AIR CHIEF

CAR RADIO DIVISION, ELECTRONIC INDUSTRIES LTD.

ASTOR HOUSE: 161-173 STURT STREET, SOUTH MELBOURNE Phone: 69 0300

SERVICE DATA

MODEL PN-C7B

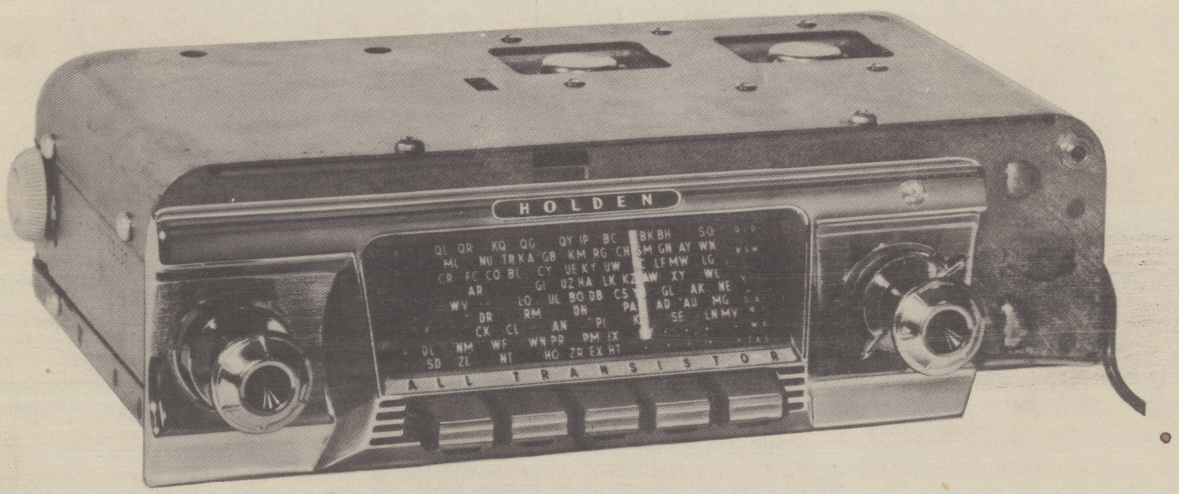
8 TRANSISTOR SUPERHETERODYNE

12 VOLT CAR RADIO

(Battery negative terminal connected to chassis)

Push Button and Manual Tuning

ESPECIALLY DESIGNED FOR HOLDEN MODELS "EJ" AND "EH"



TUNING RANGE	- 525 - 1615 Kilocycles
POWER OUTPUT	- 8 Watts
OUTPUT IMPEDANCE	- 15 Ohms
CURRENT CONSUMPTION	- No Input - 390mA (does not include dial lamp)

SETTING THE PUSH BUTTONS

1. Unlock push buttons by pulling outward.
2. Tune a desired station with the manual tuning knob.
3. Press one of the push buttons fully in.
4. Repeat above procedure to set remaining four buttons.

BROADCAST ALIGNMENT

When iron cores or tuning unit coil assy. have been replaced or if station logging is outside limits.

Oper. No.	Generator Connection	Generator Frequency	Instructions
1.	Connect IF. attenuator to test pins "B" and "C" (resistor to pin "C").		
2.	Turn perm. tuner against high frequency end of travel stop. Set all iron cores so that not less than 1/8" of shaft protrudes out through front panel of receiver.		
3.	To aerial Lead-in Socket. 65pF. dummy aerial series	1625 Kc/s	Adjust Osc. RF and both Aerial trimmer capacitors for max. output.

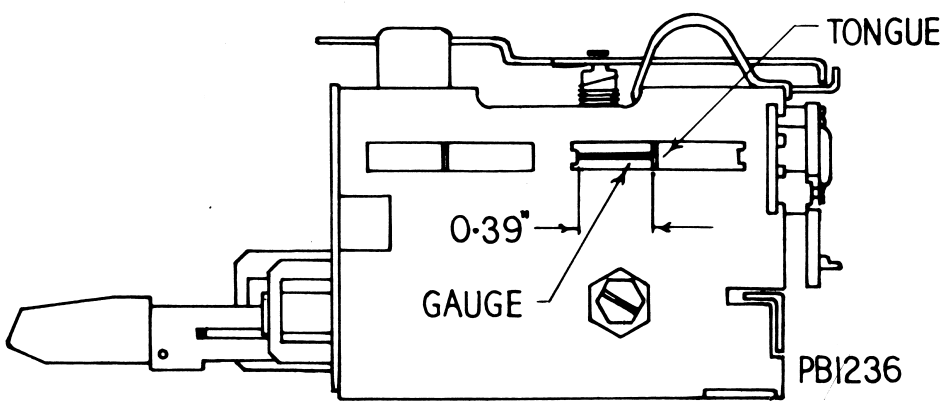
4. In the side of tuning unit, opposite end to tuning spindle there are two slots; place a gauge in the form of a flat piece of metal 0·39" wide into slot nearest rear of tuner. The 0·39" gauge is to be against projection at front edge of slot. Refer diagram. NOTE. Do not strain or tilt core carriage. Gently turn tuning spindle until the metal tongue touches the gauge.

	As oper. 3.	1000 Kc/s	With tuner set in position detailed, adjust Osc., RF. and both Aerial iron cores for maximum output.
5.	As oper. 3.	600 Kc/s	Rock tuning control through signal, adjust Osc. shunt coil iron core for max. output.

6. Turn tuning control to low freq. end of travel (iron cores full in). Tune signal generator to receiver. The low freq. tuning limit should be between 510 and 528 Kc/s.

7. Repeat operation 4.

8. Align dial pointer.



SETTING OF DIAL POINTER

Disconnect the IF attenuator.
Disconnect the generator cable from dummy aerial then connect 20 ft., of aerial wire to the dummy aerial terminal.
Accurately tune the receiver to a station marked on the dial near 1000 Kc/s. Using a screwdriver, adjust by bending the pointer carriage arm so that pointer coincides with the centre of the tuned station call sign.

Check dial logging and if necessary readjust pointer carriage arm.

PN-C7B

OPERATION OF OUTPUT TRANSISTORS AS MATCHED PAIRS

The type AT1138 transistors are operated in matched pairs, replacements MUST be made accordingly, and NOT as single units.

Matched pairs as used in this receiver are identified by a colour dot or stripe on top of transistor body. Various batch colours are in use. Transistors which have different coloured dots must not be operated together.

REPLACEMENT OF OUTPUT TRANSISTORS

When refitting or replacing transistors check that the mount positions and mount faces are clean and free from dust, grit or metal particles.

Smear a thin film of silicone compound Part No. 1036-001-04 on both sides of the mica and lead washers, also mount face of transistor and chassis.

Fit the insulating ferrules to the screw holes in chassis then fit mica washer lead washer and transistor. Fasten each transistor securely with two $\frac{1}{2}$" x No. 6 screws.

MEASUREMENT AND ADJUSTMENT OF COLLECTOR CURRENT

EQUIPMENT	Current Meter: 0-1 Amp. DC. Leads terminated with Jack Plug, Part No: 7171-015-02; positive terminal lead to tip contact. Supply Source: 13V DC
CONDITIONS	Connect receiver to 13V DC. NEGATIVE lead to chassis and POSITIVE lead to fuse block lead. Set Volume control at minimum. No signal applied to aerial input. Connect speaker to receiver socket adjacent to battery lead entry. Connect meter to receiver socket located on the rear and covered protector insert.

1. Switch receiver "ON" and allow to stabilize for at least five minutes.

2. If the collector currents indicated on meter, are outside of the limits of 160-290 mA., adjust the bias by refitting or removing the 1.2K ohm resistors (circuit numbers 92 & 94) to or from the circuit until the current reading lies within the 160-290 mA range.

NOTE. 1. It is essential that the supply voltage is maintained at 13.0V when measuring current.

NOTE. 2. After a long period of operation it will be noted the collector current will decrease slightly. This is normal and is caused by the warming of the negative temperature co-efficient components.

NOTE. 3. No further adjustment of the bias should be necessary unless output transistors are replaced.

ALIGNMENT PROCEDURE

EQUIPMENT

Signal Generator - modulated 400 cps
Output Meter - 15 Ohms Impedance
Generator Series Capacitor - .1mF Part No. 4006-005-03. for IF alignment
IF Attenuator - Part No. 4121-014-01
Dummy Aerial - 65pF Part No. 4121-009-01
Alignment Tools

(a) Chisel Point Type: Part No. 4121-005-01 for trimmer capacitor adjustment

(b) Flat Metal Blade Type: Part No. 4121-001-01 for I. F. T. and Osc. shunt coil adjustment.

(c) Tuning Unit Iron Core Adjustor: Part No. 4121-008-01

(d) Alignment Gauge: Part No. 4121-022-02 for tuner 1000 Kc/s position.

Collector Current Meter Connection - Jack plug Part No. 7171-015-02

CONDITIONS

Remove screws and slide can off receiver.

Volume Control	- maximum (fully clockwise)
Tone Control	- maximum treble (fully clockwise)
Output Level	- 50 milliwatts, output meter reading with speaker voice coil disconnected.
Output Meter Connection	Socket adjacent to receiver battery lead entry. Use plug Part No. 7171-015-02 or use original plug and leads from speaker.
Supply Voltage and Connection	13 OV DC. Connect negative supply lead to chassis and positive lead to fuse holder lead.

INTERMEDIATE FREQUENCY TRANSFORMER ALIGNMENT

Turn tuning control until perm. tuner iron cores are out of the coil formers. Insert .1mF capacitor in series with generator "hot" lead.

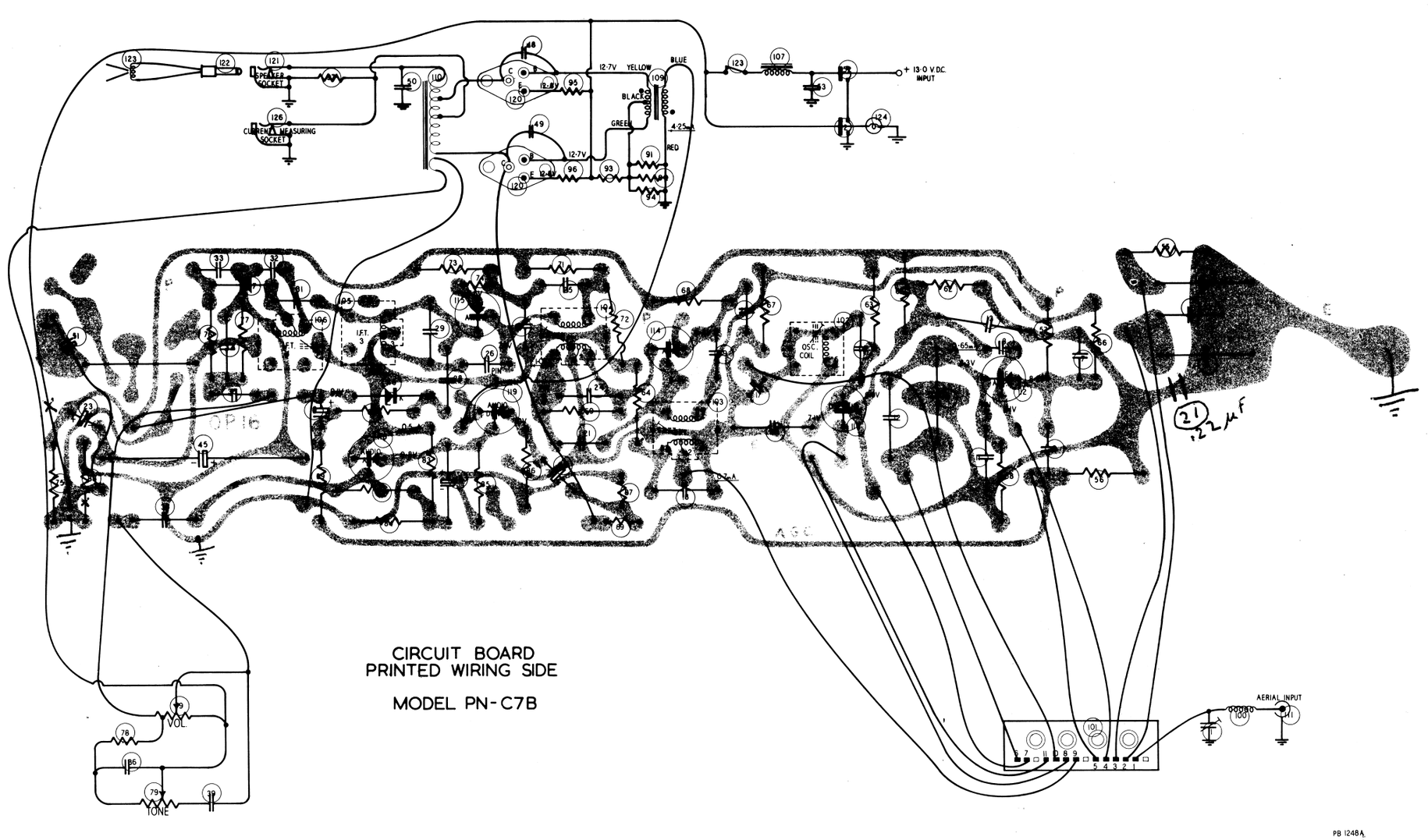
Oper. No.	Generator Connection	Generator Frequency	Instructions
1.	To test pin "B" (term 3 of 2nd I. F. T.)	455 Kc/s	Adjust iron core of 4th IF. trans. for max. output
2.	as Oper. 1.	455 Kc/s	Adjust iron core of 3rd IF. trans. for max. output
3.	Repeat operations 1 & 2		
4.	To Terminal 8. on tuner (mixer/osc. collector)	455 Kc/s	Adjust iron core of 2nd IF. trans. for max output
5.	To test pin "A" (RF. amp. collector)	455 Kc/s	Adjust iron core of 1st IF. trans. for max. output

BROADCAST ALIGNMENT

If the receiver logging is satisfactory the signal circuits may be aligned as detailed.

1. Connect IF. attenuator to test pins "B" and "C" (resistor to pin "C")

2. Aerial Lead-in Socket - 65 pF. dummy in series	1000 Kc/s	Tune receiver to generator frequency. Adjust RF. and both aerial trimmer capacitors for max. output.



CIRCUIT BOARD
PRINTED WIRING SIDE

MODEL PN-C7B

PB 1248A

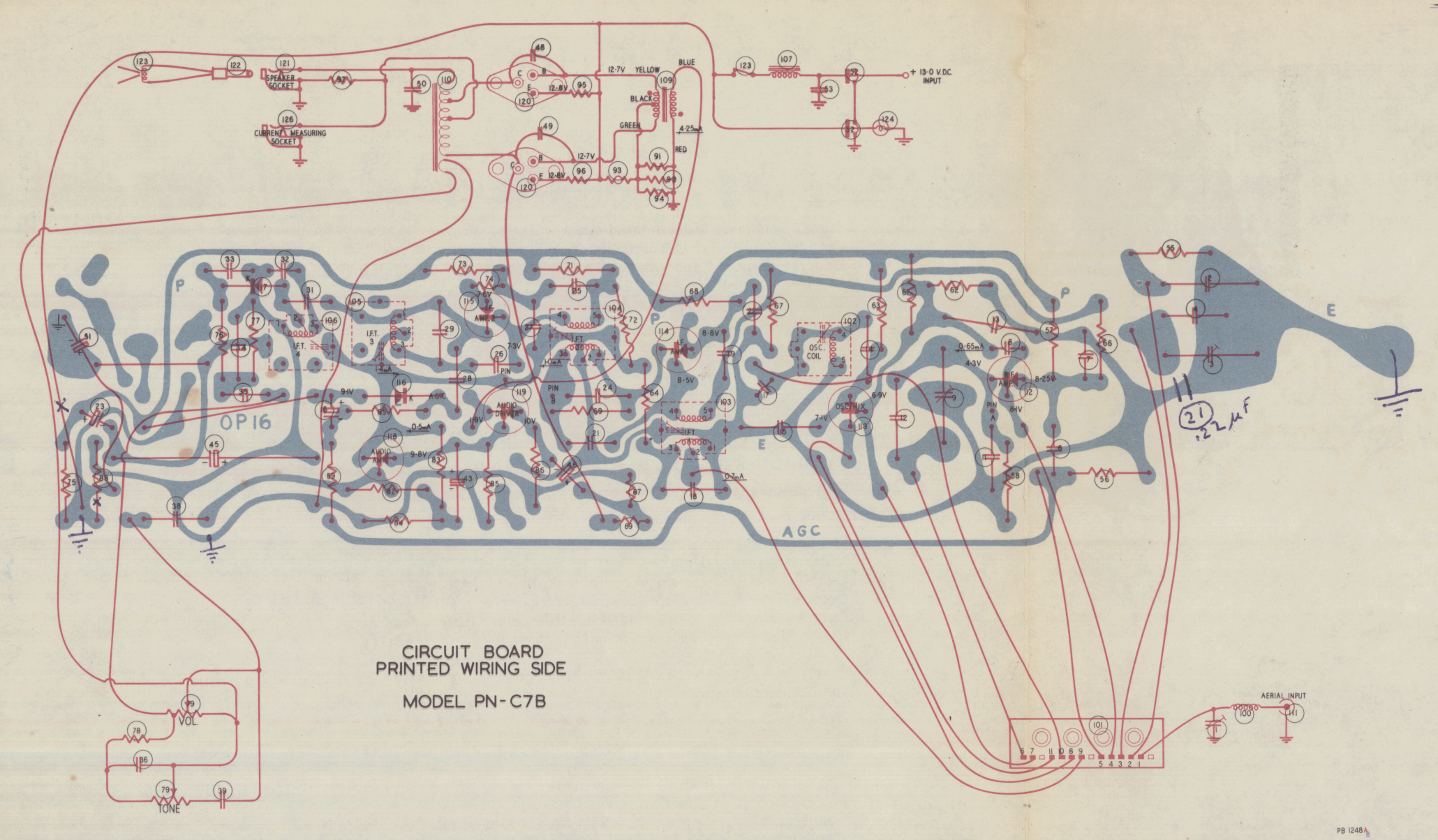
Circuit No.	Value	Capacitors Description	Tol ±	Rating DCW	Part Number
1.	12-120pF	Trimmer, Compression			4000-026-02
2.	·0047mF	Polystyrene	5%	200V	4004-019 01
3.	5-55pF	Trimmer, Compression			4000 001 02
4.	82pF	Polystyrene	10%	125V	4004 020-01
5.					
6.	·22mF	Disc, Ceramic		25V	4008 053-01
7.	·047mF	Disc, Ceramic		25V	4008 057 03
8.	39pF	Disc, Ceramic N750	10%	500V	4008 025 01
9.	5-55pF	Trimmer, Compression			4000-001-02
10.					
11.	680pF	Polystyrene	10%	125V	4004-016-02
12.	120pF	Polystyrene	10%	125V	4004-010-01
13.	·0022mF	Polystyrene	10%	200V	4004-015-03
14.	56pF	Tubular, Ceramic N470	10%	500V	4008-030-05
15.	·0027mF	Polystyrene	10%	200V	4004-003-03
16.	6·4mF	Electrolytic		25V	4005-029-01
17.	3-30pF	Trimmer - Wire wound			4000-025-01
18.	220pF	Polystyrene	5%	125V	4004-005-03
19.	·047mF	Disc, Ceramic		25V	4008-057-03
20.					
21.	3·3pF	Disc Ceramic N. P. O.	·25pF	500V	4008-014-01
22.	·1mF	Disc Ceramic		25V	4008-004-04
23.	100mF	Electrolytic		12V	4005-002-15
24.	220pF	Polystyrene	5%	125V	4004-005-03
25.	·047mF	Disc Ceramic		25V	4008-057-03
26.	3·3pF	Disc Ceramic N. P. O.	·25pF	500V	4008-014-01
27.	·047mF	Disc Ceramic		25V	4008-057-03
28.	150pF	Polystyrene	10%	125V	4004-017-01
29.	470pF	Polystyrene	5%	125V	4004-002-04
30.					
31.	33pF	Disc Ceramic N750	5%	500V	4008-007-08
32.	470pF	Polystyrene	5%	125V	4004-002-04
33.	470pF	Tubular Ceramic	20%	500V	4008-052-05
34.	470pF	Tubular Ceramic	20%	500V	4008-052-05
35.	·01mF	Disc Ceramic	20%	25V	4008-039-07
36.	·068mF	Polyester	10%	125V	4009-013-01
37.					
38.	·22mF	Disc Ceramic		25V	4008-053-01
39.	·01mF	Polyester	10%	125V	4009-014-01
40.					
41.					
42.					
43.	32mF	Electrolytic		2.5V	4005-021-03
44.					
45.	100mF	Electrolytic		16V	4005-002-18
46.	320mF	Electrolytic		2.5V	4005-028-01
47.					
48.	·015mF	Polyester	10%	125V	4009-018-02
49.	·015mF	Polyester	10%	125V	4009-018-02
50.	·01mF	Disc Ceramic		25V	4008-039-06
51.	500mF	Electrolytic		16V	4005-014-13
52.	3 x ·001mF	Feed Thru			4008-040-05
53.	·22mF	Disc Ceramic		25V	4008-053-01
54.					

Circuit No.	Value Ohms	Resistors Description	Tol ±	Rating	Part Number
55.	1K	Carbon	10%	½	4022-008 01
56.	120K	Carbon	10%	½	4022-031-01
57.	560	Carbon	10%	½	4022-010-01
58.	6.8K	Carbon	10%	½	4022-002-02
59.	560	Carbon	10%	½	4022-010-01
60.					
61.	5·6K	Carbon	10%	½	4022-022-02
62.	18K	Carbon	10%	½	4022 018-01
63.	2·7K	Carbon	10%	½	4022-043-01
64.	180K	Carbon	10%	½	4022-014-03
65.	5.6K	Carbon	10%	½	4022-022-02
66.	1·5K	Carbon	10%	½	4022-007-01
67.	150K	Carbon	10%	½	4022-038-01
68.	330	Carbon	10%	½	4022-011-01
69.	120K	Carbon	10%	½	4022-031-01
70.					
71.	3·9K	Carbon	10%	½	4022-020-01
72.	15K	Carbon	10%	½	4022-001-02
73.	1K	Carbon	10%	½	4022-008-01
74.	27	Carbon	10%	½	4022-068-01
75.	820	Carbon	10%	½	4022-009-01
76.	8·2K	Carbon	10%	½	4022-027-02
77.	68K	Carbon	10%	½	4022-048-01
78.	8.2K	Carbon	10%	½	4022-027-02
79.	Volume and tone control concentric shaft potentiometers Front Section 250K ohms. Rear Section 250K ohms tapped 100K ohms with SP. ST. Switch attached.				4030-026-02 or 4030-026-04

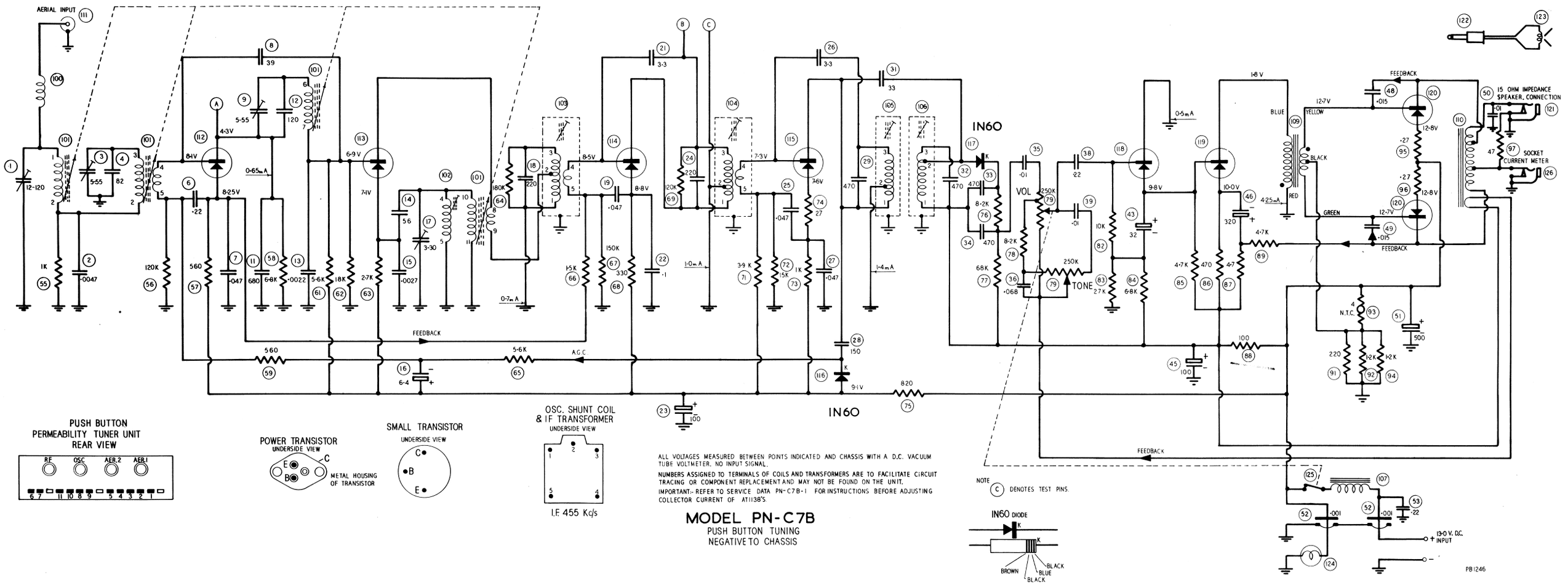
FAULT LOCATION GUIDE - GENERATOR TEST

Connect generator through a 0.1 mF capacitor to the following points:- NOTE Always start with a low generator output. Strong signals may overload the receiver or cause the AGC to function.

No.	VOLUME CONTROL	CHECK POINT	SIG. GEN. FREQ.	SIGNAL STRENGTH
1.	Set at minimum	Each output transistor base	Audio	Adjust generator to provide a low signal
2.	" " "	Audio driver transistor base	"	Increase in level of check No. 1.
3.	" " "	Audio amp. transistor base	"	Increase in level of check No. 2.
4.	Set at maximum	Top of volume control	"	Same level as check No. 3.
5.	" " "	Detector input	455 Kc/s	Adjust generator to provide a low signal
6.	" " "	2nd IF transistor base	"	Increase in level of check No. 5.
7.	" " "	1st IF transistor base	"	Increase in level of check No. 6.
8.	" " "	Osc/mix transistor base	"	Increase in level of check No. 7.
9.	" " "	Osc/mix transistor base	Sig. Freq.	Adjust generator to provide a low signal
10.	" " "	RF transistor base	" "	Increase in level of check No. 9.
11.	" " "	Dummy aerial	" "	Small decrease in level of check No. 10.


SPEAKER SOCKET
CURRENT MEASURING SOCKET
12·7V
YELLOW
BLUE
BLACK
GREEN
RED
4·25mA
12·8V
+ 13·0 V.D.C. INPUT
OP16
I.F.T.
I.F. AMP.
AUDIO AMP.
AUDIO DRIVER
OSC. COIL
OSC. MIX
AGC
VOL.
TONE
AERIAL INPUT
0·22μF
CIRCUIT BOARD
PRINTED WIRING SIDE
MODEL PN-C7B
PB 1248A

AT17 2N412 2N410-E 2N410-B 2N406 2N591 2-AT1138



ALL VOLTAGES MEASURED BETWEEN POINTS INDICATED AND CHASSIS WITH A D.C. VACUUM TUBE VOLTMETER. NO INPUT SIGNAL.

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

IMPORTANT:- REFER TO SERVICE DATA PN-C7B-1 FOR INSTRUCTIONS BEFORE ADJUSTING COLLECTOR CURRENT OF AT1138'S.

NOTE (C) DENOTES TEST PINS.

MODEL PN-C7B

PUSH BUTTON TUNING
NEGATIVE TO CHASSIS

80.					
81.					
82.	10K	Carbon	10%	½	4022-004-01
83.	27K	Carbon	5%	½	4022-073-05
84.	6·8K	Carbon	5%	½	4022-002-07
85.	4·7K	Carbon	10%	½	4022-005-01
86.	470	Carbon	5%	½	4022-016-06
87.	4·7	Wire Wound	10%	½	4024-012-03
88.	100	Carbon	10%	½	4022-062-01
89.	4·7K	Carbon	10%	½	4022-005-01
90.					
91.	220	Wire Wound	5%	5	4024-033-02
92.	1·2K	Carbon	10%	½	4022-040-01
93.	4	Disc. Thermistor NTC	10%	1.5	4021-001-03
94.	1.2K	Carbon	10%	½	4022-04 -01
95.	·27	Wire Wound	10%	½	4024-007-02
96.	·27	Wire Wound	10%	½	4024-007-02
97.	47	Carbon	10%	1	4022-041-03
98.					
99.					

Circuit No.	Miscellaneous	Part Number
100.	Spark Filter Choke 6·8uH	4048-032-01
101.	Push-button permeability tuner unit complete	4050-039-01
	Consists of	
	Iron Sleeve (3)	4065-037-01
	Iron Sleeve (1) - Oscillator	4065-038-01
	Iron Core (4)	4065-039-01
	Coil Assy.	4036-053-01
	Includes	
	Aerial coil	4036-057-01
	Aerial transformer	4043-033-01
	R.F. coil	4036-057-01
	Oscillator transformer	4043-033-01
102.	Oscillator shunt coil	4036-044-02
103.	No. 1 IF transformer 455 Kc.s (Red Green)	4044-009-04
104.	No. 2 IF transformer 455 Kc/s (Red White)	4044-009-08
105.	No. 3 IF transformer 455 Kc/s (Orange Black)	4044-022-01
106.	No. 4 IF transformer 455 Kc/s (Orange Orange)	4044-022-02
107.	Filter choke, iron cored	4048-025-02
108.		
109.	Driver transformer, 3,900 to 108 + 108 ohms imped	4042-042-01
110.	Speaker transformer	4042-058-01
111.	Aerial input - socket	7222-037-01
112.	R.F. Amplifier transistor type AT17	4128-034-01
113.	Converter transistor type 2N412	4128-011-02
114.	First IF amp. transistor type 2N410-E (Green spot)	4128-010-03
115.	Second IF amp. transistor type 2N410-B (Red spot)	4128-010-04
116.	AGC Control diode type 1N60	4127-032-01
117.	Detector diode type 1N60	4127-032-01
118.	Audio Amp. transistor type 2N406	4128-009-02
119.	Audio Driver transistor type 2N591	4128-017-02
120.	Push - pull output transistors type 2-AT1138 (matched pair)	4128-004-02
121.	Socket - speaker	7222-033-01
122.	Plug - speaker lead	7171-015-02
123.	Speaker - 9" x 6" oval permag type 96L00/69/15	4056-004-08
124.	Dial Lamp 12-16 Volt 7mm bulb BA7S Base Wotan	4068-003-04
125.	Switch, part of circuit No. 79	
126.	Socket - Collector current adjustment	7222-033-01

Part No.	Mechanical
7222-036-01	Socket (2) - Audio output transistors
7111-006-01	Heat sink (1) Audio output transistors
7102-027-01	Lead washer (2) Audio output transistors
7120-049-01	Mica washer (2) Audio output transistor
7031-050-01	Insulator (4) Audio output transistor
7201-577-07	Screw (4) ½" x No. 6 Phillips head audio output transistor
7222-065-01	Socket - Dial Lamp
7086-079-01	Eyelet - Dial Lamp
7120-087-01	Bush - Dial Lamp
7261-246-02	Washer (2) Bakelite, speaker and collector current socket
7231-102-01	Terminal strip - 3 lug type 1E1
7231-432-02	Terminal strip - 10 lug type 4E2E2
7204-576-12	Screw (2) 3/8" x No. 4 Phillips head - transformer mount
7152-751-01	Speednut (2) No.4 Transformer mount
7201-577-12	Screw (14) ¼" x No. 6 Phillips head - various
7167-058-01	Pin (8) printed circuit board
7120-072-01	Mica insulator - thermistor
7150-901-05	Spacer nut. (2) 3/8" x 32 T.P.I. hex. control bushes
7262-024-02	Washer (1) 3/8" Int. shakeproof - control bush
7120-026-01	Glass head (16) transistor mount spacer
7198-931-11	Screw (6) ¼" x 1/8" Whit. ch. hd. perm. tuner to can
7291-003-01	Connector shroud - battery lead
7244-003-01	Connector - Battery lead
7065-025-01	Shield - Feed thru filter condensers
7071-013-01	Insulating Disc. - Feed thru-condenser cover
7204-576-15	Screw (8) ¼" x No. 4 Phillips head, printed board mounting
7261-122-03	Washer (2) Bakelite, printed board mounting
7065-067-01	Can - top cover for chassis
7065-027-01	Can - bottom cover for chassis
7138-070-02	Lug (3) solder. lead dressing
7124-067-01	Outer knob assy. Volume and tuning
7055-367-02	Spring clip (2) outer knobs
7124-069-01	Inner knob assy - Tuning knob.
7124-068-01	Inner knob assy. - Tone control.
7186-010-01	Spring (2) inner knobs
7150-853-02	Barrel Nut (2) External thread
7261-380-14	Washer (2) chrome, External thread, barrel nuts
7084-163-01	Escutcheon Assy. complete
	Consists of:
7084-055-01	Escutcheon
7081-001-01	Emblem - "Diamond Dot"
7261-109-03	Washer (1) Flat Steel, dial fastening
7209 107-10	Screw (1) 3/8" x No. 2 Deutsher dial fastening
7215-034-01	Shield - light - foam plastic
7008-015-01	Metcal - "All Transistor"
7070-045-31	Dial Reading. All States
7150-854-04	Barrel Nut (2) internal thread
7261-484-02	Washer (2) chrome - internal thread barrel nuts
7173-042-05	Pointer
7005-027-01	Dial Background Assy.
7209-107-10	Screw (2) 3/16" x No. 2 Deutsher - Dial background fastening
7010-038-01	Organdie Bag for speaker
7124-285-01	Knob (1) Aerial tuning
7215-057-01	Dust shield - dial
7124-211-01	Knob Assy. (5) push button knobs
7244-001-01	Clip (2) on end of speaker lead
7224-215-05	Manual drive tuning spindle assy. complete
7031-066-01	Bush (1) - manual drive spindle
7150-057-01	Nut (1) 3/8" x 32 T.P.I. hex. nut
7225-085-01	Spring (1) manual drive pinion shaft tension
7308-014-01	Cap - collector current adjustment socket