AIR CHIEF

CAR RADIO DIVISION, ELECTRONIC INDUSTRIES LTD.

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

SERVICE DATA

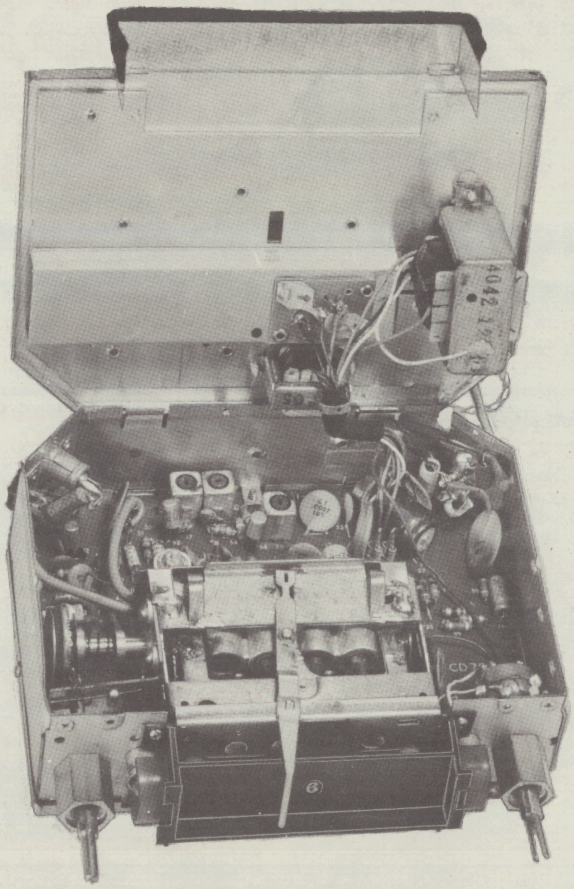
MODEL MN-C14P

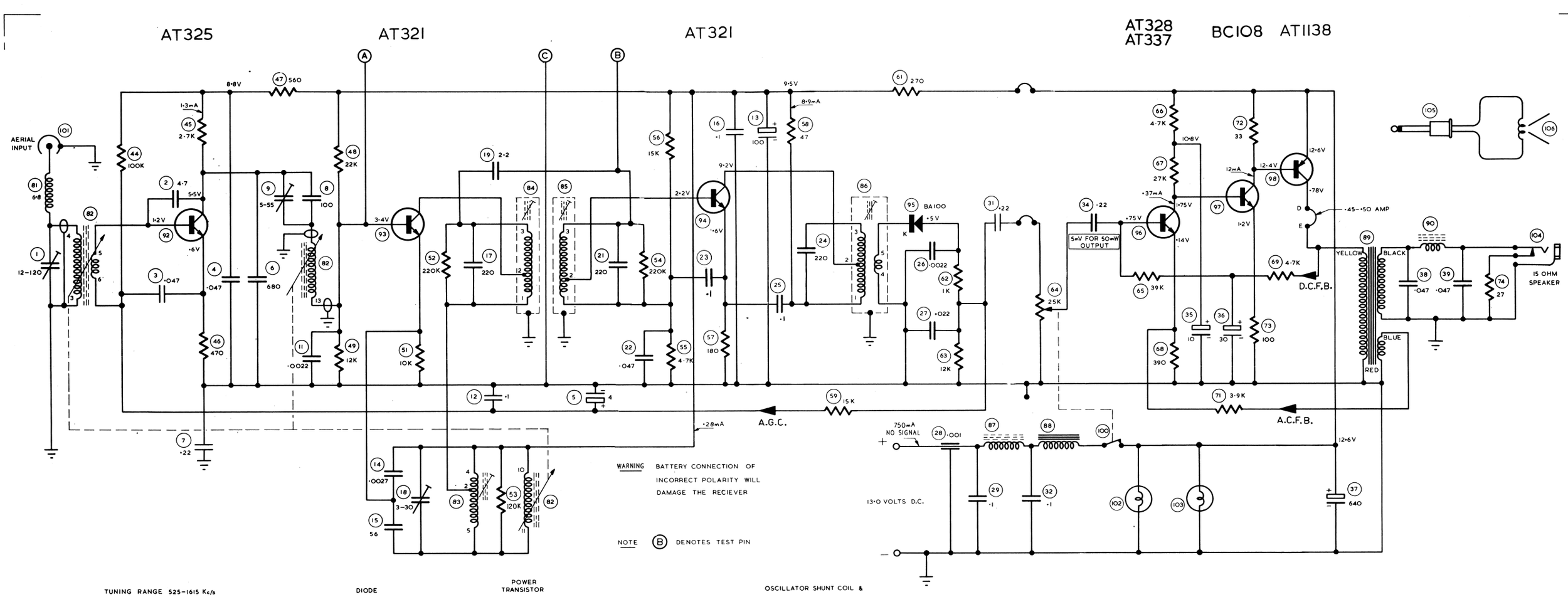
MANUALLY TUNED

6 TRANSISTOR 12 VOLT CAR RADIO RECEIVER

Especially designed for Holden Model "HK"

WARNING: BATTERY CONNECTION OF INCORRECT POLARITY WILL DAMAGE THE RECEIVER. BATTERY LEAD OF THIS RECEIVER MUST BE CONNECTED TO THE POSITIVE TERMINAL OF SUPPLY. CONNECT NEGATIVE SUPPLY LEAD TO RECEIVER CHASSIS.





ALL VOLTAGES MEASURED BETWEEN POINTS INDICATED AND NEGATIVE LINE WITH A D.C. VACUUM TUBE VOLTMETER. NO INPUT SIGNAL. NUMBERS ASSIGNED TO TERMINALS OF COILS AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMONENT REPLACEMENT AND MAY NOT BE FOUND ON THE UNIT.

MODEL MN-C14P

MANUAL

6 TRANSISTOR
NEGATIVE TO CHASSIS

DR'WN	DATE	CH'CK	DATE	APP'D	DATE
G B	9-2-'67	D. H.	13-2-'67	GM	15-2-67

PB1572

CIR-CUIT NO.	VALUE OHMS	RESISTORS DESCRIPTION	TOL ±	RATING WATTS	PART NUMBER
42					
43					
44	100K	Carbon	10%	.5	4022-013-02
45	2.7K	Carbon	10%	.5	4022-043-01
46	470	Carbon	10%	.5	4022-016-01
47	560	Carbon	10%	.5	4022-010-01
48	22K	Carbon	10%	.5	4022-026-02
49	12K	Carbon	10%	.5	4022-029-01
50					
51	10K	Carbon	10%	.5	4022-004-01
52	220K	Carbon	10%	.5	4022-063-01
53	120K	Carbon	10%	.5	4022-031-01
54	220K	Carbon	10%	.5	4022-063-01
55	4.7K	Carbon	10%	.5	4022-005-01
56	15K	Carbon	10%	.5	4022-001-02
57	180	Carbon	10%	.5	4022-025-02
58	47	Carbon	10%	.5	4022-041-01
59	15K	Carbon	10%	.5	4022-001-02
60					
61	270	Carbon	10%	.5	4022-071-01
62	1K	Carbon	10%	.5	4022-008-01
63	12K	Carbon	10%	.5	4022-029-01
64	25K	Volume Control SP.ST. switch attached			4032-029-11
65	39K	Carbon	10%	.5	4022-023-01
66	4.7K	Carbon	10%	.5	4022-005-01
67	27K	Carbon	10%	.5	4022-073-01
68	390	Carbon	10%	.5	4022-058-04
69	4.7K	Carbon	10%	.5	4022-005-01
70					
71	3.9K	Carbon	10%	.5	4022-020-01
72	33	Carbon	10%	.5	4022-072-01
73	100	Carbon	10%	.5	4022-062-01
74	27	Carbon	10%	1	4022-068-04
75					
76					
77					

CIR-CUIT NO.	VALUE	CAPACITORS DESCRIPTION	TOL ±	RATING V.DCW	PART NUMBER
1	12-120pF	Trimmer- compression			4000-026-02
2	4.7pF	Disc Ceramic NPO	.5pF	500	4008-042-07
3	.047uF	Disc Ceramic		25	4008-057-04
4	.047uF	Disc Ceramic		25	4008-057-04
5	4uF	Electrolytic		10	4005-045-01
6	680pF	Polystyrene	10%	100	4004-016-02
7	.22uF	Disc Ceramic		25	4008-053-01
8	100pF	Polystyrene	10%	100	4004-008-06
9	5-55pF	Trimmer - compression			4000-001-03
10					
11	.0022uF	Polystyrene	5%	50	4004-015-06
12	.1uF	Disc Ceramic		25	4008-004-04
13	100uF	Electrolytic		12	4005-002-31
14	.0027uF	Polystyrene	10%	50	4004-003-06
15	56pF	Polystyrene	10%	100	4004-025-02
16	.1uF	Disc Ceramic		25	4008-004-04
17	220pF	Polystyrene	5%	100	4004-005-03
18	3-30pF	Trimmer - air			4000-025-03
19	2.2pF	Disc Ceramic NPO	.25pF	500	4008-033-04
20					
21	220pF	Polystyrene	5%	100	4004-005-03
22	.047uF	Disc Ceramic		25	4008-057-04
23	.1uF	Disc Ceramic		25	4008-004-04
24	220pF	Polystyrene	5%	100	4004-005-03
25	.1uF	Disc Ceramic		25	4008-004-04
26	.0022uF	Disc Ceramic	20%	500	4008-049-07
27	.022uF	Disc Ceramic	20%	500	4008-010-05
28	.001uF	Ceramic Feed Thru			4008-040-08
29	.1uF	Disc Ceramic		100	4008-004-05
30					
31	.22uF	Disc Ceramic		25	4008-053-01
32	.1uF	Disc Ceramic		100	4008-004-05
33					
34	.22uF	Disc Ceramic		25	4008-053-01
35	10uF	Electrolytic		12	4005-007-14
36	30uF	Electrolytic		3	4005-033-03
37	640uF	Electrolytic		16	4005-046-01
38	.047uF	Disc Ceramic		25	4008-057-04
39	.047uF	Disc Ceramic		25	4008-057-04
40					
41					

ALIGNMENT PROCEDURE

EQUIPMENT

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

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

b Chisel Point Type: Part No. 4121-005-01, for RF Trimmer capacitor adjustment.

c Hexagonal Socket Type: Part No. 4121-028-02, for Osc. trimmer capacitor adjustment.

d Tuning Unit Iron Core Adjustment: Part No. 4121-008-01

e Alignment Gauge: Part No. 4121-030-02 for tuner 1200Kc/s. position.

f Clutch Release Bracket: Part No. 4121-029-01

Collector Current Meter Connection Socket - Part No.4078 -018-01.

CONDITIONS

Remove screws and hinge top lid upward.
Volume control - maximum, clockwise
Output Meter Connection - Socket, adjacent to battery lead entry.
Output Level - 50 Milliwatts, speaker disconnected.
Supply voltage - 13.0V DC.
Supply Connection - Connect positive supply lead to receiver lead. Connect negative supply lead to receiver can.

INTERMEDIATE FREQUENCY TRANSFORMER ALIGNMENT

Turn tuning control until cores of tuner unit are out of coil windings.
Insert .1uF capacitor in series with generator "hot" lead.

Oper. No.	Generator Connection	Generator Frequency	Instructions.
1	To test pin "A" (base of mixer stage) and return lead to test pin "C"(negative line.)	455Kc/s.	Adjust iron core of 3rd IF trans. for max. output.
2	As oper.1	455Kc/s.	Adjust iron core of 2nd IF trans. for max. output.
3	As oper.1	455Kc/s.	Adjust iron core of 1st IF trans. for max. output.
4	Repeat operations 1, 2 and 3 until max. output is obtained.		

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-65pF. dummy aerial in series.	1200Kc/s.	Tune receiver to generator frequency. Adjust RF and aerial trimmer capacitors for max. output.

AERIAL TRIMMER ADJUSTMENT

IMPORTANT

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

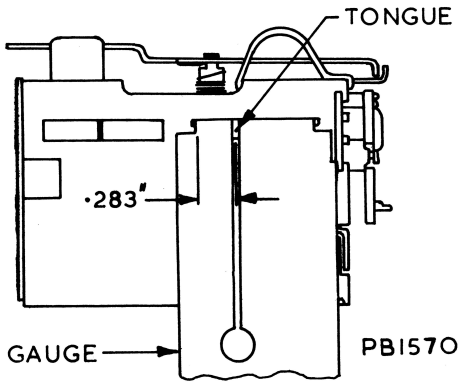
MECHANICAL

PART NUMBER	DESCRIPTION
7111-054-01	Heat Sink (1) power transistor
7222-036-01	Socket (1) power transistor
7120-049-01	Gasket (1) mica, power transistor
7201-577-04	Screw (2) 3/8" x No.6 Phillips hd., power transistor
7031-050-01	Bush (2) insulator, screws
7120-026-01	Insulator (12) glass, transistor and diode mount
7167-058-01	Pin (16) circuit board terminations
7060-022-02	Contact (4) circuit board links
7215-095-01	Shield (1) tuner terminals
7222-115-01	Socket Body (2) lamp
7086-095-02	Contact Eyelet (2) lamp socket
7150-901-03	Nut (2) volume control and tuning spindle bushes.
7262-024-02	Washer (2) shakeproof, $\frac{3}{8}$" int.
7055-412-01	Contact (2) tuner frame to can top
7185-021-02	Retainer (1) battery lead entry
7031-009-01	Bush (1) lead retainer
7152-751-01	Speednut (2) trans. mount
7201-526-14	Screw (2) $\frac{3}{8}$"x No.4 Phillips csk.hd.trans. mount.
7201-533-11	Screw (12) $\frac{1}{4}$"x No.6 Phillips csk.hd. various.
7204-576-15	Screw (19) $\frac{1}{4}$"x No.4 Phillips pan.hd. various.
7224-384-03	Spindles and Bush Assy. (1) complete includes tuning spindle and yoke, pinion shaft and yoke, captive clip, mount bush and circlip.
7055-255-01	Captive Clip (1)
7224-378-01	Pinion Shaft and Yoke Assy. (1)
7407-001-01	Trunnion (1)
7031-066-01	Bush (1)
7055-366-05	Circlip (1)
7005-064-02	Background Assy.
7169-677-01	Dust Shield
7201-577-12	Screw (2) $\frac{1}{4}$"x No.6 Phillips hd., dust shield
7124-285-03	Knob (1) aerial trimmer
7070-088-21	Dial Reading (1) all state
7124-453-01	Knob (2) front
7124-356-01	Knob (2) rear
7201-576-12	Screw (4) $\frac{1}{4}$"x No.4 pan.hd., light filter and background and background
7091-017-02	Light Filter (2) Green
7150-861-02	Barrel Nut (2) chrome
7261-531-02	Chrome Washer (2)

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 $\frac{1}{8}$" of shaft protrudes out through front panel of receiver.		
3	To aerial lead-in socket 65pF. dummy aerial in series.	1625Kc/s.	Adjust Osc. RF and aerial trimmer capacitors.for max. output.
4	1200 Kc. SETTING. Disengage clutch at crown wheel by utilizing clutch Release Bracket, before inserting gauge. In the side of tuning unit, opposite end to tuning spindle there are two slots; place the notched blade of gauge into the slot nearest rear of tuner. The 0.283" section of gauge is to be against the projection at front edge of slot. Spring fingers of gauge are to be at rear of tongue. Refer diagram.		
NOTE:	Do not strain or tilt core carriage.		
	As oper. 3	1200Kc/s.	With tuner set in position detailed, adjust Osc.,RF and aerial iron cores for maximum output.
5	As oper. 3	600Kc/s.	Rock tuning control through signal, adjust Osc. shunt coil 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 1000Kc/s.
Using a screwdriver, adjust by bending the pointer carriage arm so that the pointer coincides with the centre of the tuned station call sign.

Check dial logging and if necessary readjust carriage arm.

CIRCUIT REF	MISCELLANEOUS	PART NUMBER
78		
79		
80		
81	Choke - 6.8uH	4048-032-01
82	Permeability Tuner Unit - complete	4050-050-03
	This tuner contains the following electrical parts.	
	Iron sleeve (2)	4065-037-01
	Iron sleeve (1) oscillator	4065-038-01
	Iron core (3)	4065-039-02
	Coil Assy.	4036-082-01
	includes:	
	Aerial Transformer	4043-070-01
	R.F. Coil	4036-057-01
	Oscillator Coil	4036-057-01
83	Oscillator Shunt Coil	4043-069-01
84	No.1. IF. Transformer - Yellow/black	4044-032-01
85	No.2. IF. Transformer - Yellow/green	4044-032-02
86	No.3. IF. Transformer - Yellow/violet	4044-032-04
87	Choke - ferrite cored	4048-033-01
88	Choke - iron cored	4048-025-05
89	Speaker Transformer	4042-126-01
90	Choke	4048-043-02
91		
92	Transistor - Type AT325 - RF Amp	4128-120-01
93	Transistor - Type AT321 - Converter	4128-119-01
94	Transistor - Type AT321 - IF Amp	4128-119-01
95	Diode - Type BA100 - Detector	4127-081-01
96	*Transistor - Type AT337 - Audio Amp	4128-133-01
97	Transistor - Type BC108 - Audio Driver	4128-090-01
98	Transistor - Type AT1138 - Audio Output	4128-004-01
99		
100	Switch - ON/OFF part of Circuit No.64	
101	Socket - Aerial	7222-037-01
102	Dial Lamp - 12/16V. 0.1A.	4068-003-04
103	Dial Lamp - 12/16V. 0.1A.	4068-003-04
104	Socket - Speaker	7222-033-01
105	Plug - Speaker lead	7171-015-01
106	Speaker - 15 ohm impedance 9" x 6" Oval permag type C96L36/69/15	4056-004-18

* A type AT328 transistor may be used in this position in some receivers.

Transistor type AT328 Part No.4128-126-01

REPLACEMENT OF OUTPUT TRANSISTOR

When refitting or replacing an output transistor check that the mount position and faces are clean and free from dust, grit or metal particles.

Smear a thin film of silicon compound, P/No.1036-001-09, on both sides of the mica washer, also mount face of transistor and chassis.

Fit the insulating ferrules to the screw holes in chassis then fit mica washer and transistor. Fasten the transistor securely with two 3/8"x No.6 screws.

MEASUREMENT AND ADJUSTMENT OF OUTPUT TRANSISTOR COLLECTOR CURRENT

EQUIPMENT: Current Meter: 0-1 Amp. D.C. terminated with the lead and socket assy. P/No. 4078-018-01, positive terminal to red sleeve.
Supply Source: 13.0V DC.

CONDITIONS Connect positive supply lead to receiver battery lead. Connect negative to chassis. Connect speaker to receiver socket adjacent to battery lead entry.
No signal applied to aerial socket.
Volume control: minimum position.
Remove link from test pins "D" and "E" and connect meter leads to these pins. Socket connector with red sleeving is to be connected to test pin "D".

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

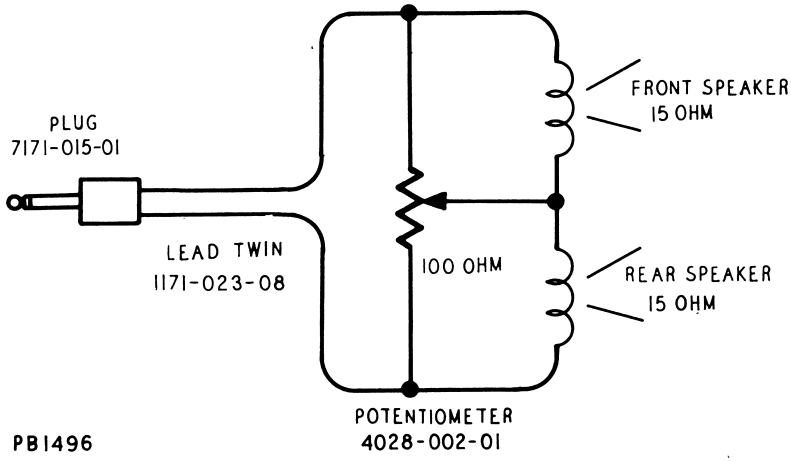
2 Meter readings will vary with temperature. The following table shows permissable current ranges.

TEMPERATURE	COLLECTOR CURRENT MIN. mA.	MAX.mA.
Less than 60°F	450	500
60° - 80°F	440	490
Greater than 80°F	430	480

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

NOTE 2 A 1Kohm resistor may be connected in parallel with circuit No. 68 when the collector current exceeds the max. limits by up to 30mA.

CONNECTION OF A FADER CONTROL FOR USE WITH FRONT AND REAR SPEAKERS



PB1496

VOLTAGES MEASURED BETWEEN POINTS INDICATED AND NEGATIVE LINE

CIRCUIT BOARD
PRINTED WIRING SIDE
MODEL
MN-C14P

DR'WN	DATE	CH'CK	APP'D	DATE
B.G.A.	9-2-'67	D.H.	Q.M.	15-2-67

PB1573 AB

OP 75A