

ASTOR

RADIO CORPORATION PTY. LTD.

DIVISION OF ELECTRONIC INDUSTRIES LTD.

Astor House, 161-173 Sturt Street, South Melbourne.

P 3B-1

File: Receivers

Battery

Date: 18-10-62

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SERVICE DATA

MODEL P 3B

PORTABLE

7 TRANSISTOR SUPERHETERODYNE BROADCAST BAND RECEIVER



NOTE: Receiver chassis does not have to be removed from cabinet for alignment purposes.

1. ACCESS TO CHASSIS.

Open the cabinet by unscrewing the single screw located on the rear, near base of cabinet.

2. CHASSIS SERIAL NUMBER.

Located on metal chassis above speaker. Visible when cabinet rear flap is opened.

3. REMOVAL OF CHASSIS FROM CABINET.

Open cabinet, detailed in paragraph 1.

Remove knobs, pull straight off shafts.

Remove two screws from chassis, located one at each end directly below the extreme outer dial cord pulleys.

Remove the screw from base of cabinet also the external aerial and earth screws.

Disengage external aerial and earth speednuts from mount brackets then lift chassis out of cabinet.

2N412

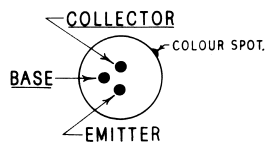
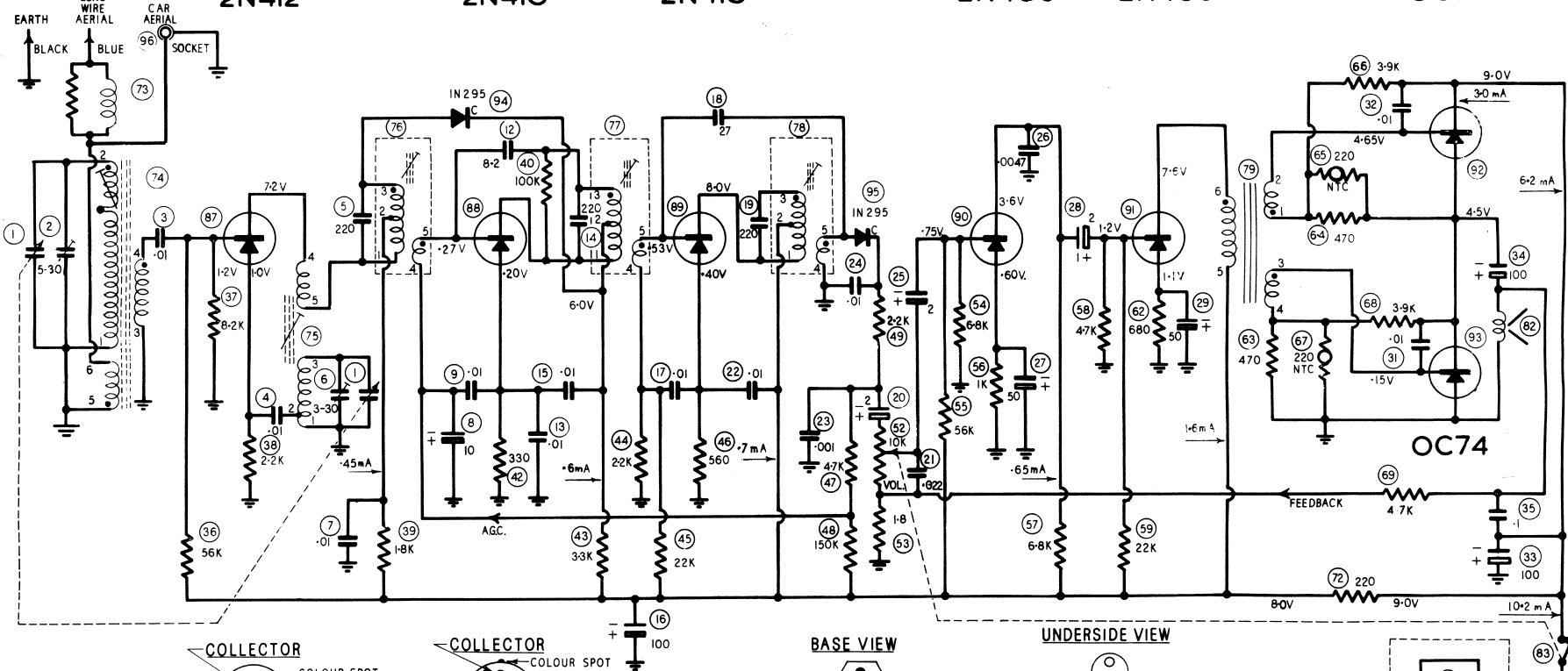
2N410

2N410

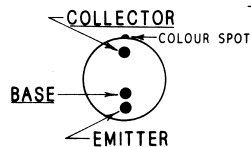
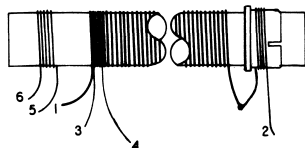
2N406

2N406

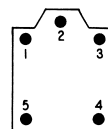
OC74

2N406, 410, 412 TRANSISTOR
UNDERSIDE VIEW

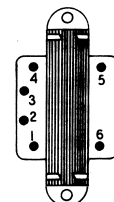
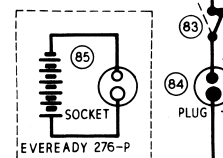
ROD AERIAL

OC74 TRANSISTOR
UNDERSIDE VIEW

BASE VIEW

OSCILLATOR COIL
& IF TRANSFORMER

UNDERSIDE VIEW

DRIVER
TRANSFORMER

I.F. 455Kc/s

MODEL P3B

NUMBERS ASSIGNED TO TERMINALS OF COILS AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT BE FOUND ON THE UNIT.

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)

ISSUE 2 — CIRCUIT NO. 21. ADDED. — CIRCUIT NO. 49. WAS 220. — CIRCUIT NO. 23. WAS -01.

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 requirement of 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. 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 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 existence of voltage or signal clicks may result in permanent damage to the transistors and components.

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 must 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 OF CABINET

Do not polish the plastic or metal 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 cabinet. To restore the lustre of the cabinet wipe with a soft cloth dampened with water and lightly polish with a neutral wax.

SUPPORT STRAP - RECEIVER TO CAR SEAT

A strap and strip assy. is supplied, to prevent the receiver from tipping whilst in use on a car seat. Loop the strap to the handle of receiver. Fashion the rigid strip section to form a hook over the back support section of seat.

Circuit No.	Value	Description Capacitors	Tol ⁺ ₋	Rating VDCW	Part Number
1		Two Gang Tuning			4000-028-04
2	5-30 pF	Trimmer, compression			4000-023-01
3	.01 mF	Disc ceramic		25	4008-039-06
4	.01 mF	Disc ceramic		25	4008-039-06
5	220 pF	Polystyrene	5%	125	4004-005-03
6	3-30pF	Trimmer, wire wound			4000-025-01
7	.01 mF	Disc ceramic		25	4008-039-06
8	10 mF	Electrolytic		6	4005-007-02
9	.01 mF	Disc ceramic		25	4008-039-06
10					
11					
12	8.2 pF	Disc ceramic N. P. O.	.5 pF	500	4008-012-01
13	.01 mF	Disc ceramic		25	4008-039-06
14	220 pF	Polystyrene	5%	125	4004-005-03
15	.01 mF	Disc ceramic		25	4008-039-06
16	100 mF	Electrolytic		12	4005-002-15
17	.01 mF	Disc ceramic		25	4008-039-06
18	27 pF	Disc ceramic N. P. O.	5%	500	4008-031-04
19	220 pF	Polystyrene	5%	125	4004-005-03
20	2 mF	Electrolytic		6	4005-005-06
21	.022 mF	Disc ceramic		25	4008-010-03
22	.01 mF	Disc ceramic		25	4008-039-06
23	.001 mF	Tubular ceramic		500	4008-040-06
24	.01 mF	Disc ceramic		25	4008-039-06
25	2 mF	Electrolytic		6	4005-005-04
26	.0047 mF	Disc ceramic		500	4008-037-01
27	50 mF	Electrolytic		3	4005-001-02
28	2 mF	Electrolytic		6	4005-005-06
29	50 mF	Electrolytic		3	4005-001-02
30					
31	.01 mF	Disc ceramic		25	4008-039-06
32	.01 mF	Disc ceramic		25	4008-039-06
33	100 mF	Electrolytic		12	4005-002-15
34	100 mF	Electrolytic		12	4005-002-15
35	.1 mF	Disc ceramic		25	4008-004-04

Circuit No.	Value Ohms	Description Resistors	Tol ⁺ ₋	Rating Watts	Part Number
36	56 K	Carbon	10%	$\frac{1}{2}$	4022-003-03
37	8.2 K	Carbon	10%	$\frac{1}{2}$	4022-027-02
38	2.2 K	Carbon	10%	$\frac{1}{2}$	4022-021-02
39	1.8 K	Carbon	10%	$\frac{1}{2}$	4022-030-01
40	100 K	Carbon	10%	$\frac{1}{2}$	4022-013-02
41					
42	330	Carbon	10%	$\frac{1}{2}$	4022-011-01
43	3.3 K	Carbon	10%	$\frac{1}{2}$	4022-006-01
44	2.2 K	Carbon	10%	$\frac{1}{2}$	4022-021-02
45	22 K	Carbon	10%	$\frac{1}{2}$	4022-026-02
46	560	Carbon	10%	$\frac{1}{2}$	4022-010-01
47	4.7 K	Carbon	10%	$\frac{1}{2}$	4022-005-01
48	150 K	Carbon	10%	$\frac{1}{2}$	4022-038-01
49	2.2 K	Carbon	10%	$\frac{1}{2}$	4022-021-02
50					
51					
52	10 K	Volume Control	S. P. S. T. switch attached		4032-007-06
53	1.8	Wire wound	10%	$\frac{1}{2}$	4024-013-01
54	6.8 K	Carbon	10%	$\frac{1}{2}$	4022-002-02
55	56 K	Carbon	10%	$\frac{1}{2}$	4022-003-03
56	1 K	Carbon	10%	$\frac{1}{2}$	4022-008-01
57	6.8 K	Carbon	10%	$\frac{1}{2}$	4022-002-02
58	4.7 K	Carbon	10%	$\frac{1}{2}$	4022-005-01
59	22 K	Carbon	10%	$\frac{1}{2}$	4022-026-02
60					
61					
62	680	Carbon	10%	$\frac{1}{2}$	4022-028-02
63	470	Carbon	10%	$\frac{1}{2}$	4022-016-01
64	470	Carbon	10%	$\frac{1}{2}$	4022-016-01
65	220	Disc N. T. C.	20%	$1\frac{1}{4}$	4021-020-01
66	3.9 K	Carbon	10%	$\frac{1}{2}$	4022-020-01
67	220	Disc N. T. C.	20%	$1\frac{1}{4}$	4021-020-01
68	3.9 K	Carbon	10%	$\frac{1}{2}$	4022-020-01
69	4.7	Carbon	10%	$\frac{1}{2}$	4022-005-01
70					
71					
72	220	Carbon	10%	$\frac{1}{2}$	4022-017-01

Circuit No.	Miscellaneous	Part Number
73	Aerial Loading Coil	4036-051-01
74	Rod Aerial	4074-041-01
75	Oscillator Coil	4043-019-01
76	No. 1 I. F. Transformer 455 Kc/s	4044-009-04
77	No. 2 I. F. Transformer 455 Kc/s	4044-009-07
78	No. 3 I. F. Transformer 455 Kc/s	4044-009-06
79	Driver Transformer - 6000: 375 + 375 ohms Imped.	4042-036-01
80		
81		
82	Speaker - 5" x 4" permag. Type 54C00/90/15	4056-007-04
83	Switch - ON/OFF. SP. St. part of circuit No. 52	
84	Plug - 2 pin, battery	7171-010-01
85	Battery - 9 volt type No. 276P. Eveready	4062-002-01
86		
87	Transistor - mixer/oscillator type 2N412	4128-011-02
88	Transistor - I. F. amp. No. 1., type 2N410E (green spot)	4128-010-03
89	Transistor - I. F. amp. No. 2., type 2N410B (red spot)	4128-010-04
90	Transistor - audio amp., type 2N406	4128-009-02
91	Transistor - audio driver, type 2N406	4128-009-02
92	Transistor - audio output, type OC74) matched	
93	Transistor - audio output, type OC74) pair	4128-012-01
94	Diode - overload type IN295	4127-001-01
95	Diode - detector/A. G. C. type IN295	4127-001-01
96	Socket - car aerial lead-in cable connection consists of	
	Socket	7222-051-01
	Spring	7225-089-03
	Contact	7031-069-01
	Insulator (14) 2 per transistor	7120-026-01
	Terminal strip - 3 lug type 1E1	7231-102-01
	Rod Aerial Mount Clamp (2)	7054-038-51
	Bush (3) tuning gang mt.	7031-017-01
	Grommet (3) tuning gang mt.	7106-032-01
	Screw (3) " " " $\frac{1}{8}$ " x 4 BA. csk. hd.	7196-067-15
	Tuning Spindle Assy. includes bush and horseshoe washer	7224-216-01
	Bush - tuning spindle	7031-025-01
	Horseshoe Washer - tuning spindle	7261-028-01
	Tuning Drum	7077-009-01
	Grub Screw (4) tuning drum and split gear assy.	7198-802-02
	Spindle and Gear Assy.	7224-218-01
	Bush - spindle and gear assy.	7057-013-01
	Washer - " " " "	7261-362-01
	Bush and split Gear Assy. - tuning gang shaft	7103-021-01
	Nut (3) spindle bushes	7150-057-01
	Washer (3) $\frac{3}{8}$ " int. shakeproof, spindle bushes	7262-024-01
	Dial Reading	7070-026-02
	Screw (6) dial fastening 5/32" x No. 2 Deutscher pan hd.	7209-107-03
	Washer (6) leatheroid - dial fastening screws	7261-108-01
	Pulley (4) dial cord	7174-015-01
	Dial Cord - 54 ins.	7107-002-02
	Tension Spring - dial cord	7225-076-01
	Retainer Clip (4) cord pulleys	7055-250-01
	Dial Pointer Assy.	7173-018-01
	Knob - tuning	7124-124-01
	Knob - volume	7124-145-01
	Clip (2) knobs	7186-010-01
	Retainer Bracket - battery	7113-011-01
	Retainer Clip - battery	7055-375-01
	Speednut (10) No. 4 captive, circuit board and brackets	7152-751-01
	Screw (4) $\frac{1}{8}$ " x No. 4 Phillip hd. circuit board	7201-576-11
	Clip - battery leads	7055-376-07
	Escutcheon Assy. complete consists of	7084-065-01
	Escutcheon	7084-057-01
	Grille	7104-029-03
	Gasket - grille	7102-023-01
	Loop (2) Handle mount	7337-001-02
	Mount Plate (2) handle loop	7169-152-01
	Cover (2) handle loop mt. plate	7065-054-02
	Screw (2) $\frac{1}{2}$ " x No. 4 Phillips, Pan hd. gold plate, handle	7201-576-03
	Screw (3) 5/8" x 4 BA. Special hd. cabinet and ext. aer. and earth	7196-917-11
	Screw - $\frac{3}{4}$ " x 4 BA. Special hd., cabinet rear flap	7196-917-12
	Clip - screw retainer, cabinet rear flap fastener	7055-251-01
	Screw (4) $\frac{3}{8}$ " x $\frac{1}{8}$ " Whit. csk. hd. speaker mt.	7198-126-22
	Nut (8) $\frac{1}{8}$ " Whit. speaker and bracket mt.	7148-302-11
	Speednut (7) escutcheon to cabinet	7152-274-01
	Leatheroid Washer - escutcheon speednut, top centre	7261-186-01
	Screw (2) $\frac{1}{4}$ " x No. 4 Deutscher pan. hd., chassis to cabinet	7209-113-11
	Surround - car aerial socket	7330-002-01
	Nut (2) "Dedloc" fastens surround to cabinet	7310-002-02
	Screw (4) aerial mount clamp $\frac{1}{2}$ " x No. 4 Phillips, pan. hd.	7201-576-06
	Screw (2) $\frac{1}{4}$ " x No. 4 Deutscher pan. hd. chassis to cabinet	7209-113-11
	Speednut (4) 4 B.A., ext. aer. and earth chassis brackets	7152-757-02

STYLING

Cabinet Assy. - less escutcheon, socket surround, handle etc.

COLOUR

Tan-White	7040-004-01
Red-White	7040-004-02
Charcoal-White	7040-004-03
Parchment-White	7040-004-04

HANDLE

Tan	7109-012-01
Red	7109-012-02
Charcoal	7109-012-03
Parchment	7109-012-04

FAULT LOCATION GUIDE - GENERATOR TEST

Connect generator through a 0.1 mF 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
OC 74 Output Base	No. 32 & Driver sec.	Audio	Weak
OC 74 Output Base	No. 31 & Driver sec.	Audio	Weak
2N406 Driver Base	Nos. 58, 59, 28	Audio	Increased level
2N406 First Audio Base	Nos. 54, 55, 25	Audio	Further increase
Det. output at vol. cont.	Nos. 20, 52	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 5, I.F.T. 1	455Kc/s	Further increase
2N412 Converter Base	No. 3 and aerial sec.	455Kc/s	Further increase
Tune receiver to generator at broadcast frequency.			
2N412 Converter Base	No. 3 and aerial sec.	Sig. Freq.	Same level as at 455 Kc/s

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.

CHECKPOINT	LOCATION Circuit Numbers at Junction Point	STRENGTH OF CLICK
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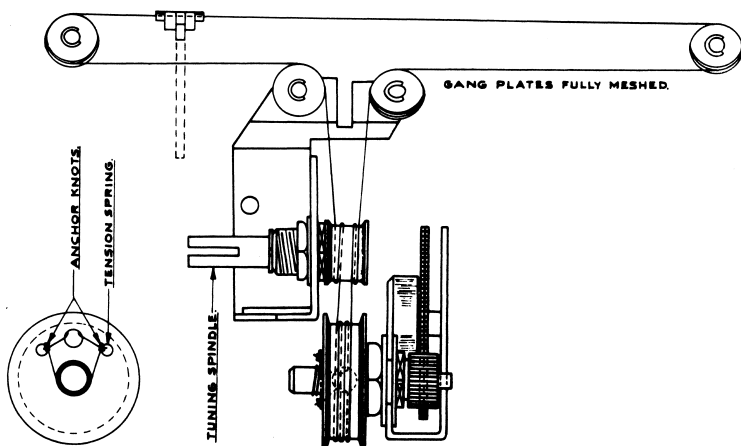
Transistor Base

Volume control at minimum:

OC74 Output	No. 31 & Driver secondary	very weak
OC74 Output	No. 32 & Driver secondary	weak
2N406 Driver	Nos. 58, 59, 28	loud
2N406 First Audio	Nos. 54, 55, 25	loud

Volume control at maximum:

2N410 I.F.2	Pin 5, I.F.T. 2	very weak
2N410 I.F.1	Pin 5, I.F.T. 1	weak
2N412 Converter	Nos. 36, 37, 3	loud



SIDE VIEW OF DIAL DRUM.

ALIGNMENT EQUIPMENT

Signal Generator - Modulated 400 c. p. s.
Output Meter - 15 ohms impedance.
Series Capacitor - Sig. gen. for I. F. T. alignment .1 mF
Part No. 4006-005-03.

Alignment Tools

- (a) Flat metal blade each end - Part No. 4121-001-01 for I. F. T. and osc. coil iron core adjustment.
- (b) Chisel point type - Part No. 4121-005-01 for trimmer capacitor adjustment.

ALIGNMENT CONDITIONS

Open cabinet by unscrewing the single screw located on the rear, near base of cabinet.

Volume Control - maximum (fully clockwise).
Output Level - 50 milliwatts
Output Meter
Connection - across speaker voice coil.
Supply voltage - 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 .01 cond. circuit No. 3.	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

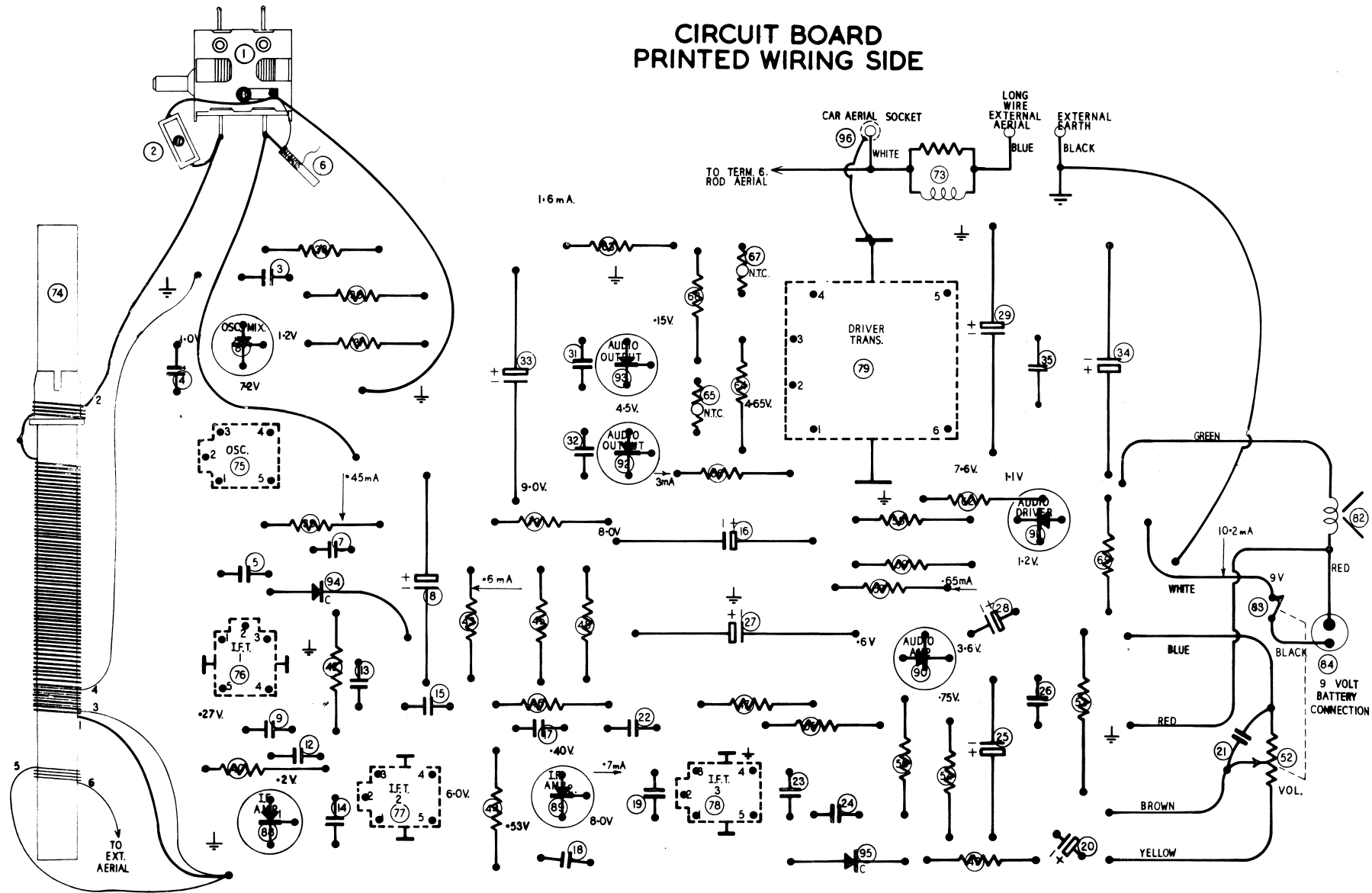
Fully mesh the gang condenser plates and align centre of indicator pointer with the centre of the low frequency end of travel spot on dial.

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 aerial coupling 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 and B.	600 Kc/s	Turn tuning gang until dial pointer aligns with 600 Kc/s spot on dial. Adjust oscl. coil core and rod aerial ind. winding for max. signal.
2.	As oper. 1	1400 Kc/s	Turn tuning gang until dial pointer aligns with 1400 Kc/s spot on dial. Adjust oscl. and aerial trimmer cond. for max. signal.
3.	Repeat oper. 1. and 2.		Tuning range after alignment 528-1630 Kc/s approx.

CIRCUIT BOARD PRINTED WIRING SIDE



CIRCUIT BOARD
PRINTED WIRING SIDE

