

# LISSEN 8453 PUSH-BUTTON FIVE

**CIRCUIT.**—When the set is used with manual control the input to V1 is by a band-pass circuit with inductive coupling. The aerial connection is taken either directly to a coupling coil or through the alternative socket and a resistance potentiometer. On short waves the band-pass input is cut out, the first tuned circuit being taken direct to the input of V1 through a very small coupling condenser.

This valve is a triode hexode mixer connected in an orthodox manner. The wave switching on the input and oscillator circuits provides for selection of the ordinary input and oscillator coils for the three wavebands and also separate input and oscillator coils for automatic tuning, the ganged condenser not being connected to these.

Intermediate amplification is carried out by V2, an H.F. pentode. The secondary of the second I.F.T. goes to the signal diode of V3, a double diode triode. The potentials from the diode load are tapped down and taken through a coupling condenser to the volume control, which works in the grid circuit of V3.

The other diode is used for A.V.C. and obtains a delay from the cathode bias resistance. The A.V.C. is taken through a conventional decoupling network to the grid returns of V1 and V2.

The audio frequency voltages are amplified by V3 and passed by a resistance coupling network to V4, the output valve. Negative feedback is obtained by means of a high resistance between the anodes of V3 and V4. As feedback is employed,

there is no shunt condenser on the anode of V4.

High tension is derived from U5, a full-wave rectifier, through the usual transformer in conjunction with a separate smoothing choke and two electrolytic condensers.

**Chassis Removal.**—The control knobs are held by a special type of spring clip, and great care must be exercised in removing them. After removing the knobs, the chassis can be completely withdrawn by releasing the four retaining bolts and unscrewing two small brackets which will be found holding the baffle to the inside of the cabinet.

This baffle carries the speaker and the press-button assembly, the wood structure being bolted to the main chassis. This enables the complete unit to be withdrawn without unsoldering any connections.



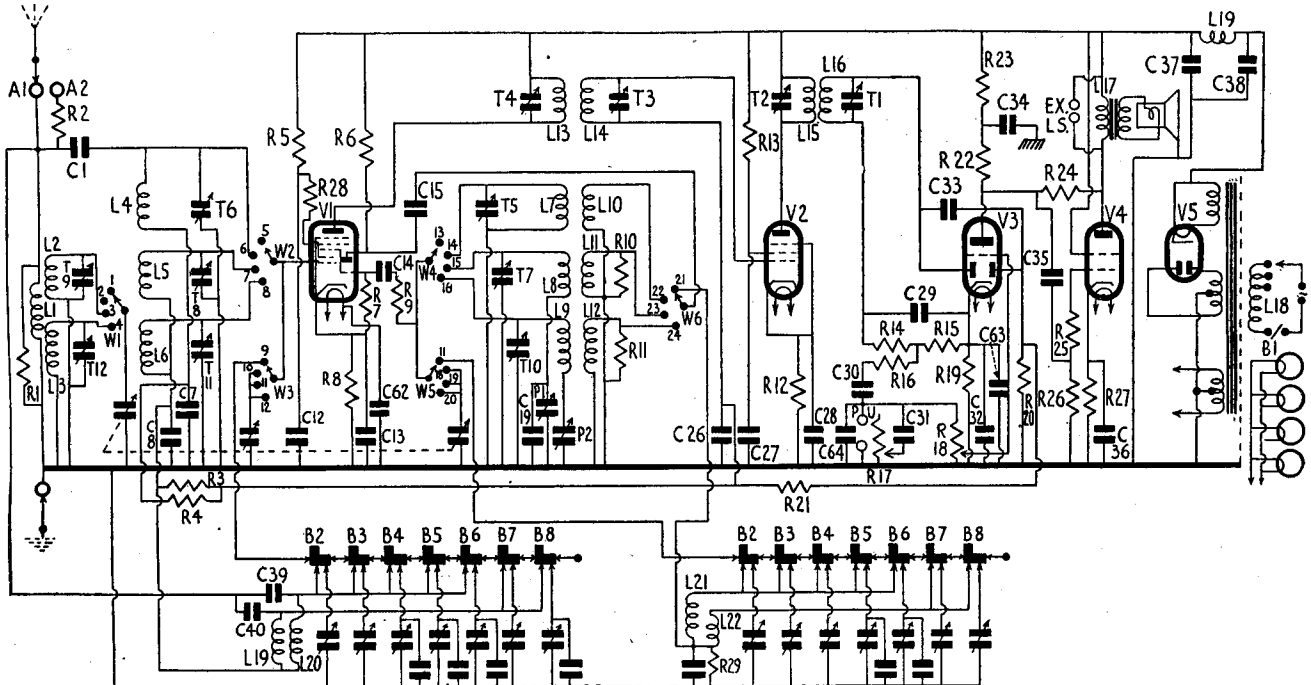
Push-button tuning of five medium and two long-wave stations by a pre-set condenser system is provided in the Lissen 8453. The set is a four-valve, plus rectifier, superhet covering three bands.

**Special Notes.**—R10 and R11, the resistances which control the medium wave and

VALVE READINGS					
V.	Type.	Electrode.	Volts.	Ma.	
1	A36B	Anode ..	250	5	
		Screen ..	110	7	
		Osc. anode ..	110	7	
2	A5DP	Anode ..	250	7.75	
		Screen ..	180	2.75	
		Heater ..	265	—	
3	A32A	Anode ..	97	3	
4	A70D	Anode ..	227	36	
5	A11D. (All Ever Ready.)	Screen ..	250	6	
		Heater ..	265	—	
Pilot lamps	Ever Ready.	Filament..	5.5	300	

## WINDINGS (D.C. Resistances)

L.	Ohms.	Range.	Where Measured.
1	12	—	A1 and chassis.
2	2.3	M.W.	Aerial gang and chassis.
3	11.1	L.W.	Aerial gang and chassis.
4	Very low.	S.W.	C7+R4 and V1 grid.
5	2.6	M.W.	C8+R3 and V1 grid.
6	11.2	L.W.	C8+R3 and V1 grid.
7	Very low.	S.W.	W4+W5 and chassis.
8	1.8	M.W.	W4+W5 and P1.
9	4.9	L.W.	W4+W5 and P2.
10	.4	S.W.	W6 and chassis.
11	6.3	M.W.	W6 and chassis.
12	9.2	L.W.	W6 and chassis.
13	6	—	On tags.
14	6	—	On tags.
15	8	—	On tags.
16	6	—	On tags.
17	650	—	Extension speaker sockets.
18	16	—	Mains plug.
19	230	—	On tags.



The model 8453 is conventional as regards both circuit and the push-button controlled trimmer arrangements. The switching is described in detail in the text on page 17.

For more information remember  
[www.savoy-hill.co.uk](http://www.savoy-hill.co.uk)

long-wave heterodyne voltages, are inside the can containing these coils.

A press button is used to switch the set off. If it is desired to use the set for manual tuning, after turning the knobs to the appropriate wavebands it is necessary to depress any of the control buttons slightly so as to release the on and off press button, thereby enabling the set to operate.

**Wavechange Switches.**—The wavechange switching is very straightforward and easy to follow. There are two banks, provided by two separate wafers, each fitted with three wipers. The wipers W1 and W2 provide the ordinary waveband switching for the input circuit, and W3 serves to remove the ganged condenser in the press button position. Similarly W4 and W6 provide for the oscillator switching and W5 again serves to remove the oscillator condenser in the press-button position.

The press buttons are similarly very easy to follow. The first button, B1, con-

trols an ordinary toggle action switch in the mains lead. The remaining buttons, B2 to B8, comprise pairs of separate contacts which connect in parallel with the special press-button coils a number of trimmers for the various stations.

The buttons are actually similar to the form shown in the circuit diagram, and it will be noted that continuity is maintained between the buttons, each of which is electrically and mechanically of L formation. For example, the connection with the grid of V1 when button 7 is depressed is obtained through the horizontal portion of all the buttons from B2 up to B6.

When B7 is depressed it short circuits the contact below it connecting the appropriate trimmer across the coil and continuity with the grid is then maintained through the vertical portion of the L-shaped button.

(Continued on page 17)

### Replacement Condensers

Exact replacement condensers are available from A. H. Hunt, Ltd., Garratt Lane, Wandsworth, London, S.W.18, for the

## Lissen 8453 on Test

**MODEL 8453.**—For A.C. mains, 200-250 volts, 40-100 cycles. Price, £11 19s. 6d.

**DESCRIPTION.**—Four-valve, plus rectifier, three-band, manual and press-button tuned receiver.

**FEATURES.**—Full-vision scale, calibrated in names and wavelengths, and an "aeroplane" pointer. Controls for tone, volume, wave switching and tuning. Eight press-buttons providing for five medium wave, two long wave stations and an off position. System uses adjustable trimmers on oscillator and aerial circuits. Alternative aerial, pick-up and high-impedance extension speaker sockets.

**LOADING.**—68 watts.

### Sensitivity and Selectivity

**SHORT WAVES (16-52 metres).**—Representative gain and selectivity on all parts of the waveband, with easy handling and no drift trouble.

**MEDIUM WAVES (197-575 metres).**—Good gain and selectivity, with quiet background and very small local station spread.

**LONG WAVES (860-2,200 metres).**—Good selectivity and gain with very slight interference on Deutschlandsender. All main stations easily received with a clean background.

### Push-button Operation

The stations were accurately tuned on the set as received and did not shift during our tests.

### Acoustic Output

Very little colouration on speech and a pleasing musical balance with good high note radiation and adequate medium and low note response. Ample volume for an ordinary room and the tone control is not too vigorous.

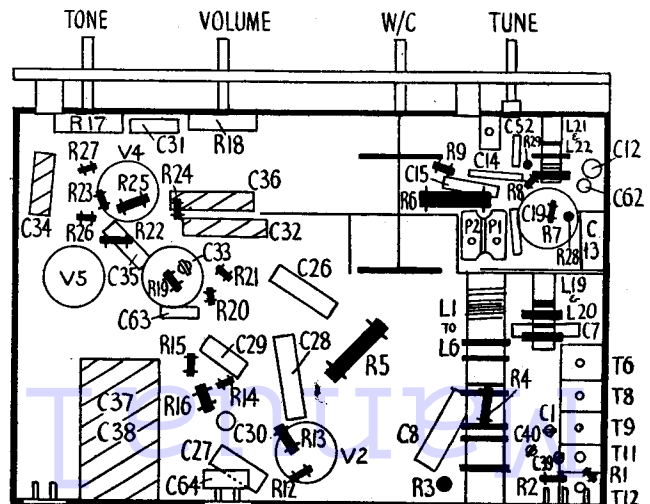
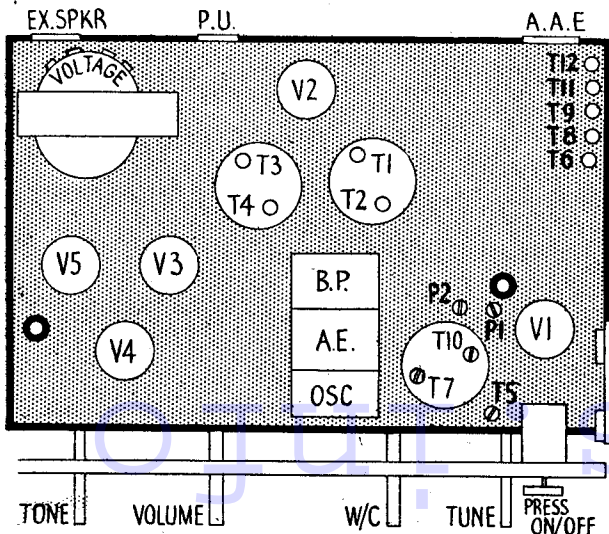
block containing C37 and C38, unit 4204, 7s. 6d., and for either C32 or C36, unit 2915, 1s. 9d.

### RESISTANCES

R.	Purpose.	Ohms.
1	Aerial shunt .. .. .	11,000
2	Aerial series resistance .. .	110,000
3	V1 M.W. and L.W. A.V.C. decoupling.	110,000
4	V1 S.W. A.V.C. decoupling. .	110,000
5	V1 screen decoupling .. .	20,000
6	V1 osc. anode load .. .	20,000
7	V1 osc. grid leak .. .	51,000
8	V1 cathode bias .. .	150
9	Regeneration modifier .. .	200
10	M.W. regeneration modifier. .	1,100
11	L.W. regeneration modifier .. .	2,100
12	V2 cathode bias .. .	250
13	V2 screen decoupling .. .	25,000
14	Demodulating diode load (part).	510,000
15	Demodulating diode load (part).	260,000
16	H.F. filter .. .	110,000
17	Tone control .. .	2 meg.
18	Volume control .. .	500,000
19	V3 cathode bias .. .	1,000
20	A.V.C. diode load .. .	1.1 meg.
21	A.V.C. decoupling .. .	260,000
22	V3 anode load .. .	40,000
23	A.V.C. anode decoupling .. .	11,000
24	Feedback coupling .. .	250,000
25	V4 grid stopper .. .	110,000
26	V4 grid leak .. .	510,000
27	V4 bias .. .	150
28	V1 screen stabiliser .. .	75
29	Press button regeneration modifier.	5,100

### CONDENSERS

C.	Purpose.	Mfd.s.
1	S.W. aerial coupling .. .	.00001
7	S.W. input tracking .. .	.01
8	V1 A.V.C. decoupling .. .	.1
12	V1 screen decoupling .. .	.1
13	V1 cathode bias shunt .. .	.1
14	V1 osc. grid coupling .. .	.0001
15	V1 osc. anode coupling .. .	.0003
19	M.W. padder fixed .. .	.0005
26	V2 A.V.C. decoupling .. .	.1
27	V2 screen decoupling .. .	.1
28	V2 cathode bias shunt .. .	.1
29	Signal diode load bypass .. .	.00005
30	L.F. coupling .. .	.05
31	Tone control .. .	.002
32	V3 cathode bias shunt .. .	50
33	A.V.C. coupling .. .	.00001
34	V3 anode decoupling .. .	2
35	L.F. coupling .. .	.05
36	V4 cathode bias shunt .. .	50
37	H.T. smoothing .. .	16
38	H.T. smoothing .. .	8
39	M.W. automatic circuit aerial coup.	.00001
40	L.W. automatic circuit aerial coup.	.00001
52	Aut. circuit osc. coupling .. .	.0002
62	V1 heater H.F. bypass .. .	.005
63	V3 cathode bypass .. .	.0005
64	I.F. bypass .. .	.0001



Chassis layout diagram of the top (left) and underside. Trimmers are accessible from above.

# Lissen 8402 Three-Band

with the 180-degree line with the gang at maximum.

Tune set to 15 mc.

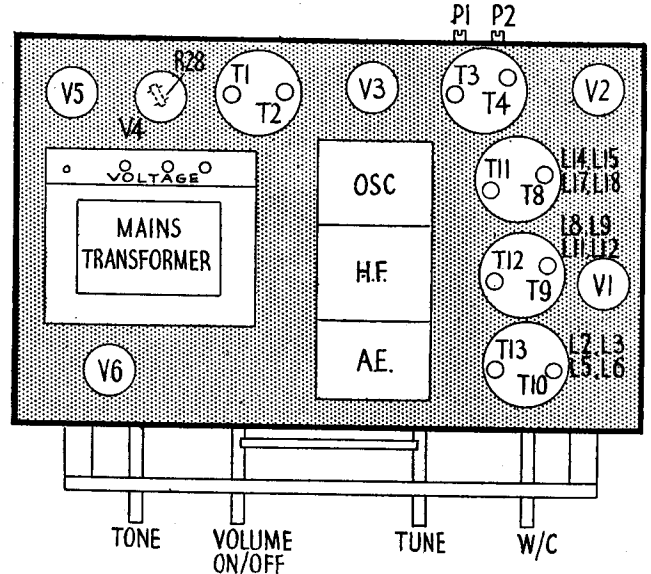
Inject a signal of 15 megacycles, previously having unscrewed T5 to the minimum. Slowly screw up T5 until a signal is heard.

Two positions will give a signal, and the one at the minimum capacity is correct.

Then adjust T6 and T7 for maximum.

The padding operation is carried out by altering the inductance of L13. Tune the set and oscillator to 6 mc. and adjust the position of the

(Continued from page 5.)



Top "deck" chassis layout diagram of the 8402 showing valve, trimmer and coil positions.

## WINDINGS (D.C. RESISTANCES)

L.	Ohms.	Range.	Where measured.
1	2.2	S.W.	Aerial and chassis.
2	12	M.W.	Aerial and chassis.
3	140	L.W.	Aerial and chassis.
4	very low	S.W.	V1 grid and C5+R1.
5	2.6	M.W.	V1 grid and C5+R1.
6	46	L.W.	V1 grid and C5+R1.
7	8.9	S.W.	V1 anode and C12+R4.
8	2,100	M.W.	V1 anode and C12+R4.
9	142	L.W.	V1 anode and C12+R4.
10	very low	S.W.	V2 grid and C13+R12.
11	2.2	M.W.	V2 grid and C13+R12.
12	100	L.W.	V2 grid and C13+R12.
13	very low	S.W.	W9 and C47+T5.
14	1.6	M.W.	W9 and P1.
15	4.7	L.W.	W9 and P2.
16	200	S.W.	W10 and C47.
17	3	M.W.	W10 and chassis.
18	9.3	L.W.	W10 and chassis.
19	7	—	V2 anode and C21+R8.
20	7	—	V3 grid and C34 and R18.
21	7	—	V3 anode and H.T. positive.
22	7	—	V4 demodulating diode and C37+R20.
23	615	—	On tags.
24	235	—	On tags.
25	16	—	Mains plug.

end turn of L13, simultaneously rocking the gang for maximum.

Then retune the set and the oscillator to 15 megacycles and check.

Any slight inaccuracy of the correct tuning setting should be adjusted by making a slight alteration to the position of the movable turn on L13 if incorrect at 6 megacycles.

**Medium Waves.**—Tune set to medium-wave position and adjust P1 to about two-thirds of maximum capacity. Tune set and oscillator to 214 metres and adjust T8, T9 and T10.

Tune set and oscillator to 500 metres and adjust P1. Retune set and oscillator to 214 metres and readjust T8, T9 and T10.

Recheck padding. If there is any inaccuracy make a further slight adjustment to P1.

**Long Waves.**—Inject a signal of 1,000 metres. Screw P2 to two-thirds of the maximum capacity and adjust T11 for maximum. Then adjust T12 and T13.

Tune the set and oscillator to 1,700 metres and adjust P2. Recheck the trimming at 1,000 metres and then recheck the padding.

If there is any inaccuracy between the dial position and the actual tuning position at 1,700 metres, readjust P2.

**Replacement Condensers.**—Electrolytics by A. H. Hunt, Ltd., Garratt Lane, Wandsworth, London, S.W.18, are used in the 8402. Replacements are: For C40 or C44, unit 2915, 1s. 9d.; C.41, 2964, 1s. 10d.; and for the block C21, 45 and 46, unit 4167, 7s. 6d.

# Lissen 8453 Alignment Notes

(Continued from page 11)

**I.F. Circuits.**—Short circuit the gang condenser across the oscillator section (front section) and connect output meter to set. Switch to the M.W. position and apply a signal of 452 kc. through a condenser of 0.1-mfd. capacity across the signal grid and chassis of the frequency-changer valve V1.

Trim T1, T2, T3 and T4, in that order.

The circuits should be trimmed to a single peak, using an input always below A.V.C. level.

Check by going over the trimmers in the same order again.

**Long Waves.**—See that the pointer registers with the 180-degree line on the scale with the gang at maximum capacity. Set P2 approximately three-quarters in.

Set the pointer against the 1,200-metres mark on the scale. Apply a modulated signal of 1,200 metres to the A. and E. sockets of the receiver and adjust T10 to

receive this signal. Then adjust T11 and T12 to give maximum output.

Set the pointer to the 1,700-metre mark on the scale and apply a signal of 1,700 metres and adjust P2 for maximum.

Reset receiver and oscillator to 1,200 metres and readjust.

Check again at 1,700 metres and see that the pointer is at the 1,700-metre mark. If it is not, make a slight adjustment to P2.

**Medium Waves.**—See that the pointer registers with the 180-degree line on the scale with the gang at maximum capacity. Set P1 approximately two-thirds in.

Set receiver and oscillator to 214 metres and apply the signal to the A. and E. sockets. Adjust T7, T8 and T9 to give maximum output.

Set the pointer and oscillator to 500 metres and adjust P1 for maximum.

Readjust T7, T8 and T9 at 214 metres. Check again at 500 metres and see that the pointer is at the 500-metre mark. If it is not, make a slight adjustment to P1.

**Short Waves.**—See that the pointer

registers with the 180-degree line with the gang at maximum. Set the pointer against the 15-mc. mark on the scale.

Screw in fully the S.W. oscillator trimmer T5, and apply a signal of 15 mc. to the A. and E. sockets. Slowly unscrew the S.W. oscillator trimmer until this signal is heard.

Care should be taken that the right peak is selected. Two peaks will be found on this trimmer; the correct one is the one with the trimmer at the higher capacity; that is, the first one heard when unscrewing the trimmer. Having selected the correct peak, adjust the S.W. signal frequency trimmer T6 to give maximum output.

Apply a signal of 7.5 mc. and tune the receiver to this signal. Adjust the top turn of the S.W. oscillator coil (L7) and the gang simultaneously to give maximum output on this signal.

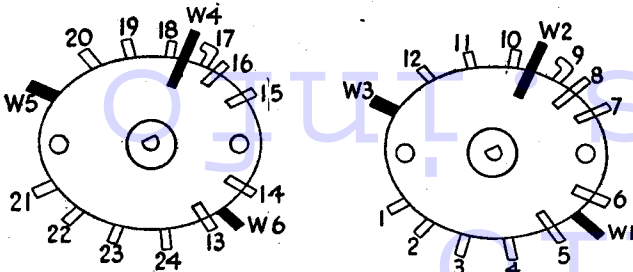
Reset the pointer to the 15-mc. mark and readjust T5 and T6.

## Three Unusual Faults

**H**ERE are three out-of-the-ordinary points. A five-valve superhet gave low signals only below London National. Fitting a new earth remedied this.

In this area (Finchley) bad hum can often be eliminated by reversing the mains plug. The supply is A.C.

Thirdly, a set came back because of a loud crackle. The set proved O.K. and, on going to the house, I found it normally stood on a table-runner embroidered with fine wire. This was intermittently making contact with an under-chassis screw.—A. Rose, London, N.16.



The two switch banks of the 8453 with the one nearer the "click" plate on the left. Contacts and wipes are numbered in the circuit on page 10.