

'ERT' SERVICE CHART

FERGUSON 358BT

SEVEN transistor personal radio, released June, 1961 at 12½gns., later increased to 13gns., then reduced to £13 2s. 6d. Battery is included in price.

Batteries. Ever Ready PP6, Drydex DT6, GEC BB26, Vidor T6006.

Consumption. 15mA under no signal conditions, rising to approximately 30mA for an average output.

Wavebands. LW, 1150-1900m; MW, 194-525m.

Transistors. AF117 (3), OC71, OC81D, OC81 (2).

Diode. OA90.

IF. 475kc/s.

Output. 200mW.

Speaker. 3½in. round, 35ohms. Personal listening socket should feed earphones of at least 30ohms impedance.

Aerial. Ferrite rod is employed, with socket for a car aerial.

Manufacturer. Ferguson Radio Corporation, Ltd.

Service departments. Eleys Estate, Angel Road, Edmonton, N18. 24 Sheepcote Street, Birmingham, 14. Derby Street, Cheetham, Manchester, 8. 160/162 Battlefield Road, Glasgow, S2.

DISMANTLING

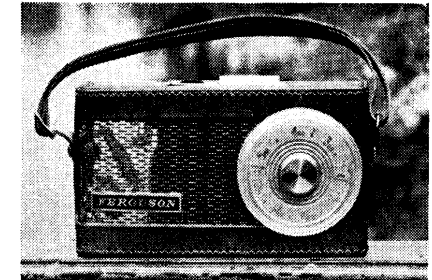
Printed panel removal. Unscrew centre trim from tuning scale, then remove scale and

washers behind. Extract three brass headed screws thus revealed, release back cover and remove printed panel from case, bottom edge first. Dismount speaker by removing two screws securing it to printed board; this will give complete access to components and alignment points.

SERVICE NOTES

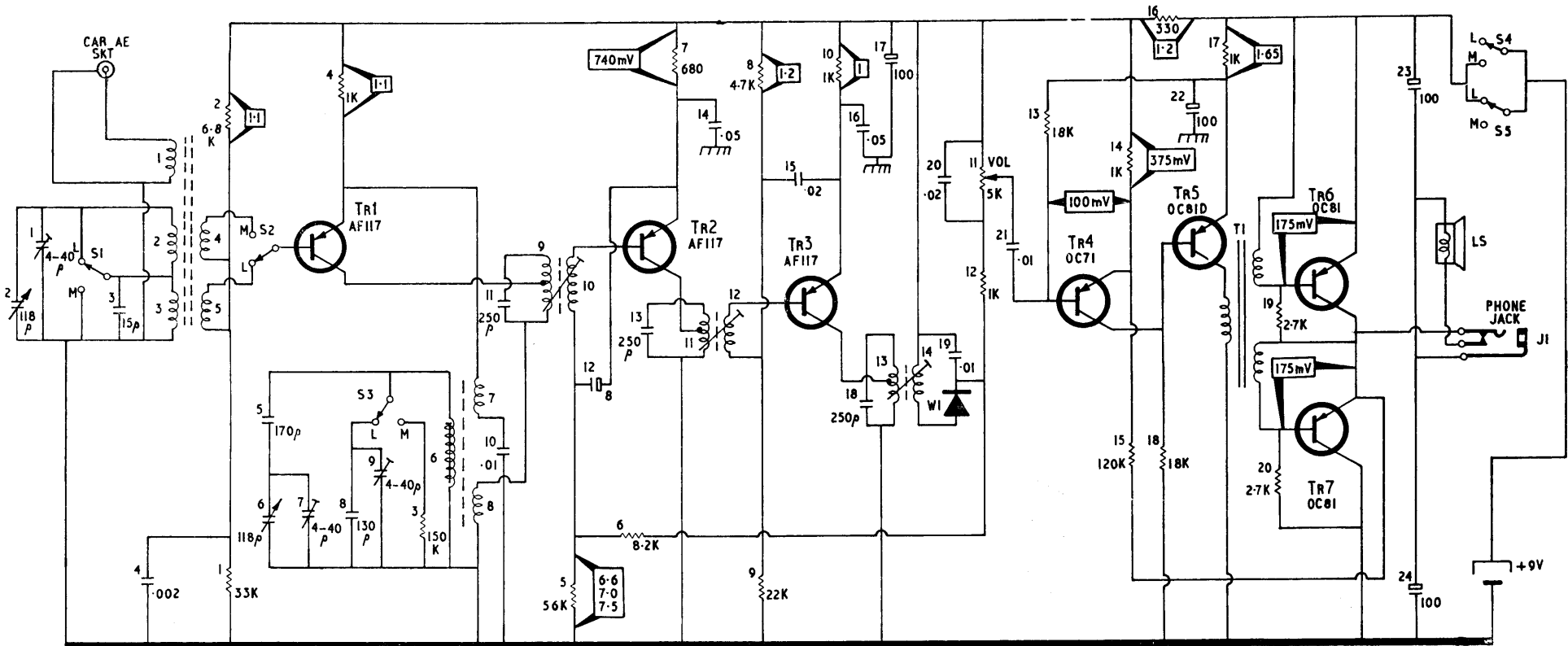
Voltages. Readings given on circuit are taken with a 20K-per-volt meter. Three figures at junction R5/R6 correspond to 475kc/s inputs of 30µV, 300µV and 3mV respectively injected as for IF alignment.

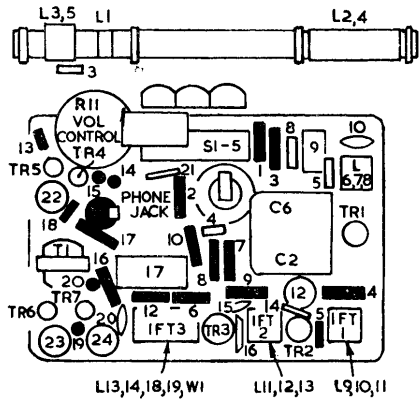
Circuit differences. Referring to the printed panel layout diagram, on some early receivers C2 was the front section of the gang, with C6



behind; also, C1 and C7 were in the reverse positions to those shown.

Oscillator operation. When Tr1 stage is operating correctly the emitter should be slightly





more negative than the base. This relationship is reversed when the stage ceases to oscillate.

Output stage. If this stage fails to operate, check first that switch associated with ear-phone socket is making proper contact. Speaker circuit is completed via spring contacts of this switch, which should be closed with plug removed.

CIRCUIT DESCRIPTION

RF and oscillator. When switched to LW, L2 is shorted by Sw1, when on MW, L3 and C3 are shorted. C1/C2 tune the selected aerial coil, with C3 added on LW. Signal is inductively coupled from L2/3 to L4/5 and applied via Sw2 to Tr1 base. Tr1 is a self-oscillating mixer with collector to emitter feedback via L8/7. Tertiary winding L6 controls local oscillator signal and is tuned by C5-7, paralleled by C8/9 on LW and R3 on MW. R4 stabilises Tr1 emitter and R1, R2 and C4 provide base bias.

IF stages. IF signal across first IF transformer is fed to base of Tr2, which operates with base bias provided by R5/6 and R11/12, emitter being stabilised by R7. Second IF transformer in Tr2 collector circuit feeds signal to base of Tr3, in the collector circuit of which is final IF transformer. The latter incorporates a diode for sound detection, signal being developed across R11.

Positive voltage across R11 is fed as AGC bias to Tr2 via R6, C12 providing decoupling. AGC is not applied to Tr3, base bias being set by R8/9.

Audio stages. R12/C20 constitute an IF filter to keep IF out of volume control R11. Signal is fed to base of Tr4, which amplifies and develops its output across R18, collector being DC coupled to base of driver stage Tr5.

Transformer in Tr5 collector circuit acts as a phase splitter, providing separate signals to bases of Tr6 and Tr7.

Output transistors operate in class B mode, with a small standing current to minimise crossover distortion. Supply voltage to output stage is effectively centre tapped by C23/24, the speaker being directly coupled to junction of two transistors. Negative feedback is applied over audio stages by R15 from output to Tr4 emitter. R19/20 provide tone correction.

ALIGNMENT

Equipment required. Signal generator covering 200-1500kc/s, with 30 per cent AM modulation. Avo model 8. 0.1mF. Coupling loop.

Setting up. Remove printed panel assembly and dismount speaker. Mount a temporary scale backing card to the tuning gang and inscribe on it a cursor line running through the spindle and parallel to side of printed board. Place scale on spindle, and relate calibration markers on scale to temporary cursor for alignment purposes.

Connect meter across speaker and set volume control to maximum. During alignment adjust the input level to maintain an output of 1-1.4V RMS. For IF alignment, C2 must be located; this is normally the section of gang next to printed panel, C6 being nearest the spindle. In some early receivers the reverse is the case. In either, the best injection point is at the yellow lead to ferrite rod aerial.

Procedure, IF. Switch to MW and turn tuning gang to minimum capacitance. Apply a 475kc/s modulated signal via 0.1mF across C2 and adjust IFT 1, 2 and 3 for maximum output, repeating until no further improvement results.

Procedure, RF. Inject signal via a loop loosely coupled to ferrite rod, switch to MW and apply 650kc/s. Set cursor to MW Pad position and adjust L6 and L2 for maximum output (L2 adjusted by sliding along former). Change input to 1400kc/s, set cursor MW Trim position and adjust C7 and C1 for maximum.

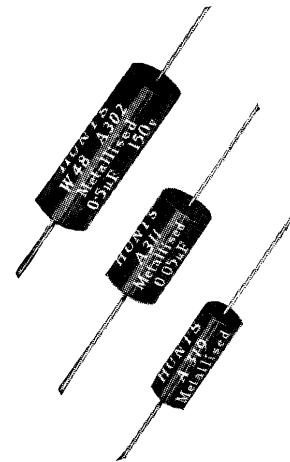
Switch to LW, apply 220kc/s, set cursor to LW Trim position and adjust C9 and L3 for maximum (L3 by sliding along rod).

INDUCTORS

Component	Value	ohms
L1	...	2.75
L2	...	14.0
L3	...	4.0
L6	...	3.0
L9	...	4.5
L11	...	4.5
L13	...	3.4
T1 (prim)	...	200.0
T1 (each sec.)	...	100.0
All others	...	less than 1ohm.



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TYPE W48 STANDARD RANGE				
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List No.	µF	DIMENSIONS (INCHES)		LIST PRICE
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150 VOLTS DC WORKING				
				s. d.
A300	0.1	7/8	3/8	1.6
A301	0.25	7/8	1/2	2.0
A302	0.5	1 1/8	1/2	2.6
A303	1	1 3/8	5/8	3.3
A304	2	1 7/8	1 1/8	5.0
250 VOLTS DC WORKING				
A305	0.05	7/8	3/8	1.6
A306	0.1	7/8	3/8	1.6
A307	0.25	1 1/8	1/2	2.3
A308	0.5	1 1/8	5/8	2.9
A309	1	1 3/8	3/4	3.9
A310	2	2 1/8	3/4	6.0
350 VOLTS DC WORKING				
A336	0.05	7/8	3/8	1.6
A337	0.1	7/8	1/2	1.9
A338	0.25	1 1/8	1/2	2.6
A339	0.5	1 3/8	5/8	3.3
A340	1	1 7/8	1 1/8	4.6

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