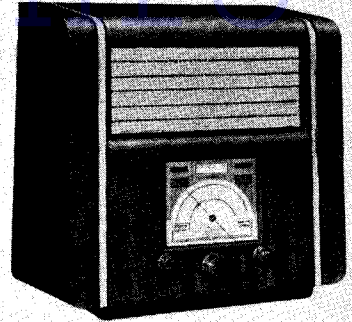


FERRANTI ALL-WAVE MODEL 1137



An improved form of the exclusive Ferranti Magnascopic scale is a feature of the 1137 four-valve A.C. superhet.

CIRCUIT.—The aerial is coupled to the grid of V1, a heptode frequency changer, through a set of H.F. transformer aerial coils, the secondary of which constitutes the grid circuit of V1 and is tuned by the aerial section of the gang condenser. The H.F. transformer has an iron-core on medium and long waves.

Between the aerial and earth terminals of the receiver is connected an I.F. rejector coil. Also in the primary circuit of the H.F. transformer is connected an image rejector. Both of these coils have, of course, trimmers for adjustment.

The output of V1, converted to the I.F. frequency, passes through an I.F. transformer to V2, an H.F. pentode acting as the I.F. amplifier.

The final valve in the radio line up is a double diode pentode, V3. The output of V2 passes to the demodulating diode of V3, which rectifies the signal. The other diode provides A.V.C. via the usual resistance and condenser network.

The signal passes by means of a coupling condenser and associated manual volume control to the control grid of the pentode section of V3, where it is amplified to speaker strength. Across the primary of the speaker transformer are connected a tone correction resistance and condenser and also a further condenser

connected in parallel with these two components.

Mains equipment consists of the mains transformer, a full-wave rectifier valve, V4, electrolytic smoothing condensers and a smoothing choke consisting of the speaker field (2,200 ohms).

Chassis Removal.—Remove the four fixing screws securing the back of the cabinet. Then, remove the three control knobs. These are of the spring-fixing type and can be removed by a slight pull.

Turn the set on its side and remove the four fixing bolts and washers securing the chassis. Then, still keeping the cabinet on its side, the set can be removed from

the cabinet to the extent of the speaker cable and is conveniently available for service requirements.

If the speaker leads are unsoldered it should be noted for replacement that the leads are connected as follows. From left to right the colours of the leads are blue, green, red and black respectively, and are

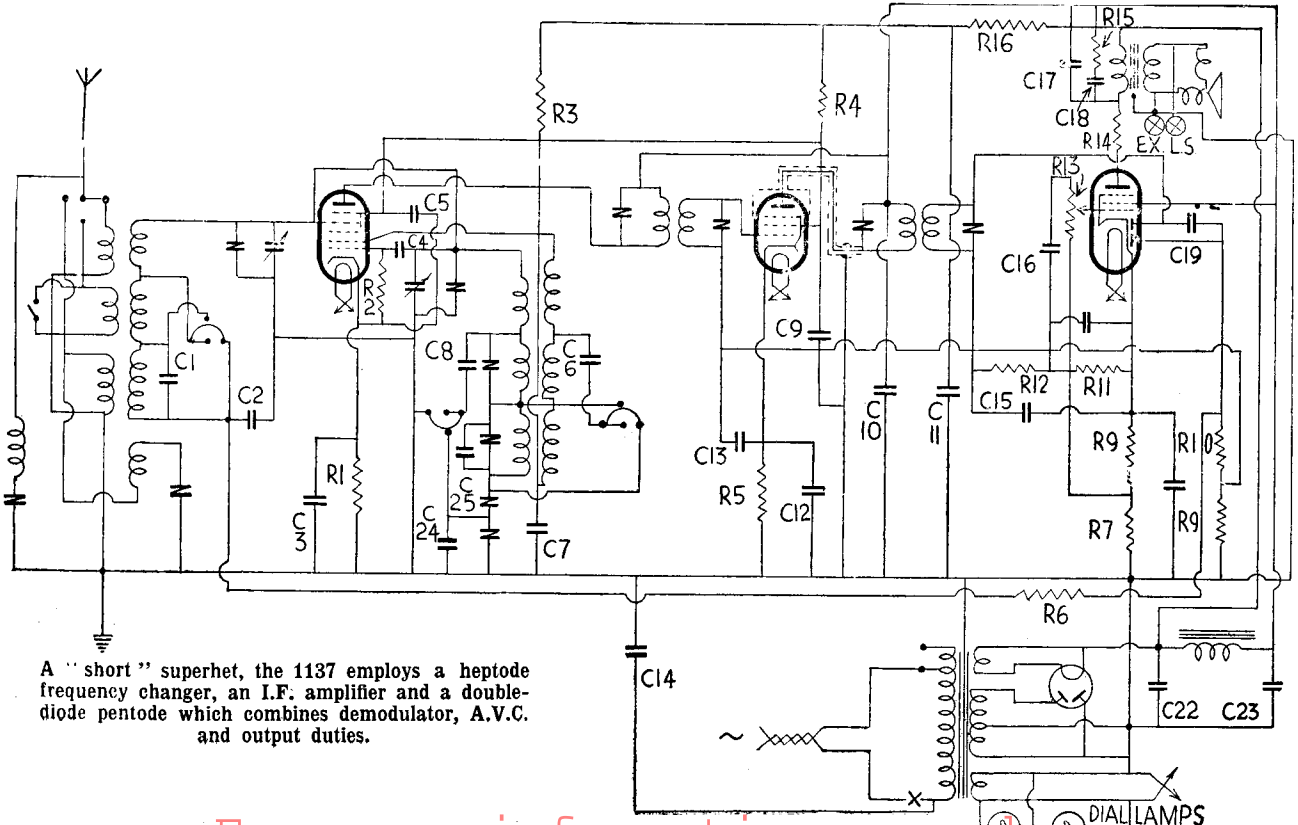
VALVE READINGS

No Signal—Volume Maximum—200 volts A.C. Mains.

V.	Type.	Electrode.	Volts.	Ma.
1	(All Ferranti). VHT4 met. (7)	Anode ..	235	2
		Osc. Anode	170	5.2
		Screen ..	90	3
2	VPT4 met. (5)	Anode ..	235	5.8
		Screen ..	88	1.5
3	PT4D (7)	Anode ..	222	30
		Screen ..	235	6
4	R4 (4)	Filament	345	—

QUICK TESTS

These are available on this receiver at the speaker transformer. Volts measured between this and the chassis should be:—
Blue lead, 340 volts, unsmoothed H.T.
Green lead, 228 volts, smoothed H.T.
Red lead, 232 volts, smoothed H.T.



A "short" superhet, the 1137 employs a heptode frequency changer, an I.F. amplifier and a double-diode pentode which combines demodulator, A.V.C. and output duties.

connected to the four tags on the speaker transformer in that order.

Special Notes.—There are two dial lights in the receiver. These are mounted in screw-in holders clamped one each side of the wavelength dial reflector strip. They are rated at 6.2 volts and each consume .3 amp.

Two terminals are provided for use with an external speaker. These are mounted on an insulating strip on the speaker frame. A permanent-magnet moving-coil speaker of low impedance should be used.

The control marked I.R. on the chassis drawing is the image rejector coil trimmer.

The receiver is sent from the factory adjusted for use on 200 to 240 volts, 40 to 100 cycles mains supply. To convert the receiver for use with voltages above that stated, unsolder the leads connected to the upper tags on the transformer and solder it to the tags below. The set can then be used on mains voltages from 240 to 270.

Circuit Alignment Notes

I.F. Circuits.—Connect a service oscillator between the top grip cap of V1 and chassis via a small condenser and an output meter across the primary of the speaker transformer. Turn the volume con-

trol to the maximum volume position and the gang condenser to maximum capacity.

Tune the service oscillator to 450 kcs. and adjust the I.F. trimmers in 1 to 4 order for maximum response in the output meter. Reduce the output from the oscillator as the circuits come into line so as to render the A.V.C. inoperative.

Signal Circuits.—Leave the output meter connected as before, but connect the service oscillator between the aerial and earth terminals either through the usual dummy aerial or a small fixed condenser. Only feed sufficient input from the oscillator to obtain definite peaks in the output meter. If too much input be fed the A.V.C. of the set begins to operate and this is precisely what is to be avoided.

Short Waves.—Turn the gang condenser right out and set the pointer to the lowest end of the scale (approximately 16.6 metres).

Tune the oscillator to 18mcs. and adjust the short wave oscillator trimmer (on gang) for maximum response in the output meter. If two peaks are found that given

(Continued on page 35.)

CONDENSERS

C.	Purpose.	Mfdts.
1	L.W. aerial trim. (fixed)	.00006
2	V1 A.V.C. decoupling	.05
3	V1 cathode shunt	.05
4	Oscillator grid	.0001
5	V1 screen decoupling	.0005
6	Short-wave regeneration control	.001
7	Oscillator anode decoupling	.4
8	Short wave fixed padder	.004
9	V1, V2, screen decoupling	.1
10	V1, V2, anode decoupling	.1
11	V1, V2, H.T. feed shunt	.4
12	V2 cathode shunt	.1
13	V2 A.V.C. decoupling	.05
14	Main s R.F. by-pass	.002
15	H.F. by-pass	.00015
16	L.F. coupling	.01
17	Tone correction	.01
18	Tone correction	.05
19	A.V.C. diode coupling	.00005
20	H.F. by-pass	.00015
21	V3 cathode shunt	.25
22	H.T. smoothing	.8
23	H.T. smoothing	.8
24	Oscillator padler	backing
25	Oscillator trimmer	backing
	condenser.	.00018
	condenser.	.00008

Ferranti 1137 on Test

MODEL 1137.—Standard model for A.C. mains operation, 200-270 volts, 40-100 cycles. Price, 12 gns.

DESCRIPTION. Three-waveband superhet, using three valves (with combined d.-d.-pentode) and rectifier.

FEATURES.—Improved Magnascope dial. Full-vision scale calibrated in names and wavelengths on medium and long, wavelengths only on short. Controls for volume, tuning and wave selection. Sockets for extension speaker.

LOADING.—80 watts.

Selectivity and Sensitivity

SHORT WAVES (16.7-51 metres).—Average gain, adequate selectivity and great ease of handling. Magnascope dial feature an excellent aid.

MEDIUM WAVES (200-550 metres).—Representative selectivity and sensitivity, comparative freedom from whistles. Local stations spread on adjacent channels only.

LONG WAVES (1,000-2,000 metres).—Good gain and average selectivity. All main stations easily received. Overlap on Deutschland-sender.

Acoustic Output

Normally balanced pentode output with adequate volume for ordinary room. Good attack and crispness and appreciable low-note radiation. Little colouration on speech.

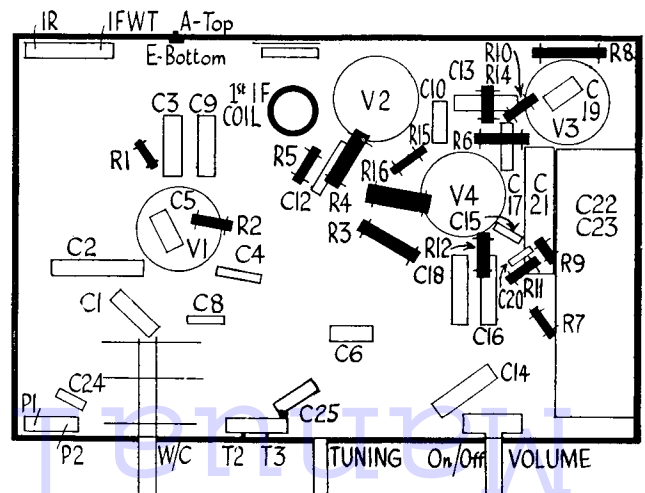
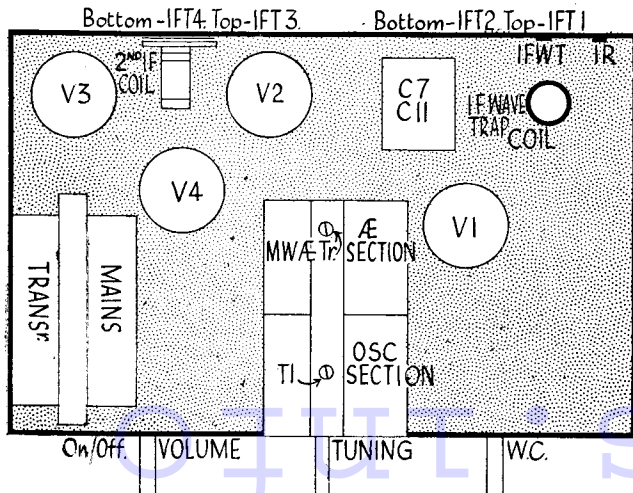
Replacement Condensers

THREE exact replacement condensers for the Ferranti 1137 are available from A. H. Hunt, Ltd., of Garratt Lane, Wandsworth, London, S.W.18.

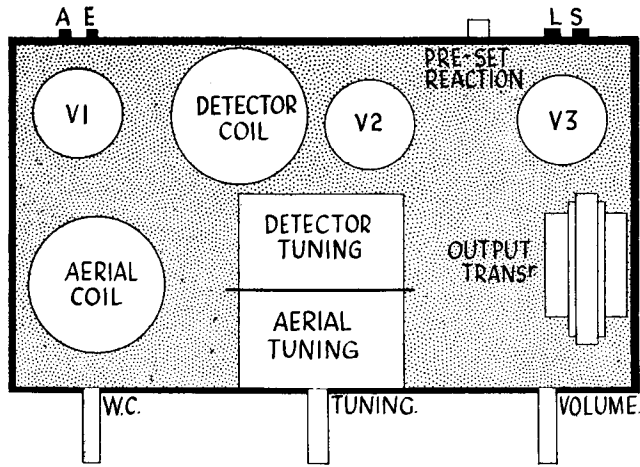
These are: For block containing Cs 7 and 11, unit list 3633, 4s. 6d.; block of Cs 22 and 23, 2856, 6s. 6d.; C21. 1797, 1s. 10d.

RESISTANCES

R.	Purpose.	Ohms.
1	V1 cathode bias	200
2	Oscillator grid leak	50,000
3	Oscillator anode decoupling	10,000
4	V1, V2, screen decoupling	25,000
5	V2 cathode bias	300
6	V1 A.V.C. decoupling	1 meg.
7	V3 cathode bias potr. (part)	600
8	A.V.C. diode load (part)	1 meg.
9	V3 cathode bias potr. (part)	140
10	A.V.C. diode load (part)	4 meg.
11	Demodulator diode load (part)	500,000
12	Demodulator diode load (part)	100,000
13	Volume control	1 meg.
14	V3 anode stabiliser	140
15	Tone correction	10,000
16	V1, V2, H.T. feed	10,000



Left, "tinted," is the layout diagram identifying the parts on the top of the Ferranti 1137 chassis. The details of the underside are given in the diagram on the right.



The diagram on the left identifies the valves and other parts on the top of the G.E.C. Battery S.P. Three. The receiver is a simple service proposition.

G.E.C. S.P.3 on Test

MODEL Battery S.P. Three.— Standard model for battery operation, using a G.E.C. 120-volt, type BB720, battery and a Genalex No. BC145 2-volt 45-amp. accumulator. Price £6 15s.

DESCRIPTION.— Two-waveband, three pentode straight set with pre-set reaction. Brown cellulose table cabinet.

FEATURES.— Full-vision scale with wave indicator operated by selection switch. Controls for tuning and volume. Sockets for external speaker.

LOADING.— I.T., 0.43 amp.; H.T., 7.1 ma.

Sensitivity and Selectivity

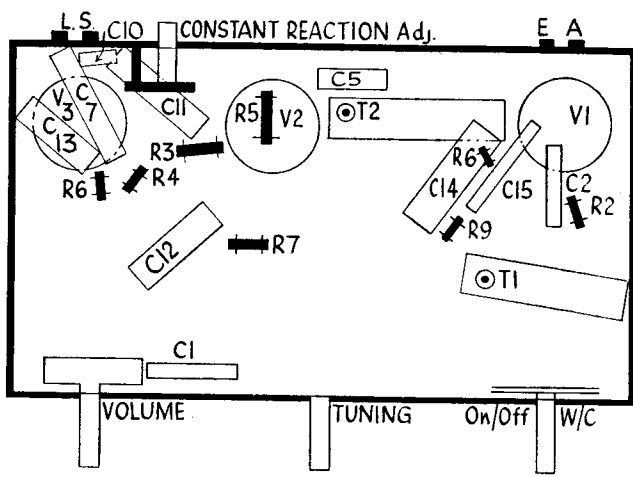
MEDIUM WAVES (200-550 metres).— Very good gain, well maintained over the band. Pre-set reaction constant. Adequate selectivity for most areas. Local stations spread appreciably in "swamp" area.

LONG WAVES (800-2,000 metres).— Similar performance to medium waves. All main stations easily separated if volume control is not advanced too far. Reaction again very constant.

Acoustic Output

Excellent volume for very moderate H.T. loading. Ample for ordinary room. Well balanced tone and good upper and lower note radiation.

A replacement condenser for C14 is available from A. H. Hunt, Ltd., list number 2970; it retails at 1s. 10d.



Right is the under-chassis layout of the S.P.3. Note the pre-set reaction adjustment. There are only two tuned circuits and the trimmers for the medium-waveband are under the chassis.

FERRANTI 1137 SUPERHET

(Continued from page 33.)

by the lower capacity is the correct one. The gang should be rocked.

Medium Waves.— Tune the set and oscillator to 200 metres (1,500 kcs.) and adjust trimmer T2 whilst rocking the gang.

Tune the set and oscillator to 228 metres (1,316 kcs.). Adjust the medium wave aerial trimmer (on gang) for maximum response, simultaneously rocking the gang.

Now tune the set to 500 metres and apply a signal of 500 metres (600 kcs.). Adjust P1 for maximum response, simultaneously rocking the gang.

With the gang condenser at maximum apply a 450 kcs. signal to the set. Adjust the I.F. wavetrap (I.F.W.T.) for minimum.

It is now necessary to repeat the first three operations under this heading.

Long Waves.— Tune the set and oscillator to 1,128 metres (266 kcs.) and adjust T3 for maximum, simultaneously rocking the gang.

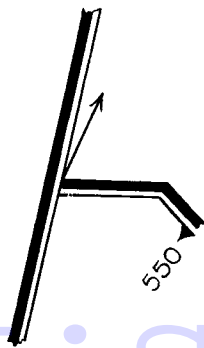
Tune the set and oscillator to 1,818 metres (165 kcs.) and adjust P2 for maximum response. Any alteration to T3 affects the setting of P2.

Now, with the set still switched to the long-wave band, apply a signal of 261 metres. Tune this in on the set (approximate reading 1,200 metres), and adjust I.R. (image rejector trimmer) for minimum output.

(Continued from page 5.)

Tune the oscillator to a frequency of 465 kcs. and adjust the I.F. trimmers IFT1, IFT2, IFT3 and IFT4 for maximum output in the output meter, reducing the input from the oscillator as the circuits come into line to prevent the A.V.C. working.

Signal Circuits.— Leave the output meter connected as before, but connect the



The tuning pointer of the McMichael 137 should be set as in this diagram with the condenser at maximum (see "Signal Circuits.")

leads of the oscillator between the aerial and earth terminals of the receiver.

Feed only sufficient input to obtain a reasonable signal. If too much input is fed the A.V.C. comes into operation and a false reading will be obtained.

Before calibrating the receiver, turn the gang condenser to maximum and set the pointer so that it takes up the position as shown in the diagram.

Short Waves.— This is the first range to be adjusted. Inject a signal of 18 mcs. (approximately 16.5 metres). There is a mark on the wave-length scale half-way between the 16.5 and 17 metre position, to which the pointer of the receiver is to be set while the calibration of the receiver on short waves is being carried out. Adjust the trimmers on the condenser gang T1, T2 and T3 in that order for maximum response on the output meter.

Long Waves.— Calibrate this range before the medium waves, as the adjustment of the long waves affects the M.W. calibration to a certain extent.

Inject a signal of 1,000 metres (300 kcs.) and turn the pointer of the set to the same wave length.

Adjust the long-wave oscillator trimmer T4 until the maximum response is obtained, then adjust BP1 and BP2 respectively for maximum sensitivity.

Medium Waves.— A mark is to be found on the wave-length scale approximately half-way between 210 and 220 metres, opposite the station Radio Lyons. Inject a signal of 1,400 kcs. and adjust the medium-wave oscillator trimmer T5 for maximum response. Then adjust BP2 and BP3 respectively for maximum sensitivity.