver wiring with the transistors in circuit. A transistor must not be checked for continuity with an ohm meter as the applied voltage and resultant excess current flow may result in permanent damage to the transistor. A voltmeter of the high impedance vacuum tube type is a safe means of measuring circuit voltages.
- C. A screwdriver or similar instrument must not be used to short components together or to the metal chassis. 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.
- D. The receiver must not be operated at maximum power with the speaker voice coil open circuit. However, operation under open circuit conditions for short periods at low power levels is permissible.

ROD AERIAL CONNECTIONS

- 54 TURN FIXED PRIMARY WINDING:- Lead from end turn furthest from movable 4 turn winding. Connect to the tuning condenser and the trimmer condenser.
- 4 TURN MOVEABLE PRIMARY WINDING:- Lead from end turn furthest from 54 turn winding. Connect to the chassis.

$4\frac{1}{2}$ TURN FIXED SECONDARY WINDING (interwound at end of primary): Lead from end nearest to 4 turn moveable winding. Connect to the chassis.

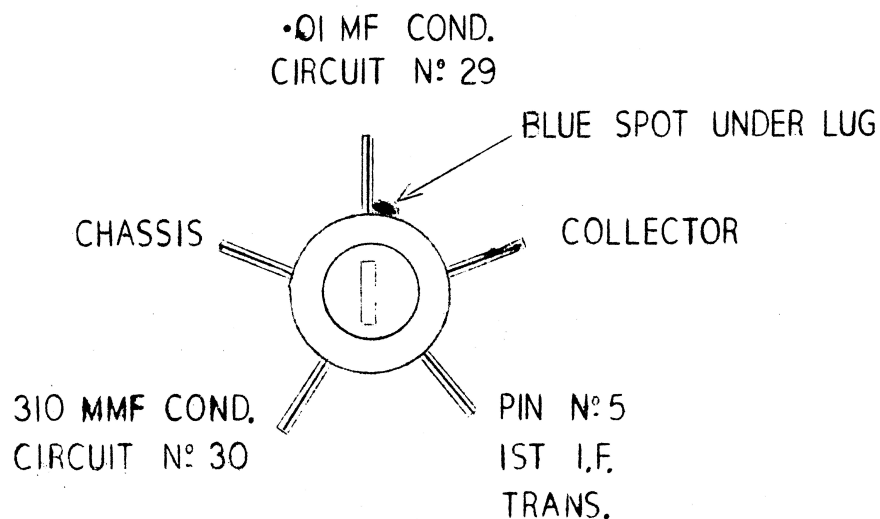
$4\frac{1}{2}$ TURN FIXED SECONDARY WINDING (interwound at end of primary): Lead from end furthest from 4 turn moveable winding. Connect to .01MF condenser circuit No 28.

TRANSFORMER CONNECTIONS

IF. TRANS

Connections for IF transformer base lugs are shown on the circuit diagram. The numbers correspond to the numbers on the transformer moulded base.

OSCILLATOR COIL



COIL VIEWED FROM LUG END