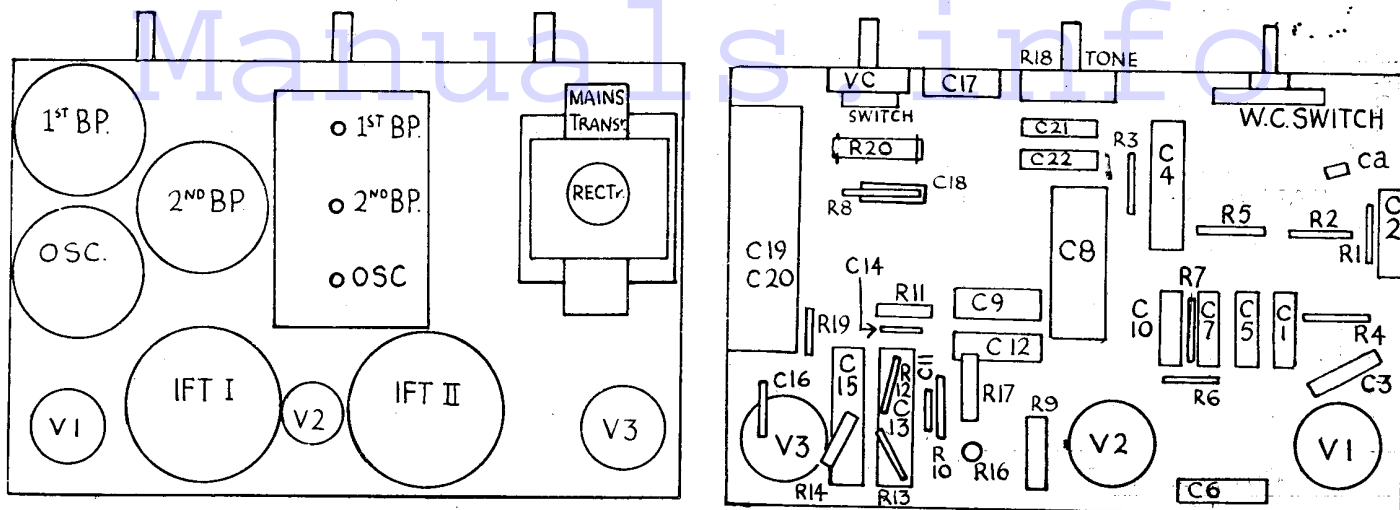


CHASSIS DIAGRAMS OF FERRANTI "NOVA" SUPERHET



The I.F. trimmers project above the screening cans and are easily adjusted from the top of the Ferranti "Nova" chassis. The circuit simplicity is reflected in the open under-chassis layout (right).

McMICHAEL RADIO'S MODEL 135



**Circuit.**—The first detector-oscillator valve, AC/TP met. (V1), is used with band-pass aerial coupling. Oscillator tuning is in the anode circuit of the triode section, and the grid circuit includes a harmonic suppressor.

Bias is obtained by A.V.C. with limiting cathode resistance. The I.F. coupling is a band-pass I.F. transformer (frequency 128 kc.).

The single I.F. valve, MVS Pen. met. (V2), is biased from the A.V.C. potentiometer and is followed by a second band-pass I.F. transformer. The grid circuit contains a harmonic suppressor choke.

The second detector is a double-diode DD4 (V3). The A.V.C. diode anode is coupled to the primary of IFT2.

The McMichael 135 (left) is a four-valve plus rectifier superhet with dual speakers and a novel tuning dial.

The output valve is an AC2 Pen. (V4), of which the grid leak forms the volume control. Both grid and anode stabilising resistances are used and tone control is provided by means of a condenser in series with a variable resistance across the output.

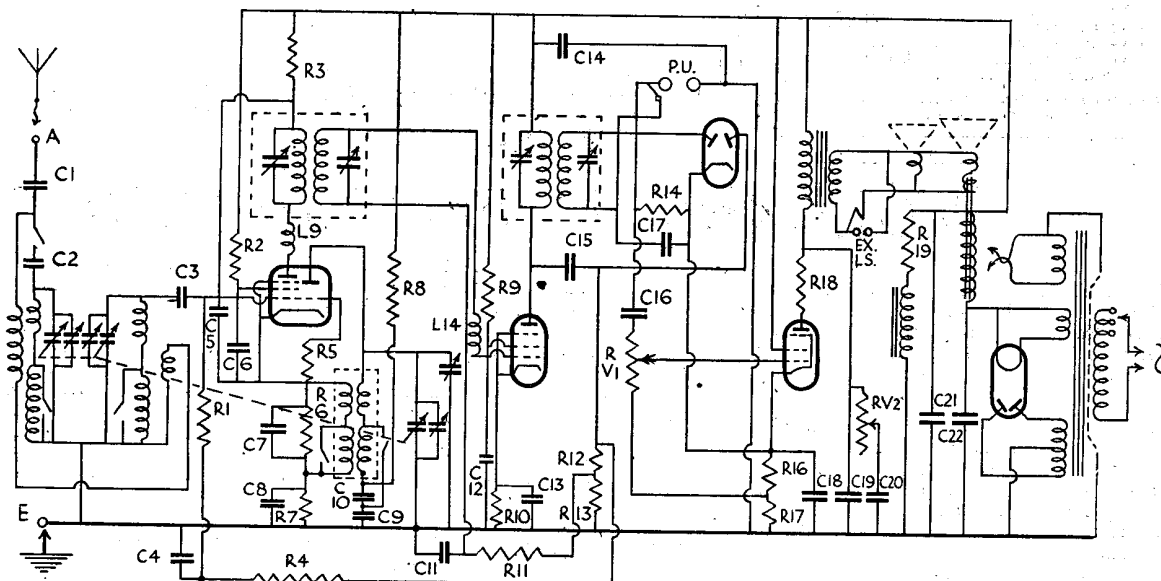
Mains equipment consists of transformer, full-wave 442BU rectifier, 1,500-ohm field coil in the positive H.T. lead, and two electrolytic condensers. The second field coil (left hand, smaller speaker) of 7,500-ohms is connected in series with a resistance across the smoothed H.T.

**Special Notes.**—The smoothing condenser block and the resistance R19 are mounted beside the speakers, the speech coils of which are connected in parallel.

The pilot lamp (6.2 volt, Osram) is inside a holder on the lid. To free this, slacken the

(Continued on next page.)

The McMichael circuit is straightforward and uses an H.F. pentode-triode as frequency-changer and a high-slope output pentode. The speech coils of the dual speakers are in parallel.



### McMICHAEL MODEL 135 (Cont.)

thumb-screws at the ends, lift out and pull apart.

**Quick Tests.**—Between the tags on the terminal strip on the right-hand side and chassis:—

VALVE READINGS				
Valve.	Type.	Electrode.	Volts.	M.A.
1	ACTP met. (9)	anode	180	*
		aux. grid	190	*
		osc. anode	110	*
2	MVS Pen. met.	anode	250	7.5
		aux. grid	120	
3	DD4 (5)	double diode only.		
4	AC/2 Pen.	anode	230	29
		aux. grid	250	4.8

\* Owing to small space, it is not possible to get an adaptor into position.

CONDENSERS		
C.	Purpose.	Mfd.
1	Series aerial	.0002
2	Series aerial	.00001
3	V1 grid	.001
4	Decoupling V1 grid	.1 (375)
5	V1 anode decoupling	.1 (450)
6	V1 aux. grid decoupling	.5 (450)
7	V1 osc. grid reservoir	.0002
8	V1 bias resistor by-pass	.1 (375)
9	Osc. M.W. track	.001258
10	Osc. L.W. track	.0023
11	Decoupling V2 grid	.1 (375)
12	V2 aux. grid by-pass	.1 (450)
13	V2 cathode by-pass	.1 (375)
14	V2 anode decoupling	.1 (450)
15	L.F. feed to AVC diode	.0001
16	L.F. coupling from diode	.005 (375)
17	H.F. by-pass	.0001
18	V4 cathode by-pass (el.)	25 (25)
19	Tone compensating	.002(100.0)
20	Part of tone control circuit	.03(100.0)
21	H.T. smoothing (el.)	8 (450)
22	H.T. smoothing (el.)	8 (450)

Bracketed figures denote working voltage rating.

RESISTANCES		
R.	Purpose.	Ohms.
1	V1 grid leak	1 meg. (4)
2	Voltage dropping to V1 aux. grid	25,000 (1)
3	V1 anode decoupling	10,000 (1)
4	V1 grid decoupling	1 meg. (4)
5	V1 osc. grid harmonic suppressor	1,000 (4)
6	V1 osc. grid leak	50,000 (4)
7	V1 cathode bias	1,000 (4)
8	V1 osc. anode decoupling	60,000 (1)
9	Voltage dropping to V2 aux. grid	60,000 (1)
10	V2 cathode bias	175 (4)
*11	V2 grid decoupling	.5 meg (4)
12	Part of A.V.C. ptr.	.5 meg. (4)
13	Part of A.V.C. ptr.	.5 meg. (4)
*14	Diode load	.5 meg. (4)
15	V4 grid stabiliser	.1 meg. (4)
16	V4 bias ptr.	150 (1)
17	V4 bias ptr.	500 (1)
18	V4 anode stabiliser	50 (4)
19	Voltage dropping to L.S. field No. 2	3,000 (1 1/2)

Bracketed figures denote wattage rating.  
\* These are not colour coded.

Top (F) (pink lead), H.T. unsmoothed, 380 volts, 1 and 2, L.T. to pilot lamp;

3 and 4, speech coils;

F. (cream lead), H.T. smoothed, 250 volts.

**Removing Chassis.**—If performed methodically, this task is easy. Tune to minimum. Pull off the knobs that have the long shanks. Remove the metal panel in front of the dial by undoing the coin-slot screws. Remove the glass and, taking care that the tuning is not shifted, pull off the indicator pointer—this also has a long shank.

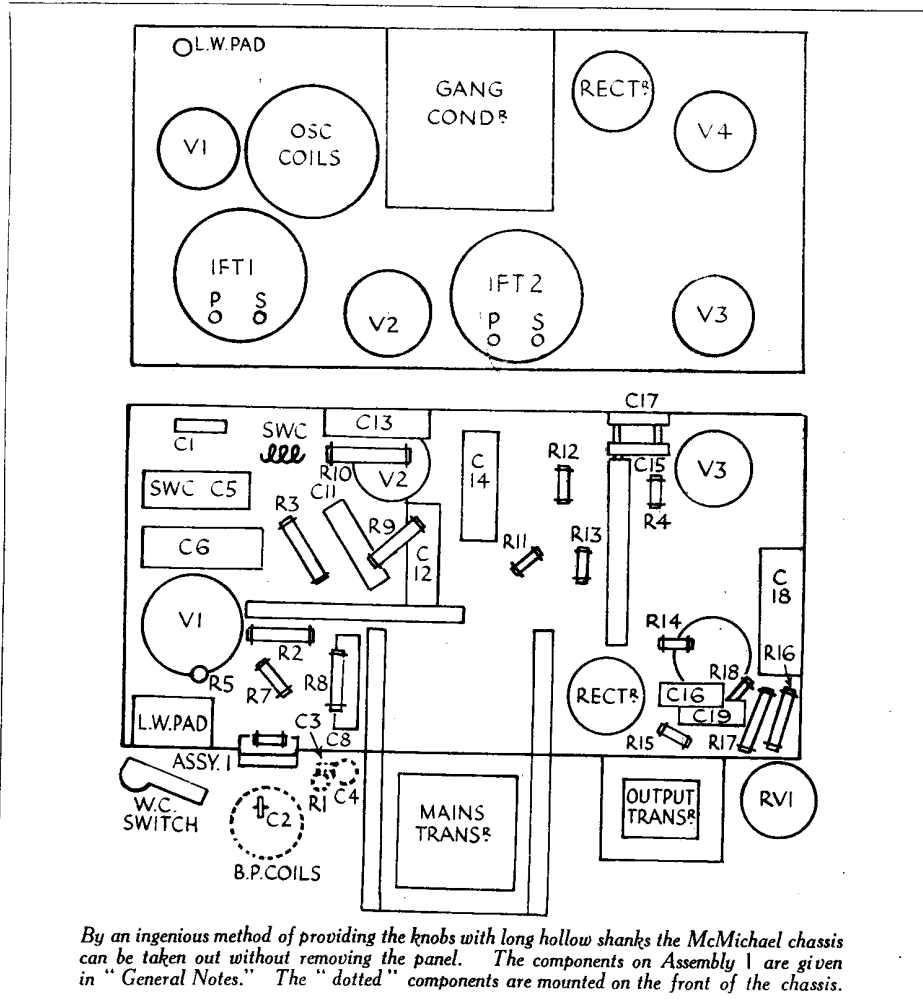
Remove four screws from underneath and, while easing the chassis upwards at the rear to let the pointer spindle clear the aperture, lift the chassis out, left-hand side first. The leads are sufficiently long to allow the set to be tested while still connected to the speakers.

**General Notes.**—If the chassis must be removed entirely the speaker leads should be unsoldered. The connections of the leads are given in "Quick Tests."

The volume control RV1 and the tone control RV2 are mounted on the same bracket. Assembly 1 consists of the fixed oscillator tracking condensers C9 and C10 with oscillator circuit resistances R6 (green) and R7 (brown).

The rubber-covered wire wound round C5 forms a short-wave choke in the anode circuit of V1.

**Replacing Chassis.**—Lay chassis inside cabinet and replace the knobs. Replace the holding screws and press home the pointer in the zero position. Check the tuning before replacing the glass and front plate, remembering the distance pieces under the plate.



## MULLARD MU35 SUPERHET

**Circuit.**—The first detector oscillator valve, F.C.13 met. (V1), has a band-pass aerial coupling with a special I.F. filter in the aerial lead. Bias is by cathode resistance and A.V.C. and coupling to the next valve is by band-pass I.F. transformer (frequency 115 kc.).

The I.F. valve, VP13A met. (V2), is also biased by cathode resistance and A.V.C., but the grid circuit is connected to a potentiometer (R3 and R4) across the H.T. This provides a form of muting and amplified A.V.C. by having the potentials across R4 and R10 in opposition.

Coupling to the next valve is by a second band-pass I.F. transformer. The second

detector is a double diode, 2D13A met. (V3), of which one anode is used for L.F. purposes, and is biased by the voltage drop across the R10 and R11 potentiometer. The other anode is used for A.V.C. with the load resistance R21.

The following coupling is a resistance-capacity filter of which the grid leak is the volume control potentiometer.

The L.F. valve, HL13 met. (V4), is also coupled by resistance-capacity filter to the output valve, a Pen 26. This is stabilised by a grid resistance and tone compensation is provided by a condenser in series with a variable resistance across the primary of the output transformer.

The speaker is a permanent-magnet model.

Mains equipment consists of:—H.F. chokes (mounted in the top of the cabinet), barretter lamp C1, half-wave UR1 rectifier, a smoothing choke in the positive H.T. lead and two 32 mfd. electrolytic condensers.

**Special Notes.**—The pilot lamps are No. 8066. To remove them, unscrew the milled screws on the supports.

The noise suppressor control potentiometer R11 is mounted in the top of the cabinet at the back. The condenser connected across it is C48.

The extension speaker leads are connected to the transformer primary through two .2 mfd. condensers.

**Quick Tests.**—Between the soldering tag

(Continued on page 72.)