SERVICE MANUAL

FOR

"HIS MASTER'S VOICE"

AUTOMOBILE RADIO

MODEL 100

6-volt Operation

MODEL 100

12-volt Operation

CONDENSER AND POINTER DRIVE

Use only the correct grade of wire when renewing the drive. Supplies of wire may be obtained from The Gramophone Co. Ltd. Approximately 48 inches of wire is required.

1. Form a loop with an opening of about 1-8 inch in diameter at one end of wire. It will be found that the twisted part of the wire can be readily soldered.

2. Measure a distance of $30\frac{1}{2}$ inches from loop, fix cursor at this point by threading wire through the cursor, and passing it one turn round extended end of pointer. Slip cursor into cursor bar on chassis.

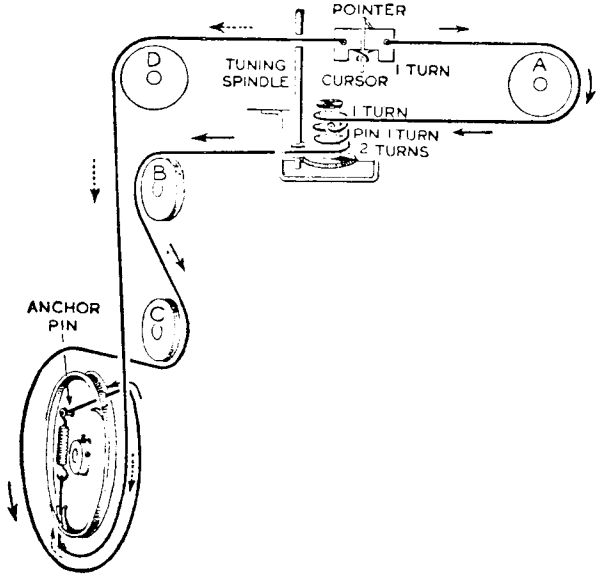
3. With gang condenser at maximum, set pointer to read 550 metres on the scale and wedge cursor in position temporarily, by means of a small block of wood.

4. Take end of wire with loop and pass it round pulley "A". (See diagram).

5. Take wire round small drum in a clockwise direction (looking from front) for one turn Wedge drum temporarily by means of a small block of wood.

6. Take wire round small pin on top of drum for one turn. Wind another two turns round drum in a clockwise direction (looking from front).

7. Pass wire over the rubber tyre on tuning spindle, through slot in adjacent bracket, and over pulley "B".



8. Take wire over pulley "C" and then partly round drum on gang condenser spindle, through hole in periphery and assemble loop on anchor pin.

9. Take other end of wire over pulley "D," then partly round condenser drum and through hole in periphery.

10. Assemble tension spring as shown. Pass wire through end of spring, twist wire to form loop, solder and cut off surplus.

11. Remove blocks of wood fitted temporarily in operations 3 and 5.

12. Check calibration by tuning in stations of known wavelength about the middle of the scale, on medium and long waves, adjust the pointer if necessary for the best compromise.

SPARE PARTS LIST

RECEIVER

INDUCTANCES

Ref.	Description	Part No.
L1	Series Aerial Coil	RMH35967B
L2, L3	Aerial Coil, MW	RMH27389AS
L4, L5	Aerial Coil, LW	RMH27389AT
L6	Low pass filter coil	RMH27389AX
L7	I.F. acceptor coil	RMH27389AW
L8, L9	Oscillator coil, MW	RMH27389AU
L10	Oscillator coil, LW	RMH27389AV
L11	IFT1 primary coil	See IFT1
L12	IFT1 secondary coil	See IFT1
L13	IFT2 primary coil	See IFT2
L14	IFT2 secondary coil	See IFT2
L15	Choke	RMH35969A
L16	Choke	RMH35969A

CONDENSERS

Ref.	Description	Part No.
C1	10 mmfd.	RMH22164C
C2	0.047 mfd.	RMH36700F
C3	0.047 mfd.	RMH36700F
C4	0.047 mfd.	RMH36729F
C5	50 mmfd.	RMH22164J
C6	35 mmfd. ± 5 per cent.	RMH117901BH
C7	0.047 mfd.	RMH36700F
C8	50 mmfd.	RMH22164J
C9	15 mmfd.	RMH117901CE
C10	500 mmfd. ± 2 per cent.	RMH117904AF
C11	0.001 mfd.	RMH113543A
C12	50 mmfd. ± 5 per cent.	RMH117901BJ
C13	250 mmfd. ± 2 per cent.	RMH117904AD
C14	0.1 mfd.	RMH36729G
C15	220 mmfd. ± 2 per cent.	See IFT1
C16	220 mmfd. ± 2 per cent.	See IFT1
C18	0.1 mfd.	RMH36700G
C19	220 mmfd. ± 2 per cent.	See IFT2
C20	220 mmfd. ± 2 per cent.	See IFT2
C21	0.1 mfd.	RMH36729G
C22	100 mmfd.	RMH22164L
C23	100 mmfd.	RMH22164L
C24	0.047 mfd.	RMH36729F
C25	0.01 mfd. (Model 100)	RMH113543D
C25	0.005 mfd. (Model 101)	RMH113543C
C26	16 mfd.	See C28
C27	0.02 mfd.	RMH36355E
C28	16 mfd.	RMH35955A
C29	100 mmfd.	RMH22164L
C30	50 mfd.	RMH123977D
VC1, VC2	Gang cond. Mod. 100)	RMH35888C
VC1, VC2	Gang cond. (Mod. 101)	RMH35888J
TC1	10-135 mmfd.	RMH26350BQ
TC4	10-135 mmfd.	RMH26350BQ
TC2	3-30 mmfd.	RMH30480A
TC3	3-30 mmfd.	RMH30480A

RESISTANCES

Ref.	Description	Part No.
R1	1,000 ohms 1-10 w.	RMH105574DN
R2	0.22 megohms, ¼ w.	RMH33362EC
R3	220 ohms, ¼ w.	RMH33362DJ
R4	10,000 ohms, 1 w.	RMH33373DU
R5	47,000 ohms, ½ w.	RMH33363DY
R6	0.47 megohms, ¼ w.	RMH33362EE
R7	10,000 ohms, 1-10 w.	RMH105574DU
R8	220 ohms, ¼ w.	RMH33362DJ
R9	47,000 ohms, ¼ w.	RMH33362DY
R10	33,000 ohms, ½ w.	RMH33363DX
R11	22,000 ohms, 1 w.	RMH33373DW
R12	220 ohms, ¼ w.	RMH33362DJ
R13	47,000 ohms, ¼ w.	RMH33362DY
R14	0.47 ohms, ¼ w.	RMH33362EE
R15	47,000 ohms, ½ w.	RMH33363DY
R16	47,000 ohms, ¼ w.	RMH33360DY
R17	1,500 ohms, 2 w.	RMH33377DP
R18	0.47 megohms, ¼ w.	RMH33362EE
R19	100 ohms, ¼ w.	RMH33362DG
R20	150 ohms, ¼ w.	RMH33360DH
R21	18 ohms ± 5 per cent., 5 w.	RMH33381RG
R22	6,800 ohms, ½ w.	RMH33363DT
R23	0.1 megohms, ¼ w.	RMH33362EA
VR1	0.5 megohms volume control	RMH27655KW

Note: R21 used in 12v. model only

VALVES

V1	W81	
V2	X81	
V3	W81	
V4	DL82	
V5	KT81	

TRANSFORMERS

IFT1	1st I.F. Transformer	RMH33860J
IFT2	2nd I.F. Transformer	RMH33860J
T1	Output Transformer	RMH35527G

MISCELLANEOUS

S1	4 pole, 2-way switch	RMH35909A
S2	Switch	RMH35915B
S3	On/Off Switch	See VR1
LS1	Loudspeakker	RMH35951C
F1	Fuse	RMH19850N

SPARE PARTS LIST—continued

POWER PACK

Ref.	Description	Part No.
	INDUCTANCES	
L50	Choke	RMH31985A
	CONDENSERS	
C50	16 mfd.	RMH36168A
C51	0.01 mfd.	RMH37539B
C52	0.01 mfd.	RMH37539B
C53	25 mfd.	RMH123977F
C54	50 mfd.	RMH123977D
	RESISTANCES	
R50	220 ohms, 1 w.	RMH33373DJ
R51	220 ohms, 1 w.	RMH33373DJ

Ref.	Description	Part No.
	VALVES	
V50	Marconi U82	
	TRANSFORMERS	
T50	Vibrator Trans. 6-volt	RMH35980E
T50	Vibrator Trans. 12-volt.	RMH35980H
	VIBRATORS	
V50	6-volt Cartridge	RMH36989A
V50	12-volt Cartridge	RMH36212A

Additional information may be obtained from:

The Service Department, The Gramophone Co. Ltd. 2 Parramatta Road, Homebush, N.S.W.

Please quote Model No., Serial No., and Voltage in all correspondence concerning these instruments.

(The Company reserves the right to make any modifications without notice).

THE GRAMOPHONE COMPANY LTD.
(Incorporated in England)
HOMEBUSH, N.S.W.

SPECIFICATION

MECHANICAL

OPERATING CONTROLS

Combined volume control/power switch. Manual tuning (clutch operated, ratio 12:1). Four rapid adjustment tuning push-buttons. Two wave-change push-buttons. Two tone control push-buttons.

SCALE

Red and white lettering on black background. Fully illuminated. Calibrated in wave-length.

OVERALL DIMENSIONS

Height ..... 4/13-16 inches
Width ..... 8/9-16 inches
Width (over mounting flanges) ..... $9\frac{3}{4}$ inches
Depth (front to back) ..... 12/3-8 inches

NOTE: The Power Unit measures 8/5-8 inches by 4/7-8 inches by 2/3-4 inches and may be detached from the Radio Unit if space considerations necessitate. The front to back depth of the Radio Unit is then 9/3-8 inches.

WEIGHT

$17\frac{1}{4}$ lb.

FINISH

Receiver and power unit, ripple black. Control knobs black.

ELECTRICAL

TUNING RANGE

Medium waveband 195-550 metres (1,538-545.5 kc/s).
Long waveband 1000-2000 metres (300-150 kc/s).

BANDWIDTH

10 kc/s total at 6dbs. down.

VALVES

W81—Radio frequency amplifier.
X81—Frequency changer.
W81—I.F. amplifier.
DL82—Second detector — audio frequency amplifier—A.G.C. rectifier.
KT81—Power Output.
U82—Full wave rectifier.

LOW TENSION SUPPLY

6 or 12 volt Battery (positive earthed supply).

HIGH TENSION SUPPLY

Non-synchronous vibrator.

POWER CONSUMPTION

3.25 amps. at 12 volts.

FUSE

A 10 amp. fuse is recommended.

PILOT LAMP

12 volt 0.2 amp. M.E.S. type.

POWER OUTPUT

3.5 watts maximum.

LOUDSPEAKER

High efficiency Ticonal permanent magnet. 5-inch cone. Speech coil D.C. resistance 3.7 ohms, impedance 5 ohms at 800 c.p.s.

INTERMEDIATE FREQUENCY

465 kc/s.

CIRCUIT DESCRIPTION

AERIAL COUPLING

The aerial coupling circuit used gives maximum transfer of energy on both the Medium and Long wavebands and incorporates anti-interference filters. The two-section low-pass filter consists of an inductance, L1, in conjunction with lead-in and aerial capacity, and resistance, R1, together with the grid-cathode capacity of the R.F. amplifier, V1. Separate coupling coils are used for the Medium and Long wave tuning coils, and the wave-change switch is arranged to short circuit the Medium wave coil and remove the top coupling condenser, C1, on Long waves.

R.F. AMPLIFIER

The R.F. amplifier, V1 (W81), is coupled by a broad band filter to the frequency changer. A further interference rejection network consisting of L6, R7 and valve capacities is included in the coupling. A tuned acceptor circuit at the intermediate frequency (465 kc/s), comprising L7, C6, prevents noise at I.F. from reaching the succeeding stages.

FREQUENCY CHANGER

The frequency changer, V2, is an X81 triode-hexode with tuned grid oscillator circuit, trans-

former coupled to the I.F. stage. The first iron-dust cored I.F. transformer is damped on the secondary by a 0.1 megohm resistance (R23) to produce an I.F. response of the correct shape.

I.F. AMPLIFIER

This valve, V3 (W81), amplifies at the intermediate frequency of 465 kc/s. The second iron-dust cored I.F. transformer couples this valve to the detector.

DETECTOR, A.G.C. AND L.F. AMPLIFIER

V4 (DL82) is a double-diode-triode. One diode is used as a detector and A.G.C. rectifier. The triode section has a variable mu characteristic and is therefore used as a fourth controlled valve (all three H.F. valves are controlled) in the A.G.C. system, and receives its correct operating bias and audio input via the volume control. Resistance—capacity coupling is used between the triode portion of V4 (L.F. amplifier) and the output valve.

OUTPUT STAGE

This stage employs a beam power tetrode, V5 (KT81), and incorporates a negative feed-back circuit. A compensating network, across the output transformer, balances the response correctly for the acoustic conditions existing in the average car. A switch, S1 (operated by push-buttons), connects a condenser across the input of the valve in the "music" position (M.U.) of the tone switch.

HEATER FILTERS

The valve heater circuit and the supply to the Power Unit is filtered by L15, L16, C29 and C30 against R.F. interference entering the Receiver via the supply lead, and also against lower frequency noise (such as dynamo whine, etc.).

POWER UNIT

The power unit incorporates a non-synchronous vibrator and full-wave rectifier valve, V50 (U82).

INSTALLATION

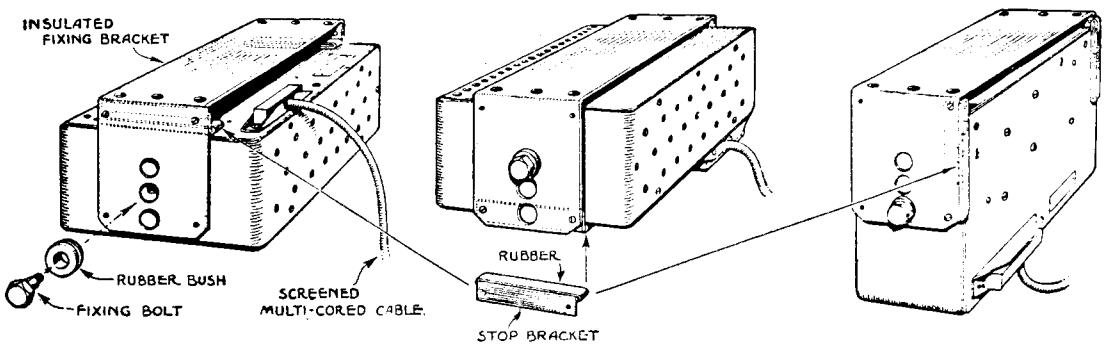
In the case of a Receiver already installed in a car, all the necessary attachments will have been provided by the car manufacturer. For re-installing after servicing, therefore, assemble the Receiver in its correct position, making certain that all electrical connections are properly made.

When a Receiver is being installed for the first time (and to assist in re-installation) the following paragraphs should be followed carefully.

Wherever possible the Receiver and Power Unit should be mounted as one unit below the facia panel, in the central position. This location ensures that the controls are easily accessible and visible to both driver and front passenger, and preserves the general symmetry of the instrument layout.

Eight holes, slotted to take $\frac{1}{4}$-inch bolts, are provided in the flanges of the Receiver case for mounting purposes. Wherever possible mount directly to metal work employing at least four of these holes. If it is not possible to mount directly to metal work, the Receiver case should be earthed to the body metal work by the shortest possible piece of flat copper braid. This braid should be as substantial as possible (approximately 1 inch wide) and the ends filled solid with solder and drilled to clear the fixing bolts.

If it is absolutely impracticable to mount the equipment as one unit, the Power Unit may be separated from the Radio Unit and mounted in any convenient position either behind or in front of the bulkhead (see details below). When this unit is placed forward of the bulkhead, i.e., under the bonnet, it is desirable to locate it as far as possible from the ignition equipment and wiring, in order to reduce radio interference pick-up, and from the hotter parts of the engine. The Receiver casing should be earthed as detailed above, but the Power Unit casing must **on no account** be earthed by its fixings, as this may result in inadequate interference suppression. Special insulated fixing brackets are supplied for mounting the Power Unit; this enables the unit to be mounted in any one of three positions (see illustration).



When the units are mounted separately, they must be interconnected by means of the screened three-core cable provided, which is fitted with the appropriate plug and socket to fit each unit. In cases where this cable must pass through the bulkhead, it is necessary to cut a hole in the bulkhead to clear the cable and socket. A rubber grommet is supplied with the cable assembly to prevent chafing and to seal the bulkhead against engine fumes.

If the equipment is being installed in a car which has a negative earth supply, it will be necessary to make the following alteration: The connections to condensers C30, C53 and C54 must be reversed. This is best done by unsoldering the leads to the condensers (at the tags) and reversing, physically, each condenser and resoldering the leads.

The battery supply lead (which is for battery **negative** connection) at the left hand side of the Receiver includes a fuse and should be wired to a point on the car wiring system as near as possible electrically to the battery. On cars fitted with voltage regulators a suitable point is the auxiliary supply terminal on the control box. (On Lucas voltage regulator control boxes the appropriate terminal is marked "A2").

The aerial lead plugs into the socket at the right hand side of the Receiver.

To separate the Power Unit from the Receiver Unit:

(a) Remove the four screws securing the Power Unit cover. The cover should then be withdrawn.
(b) Remove the three screws securing the Power Unit to the Receiver Unit; the Power Unit may then be withdrawn from the latter.
(c) Replace cover of Power Unit.
(d) Connect the two units together by means of the screened three-cored cable, Part No. 35720D. This cable is fitted with a three-way plug at one end and a corresponding socket at the other. The socket must be attached to the Receiver Unit and the plug to the Power Unit; both plug and socket should be secured to their respective units by means of the screws provided.

OPERATION

The combined Volume Control and "On/Off" Switch, switches off the Receiver when turned fully anti-clockwise. Turning the knob clockwise switches on the Receiver (indicated by the illumination of the tuning scale) and controls the volume. A period of about forty seconds after switching on is required for the valves to warm up.

The MW and LW buttons enable either the Medium or Long waveband, respectively, to be selected by pushing the appropriate button. Note: The LW button has been locked by means of a self-tapping screw for Australian conditions.

The MU and SP buttons are for the tone control; by pushing the MU button the tonal balance is set to conditions favourable to musical reproduction, while the SP button provides improved high frequency response for good speech intelligibility.

The Manual Tuning Control operates through a friction clutch, and in order to tune in a station it is necessary to press the tuning knob while turning it.

The four Tuning Push-buttons at the right of the control panel provide automatic tuning of four stations. The required station is selected simply by pushing the appropriate button.

The buttons can be adjusted easily to tune any four stations, as follows:

(1) Switch on Receiver, leaving Volume Control set at roughly two-thirds of full rotation.
(2) Tune in the desired station in the usual way, using the Manual Tuning Control.
(3) Gripping the knurled portion of one of the Tuning Push-buttons between finger and thumb unscrew it about half a turn, then push the button firmly as far as it will go. Allow it to spring back to normal position, and tighten firmly by turning it clockwise. The push-button is now set to tune the station required, and when pressed will "bring in" the station irrespective of the position to which the scale pointer may have been adjusted previously.
(4) Proceed in the same manner for the other push-buttons.

SUPPRESSION

In general, it will be found that where necessary, the appropriate ignition and other electrical interference suppression devices will have been fitted by the car manufacturer, but if excessive interference is evident, such suppression equipment should be checked for satisfactory operation.

To facilitate the location and suppression of interference, a brief outline is given below of the possible types, their source, and the suitable suppression necessary for such interference as may be encountered.

IGNITION

Intereference from this source is normally apparent as a regular "plop-plop" noise from the loudspeaker, increasing in frequency with engine speed. If the engine is "revved" and then switched off, the noise will cease, although the engine continues to turn. This interference is usually radiated from the ignition wiring and can be reduced by suitable dressing of the leads. The plug leads and the H.T. lead from coil to distributor should be kept as short as possible and dressed close to the cylinder block. In extremely difficult cases where the H.T. wiring is unavoidably dispersed so as to favour radiation of interference, it may be necessary to fit a 5000 ohm suppressor resistance in the H.T. lead from coil to distributor; this suppressor should be fitted as close to the distributor cap as possible.

The L.T. wiring to the ignition coil, distributor, and switch, should be laid out so as to take advantage of such screening facilities as are offered by the car chassis metal-work, for example by routing these leads in metal channels (where such exist) and dressing them close to the chassis. In particular, it is advantageous to separate the lead from the switch to the coil from other wiring to reduce induced interference in the latter. The L.T. lead from coil to distributor should also be separated from other wiring where possible; alternatively, it may be necessary to screen this lead.

In the majority of cases of interference radiated or induced from the L.T. ignition wiring, where it is not possible to modify the layout as recommended above, effective suppression is obtained by fitting a 0.5 mfd. suppressor condenser between the coil switch terminal and earth. The mounting lug of the condenser should be fixed under one of the coil fixing bolts, and the lead from condenser to coil switch terminal kept to the minimum possible length.

VOLTAGE REGULATOR

Most cars are now equipped with voltage regulators, which contain vibrating contacts at which sparking occurs and which therefore are a possible source of interference.

This interference is usually radiated from the leads connecting the regulator to the dynamo and/or to the lighting and auxiliary circuits. In troublesome cases it may be necessary to screen the lead from dynamo to cut-out, and to apply suppressor condensers (0.5 mfd.) at various points in the lighting system.

Condensers should not under any circumstances be connected across the regulator contacts, as this will result in damage to the regulator.

DYNAMO

Dynamo interference takes the form of a high-pitched whine which is audible in the Receiver at any engine speed at which the ammeter shows a charge, whether the engine is switched on or off. It may usually be eliminated by means of a 1 mfd. condenser connected between the dynamo frame and the dynamo supply terminal feeding the cut-out. The condenser mounting lug should be securely fixed under one of the dynamo frame bolts, and the connecting lead from condenser to dynamo terminal kept as short as possible.

ELECTRIC WINDSCREEN-WIPERS, PETROL PUMPS, PETROL GAUGES, CAR HEATERS

Interference from these sources can generally be eliminated by connecting a 0.5 mfd. condenser between the terminals of the device, or between the "live" terminal and earth. The metal case (if any) of the appliance should be directly in earthed contact with the car chassis where possible, or failing this connected to the car chassis via copper braid. In cases where the wiring inevitably passes close to the aerial it may be necessary to screen the leads.

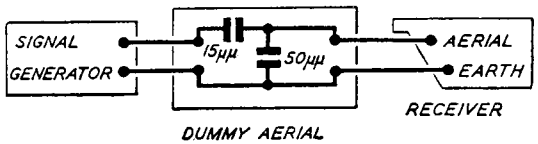
WHEEL STATIC

Wheel static interference is caused by intermittent electrical discharges resulting from friction between the car tyre and the road, and is more usually experienced when driving on hard, dry roads. These discharges may occur between wheel and axle, which are separated by a thin insulating film of oil which under mechanical or electrical strain breaks down. Under-car aerials are more likely to pick up this type of interference than other aerials.

The only completely effective method of dealing with this trouble when it occurs is to provide a permanent electrical connection between wheel and axle. This may take the form of a spring contact from hub cap to axle end.

H.F. MEASUREMENTS

All H.F. tests should be carried out with the Receiver and power pack removed from the car. To obtain access to the valves, trimmers, etc., the top, bottom and condenser drive inspection covers must be removed. With a suitable test oscillator connected to the aerial socket, via a dummy aerial (see diagram), and a 12-volt battery supply connected (the negative to the battery lead, and the positive to the chassis of the Receiver), the Set is ready for complete ganging and voltage measurements.



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

In carrying out ganging operations the input from the test oscillator to the Receiver must be kept low and progressively reduced as the circuits are brought into line so that the output does not exceed 200 mW. across a 5 ohm non-inductive load.

An A.C. voltmeter, connected across the loudspeaker speech coil, may be used as an output meter.

I.F. GANGING

(1) Set wave-change switch to MW, volume control fully clockwise, and gang condenser to maximum (movable vanes "in"). Short the A.V.C. line, i.e., short circuit C18. Set tone control to speech, i.e., press SP push-button.

(2) Inject a signal of 465 kc/s, into grid of V2 and chassis (leaving grid connection made).

(3) Adjust cores L11, L12, L13 and L14 in that order for maximum output. When adjusting any coil its companion coil must be damped with a 47,000 ohm resistance, i.e., adjust L12 with 47,000 ohm connected across L11.

(4) Inject a signal of 465 kc/s, into grid of V1 and chassis (leaving grid connection made).

(5) Adjust core L7 for minimum output.

R.F. GANGING—MEDIUM WAVES

Set controls as in operation (1) of I.F. Ganging, and connect the test oscillator to the aerial socket and chassis via the dummy aerial.

Op. No.	Gang Condenser or Tuning Pointer Setting	Tune Test Oscillator to		Operation
		m.	kc/s.	
1	Gang at maximum	—	—	Set receiver pointer to 550 m.*
2	500 m.	500	600	Adjust core L8 for maximum output.
3	Mark on scale below "MW"	193.5	1,550	Adjust TC3 for maximum output.
4	—	—	—	Repeat operations 2 and 3, then reseal TC3.
5	Tune-in	500	600	Adjust core L3 for maximum output.
6	Tune-in	207	1,450	Adjust TC2 for maximum output.
7	—	—	—	Repeat operations 5 and 6, then reseal TC2.

* The pointer is adjusted by either (a) sliding the cursor along the drive wire, or (b) slackening the screws fixing the condenser drum to the condenser spindle, adjusting the pointer by means of the Manual Tuning Control and, with the gang still at maximum, retightening the condenser drum fixing screws.

LOCATION OF ADJUSTMENTS

L7 Underneath chassis — remove bottom plate.

L8 Right-hand side of case—remove rubber plug.

L3 Left-hand hole in coil box under push-button rods—remove top cover.

TC2 Concentric air trimmer under chassis near side—remove bottom cover.

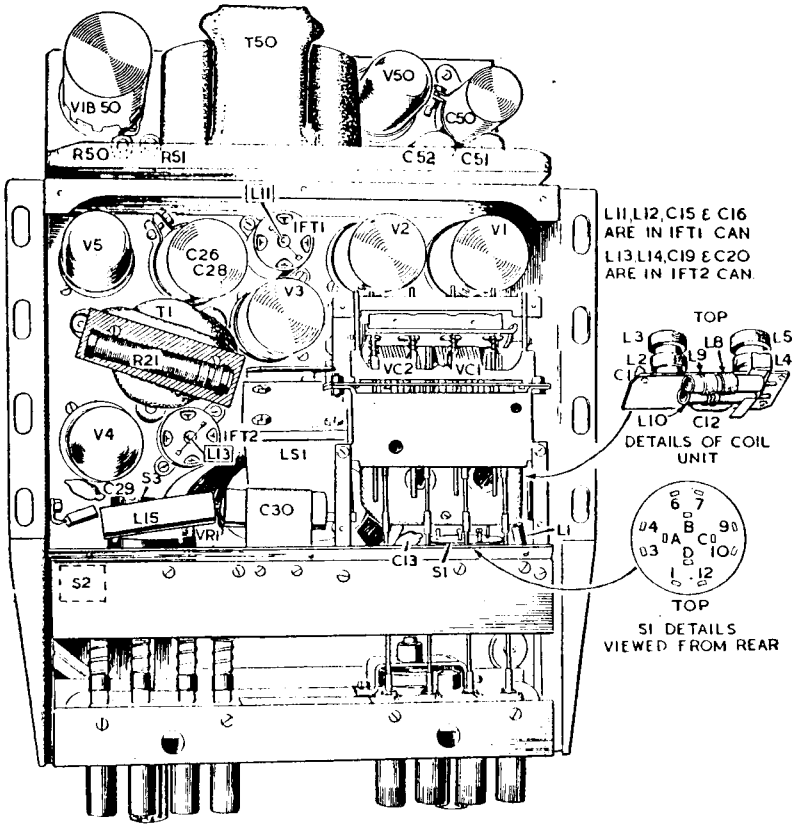
TC3 Concentric air trimmer under chassis near centre—remove bottom cover.

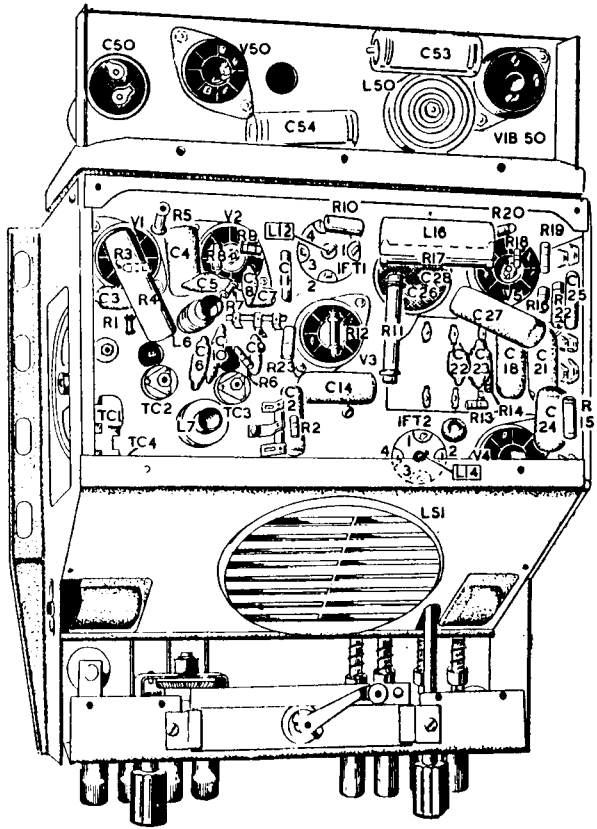
VALVE TABLE

The following represents actual values with a Receiver operating on a 12V battery and with no input signal. The meter used was an Avometer Model 7 which has a resistance of 500 ohms per volt. Allowance must be made if a meter of different resistance is used. A variation of ±15 per cent. on all readings can be anticipated. All values are D.C. unless otherwise stated.

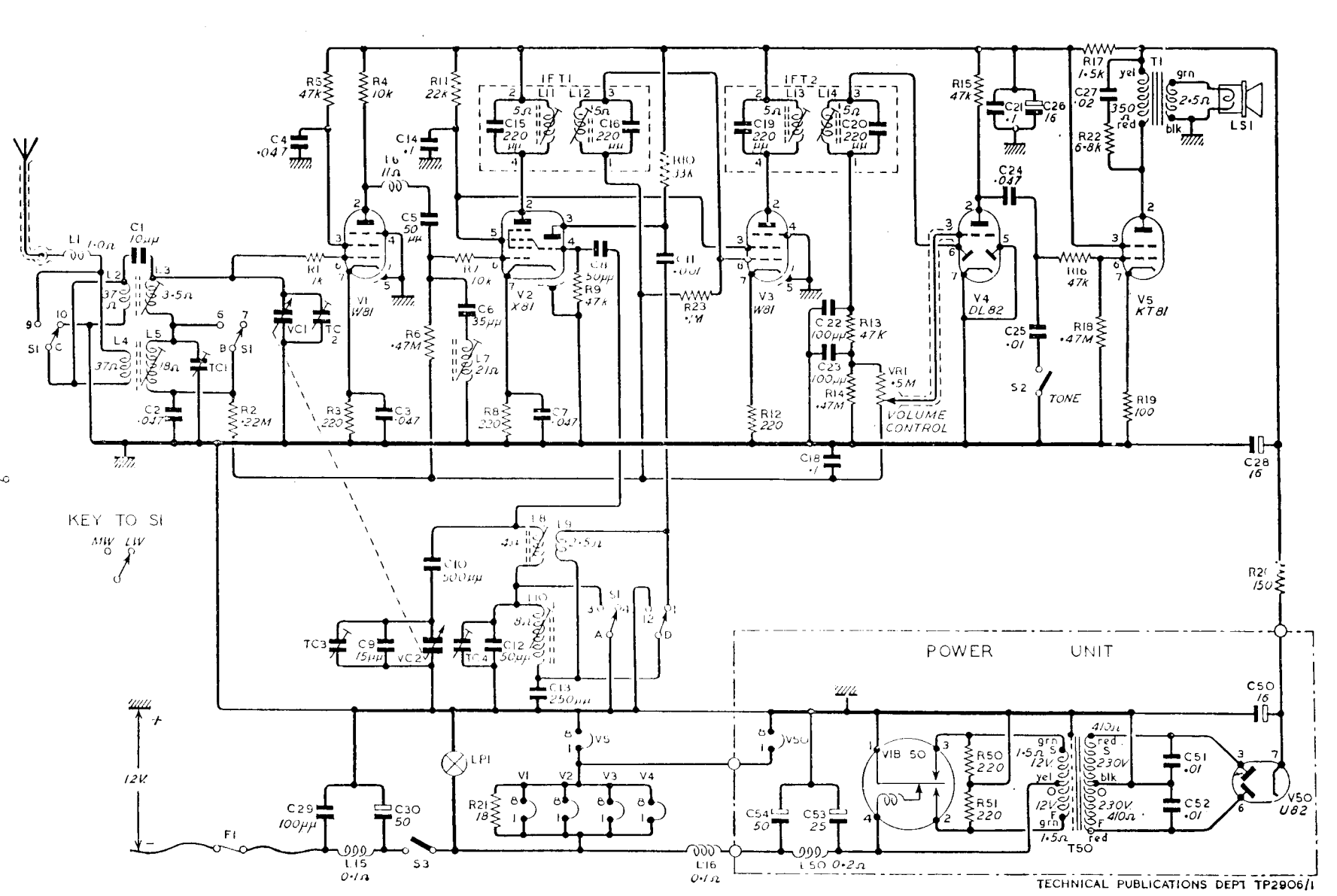
Valves	Anode		Screen		Cathode	
	Volts to Chassis	Current mA	Volts to Chassis	Current mA	Volts to Chassis	Current mA
V1 (W81)	112	6.3	78	2.0	2.2	8.3
V2 (X81)	Mx. 180 | Osc. 66	Mx. 1.7 | Osc. 3.0	78	2.3	1.6	7.0
V3 (W81)	175	7.0	78	2.5	1.8	9.5
V4 (DL82)	65	2.0	—	—	Nil	2.0
V5 (KT81)	200	22.0	175	4.0	2.7	26.0
V6 (U82)	250 A.C.	—	—	—	220	—

Total H.T. current 53.5 mA (D.C.), Current (measured in battery lead), 3.25A.
Total H.T. voltage (smoothed), 210 V.


T50
VIB 50
V50
C50
R50
R51
C52
C51
L11
IFT1
V5
C26
C28
V2
V1
V3
T1
R21
VC2
VC1
V4
IFT2
L13
LS1
C29
S3
L15
C30
VR1
L1
C13
S1
S2
L11,L12,C15 & C16
ARE IN IFT1 CAN
L13,L14,C19 & C20
ARE IN IFT2 CAN
TOP
L3
L8
L5
L2
L9
L4
C1
L10
C12
DETAILS OF COIL
UNIT
6
7
4
9
A
B
C
3
D
10
1
12
TOP
S1 DETAILS
VIEWED FROM REAR


C50
V50
C53
L50
C54
VIB 50
V1
R5
V2
R10
R20
L12
L16
R19
R3
C4
R8
C8
C3
IFT1
R17
C28
C26
C5
C7
R4
R7
R18
C25
R1
C27
L6
C9
R12
R11
V3
R2
R6
C14
C22
C18
C21
TC2
TC3
C2
TC1
L7
R2
R13
R14
C24
R15
IFT2
TC4
L14
V4
LS1

MODEL 100



Model for 6-volt operation differs in that R18 is deleted and all valve heaters are in parallel.