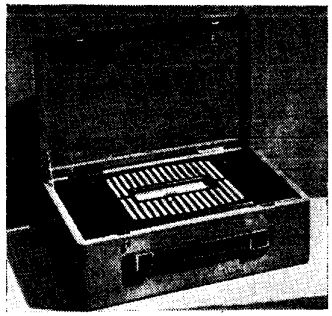
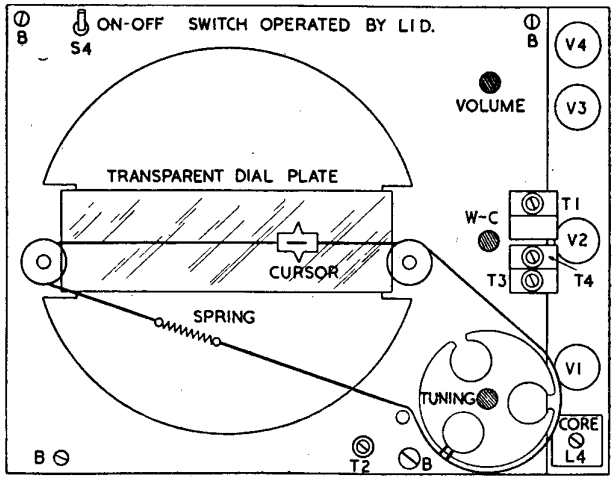
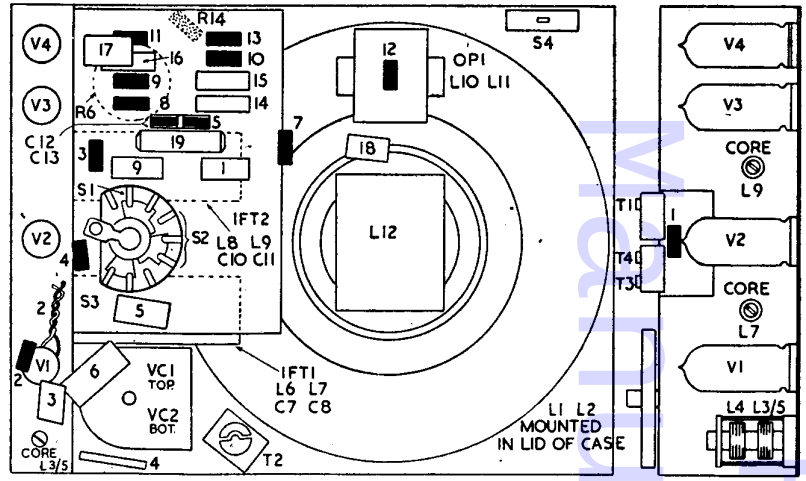
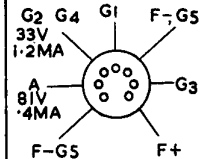
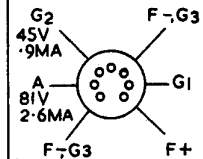
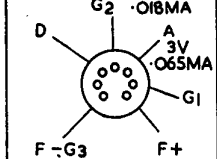
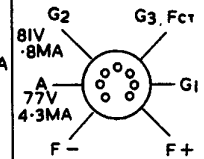
FERRANTI 815



Four-valve two-waveband all-dry battery portable in maroon or lizard leather cloth covered attache case fitted with plastic carrying handle. Weight with batteries 8 lb. Made by Ferranti, Ltd., Moston, Manchester.



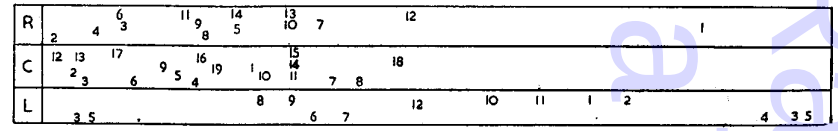


V1—DK91	V2—DF91	V3—DAF91	V4—DL94
			
G2 G4 33V 1·2MA; G1; F-G5; A 81V ·4MA; G3; F-G5; F+	G2 45V ·9MA; F-G3; A 81V 2·6MA; G1; F-G3; F+	G2 ·018MA; D; A 3V ·065MA; G1; F-G3; F+	G2 81V ·8MA; G3, Fct; A 77V 4·3MA; G1; F-; F+

TOTAL HT CURRENT = 10·3MA LT CURRENT = 250MA BIAS ACROSS R13 = 5·2V

RESISTORS

R	Ohms	Watts
1	33	¼
2	100K	¼
3	18K	¼
4	8.2K	¼
5	47K	¼
6	500K	Potr.
7	2.2M	¼
8	4.7M	¼
9	3.9M	¼
10	1M	¼
11	2.2M	¼
12	10K	¼
13	560	¼
14	2.2K	¼

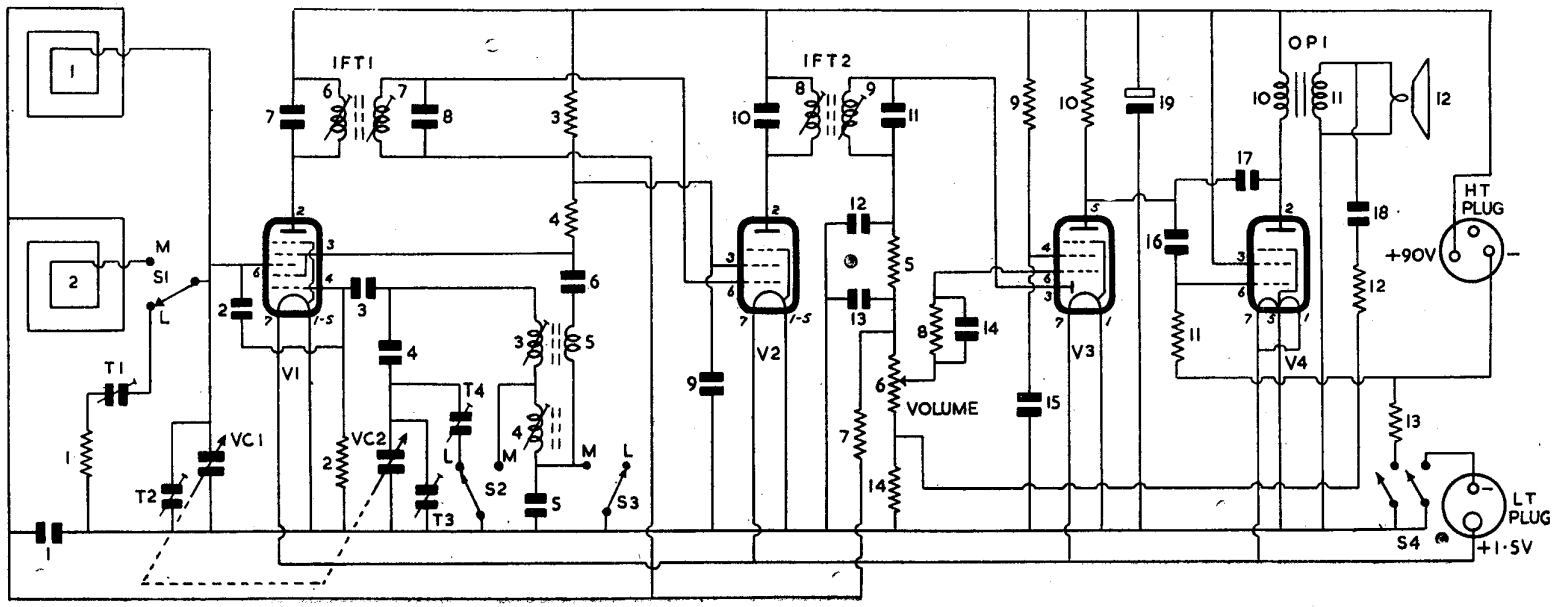


CAPACITORS

C	Capacity	Type
1	.05 Tubular 250V	
2	3pF Twisted PVC Wire	
3	100pF Silver Mica	
4	550pF Silver Mica	
5	200pF Silver Mica	
6	200pF Silver Mica	
7	100pF Silver Mica	
8	100pF Silver Mica	
9	.05 Tubular 250V	
10	100pF Silver Mica	
11	180pF Silver Mica	
12	100pF ∫ Special Type	
13	100pF ∫ formed on R5	
14	.005 Tubular 250V	
15	.05 Tubular 250V	
16	.005 Tubular 250V	
17	15pF Silver Mica	
18	.05 Tubular 250V	
19	2 Electrolytic 150V	

INDUCTORS

L	Ohms
1	16
2	1.3
3	2
4	4.5
5	1
6	7.5
7	7.5
8	7.5
9	5.5
10	690
11	.3
12	2.5



AERIAL. The receiver is provided with self-contained frame aerials L1 (LW) and L2 (MW) which are housed under a removable panel inside lid of case. The LW frame L1 is connected directly to aerial tuning capacitor VC1 and to control grid (g3) of heptode frequency-changer V1. The LW trimmer T1, with series connected damper resistor R1, is switched in circuit across L1 only when S1 is in LW position.

On MW band L2 is switched by S1 across L1 with T2 functioning as MW trimmer. AVC decoupled by R7 C1 is fed through the tuned circuits to g3 of V1. Primary L6 C7 of IFT1 is in the anode circuit.

Oscillator is connected in a tuned-grid shunt-fed circuit. The grid coils L3 (MW), L4 (LW) are series connected with MW padder C4 at grid and LW padder C5 at earthy end and are coupled by C3 to oscillator grid (g1) of V1, and through C4 to oscillator tuning capacitor VC2. On LW band L3 L4 are tuned by VC2 and trimmed by T4 which is switched in by S2. On MW band L4 C5 are shorted out by

Continued on page 30.

EASIPOWER IRONS—*Contd.*

also remove inside bracket. Loosen nut under which lamp contact strip is clamped and move strip to one side. Withdraw lampholder, replace 2.5V .3A MES bulb, replace holder and reassemble in reverse order.

Renewal of element. Remove cover plate and holding bracket as described. Remove two handle-fixing nuts—the righthand side one of which secures the green earth lead of mains cable. Next undo and remove nut securing black neutral mains lead and element connecting strip—straighten out strip to allow it to pass through slot in base of handle. Place heat control knob in LOW position. Carefully raise rear of handle until projecting setting rod on underside is clear of body—then swing it sideways and forwards out of groove between front body fixing and lock nuts (Fig. 3).

Remove front locking and fixing nuts with spacer washer between and the two rear Spire lock nuts—lift off body. Remove three weight fixing screws and remove weight and underneath asbestos pad (Fig. 4). Undo screw holding bi-metal and element to soleplate. Element complete with bi-metal can now be removed.

Fitting Elements. Examine the clamping area of the soleplate for metal "pips." If the old element has failed to earth on the soleplate, it may leave a small "pip" which will puncture the mica and cause another failure. Rub a fine file over the area.

Clean the clamping surface of the soleplate thoroughly and use a new asbestos pad unless the old one is complete and intact.

New element should be positioned so that rivets fit into spot holes in soleplate and bi-metal projects centrally over recess and so that hole in element mica coincides with tapped fixing screw hole. Insert fixing screw, making sure that mica washers are in place, and carefully tighten screw. Place asbestos pad over element.

The life of an element depends largely on even and firm clamping. Make sure that all screws are pulled down evenly and as firmly as possible, using the largest practical screwdriver.

Check that distance from bottom of soleplate recess to tip of free end of bi-metal is approximately ½ in. Replace body and handle and connect earth, negative and element wires to appropriate terminals. Reposition indicator bulb shunt taking care that it is not shorting to any other terminal. Do not replace rear cover panel of handle until thermostat has been reset.

ADJUSTMENT OF THERMOSTAT

Connect mains lead to any continuity tester and place heat control knob in SILK position. With blunt-tipped screwdriver adjust "Star" screw at top of setting rod so that slightest movement in either direction makes and breaks continuity.

Then carefully rotate adjusting screw in an anti-clockwise direction exactly 10 "spikes" (1¾ complete turns). If soleplate temperature tester is available then iron should be set to COTTON and switched on for at least a quarter of an hour: temperature should read approximately 180 deg C. If temperature is too high then adjusting screw requires to be rotated in a clockwise direction —as a rough guide, moving the screw one spike gives a 10 degree change in controlled temperature.

Finally replace cover panel on rear of handle.

MODEL 99

Model 99 is externally similar to 100/D but differs internally as follows:—

The element is embedded in a ceramic insulation material inside the weight (Fig. 6) and the entire block is replaced when the element fails. Bi-metal strip is a separate item insulated from soleplate with mica gaskets and attached by insulated screw to a raised pillar. Front body fixing screw is tapped into a support strip attached by two bolts to top of element-weight.

Model 99U is a version of Model 99 for use on AC/DC mains and for this reason incorporates a mica arc suppression capacitor across the switch contacts. One side of capacitor is connected direct to bi-metal contact terminal whilst other side of capacitor is connected through a contactor strip fastened to pillar opposite to bi-metal mounting, to the upper switch contact on setting rod (Fig. 5).

EARLIER MODELS

The very first irons produced had a porcelain bridge inside supporting the switch and terminal connections and when these models come in for servicing it is recommended they be returned to the factory for conversion to latest design. The Company undertake this conversion at a nominal charge.

Model 100/C, except for minor differences such as use of self-tapping screws and shape of handle, is basically the same as latest model 100/D.

A few of the first issue of Model 99 were not fitted with indicator light.

FERRANTI 815—*Continued*

S2 leaving L3 C4 in circuit tuned by VC2 and trimmed by T3. Automatic bias for oscillator grid is developed on C3 with R2 as leak.

C2 which is formed by a short length of twisted PVC flex is a neutralising capacitor between control and oscillator grids of V1. Anode reaction voltages are obtained from L5 on MW band and from across padder C5 on LW band and are fed by C6 to oscillator anode (g2 g4) of V1 of which R4 is the load resistor. On MW band position of wavechange switch the LW padder C5 is shorted out by S3.

IF amplifier operates at a frequency of 470kc/s. Secondary L7 C8 of IFT1 feeds signal, and AVC voltages decoupled by R7 C1 to g1 of IF amplifier V2. Screen voltage is obtained from R3 decoupled by C9. Primary L8, C10 of IFT2 is in the anode circuit.

Signal rectifier. Secondary L9, C11 of IFT2 feeds signal to diode anode of V3. R6 the volume control is the diode load, and R5 C12 C13 an IF filter.

AVC. The DC component of the rectified signal across R6 is used for AVC and is fed through decoupling network R7 C1 to V2 and V1.

AF amplifier. Signal across volume control R6 is fed through C14 to pentode amplifier section of V3. Automatic bias is developed on C14 with R8 as leak. Screen voltage is obtained from R9 decoupled by C15. Anode load is R10.

Output stage. Signal at anode V3 is fed by C16 to pentode output amplifier V4. Bias for grid is obtained by connecting load R11 to R13 in HT negative return lead to chassis. Screen voltage is obtained direct from HT line. Amplified output signal at anode is transformer coupled by OP1 to a 6½in. PM speaker L12. Top cut tone correction is by C17.

Negative feedback from secondary L11 of OP1 is applied through C18 R12 to R14 in grid circuit of AF amplifier V3.

HT of 90V is by Drydex Drymax 526, Ever Ready Batrymax B126 or Vidor type L5512 battery. Total HT consumption 10.3mA. HT battery is decoupled by C19. S4, which forms one section of the lid-operated ON/OFF switch, breaks HT negative connection to chassis through bias resistor R13.

LT of 1.4V for the parallel connected filaments is obtained from a Drydex H1184, Ever Ready All-dry 35, or Vidor L5040 battery. Total filament current 250mA. Second section of lid-operated S4 breaks negative LT lead to chassis.

Chassis removal. Remove three control knobs held by sunk grub screws. Undo and remove four countersunk screws securing metal LS escutcheon to top plate of chassis and lift off escutcheon and fabric-covered panel below. Finally undo and remove the four chassis fixing screws marked B on layout diagram. Chassis is now free to be withdrawn from case and all servicing can be carried out without the need to disconnect frame aerial leads.

TRIMMING INSTRUCTIONS

Apply signal as stated below	Tune receiver to	Trim in order stated for maximum output
(1) Connect high resistance output meter (100V-AC) via a 0.1 capacitor across L10. During alignment keep signal at a level to produce 20V deflection.		
(2) 470 kc/s to g1 of V1 through .1mF	LW band. VC1-2 at max.	Cores L9, L8, L7 L6.
(3) RF alignment should be carried out with receiver in position in case but with metal escutcheon and knobs removed to give access to trimmers etc.		
(4) With VC1-2 at max. check and adjust dial cursor to coincide with 550M calibration.		
(5) 1.5 mc/s to frames via loop	MW Band 200 metres	Remove LW core L4 and trim T3 T2
(6) 600 kc/s as above	500 metres	Core L3 whilst rocking VC1-2. Repeat (5) and (6)
(7) 300 kc/s as above	LW Band 1000 metres	Replace LW core L4 and trim T4 T1.
(8) 167 kc/s as above	1800 metres	Core L4 whilst rocking VC1-2. Repeat 7 and 8.

NOTE.—Loop consists of a two turn 10 inch diameter coil placed behind and parallel to receiver frame.

CASEBOOK

HMV MODEL 1604 RG

THE set had always shown a tendency to be unstable at certain settings of the volume control, and the owner had attributed it to bad spots on the carbon track, but since fitting a new one the trouble had persisted.

On the bench it was found that when the tone control was turned to "high" the receiver was definitely unstable; it was apt to develop squeggering noises at certain VC positions.

After first checking all VC connections and that screened leads were earthed, we tried an electrolytic across each smoothing condenser—but this effected no improvement.

We tried two new KT71s in the push-pull output stage and we shunted a .002 condenser across the .0023 mF that is connected across the primary of the output transformer; similarly replacing the 230 pF across the push-pull input transformer resulted in no improvement.

Ultimately we found that the only way to remove this squeggering noise was to connect a 150 pF condenser from each KT71 anode to the centre tap on the output transformer.—G. R. W.

EKCO TS 114

COMPLAINT: sound intermittent, picture jumping.

It was found on examination that picture jumped mainly on speech; it was only slightly noticeable on music.

Removing the chassis from cabinet and connecting the LS on long leads did not cure, but replacing bias condenser to sound output valve did. Positive end was s.c. to case.—W. T. CLEMENTS.

KB FV30L, FV40L, EV30L

ON several of these models, after some few months of operation, the picture definition has become poor, with pronounced sound-on-vision trouble, the overall effect giving one the impression of mis-alignment.

The trouble is usually caused by a 5pF silver-ceramic capacitor inside the case of coil L6 (maker's service sheet) going open-circuit or low capacity. I have found that fitting a replacement capacitor *outside* the case and directly across the appropriate tags is a much preferable plan, as this coil case does get hot in use due to the proximity of two 6AM6 valves.

Another common fault with these models, also after some few weeks' or months' use, is critical line and frame sync, due to the 500K pre set controls increasing in resistance or going open-circuit.

These controls, though actually potentiometers, are used in the design as variable resistors, and in most cases, it is a good dodge (even if only as a temporary measure) to reverse the end connections to the element, such a procedure giving perhaps six months more life.—P. W. BARNETT.

LOW OUTPUT IN PREWAR MURPHYS

A COMMON fault with prewar Murphy receivers, particularly the 1937 range, is low gain in the FC and IF stages, resulting in low volume on MW and often little or no output on LW. This suggests a fault in the IF stage and it is here that the trouble will be found. The fault is low Q coils, caused by a sulphur deposit on the windings from the push-back rubber insulated connecting wires in the IF coil cans.

Sets with this fault can be identified, as a "sooty" deposit will be found on the coil windings in the vicinity of push-back wires.—K. D.