

FERGUSON 772 PUSH-BUTTON SEVEN

CIRCUIT.—Shunt feed from the aerial circuit is used on all wavebands, the aerial being connected through an isolating condenser to a resistance-inductance combination to which the tuned circuits are connected in shunt through a small condenser.

All circuit switching is accomplished by means of a special multiple push-button switch which provides the change-over from short, medium and long waves on input and oscillator coils as well as selecting pre-set condensers for automatic tuning. Details of the switching are given in a special note.

The switch bank connects the input circuit to the grid of V1, the frequency-changer, the oscillator circuits being normal. The anode circuit of V1 contains the first immediate frequency transformer which is trimmer tuned.

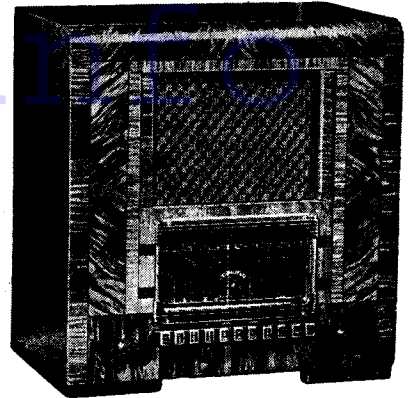
For I.F. amplification a variable pen-

tode, V2 is employed. Slight damping on the primary winding of the second I.F. transformer is used and the secondary works into a double diode triode V3.

Both diodes are strapped and provide the demodulation and A.V.C. voltage. A simple resistance-capacity filter is used, the output of the diode load being taken to the volume control. This works into the grid circuit of the triode section of V3.

V3 is resistance-capacity coupled, again through a simple grid filter, to V4, a triode which is provided with series bias. This acts as a paraphase valve and feeds one of the push-pull output valves, V6, while the other output valve, V7, has the grid circuit connected to the anode load of V3 through the usual coupling condenser.

The tuning indicator is of the magic
(Continued on page 50.)



In the 772 push-buttons select the bands for both manual and auto tuning.

VALVE READINGS

No signal. Volume maximum. M.W. band. 200v. mains.

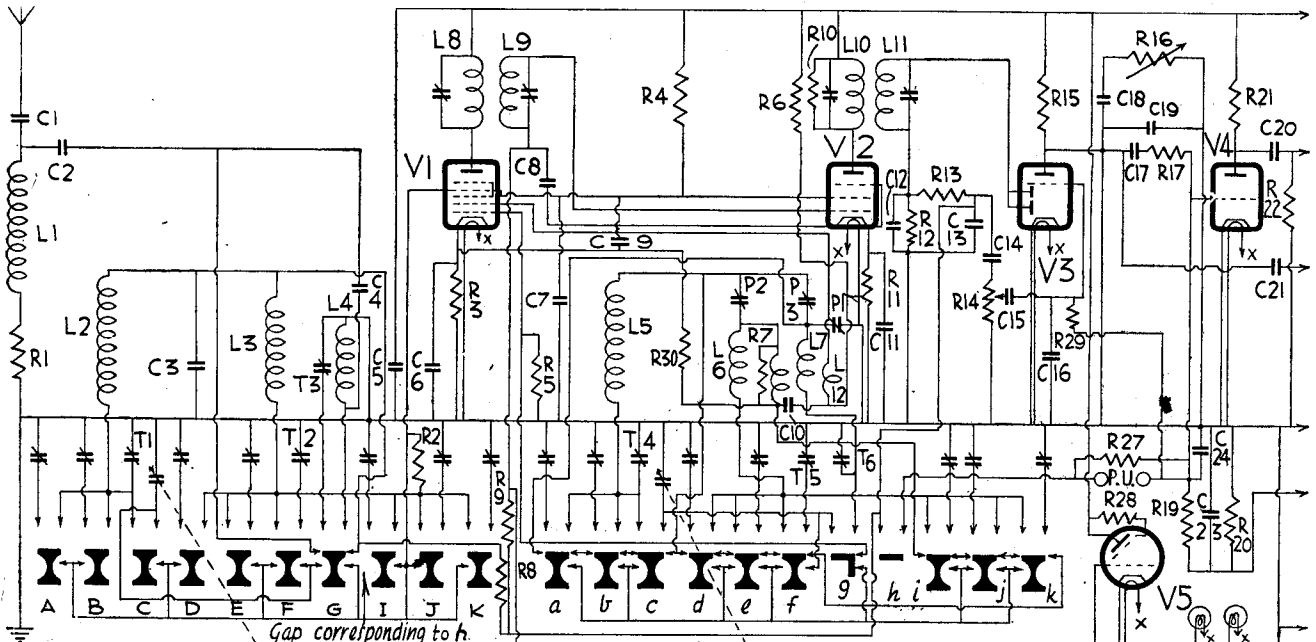
Valve	Type.	Electrode.	Volts.
1	6AG8 (Brimar)	Osc. anode	240
		Screen	90
2	6U7G (Brimar)	Anode	240
		Screen	90
3	6B7G (Brimar)	Anode	65
		Screen	90
4	6C5 (Mullard)	Anode	90
		Screen	90
5	6G5 Tuning indicator (Mullard)	Anode	250
		Screen	250
6	6V6G (Mullard)	Anode	240
		Screen	250
7	6V6G (Mullard)	Anode	240
		Screen	250
8	5Y3 (Mullard)	Cathode	330
		Screen	250

WINDINGS (D.C. RESISTANCES)

L.	Ohms.	Range.	Where measured.
1	21	—	On tags.
2	17.6	L.W.	V1 grid R8.
3	2.9	M.W.	V1 grid R8.
4	Very low	S.W.	Across T3.
5	5	L.W.	Red and white lead and P3.
6	2.1	M.W.	Brown lead and P2.
7	.1	S.W.	Yellow lead and P1.
8	9.2	—	V1 anode and H.T. plus.
9	13.8	—	V2 grid and (C8 and R9).
10	12.6	—	V2 anode and H.T. plus.
11	8.9	—	(R12 and R13) demodulating diode.
12	.5	—	(C10 and R6) osc. anode.
13	700	—	On tags.
14	15	—	Mains plug.
15	1,070	—	On tags.

CONDENSERS

C.	Purpose.	Mfds.
1	Series aerial	.0005
2	Aerial coupling	.0001
3	L.W. series aerial coupling	.004
4	S.W. aerial coupling	.00002
5	H.T. line shunt	.1
6	V1 cathode bias	.1
7	V1 and V2 screen decoupling	.1
8	V2 A.V.C. decoupling	.1
9	V1 screen S.W. decoupling	.00025
10	Osc. anode feed	.00025
11	V2 cathode bias shunt	.1
12	H.F. by-pass	.00025
13	H.F. by-pass	.00025
14	L.F. coupling	.02
15	V3 L.F.	.02
16	V3 grid shunt	.0001
17	V4 grid coupling	.01
18	Tone control	.05
19	V3 anode shunt	.00025
20	V6 grid coupling	.01
21	V7 grid coupling	.01
22	V6 and V7 bias shunt	5
23	V4 bias shunt	25
24	V4 bias decoupling	.25
25	H.T. smoothing	8
26	H.T. smoothing	16
27	Mains filter	.01



For more information remember
www.savoy-hill.co.uk

Press Button and Switch Notes

AUTOMATIC tuning is provided on the pre-set condenser system. The 11-button switch unit performs the operation of selecting pre-set condensers and the required coils, and also changes wavebands for manual operation.

Switching Explanation.—The multiple press-button switch unit shown in the main circuit diagram will be clearly understood by examining it in conjunction with the adjoining special switch diagram.

In the circuit, each black reel-shape indication represents a moving contact. Each button controls two of these reel-shape pieces, one switching the aerial circuit and the other the oscillator.

There are 11 buttons, and the respective contacts are shown in the circuit by the use of letters A-K for the aerial switches

and a-k for the oscillator switches. For example, one button operates contacts A and a.

Note that in the aerial section there is a gap corresponding to where the pick-up contact occurs in the oscillator section.

In the diagrams the moving contacts (reel-shape indications) "move" upwards when a button is pressed. Reference to the small diagram helps show what happens.

Directly in front of the blade is a pair of fixed contacts such as 1 and 4. There are also fixed side contacts such as 2 and 5, and 3 and 6. In the small diagram the blade X is shown in the normal position and the Y is shown depressed.

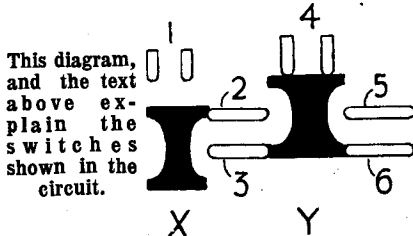
When a button moves forward it not only joins together the two contacts in front of it, but the tail connects with the two lower side contacts and disconnects the two upper contacts. Button Y, therefore, connects together the pair of contacts 4 and also contact 3 and contact 6, contacts 2 and 5 being broken.

On the input set of contacts, that is A to K, the top row of side contacts (such as 2 and 5 in the little drawing) are omitted except on button G.

In the circuit drawing all the fixed contacts are shown as arrow-heads, and the fixed side contacts are shown as short lines with an arrow-head at each end.

Certain side contacts are not actually double-ended, and again, one or more may be missing from a certain button.

(Button Adjustment and Ganging Notes on page 50.)



QUICK TESTS

Quick tests can be made on this receiver between the chassis and the following leads on the speaker strip:—

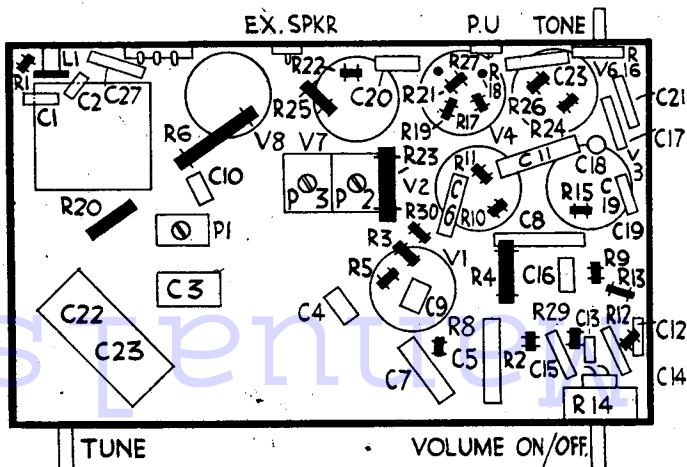
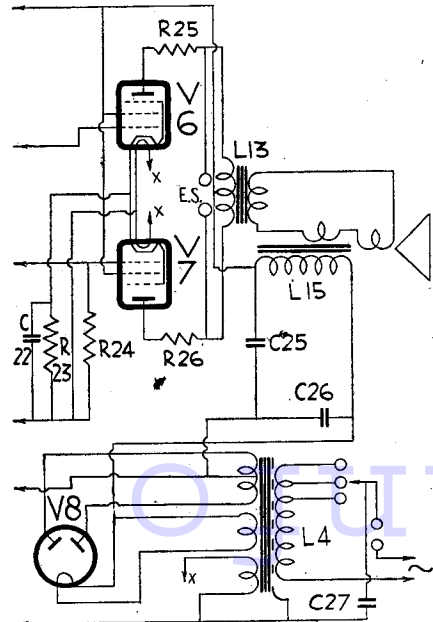
- Chassis—red, 250v., smoothed H.T.
- Chassis—blue, 240 v., output anodes.
- Chassis—red-white, 330v., unsmoothed H.T.

Left, the circuit, which is shown divided only for presentation reasons. The set incorporates push-pull with a paraphase valve.

Right, the underside of the chassis as seen with the push-button switch unit removed.

RESISTANCES

R.	Purpose.	Ohms.
1	Aerial input resistance	10,000
2	V1 grid series	3 meg.
3	V1 cathode bias	150
4	V1 and V2 screen decoupling	25,000
5	V1 osc. grid leak	500,000
6	V1 osc. anode feed	25,000
7	M.W. regeneration control	2,500
8	V1 A.V.C.	500,000
9	V2 A.V.C.	500,000
10	I.F.T.2 primary shunt	600,000
11	V2 cathode bias	300
12	Demod. diode load	500,000
13	H.F. filter	25,000
14	Volume control	100,000
15	V3 anode load	250,000
16	Tone control	100,000
17	V4 grid stopper	500,000
18	V4 grid leak	55,000
19	V4 grid decoupling	250,000
20	V4 series bias	50
21	V4 anode load	250,000
22	V6 grid leak	500,000
23	V6 and V7 cathode bias	300
24	V7 grid leak	500,000
25	V8 anode stabiliser	100
26	V7 anode stabiliser	100
27	Pick-up shunt	25,000
28	Tuning indicator feed	250,000
29	V3 grid leak	500,000
30	V1 osc. grid leak	50,000



Ferguson 772 on Test

MODEL 772.—A.C. operation, 200-250 volts, 50-100 cycles. Price, 14 gns.

DESCRIPTION.—Six-valve, plus rectifier and tuning indicator, push-button and manually operated, three-band superhet.

FEATURES.— Full vision scale, calibrated with names and wave-lengths, illuminated by pilot lamps on each side. Horizontally travelling indicator and an incorporated magic eye. Controls for tuning, volume combined with switching, and tone (located at the back). Press-buttons provide for short, medium and long wave-band switching, gramophone, five medium wave stations and two long wave stations. Sockets for pick-up, an external speaker, and leads with clips for aerial and earth connections.

LOADING.—75 watts.

Sensitivity and Selectivity

SHORT WAVES (16-50 metres).— Good gain and selectivity. Good performance at the higher frequency end; easy handling and no drift.

MEDIUM WAVES (190-550 metres).—Excellent gain and selectivity, with a clean background and well maintained sensitivity. Local stations spread on adjacent channels only.

LONG WAVES (900-2,000 metres).—Excellent gain and selectivity. Deutschlandsender received with very little side splash, a clean background and good reception on all main stations.

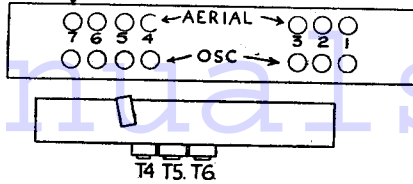
Acoustic Output

The push-pull stage gives ample volume for a large room. While there is a certain amount of crispness and clean attack, the tone is generally on the deep side and is very full. Speech is by no means unduly coloured and orchestral balance is pleasing, the middle and low note radiation being good.

Exact replacement condensers are available from A. H. Hunt, Ltd. For the block C22 and C23, there is unit 1020, 4s.; and for C25 and C26, 1014, 9s.

Ferguson 772

(Continued from page 48.)



eye type and is connected in an orthodox manner. The high tension supply is equally conventional and is obtained from a full-wave rectifier with the usual smoothing circuit embodying the speaker field as a choke.

Chassis Removal.—Chassis removal is a simple matter, it being necessary only to withdraw the two knobs from the front and the eleven push-button knobs—all simply pull-off. Before removing the push-buttons make a list giving their actual order. Then, on releasing the four retaining bolts, the chassis can be withdrawn. Should it be necessary to disconnect the speaker the four leads can be unsoldered from the strip or the speaker can be removed bodily as desired.

Special Notes.—The resistance R23, which is part of the tuning indicator feed network, will be found inside the cover of the cap housing the leads to the tuning indicator socket.

The resistance R10, having a value of 600,000 ohms, used as the shunt to the primary winding of the second intermediate transformer, is not inside the can but is connected to the valve socket.

In the chassis examined, R2 had a value of 2 megohms and not 3 as given by the makers' data sheet.

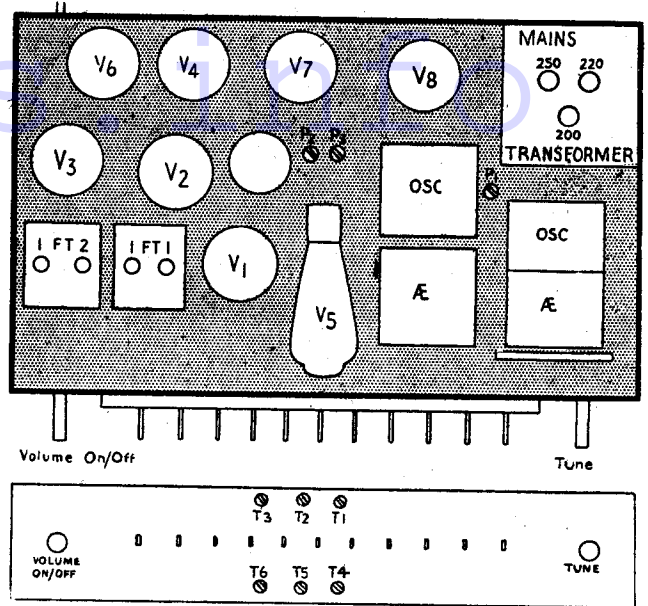
It is important to determine accurately the location of the three padders, as in the chassis tested the positions shown in the accompanying diagram were different from those given in the makers' leaflet.

In locating certain components it should be particularly noted that R23, the common cathode resistor for the output stages, resembles a moulded condenser.

Alignment Notes

I.F. Circuits.—Switch set to M.W., fully mesh gang, connect oscillator be-

Components on the top of the 772 chassis and the trimmers are identified by these diagrams.



tween grid of V1 and chassis via a small condenser, connect output meter.

Inject 465 kc. signal and adjust I.F. trimmers for maximum. Keep the signal as low as possible.

Signal Circuits.—First see that when the gang is fully meshed, the pointer is in line with the L of the Long Waves and the S of the Short Waves.

Short Waves.—Connect the oscillator to the aerial and earth of the receiver.

Tune set and oscillator to 15 mc. and adjust T6 and T3 in that order for maximum.

Tune set and oscillator to 6 mc. and adjust padder P1.

Repeat 15mc. adjustment.

Medium Waves.—Tune set and oscillator to 1,200 kc. and adjust T5 and T2.

Tune set and oscillator to 590kc. and adjust padder P2.

Repeat 1,200 kc. adjustment.

Long Waves.—Tune set and oscillator to 240 kc. and adjust T4 and T1.

Tune set and oscillator to 145 kc. and adjust padder P3.

Repeat 240 kc. adjustment.

Button Adjustment

To reset the buttons to different stations the following method is carried out:

With the set lying on its back the station trimmers are accessible through the holes in the bottom of the cabinet. As in the drawing, the oscillator trimmers are found nearer the front. Nos. 1, 2, 3, 4, and 5 cover the M.W. band:—

- No. 1, 200—300 metres.
- No. 2, 250—350 metres.
- No. 3, 300—400 metres.
- No. 4, 350—500 metres.
- No. 5, 400—550 metres.

Nos. 6 and 7 cover the L.W. band:—

- No. 6, 1,000—1,600 metres.
- No. 7, 1,400—2,000 metres.

When undertaking any adjustments which involve removing the name caps, first to compile a list giving the positions.

Pilot BT 530 Alignment

(Continued from page 53.)

I.F. Circuits.—The service oscillator must be set at 451 kc. Switch the receiver to medium waves and tune to maximum capacity. Connect an output meter.

Connect the aerial lead of the external oscillator to the control grid of V2 through a .1-mfd. fixed condenser. Connect the earth lead of the oscillator to the receiver earth clip. The I.F. alignment adjustments are located at the sides of the shielded I.F. transformers.

Rotate the adjusting screw of each tuner on I.F.T.2 slowly until maximum output is noted.

On completion of this operation, remove the external oscillator leads from V2 and connect it in the same manner to the control grid at the top of V1. Now rotate each adjustment screw on I.F.T.1 for maximum output.

During these operations, use the least possible input to prevent broadening of the resonance peaks. For the most accurate re-alignment of the I.F. amplifier it is essential to repeat the alignment process of both I.F. units with the external oscillator leads connected across the control grid of V1.

Medium Waves.—Connect the external oscillator leads to the receiver aerial and earth.

Tune set and oscillator to 200 m. Adjust T5 and then T2.

Tune set and oscillator to 500 m. Then rock the tuning control slightly and adjust the padder iron core.

Repeat the 200-m. adjustments.

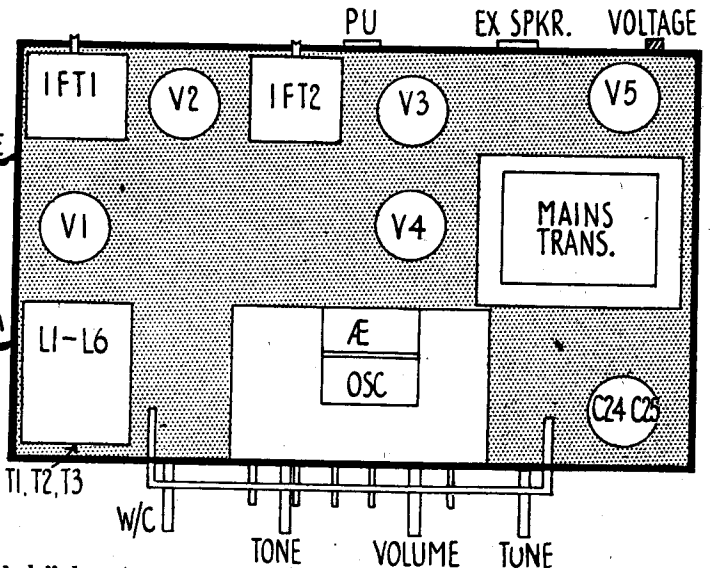
Short Waves.—Tune oscillator and receiver to 17 m.

Adjust T4 for maximum response. Adjust T1 for maximum.

Long Waves.—Tune oscillator and receiver to 1,100 metres.

Adjust T6 and then T3.

Tune set and oscillator to 1,900 metres and adjust P1.



Top "deck" layout of the Pilot BT530.