

FERRANTI 617PB PUSH-BUTTON

CIRCUIT.—The aerial input to the hep-tode frequency changer V1 is via aerial transformers, some of which incorporate iron-cored inductances. Wave traps both for the intermediate frequency and also to prevent break-through of London National on the long waves are included.

The press-tune coil has further primary-secondary coupling in the form of C4. A small capacity between the signal and oscillator grids of V1 is provided by the twisting together of two insulated wires.

A variable band-width I.F. transformer couples V1 to the pentode I.F. amplifier V2. The wide-band characteristic of the transformer is used for the press-button range to compensate for any slight variation in capacity of the oscillator trimmers. Both V1 and V2 are A.V.C. controlled.

A fixed band-width transformer provides the coupling between the I.F. amplifier and the demodulating diode of V3, a double diode triode, and to the demodulating diode load via an H.F. filter network. The other diode, fed by a condenser, gives automatic volume control.

The coupling arrangements to the grid of the triode section of V3 include a gram-radio control switch and a manual volume control.

V3 is resistance capacity coupled to V4, a beam power output valve operating in push-pull with V5. V5 is fed via a coupling condenser from a resistance R13 in the anode circuit of V4. A tone-control circuit R11, R17 and C19 is connected across the two anodes providing variable tone modification.

Mains equipment consists of a transformer, a full-wave rectifying valve V6,

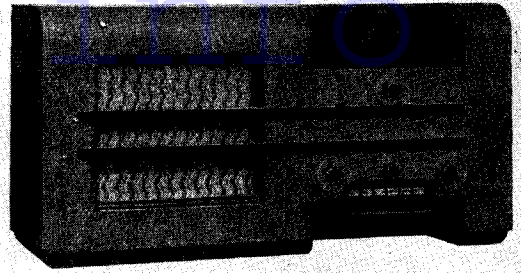
electrolytic smoothing condensers and smoothing choke (the speaker field coil). A mains suppressor condenser is also provided.

Special Notes.—A pair of sockets at the rear of the chassis enable a pick-up to be connected.

Two sockets on the speaker transformer panel are for connecting a low-impedance extension speaker.

The pilot lights illuminating the main tuning scale, and also the push-button tuning scale are Osram bulbs, type S, rated at 6.5 volts, .3 amp. and have M.E.S. bases.

R2 is mounted inside I.F.T.1 and R3, R4, C15, and C16 are inside I.F.T.2. In



The Ferranti "Prestune" model gives six push-button stations and manual tuning. The pre-set condenser system is employed.

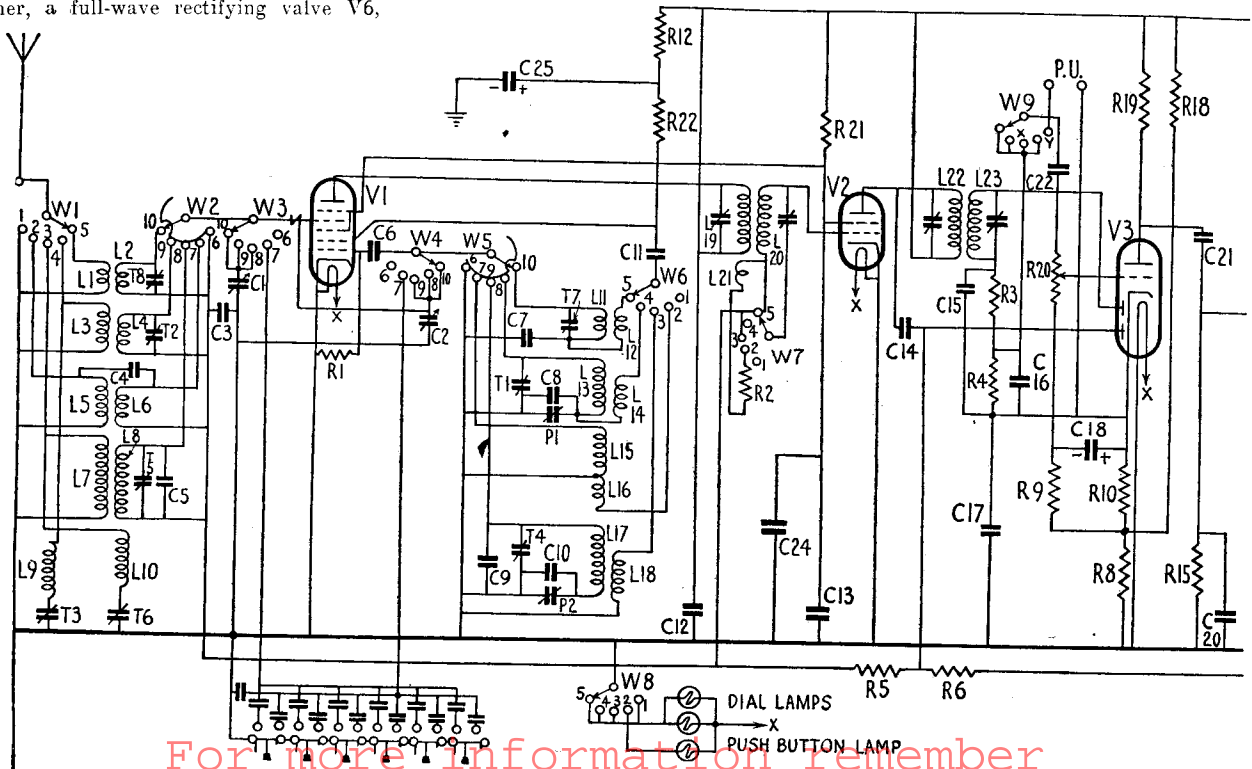
VALVE READINGS

No signal. Volume maximum. M.W. min. cap. 200 volt A.C. mains.

V.	Type.	Electrode.	Volts.	Ma.
1	(Ferranti octals or Osram) 6A8G or X63	Anode ..	255	2.8
		Screen ..	78	3.5
		Osc. anode	150	4.1
2	6K7G or KTW63	Anode ..	255	4.9
		Screen ..	78	1
3	6Q7G or DH63	Anode ..	100	.9
4	6F6G or KT63	Anode ..	210	.32
		Screen ..	255	Inaccess.
5	6F6G or KT63	Anode ..	240	.34
		Screen ..	255	Inaccess.
6	5Y3G or U50 ..	Heater ..	320	—

RESISTANCES

R.	Purpose.	Ohms.
1	Osc. grid leak	50
2	I.F. correction	50
3	H.F. stopper	50
4	Demodulating diode load	500
5	A.V.C. decoupling	2 meg.
6	A.V.C. diode load	2 meg.
7	A.V.C. delay	30
8	V3 cathode bias (part)	1
9	V3 grid decoupling	50
10	V3 cathode bias (part)	3
11	Tone control	100
12	Osc. anode decoupling	10
13	P.P. coupling resistance	990
14	V4 and V5 cathode bias	220
15	V4 grid leak	500
16	V4 anode stopper	100
17	Tone modifier	1
18	H.T. bleeder	25
19	V3 anode load	130
20	Volume control	1 meg.
21	V1 and V2 screens decoupling	40
22	Osc. anode load	10
23	V5 anode stopper	100
24	V5 grid stopper	140
25	V5 grid leak	330



our particular chassis R21 consisted of two 20,000 ohm resistances in series.

Chassis Removal.—Remove the four spring-fixed control knobs and the back (secured by screws). Take out the four chassis-securing bolts and washers. The chassis can then be tilted slightly and withdrawn.

To obtain access to that portion of the chassis covered by the trimmer unit, it will be necessary to remove the two screws securing this to the front of the chassis.

Button Adjustment

Connect an aerial and earth system to the receiver, turn the wave selection switch to press-button tuning.

Press a button, adjust the oscillator trimmer to tune in the station spot on, and then the corresponding aerial trimmer for maximum sensitivity and volume. The chassis must be removed from the cabinet for adjustment of the aerial trimmers.

To change the stations of the push-buttons, it will be sometimes necessary to change the fixed condensers connected across the oscillator and aerial trimmers. If the press-button will not

(Continued on page 56)

CONDENSERS		
C.	Purpose.	Mfds.
3	V1 A.V.C. decoupling	.05
4	Top coupling P.B. coil	.00001
5	L.W. aerial fixed trimmer	.00005
6	Osc. grid	.0001
7	S.W. osc. fixed padder	.004
8	M.W. osc. fixed padder	.0004
9	L.W. osc. fixed trimmer	.0001
10	L.W. osc. fixed trimmer	.00015
11	Osc. anode coupling	.001
12	V1 anode decoupling	.1
13	V1 and V2 screens decoupling (part)	.1
14	A.V.C. diode coupling	.00005
15	H.F. by-pass	.00015
16	H.F. by-pass	.00015
17	V3 cathode bias shunt	.05
18	V3 grid decoupling	.6
19	Tone control	.02
20	V4 grid shunt	.0004
21	L.F. coupling	.05
22	L.F. coupling	.02
23	L.F. coupling	.05
24	V1 and V2 screens decoupling (part)	.2
25	Osc. anode decoupling	.6
26	H.T. smoothing	.12
27	H.T. smoothing	.12
28	Mains suppressor	.002

WINDINGS (D.C. Resistances)			
I.	Ohms.	Range.	Where measured.
1	.2	S.W.	Aerial socket and chassis.
2	2.5	S.W.	Top grid V1 and R5.
3	.36	M.W.	Aerial and chassis.
4	7.4	M.W.	Top grid V1 and R5.
5	.84	Auto	Aerial and chassis.
6	.66	Auto	Top grid V1 and R5.
7	.66	L.W.	Aerial and chassis.
8	.30	L.W.	Top grid V1 and R5.
9	.34	M.W.	Aerial and T8.
10	.5	L.W.	Aerial and T6.
11	.2	S.W.	C6 and C7.
12	.7	S.W.	C11 and C7.
13	6.3	M.W.	C6 and P1.
14	1.3	M.W.	C11 and P1.
15	6.3	Auto	C6 and chassis.
16	7.7	Auto	C11 and chassis.
17	14.7	L.W.	C6 and P2.
18	3.7	L.W.	C11 and chassis.
19	10.7	—	Anode B1 and C12.
20	.11	—	Top grid V2 and R5.
21	—	—	Inaccessible.
22	10.7	—	Anode V2 and C12.
23	—	—	Inaccessible.
M.T. prim. total	50	—	Mains plug pins.
Total H.T. sec.	590	—	Anode pins V6.
O.T. prim. (part).	330	—	Blue and red leads spkr. panel.
O.T. prim. (part).	240	—	Green-yellow lead and red lead, spkr. panel.
O.T. prim. (part).	240	—	Green and red-green leads spkr. panel.

Ferranti 617 PB on Test

MODEL 617P.B.—For A.C. operation, 200-270 volts, 40-100 cycles. PRICE.—17 gns.

DESCRIPTION.—Five-valve, plus rectifier, three-waveband Prestune table model.

FEATURES.—Choice of four medium wave and two long wave stations by press-button. Full-vision scale calibrated in metres and station names, coloured as to waveband and traversed by vertical pointer. Controls for combined volume and master switch; tone; concentric tuning; and combined wave selection, gram. and manual-Prestune switch. Sockets for pick-up and extension speaker.

LOADING.—90 watts.

Sensitivity and Selectivity

SHORT WAVES (16.5-51 metres).—Satisfactory gain with easy handling and no drift.

MEDIUM WAVES (201-560 metres).—Good gain and selectivity, with small local station spread.

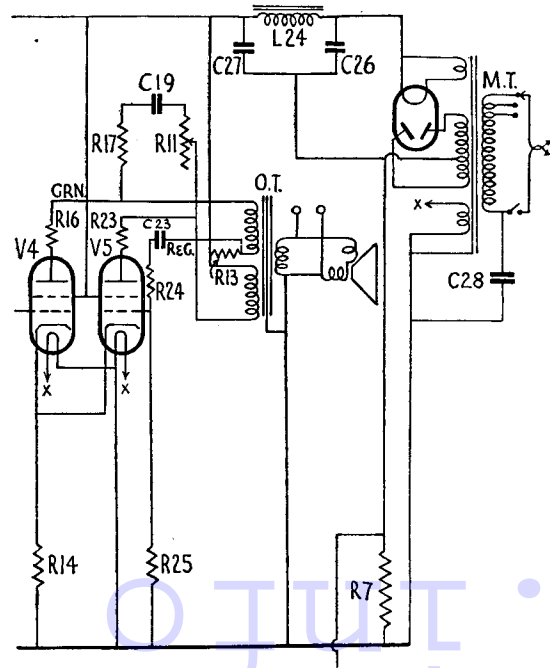
LONG WAVES (1,000-2,000 metres).—All main stations easily received; a little interference on Deutschlandsender.

Acoustic Output

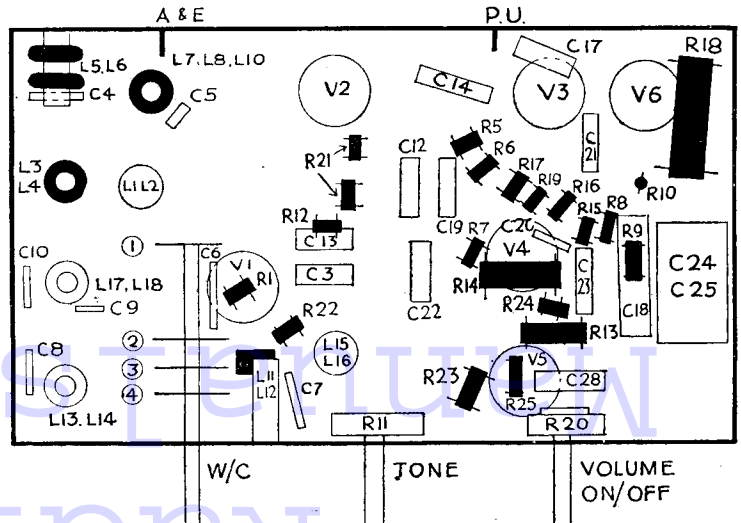
Ample volume for an ordinary room, with noticeable low-note radiation and at the same time reasonably crisp upper registers.

Press-button Operation

Press-buttons were accurately tuned when the set was received and did not drift during our tests.



Below is the under chassis diagram (top view page 56). Switch wipes are on the following banks: W1 and 2, bank 1; W3 and 7, bank 2; W5 and 6, bank 3; W4 and 8, bank 4. Contacts run consecutively in clockwise order looking from the rear.



Wave changing and tuning to automatic is by rotary switch. The press buttons switch pre-set condensers across the aerial and oscillator coils.

Replacement Condensers

EXACT replacement condensers available from A. H. Hunt, Ltd., for the model 617P.B. are: For C18, unit 2,943, 1s. 3d.; for the block containing C25 and 24, unit 4,243, 4s. 6d.; for the block containing C26 and 27, unit 4,244, 8s. 6d.

H.M.V. 656 Four-band Six

(Continued from page 53)

that order for maximum response, reducing the input from the service oscillator as the circuits come into line to keep the signal below the A.V.C. point.

Signal Circuits.—With the gang at maximum the pointer should register exactly on the small mark just below the L.W. calibration on the right hand end of the scale.

Connect the service oscillator to the A. and E. sockets. Only feed sufficient input to obtain reliable peaks in the output meter and progressively reduce the input as the circuits come into line. Remove short circuit from oscillator section of gang.

Long Waves.—Turn gang to maximum, tune service oscillator to 725 metres (413.8 kc.) and adjust T5 for maximum response.

Set oscillator to 850 metres (352.9 kc.), tune in on receiver and adjust T6 and then T7 for maximum.

Set oscillator to 1,900 metres (157.9 kc.), tune in on receiver and adjust P1 for maximum, simultaneously rocking the gang.

Return to 725 metres and check setting of T5.

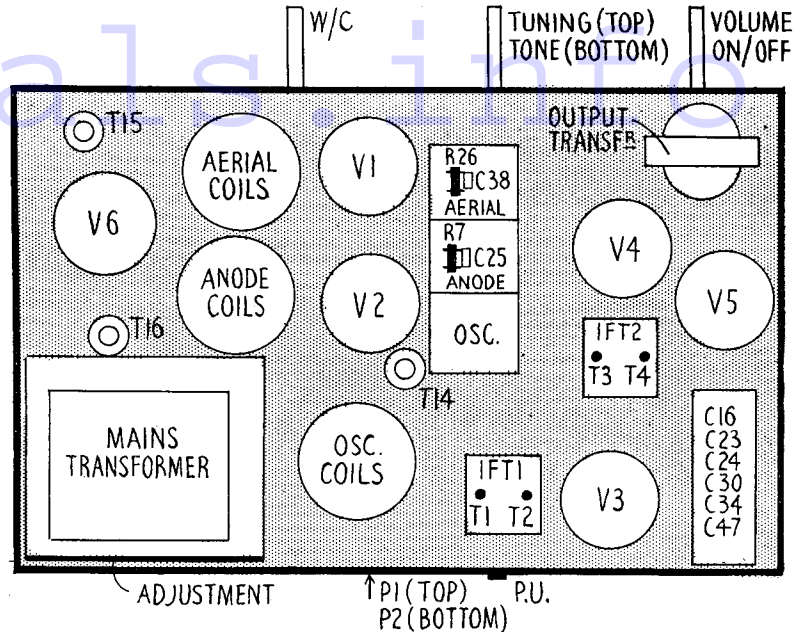
Medium Waves.—With gang at maximum and service oscillator tuned to 195 metres (1,538.5 kc.), adjust T8 for maximum response.

Set service oscillator to 210 metres (1,428.6 kc.), tune in on receiver and adjust T9 and then T10 for maximum.

Set oscillator to 530 metres (566 kc.), tune in on receiver and adjust P2 for maximum, simultaneously rocking the gang.

Return to 195 metres and check setting of T8.

Short Wave 1 (30 to 90 metres).—With gang at maximum and service oscillator tuned to 30 metres (10 mc.), adjust T11 for maximum.



Components can be identified and valve positions located with the aid of this layout diagram of the top of the H.M.V. model 656 chassis.

Set oscillator to 32 metres (9.38 mc.), tune in on receiver, and adjust T12 and then T13 for maximum.

If L9 has been replaced, tune service oscillator to 86 metres (3.88 mc.), tune in on receiver and adjust loop of wire joining C7 to coil tag for maximum, at the same time rocking the gang.

Return to 30 metres and check setting of T11.

Short Wave 2 (13-30 metres).—The trimmers of this band are adjusted from the top of the chassis by slackening the hexagonal lock-nut sufficiently for the rod

to be moved up or down with a piece of bent wire. After adjustment the hexagonal nut should be tightened.

With gang at maximum and service oscillator tuned to 13 metres (23.08 mc.), adjust T14 for maximum.

Set service oscillator to 14 metres (21.43 mc.), tune in on receiver and adjust T15 and then T16 for maximum, simultaneously rocking the gang.

If L22 has been replaced, set oscillator to 30 metres (10 mc.), tune in on receiver and adjust loop of L22 for maximum, simultaneously rocking the gang.

Ferranti 617PB Push-button Six

(Continued from page 55)

tune in the new station, then replace the condensers according to the wavelength required. Sets of fixed condensers can be obtained from the set makers.

Alignment Notes

I.F. Circuits.—Set volume control to maximum, pointer to 200 metres, wave selection switch to L.W. band and tone to "high" position.

Connect an output meter across the primary of the speaker transformer and a service oscillator between the top grid cap of V1 (via a .05 mfd. condenser) and chassis.

Tune the service oscillator to 450 kcs. and adjust the trimmers of the second I.F. transformer, and then the first I.F. transformer for maximum, reducing the input as the circuits come into line to keep the A.V.C. inoperative.

Signal Circuits.—Connect the service oscillator to the A. and E. sockets via a dummy aerial. Only feed sufficient input to obtain reliable peaks in the output meter and progressively reduce the input as the circuits come into line.

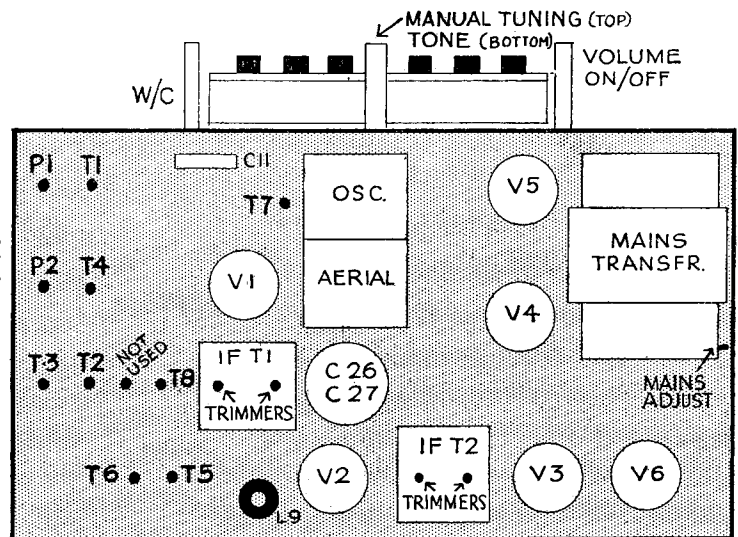
Medium Waves.—With gang at minimum, tune service oscillator to 200 metres (1,500 kcs.) and adjust T1 for maximum.

Tune set and oscillator to 228 metres (1,315 kcs.) and adjust T2 for maximum.

Tune set and oscillator to 500 metres (600 kcs.) and adjust P1 for maximum simultaneously rocking the gang.

With the gang at maximum, tune service

The trimmers — excluding those for automatic tuning — are accessibly arranged on the top of the Ferranti model 617PB.



oscillator to 450 kcs. and adjust T3 for minimum.

Repeat the medium wave alignment at 200, 228 and 500 metres and then finish at 200 metres.

Long Waves.—Tune set and oscillator to 1,128 metres (266 kcs.) and adjust T4 and then T5 for maximum.

Tune set and oscillator to 1,807 metres (166 kcs.) and adjust P2 for maximum, simultaneously rocking the gang.

Tune set to 1,200 metres, inject a strong 261

metres (1,149 kcs.) signal and adjust T6 for minimum.

Then repeat 1,128 and 1,800 metres operations until no increase in signal strength can be obtained.

Short Waves.—With gang at maximum, tune service oscillator to 18 mcs. (approx. 16.6 metres), screw T7 right up and then unscrew until the second peak (lower capacity) is heard.

Tune set and service oscillator to 20 metres (15 mcs.) and adjust T8 for maximum.

FERRANTI 617PB

Five-valve, plus rectifier, three-waveband, press-button and manual tuning superhet, with push-pull output. Provision is made for a pickup and low impedance extra loud-speaker. Suitable for AC mains, 200-270 volts, 40-100 cycles. Marketed by Ferranti Limited, of Moston, near Hollinwood, Lancs. and Kern House, Kingsway, London, WC2.

THE basic arrangement of this model is similar to that of the Ferranti 514 PB and 515 PB models reviewed elsewhere in this issue. The high frequency and intermediate frequency circuits are practically identical except for one or two additional decoupling components and the major difference is the push-pull output stage.

The LF output from V3 is resistance capacity coupled by R9, C24 and R16 to one of the push-pull pentode valves V4. HF and IF filtering is effected by C25.

The output from V4 is fed to one of the output transformer primaries L24A, which is coupled to the other primary L24B by R24. The voltages

developed across this resistance are fed via C27 to the potential divider R22, R23, whose values are arranged so that the required voltage is fed to the grid of V5 in opposite phase to the signal fed to V4.

The output from V5 is fed to the second half of the primary, L24B, of the output transformer.

Stabilising resistances R18, R19, are connected in the anode circuits of the output valves and a variable

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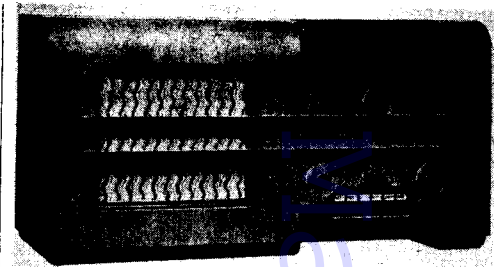
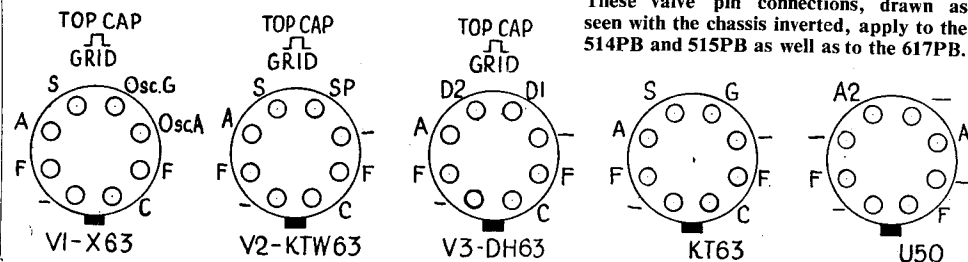
VALVE READINGS

V	Type	Electrode	Volts	Ma
1	X63	Anode	253	2.2
		Osc anode	158	4.0
		Screen	81	3.0
2	KTW63	Anode	253	5.0
		Screen	81	1.2
		Anode	118	.7
3	DH63	Anode	210	35
		Screen	253	6.2
4	KT63	Anode	240	36
		Screen	253	6.6
6	U50	Heater	350	—

Pilot lamps, 6.5 v., .3 amp M.E.S.
For valve base connections see review for Ferranti Models 514PB, 515PB.

RESISTORS

R	Ohms	R	Ohms
1	50,000	14	2 meg
2	50	15	2 meg
3	10,000	16	500,000
4	10,000	17	220
5	40,000	18	100
6	250,000	19	100
7	500,000	20	1,000
8	1 meg	21	100,000
9	130,000	22	140,000
10	50,000	23	330,000
11	3,000	24	990
12	25,000	25	30
13	1,500		



The 617PB is very similar to the 515PB, but has push-pull output.

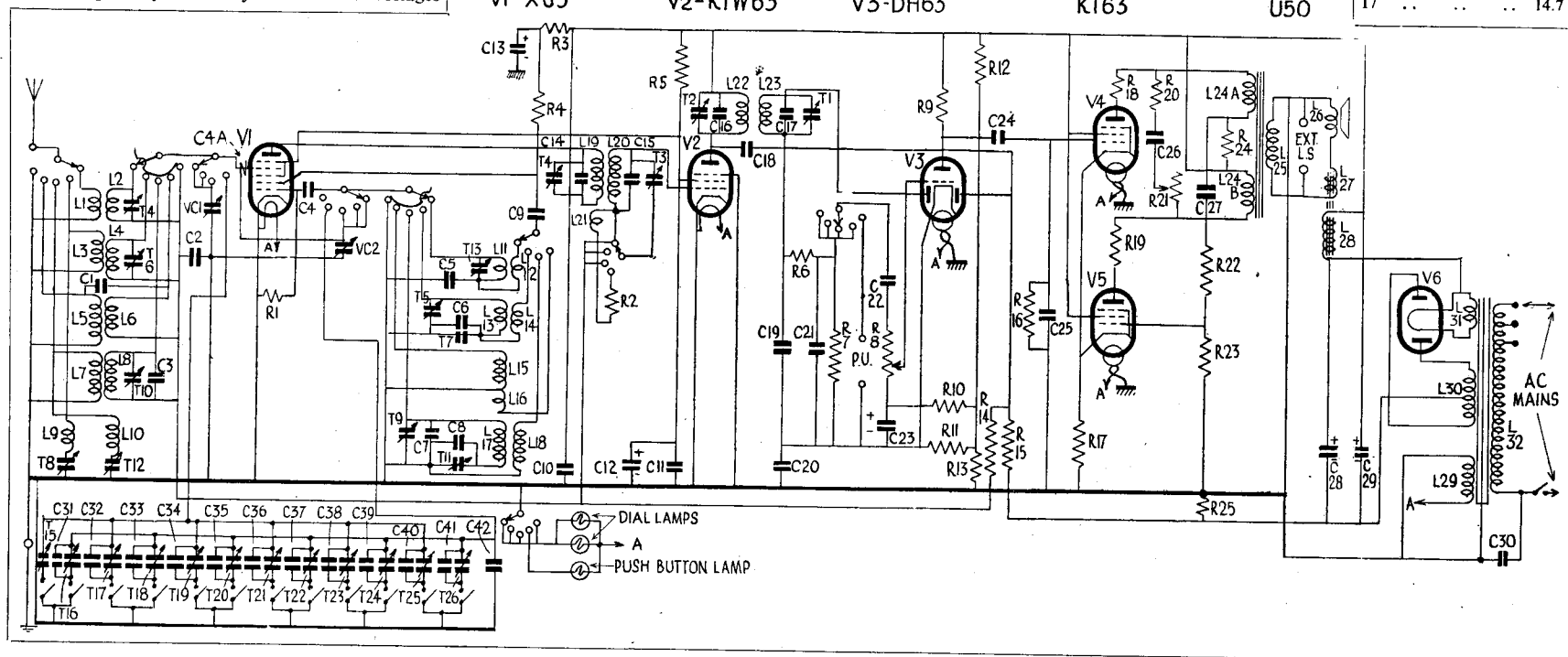
WINDINGS

L	Ohms	L	Ohms
1	.2	18	3.7
2	2.5	19	10.7
3	3.6	20	11
4	7.4	21	.8
5	84	22	10.7
6	6	23	11
7	66	24A	250
8	30	24B	300
9	34	25	.5
10	5	26	.25
11	.7	27	2
12	2	28	550
13	6.3	29	.1
14	1.3	30 (total)	280
15	6.3	31	.1
16	7.7	32 (total)	30
17	14.7		

CONDENSERS

C	Mfd
1	.0001
2	.05
3	.00005
4	.0001
4A*	.0001
5	.004
6	.0004
7	.0001
8	.00015
9	.001
10	.1
11	.1
12	2
13	6
14	.00009
15	.00009
16	.00009
17	.00009
18	.00005
19	.00015
20	.05
21	.00015
22	.02
23	.6
24	.05
25	.0004
26	.02
27	.05
28	12
29	12
30	.002

* Comprises twisted insulated wire with very low capacity. Condensers C31-C42 capacity depends on station required.



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

FERRANTI 617PB

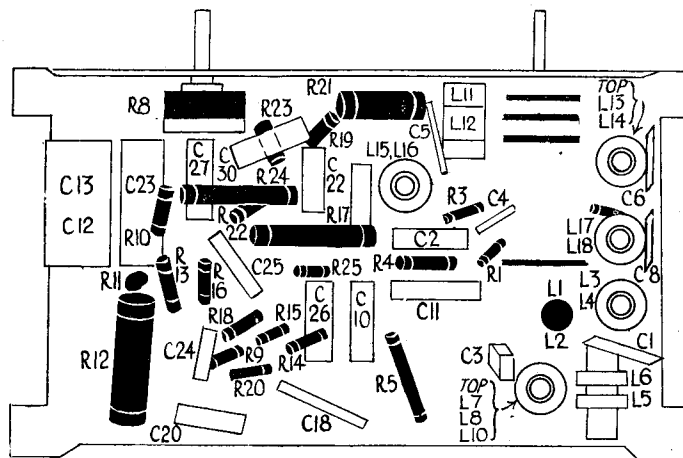
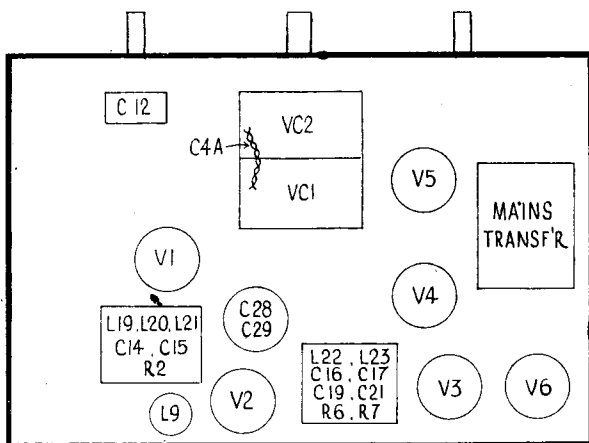
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tone control network R20, C26, R21 is introduced across L24A, L24B.

A certain degree of negative feedback is effected by omitting a decoupling condenser across the cathode biasing resistance R17.

The supply circuits follow standard practice but note that all high-tension circuits are taken via the field winding L28. The separate feed for screens and oscillator incorporated in the Models 514PB, 515PB, has been omitted.

Ganging instructions are as for 515PB.



the cabinet, may be readjusted in case they have moved whilst replacing the chassis.

It will not always be found necessary to adjust the aerial trimmers as the oscillator trimmers are the most likely to drift.

To change the stations of the push-buttons it will be necessary sometimes to change the fixed condensers connected across the oscillator and aerial trimmers. If a press-button will not tune in the new station required, replace the condensers according to the wavelength required. For table of condenser values see review covering Ferranti 617PB in this issue.

FERRANTI 515PB—Contd.

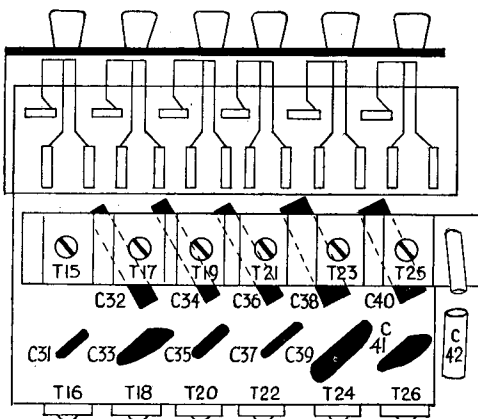
right up and then unscrew until the second peak (lower capacity) is heard.

Tune set and oscillator to 20 m (15 mcs) and adjust T14 for maximum. The short-wave padding is fixed, but check calibration throughout the range covered.

Push-Button Alignment.—To re-align the push buttons, connect an aerial and earth system to the receiver, turn the wave-selection switch to press-button tuning. The press-button panel will then be illuminated.

Press a button and adjust the oscillator trimmer to tune in the station spot on. The adjust the corresponding aerial trimmer for maximum sensitivity and volume. The chassis must be removed from the cabinet for adjustment of the aerial trimmers.

The chassis may then be replaced in the cabinet and, if necessary, the oscillator trimmers which, accessible underneath the chassis from the rear of



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