

C	Capacitors	Value	Working Voltage D.C.	List No.	Notes
35	Paper	50000 pF ± 20%	160 V	TC 101 50k	L = 0
36	Paper	10000 pF ± 20%	250 V	TC 102 10k	
37	Mica	7 pF ± 10%	500 V	TC 200 7/A	
38	Paper	5000 pF ± 20%	1000 V	TC 105 5k	
39	Paper	25000 pF ± 20%	600 V	TC 104 25k	
41	Paper	20000 pF ± 20%	1000 V	TC 105 20k	
42	Mica	12 pF ± 10%	500 V	TC 200 12/A	
43	Paper	6400 pF ± 20%	400 V	TC 103 6k4	
46	Mica	39 pF ± 2%	500 V	TC 200 39/C	

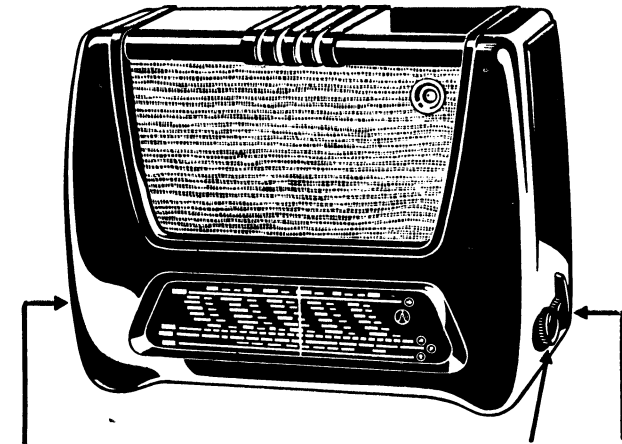
R	Resistors	Value	Load	List No.	Notes	
1	Wire-wound	170 Ω ± 5%	7 W	EK 300 60	divider	
2	Wire-wound	72 Ω ± 5%	1 W	TR 502 72 B		
3	Carbon	50000 Ω ± 13%	0.25 W	TR 101 50k		
4	Wire-wound	350 Ω ± 10%	4 W	PF 674 01		
5	Wire-wound	130 Ω ± 5%	6 W			
6	Wire-wound	360 Ω ± 5%	4.5 W	with on/off switch		
7	Carbon	0.8 M Ω ± 13%	0.25 W			TR 101 M8
8	Carbon	20 Ω ± 5%	0.5 W			TR 102 20 B
9	Carbon	12500 Ω ± 13%	0.5 W			TR 102 12k5
10	Carbon	10000 Ω ± 13%	1 W			TR 103 10k
11	Carbon	1250 Ω ± 13%	2 W		TR 104 1k25	
14	Carbon	64000 Ω ± 13%	0.5 W		TR 102 64k	
15	Carbon	1 M Ω ± 13%	0.25 W		TR 101 1M	
16	Carbon	50000 Ω ± 13%	0.25 W		TR 101 50k	
17	Potentiometer	0.5 M Ω log.			WN 697 18/M5 C	
18	Carbon	20000 Ω ± 13%	0.25 W	TR 101 20k		
19	Carbon	0.4 M Ω ± 13%	0.25 W	TR 101 M4		
20	Carbon	1 M Ω ± 13%	0.25 W	TR 101 1M		
22	Carbon	1 M Ω ± 13%	0.25 W	TR 101 1M		
23	Carbon	1 M Ω ± 13%	0.25 W	TR 101 1M		
24	Carbon	1 M Ω ± 13%	0.25 W	TR 101 1M		
25	Carbon	160 Ω ± 10%	0.5 W	TR 102 160 A		
26	Carbon	100 Ω ± 13%	0.25 W	TR 101 100		
27	Carbon	2 M Ω ± 13%	0.25 W	TR 101 2M		
28	Carbon	0.5 M Ω ± 13%	0.25 W	TR 101 M5		



SERVICE INSTRUCTIONS FOR TESLA "ACCORD 402 U"



(Refers to version 402U-5, 402U-5z and 402U-7)



Mains switch, volume control and tone control, ganged

Tuning Waveband switch

DESCRIPTION

• CIRCUIT

3 + 2 valve superheterodyne with six circuits for operation on A.C./D.C. mains.

• WAVEBANDS

I. short waves 13.8— 20 m
(21.7— 15 Mc/s)
II. short waves 20 — 40 m
(15 — 7.5 Mc/s)
III. short waves 40 —131 m
(7.5— 2.3 Mc/s)
medium waves 187 —571 m
(1604 —525.4 kc/s)

• VALVES

UCH 21 — mixer and oscillator
UCH 21 — I. F. and A. F. amplifier
UBL 21 — detector and power amplifier
UY 1 N — half-wave rectifier
EM 11 — cathode-ray tuning indicator
Two pilot lamps 6—7 V/0.3 A

• INTERMEDIATE FREQUENCY

468 kc/s

• MAINS SUPPLY

A.C./D.C. 120, 150, 220, 240 V; 30-100 c/s

• CONSUMPTION

35 W at 120 V
50 W at 220 V
Primary current 230 mA ± 10% at 220 V ~

• POWER OUTPUT

2 W at 220 V (at 10% distortion)
0.75 W at 120 V

• LOUDSPEAKER

Permanent magnet moving coil, diameter 170 mm, speech coil impedance approximately 5 Ω.

• DIMENSIONS AND WEIGHTS

	Receiver	Receiver incl. packing
Width	390 mm (incl. knobs)	435 mm
Height	275 mm	345 mm
Depth	160 mm	235 mm
Weight	5 kg	7 kg

SPARE PARTS

Item	Mechanical Parts	List No.	Notes
1	Cabinet, brown	PA 257 06	
2	Baffle, complete	PF 110 23	
2a	Baffle board only	PA 110 22	
2b	Baffle, complete	PF 110 30	402U-5z
3	Brocade	PM 100 02	
4	Back panel	PF 132 20	
4a	Back panel	PF 132 25	402U-5z
5	Back panel holder	EK 514 10	
6	Bottom cover	PF 806 54	
7	Window for EM 11	187 L8 Vd2	
8	Bracket for socket of cathode-ray indicator	187 L8 Vd4	
9	Knob, round, brown	PA 243 13	
10	Knob for waveband switch, brown	PA 243 11	
11	Sealing cup	PA 449 00	
12	Dial	PF 157 59	402U-5
12a	Dial	PF 157 60	402U-7
13	Rubber ring for dial	EK 764 50	
14	Dial screen	PA 614 03	
15	Pointer	PF 166 01	
16	Guiding rod for pointer	PA 892 00	
17	Pulley	EK 401 00	
18	Tuning drive drum	EK 399 10	
19	Tension spring for cord	EK 975 86	
20	Tension spring for cable	EK 975 30	
21	Cable	M4-37	
22	Cord	M4-38	
23	Tuning spindle	EK 448 65	
24	Securing ring for spindle	NTN 029-3.2 St-2	
25	Volume control spindle	PA 726 16	
26	Tone switch wafer	PA 670 05	
27	Tube	PA 910 00	
28	Securing ring	NTN 028-5-St	
29	Tone control switch	PK 521 00	
30	Rubber bushing under variable capacitor	EK 323 00	
31	Clamp for mains cord	EK 514 35	
32	Mains cord with plug	PF 615 00	
33	Waveband switch spindle with locking disc	PF 705 10	
34	Locking spring for band switch	PA 783 09	
35	Locking friction roller	PA 013 09	
36	Waveband switch wafer P 1	PK 533 12	
37	Waveband switch wafer P 2	PK 533 13	
38	Socket for UY 1 N valves	PK 497 02	
39	Socket for U 21 series valves	PK 497 01	
40	Socket for EM 11 valves	PK 497 04	
41	Mounting clamp assembly for EM 11	187 L9	
42	Aerial-earth socket plate with wavetrap	PK 852 04	
43	Speaker socket plate	PF 806 02	
44	Pickup socket plate	PF 523 02	
45	Pickup on/off switch	EK 133 10	
46	Mains voltage adjustment selector plate	PF 806 40	
47	Mains voltage adjustment disc	PK 461 01	
48	Coils bracket, spare	EK 514 30	
49	Sealing compound	PM 046 03	
50	Dial lamp holder, left-hand	PF 498 12	
50a	Dial lamp holder, right-hand	PF 498 09	
51	Dial lamp 6-7 V/0.3 A	PN 866 02	
52	Loudspeaker	PN 632 06	
53	Cone with coil	PF 759 05	
54	Annular rim	PA 029 09	
55	Annular spacer	PA 265 03	
56	Canvas cover for speaker	PV 791 16	

ELECTRICAL PARTS

L	Coils	Resistance Ω	List No.	Notes
1	I. F. rejector circuit	40 Ω	PK 586 31	
2	Aerial, SW ranges I. and II.	3 Ω	PF 600 08	
3		< 1 Ω		
4		31 Ω		
5	Aerial, MW and SW range III.	7.3 Ω	PK 590 13	
6		11.6 Ω		
7		< 1 Ω		
11	Oscillator, MW and SW ranges I. and II.	2.35 Ω	PK 590 12	
12		< 1 Ω		
13		< 1 Ω		
14		3.1 Ω		
15	Oscillator, SW range III.	6.5 Ω	PF 600 09	
16		1.2 Ω		
17		0.6 Ω		
21	1st I. F. transformer	9 Ω	PK 854 26	
22		9 Ω		
23		9 Ω		
24	2nd I. F. transformer	5.44 Ω	PK 854 27	
24		4.05 Ω		
28	Gram. pickup transformer	1200 Ω	EK 100 25	
29		1800 Ω		
30	Output transformer	141 Ω	PN 673 13	
31		0.24 Ω		

C	Capacitors	Value	Working Voltage D.C.	List No.	Notes
1	Mica	40 pF \pm 10%	500 V	TC 200 40 A	
2	Paper	5000 pF \pm 20%	1000 V	TC 105 5k	
3	Paper	1000 pF \pm 20%	1000 V	TC 105 1k	
4	Wire-wound	25 pF		PN 700 03	
5	Mica	86 pF \pm 1%	500 V	TC 200 86/D	
7	Wire-wound	25 pF		PN 700 03	
8, 20	Variable	2 \times 400 pF		EK 215 24	
9	Mica	94 pF \pm 1%	500 V	TC 200 94 D	
10	Mica	100 pF \pm 10%	500 V	TC 200 100/A	
11	Mica	80 pF \pm 10%	500 V	TC 200 80/A	
12	Wire-wound	25 pF		PN 700 00	
13	Trimmer	30 pF		PN 703 01	
14	Mica	1450 pF \pm 1%	500 V	TC 202 1k45 D	
15	Mica	396 pF \pm 1%	500 V	TC 201 396 D	
16	Wire-wound	25 pF		PN 700 00	
17	Wire-wound	25 pF		PN 700 00	
18	Mica	76 pF \pm 1%	500 V	TC 200 76 D	
19	Mica	86 pF \pm 5%	500 V	TC 200 86/B	
21-24	Mica	103 pF \pm 5%	500 V	TC 200 103 B	
25	Paper	40000 pF \pm 20%	160 V	TC 101 40k	
26	Mica	100 pF \pm 10%	500 V	TC 200 100 A	
27	Paper	50000 pF \pm 20%	250 V	TC 102 50k	
28	Paper	0.1 μ F \pm 20%	250 V	TC 102 M1	
29, 30	Electrolytic	2 \times 50 μ F \pm 50%			
			250 275 V	TC 517 50 50M	
31	Electrolytic	25 μ F	12-15 V	TC 500 25M	
32	Paper	25000 pF \pm 20%	250 V	TC 102 25k	Shielded PF 717 00
33	Mica	80 pF \pm 10%	500 V	TC 200 80/A	
34	Mica	100 pF \pm 10%	500 V	TC 200 100 A	

RECEIVER ALIGNMENT

• IMPORTANT!

When aligning or carrying out any other adjustment or test with the receiver switched on, the receiver must be connected to the mains via an insulating transformer, i. e. a transformer with separate secondary winding and with high insulation resistance between primary and secondary windings. The receiver chassis, which would otherwise be connected directly to the mains, may now be earthed; it can then be handled just as safely as a normal A. C. receiver with transformer. Before connecting the receiver to the mains be sure the cathode-ray tuning indicator EM 11 is inserted, otherwise resistor R 25 connected in parallel to the heater of this valve will burn out.

• GENERAL

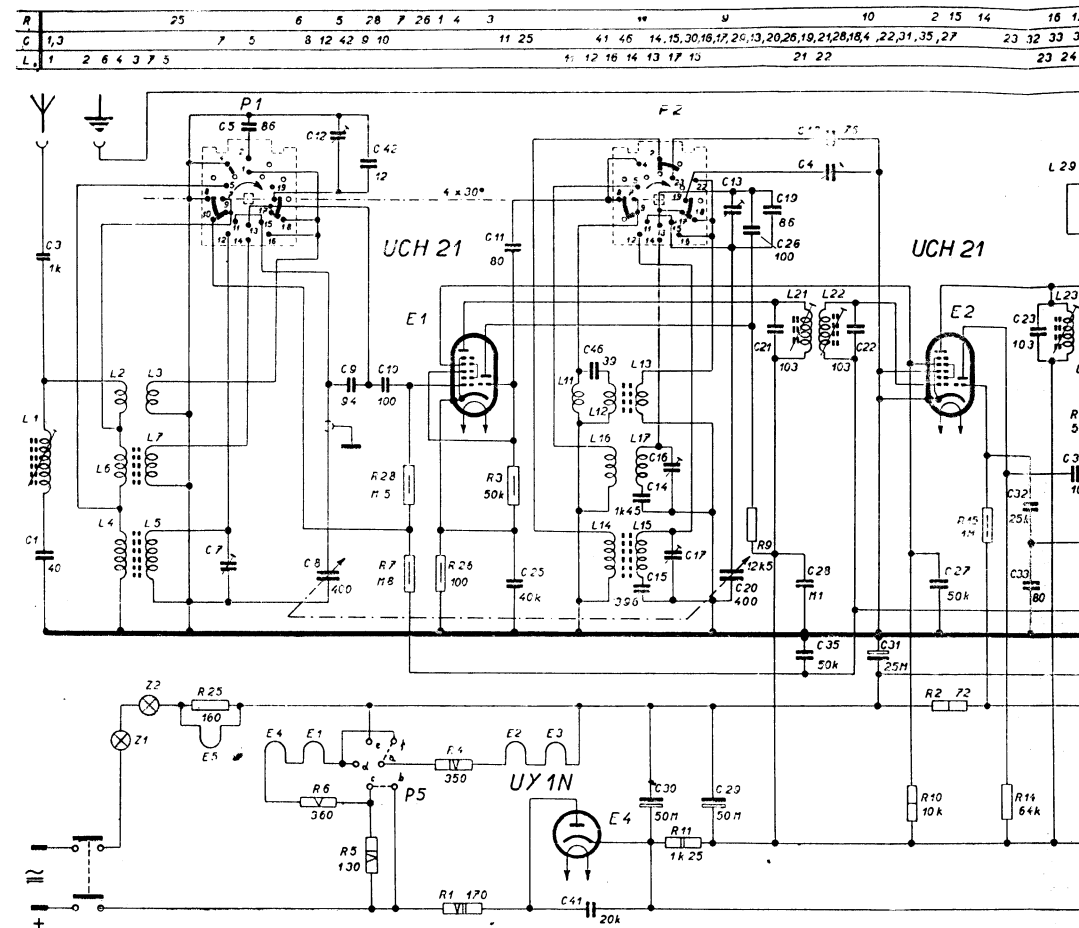
Before alignment the receiver should be mechanically and electrically adjusted, and the valves which will be used in the receiver have to be inserted. The dial pointer has to cover the two triangular

marks of the right-hand edge of the dial, when the stator and rotor plates of the variable capacitor are flush. The iron cores are adjusted by a special screwdriver (without metal parts), the capacitors C 4, C 7, C 16, C 12 and C 17 by reeling off the appropriate length of thin wire. When adjusting the wire-wound trimmer capacitors, take care not to pass over optimum alignment. The air trimmer C 13 can be adjusted by means of a special spanner made of insulating material and capacitor C 18 by scraping off silver film in the small window. The local oscillator frequency is on all wave ranges by I. F. higher than the signal frequency, therefore the reached maximum with lower capacity of the trimmer is correct. Connect the signal generator as indicated in the alignment chart, earth the receiver, turn volume control to maximum and connect output meter to sockets of extension speaker. The aligned parts should be secured with sealing wax.

ALIGNMENT CHART

Steps	Circuit aligned	Signal generator		Receiver			Output meter deflection	
		Frequency	Connection to	Band switch	Set dial pointer to	Connect 100 pF capacitor parallelly to coil		Sequence of adjustment
1	I. F.	468 kc/s	signal grid of first UCH 21 via 30000 pF capacitor	MW	beginning of MW range (200 m)	L 23	iron cores of L 24+L 24'	maximum
2						L 24'	iron core of L 23	
3						L 21	iron core of L 22	
4						L 22	iron core of L 21*	
5	I. F. rejector circuit	468 kc/s	aerial socket via standard dummy aerial	MW	end of MW range (550 m)	—	iron core of L 1	minimum
6	SW (13.8—20 m)	15.5 Mc/s	aerial socket via 400 Ω dummy aerial	SW (13.8—20 m)	19.35 m mark	—	capacitor C 13	maximum
7		21 Mc/s			14.28 m mark	—	capacitors C 4, C 12	maximum
8		12 Mc/s			25 m mark	—	capacitor C 18	maximum
9	SW (40—131 m)	6.5 Mc/s	aerial socket via standard dummy aerial	SW (40—131 m)	46.15 m mark	—	capacitor C 16	maximum
10	MW (187—571 m)	1500 kc/s		MW (187—571 m)	200 m mark	—	capacitors C 17, C 7	maximum

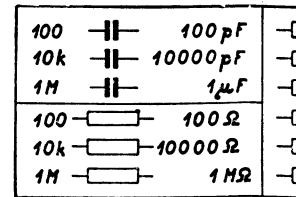
* Upper coils of I. F. transformers.



Valves and Currents	at 220 V				at 120 V				V _f V	
	V _a V	V _{g2} V	I _a mA	I _{g2} mA	V _a V	V _{g2} V	I _a mA	I _{g2} mA		
UCH 21	heptode	157	82	1.9	4.8	88	62	0.74	2.35	20
	triode	112	—	4.2	—	68	—	1.53	—	
UCH 21	heptode	157	82	3.4	3.4	88	62	1.8	1.38	20
	triode	56	—	1.5	—	28	—	0.85	—	
UBL 21	duodiode pentode	182	157	55	7.5	100	90	20	3.5	55
UY 1 N	half-wave rectifier	200	—	81	—	110	—	37	—	50
EM 11	cathode-ray tuning indicator	1st deflect. plate 15 V 2nd deflect. plate 22 V				1st deflect. plate 10 V 2nd deflect. plate 15 V				6.3
Electrolytic Capacitors	193 V D. C. on C 30 157 V D. C. on C 29				100 V D. C. on C 30 90 V D. C. on C 29					

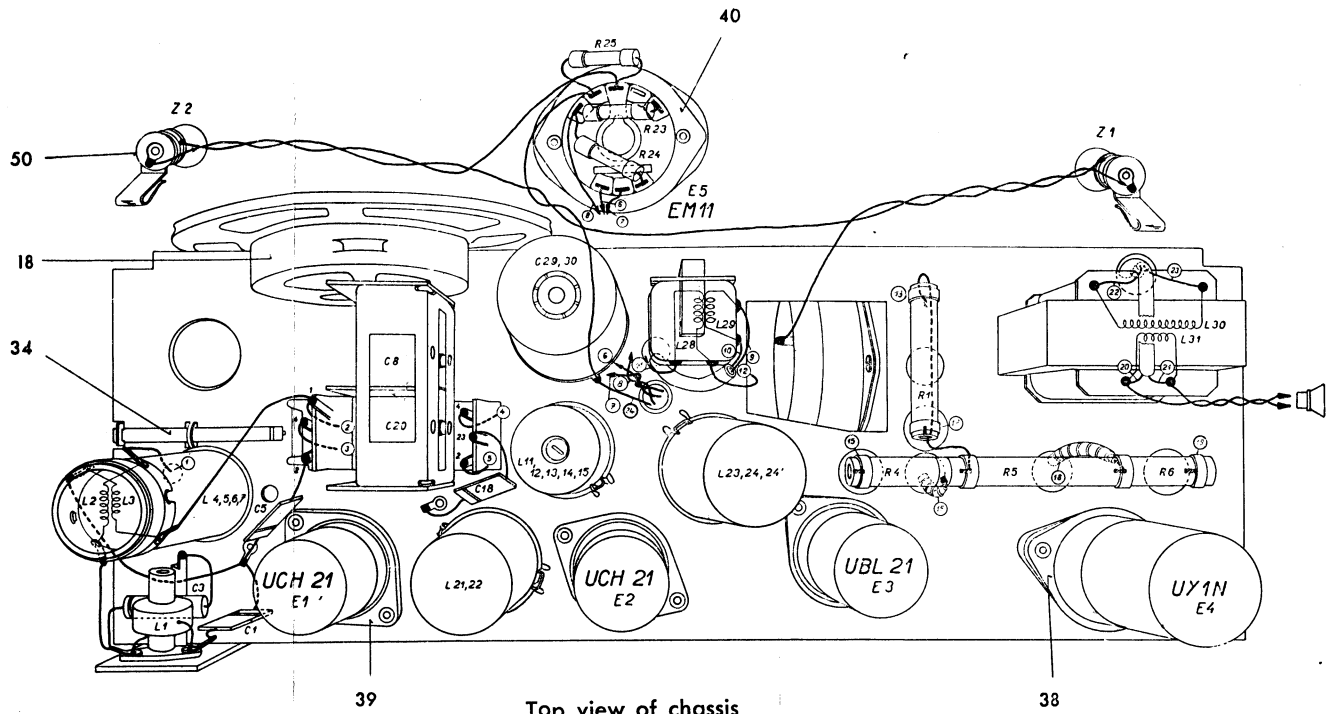
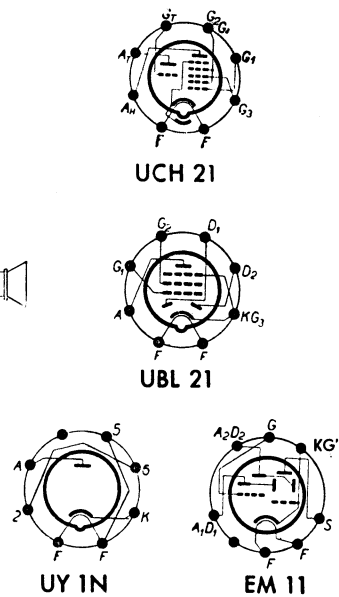
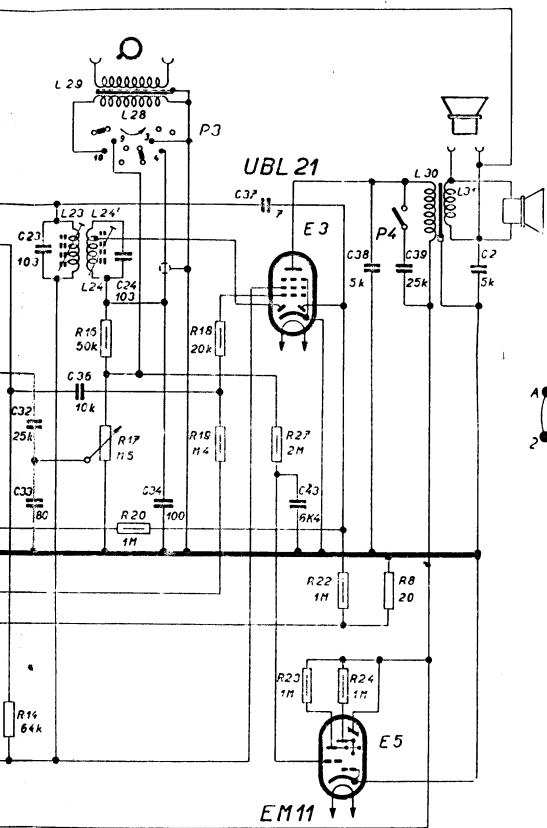
All voltages and currents have been measured by a 1000 Ω/V meter.

Circuit diagram of



Wave ranges	
I. Short waves	8-9
II. Short waves	1-2
III. Short waves	4-5
Medium waves	2-4

16	17	20	18	19	27	23	24	22	8	
23	32	33	36	24	34	37	43	38	39	2
23	24	24'	29	28				30	31	

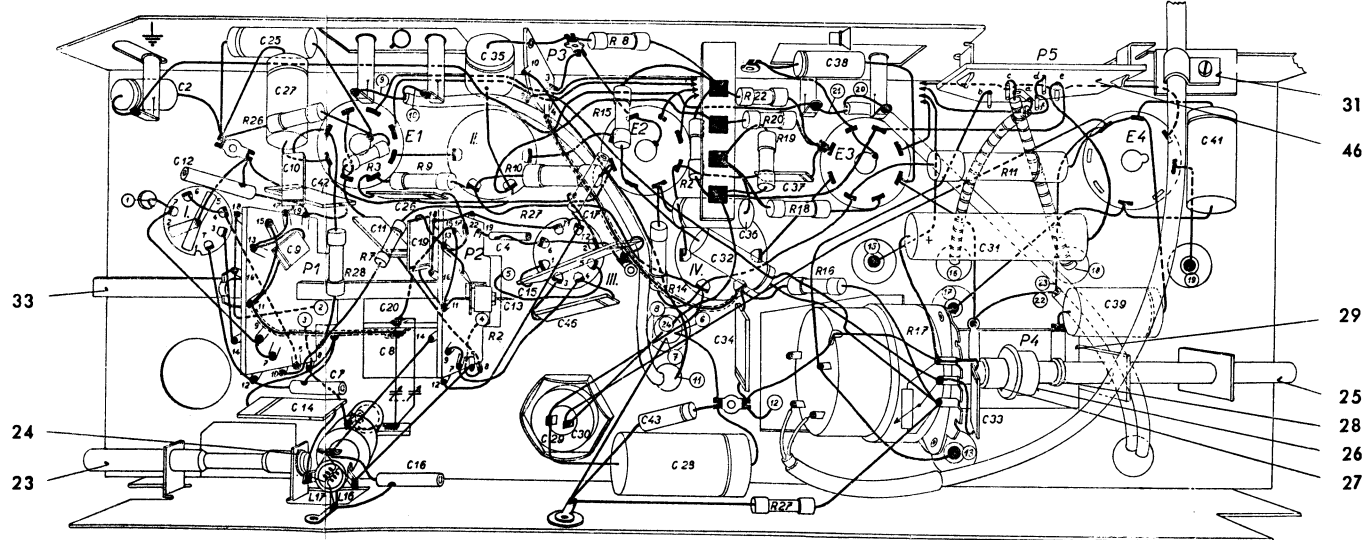
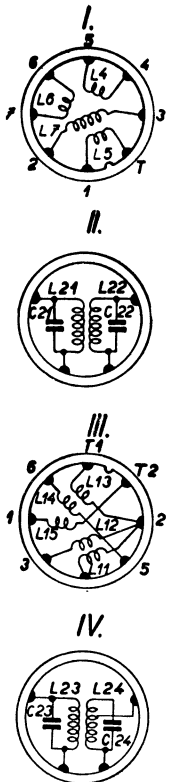


R	26	28	7	3	9	10	8	15	14	2	20,22,19	27	18,16	17	11															
C	2	12	25	27	10	42	9	14	7	11,26,20,8,16,19	13	35	15	4	4	6	17	29	30	43	28	36	32	34	37	38	33	31	39	41
L	1.4-5-6-7			17	16	11.21-22			11.11-12-13-14-15			11.23-24-24'																		

am of TESLA "ACCORD 402 U"

PF		0.25 W
PF		0.5 W
μF		1 W
Ω		2 W
Ω		3 W
MΩ		4 W

Voltage selector	
120 V	a-b, d-e
150 V	a-c, e-f
220 V	a-f, b-c
240 V	a-d



Underside view of chassis wiring