AIR CHIEF

CAR RADIO DIVISION, ELECTRONIC INDUSTRIES LTD.
ASTOR HOUSE: 161-173 STURT STREET, SOUTH MELBOURNE Phone: 69 0300

SERVICE DATA

MODEL MN-C6H

8 TRANSISTOR SUPERHETERODYNE

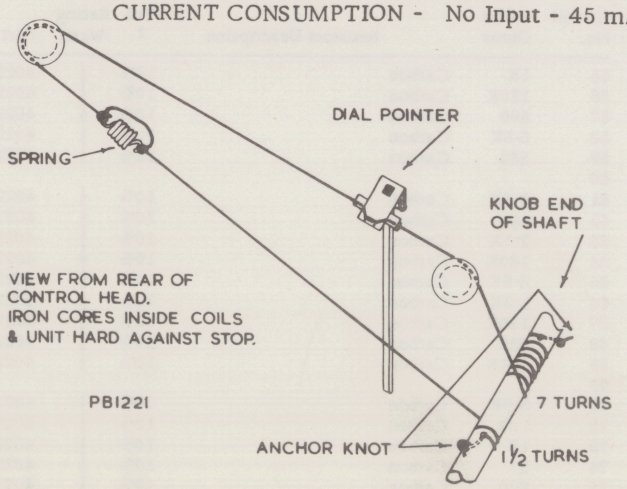
12 VOLT CAR RADIO

(Battery negative terminal connected to chassis)

Manual Tuning

ESPECIALLY DESIGNED FOR HOLDEN MODEL "HD"

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



ALIGNMENT PROCEDURE

EQUIPMENT

Signal Generator - modulated 400 cps
Output Meter - 15 Ohms Impedance
Generator Series Capacitor - .1uF. Part No. 4006-005-03. for 1F 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 .1uF. 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.

IMPORTANT — AERIAL TRIMMER ADJUSTMENT

When the receiver has been installed in the vehicle and the aerial connected, the aerial trimmer must be readjusted. Raise aerial to half extended height. Adjust knob on passenger side of receiver for maximum output on a weak station near 1000 Kc/s (approx. centre of dial).

ALIGNMENT PROCEDURE

EQUIPMENT

Signal Generator - modulated 400 cps
Output Meter - 15 Ohms Impedance
Generator Series Capacitor - .1uF. Part No. 4006-005-03. for 1F 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

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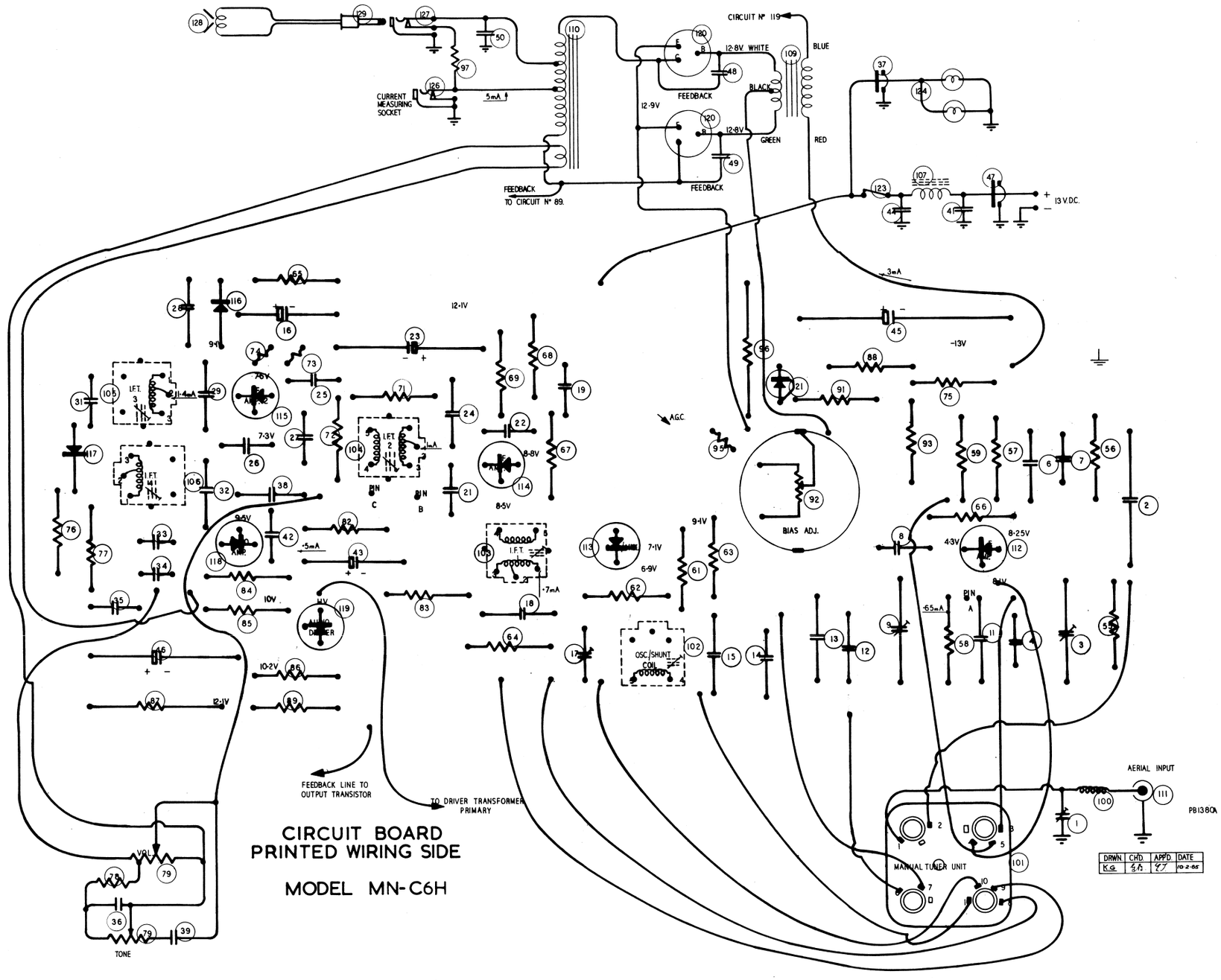


FAULT LOCATION GUIDE - GENERATOR TEST

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

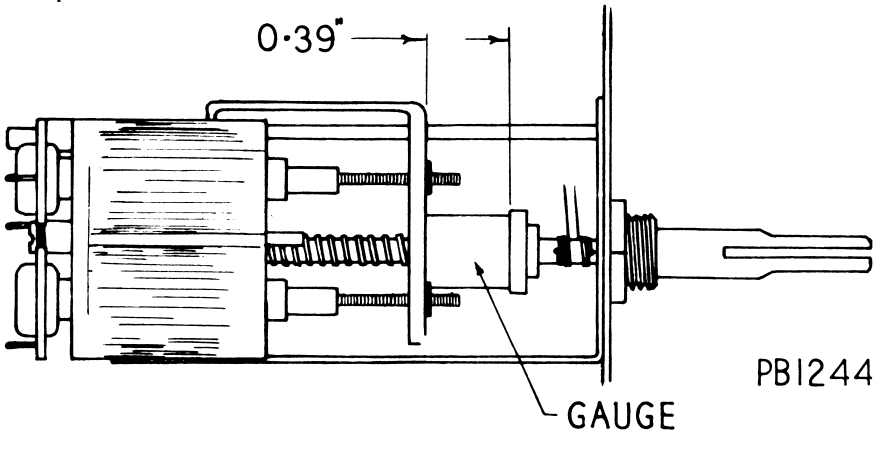
Circuit No.	Value	Capacitors Description	Tol ±	Rating VDCW	Part Number
1	6-75pF	Trimmer, compression			4000-017-02
2	.0047uF	Polystyrene	5%	200	4004-019-01
3	5-55pF	Trimmer, compression			4000-001-03
4	82pF	Polystyrene	10%	125	4004-020-01
5					
6	.22uF	Disc Ceramic		25	4008-053-01
7	.047uF	Disc Ceramic		25	4008-057-03
8	39pF	Disc Ceramic N 750	10%	500	4008-025-01
9	5-55pF	Trimmer, compression			4000-001-03
10					
11	680pF	Polystyrene	10%	125	4004-016-02
12	120pF	Polystyrene	10%	125	4004-010-01
13	.0022pF	Polystyrene	10%	200	4004-015-03
14	56pF	Tubular Ceramic N 470	10%	500	4008-030-05
15	.0027uF	Polystyrene	10%	200	4004-003-03
16	10uF	Electrolytic		12	4005-007-14
17	3-30pF	Trimmer, wire wound			4000-025-01
18	220pF	Polystyrene	5%	125	4004-005-03
19	.047uF	Disc Ceramic		25	4008-057-03
20					
21	3.3pF	Disc Ceramic N.P.O.	.25pF	500	4008-014-01
22	.1uF	Disc Ceramic		25	4008-004-04
23	100uF	Electrolytic		12	4005-002-31
24	220pF	Polystyrene	5%	125	4004-005-03
25	.047uF	Disc Ceramic		25	4008-057-03
26	3.3pF	Disc Ceramic N.P.O.			4008-014-01
27	.047uF	Disc Ceramic		25	4008-057-03
28	150pF	Polystyrene	10%	125	4004-017-01
29	470pF	Polystyrene	5%	125	4004-002-04
30					
31	33pF	Disc Ceramic N 750	5%	500	4008-007-08
32	470pF	Polystyrene	5%	125	4004-002-04
33	.001uF	Tubular Ceramic		500	4008-040-07
34	.001uF	Tubular Ceramic		500	4008-040-07
35	.01uF	Disc Ceramic		25	4008-039-07
36	.068uF	Polyester	10%	125	4009-013-01
37	.001uF	Ceramic Feed-Thru			4008-040-08
38	.22uF	Disc Ceramic		25	4008-053-01
39					
40					
41	.22uF	Disc Ceramic		25	4008-053-01
42					
43	30uF	Electrolytic		6	4005-033-01
44	.22uF	Disc Ceramic		25	4008-053-01
45	250uF	Electrolytic		16	4005-011-07
46	320uF	Electrolytic		2.5	4005-028-01
47	.001uF	Ceramic Feed-Thru			4008-040-08
48	.01uF	Polyester	10%	125	4009-014-01
49	.01uF	Polyester	10%	125	4009-014-01
50	.01uF	Disc Ceramic		25	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	15K	Carbon	10%	½	4022-001-02
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				4030-026-05

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-C6H

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.

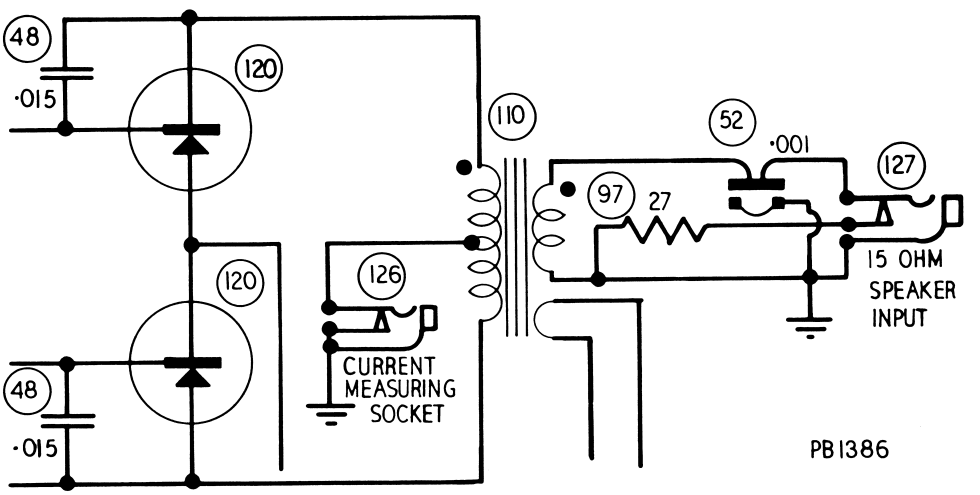
NOTE. 1. It is essential that the supply voltage is maintained at 13.0V when measuring current.

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.

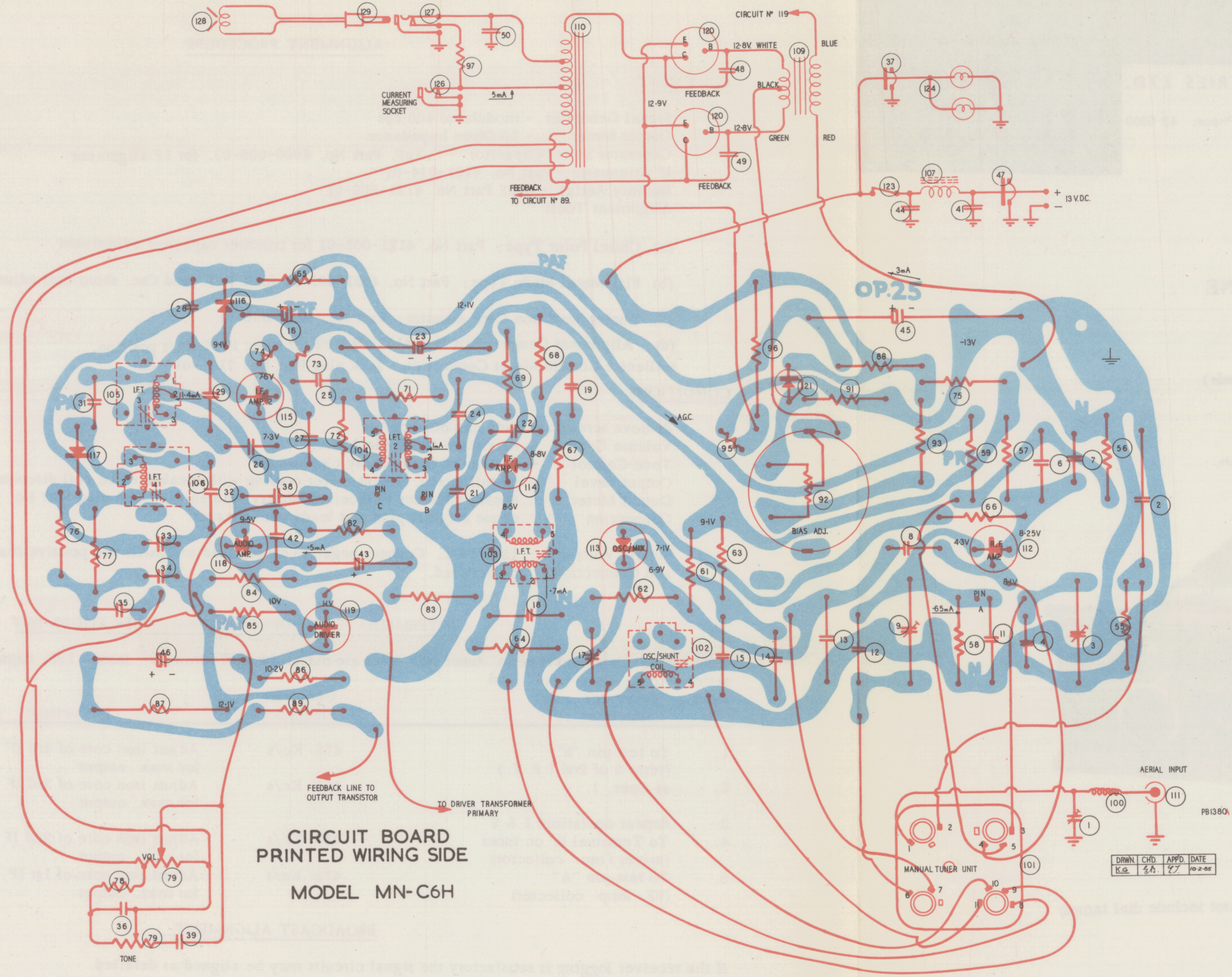
NOTE. 3. No further adjustment of the bias should be necessary unless output transistors or associated componentry are replaced.

SPEAKER TRANSFORMER

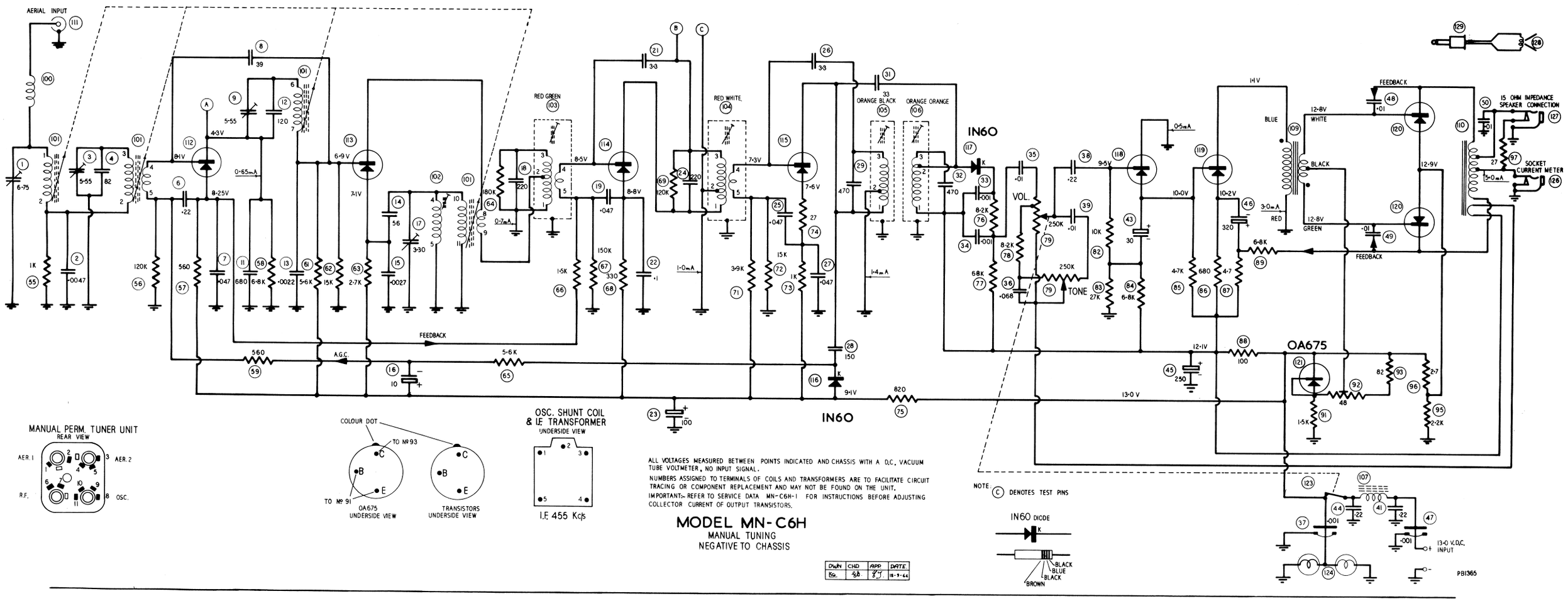
The first production run receivers used a transformer, Part No. 4042-047-01 and are wired as shown:-



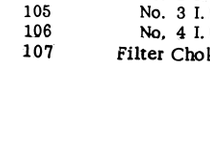
All receivers after the first production run use transformer Part No. 4042-059-01 and are wired as shown on main circuit diagram.

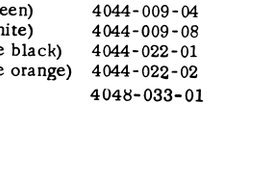

CIRCUIT BOARD
PRINTED WIRING SIDE
MODEL MN-C6H
CIRCUIT Nº 119
BLUE
12·8V WHITE
BLACK
GREEN
RED
FEEDBACK
FEEDBACK
FEEDBACK
TO CIRCUIT Nº 89.
CURRENT MEASURING SOCKET
5mA
12·9V
12·8V
13 V.D.C.
OP.25
3mA
-13V
A.G.C.
BIAS ADJ.
I.F.T.
I.F. AMP. 1
I.F. AMP. 2
R.F. AMP.
AUDIO AMP.
AUDIO DRIVER
OSC/MIX
OSC/SHUNT COIL
MANUAL TUNER UNIT
AERIAL INPUT
VOL.
TONE
FEEDBACK LINE TO OUTPUT TRANSISTOR
TO DRIVER TRANSFORMER PRIMARY
PB1380
DRWN. K.G.
CHD.
APPD.
DATE 10-2-65

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

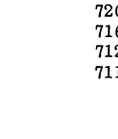


MANUAL PERM. TUNER UNIT
REAR VIEW





OSC. SHUNT COIL
& I.F. TRANSFORMER
UNDERSIDE VIEW



I.F. 455 Kc/s

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-C6H-1 FOR INSTRUCTIONS BEFORE ADJUSTING COLLECTOR CURRENT OF OUTPUT TRANSISTORS.

MODEL MN-C6H

MANUAL TUNING
NEGATIVE TO CHASSIS

DWN	CHD	APP	DATE
KG.	SB	[illegible]	18-9-64

NOTE: (C) DENOTES TEST PINS

IN60 DIODE

Circuit No.	Miscellaneous	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	2.2K Carbon 10% ½	4022-021-02
96	2.7 Wire Wound 10% ½	4024-043-01
97	27 Carbon 10% 1	4022-068-04
98		
99		
100	Spark Filter Choke 6·8uH	4048-032-01
101	Manual Permeability Tuner Unit Complete	4050-038-04
	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	Filter Choke	4048-033-01
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 refer back page
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 refer back page
121	Temperature compensating Transistor Type OA675	4127-039-01
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	Socket - Collector Current Adjustment	7222-033-01
126	Socket - Speaker	7222-033-01
127	Speaker - 9" x 6" oval, permag type C96L35/69/15	4056-004-16
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	
7262-008-01	Washer (4) shakeproof, 1/8" int., heat sink mounting	
7148-302-11	Nut (4) 1/8" Whit. hex.	
7044-007-12	Cover Can (1) receiver outer.	
7152-751-01	Speednut (4) No. 4 transformer/choke mounting	
7204-576-11	Screw (4) 3/8" x No. 4 Phillips hd., trans. mt.	
7204-577-16	Screw (14) ¼" x No. 6 Phillips hd., various	
7294-036-02	Spacer (1) circuit board support	
7209-116-02	Screw (1) 3/8" x No. 5 - 40, spacer	
7167-058-01	Pin (20) circuit board.	
7120-026-01	Glass Bead (18) transistor and diode mount.	
7113-035-01	Plastic Holder (1) battery lead entry	
7244-003-01	Terminal Lug (1) on end of battery lead	
7291-003-01	Shroud (1) terminal lug	
7262-016-02	Washer (1) shakeproof, ¼" int., speaker socket	
7031-124-01	Hexagonal Spacer Nut (2) ¾", control spindle bushes	
7215-043-01	Shield (1) tinplate, above battery lead input	
7262-024-02	Washer (1) shakeproof, 3/8" int.	
7231-125-01	Terminal Strip (1) 10 lug, type 1E6E1	
7231-103-01	Terminal Strip (1) 4 lug, type 1E2	
7263-002-01	Formed Washer (1) collector current socket	
7261-246-02	Bakelite Washer (1) collector current socket	
7173-056-03	Dial Pointer (1)	
7046-018-01	Dial Pointer Carriage Assy. (1)	
1107-002-03	Dial Cord - 30" required	
7225-081-01	Spring (1) dial cord	
7005-053-01	Dial Background (1)	
7201-576-12	Screw (2) ¼" x No. 4, dial background	
7027-449-01	Light Filter and Bracket Assy. (1) driving side	
7027-449-51	Light Filter and Bracket Assy. (1) passenger side	
7084-239-01	Escutcheon Assy. (1) includes:	
7081-002-01	"Diamond Dot" emblem	
7169-431-01	Filler Bar (1) escutcheon opening	
7152-302-01	Speednut (2) filler bar fastening	
7070-088-03	Dial Reading (1) GMH. Part No. M35460	
7027-407-01	Dial Clip (2) dial fastening to escutcheon	
7209-107-03	Screw (2) 5/32" x No. 2 Deutsher, dial clip	
7222-065-01	Dial Lamp Socket Body (2)	
7120-087-01	Insulator Bush (2) lamp sockets	
7086-079-01	Contact Eyelet (2) lamps sockets	
7124-285-04	Knob (1) aerial trimmer adjust	
7124-355-01	Knob (2) tuning and volume, front	
7124-356-01	Knob (2) tuning and tone, rear	
7309-002-02	Barrel Screw (2)	
7261-531-02	Washer (2) chrome, barrel screw	

AIR CHIEF
CAR RADIO DIVISION, ELECTRONIC INDUSTRIES LTD.
ASTOR HOUSE: 161-173 STURT STREET, SOUTH MELBOURNE Phone: 69 0300

SERVICE DATA

MODEL MN-C6H

CORRECTION TO PROCEDURE FOR MEASUREMENT

OF COLLECTOR CURRENT.

When checking the collector current of the output transistors in receivers which are fitted with an Auto-transformer type output circuit, it is most important that the speaker be DISCONNECTED from the jack socket. Failure to do this, shunts the speaker voice coil across the meter thus giving a lower than true current reading.

IGNITION OR ALTERNATOR INTERFERENCE

Reports have been received of receivers which are affected by interference which originates in the ignition system or the alternator.

The interference is in the form of a ticking noise.

If after fitting the specified by-pass capacitors this interference is still present, it will be necessary to modify the battery input filter circuit of the receiver.

Two components are required:

4048-025-01	Iron Cored Choke
4005-002-22	100 uF Electrolytic 16 VDC.

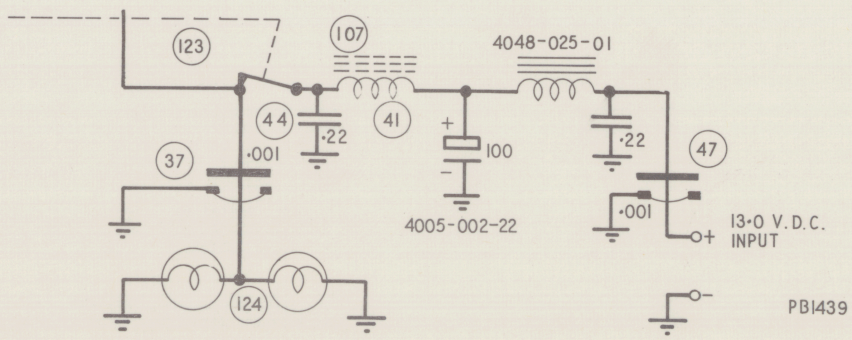
The choke is to be mounted on the base of the can near the battery lead feed thru. Two mount holes in the base may be used for this purpose.

Disconnect existing choke lead from the feed-thru and .22uF Disc capacitors.

Connect one lead from new choke to the feed thru and .22uF disc capacitors

Connect the other lead from new choke to the free lead of existing choke.

From this junction connect the 100 uF Electrolytic capacitor with the negative end to chassis.



MODIFIED BATTERY INPUT CIRCUIT