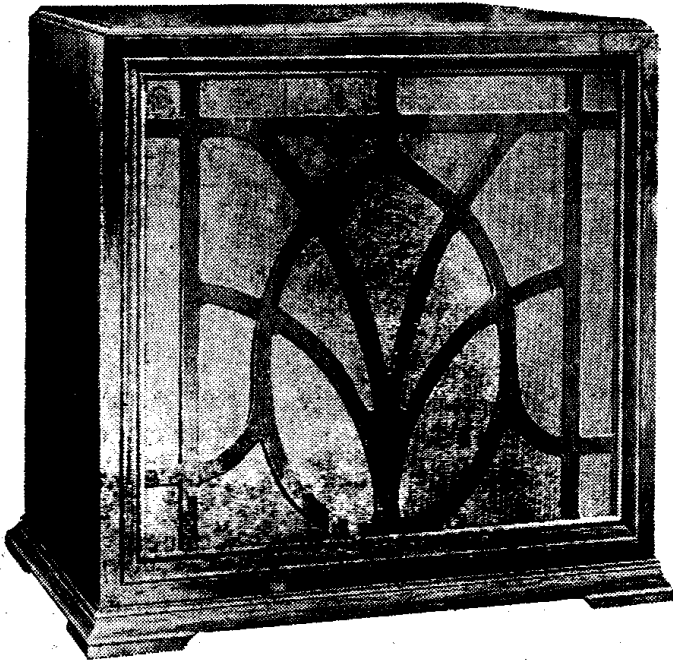


# MARCONIPHONE SERVICE MANUAL No. 2



**MODEL '131'**  
(Cabinet)

**MODEL '91'**  
(Unit)

MOVING COIL  
SPEAKER  
(PERMANENT MAGNET)



The First and Foremost  
Name in Radio.

## PART I.

Information applying equally to both cabinet and unit models

### GENERAL NOTES.

Both models are of the permanent magnet type and require no field or energising current. Each has a universal input transformer suitable for super-power, pentode or push-pull circuits.

**The Performance** of both Speakers is identical, conditionally upon the unit, Model '91,' being carefully mounted in a cabinet equal in acoustic and mechanical properties to that employed in the Model '131'.

**Reproduction** is governed largely by the characteristics of the receiver and the suitability of the output stage for the required volume; a reasonably modern circuit, with components of good quality, will ensure wide and even frequency response, with volume and sensitivity at least equal to most separately excited instruments.

**Results** which do not approach perfection indicate an inadequate output stage or unsatisfactory components rather than a faulty speaker. Make certain, however, that the mounting instructions have been followed closely in the case of the unit, Model '91.'

**Suitable Receivers** comprise almost every good quality instrument of from two valves upwards, having a small super-power or pentode output valve, operated at about 150 volts High Tension, and capable of reproduction at good domestic volume. Much larger output stages (see table overleaf) may, however, be used when necessary.

## UNIVERSAL INPUT TRANSFORMER.

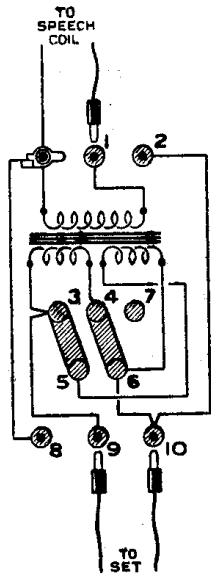


Fig. A.—For 3-electrode Valves.

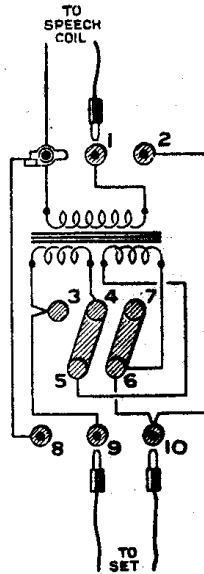


Fig. B.—For Pentode Valves.

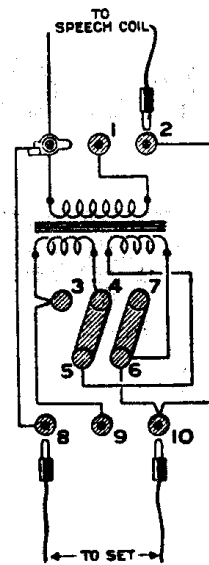


Fig. C.—Direct to Speech Coil.

### RANGE OF ADJUSTMENTS.

- (a) For three electrode output Valves (impedance preferably not exceeding 3,000 ohms). Connect as in Figure A.
- (b) For pentode and other output Valves exceeding 3,000 ohms impedance. Connect as in Figure B.
- (c) For push-pull output Valves. Impedance preferably not exceeding 3,000 ohms per Valve. Connect as in Figure B, joining H.T.+ to screw 4 or 5, and leaving link in position as shown; join terminals 9 and 10 to anodes of Valves; see that H.T.+ lead does not make contact with other metal parts.
- (d) To cut out input transformer. Remove Speaker transformer from the circuit by connecting as in Figure C. This enables the low resistance speech coil to be joined directly to the secondary winding of an existing transformer (e.g. as in Model 560).

### SERVICE INFORMATION—RATTLE or CHATTER

Should rattle or chatter develop, ascertain that it is not produced by over-loading or similar defects in the Receiver itself; check by substituting another moving coil Speaker, preferably of the same type. Rattle from the Speaker may be classified thus:—

**Cabinet Vibration**, encountered with the Unit Model '91.' Due to a resonance period in the fret, back, or some part of the cabinet, to a loose screw, terminal or vibrating lead. Occurs generally on some particular note, usually at a low frequency; can only be eliminated by trial and error methods. Note that the red leads from coil may occasionally vibrate against the cone support.

**Dust in the air gap.** Dust, particles of metal, etc., on the pole pieces will give rise to a buzz. Carefully clean the air gap with a small stiff brush or a slip of stiff paper; this will necessitate the removal of the cone and, in Model '131,' of the chassis from the cabinet, for which see Special Notes below. To remove Cone, proceed as follows.

- Removal of cone.**
1. Remove the felt ring; this is secured by adhesive to the metal cone-securing ring. NOTE: This ring may be in three parts.
  2. Withdraw the cone centering screw and washer. NOTE: a fibre washer is fitted on each side of the cone to prevent cutting of the material. Take care not to lose these or the metal spacing washer fitted behind the cone.
  3. Remove the 8 screws and nuts which hold the cone-securing ring in position; do not damage the cone or velvet during this operation.
  4. Remove metal cone-securing ring.
  5. Unsolder the red lead from the transformer lug and withdraw it, together with the lead carrying the plug, through the space between the transformer and base.
  6. Lift one side of the cone, ascertaining that the leads from coil are quite free, and remove cone assembly. Do not lose the washers which are thus released from behind the cone.

**Replacement of Cone.** Arrange the unit in a horizontal position; place the metal spacing washer and fibre washer over the hole for the cone centering screw; insert the centering screw, with washers, through the diaphragm, drop cone into position and lightly tighten centering screw. Take care that the holes in the rim of the cone register with the hole in the frame when inserting. Now screw up metal ring, connect coil leads and refasten the felt ring with seccotine or similar adhesive.

**Cone out of Centre.** A rattle or buzzing, mainly on loud notes but not on any particular frequency, indicates that the cone and coil are out of centre ; proceed as follows :—

1. Connect up speaker to source of loud signals.
2. Lightly slacken centering screw and move cone very gently from side to side with elliptical motion until rattle ceases ; grip with thumbs in front and fore-fingers behind. (Figure D.)
3. Tighten centre screw and test on full volume.

NOTE.—An alternative method, and one which may be employed if no transmission is available is as follows :—Check centering by gripping cone successively in four or five positions round the diameter and moving in and out. The side on which rubbing is occurring can thus be felt ; slacken the screw, move the cone in the indicated direction, tighten and retest.

### SPECIAL NOTES.

**Model '91' Unit.** It is essential to retain the special dust cover in position to prevent the entry of dust, metal filings, etc. Care should be taken not to damage this cover.

**Model '131' Cabinet. Removal of Chassis.** Before adjusting cone (see above) the chassis must be removed from the cabinet ; proceed as follows :—

1. Remove back panel. NOTE.—When replacing back panel every screw should be driven tightly home to prevent buzz or rattle.
2. Remove red plugs and screws.
3. Lay speaker face downwards on a piece of cloth to prevent damage to cabinet ; remove clamps, securing chassis to back of baffle.
4. Remove bolts securing chassis to wooden platform. NOTE.—If the nuts do not revolve easily place the blade of a screw driver between the nut and the base of the chassis to prevent the bolts turning.

Do not lose the spring washers.

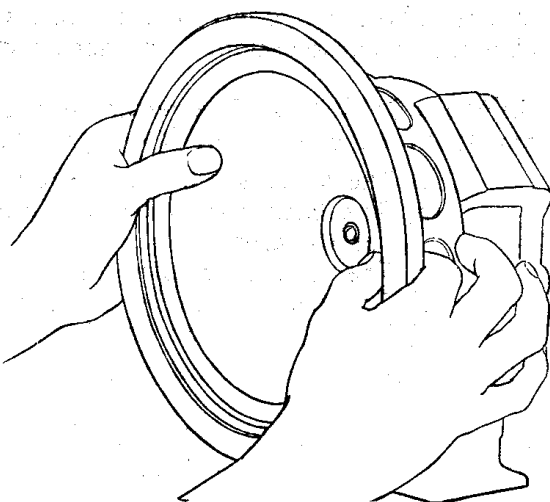


Fig. D.

### RESISTANCE DATA—TRANSFORMER WINDINGS

(See Fig. E)

Primary strip sockets 3-4 (strip disconnected) ...	300 ohms
" " " 5-6 " " ...	300 ohms
Total primary resistance (sockets 9-10) adjusted as Figure A for low impedance Valves ...	150 ohms
Total primary resistance (sockets 9-10) adjusted as Figure B for high impedance Valves ...	600 ohms
Secondary winding with coil detached (left hand lug and No. 1 socket) ...	1.0 ohms
Coil only (red leads) ...	11.0 ohms

NOTE.—The maximum primary current for this transformer is 60 M.A. (adjusted as Fig. A).

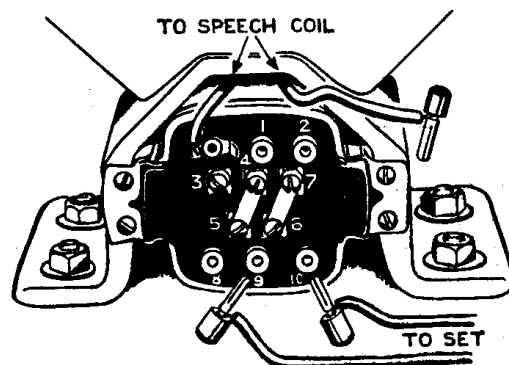


Fig. E.

### VALVE DATA—SUITABLE OUTPUT STAGES

Volume required.	Marconi output Valve.	H.T. Voltage.	Negative Grid Bias.
Moderate for small room...	L.P.2, P.410, P.610	120-150	4½-9
Full for small room	P.2, P.425	120-150	9-16.5
Full for average room	PT.240, P.T.425	150-200	6-9
Full for large room	PT.625, P.625, P.625A, PX.4	200-250	15-33
Full for small hall ...	LS.5A, LS.6A	300-400	80-112

**Use of existing output transformers.** If a suitable step-down transformer is already fitted in the Receiver, it may, in special cases, be used in place of that supplied with and especially designed for the Speaker ; arrange the input as Figure C, joining sockets 8 and 10 to the secondary of transformer in the set.

#### Suitable transformer ratios.

- (a) Valve impedance not exceeding 3000 ohms—turns ratio 15-1 approx.
- (b) Valve impedance exceeding 3000 ohms (including pentodes) turns ratio 30-1 approx.
- (c) Push-pull circuits ; total Valve impedance not exceeding 6000 ohms—turns ratio 30-1 approx.

**Long Extensions and Special Circuits.** For push-pull circuits or when a very long extension is in use, it is preferable to remove transformer from Speaker and place it direct in set. When this course is followed, disconnect red leads, remove the four transformer fixing screws and fasten red leads with adhesive tape to lower side of cone support, thus preventing strain on coil ; allow ample slack in these leads. Transformer may be held horizontally in set by a clamp of strip brass.

NOTE.—Loudspeaker extension leads, if over 15-20 feet in length, should be of heavy gauge armoured cable and the casing properly earthed.

## PART 2.

### Information applying to Model '91' (unit) only.

It cannot be too strongly emphasised that the cabinet or baffle must be of correct acoustic design and reasonably robust construction. Any deficiency will seriously impair the quality of reproduction.

**Suitable Cabinets.** The recommended size for a cabinet of ordinary design is from 16 to 18 inches square and about 9 inches deep. It is highly desirable that

- (a) The wood should not be less than  $\frac{1}{2}$  inch in thickness.
- (b) The back should be left open, or provided with holes or apertures over about half the surface area.
- (c) The speaker chassis, terminals, ornamental mouldings, etc., must be held rigidly in position.
- (d) The fret should be as open as possible and any covering material must be of thin texture.
- (e) The felt ring on the front of chassis should bear firmly against the fret or cabinet-front.

Lack of attention to the above points may lead to cabinet resonance, "drumming" reproduction or rattle.

**Suitable Baffles.** Material should be at least  $\frac{1}{2}$  inch thick and may be re-inforced by an ornamental moulding round the four sides. This must, however, be fixed firmly in position.

The chassis should be mounted on a strong shelf or similar support at the centre of baffle and must be screwed or bolted in position.

The recommended size for baffles is from 3 feet to 4 feet square; the former is generally adequate.

**Special Notes.** Cabinets and baffles must not be allowed to back closely upon a wall; allow a space of at least 18 inches.

The unit, despite its very small air gap, has a stray magnetic field which may act upon watches, etc. Do not allow any such articles within 12 inches of unit.

## PART 3.

### SPARE PART LIST (BOTH MODELS)

CABINET				Spare Part No.
Silk for mask 15 in. x 14 in. (131 only) ... ..				1989
Silk for back (5 pieces) $4\frac{1}{2}$ x $4\frac{1}{2}$ in. (131 only) ... ..				1990
Nut let into wood for securing clamp bolt (131 only) ... ..				5658
UNIT	Spare Part No.	TRANSFORMER	Spare Part No.	
<b>Loudspeaker Unit complete</b> ... ..	1494-D	<b>Transformer in L.S. Unit</b> ... ..	1465-A	
Loudspeaker support ... ..	1494	Ratio adjusting link ... ..	1518	
Magnet... ..	3743-A	Link securing screw ... ..	2412	
Magnet to base securing bolt ... ..	1436	Lead and tag (131 only) ... ..	3851-A	
Clamp plate ... ..	7239	Red plug only ... ..	3475-A	
Nut ... ..	1437	Transformer to unit securing screws ... ..	5329	
Spring washer... ..	3460	Transformer to unit securing screw washer ... ..	1048	
Cone frame ... ..	3351	Exterior connecting socket (black) (131 only) ... ..	3849-A	
Cone frame to magnet securing screw ... ..	2791	Exterior connecting plugs (black) (131 only) ... ..	3850-A	
Moving coil and cone assembly ... ..	1528-B	Terminal bracket only ... ..	4340	
Centre screw ... ..	2387	Unit to Cabinet securing bolt ... ..	1476	
Spacing Washer (Thick) ... ..	1529	Unit securing nut (131 only) ... ..	1478	
Washer (Thin) ... ..	3175	Spring washer (131 only)... ..	3460	
Leatheroid Washer ... ..	1530	Washer Plate (131 Only)... ..	1481	
Clamping ring segment (3 used) ... ..	3327	Unit to baffle securing clamp (131 only) ... ..	1440	
Clamping ring screw ... ..	1526	Unit to baffle securing screw (131 only) ... ..	2665	
Clamping ring nut ... ..	4235			

NOTE :—When ordering spare parts always quote :—

1. The spare part number.
2. The description of part.
3. Type and serial number of instrument.

In order to facilitate despatch, spare parts should be ordered from—

THE SERVICE DEPARTMENT, THE MARCONIPHONE COMPANY LIMITED,  
DAGENHAM, ESSEX. Telephone: Romford 870.