

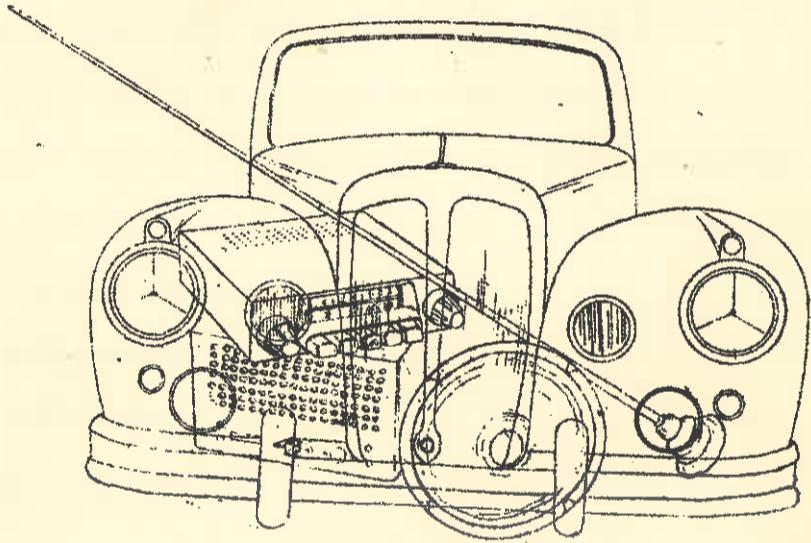


.... The Hallmark of Quality

"HIS MASTER'S VOICE"

SERVICE SHEET for....

RADIOMOBILE MODELS 203XC & 203XD



ISSUED BY HIS MASTER'S VOICE (N.Z.) LTD. G.P.O. BOX 296, WELLINGTON

Radiomobile

Models:-

203XD - 203XE

GENERAL DESCRIPTION

The models treated in this manual, consist basically of a high-sensitivity permeability tuned superheterodyne circuit, incorporating one stage of RF amplification prior to the frequency changer. The aerial is coupled to the grid of the RF amplifier by means of an efficiently tuned circuit designed for maximum signal transfer, combined with freedom from spurious responses. The coupling between RF amplifier and frequency changer is also a tuned circuit. Permeability tuned IF transformers are employed and mechanically pre-set push-button tuning is provided in addition to the normal manual control. Automatic gain control is applied to RF amplifier, frequency changer and first IF stage, the control voltage is undelayed. A three-position tone control provides for bass cut in position one, bass lift by means of a frequency selective negative feed-back circuit in number two position, and in number three position the bass lift is retained and an additional top cut effected. The circuit is divided into two parts, which comprise control unit and amplifier-power unit respectively. The division occurs at the first audio-amplifier (6AT6), at which point the control unit is connected to the amplifier unit by means of a multi-core cable.

The two basic amplifier/power units provide for single stage and push-pull outputs. In all amplifiers, high tension supply is provided by means of a non-synchronous vibrator, the output of which is rectified conventionally, in the case of the single output stage amplifier, by a 6X4, and in the case of the push-pull amplifier, by means of a compact metal rectifier.

Low tension input is twelve volts only, or six/twelve volts, according to model. In the six/twelve volt models, voltage change-over is effected by means of tag panels. It is also necessary to ensure that a vibrator of the correct voltage is used in each case.

SPECIFICATION

CONTROL UNIT

Physical:

Height: 2 inches
Width: 7 inches
Depth: 7 inches
Weight: 4½ lbs - less leads

Valves:

6BA6 - RF Amplifier
6BE6 - Frequency Converter
6BA6 - IF Amplifier
6AT6 - Detector, A.G.C. and L.F. Amplifier

Wave Range:

Model 203X Broadcast: 186-577 metres
(1610-520 Kc/s)

Low Tension Supply:

6 or 12 volt battery - either pole earthed

Scale Illumination

Lamps:

14 volt 0.14 Amps for 12 volt operation
7.5 volt 0.2 Amps for 6 volt operation

Aerial Input Conditions:

The Trimmer provided gives adjustment for a range of total aerial input capacity from 33-80 mmfd.

Intermediate Frequency:

470 Kc/s

AMPLIFIER UNIT MODELS XC, XD

In view of their similarities, and for convenience of description, details given apply to the above models, unless otherwise stated.

Physical:

Height: 4½ inches
Width: 7 inches
Depth: 4½ inches
Weight: 5 lbs 6 oz

Valves:

Model XC (6AQ5 - Output Valve
(6X4 - Full wave Rectifier
Model XD (6AT6 - Phase Splitter
(6AQ5 - Push/Pull Output Valve
(6AQ5 - Push/Pull Output Valve
(- - Full Wave Rectification
(Metal Rectifier)

Low Tension Supply:

Models XC & XD 12 volt battery - either pole earthed or 6 or 12 volt battery - either pole earthed

High Tension Supply:

Model XC Non Synchronous Vibrator with hard valve Rectifier

Model XD Non Synchronous Vibrator with metal Rectifier

Power Output:

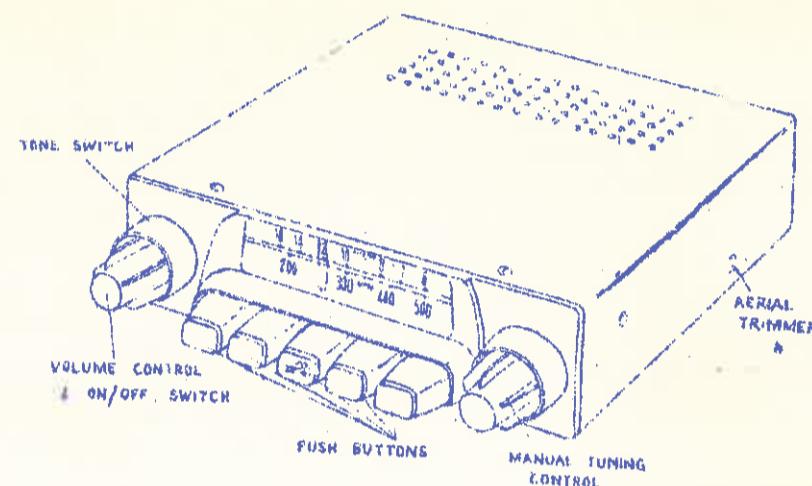
Model XC 2 Watts (at 5% total distortion)
Model XD 5 Watts (at 5% total distortion)

Loudspeaker:

Model XC Output Impedance - 3.5 ohms at 1000 c.p.s.

Model XD Output Impedance - 3.5 and 1.75 ohms at 1000 c.p.s.

GENERAL VIEW OF CONTROL UNIT



The controls for these receivers are shown in the illustration.

THE COMBINED VOLUME CONTROL AND ON/OFF SWITCH switches the receiver on when turned clockwise, and progressive rotation of the control increases the volume. Turning the control fully anti-clockwise switches off the receiver.

THE TONE CONTROL provides selective tone correction for reproduction of either speech or music by means of three separate tone settings:

Fully anti-clockwise, the amount of bass reproduction is reduced.

In the centre position, the bass is restored.

Fully clockwise, the amount of treble reproduction is reduced.

THE MANUAL TUNING CONTROL provides variable station selection and is permanently engaged.

THE FIVE PUSH-BUTTONS

These buttons provide selection of five stations in the Medium (Broadcast) Waveband.

THE TUNING SCALE

The scale is calibrated both in Kilocycles (Mcs/10) and Metres, covering the Broadcast-band.

Illumination of the scale on all models is by means of "edge lighting".

TO SET UP THE PUSH BUTTONS

Ensure that the receiver has been switched on for at least ten minutes before proceeding with the setting up of push-buttons.

1. Tune in to the desired station by means of the manual tuning control.
2. With the station accurately tuned in, pull the push-button outward to full extent - about $\frac{1}{4}$ inch movement, to release the locking mechanism; then push button fully home, thus locking the mechanism in the required position.

The push-button is now set to the desired station and independent of the manual tuning. Proceed in the same

ALIGNMENT

All H.F. Tests must be carried out in conjunction with the appropriate Amplifier.

If any I.F. or R.F. Circuits have been disturbed, complete I.F. and R.F. Alignment must be carried out.

During alignment, the input to the receiver must be progressively reduced as the circuits are brought into line, so that the output does not exceed 200 mW. An AC voltmeter (rectifier type) may be used as an output meter.

I.F. ALIGNMENT

1. Set Volume Control to maximum, Tone Control fully anti-clockwise and bring tuning carriage right out, i.e. towards front panel.
2. Inject a modulated signal at 470 Kc/s (modulated at 400 cycles to 30%) between the grid of V2 and chassis, via a 0.1 mfd Capacitor leaving grid connection made.
3. Adjust cores of L13, L12, L9 and L8, in that order, for maximum output. When adjusting any coil its companion coil must be damped with a 47,000 ohm resistor.
4. Repeat until no further output is obtainable.

R.F. ALIGNMENT

Controls as for operation 1 of I.F. Alignment, connect signal generator to the aerial socket and chassis via the dummy aerial.

Ensure that the tuning cores are screwed back as far as possible into their square rubber grommets before proceeding with alignment.

<u>OPER. NO</u>	<u>SET. POINTER TO</u>	<u>GENERATOR TO Kc/s</u>	<u>ADJUST FOR MAX. OUTPUT</u>
1.	Tuning carriage fully out	1620	185
2.	Tuning carriage fully in	520	577
3.	Tune in	1100	272
4.*	Tune in	550	545
5.	Repeat operation 3 (L2 Only) and 4		Ferroxcube Rod

* This operation must only be carried out when L2 has been replaced. After adjustment, ensure that the ferroxcube rod is sealed.

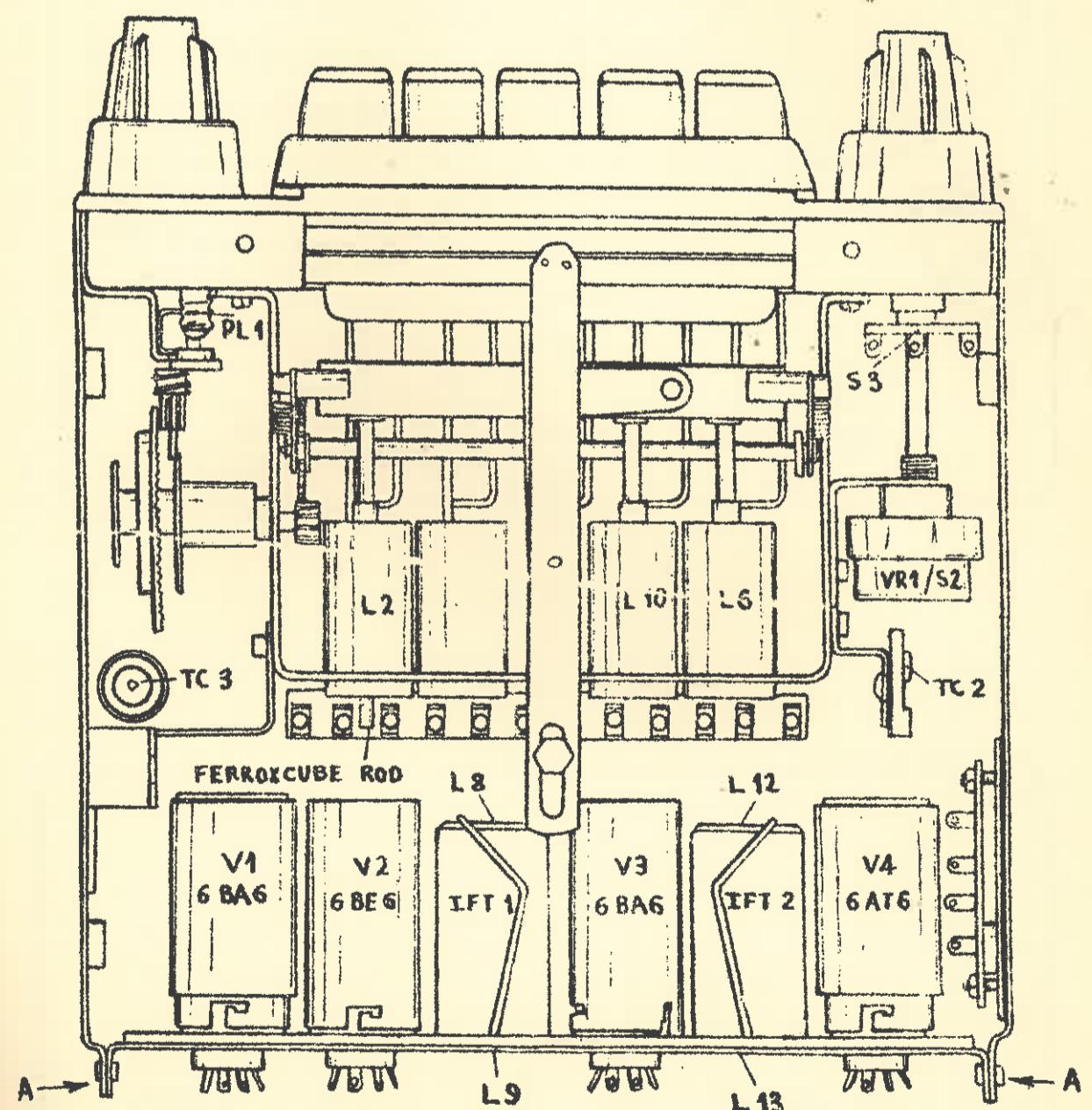
For access to cores of L2, L3, L6 and L10, remove Back plate and Diffuser Assembly.

SENSITIVITY: With input level 110 db below 1 volt (3 microvolts) check that the output is not less than 200 m.W.

CONTROL UNIT

COMPONENT LAYOUT OF CONTROL UNIT

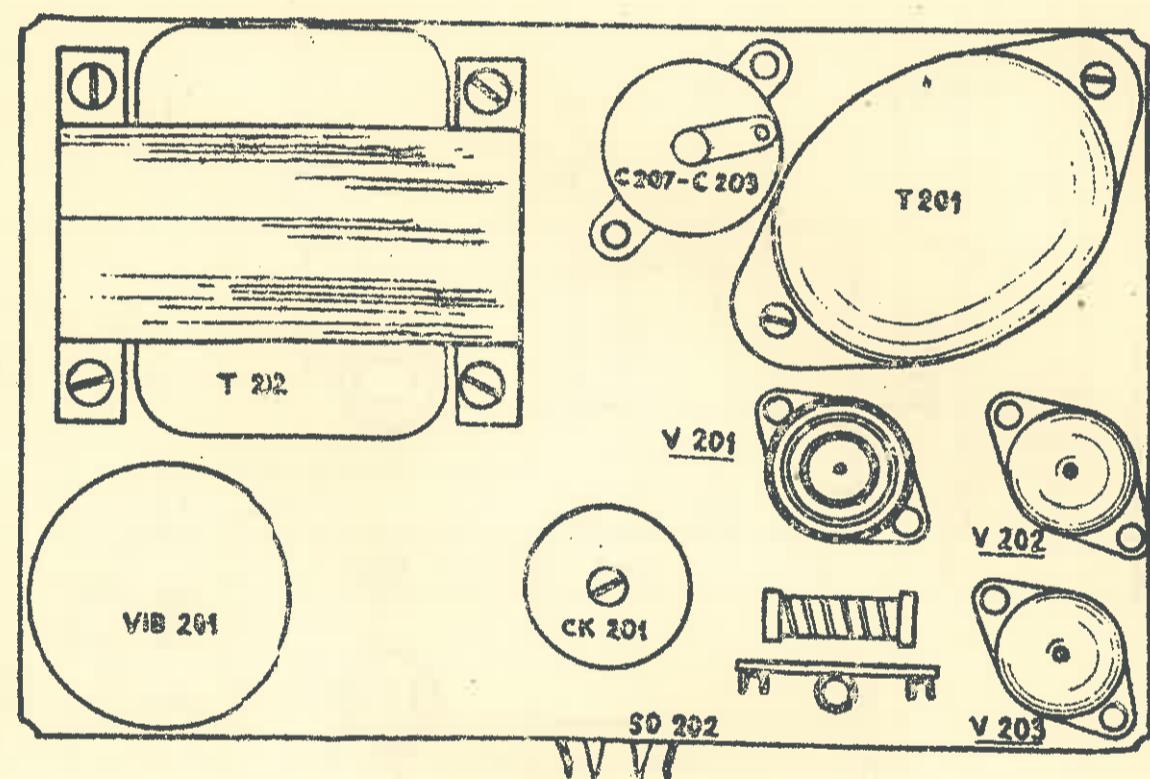
Remove back plate assembly (2 P.K. Screws)
for access to cores of L2, L6 and L10



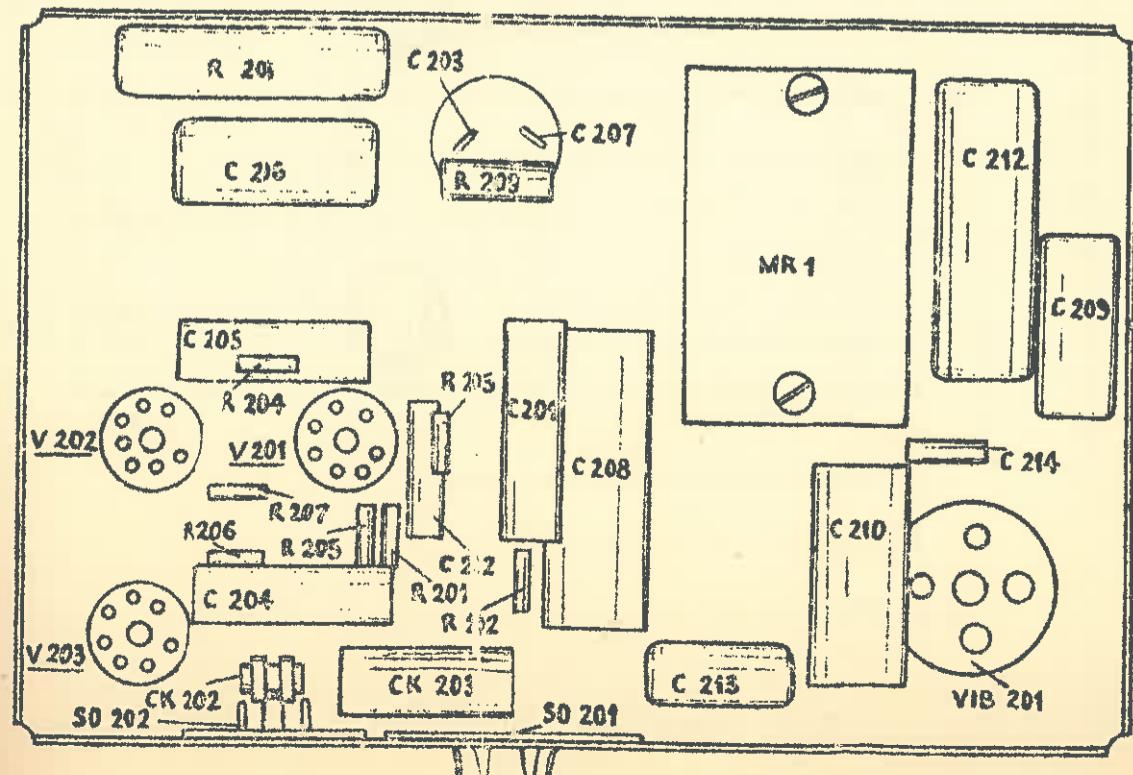
For access to IF Transformer slug, move pointer to
extreme end of dial and loosen screws A and turn
sub-chassis upwards.

AMPLIFIER UNIT MODEL 203 XD

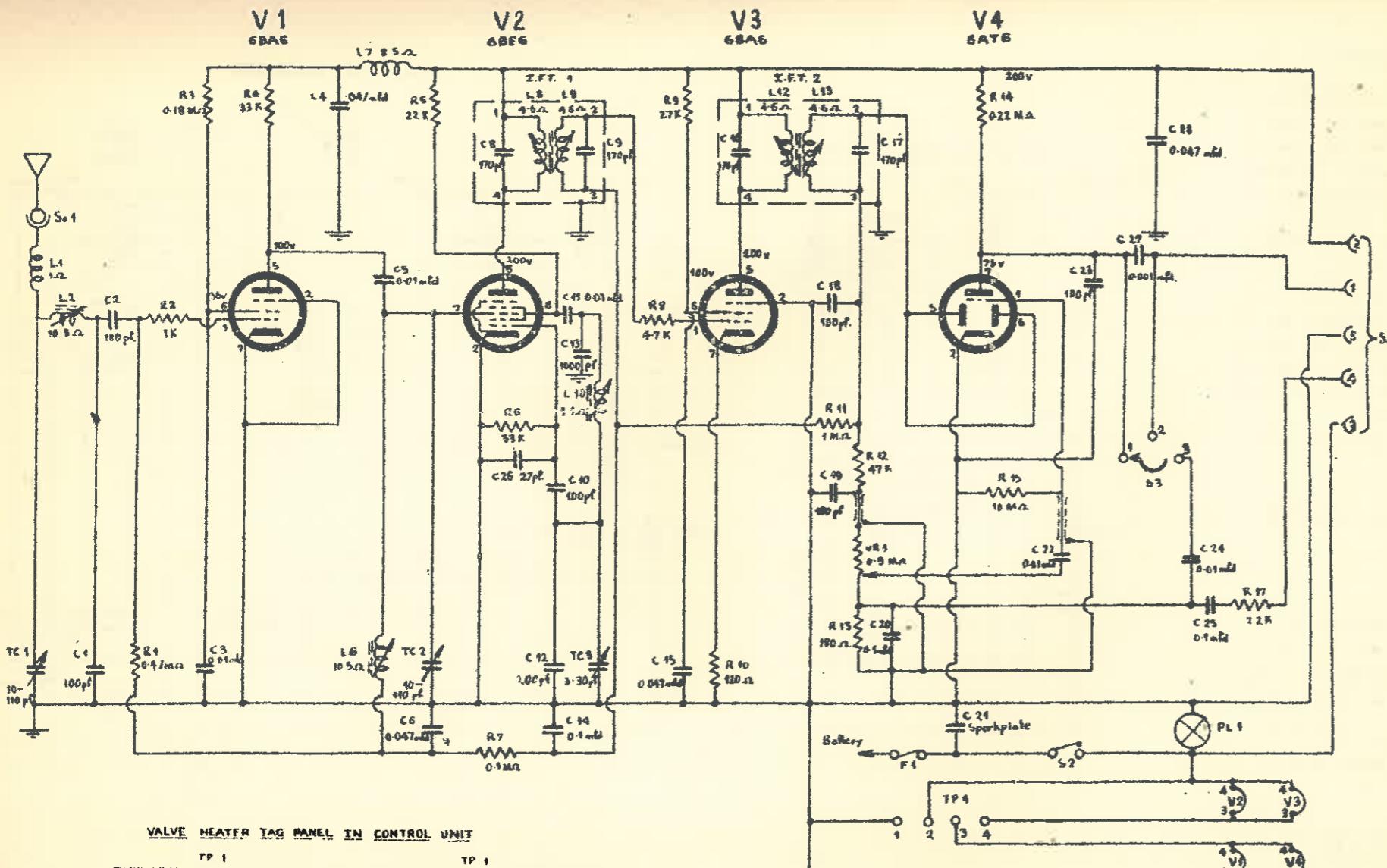
PLAN VIEW



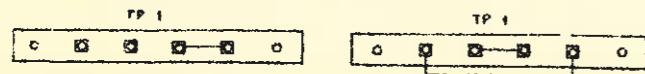
INVERTED PLAN VIEW



SCHEMATIC DIAGRAM



VALVE HEATER TAG PANEL IN CONTROL UNIT

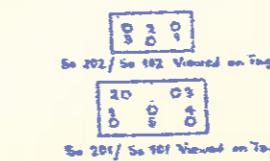
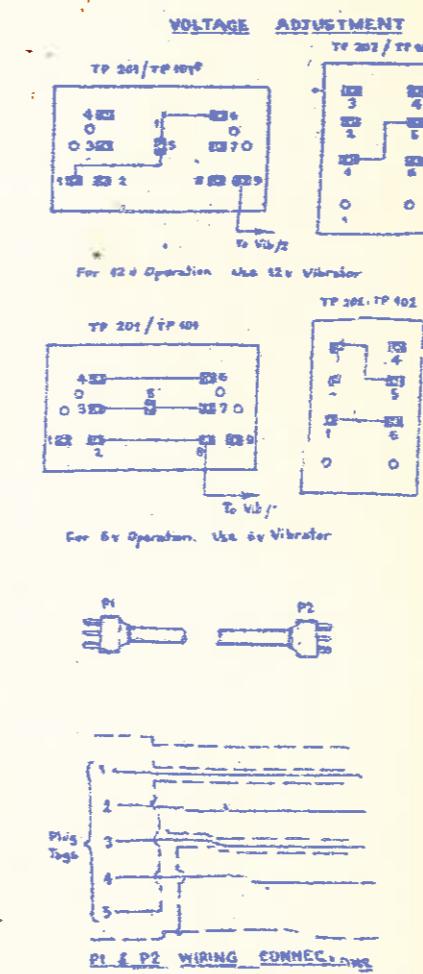
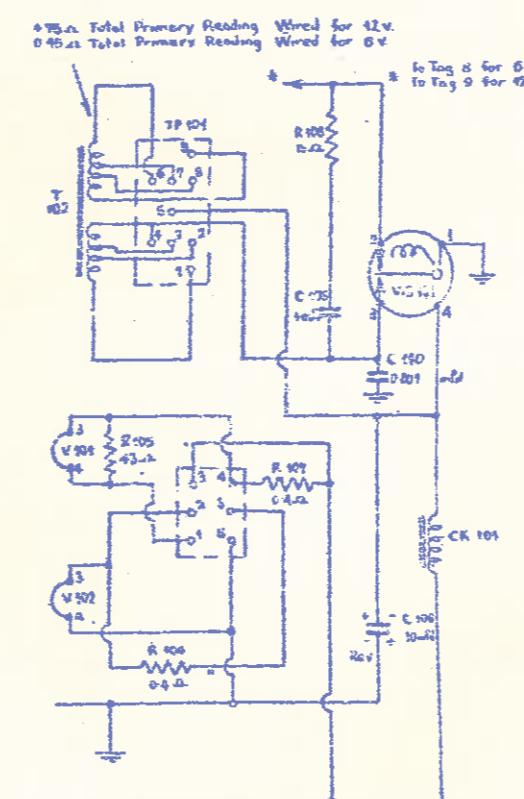
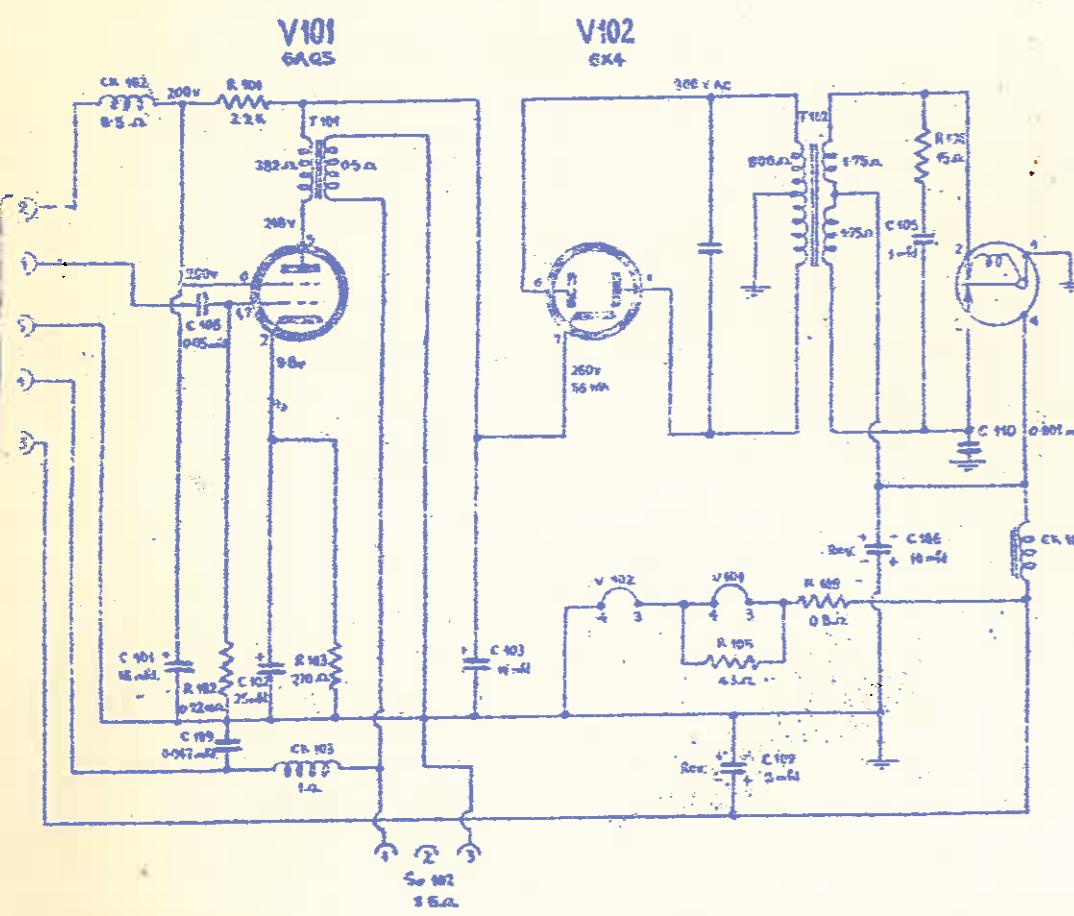


1 For 42 v Operation
 For 6 v Operation use 10amp fuse and 7.5 v Pilot lamp
 For 12v Operation use 5amp fuse and 14 v Pilot lamp

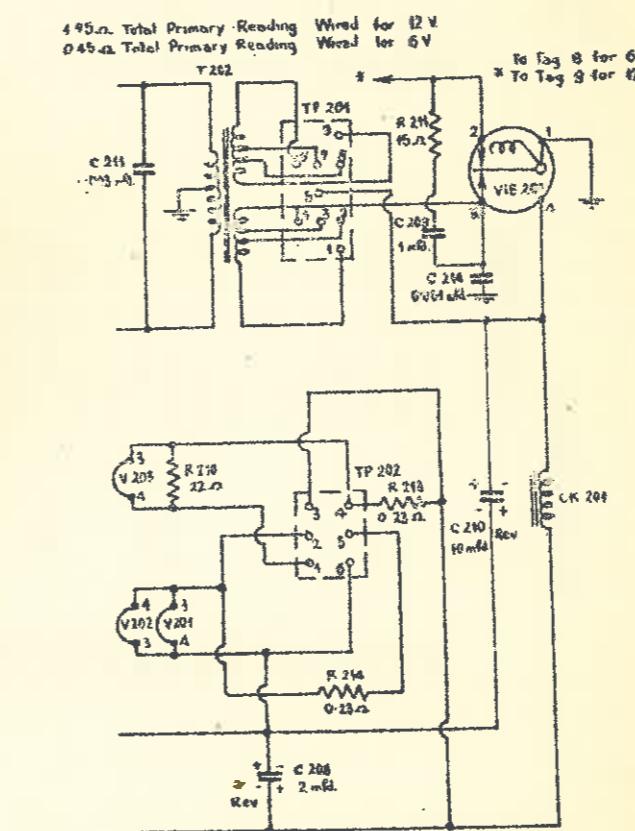
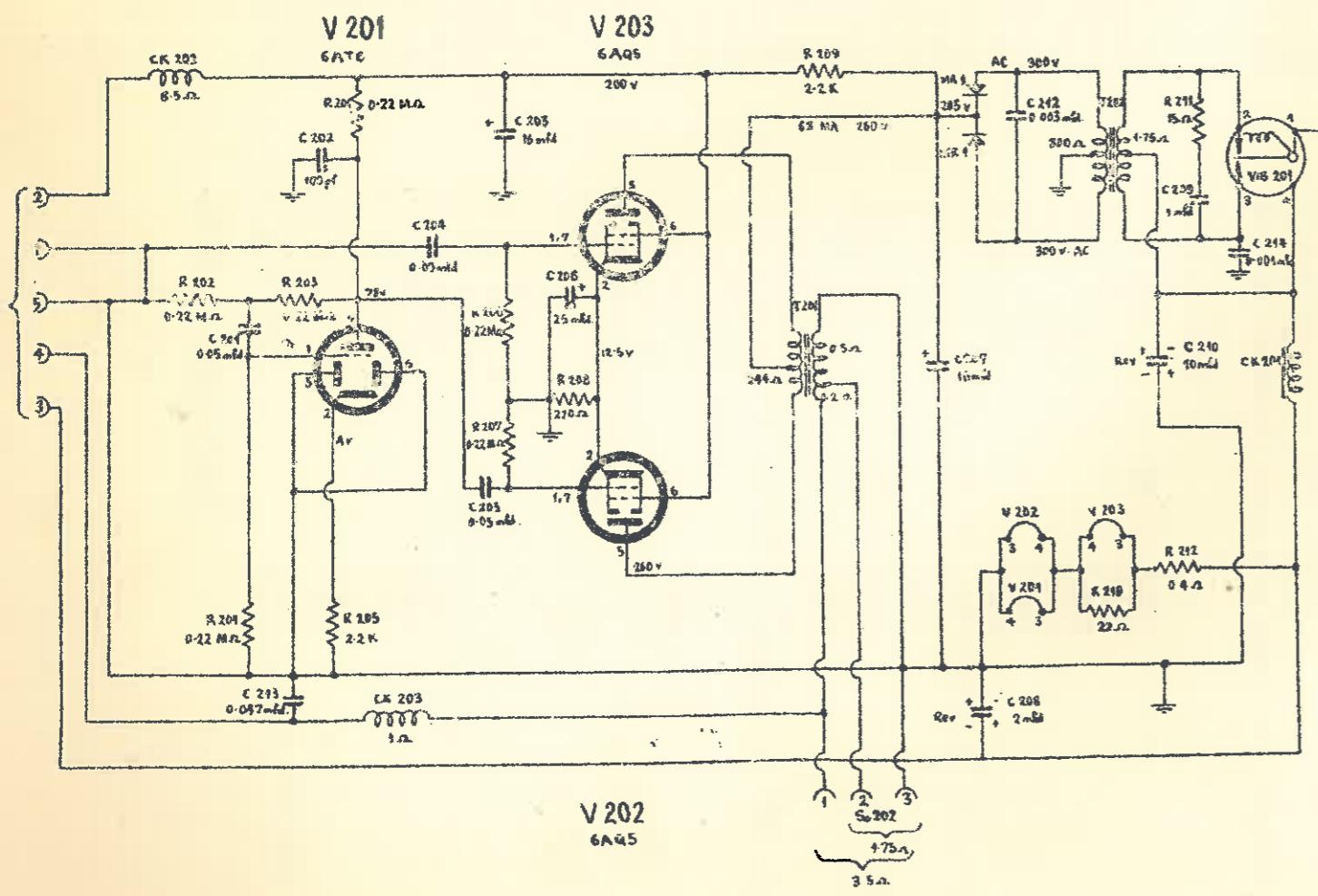
CONTROL UNIT

AMPLIFIER UNIT MODEL 203 XC

SCHEMATIC DIAGRAM



SCHEMATIC DIAGRAM



AMPLIFIER UNIT MODEL 203 XD

COMPLETE PARTS LIST FOR
CONTROL UNIT MODEL 203X

<u>Item No</u>	<u>Part No</u>	<u>Description</u>		
<u>RESISTORS</u>				
R1	1300-N2	470 K. ohms		1/2W.
R2	1300-O4	1 K. ohms		1/2W.
R3	1300-L2	180 K. ohms	10%	1/2W.
R4	1300-N3	33 K. ohms		1/2W.
R5	1300-I2	22 K. ohms		1W.
R6	1300-N3	33 K. ohms		1/2W.
R7	1300-G7	100 K. ohms		1/2W.
R8	1300-Q4	4,700 ohms		1/2W.
R9	1300-L7	27 K. ohms	10%	1W.
R10	1300-K	120 ohms	10%	1/2W.
R11	1300-I8	1 M. ohm		1/2W.
R12	1300-F8	47 K. ohms		1/2W.
R13	1300-K5	180 ohms	10%	1/2W.
R14	1300-H4	220 K. ohms		1/2W.
R15	1300-K1	10 M. ohms		1/2W.
R16	1300-G6	0.4 ohms	15%	1.3W.
R17	1300-F9	2,200 ohms		1/2W.
VR1/S2	P0 1184	Volume Control (0.5 meg ohm) and On/Off Switch		
<u>CAPACITORS</u>				
C1	1500-R	100 pfd.	5%	350v
C2	1500-J4	100 pfd.		750v
C3	1500-B5	0.01 mfd.		350v
C4	1500-K3	0.047 mfd.		350v
C5	1500-B5	0.01 mfd.		350v
C6	1500-K3	0.047 mfd.		350v
C8-9	1500-M1	170 pfd + 170 pfd	2%	(included in 1FT 1)
C10	1500-J4	100 pfd		750v
C11	1500-B5	0.01 mfd		350v
C12	1500-Q6	200 pfd.	2%	350v
C13	1500-P7	1000 pfd.	5%	350v
C14	1500-J8	0.1 mfd.		150v
C15	1500-K3	0.047 mfd.		350v
C16-17	1500-M1	170 pfd + 170 pfd	2%	(included in 1FT 2)
C18	1500-J4	100 pfd.		750v
C19	1500-J4	100 pfd.		750v
C20	1500-J8	0.1 mfd.		150v
C21	92506	Sparkplate		
	92508	Insulation		
	92432	Washer		
	92507	Screen		
	200506	(Nut 6BA		
	201806	{S. P. Washer		
	200062H	{6 BA Screw		
C22	1500-B5	0.01 mfd.		350v
C23	1500-J4	100 pfd.		750v
C24	1500-B5	0.01 mfd.		350v
C25	1500-J8	0.1 mfd.		150v
C26	1500-J9	27 pfd.		750v
C27	1500-N3	0.001 mfd		350v
C28	1500-K3	0.047 mfd.		350v (or 1500-R2)
<u>TRIMMER CAPACITORS</u>				
TC1	1500-M4	10-110 pfd.		
TC2	1500-M4	10-110 pfd.		
TC3	1500-M2	3-30 pfd.		

<u>Item No</u>	<u>Part No</u>	<u>Description</u> <u>AMPLIFIER MODEL XC</u>		
<u>RESISTORS</u>				
R101	1300-G3	2.2K ohms	5%	4W
R102	1300-H4	.22M ohms		1/2W
R103	1300-G1	270 ohms	10%	1W
R104/7	1300-G6	0.4 ohms	15%	1.3W
R105	1300-G4	43 ohms	5%	4W
R106	1300-F6	15 ohms		1/2W
<u>CONDENSERS</u>				
C101/3	1500-I5	16-16 Mfd Electro		350v
C102	1500-I9	25 Mfd Electro		25v
C104	1500-H9	.007 Mfd	10%	200VAC
C105	1500-K6	1 Mfd	25%	150v
C106	1500-G2	10 Mfd Rev. Electro		15v
C107	1500-G7	2 Mfd		150v
C108	1500-I7	.05 Mfd		200v
C109	1500-K3	.047 Mfd		350v
C110	1500-N3- (1500-R2)	.001 Mfd + 100% -20%		350v
<u>TRANSFORMERS</u>				
TR 1171		Vibrator Transformer 6-12v		
TR 1203		Vibrator Transformer 12v		
TR 1125		Output Transformer DCG 87		
<u>CHOKES</u>				
CK101	92459A	Input Choke		
CK102	40938A	H.T. Choke		
CK103	35967B	Choke		
<u>VIBRATORS</u>				
VI1122		Vibrator 12v Plessey 1214		
VI1123		Vibrator 6v Plessey 614		
<u>VALVES</u>				
V101	1400-Z	Valve 6AQ5		
V102	1400-Q7	Valve 6X4		
<u>MISCELLANEOUS</u>				
SO 69		Min Valve Socket		
RI 1097		Arched Ring		
CL 1113		Clamp 1 or Electro 16-16		
SO 328		4 Pin Vibrator Socket		
CL 1124		Clamp for Vibrator		
92456-B		Tag Panel (Voltage Adjustment)		
SO 1172		5 Way Socket		
92433		Earth Clip		
SO 1152		3 Way Socket		
<u>AMPLIFIER MODEL XD</u>				
<u>RESISTORS</u>				
R201/2/ 3/4/6/7	1300-H4	.22M Ohms		1/2W
R205	1300-F9	2.2K Ohms		1/2W
R208	1300-G8	270 Ohms	5%	2W
R209	1300-G3	2.2K Ohms	5%	4W
R210	1300-H5	22 Ohms	5%	4W
R211	1300-G6	15 Ohms	5%	1/2W
R213/4	1300-I1	.23 Ohms	15%	1.3W

<u>Item No</u>	<u>Part No</u>	<u>Description</u>
<u>CONDENSERS</u>		
C201/4/5	1500-I7	.05 Mfd
V202	1500-J4	100 Pfd
C203/7	1500-I5	16-16 Mfd Electro
C206	1500-L9	25 Mfd Electro
C208	1500-G7	2 Mfd
C209	1500-K6	1 Mfd
C210	1500-H2	10 Mfd Rev Electro
C212	1500-I1	.003 Mfd
C213	1500-K3	.047 Mfd
C214	1500-N3 (1500-R2)	.001 Mfd
		200v 750v 250v 25v 150v 150v 15v 800VAC 350v 350v
<u>TRANSFORMERS</u>		
TR 1171		Vibrator Transformer 6-12v
TR 1203		Vibrator Transformer 12v
TR 1186		Output Transformer DQL44/B
<u>CHOKES</u>		
CK201	92459A	Input Choke
CK202	40938-A	H.T. Choke
CK203	35967-B	Choke
<u>VIBRATORS</u>		
VI 1122		Vibrator 12v Plessey 1214
VI 1123		Vibrator 6v Plessey 614
<u>VALVES</u>		
V201	1400-Y6	Valve 6AT6
V202	1400-Z	Valve 6AQ5
V203	1400-Z	Valve 6AQ5
<u>MISCELLANEOUS</u>		
SO 69		Min Valve Socket
RI 1097		Anchor Ring
46338A		Valve Can for Min Socket
SP 501		Spring for Valve Cap
CL 113		Clamp for Electro 16-16
SO 328		4 Pin Vibrator Socket
CL 1124		Clamp for Vibrator
GR 286		Rubber grommet G14
ST 62		Terminal Strip
GR 288		Rubber grommet G8
92456-B		Tag Panel (Voltage Adjustment)
SO 1172		5 Way Socket
92433		Earth Clip
SO 1152		3 Way Socket
RE 1028		Metal Rectifier (Full wave)

INSTALLATION

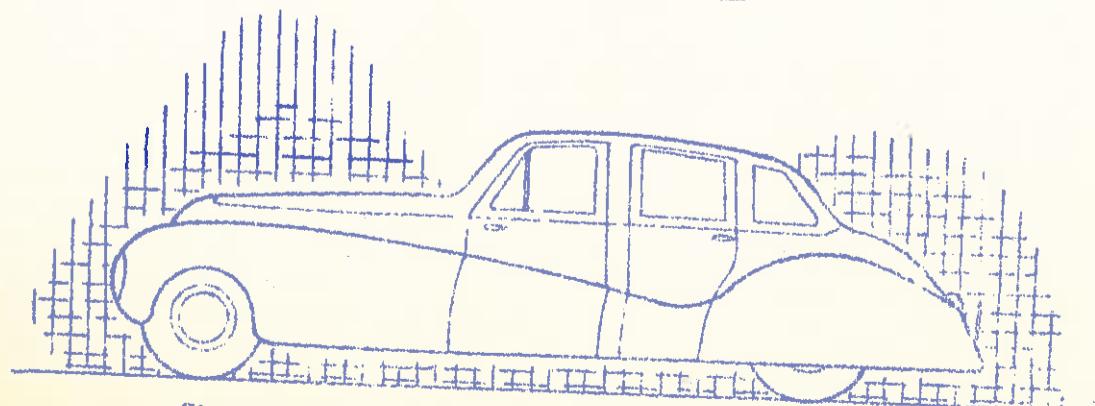
Firstly, make use of the information supplied by the manufacturer, as he has gone to considerable expense and spent a great deal of time in arranging his unit placings, and to the manufacture of special brackets and leads to give the best results obtainable from his product in the particular make of car you are fitting.

SET: Make certain that all screws from brackets to car chassis, and from brackets to set are making good electrical contact, and that you are not relying on the braid of your aerial lead or such for your earth return to the battery. Any resistance in the L.T. circuit will cause interference and a voltage loss, the latter by reducing voltage applied to the set will of course be a cause of drop in sensitivity and volume of the set.

AERIAL: The aerial should be placed in a low interference field as shown in sketch, with due consideration being given to the following points -

- a. Requirements of customer - The general public opinion varies considerably, some being proud of the fact that their car is fitted with a radio, while others like to have the aerial as inconspicuous as possible, and again others need the aerial in such a position that it will not be damaged in shipping or garaging.
- b. Length of aerial lead - To obtain the best results this should be kept as short as possible, and be of a low capacity type as recommended by the manufacturer. Care should also be taken to see that lead shielding is completely insulated and only earthed at aerial and set, and also that it is kept as completely as possible clear of all other wiring. Use rubber grommets when leads are taken through body of car, otherwise continual rubbing due to car motion will cause aerial insulation to wear, and braid touching the metal of the car will cause interference.

INTERFERENCE FIELD



Shaded area shows maximum interference field around an automobile. Care should be taken to mount aerial outside field wherever possible