FERGUSON 881, 884

Four-valve, plus rectifier, three-waveband superhet, with seven-station press-button tuning and manual. Wavechange and radiogram switch, also by press-button. Provision is made for a pickup and high impedance extra loudspeaker. The 881 is a table model and the 884 a console; both operate from AC or DC mains, 200–250 v.

THE basic chassis and circuit of Models 801 and 804 are employed in these Ferguson Models, with the addition of a seven-station push-button unit. As will be seen from the accompanying circuit diagram, the station push-buttons control switches which bring into circuit trimming condensers designated TC1-TC14 in the circuit diagram.

Trimmers TC1-TC7 are shunted across the aerial tuning coils as and when required, while trimmers TC8-TC14 are switched across the oscillator coils.

In the Models 881 and 884 the station button trimmers may be adjusted through the holes in the bottom of the cabinet. Page iv gives the layout of the trimmers looking at the underside of the chassis. The trimmers cover the following wavebands :—

MEDIUM WAVES

1. 200-300m.
2. 250-350m.
3. 300-400m.
4. 350-500m.
5. 400-550m.

LONG WAVES

6. 1000-1600m.
7. 1400-200m

Select the button covering the wavelength of the required station, and adjust the oscillator trimmer until the station is heard. Then adjust the RF trimmer for maximum output. Finally, readjust both trimmers.

If the station to which the button is being adjusted is not very strong, it may be difficult to hear it on the oscillator trimmer while the RF is far off tune. It may then be necessary to tune both trimmers to the nearest strong known station, and then to take the R.F. trimmer up or down in small steps, searching on the oscillator trimmer for the required station at each step. Alternatively, a signal generator is useful for rough adjustment.

FERGUSON 882, 885

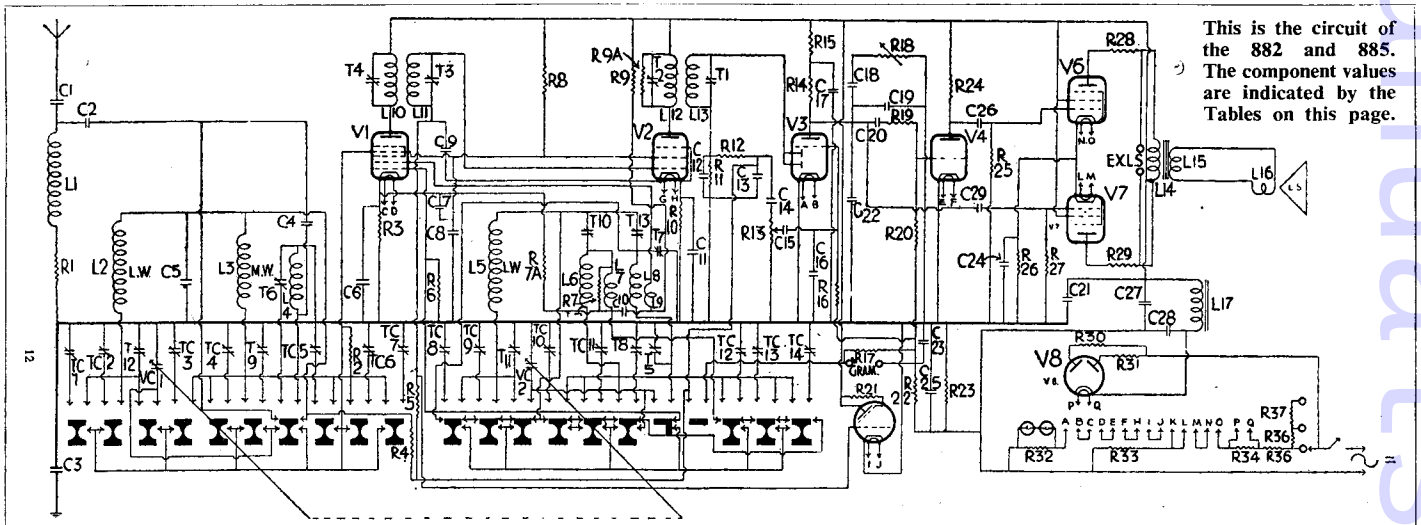
Six-valve, plus rectifier and CR tuning indicator, three wave-band superhet, with seven-station press-button tuning and manual. Press-button wavechange and radiogram switching. The 882 is a table model and the 885 a radiogram, both operating from AC or DC mains, 200–250 v. Marketed 1938. Service by TEI Service, Ltd., 55, Blossom Street, Manchester, 4.

THESE models incorporate the basic chassis and circuit of the Ferguson Models 802 and 805, reviewed elsewhere in this issue, with the addition of a seven-station push-button unit.

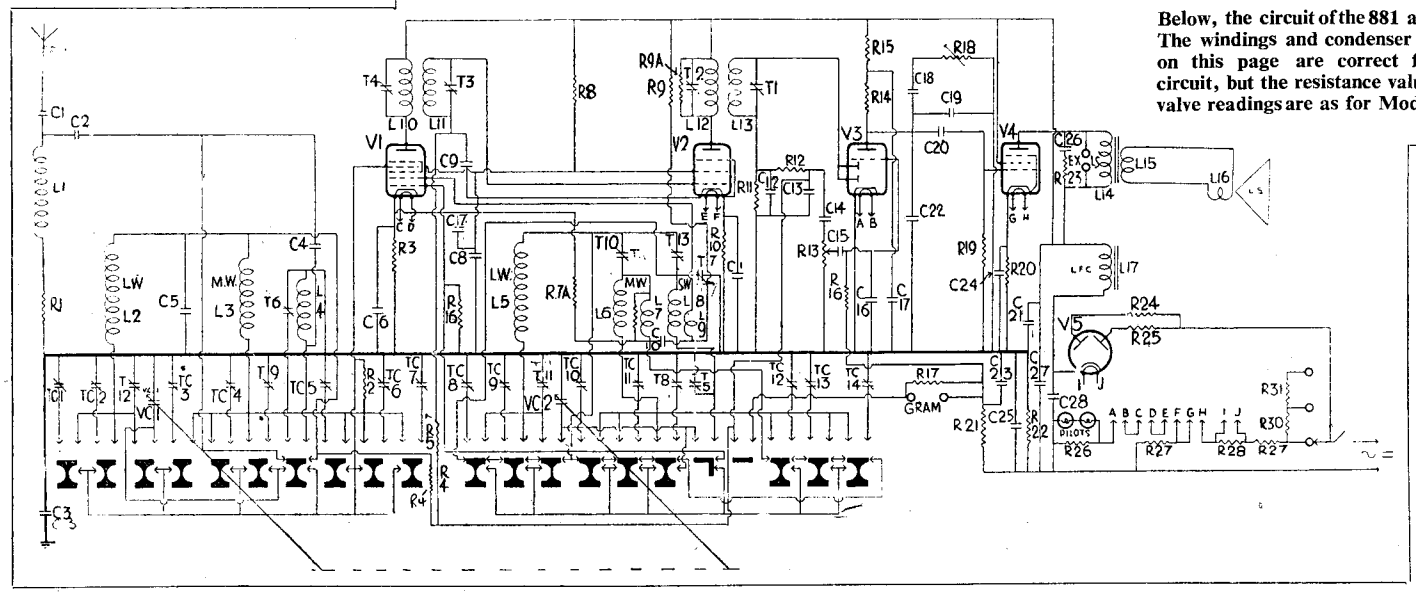
The station buttons switch trimming condensers across the aerial and oscillator coils as required. The aerial trimmers are TC1-TC7 in the accompanying circuit diagram and the oscillator trimmers TC8-TC14. The setting up of the station button trimmers is as described in the reviews of the Models 881 and 884.

GANGING

As for Ferguson Models 801 and 804.



This is the circuit of the 882 and 885. The component values are indicated by the Tables on this page.



Below, the circuit of the 881 and 884. The windings and condenser figures on this page are correct for this circuit, but the resistance values and valve readings are as for Model 801.

CONDENSERS

C		Mfds
1	..	.0005
2	..	.0001
3	..	.1
4	..	20 mmfd
5	..	.004
6	..	.1
7	..	.00025
8	..	.1
9	..	.1
10	..	.00025
11	..	.1
12	..	.00025
13	..	.00025
14	..	.02
15	..	.02
16	..	.0001
17	..	.1
18	..	.01
19	..	.00025
20	..	.01
21	..	.25
22	..	.00025
23	..	.25
24	..	.5
25	..	25
26	..	.01
27	..	16
28	..	16
29	..	.01

WINDINGS

L		Ohms
1	..	20
2	..	17
3	..	3
4	..	1
5	..	5
6	..	3
7	..	.1
8	..	.1
9	..	.5
10	..	9
11	..	11
12	..	9
13	..	12
14	..	330
15	..	.5
16	..	2
17	..	230
Pick-up*	..	2,000

* Model 885 radiogram.

RESISTANCES

R		Ohms	R		Ohms
1	..	10,000	20	..	35,000
2	..	3 meg	21	..	.25 meg
3	..	150	22	..	.25 meg
4	..	.5 meg	23	..	25
5	..	.5 meg	24	..	.25 meg
6	..	.5 meg	25	..	.5 meg
7	..	2,500	26	..	300
8	..	25,000	27	..	.5 meg
9	..	25,000	28	..	100
10	..	300	29	..	100
11	..	.5 meg	30	..	100
12	..	25,000	31	..	100
13	..	.5 meg	32	..	90
14	..	.25 meg	33	..	277
15	..	50,000	34	..	166
16	..	.5 meg	35	..	290
17	..	25,000	36	..	45
18	..	100,000	37	..	45
19	..	.5 meg			

FERGUSON 801, 804

Four-valve, plus rectifier, three-waveband superhet, for operation from AC or DC mains, 200–250 v, 40–100 cycles. Press-button wave-change and radiogram switches, but manual tuning. Provision is made for a pickup and a high impedance extra speaker. The 801 is a table model and the 804 a console.

SIGNALS are fed via the series condenser, C1, to the aperiodic choke, L1, and resistance, R1, and thence by C2 to the tuning coils L2 (LW), L3 (MW), L4 (SW) which are tuned by VC1 section of the ganged condenser. From these circuits the signal is fed to the control grid of the mixer, V1, which is biased by R3 decoupled by C6.

The oscillator coils are L5 (LW), L6 (MW) and L8 (SW) with reaction windings L7 and L9 for the MW and SW coils. Additional coupling is effected by the padders T7 (SW), T10 (MW) and T13 (LW). The oscillator coils are tuned by VC2 section of the ganged condenser.

IF signals are transferred by the IF transformer L10, L11, to the IF amplifying pentode, V2, which is biased by R10 decoupled by C 11.

A second IF transformer, L12, L13, hands on the signal to the strapped diodes of the double diode triode, V3. R11 is the load resistance and the LF signal is IF filtered by R12 and C12 and fed via C14 to the volume control, R13. From this component the signal is coupled by C15 to the grid of the triode section of the valve.

AVC is obtained from the DC component built up across R11 and is fed via decoupling components R4 and R5 to the grid circuits of V1 and V2.

V3 cathode is taken straight to chassis and biasing is obtained by connecting the grid circuit via decoupling components to the negative end of R22, which is between HT negative and chassis. The resistance is decoupled by C25.

Pick-up sockets are provided for connecting a pickup into the grid circuit of V3 via the "Gram" push-button switch, which feeds the pickup output to the volume control. The earthy side of the pickup is isolated from the chassis by C23.

The output from V3 is resistance capacity coupled by R14 and C20 to the grid of the pentode output valve, V4. C19 and C22 comprise the anode HF by-pass and a tone control circuit comprising C18 and R18 is connected between anode and chassis. The anode circuit is decoupled by R15, C17.

V4 is cathode biased by R20 decoupled by C24 and the output is transformer coupled by L14, L15, to the speech coil, L16, of the permanent magnet speaker.

A permanent degree of tone correction is effected by R23 and C26 which shunt L14, which across this winding are also connected the extra loudspeaker sockets. Therefore, an extra loudspeaker must be of the high impedance type or fitted with a suitable pentode matching transformer.

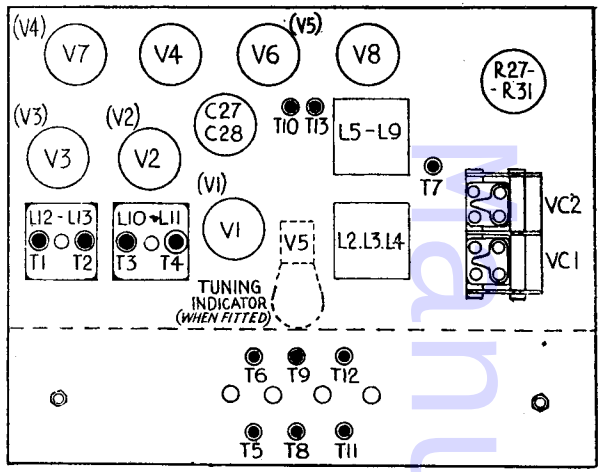
The HT circuit comprises the full-wave rectifier, V5, with its anodes strapped for half-wave rectification with C28 the reservoir condenser, L17 the smoothing choke, and C27 the smoothing condenser.

The heater circuit comprises the voltage droppers R29, R30, R31, with shunts R26 across the pilot lamps and R28 across V5 heater. R27 shunts V1-V3 heaters.

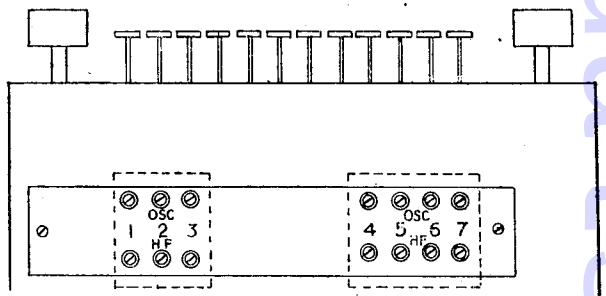
GANGING

IF Circuits.—Remove grid clip from V1 and connect a .5 megohm resistance between valve grid and grid clip. Inject a 465 kc signal into the grid of V1 via a 250 mmfd condenser (if service oscillator

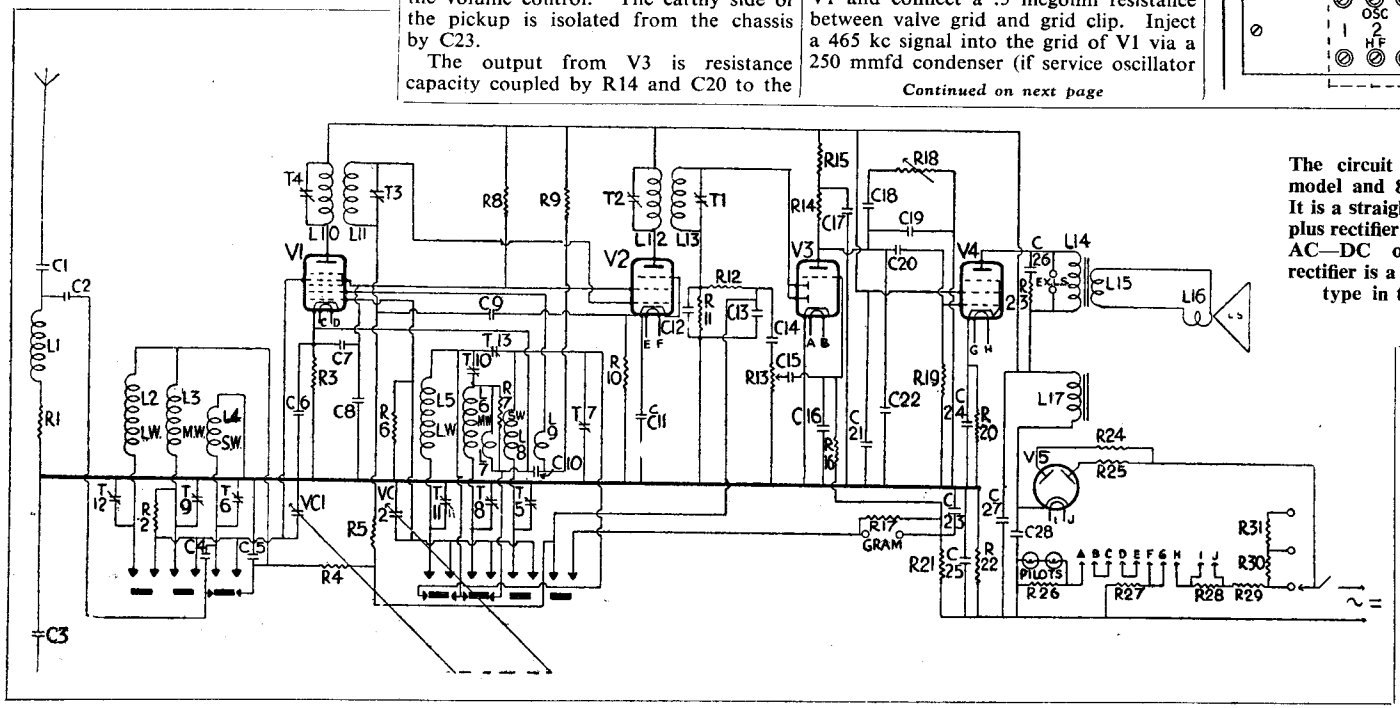
Continued on next page



The standard chassis used in the Ferguson models. The numbers in brackets apply to the five-valve models. Trimmers are the same for all versions.



Left : The station button trimmer layout for Models 881, 882, 884, and 885.



The circuit for the 801 table model and 804 console version. It is a straightforward four-valve plus rectifier type. The set is for AC—DC operation and the rectifier is a twin-path half-wave type in the usual circuit

WINDINGS

L	Ohms
1	20
2	17
3	3
4	.1
5	5
6	3
7	1
8	.1
9	.5
10	9
11	11
12	9
13	12
14	500
15	.5
16	2
17	230

CONDENSERS

C	Mfd	C	Mfd
1	.0005	15	.02
2	.0001	16	.0001
3	.1	17	.1
4	20 mmfd.	18	.01
5	.004	19	.00025
6	.1	20	.01
7	.00025	21	.25
8	.1	22	.00025
9	.1	23	.25
10	.00025	24	5
11	.1	25	25
12	.00025	26	.01
13	.00025	27	16
14	.02	28	16

RESISTANCES

R	Ohms	R	Ohms
1	10,000	17	25,000
2	3 meg	18	100,000
3	150	19	.5 meg
4	.5 meg	20	300
5	.5 meg	21	.25 meg
6	.5 meg	22	35
7	2,500	23	10,000
8	25,000	24	100
9	25,000	25	100
10	300	26	90
11	.5 meg	27	193
12	25,000	28	166
13	.5 meg	29	332
14	.25 meg	30	45
15	50,000	31	45
16	.5 meg		

MODELS 801, 804 *Continued*

output does not incorporate a feed condenser) and adjust T1, T2, T3 and T4 for maximum output.

SW Band.—Switch receiver to SW and adjust pointer to 15 megacycles. Inject a 15 megacycles signal into the aerial socket and adjust T5 and T6 for maximum output. Inject and tune in a 6 megacycle signal and adjust T7 while rocking gang to obtain maximum output. Retrim at 15 megacycles.

MW Band.—Inject and tune in a 1200 kc signal and adjust T8 and T9 for maximum output.

Inject and tune in a 580 kc signal and adjust T10 for maximum output while rocking gang.

Check over T8 and T9 adjustments.

LW Band.—Inject and tune in a 240kc signal and adjust T11, T12, for maximum output.

Inject and tune in a 145 kc signal and adjust T13 for maximum output while rocking gang.

Readjust T11 and T12 if necessary.

VALVE READINGS

V	Type	Electrode	Volts	Ma.
1	6A8G	Anode	240	5.2
		Osc. anode	138	3.1
		Screen	90	3.4
		Cathode	1.8	—
2	6U7G	Anode	240	7.2
		Screen	90	2.1
		Cathode	2.2	—
3	6Q7G	Anode	115	.4
		Grid	2.3	—
4	6V6G	Anode	220	35
		Screen	240	3.2
		Cathode	12	—
5	25Z6G	Cathode	340	—

Pilot lamps 6-8v, .3 amps MBC.

Above voltages apply when the smoothed HT measures 240v with a 1,000 opv meter, receiver switched to MW, gang fully meshed, A and E shorted and vol control at minimum.

Motor Field Winding

WHEN replacing the field coils on small electric motors after rewinding, be very careful to see that the turns are in the same direction as formerly and that the connections are the same. If not the motor will run slow and fail to turn a record when the pick-up is in position. If in any doubt, change the connections to one field coil.

The coils can be tested for correct connections by passing a current from a dry cell or accumulator through them and testing for polarity of the magnet poles. In a two-pole machine the opposite poles should have different polarity and a small compass will indicate if this is the case.—F. D-L.

FERGUSON 802, 805

Six-valve, plus rectifier and CR tuning indicator, superhet, with push-pull output. Manual tuning with press-button wavechange and radio-gram. switches. For operation from AC or DC mains, 200–250 v. The 802 is a table model and the 805 a radiogram.

THESE models employ a similar chassis and circuit to those in the Models 801-804 reviewed elsewhere in this issue. The essential differences are, the addition of a cathode ray tuning indicator and a push-pull output.

From the accompanying circuit diagram it will be seen that the cathode ray tuning indicator is designated V5 and its control grid is fed from the grid circuit end of R5, which is the AVC line to V2.

To feed the push-pull output the LF output from the anode circuit of V3 is split into two channels. One feeds direct via C29 to one of the output pentodes, V7, while the other channel is taken via C20 to a potential divider R19, R20, which cuts down the signal fed to the grid of the phase reversal valve ,V4, and thus compensates for the extra amplification of this valve.

The output from V4 is resistance capacity coupled by R24 and C26 to the grid of the second pentode output valve, V6.

Anode instability suppressors, R28 R 29, are connected in the anode circuit of V6 and V7, and extra loudspeaker sockets for a high impedance speaker are provided across the primary of the output transformer L14, L15.

Ganging is same as with 801.

CONDENSERS

C	Mfd	C	Mfd
1	.0005	16	.0001
2	.0001	17	.1
3	.1	18	.01
4	20 mmfd.	19	.00025
5	.004	20	.01
6	.1	21	.25
7	.00025	22	.00025
8	.1	23	.25
9	.1	24	.5
10	.00025	25	25
11	.1	26	.01
12	.00025	27	16
13	.00025	28	16
14	.02	29	.01
15	.02		

WINDINGS

L	Ohms	L	Ohms
1	20	10	9
2	17	11	11
3	3	12	9
4	.1	13	12
5	5	14	330
6	3	15	.5
7	1	16	2
8	.1	17	230
9	.5	Pickup*	2000

* Model 805 Radiogram.

VALVE READINGS

V	Type	Electrodes	Volts	Ma.
1	6A8G	Anode	245	4.7
		Osc anode	140	2.5
		Screen	93	3.8
		Cathode	2	—
2	6U7G	Anode	245	6.8
		Screen	93	1.8
		Cathode	2	—
3	6Q7G	Anode	118	.4
		Grid	2.2	—
4	6C5G	Anode	50	.8
5	6G5	Anode	245	—
6, 7	6V6G	Anode	238	27
		Screen	245	1.5
		Cathode	15	—
8	25Z6G	Cathode	340	—

Pilot lamps 6-8v, .3 amps MBC.

Voltages measured with a 1,000opv meter, A and E shorted, vol control at minimum, gang maximum capacity on MW.

RESISTANCES

R	Ohms	R	Ohms
1	10,000	20	35,000
2	3 meg	21	.25 meg
3	150	22	.25 meg
4	.5 meg	23	25
5	.5 meg	24	.25 meg
6	.5 meg	25	.5 meg
7	2,500	26	300
8	25,000	27	.5 meg
9	25,000	28	100
10	300	29	100
11	.5 meg	30	100
12	25,000	31	100
13	.5 meg	32	90
14	.25 meg	33	277
15	50,000	34	166
16	.5 meg	35	290
17	25,000	36	45
18	100,000	37	45
19	.5 meg		

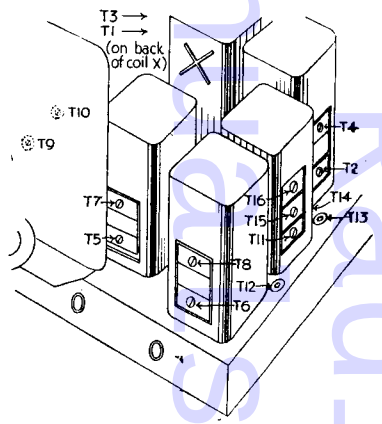
FERGUSON 378

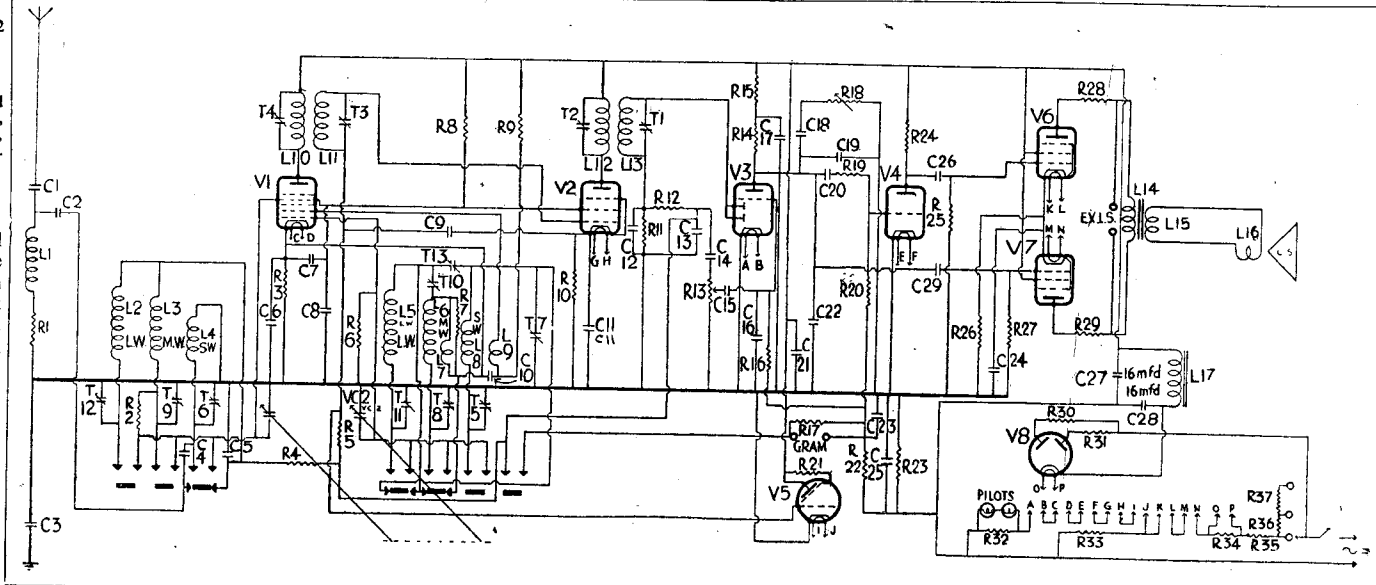
IN the January issue we published service sheets for the Ferguson 378 AC and 378 AC-DC. It appears that the trimmer positions given are not those found in the majority of models.

A revised diagram is given below and the trimmer numbers correspond to those given in the circuit and text for the AC model on page vi of the January issue.

The same instructions apply to AC-DC models and the details given previously for that set should be ignored.

The IF of both AC andAC-DC models is 465 kcs.





In the 802 table model and 805 radiogram there are eight valves against the five of the 801. Push-pull output is provided with a phase reversing input stage. The third additional valve is a CR type tuning indicator.