FERRANTI LANCASTRIA PARVA (Contd.)

rubber washers. The speaker leads need not be disconnected.

Special circuit values.—Field coil, 1,600 ohms, speech coil 7 ohms : D5 speaker.

General Notes.—The centre pin on the rectifier valveholder is used merely as an anchorage. The resistances are suspended in the wiring, and all the important ones are accessible. When the wiring has to be moved to reach a component it should be replaced in its original position. This is important, as stray unbalanced capacities and unwanted couplings may be created.

Switch contacts are easily cleaned and are opposite the bases of their respective coils.

The wiring to the electrolytic condenser block on the speaker is coded, but it is immaterial to which end of the L.S. field *either black lead* is connected.

If calibration is wrong, remove chassis only and move pointer and reflector to correct setting. These swivel on one rivet.

The tuning of this set is very critical, and attempts to improve efficiency by adjusting the small trimmers should not be made.

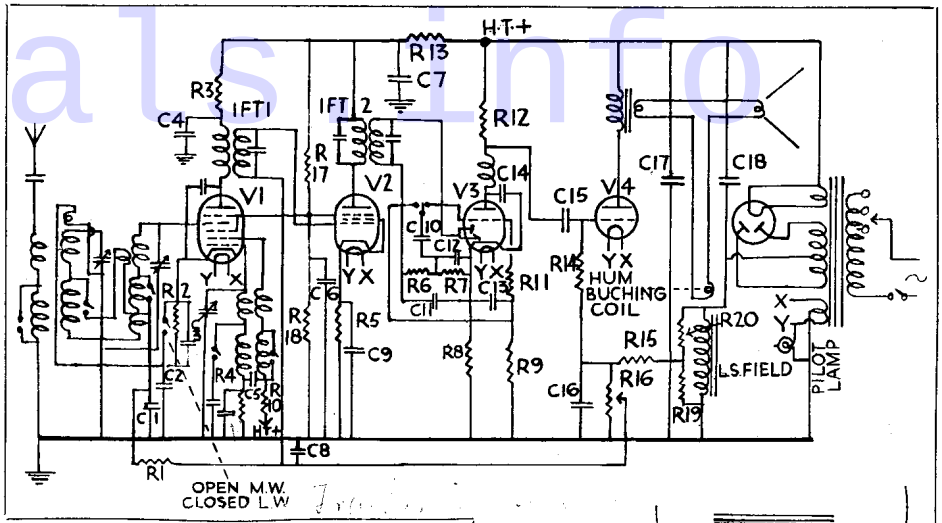
Replacing Chassis.—Replace speaker first, tightening the four bolts. Replace the rubber washers and place the chassis carefully on them and insert the four holding screws. Replace the knobs.

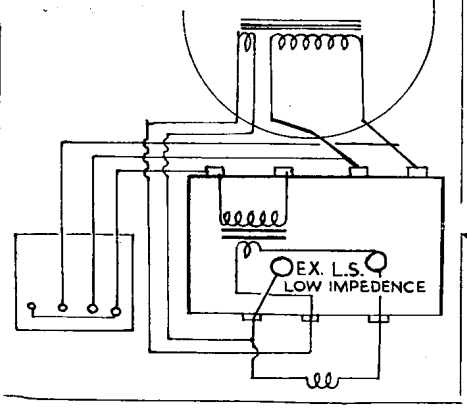
CONDENSERS

	Purpose.	Mfd.
C 1	Band pass coupling	.05
C 2	Cathode, V 1	.02
C 3	Part of suppressor circuit	.02
C 4	Anode decoupling, V 1	.1
C 5	Coupling osc. and reaction, V 1	.01
C 6	Decoupling SG's	.1
C 7	Decoupling anodes, V 1 and V 2	.1
C 8	Decoupling grid, V 2	.05
C 9	Cathode, V 2	.1
C 10	Coupling to triode grid, V 3	.01
C 11	HF by-pass to cathode, V 3	.00015
C 12	HF by-pass to cathode, V 3	.00015
C 13	Decoupling grid, V 3	.25
C 14	Anode by-pass triode of V 3	.0003
C 15	LF coupling condenser, V 3, V 4	.02
C 16	Decoupling grid, V 4	.25
C 17	(*Electrolytic*) smoothing	8
C 18	(*Electrolytic*) smoothing	8

RESISTANCES

	Purpose.	ohms.
R 1	Decoupling grid, V 1	.5 meg.
R 2	Bias resist, V 1	300
R 3	HF decoupler anode, V 1	1,000
R 4	In osc. coil circuit	50,000
R 5	Bias resist, V 2	450
R 6	HF stopper to triode grid	100,000
R 7	Part of diode output pot. with R 6	.5 meg.
R 8	Bias resist, V 3	3,500
R 9	Decoupling grid of V 3	100,000
R 10	Voltage dropping to osc. anode	100,000
R 11	Triode section grid leak, V 3	1 meg.
R 12	Anode coupling resist, V 3 to V 4	100,000
R 13	Anode decoupling of V 1 and V 2	10,000
R 14	Grid leak, V 4	.25 meg.
R 15	Decoupling grid, V 4	.2 meg.
R 16	VC pot. for HF bias across bias pot.	1 meg.
R 17	Upper part of SG pot.	20,000
R 18	Lower part of SG pot.	30,000
R 19	Bias pot. across LS field	120,000
R 20	Bias pot. across LS field	250,000
D 5	Field coil	1,600
	Speech coil	7





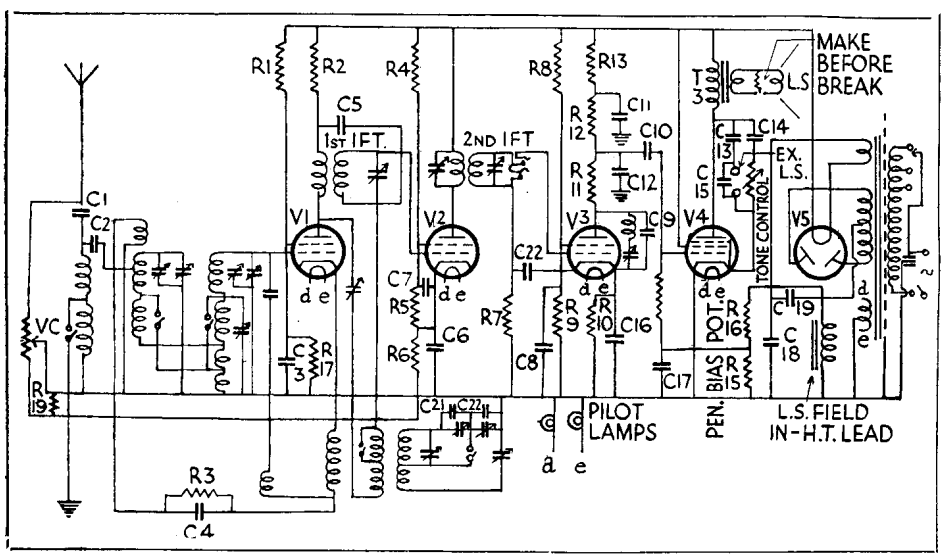
Above, the circuit of the Ferranti Lancastria Parva and, right, the connections to the output transformer, field coil and electrolytic condensers.

VALVE READINGS

Volume Control at Max.

Valve.	Connection.	Volts.	M.A.
V1 (VHT4)	anode	160	1.3
	osc. anode	60	1.
	screen	80	
V2 (VPT4)	anode	172	2.9
	screen	80	
V3 (H4D)	anode	80	2.5
V4 (LP4)	anode	200	52.

A.C. MAINS "SUPERHET FIVE" BY G.E.C.



The first valve is the combined-detector oscillator in the G.E.C. Superhet Five.

Circuit.—The *combined oscillator first detector-frequency changer* valve V1 (*MS4B*) is preceded by an inductively coupled band-pass filter, and the aerial is coupled to the first band-pass coil partly by inductance and partly by capacity C2. The volume control R21, besides damping the aerial coil in series with R19 and C1, also increases bias on V2. Anode-grid reaction is used through a coupling coil in the cathode circuit at the oscillator frequency, and a second-channel suppressor circuit is taken to the grid and to a small coupling coil in the first band-pass circuit. The anode circuit is decoupled by R2, C5.

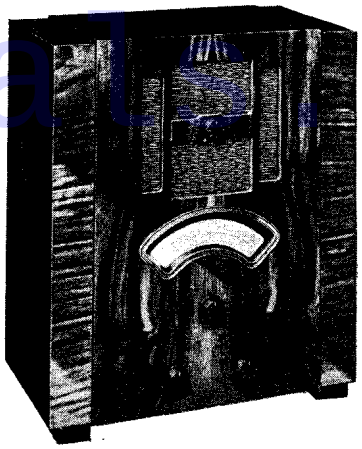
The *I.F. valve VMS4* (V2) is coupled by a band-pass intermediate transformer T2 to the grid of the second detector. *Pick-up* connection by means of jack short circuits the secondary and connects P.U. between earth and grid. *Intermediate frequency* 107 kc.

Second detector MS4B (V3).—Anode bend detector with automatic bias has an additional second-channel suppressor filter in the anode circuit and an H.F. stopper R11. Coupling to the output valve is by R12 and C10. The anode decoupling is R13, C11.

G.E.C. SUPERHET FIVE (Contd.)

Output valve MPT4 (V4).—Bias is from potentiometer R15, R16 across the field coil which is used as smoothing choke in negative H.T. lead. In the anode circuit a variable tone filter C14, R20 is used, and provision is made for an *external high-impedance speaker* to be fed through filter condenser C13. The internal speaker can be switched off and the switch connects a safety resistance load. (See special note.)

Full-wave rectification U12 (V5) is used,



The General Electric Co.'s popular "Superhet Five," BC 3440, selling at 14 gns.

and two 8-mfd. electrolytic condensers are connected between H.T.+ to the opposite ends of the speaker field. The mains transformer primary is screened.

Special Notes.—The speaker switch does not operate the external speaker, but allows an external speaker to be used either with or without the internal speaker. Special spanners and an insulated trimmer screwdriver can be supplied by the makers at a small charge.

Different Models.—BC3440 table model, BC3440K with Catkins. The Catkin models have seven-pin output MPT4, with which R14 is 220,000 ohms and R15, 99,000 ohms. The same chassis is used in Radiogram, model BC3448, but V.C. (R21) is external to

(*Continued in col.* 1, *page* 10.)

VALVE READINGS

(Volume control at max.)

Valve.		Connection.	Volts.	M.A.
V 1	MS4B ...	anode	240	1.2
		screen	85	
V 2	VMS4 ...	anode	250	7
		screen	85	
V 3	MS4B ...	anode	*	*
		screen	90	
V 4	MPT4 ...	anode	235	31
		aux. grid	250	6
V 5	U12 ...	350 A.C. between each anode and H.T.-		

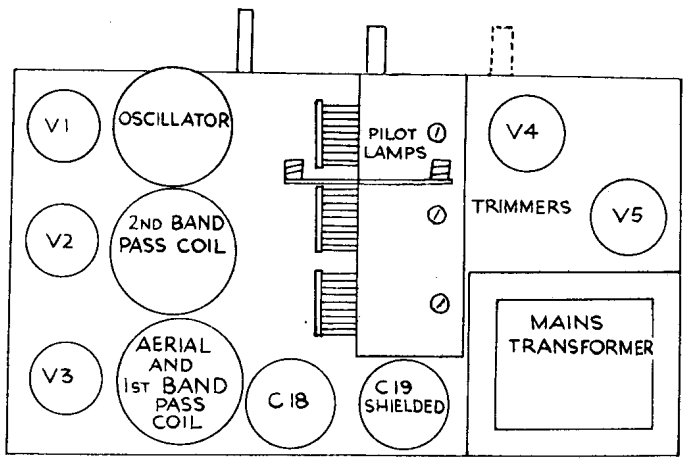
* Owing to high resistances in circuit and low current of .4 ma. approx., a voltage of 90-100 can be read with a 1 ma. max. meter (300 scale). Approx. applied voltage is 190.

RESISTANCES

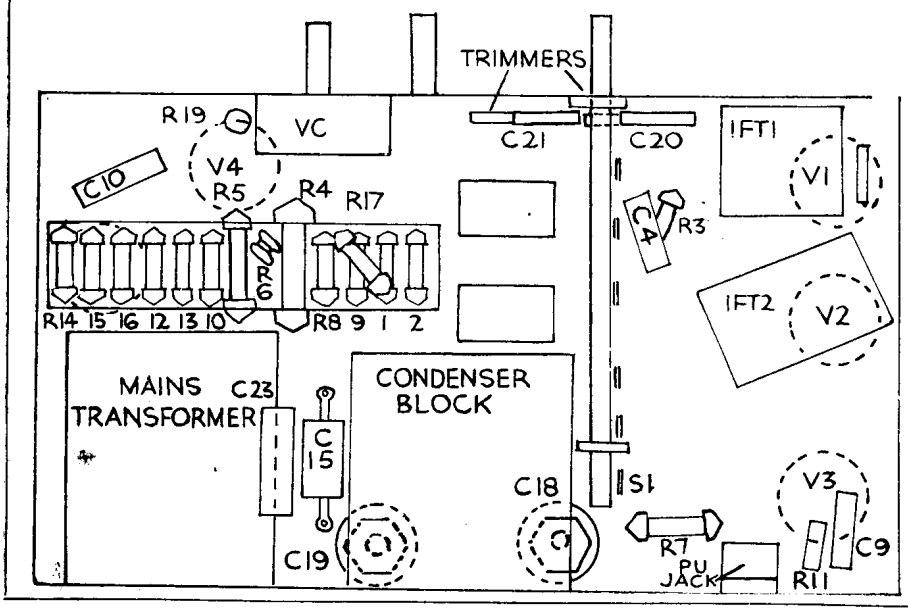
	Purpose	Ohms.
R 1	Top of V 1 screen prt.	88,000
R 2	V 1 anode decoupler	20,000
R 3	V 1 bias resist	2,500
R 4	Top of V 2 screen prt.	24,000
R 5	Lower part of V 2 screen prt. ...	13,000
R 6	Part of bias resist. V 2	150
R 7	Grid decoupler V 3	33,000
R 8	Top of V 3 screen prt.	88,000
R 9	Lower part of V 3 screen prt. ...	55,000
R 10	Bias resist, V 3	8,800
R 11	H.F. stopper	33,000
R 12	Coupling V 3	200,000
R 13	Decoupling V 3	33,000
R 14	Grid leak of V 4	250,000
R 15 *	V 4 bias	See note
R 16 *	prt.	420,000
R 17	Part of V 1 screen prt.	44,000
R 18	Speaker safety load	8
R 19	Part of bias circuit of V 2 ...	9,900
—	Var. tone control	50,000
—	Volume control	10,000
—	Speaker speech coil	3.1
—	Output trans.—	
—	Primary B.C. 3440	400
—	B.C. 3444 and B.C. 3448	300
—	Secondary B.C. 3440	.55
—	B.C. 3444 and B.C. 3448	.35
—	Mains transformer primary ...	40
—	Mains transformer high voltage sec.	420
—	Mains transformer rect. fil. ...	.15
—	Mains transformer set valve fil. ...	.15

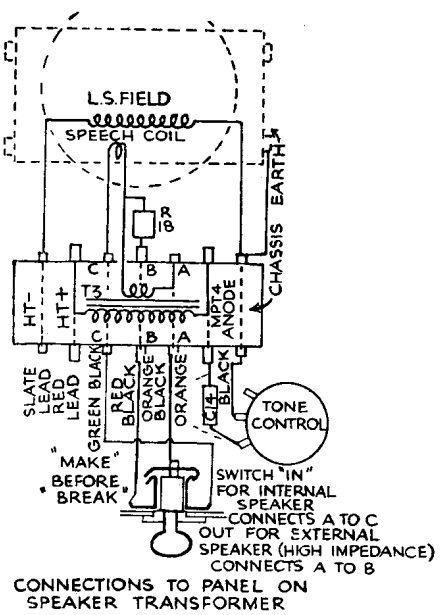
CONDENSERS

	Purpose	Mfd.
C 1 ...	aerial	.0001
C 2 ...	aerial coupling	.0025
C 3 ...	V 1 screen	.1
C 4 ...	V 1 cathode	.005
C 5 ...	V 1 anode decoupling ...	.11
C 6 ...	V 2 cathode	.25
C 7 ...	V 2 screen	.25
C 8 ...	V 3 screen	.25
C 9 ...	V 3 anode by-pass... ...	.0001
C 10 ...	coupling V 3, V 4	.01
C 11 ...	decoupling V 3 anode ...	.11
C 12 ...	V 3 anode by-pass... ...	.0001
C 13 ...	filter to Ex.LS.	.25
C 14 ...	Part of tone control ...	.04
C 15 ...	Across Ex. LS.	.001
C 16 ...	V 3 cathode	.25
C 17 ...	V 4 grid decoupling ...	.3
C 18 ...	HT smoothing electrolytic	8
C 19 ...	HT smoothing electrolytic	8
C 20 ...	Oscillator padding	.0014
C 21 ...	Oscillator padding	.0013
C 22 ...	V 3 grid decoupling ...	.25



Above, the "above deck" layout of the G.E.C. Superhet Five. The underneath plan of the chassis is given below on the left. To the right, below, are shown the connections to the panel on the speaker transformer.





G.E.C. SUPERHET FIVE (Cont.)

chassis. (Console, BC13444.). Suffix "K" denotes Catkin model.

Wiring Colour Code.—

Grid wiring, green;	HT+, red.
Anode wiring, orange;	HT−, slate.
Cathode, pink;	Earth, black.
Screening grids, blue.	

Preliminary Tests.—Full eliminator voltage of 330-340 volts between two left-hand terminals on speaker transformer. Voltage drop of 75 across field, left-hand (−) and right-hand (+) terminals.

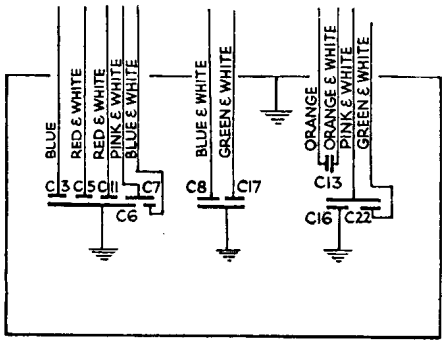
Removing Chassis.—Pull off the control knobs and undo four screws from underneath cabinet. Rubber washers may make them seem stiff. Withdraw chassis, leaving speaker leads connected for chassis tests.

Removing Speaker.—*Do not unbolt speaker from its own baffle.* Unscrew the baffle from the cabinet and undo the speaker switch from its bracket.

Stand the set on the mains transformer end for tests.

If trouble develops in any of the tuning or intermediate coils the set should be returned to the makers.

If one or more condensers in the block become defective and suitable values of the



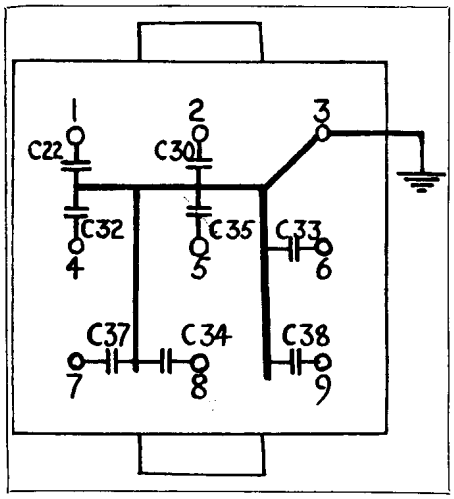
BLOCK CONDENSER

small tubular type cannot be suspended in the wiring the block should be removed.

All the wires are coded and it is immaterial which red and white lead is taken to R2 and R12. The condensers are identical.

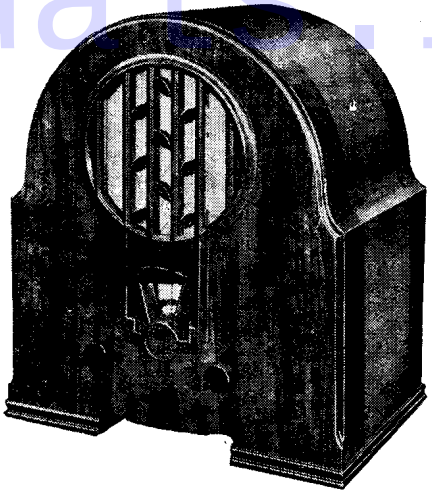
As the full voltage drop across the L.S. field exists between the case of C19 the can is insulated from points at chassis potential.

Replacing the Chassis.—Replace and screw up the speaker baffle. Replace chassis and screw in the four bolts and press the knobs on to the spindles.



This diagram, in conjunction with the condenser "key" panel, shows the capacities of the units in the condenser blocks of the Philips 634 A.

PHILIPS 634A "STRAIGHT"



As a sensitivity control is ganged with the tuning knob of the Philips 634A, the scale should be turned to maximum when taking valve current and voltage measurements.

Circuit.—The *first H.F. valve V1 (S4VB)* is preceded by a band-pass aerial circuit and is coupled to the *second H.F. valve V2 (S4VB)* by a tuned secondary H.F. transformer. A similar transformer couples V2 to the diode section of the *single diode tetrode detector V3 (SD4)*, and true automatic volume control is employed from the plate of the diode to the grid circuit of the first H.F. valve. In addition, a compensating sensitivity control R4 is made automatic by ganging with the tuning condensers.

The amplifying section of the S.D.T. valve is resistance capacity coupled to the grid of the pentode output which is compensated and fitted with a manual tone-control three-way switch. The speaker is a permanent-magnet moving-coil.

Full-wave rectification is used, and smoothing is by resistances R4, R16, R17 in the negative H.T. lead in conjunction with 16 mfd. electrolytic condensers. The tapping between R16, R17 provides bias for the S.D.T. grid, which is decoupled.

Special Notes.—This receiver appears more complicated than it really is. Philips own slip-on resistances are used and are obtainable from the makers. (The soldering iron should not be too hot.)

The sensitivity switch operates by connecting R30 in parallel with R18 and part of R4 to lower the minimum bias on the H.F. valves.

In some cases an extra condenser may be

VALVE READINGS

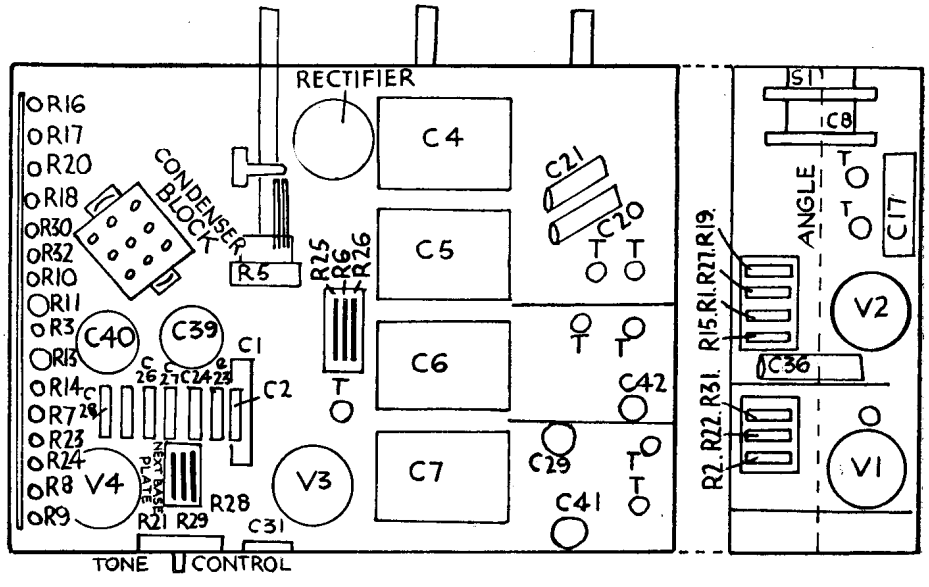
(Tuning scale at max. Sensitivity switch out.)*

Valve.	Connection.	Volts.	M.A.
V 1, S4VB ...	anode ...	215	2.5
	screen ...	95	
V 2 S4VB] ...	anode ...	215	5.5
	screen ...	95	
V 3 S4D ...	anode ...	70	.5
V 4 PM24A ...	anode ...	210	15
	aux. grid	208	4.5

* The resistance R 4 is ganged to the tuning, and consequently alters the bias.

CONDENSERS

	Purpose.	Mfd.
C 1	Coupling to tetrode grid V 3 ..	.01
C 2	HF by-pass V 3..	.0002
C 3	Aerial input filter	.0001
C 17	Across valve filament	.1
C 19	H.F. feed to diode anode ..	.13mmf.
C 20	Band pass coupling	.025
21	Band pass coupling	.04
22	Decoupling bias circuit V 3 ..	.25
23	Anode by-pass V3	.00025
24	LF coupling V 3, V 4	.002
26	Tone control V 4	.01
27	Tone control V 4	.032
28	Tone corrector V 4	.002
29	Decoupling anodes V 1, V 2 ..	.1
30	Part of AVC system	.1
31	Diode output filter	.00001
32	Decoupling bias circuit V 2 ..	.25
33	Decoupling SG, V 3	.5
34	Decoupling SG's, V 1, V2 ..	.5
35	Decoupling anode V 3	1
36	HF decoupling aux. grid V 1 ..	.1
37	Decoupling grid, V 4	.1
38	Decoupling aux. grid, V 4 ..	.1
39	Electrolytic smoothing.. ..	16
40	Electrolytic smoothing ..	16
41	Short circuiting and across LW and HF trans.	1.04
42	Short circuiting and across LW grid, V 2	.04



Under chassis arrangement of resistances and condensers in the Philips 634A five-valve A.C. mains receiver. On the right is shown the layout of components on he end of the chassis.