AIR CHIEF

CAR RADIO DIVISION, ELECTRONIC INDUSTRIES LTD.

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

MN-C6B-1

File : RECEIVERS GENERAL

Date: 28/8/1963

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SERVICE DATA

MODEL MN-C6B

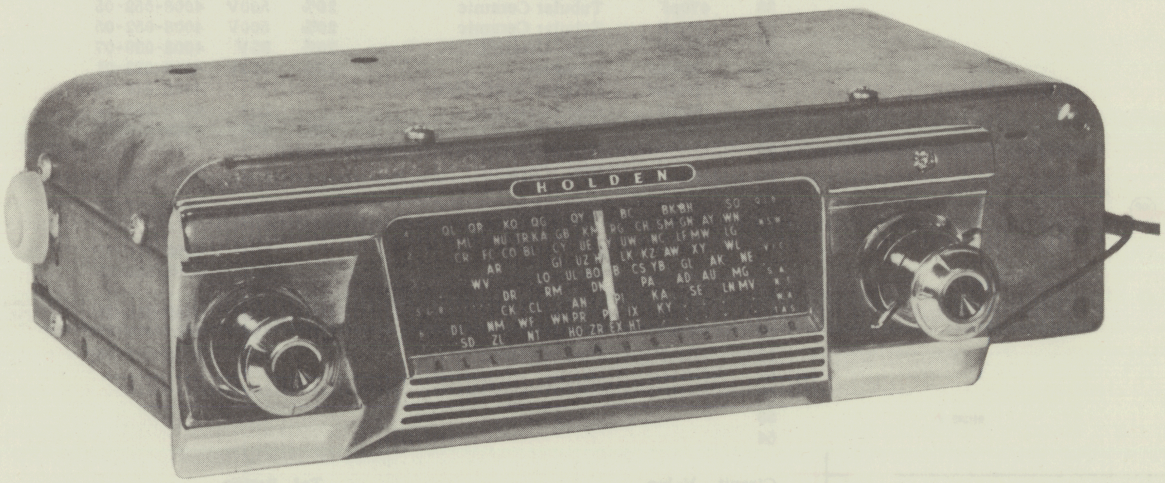
8 TRANSISTOR SUPERHETERODYNE

12 VOLT CAR RADIO

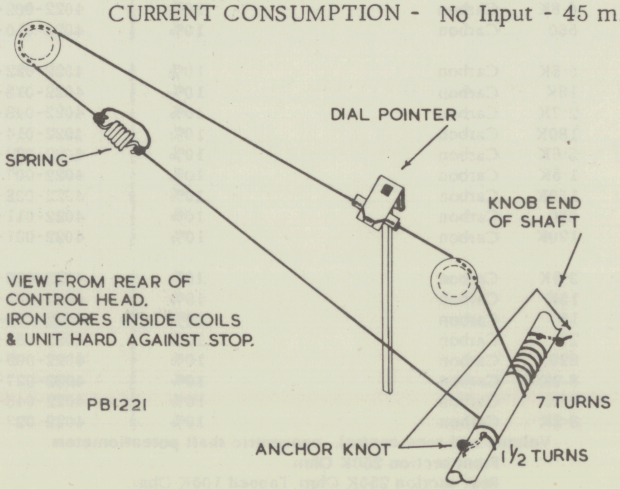
(Battery negative terminal connected to chassis)

Manual Tuning

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



TUNING RANGE	-	525 - 1615 Kilocycles
POWER OUTPUT	-	2 Watts
OUTPUT IMPEDANCE	-	15 Ohms
CURRENT CONSUMPTION	-	No Input - 45 mA (does not include dial lamp)



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. 4121-023-02 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.

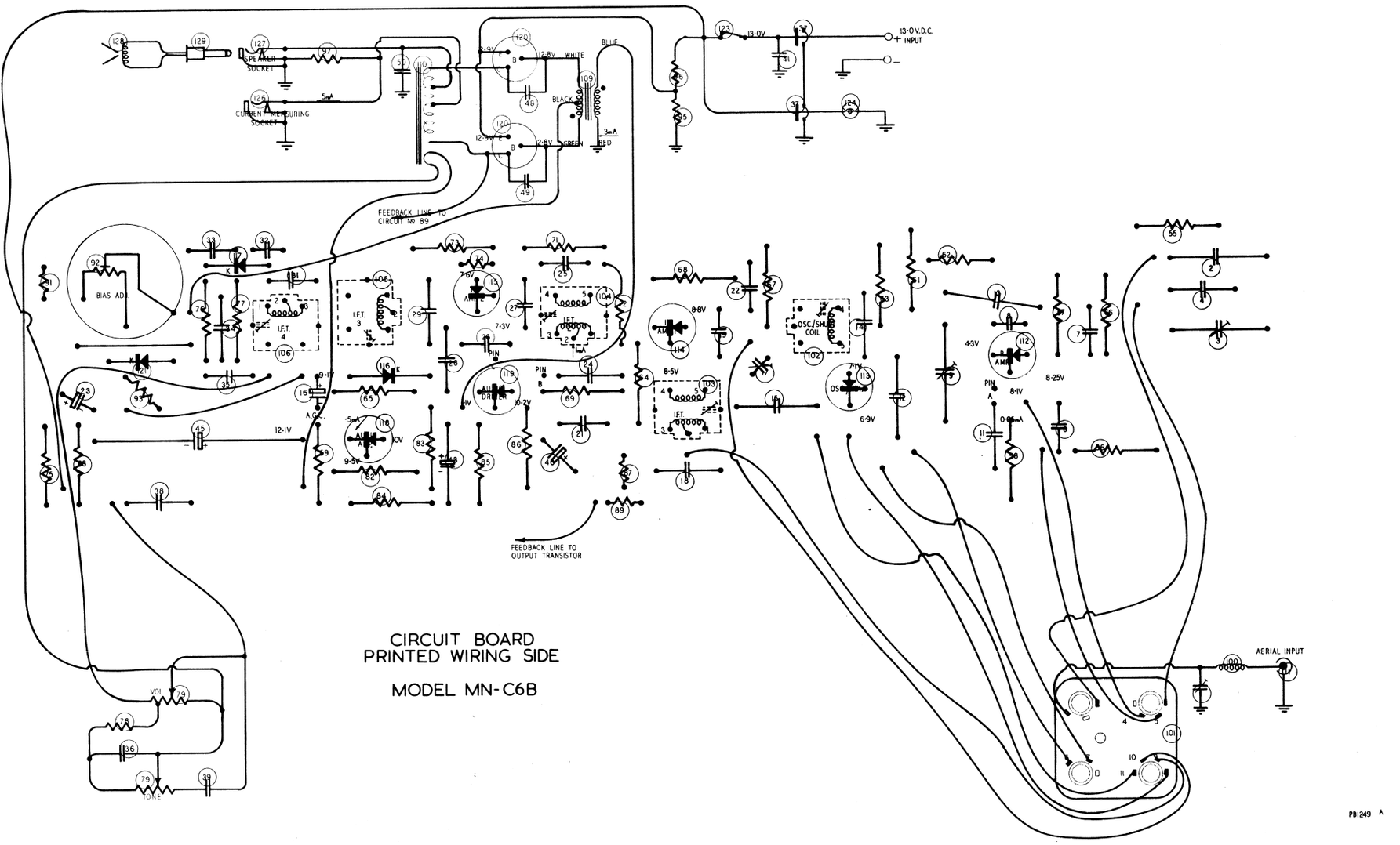
Oper. No.	Generator Connection	Generator Frequency	Instructions
1.	To test pin "B" (term 3 of 2nd I. F. T.)	455 Kc/s	Adjust iron core of 4th IF trans for max. output
2.	as Oper. 1.	455 Kc/s	Adjust iron core of 3rd IF. trans. for max. output
3.	Repeat operations 1 & 2		
4.	To Terminal 8. on tuner (mixer/osc. 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 MN-C6B

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.

COMPONENT PARTS LIST

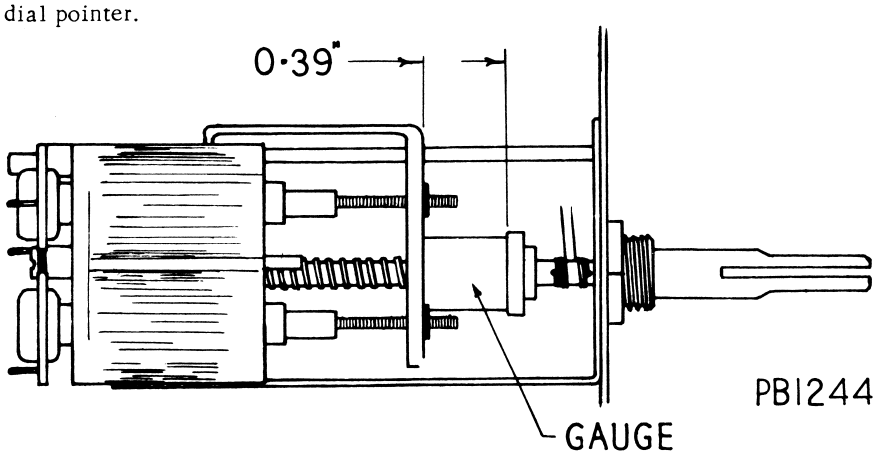
Circuit No.	Value	Capacitors Description	Tol ±	Rating DCW	Part Number
1	12-120pF	Trimmer Compression			4007-026-02
2	·004mF	Polystyrene	5%	200V	4004-019-01
3	5-55pF	Trimmer, Compression			4000-001-02
4	82pF	Polystyrene	10%	125V	4004-020-01
5					
6	·22mF	Disc. Ceramic		25V	4008-053-01
7	·047mF	Disc. 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	·001mF	Ceramic Feed-Thru			4008-040-05
38	·22mF	Disc. Ceramic		25V	4008-053-01
39	·01mF	Polyester	10%	125V	4009-014-01
40					
41	·22mF	Disc. Ceramic		25V	4008-053-01
42					
43	32mF	Electrolytic		2·5V	4005-021-03
44					
45	250mF	Electrolytic		16V	4005-011-07
46	320mF	Electrolytic		2·5V	4005-028-01
47					
48	·01mF	Polyester	10%	125V	4009-014-01
49	·01mF	Polyester	10%	125V	4009-014-01
50	·01mF	Disc. Ceramic		25V	4008-039-06
51					
52					
53					
54					

Circuit No.	Value Ohms	Resistors Description	Tol ±	Rating Watts	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 Ohm. Rear section 250K Ohm Tapped 100K Ohm. With SP. ST. Switch attached				4030-026-04or 4030-026-02

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 3/8" of adjusting shafts protrude forward of front face of core carriage.		
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.	Refer diagram. Place the 1000 Kc/s alignment gauge Part No. 4121-023-01 or alternatively a flat piece of metal 0.39" wide between the core carriage and loose collar. Gently turn tuning spindle until gauge is located squarely between collar and carriage.		
5.	As oper. 3.	1000 Kc/s	With tuner set in position detailed, adjust Osc., RF. and both Aerial iron cores for maximum output.
6.	As oper. 3.	600 Kc/s	Rock tuning control through signal, adjust Osc. shunt coil iron core for max. output.
7.	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.		
8.	Repeat operations 4 and 5.		
9.	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 1,000 Kc/s.

Slip dial pointer carriage assy. along guide rail until the centre of the pointer coincides with centre of the tuned station call sign.

Check dial logging and if necessary readjust pointer carriage.

MN-C6B

OPERATION OF OUTPUT TRANSISTORS AS MATCHED PAIRS

The type AC128 transistors are operated in matched pairs, designated 2-AC128; replacements MUST be made accordingly and not as single units.

The transistor pairs are identified by a letter symbol stamped on to the top of transistor housing. Transistors which have different batch symbols must not be operated together.

MEASUREMENT AND ADJUSTMENT OF COLLECTOR CURRENT

EQUIPMENT — Current Meter: 0-10mA. 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 by protector insert.

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

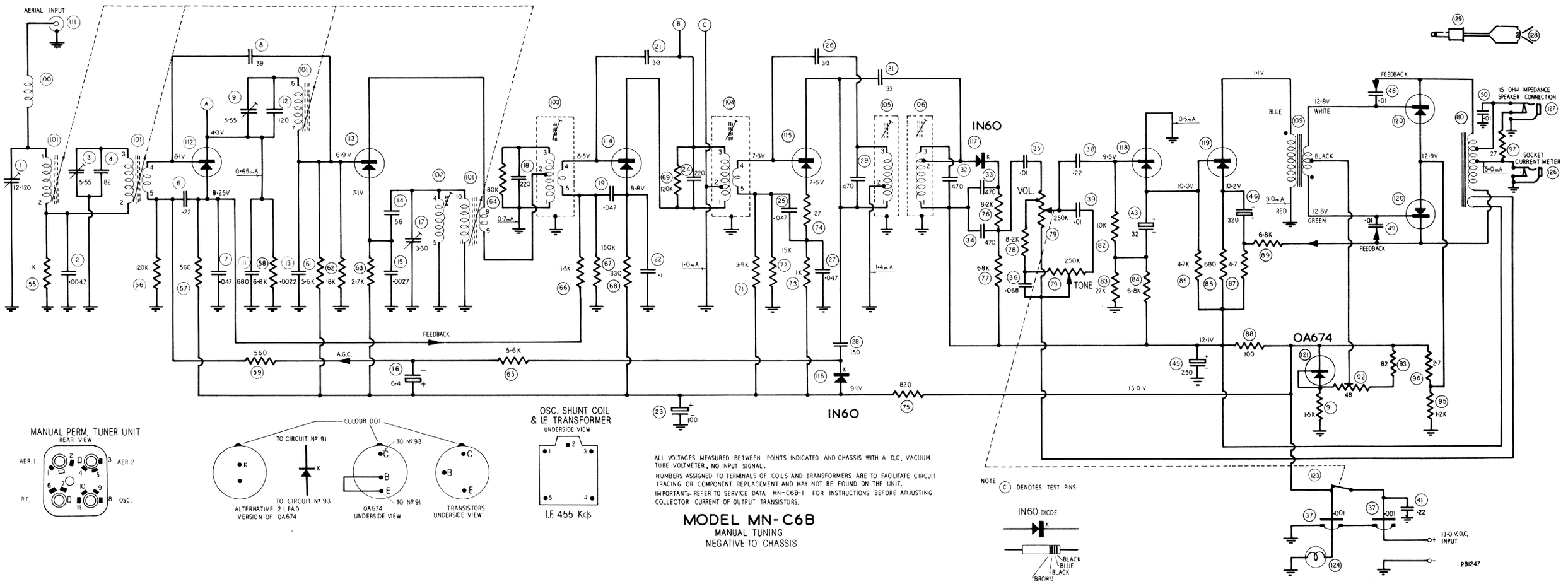
2. Carefully adjust bias rheostat to obtain a reading of 5mA.

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 positive temperature co-efficient components.

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

AT17 2N412 2N410-E 2N410-B 2N406 2N591 2-AC128



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 MN-C6B-1 FOR INSTRUCTIONS BEFORE ADJUSTING COLLECTOR CURRENT OF OUTPUT TRANSISTORS.

NOTE (C) DENOTES TEST PINS

MODEL MN-C6B

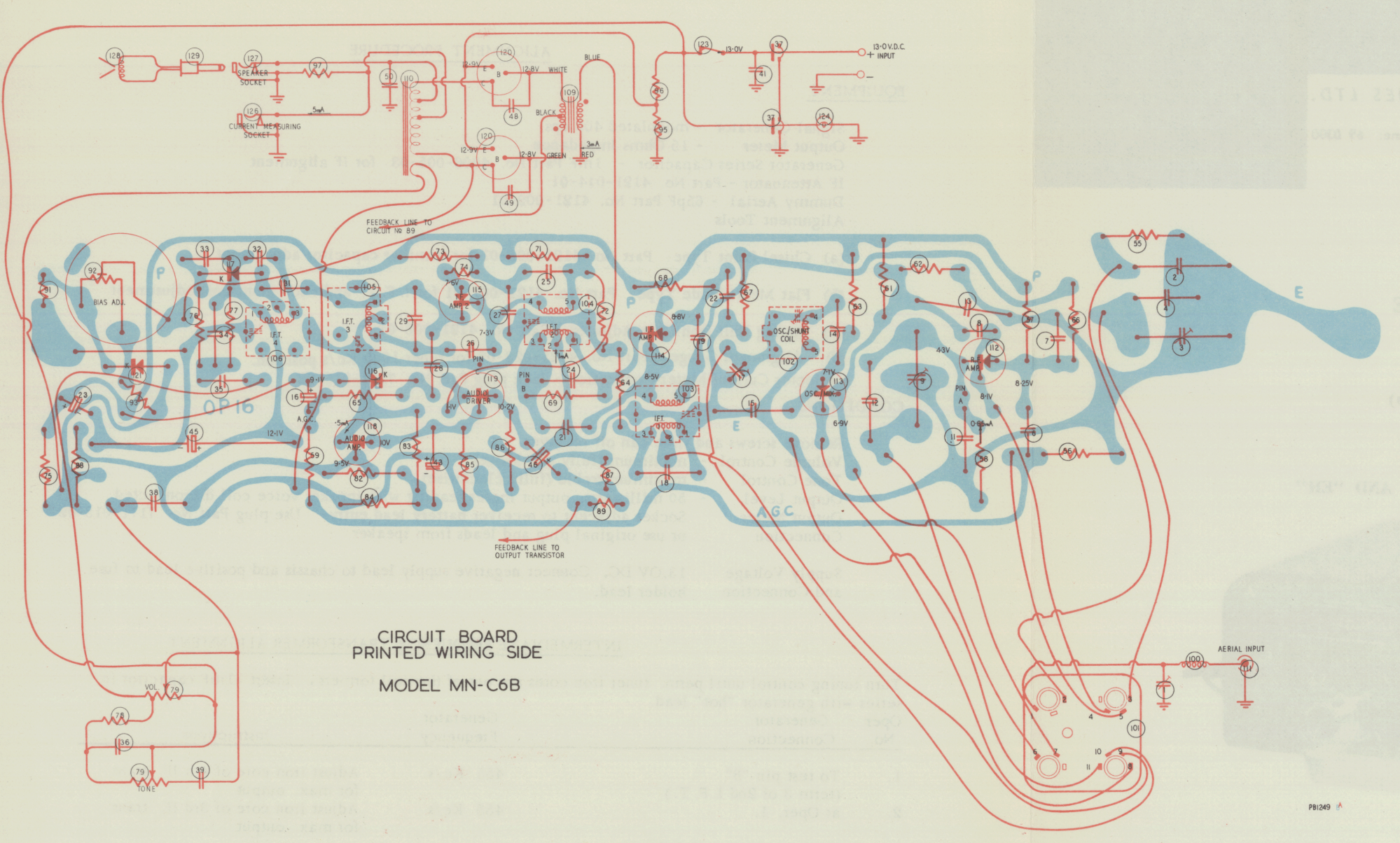
MANUAL TUNING
NEGATIVE TO CHASSIS

Circuit No.					Part Number
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	680	Carbon	5%	½	4022-028-05
87	4·7	Wire Wound	10%	½	4024-012-03
88	100	Carbon	10%	½	4022-062-01
89	6·8K	Carbon	10%	½	4022-002-02
90					
91	1·5K	Carbon	10%	½	4022-007-01
92	48	Wire Wound Potentiometer			4028-006-01
93	82	Carbon	10%	½	4022-070-01
94					
95	1·2K	Carbon	10%	½	4022-040-01
96	2·7	Wire Wound	10%	½	4024-043-01
97	27	Carbon	10%	1	4022-068-04
98					
99					

Circuit No.	Miscellaneous	Part Number
100	Spark Filter Choke 6·8uH	4048-032-01
101	Manual Permeability Tuner Unit Complete	4050-038-02
	Consists of:	
	Iron Sleeve (3)	4065-037-01
	Iron Sleeve (1)	4065-038-01
	Iron Core (4)	4065-039-01
	Coil Assy.	4036-055-01
	Includes: Aerial Coil	4036-057-01
	Aerial Transformer	4043-033-01
	R.F. Coil	4036-057-01
	Osc. Transformer	4043-033-01
102	Oscillator Shunt Coil	4036-044-02
103	No. 1 I.F. Transformer 455 Kc/s (red green)	4044-009-04
104	No. 2 I.F. Transformer 455 Kc/s (red white)	4044-009-08
105	No. 3 I.F. Transformer 455 Kc/s (orange black)	4044-022-01
106	No. 4 I.F. Transformer 455 Kc/s (orange orange)	4044-022-02
107		
108		
109	Driver Transformer 3900 to 240 + 240 ohms imped.	4042-057-01
110	Speaker Transformer 28 + 28 to 15 ohms imped.	4042-059-01
111	Aerial lead-in socket	7222-037-01
112	R.F. Amp. Transistor Typ AT17	4128-034-01
113	Converter Transistor 2N412	4128-011-02
114	First I.F. Amp. Transistor Type 2N410E (Green spot)	4128-010-03
115	Second I.F. Amp. Transistor Type 2N410B (Red spot)	4128-010-04
116	A.G.C. 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-AC128 (Matched Pair)	4128-035-01
121	Temperature compensating Transistor Type 0A674	4127-034-01
122		
123	Switch-Part of Circuit No. 79	
124	Dial Lamp - 12/16 Volt 7mm bulb BA7S base, Wotan 20-70420	4068-003-04
125		
126	Socket - Collector Current Adjustment	7222-033-01
127	Socket - Speaker	7222-033-01
128	Speaker - 9" x 6" oval, permag type 96L00/69/15	4056-004-08
129	Plug - Speaker Lead	7171-015-02

MECHANICAL

7111-007-01	Heat sink (4) Audio output transistors
7261-128-08	Washer (4) flat steel, output transistor heat sink mounting
7198-576-11	Screw (4) ¼" x 1/8" whit. Pan Hd. heat sink mounting
7148-302-11	Nut (4) 1/8" whit. heat sink mounting
7262-008-01	Washer (4) shakeproof, 1/8" int. heat sink mounting
7222-065-01	Socket (1) Dial Lamp
7120-087-01	Insulator (1) Dial Lamp Socket
7086-079-01	Eyelet (1) Dial Lamp Socket
7065-067-10	Top Cover (1) can
7065-027-01	Bottom Cover (1) can
7152-751-01	Speednut (4) No. 4 Transformer mounting
7204-576-12	Screw (4) 3/8" x No. 4 Phillips head, transformer mounting
7204-576-15	Screw (8) ¼" x No. 4 Phillips head, circuit board mounting
7261-122-03	Washer (2) Bakelite, circuit board mounting
7201-577-12	Screw (14) ¼" x No. 6 Phillips head, covers to chassis mounting
7046-017-01	Pointer carriage assy.
7173-042-05	Pointer
1107-002-02	Dial Cord - 2½ ft.
7225-081-01	Spring (1) Dial Cord
7138-070-02	Solder lug (2) lead dressing
7065-025-01	Cover (1) feed - thru battery lead
7071-013-01	Insulating disc (1) feed-thru cover
7120-026-01	Glass bead (18) Transistor spacers
7167-058-01	Pin (3) McMurdo, printed circuit board
7167-099-01	Pin (12) Tucker, printed circuit board
7262-016-02	Washer (2) shakeproof, ¼" int., collector current socket
7262-024-02	Washer (1) shakeproof 3/8" int., volume control mounting
7244-003-01	Lug (1) battery lead contact
7291-003-01	Shroud (1) battery lead contact
7231-102-01	Terminal strip - 3 lug type 1E1
7231-125-01	Terminal strip - 10 lug type 1E6E1
7124-285-01	Knob (1) aerial trimmer adjust
7150-901-05	Spacer nut (2) control mounting
7124-069-01	Inner Knob assy. - tuning control
7124-068-01	Inner Knob assy. - tone control
7186-010-01	Spring (2) inner knobs
7124-067-01	Outer knob assy. (2) volume and tuning
7055-367-02	Spring (2) outer knobs
7150-853-02	Barrel nut (2) external thread
7261-380-14	Washer (2) chrome, external thread barrel nuts
7150-854-03	Barrel Nut (2) internal thread
7261-484-02	Washer (2) internal threaded barrel nuts
7084-163-01	Escutcheon assy. complete
	Includes:
7081-001-01	Emblem 'Diamond Dot'
7261-109-03	Washer (1) Flat steel, dial fastening
7209-107-10	Screw (1) 3/16" x No. 2 Deutsher. dial fastening
7215-034-01	Light Shield - foam plastic
7008-015-01	Metcal - "All Transistor"
7070-045-41	Manual dial reading, all States
7119-046-01	Filler Bar (1) push button opening
7152-272-01	Speednut (2) filler bar fastening
7005-027-01	Dial background assy.
7209-107-10	Screw (2) 3/16" x No. 2 Deutsher - dial background fastening
7215-057-01	Dust shield - dial


SPEAKER SOCKET
CURRENT MEASURING SOCKET
5mA
3mA
BLUE
WHITE
BLACK
GREEN
RED
12-9V
12-8V
13-0V
13-0 V.D.C. + INPUT
FEEDBACK LINE TO CIRCUIT No 89
FEEDBACK LINE TO OUTPUT TRANSISTOR
BIAS ADJ.
I.F.T. 4
I.F.T. 3
I.F.T. 2
I.F.T. 1
I.F. AMP. 2
I.F. AMP. 1
AUDIO DRIVER
AUDIO AMP.
A.G.C.
OSC/SHUNT COIL
OSC/MIX.
R.F. AMP.
PIN A
PIN B
7·5V
7·3V
8·8V
8·5V
7·1V
6·9V
4·3V
8·25V
8·1V
0·68mA
1·5mA
1·4V
10·2V
9·5V
9·1V
12·1V
AERIAL INPUT
VOL
TONE
OP16
AGC
CIRCUIT BOARD
PRINTED WIRING SIDE
MODEL MN-C6B
PB1249