

FERGUSON 702, 705

Six-valve, plus rectifier and electronic tuning indicator, super-het covering three wavebands, with push-pull output in table (702) and radiogram (705) models, and suitable for 200-250-volt A.C. supplies. Marketed in 1938. T.E.I Service, 64, Jersey Street, Ancoats, Manchester, 4.

Circuit.—On medium and long bands the aerial is coupled to the grid circuit of V1 by being connected across C4, the A.V.C. decoupling condenser, in the bottom of the circuit. On S.W. the aerial is connected through C3 to the top of the tuned circuit.

V1 is the frequency-changer. The oscillator section is tuned grid. On L.W. oscillation is caused by energy fed back from the anode via C9 and applied across the padding condenser, T9, in the grid circuit.

The M.W. coupling is both inductive by L6 and reactive by T6. The S.W.

coupling is by L7 direct in the anode circuit. R28, although coming within the anode arrangements, is actually the oscillator grid resistance. R6 is permanently across the grid circuit to tie it down during switching operations.

Trimmer tuned I.F. transformers link up V2, the I.F. amplifier, and V3, the double-diode triode. The diodes are strapped, and the load, R11, provides L.F. via an I.F. filter R12-C12 and an L.F. coupler C13. A.V.C. is taken off a wire which passes to the pick-up switch and serves to connect the P.U. across C13-R13 when the switch is closed.

V5, the cathode-ray type tuning indicator, is also controlled from the A.V.C. line. The grid of the triode section of V3 is biased, together with the grid of V4, by being taken to the negative end of a resistance, R21, between chassis and H.T. negative. The voltage across R21 should be 2-3 volts.

The triode section of V3 has a parallel tone control circuit in C18-R17 and C19 for an I.F. filter. The anode is resistance and capacity coupled to V7, one of the push-pull output pentodes.

V4 is a phase inverter to feed a signal of opposite polarity to V6. It is not, therefore, required to amplify, and so is driven from the anode of V3 via a step-down potentiometer, R18-R19, arranged to offset the valve gain.

The opposite phase outputs of V6 and V7 are combined in a centre-tapped push-pull output transformer. There are parasitic oscillation stoppers in R26, R27, and a high-impedance connection is provided for an extension speaker with its own matching transformer.

H.T. is provided by V8, a full-wave rectifier, with L17, the speaker field, and electrolytics, C26 and C27, for smoothing.

GANGING

I.F. Circuits.—Insert .25 meg. leak between V1 grid and grid clip and inject 465 kc. to grid via 250 mfd's. Adjust four I.F. trimmers for maximum on output meter, keeping input low to reduce A.V.C. effects.

S.W. Band.—This must be adjusted first, as the padder is in series with M. and L.W. padders.

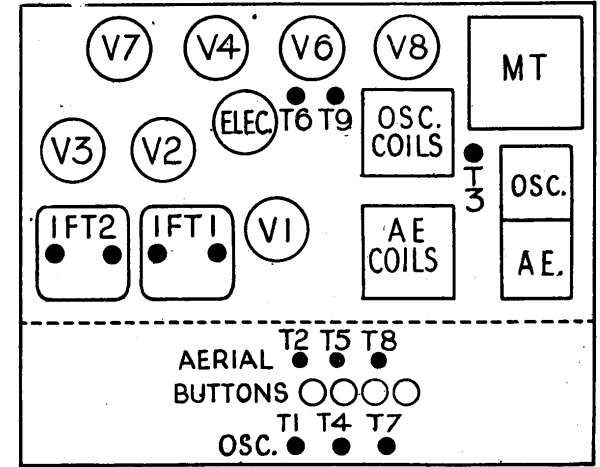
Tune to 15 m.c., inject 20 m. to aerial and earth, and adjust T1 (using peak at least capacity setting) and T2.

Tune to 6 m.c., inject 50 m. and pad with T3 while rocking gang slightly.

M.W. Band.—Tune to 250 m., inject 1,200 kc., and adjust T4 and T5. Tune to 520 m., inject 580 kc., and pad with T6.

L.W. Band.—Tune to 1,250 m., inject 240 kc., and adjust T7 and T8. Tune to 2,000 m., inject 150 kc., and pad with T9.

Diagram of the Ferguson chassis with the front side included in order to show the positions of the trimmers.



WINDINGS

| L. | Ohms. | L. | Ohms. |
|----|-------|----|-----------|
| 1 | 17 | 11 | 12 |
| 2 | 3 | 12 | 9 |
| 3 | .1 | 13 | 330 + 330 |
| 4 | .5 | 14 | .5 |
| 5 | .3 | 15 | .15 |
| 6 | .1 | 16 | 2 |
| 7 | .1 | 17 | 1,000 |
| 8 | .5 | 18 | 14 - 17.5 |
| 9 | .9 | 19 | 100 + 700 |
| 10 | 11 | | |

VALVE READINGS

| V. | Type. | Electrode. | Volts. | Ma. |
|-------|-------|------------|----------|------|
| 1 | 6A8 | Anode | 245 | 4.7 |
| | | Screen | 93 | 3.8 |
| | | Osc. anode | 140 | 2.5 |
| 2 | 6U7 | Cathode | 2 | 11.0 |
| | | Anode | 245 | 6.8 |
| | | Screen | 93 | 1.8 |
| | | Cathode | 2 | 8.6 |
| 3 | 6Q7 | Anode | 118 | .4 |
| 4 | 6C5 | Anode | 50 | .8 |
| 5 | 6G5 | Anode | 245 | — |
| 6 & 7 | 6V6 | Anode | 238 | 27 |
| | | Screen | 245 | 1.5 |
| | | Cathode | 15 | — |
| 8 | 5Y3G | Cathode | 350 D.C. | — |

CONDENSERS

| C. | Mfd's. | C. | Mfd's. |
|----|-------------|----|-------------|
| 1 | 500 mmfd's. | 15 | 100 mmfd's. |
| 2 | 100 " | 16 | .1 |
| 3 | 20 " | 17 | 250 mmfd's. |
| 4 | .004 " | 18 | .01 |
| 5 | .1 | 19 | 250 mmfd's. |
| 6 | 250 mmfd's. | 20 | .01 |
| 7 | .1 | 21 | .25 |
| 8 | .1 | 22 | .25 |
| 9 | 250 mmfd's. | 23 | .01 |
| 10 | .1 | 24 | .01 |
| 11 | 250 mmfd's. | 25 | 5 |
| 12 | 250 " | 26 | 8 |
| 13 | .02 | 27 | 16 |
| 14 | .02 | | |

RESISTANCES

| R. | Ohms. | R. | Ohms. |
|----|---------|----|---------|
| 1 | 10,000 | 16 | 250,000 |
| 2 | 3 meg. | 17 | 100,000 |
| 3 | 150 | 18 | .5 meg. |
| 4 | .5 meg. | 19 | 35,000 |
| 5 | .5 meg. | 20 | 25,000 |
| 6 | .5 meg. | 21 | 25 |
| 7 | 2,500 | 22 | 250,000 |
| 8 | 25,000 | 23 | .5 meg. |
| 9 | 25,000 | 24 | 300 |
| 10 | 300 | 25 | .5 meg. |
| 11 | .5 meg. | 26 | 100 |
| 12 | 25,000 | 27 | 100 |
| 13 | .5 meg. | 28 | 50,000 |
| 14 | .5 meg. | 29 | 250,000 |
| 15 | 25,000 | | |

