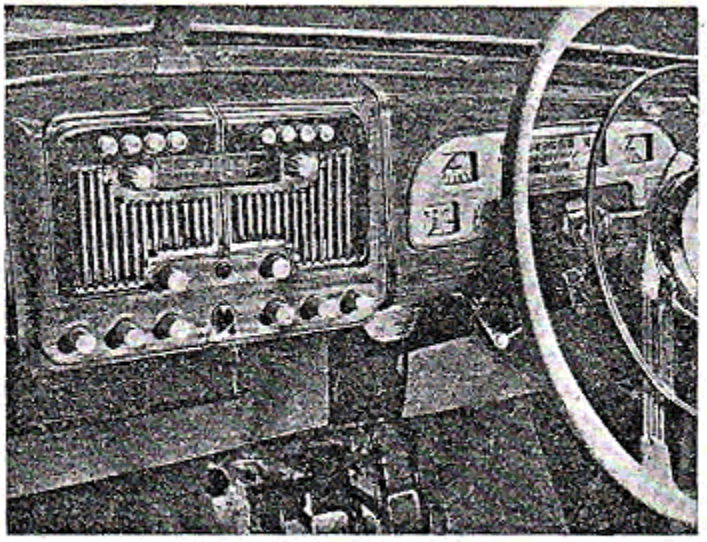
SERVICE DATA FOR RADIOMOBILE 100 RADIO AS FITTED TO BENTLEY MKVI AND BRISTOL 400



The Model 100 embodied in the design of the fascia board of a car.

TEST REPORT

Push-button Car Set

IN this set we see the result of an eminently rational pooling of experience in the diverse fields of radio and car equipment manufacture. The design of the set represents collaboration between the Gramophone Company (H.M.V.) and Smith's Motor Accessories; it is sold, installed and serviced by a subsidiary firm, Radiomobile, Ltd.

The user of a car radio, who is very often the driver, can rarely do more than give the set a cursory glance before switching on, or changing the programme, so that the very simplest form of tuning is most desirable. This fact has been realized by the designers of the Radiomobile set and most of the operations are effected by push buttons. These include programme selection, waveband changing and tone control.

If a passenger wishes to search for a programme not previously set-up on the push buttons he or she can do so merely by pressing in a knob and turning the set in the customary fashion. A wavelength calibrated scale and pointer are included for this purpose.

All the controls of the set are grouped on a small panel measuring 9½ × 2½in mounted slightly forward of the receiver unit proper. It has a detachable moulded escutcheon which is available in a range of colours to harmonize with the car instrument panel. The front of the receiver unit has a slight backward tilt and in this inclined face is mounted a 5in loudspeaker.

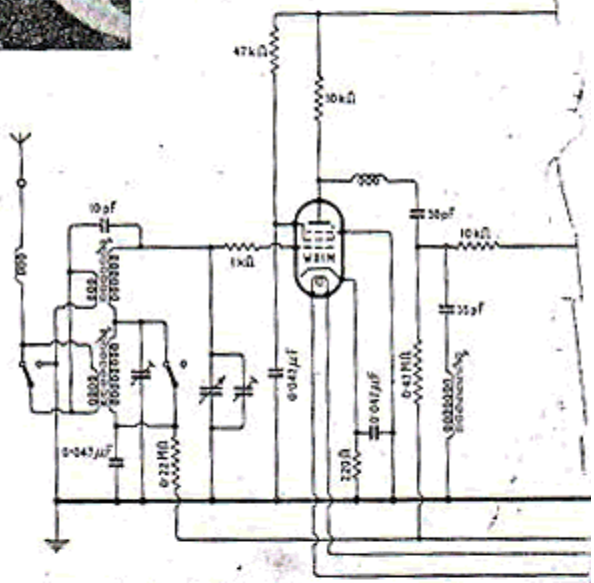
As the available space for mounting the receiver in some cars may be limited the receiver and power supply units are separate entities, but normally combined. They can be separated when occasion demands and the power unit could then be stowed either in the engine compartment or anywhere else more convenient.

Considerable use is made of miniature components in order to keep the size as small as possible and the weight low. Miniature type valves of the all-glass pattern are used and as a result the overall dimensions, excluding the power unit, are 9¾in wide, 4¾in high and 9⅜in deep. The power unit adds another 2¾in to the depth. The total weight is 17¼lb.

The push buttons for programme selection act directly on the gang condenser and each rotates it a pre-determined amount. The setting-up process is very simple; the desired station is tuned in manually and then one of the push buttons is made to register with this setting of the condenser. This operation is effected by loosening the milled head of the button, allowing the spindle to be drawn in by its spring and register on its condenser stop, then retightening the milled head.

By repeating this procedure, choosing either medium- or long-wave stations, four pre-selected programmes become available by finger-tip control. It is perfectly feasible to make these changes in the selected stations while on the road, the passenger being able to do it while the car is actually in motion as no tools of any kind are required.

The four-programme push buttons are just above and to the right of the scale aperture



Theoretical circuit of the Model 100 showing the power unit arranged for connection to a 12-volt car installation with a positive earth.

Radiomobile

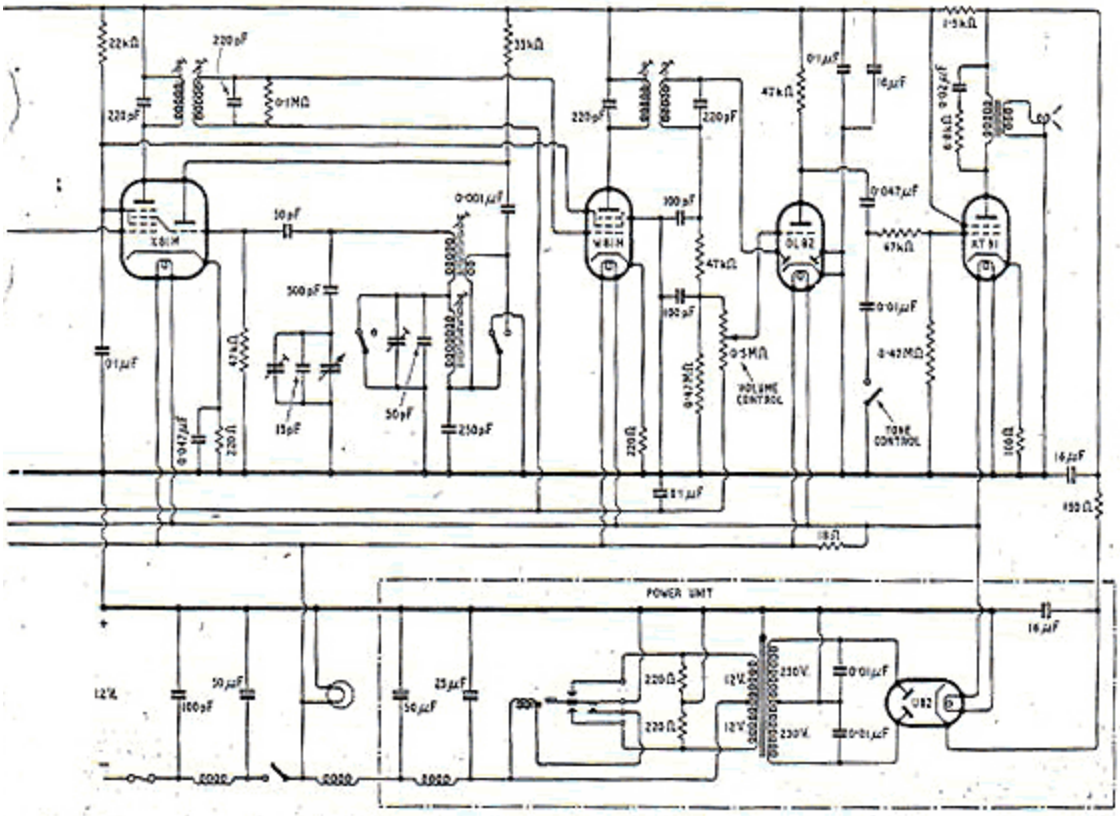
Model 100

FEATURES	
Circuit.	Five-valve (plus rectifier) superhet.
Controls.	Push-button or manual tuning. Push-button waveband change. Push-button tone control. Volume combined with on-off switch.
Tuning Range.	195 - 550m; 1,000-2,000m.
Output.	3.5 watts.
Input.	3.25A at 12V (6-V models available).

and they are balanced on the left by four more, two for tone and two for waveband switching. Immediately to the right of the scale aperture is the manual tuning control which drives the condenser through bevel gears and arranged so that a spring normally holds the driving bevel out of mesh. This prevents disturbing the tuning by turning the knob accidently. On the left of the scale is another rotary control knob. This is the combined volume control and on-off switch.

The superheterodyne circuit is by no means orthodox. The very short aerial that has to be used necessitates a sensitivity above the average for a broadcast receiver. As the signal pick-up is small, matching the aerial and its screened co-axial cable to the receiver input circuit is of far more importance than usual. But this is embodied in the design of the input circuit and merely results in certain limits being set for the length of the co-axial cable, and the type that can be used. Included in the aerial circuit is a form of anti-interference filter.

The receiver has an R.F. stage with a tuned input circuit with a wide-band coupling linking its anode circuit to the frequency changer. This covers medium and long waves without switching and obviates the need for a third section in the tuning gang condenser. There is included also a further interference rejection network.



Radiomobile Model 100—

The frequency changer is a triode-hexode of normal design, and it is followed by one I.F. stage working on 465 kc/s and having a band width of 10 kc/s for 6db attenuation at the limits.

Signal detection, A.G.C., and one stage of A.F. amplification, are provided by a double-diode-triode which in turn is resistance-capacity coupled to an A.F. pentode giving about 3.5 watts output.

A.G.C. is applied in full to the R.F., F.C. and I.F stages, and consequently good control is obtained under all conditions of operation, and they vary very considerably on the road.

High tension at 210 volts and 55 mA is supplied by a vibrator in conjunction with a transformer and valve rectifier. This, and the filaments of the valves, which are 6.3-volt type and arranged in series-parallel, draw 3.25 amps from the car's 12-volt battery. The valves used in the set and in the sequence described here are W81, X81, W81, DL81, KT81 and U82, the last mentioned being the H.T. rectifier.

It is a tribute to the design that with the majority of modern cars only the minimum of engine suppression is needed. Some rearrangement of the plug leads and H.T. wiring may be required, also possibly repositioning of the coil. As for suppressors, one 5-kΩ resistor in the lead from the coil to the distributor and a few 0.5-μF capacitors across some of the L.T. make and break contacting points will generally suffice.

Radiomobile is building up an installation and servicing organization throughout the country. Likely mechanics drawn mainly from garages are given a week's intensive course at the Radiomobile school at Hayes, Middlesex. Here they are coached in the circuit technique, in fault-finding, in installation and the many other aspects of the subject deemed necessary to inspire confidence in the pupils to tackle any problem arising from the use of this equipment.

A road test was made with a Model 100 fitted in a 1947 family saloon car, the installation having been carried out by the Radiomobile service department in Cricklewood. One suppressor resistor only was fitted in the ignition system and a few changes were made in the run of the leads from the distributor to the plugs. The object of this was to eliminate, so far as possible, loops between the leads and engine casing, thereby minimizing the radiation from these leads. A roof aerial was fitted just above the middle of the windscreen.

With the volume control turned fully up and the set detuned from a station so that maximum sensitivity was obtained, a slight suspicion of ignition noise could be discerned in the background noise of the set. This condition of maximum sensitivity rarely, if ever, is needed for broadcast reception, as in most cases the signal will be strong enough to operate the A.G.C. and so lower the general sensitivity.

As an example of this, the B.B.C. Moorside Edge transmitter was receivable in London at sufficient strength to operate the A.G.C. except in badly screened localities. Several Continental stations were tuned in with ease and provided a signal of real entertainment value. Indeed, on open ground, such as on Wimbledon Common, these stations were of such strength that the volume control had to be backed off, and this was during daylight.

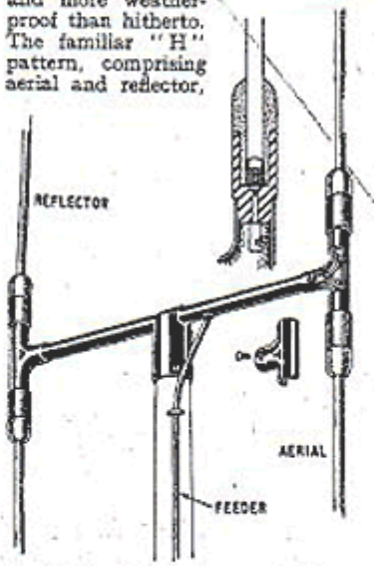
The only interference of any consequence experienced during the tests emanated from passing lorries, motor buses and trolley buses, the former two producing typical ignition noises and the last mentioned the "scratchy" type of interference associated with electrical contacting equipment. The overhead power wires accentuated this, but at no time were these forms of interference really troublesome, due, no doubt, to the filtering action of the built-in noise suppressors.

The set sold by Radiomobile, Ltd., Cricklewood Works, London, N.W.2, costs £27 6s, plus £10 4s 9d purchase tax.

Wolsey Television Aerial

Use of Synthetic Rubber Waterproof Fittings

SEVERAL improvements have been made in the design of Wolsey television aerials and the latest models are lighter, stronger and more weatherproof than hitherto. The familiar "H" pattern, comprising aerial and reflector, weighs only 4lb and consists of a light-weight tubular cross arm with welded-on masthead cap and end junction boxes.



Synthetic rubber waterproof fittings are used at the joints between the aerial rods and junction boxes in the latest Wolsey television aerial.

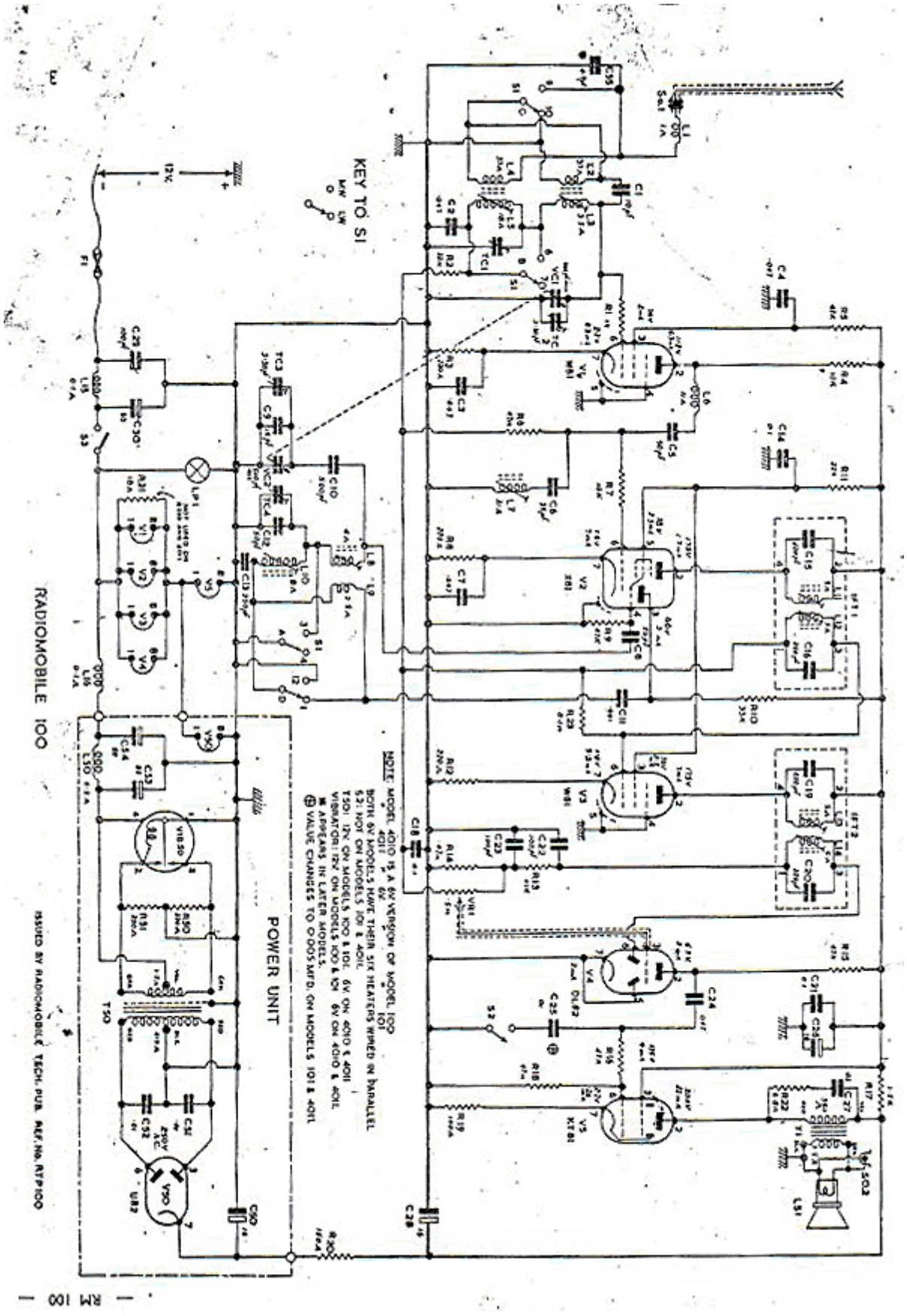
Aluminium alloy tubes, fitted with synthetic rubber connectors, screw into waterproof sockets on the junction boxes. The aerial junction box has a removable cover giving access to the centre connections for joining up the feeder. The other has a sealed-in straight-through connector.

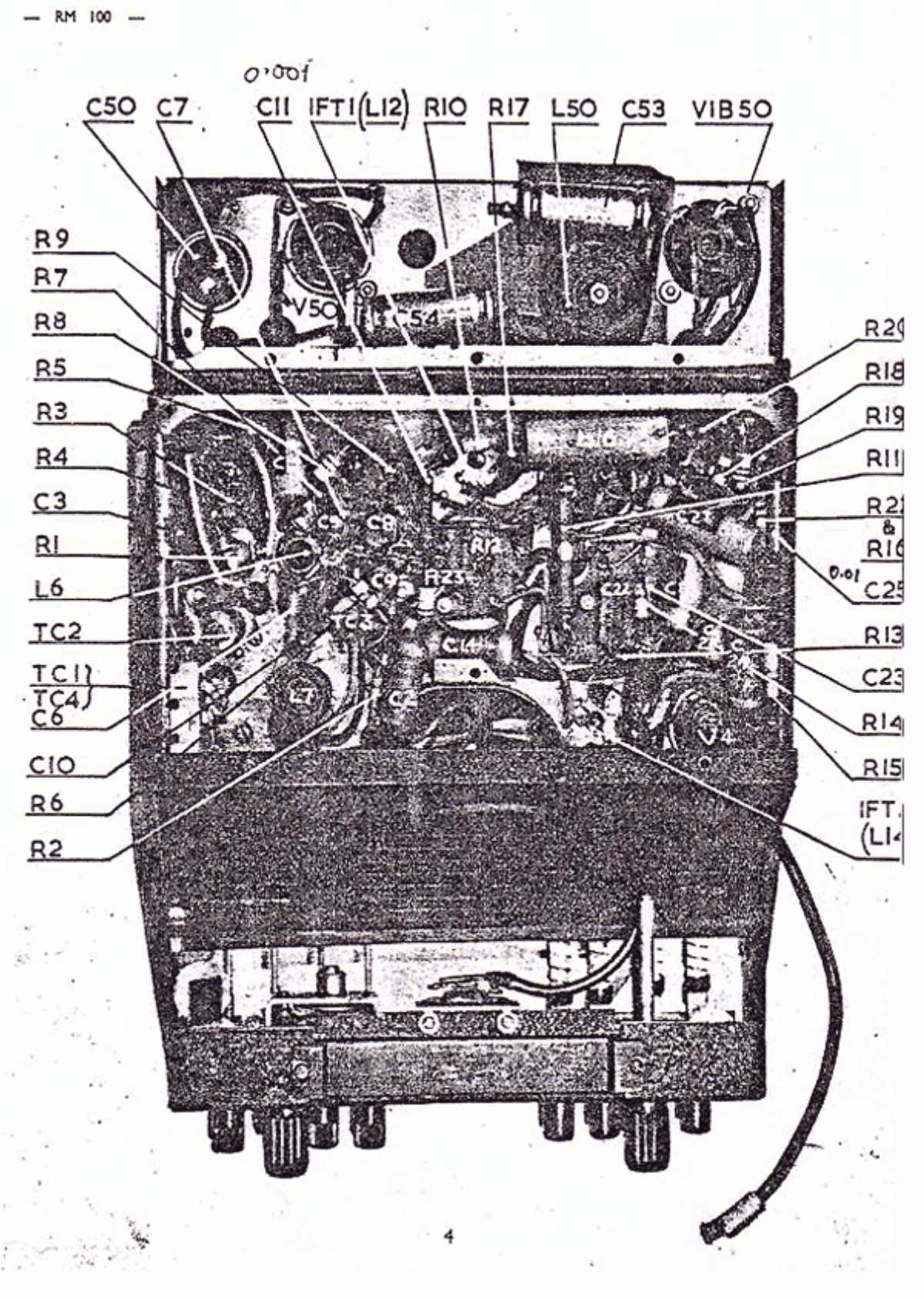
Either co-axial or twin wire cable can be used. It is brought out through a hole at the masthead cup so that it can be lashed to and brought down the pole.

The "H" pattern aerial, which is listed as model H/M, is a close-spaced array with the reflector 32in. or ½λ approximately at 45Mc/s behind the aerial. The complete aerial, less pole and securing fittings, costs 67s 6d. Wall brackets, chimney stack lashings and feeder are extra. For example, a double set of chimney stack lashings and 8ft pole costs 60s 6d.

A single dipole without reflector and constructed on the same light-weight and weatherproof lines is also available. It costs 37s 6d.

The makers are Wolsey Television, Ltd., 87, Brixton Hill, London, S.W.2.


RADIOMOBILE 100
POWER UNIT
KEY TO S1
12V
NOTE: MODEL 4010 IS A 6V VERSION OF MODEL 100
4011
BOTH 6V MODELS HAVE THEIR SIX HEATERS WIRED IN PARALLEL
S2: NOT ON MODELS 101 & 401L
T50: 12V ON MODELS 100 & 101. 6V ON 4010 & 4011
VIBRATOR: 12V ON MODELS 100 & 101. 6V ON 4010 & 401L
M APPEARS IN LATER MODELS.
VALUE CHANGES TO 0·005 MFD. ON MODELS 101 & 401L
ISSUED BY RADIOMOBILE TECH. PUB. REF. NO. RTP100
RM 100


— RM 100 —
0·001
C50
C7
CII
IFT1 (LI2)
RIO
RI7
L50
C53
VIB 50
R9
R7
R8
R5
R3
R4
C3
RI
L6
TC2
TC1
TC4
C6
CIO
R6
R2
V50
54
R20
RI8
RI9
RII
R21
&
RI6
0·01
C25
RI3
C23
RI4
RI5
IFT.
(LI4
4

CAR RADIO RECEIVER

MODELS

100, 101, 4010 AND 4011

Models 100 and 101 are electrically identical except that model 101 is not provided with tone control.

Models 4010 and 4011 are 6 volt versions of model 100 and 101 respectively (for details see Circuit Diagram).

Unless otherwise stated, details apply to all the above models.

H.F. ADJUSTMENTS

For expeditious and accurate servicing, the test equipment and the complete set of trimming tools, (part number QD.503) supplied by S. Smith and Sons (Radiomobile) Ltd., should be used. The all-wave Service Generator (part number RMO.689) directly calibrated, covering the frequency range 100 Kc/s to 120 Mc/s and including a special car radio dummy aerial is particularly recommended.

In carrying out alignment, the input from the test oscillator must be kept low and progressively reduced as circuits are brought into line so that the output does not exceed 200 mW into a 5 ohm non-inductive load (i.e. 1 volt). An A.C. voltmeter, connected across the loudspeaker speech coil may be used as an output meter.

IF ALIGNMENT.

(1) Set Wave change switch to " MW ", Volume Control fully clockwise, and variable capacitor to maximum wavelength, (vanes " in "). Short A.G.C. line. Set Tone Control (100 and 4010 only) to " speech ".

(2) Inject a signal at 465 Kc/s (modulated at 400 c.p.s. to 30%) between grid of V2 and chassis (leaving grid connection made).

(3) Adjust cores L14, L13, L12, L11 in that order for maximum output. When adjusting any IF coil, its companion coil must be damped with a 47,000 ohm resistor.

(4) Inject a signal of 465 Kc/s between grid of V1 and chassis (leaving grid connection made).

(5) Adjust L7 for minimum output.

(6) Repeat procedure as indicated until no further increase in output is obtainable.

RF ALIGNMENT

MEDIUM WAVES 195-550 metres (1,538-545Kc/s).

Controls as in operation (1) of IF alignment, and connect test oscillator to Aerial Socket and chassis via special car radio dummy aerial.

OP. No.	Tuning Capacitor or Pointer Setting	Tune Test Osc. to		Adjustment
		M	K/cs	
1	Capacitor at Max. (Vanes in)	—	—	Set pointer to 550m.*
2	500M	500	600	L8 for max. output.
3	Mark on scale below " MW "	193.5	1,550	TC3 for max. output
4	—	—	—	Repeat 2 and 3 then reseal TC3
5	Tune in	500	600	L3 for max. output
6	Tune in	207	1,450	TC2 for max. output
7	—	—	—	Repeat 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 capacitor drum to the spindle, adjusting the pointer by means of the manual Tuning Control, and with the capacitor still at maximum, retightening the drum fixing screws.

LONG WAVES 1,000-2,000 metres (300-150 Kc/s).

Set controls as before, but with wave change switch to LW.

OP. No.	Tuning Capacitor or Pointer Setting	Tune Test Osc. to		Adjustment
		M	KC/s	
1	2,000 M	2,000	150	L10 for Max. output
2	1,000 M	1,000	300	TC4 for Max. output
3	—	—	—	repeat 1 and 2 then reseal TC4
4	Tune in	1,665	180	L5 for Max. output
5	Tune in	1,150	260	TC1 for Max. output
6	—	—	—	Repeat 4 and 5 then reseal TC1

For location of cores and trimmers see photographs of model 100; page 3.

For spare parts list see end of manual.