

ELECTRONIC INDUSTRIES LTD.

CAR RADIO DIVISION

126-130 GRANT STREET, SOUTH MELBOURNE, S.C. 4

SERVICE BULLETIN

Bulletin:CR

File:
RECEIVERS A

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Page: 1.

AIRCHIEF MODEL "CRM" 6-VALVE SUPERHETERODYNE TWO UNIT CAR RADIO RECEIVER

INTERMEDIATE FREQUENCY—455 Kc/s

FOR OPERATION FROM: 12 - volt Accumulator

BATTERY CONSUMPTION: 3.25 Amps, which
does not include
dial lamps

TUNING RANGE: 530 - 1610 Kilocycles
566.3 - 186.3 Metres

THIS BULLETIN CONTAINS:

1. Alignment Procedure
2. Circuit Diagram
3. Electrical and Mechanical Parts List
4. Connections for Transformers
5. Chassis Serial Number
6. Antenna Compensating Condenser Adjustment

ALIGNMENT INSTRUCTIONSEQUIPMENTALIGNMENT CONDITIONS

Signal Generator:		Supply voltage:	12 volt accumulator
Output Meter :			
Mica Capacitor :	0.01 MF Part No. PC145 for I.F.T. alignment	Volume control:	maximum volume (fully clockwise)
Dummy Antenna :	65 MMF Part No. M410	Output level :	50 milliwatts speaker voice coil disconnected.
IF. Attenuator :	Part No. M447		15 milliwatts speaker in circuit and output meter connected in parallel with voice coil.
Alignment Tools :			
(a)	Chisel point type Part No. M195 for trim. cond. adjustment		
(b)	Hexagonal tip type Part No. 418/81 for I.F.T. iron core adjustment		
(c)	Tuning unit iron core adjustment tool Part No. M471	Output meter	
(d)	Tuning unit pointer pivot spanner Part No. M445	impedance :	4 Ohms
		Tone control :	Treble (fully clockwise)
		IF. Frequency :	455 Kc/s.

IF. TRANSFORMER ALIGNMENT

Remove the six screws fastening metal can to tuning unit. Slide can off the rear of the tuning unit.

IMPORTANT: Maximum output peaks will be obtained at two positions of each adjustable core. The correct setting is the one in which the cores are furthest apart.

NOTE: The final peaking of the cores nearest the top of the IF. transformers should be performed last. This is necessary so that the upper cores will not be disturbed when withdrawing the hexagonal tip alignment tool.

Oper. No.	Generator Connection	Generator Frequency	Dummy Antenna	Instructions
1	To control grid of 12BA6 IF. valve (pin 1.)	455 Kc/s.	0.01 MF mica cond. in series with generator	Peak 2nd IF. trans. pri. and sec. iron cores for max. output.
2	To control grid of 12BE6 converter valve (pin No.7.)	455 Kc/s.	0.01 MF mica cond. in series with generator	Turn tuning control until perm. tuner iron cores are out of the coil windings. Peak 1st IF. trans. pri. and sec. iron cores for max. output. Do not repeak 2nd IF. trans. iron cores.

BROADCAST ALIGNMENT

When iron cores and tuning coil assy. are in original factory sealed condition.

- | | | | | |
|---|---|------------|--|--|
| 1. | Antenna lead-
in socket | 1615 Kc/s. | Part No. M410
65 MMF in
series with
generator | Turn tuning control to
the high freq. end of
travel (iron cores full
out) Adjust osc. trimmer
cond. for max. output. |
| 2. | Antenna lead-
in socket | 525 Kc/s. | Part No. M410
65 MMF in
series with
generator | Turn tuning control to
low freq. end of travel
(iron cores fully in).
Adjust osc. shunt coil
inductance trim (iron
core) for max. output. |
| NOTE: If the iron core of the osc. shunt coil is adjusted more than one
half turn, repeat operation No.1 | | | | |
| 3. | Connect IF. attenuator (part No. M447) between control grid of
12BA6 IF. valve pin No.1 and the chassis. | | | |
| 4. | Antenna lead-
in socket | 1200 Kc/s. | Part No. M410
65 MMF in
series with
generator | Tune receiver to generat
frequency. Adjust RF. an
antenna trimmer condense
for max. output. |

SETTING OF DIAL POINTER

Disconnect the IF. attenuator.

Disconnect the generator cable from the dummy antenna then connect 20 ft of
aerial wire to the dummy antenna terminal.

Accurately tune the receiver to a station marked on the dial near 800 Kc/s.

Using spanner (part No. M445) or a 3/32" hexagonal key wrench, adjust
eccentric pointer arm pivot so that pointer coincides with centre of tuned
station call sign.

Check the dial logging and if necessary readjust eccentric arm pivot.

NOTE: After this adjustment the eccentric section of the pointer arm pivot
must be within + 90° of the rear position when the pointer is at the
centre of the dial. Incorrect length of travel and logging will
result if the eccentric section is outside these limits.

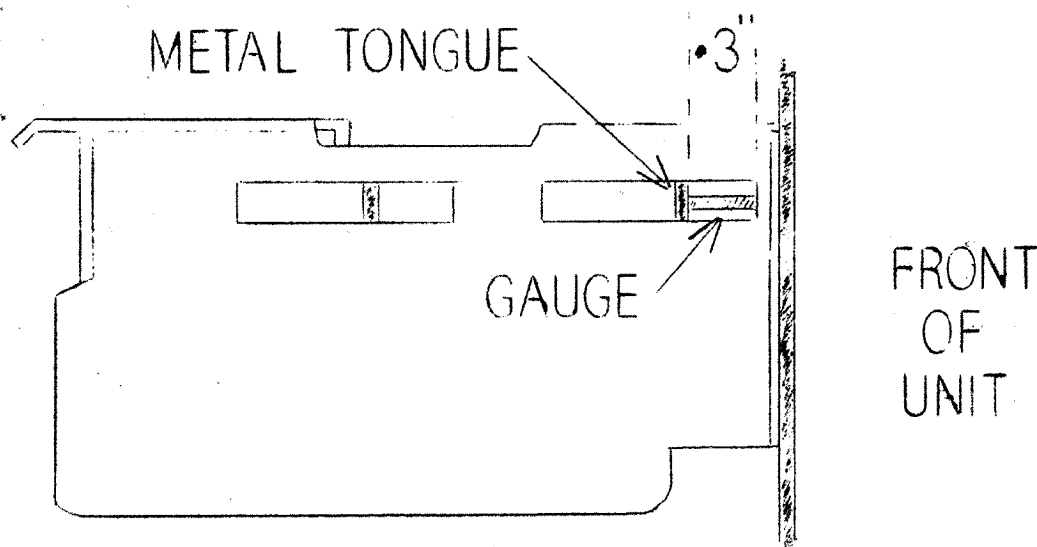
BROADCAST ALIGNMENT

When iron cores or tuning unit coil assy. have been replaced and therefore
are not in original factory sealed condition.

1. Before fitting the tuning unit into the receiver turn the tuning
control spindle until the perm tuner is against the high freq. end o
travel stop. Adjust the iron cores so that the distance between the
extreme end of the formers protruding through the grommet and the
iron core in the former is 1.365".

er.	Generator Connection	Generator Frequency	Dummy Antenna	Instructions
	Antenna lead-in socket	1615 Kc/s.	Part No. M410 65 MMF in series with generator	Perm tuner against high freq. end of travel stop. Adjust osc., aer. and RF. trimmer cond. for max. output.

In the side of tuning unit near the volume control there are two slots. Place a gauge in the form of a flat piece of metal O.300" wide into the slot nearest the front of tuning unit. The $3"$ gauge is to be against front edge of the slot. refer diagram.



Turn the tuning control until the metal tongue in the slot touches the $.3"$ gauge.

Antenna lead-in socket	1200 Kc/s.	Part No. M410 65 MMF in series with generator	Connect IF. attenuator (part No. M447) to the control grid of 12BA6 IF. valve pin No.1 and chassis. With the tuning unit set in the position detailed in para. 5, adjust the osc. aer. and RF. iron cores for max. output.
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Turn tuning control to the low freq. end of travel (iron cores fully in) Tune the signal generator to approx. 525 Kc/s. The low freq. tuning limit should be between 520 and 530 Kc/s. If the receiver is outside these limits adjust osc. shunt coil as follows:-

Antenna lead-in socket	525 Kc/s.	Part No. M410 65 MMF in series with generator	Turn tuning control to the low freq. end of travel (iron cores full in) Adjust osc. shunt coil inductance trim, (iron core) for max. output.
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E: If the iron core of osc. shunt coil is adjusted more than one half turn, repeat operations 3 to 7 inclusive. (continued on Page 5.)

9. Align dial pointer as detailed on page 3.
10. Refit metal can to tuning unit, fasten securely with six screws.

Circuit No.	Description	Tol-	Rating	Part No
1	11-90 MMF			PC954
2	87 MMF	5%	500V DCW	C265
3	100 MMF	+50%-0%	500V DCW	C280
4	.047 MF	20%	200V DCW	E4733
5	.1000 MMF	500 MMF	500V DCW	C108
6	200 MMF	+50%-0%	500V DCW	C256
7	.047 MF	20%	400V DCW	F4733
8	10 MF	20%	25V DCW	C274
9	470 MMF	2 $\frac{1}{2}$ %	500V DCW	C144
10	33 MMF	10%	500V DCW	C147
11	3-55 MMF			PC929
12				
13				
14	.0082 MF	20%	2000V DCW	N8223
15	.25 MF	20%	100V DCW	PC988
16	3-30 MMF			PC663
17	.25 MF	20%	100V DCW	PC988
18	50 MMF	5%	500V DCW	C259
19	.1 MF	20%	200V DCW	E1043
20	100 MMF	+50%-0%	500V DCW	C280
21	15 MMF	1 MMF	500V DCW	PC811
22	.01 MF	20%	400V DCW	F1033
23	24 MF	20%	450V DCW	C237
24	.1 MF	20%	400V DCW	F1043
25	.047 MF	20%	200V DCW	E4733
26	1 MF	20%	200V DCW	PC997
27	10 MF	20%	25V DCW	C274
28	16 MF	20%	450V DCW	PC300
29				
30				
31	100 MMF	+50%-0%	500V DCW	C280
32	.047 MF	20%	400V DCW	F4733
33	100 MMF	10%	500V DCW	PC571
34	100 MMF	+50%-0%	500V DCW	C280
35	100 MMF	+50%-0%	500V DCW	C280
36	25 MF	20%	40VP	PC996
37	200 MMF	+50%-0%	500V DCW	C256
38	.0047 MF	20%	400V DCW	F4723
39	.047 MF	20%	200V DCW	F4733
40	.022 MF	20%	400V DCW	F2233
41	.0022 MF	20%	600V DCW	G2223
42	.047 MF	20%	200V DCW	E4733
43	.0022 MF	20%	400V DCW	F2223
44	.047 MF	20%	200V DCW	E4733
45				
46				

150,000 Ohm carbon resistor	10%	$\frac{1}{2}$ watt	R1542
220 Ohm carbon resistor	10%	$\frac{1}{2}$ watt	R2212
1.5 Megohm carbon resistor	10%	$\frac{1}{2}$ watt	R1552
10,000 Ohm carbon resistor	10%	1 watt	Z1032
100,000 Ohm carbon resistor	10%	$\frac{1}{2}$ watt	R1042
22 Ohm wire wound resistor	10%	$\frac{1}{2}$ watt	PR733
220 Ohm carbon resistor	10%	$\frac{1}{2}$ watt	R2212
100 Ohm wire wound resistor	10%	$\frac{1}{2}$ watt	PR262
22,000 Ohm carbon resistor	10%	$\frac{1}{2}$ watt	R2232
330 Ohm carbon resistor	10%	$\frac{1}{2}$ watt	R3312
470,000 Ohm carbon resistor	10%	$\frac{1}{2}$ watt	R4742
1,500 Ohm carbon resistor	10%	2 watt	
consists of a 3,300 Ohm 10%			
1W resistor part No. Z3322			
and a 2,700 Ohm 10% 1W resistor			
11,000 Ohm carbon resistor	10%	3 watt	
consists of three 33,000 Ohm 10%			
1W resistors part No. Z3332 wired			
in parallel			
220,000 Ohm carbon resistor	10%	1 watt	Z2242
47,000 Ohm carbon resistor	10%	$\frac{1}{2}$ watt	R4732
470,000 Ohm carbon resistor	10%	$\frac{1}{2}$ watt	R4742
470,000 Ohm carbon resistor	10%	$\frac{1}{2}$ watt	R4742
1.5 Megohm carbon resistor	10%	$\frac{1}{2}$ watt	R1552
47,000 Ohm carbon resistor	10%	$\frac{1}{2}$ watt	R4732
270 Ohm carbon resistor	10%	1 watt	Z2712
10 Megohm carbon resistor	10%	$\frac{1}{2}$ watt	R1062
Volume control and tone control concentric shaft potentiometers			
FRONT SECTION - 100,000 Ohm			
REAR SECTION - 1.2 Megohm tapped at 40,000 Ohm			
DP.ST. switch attached			
			PR998
Same control as above except SP.ST. switch attached			
			PR998-1
2.200 Ohm carbon resistor	10%	$\frac{1}{2}$ watt	R2222
22 Ohm wire wound resistor	10%	$\frac{1}{2}$ watt	PR733
47 Ohm wire wound resistor	10%	$\frac{1}{2}$ watt	PR853
22,000 Ohm carbon resistor	10%	$\frac{1}{2}$ watt	R2232
Antenna filter choke			
			L130
Permeability tuner unit - complete			
			L336
includes			
Tuning coils assy. - less iron cores			
			L335
Iron core (3)			
			52/249
Oscillator shunt coil			
			L328
1st. IF. transformer			
			L291
2nd. IF. transformer			
			L291
Indicator and dial lamps (3) 16 volt min. bay. base			
G3 $\frac{1}{2}$ bulb LUGON type 163-11			
			M440

#	Alternative indicator and dial lamps (3) 12V 0.183A min. bay. base G3 $\frac{1}{2}$ bulb	M37C
#	Series resistor (3) alternative ind. and dial lamps 4.7 ohm $\frac{1}{2}$ watt	PR85
85	DP.ST. switch part of volume control circuit No. 70	
86	6 pin plug assy.	A102/36
87	Fuse - 15 amp	PM219
88	Vibrator - 12 volt non-sync 150 cycle 4 pin (6 pin spacing)	M32
89	Vibrator transformer - 12 volt	T13
90	Iron cored choke	PT79
91	Iron cored choke	PT79
92	Choke - layer wound	L13
93	6 pin socket assy.	A101/36
94	Speaker input trans. - 5000 - 3.5 ohms imped. type KBG112	PT87
95	Choke - spiral wound	L19
96	Speaker 6" x 9" Permag speaker type 6-9L cone type F59	K15
	Power supply and output unit - 12 volt , complete	A148/39
	Condenser - .5 MF metal-clad, shielded generator armature by-pass	PC54
	Condenser - .5 MF metal-clad, shielded ignition coil by-pass	PC545-1
	Suppressor - 12,500 ohm screw-in type	PR31
	Units connecting connecting cable includes	PA52
	6 pin plug A102/366 and shield 13/392	
	Terminal strip assy. (2) 3 lug type 1E1	A591/3C
	Terminal strip assy. - 11 lug	A622/3C
	Terminal strip assy. (4) 2 lug type 1E	A557/3C
	Terminal strip assy. (2) 3 lug type 1E1	A555/3C
	Terminal strip assy. (2) 3 lug type 2E	A598/3C
	Retaining spring (2) IF, transformer	510/25C
	Valve shield (2)	38/62
	Valve socket (6) 7 pin	A104/56
	Vibrator socket - 6 pin	PM146
	Vibrator chassis clip	42/98
	Valve shield chassis contact (2)	65/635
	Speaker socket - single pin - top section	19/96
	Speaker socket - single pin - bottom section	18/96
	Contact - speaker socket	15/58-2
	Contact pin - on speaker lead	11/252
	Press stud - chassis connector - on speaker lead	246/25C
	Valve retaining clip (2) rectifier and output valve	307/25C
	Knob - antenna matching adjustment	341/81
	Cover - base of power supply	22/392
	Metal cover - power supply and output unit	A139/39
	Knurled nut - power supply stud	48/352-
	Power supply stud - $\frac{5}{8}$ " x 3/32" Whit. rd. hd.	4/560-1
	Hex nut - 3/32" Whit. - power supply stud	14/226
	Tuning unit can assembly	A141/39
	Tuning spindle and pinion assy. part of L336	A102/39
	Lamp socket and bracket assy. - ind. lamp.	A145/39
	Dial background and socket assy. - dial lamps	A173/38
	Eyelet and washer assy. (3) lamp sockets	62/245
	Leatheroid washer (3) lamp sockets	511/30C
	Spring (3) lamp sockets	55/245

ght shield (3) ind. and dial lamps	24/698
licator light button - red	3/386-2
ght carrier - ind. lamp to light button	68/387
se and lead wire assy.	PA596
consists of	
Fuse - 15 amp	PM219
Fuse holder - long section	11/245
Fuse holder - short section	14/245
Fuse insulator - cardboard tubing	15/245
Socket - receiver power connector	151/245
Eyelet and bush assy. (3) moulded bakelite - inside fuse holder and receiver power socket	17/245
Plug terminal - dial illum. lead	23/386
Spade lug (2) lead connections to terminals of car	59/292
Feed lead - brown 34" long 14/.012 copper wire	WM248-1
Feed lead - grey 27" long 9/.012 copper wire	WM247-8
Spring - fuse holder	89/300-2
connector - double sleeve type - dial lamp leads	24/386-2
dial reading	459/81-2
dial pointer	457/81
dial pointer holder	57/387
escutcheon - moulded includes badge	456/81
badge - 'Airchief' part of escutcheon	57/387
metal namestrip - 'Airchief'	561/250
metal - chrome	66/374-2
brass washer (2) barrel nut	19/304
brass nut (2)	17/304-5
brass bush (2) control spindles	60/387
brass knob assy.	A176/392-3
brass control knob assy.	A175/392-3
brass control knob	349/81-3
brass - tone knob	22/755
brass - volume knob	430/250
brass - tuning knob	161/81
brass (2) chrome - vol. and tuning knobs	2/358
brass contact pin - on speaker lead	11/252
brass stud - on speaker lead	246/250
brass gandie bag - speaker	482/250
brass socket - rear of tuning unit	62/387
brass socket - front of tuning unit	A163/387
brass socket - power supply small 'Z' shape	63/387
brass socket - power supply large 'Z' shape	64/387
brass (2) fastens fuse holder and power supply plug	422/250
brass terminal lead-in cable clip	423/250
brass tension spindle - tone control	70/374
brass washer nut (2) front mt. bracket of tuning unit.	13/387
brass screw (2) self-tapping $\frac{3}{8}$ " x No.6 bdr.hd. front mt. bracket	35/560-6
brass locknut (2) No.6 captive - side of tuning unit.	476/250

ALTERNATIVE DIAL AND INDICATOR LAMPS

When a 12 volt 0.183 Amp. indicator lamp part No. M370 is fitted, a 4.7 Ohm $\frac{1}{2}$ W resistor part No. PR858 is wired in series with the lead to lamp socket.

When two 12 volt 0.183 Amp./dial lamps part No. M370 are fitted, two 4.7 ohm $\frac{1}{2}$ W resistors part No. PR858 connected in parallel are wired in series with the lead to lamp sockets.

ANTENNA COMPENSATING CONDENSER ADJUSTMENT

When the receiver is refitted to car, the antenna trimmer condenser must be adjusted to ensure correct matching of the antenna to the receiver for maximum long distance reception.

A small knob attached to the trimmer condenser shaft is located on the driving side of the tuning unit case.

To adjust the trimmer condenser, extend the antenna to half its fully extended height, then tune the receiver to a barely audible distant station near the centre of the dial. Slowly turn the small knob in either direction for maximum volume of the signal.

If a barely audible distant station is not available, adjust the antenna trimmer condenser for maximum volume of the background noise between two stations near the centre of the dial.

For best results it should be adjusted in a locality free from interference from overhead power lines, etc. Once the trimmer condenser has been set it should not require readjustment unless the receiver or antenna and lead-in cable have been moved or removed from the vehicle,

CHASSIS SERIAL NUMBER

The serial number is stamped into the metal chassis and is visible through a slot at the rear of the metal can.

COIL AND TRANSFORMER CONNECTIONS.ANTENNA COIL

Blue cotton covered lead - Junction of circuit Nos.1, 47, and 78.

Red cotton covered lead - Junction of circuit Nos.2 and 3

OSCILLATOR COIL

Blue cotton covered lead - Chassis
Red cotton covered lead - Junction of circuit Nos.16, 18, 20, 21 and osc. shunt coil

RF. COIL

Blue cotton covered lead - Junction of circuit Nos.6, 9, and 51.
Red cotton covered lead - Junction of circuit Nos.10, 11, and 53.

POWER TRANS.

Pri. start - Red sleeving on heavy gauge wire

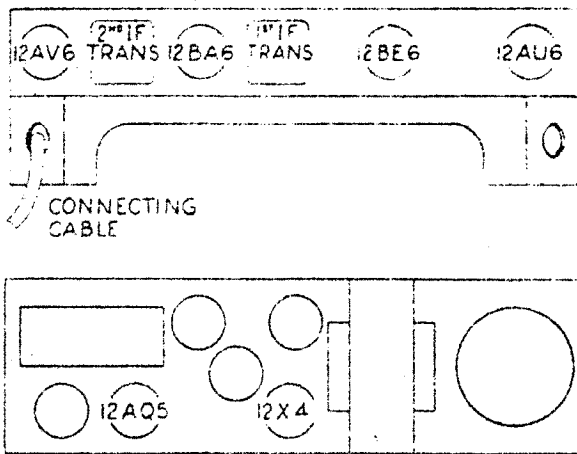
Pri. centre-tap - Green sleeving on heavy gauge wire

Pri. finish - Black sleeving on heavy gauge wire

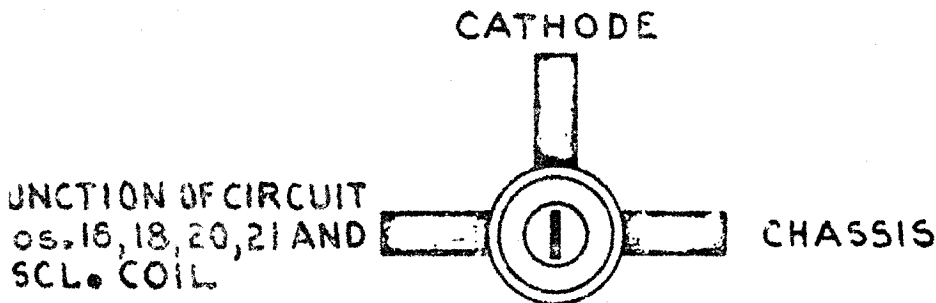
Sec. start - Red cotton covered stranded lead

Sec. centre - Green cotton covered stranded lead

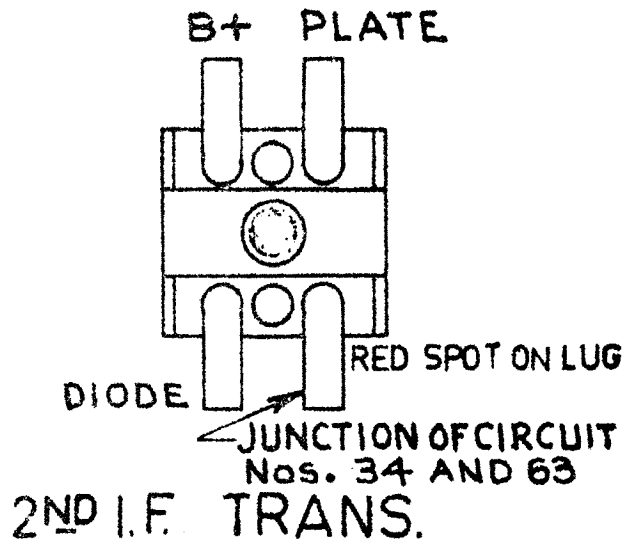
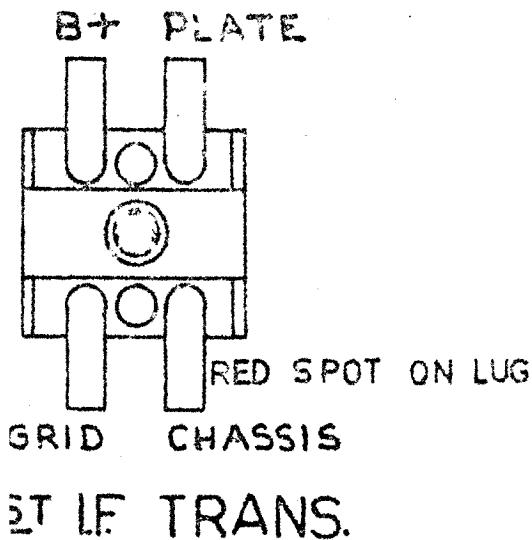
Sec. finish - Black cotton covered stranded lead

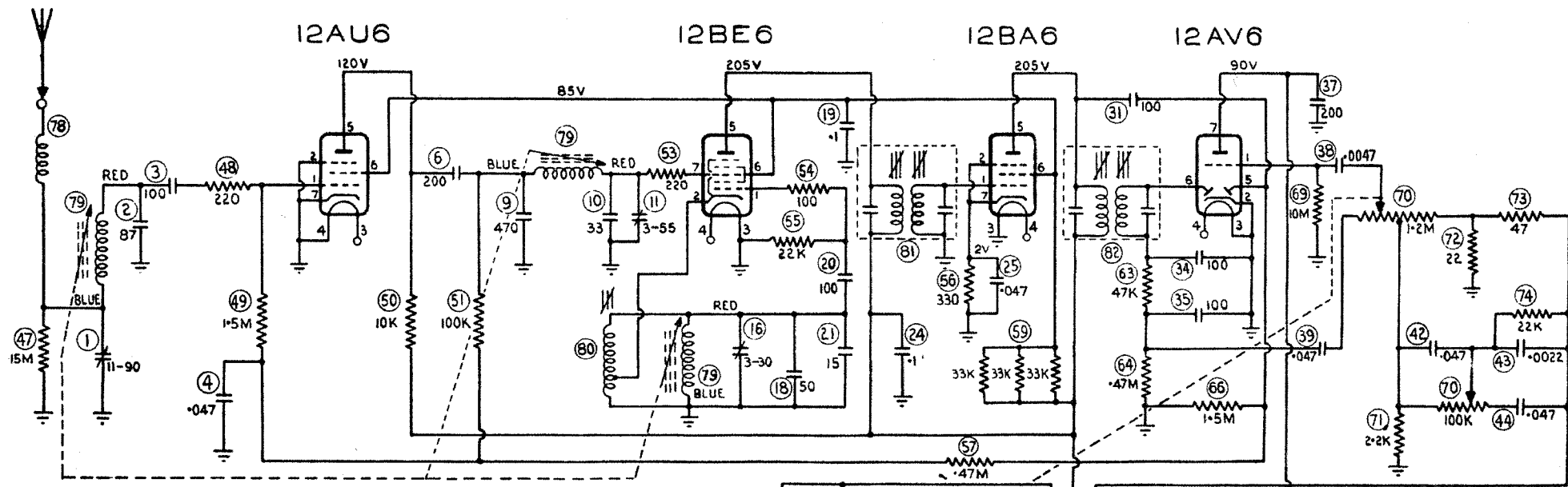


OSC. SHUNT COIL.



LUG VIEW OF COIL.



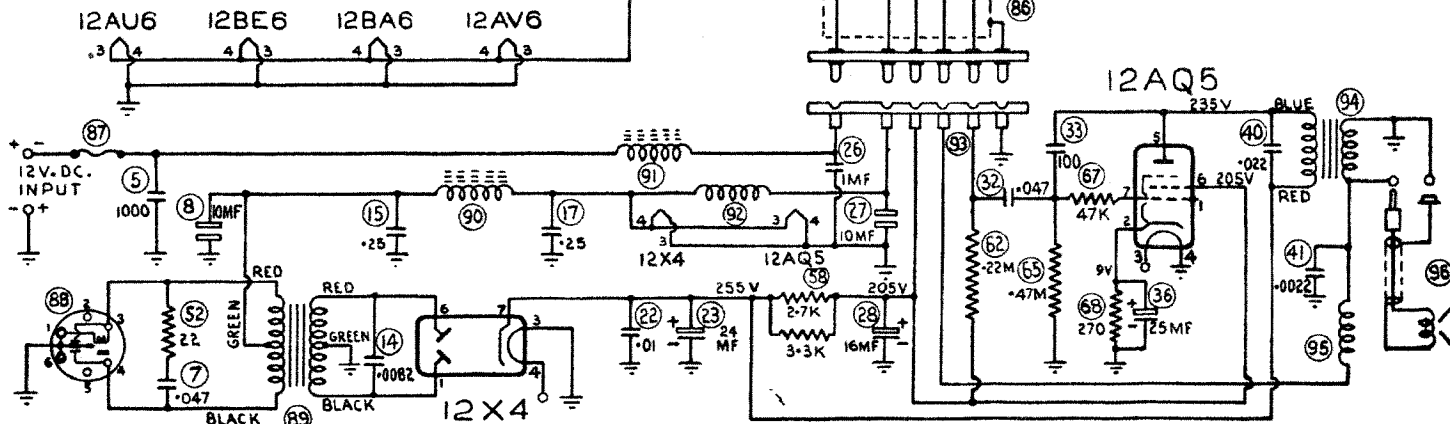


MODEL - CRM

IF - 455 Kc/s.

VOLTAGES ON CIRCUIT ARE MEASURED BETWEEN POINTS INDICATED AND CHASSIS WITH A DC. VACUUM TUBE VOLTMETER.

WHEN MEASURING VOLTAGES IN HIGH IMPEDANCE CIRCUITS, LOWER READINGS THAN THOSE SHOWN WILL BE OBTAINED IF A VTVM IS NOT USED DEPENDING ON THE RESISTANCE OF THE METER USED EG. 1000 Ω/VOLT OR 20,000 Ω/VOLT.



SERVICE DEPARTMENT SUGGESTIONS

Service Department Personnel may materially assist our Design Engineers the development of new designs or in the improvement of existing models.

As new models are returned for service, we invite your comments on items such as :-

Is the product accessible for servicing. ?

Is there any advice or help we may offer regarding Service Equipment or Methods of Servicing. ?

Is any component known to be troublesome. ?

Is the packaging adequate to ensure the product is delivered in first class condition. ?

Is the product performance satisfactory. ?

Is the service data supplied sufficient. ?

Is the service data supplied in the best form for your use. ?

On the attached sheets write us your suggestions or problems and forward the sheets to :-

The Field Liaison Section,
Design Department,
126 Grant Street,
SOUTH MELBOURNE VICTORIA.

Your suggestions will, at all times, receive full consideration
You will be advised of what action is taken in regard to same.

REMEMBER - YOUR PROBLEMS ARE OUR PROBLEMS

SERVICE DEPARTMENT REPORT

Model _____

Serial No. _____

Date _____

FROM _____

ADDRESS _____