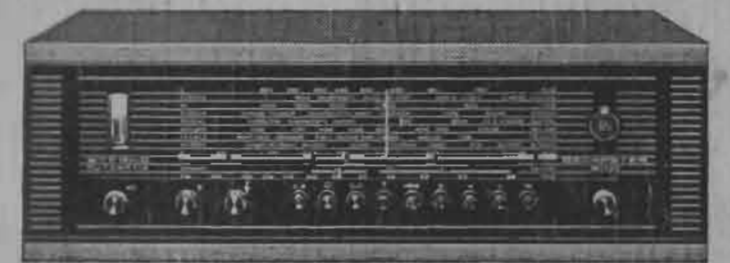
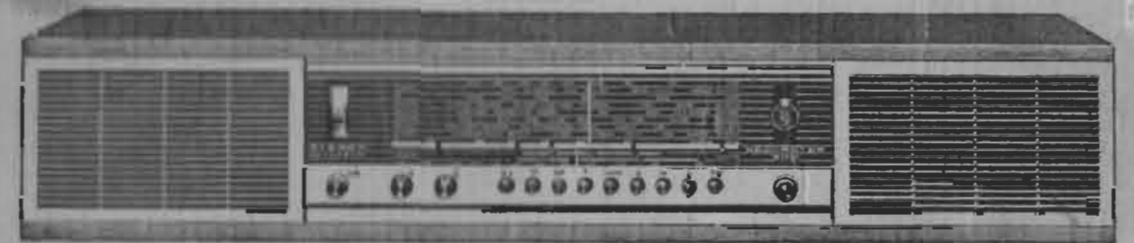


Ryland Huntley
15 OLD BOND STREET, BATH. Tel. 4532
RADIO & TELEVISION

beomaster 900 k, m, and rg

SERVICE MANUAL



PRINTED IN DENMARK
RESERVE-REPERERT - STRUER

BANG & OLUFSEN PRODUKTIONSSKAB

STRUER - DENMARK Telephone (678) 81122* - Telex 4266 - Cable Address: Bangoluf

TECHNICAL DATA

AM aerial: Ferrite aerial for LW, MW, FW; push-button switching to external aerial.

Channel separation: Better than 28 dB.

Dimensions, Model K: 29 1/4 in. wide, 5 9/16 in. high, 9 in. deep
(744 x 142 x 229 mm).

Dimensions, Model M: 17 in. wide, 5 9/16 in. high, 9 in. deep
(432 x 142 x 229 mm).

External-speaker impedance: 3-5Ω, switching provided in connector sockets. DIN sockets for two side speakers and one additional speaker on left channel.

FM aerial: Built-in FM aerial, and telescopic dipole.

FM: Tuner with automatic frequency control (AFC).

Frequency range: 30-15000 c/s at ±3 dB (bass and treble controls at mid-scale).

Gramophone connection: B&O stereo player G 42 VF or crystal pick-up
Sensitivity: 180 mV at max. output.

Hum with volume control at minimum: under 4 microwatts.

Oscillator radiation: Suppressed in conformity with present German standards.

Power consumption: 10 watts at 100 mW output. Max. output approx. 65 watts.

Power output: 2 x 6 watts.

Stereo indicator: Green light for stereo gramophone, stereo reproduction from tape, and with stereo decoder installed.

Supply voltage: 220 volts AC (for operation on 110 and 240 volts, see page 6).

Tuning indicator: Pointer instrument.

Tape recorder connection: 5-contact DIN socket for monaural and stereo tape recorders. Playback through separate push-button.

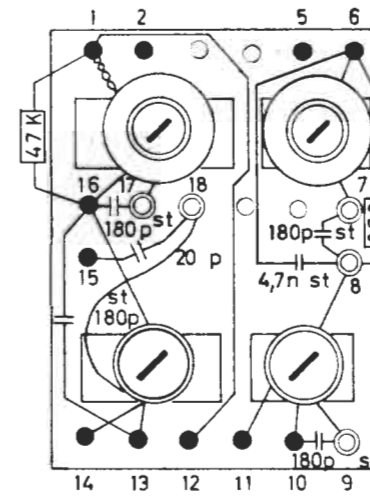
Wave bands, receivers with serial numbers under S.263:

LW	2040 - 940 m,	147 - 320 kc/s
MW	578 - 188 -	520 - 1600 -
FW	194 - 75 -	1550 - 4000 -
FM	3.4 - 2.8 -	88 - 108 Mc/s

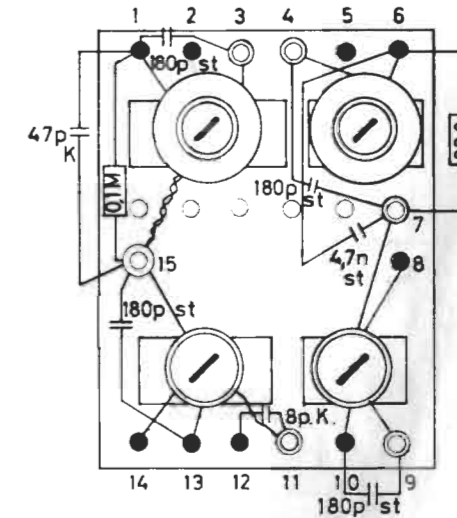
Receivers numbered S.263 and higher:

LW	2040 - 857 m,	147 - 350 kc/s
Other bands identical.		

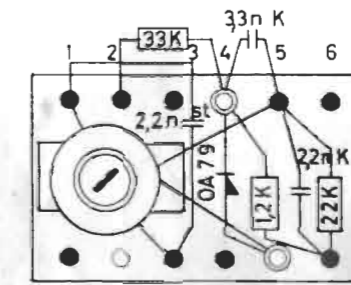
WIRING DIAGRAM FOR FF TRANSFORMERS



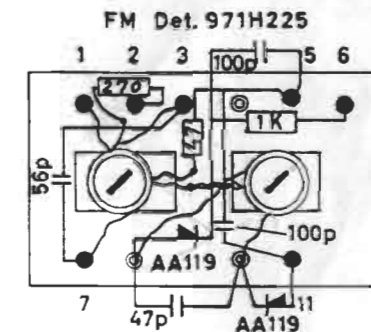
1' MF 971H 206
1' IF



2' MF 971H 207
2' IF



AM Det. 971H 209

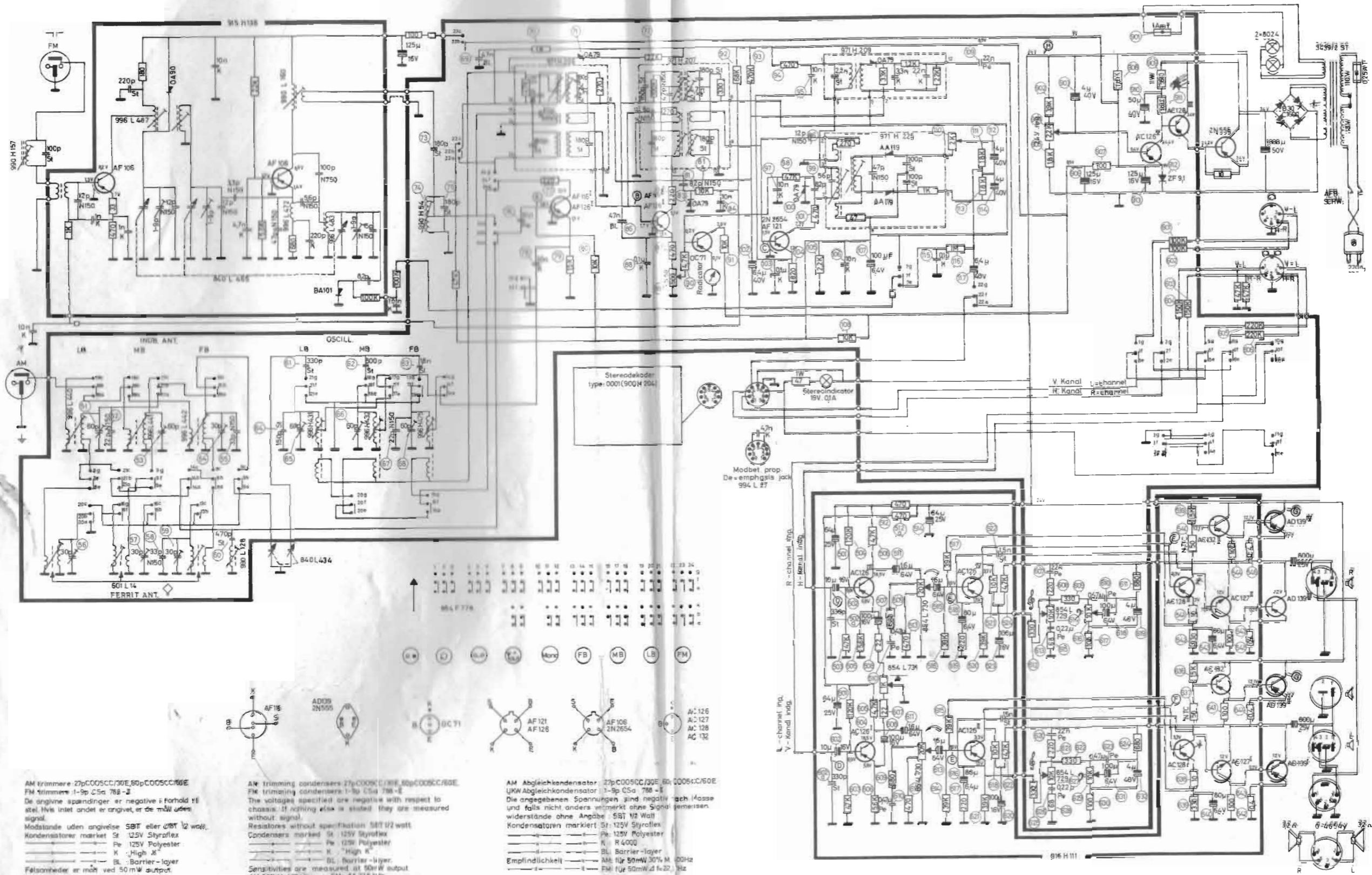


FM Det. 971H 225

680F640

CIRCUIT DIAGRAM OF BEOMASTER 900

Remove 903
 pt 0.1µF from B to C
 of AC126 (i power supply)
 * change to AC153
 to reduce "noise"
 DRIVER

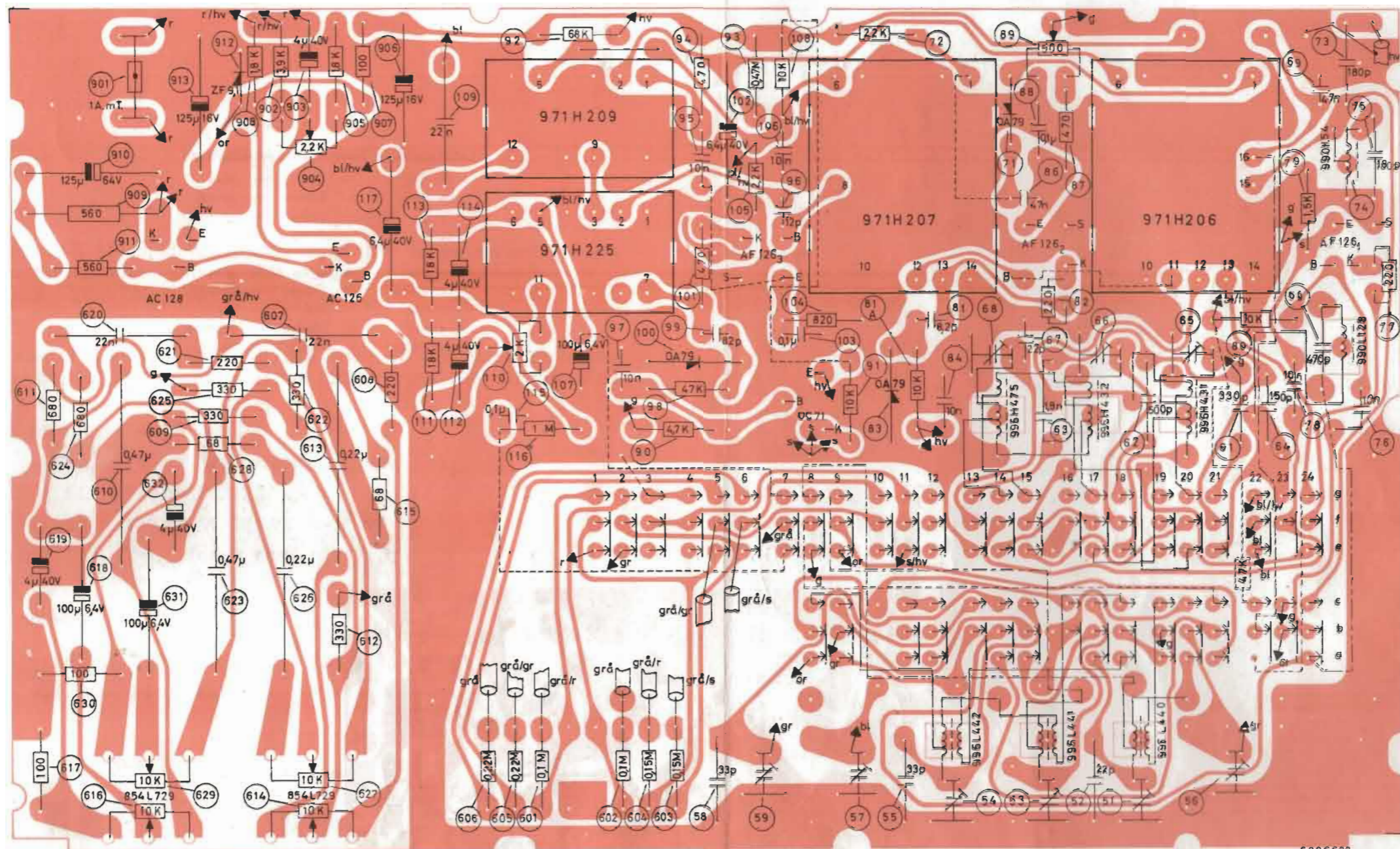


AM trimmere 27pCO05CC/30E, 50pCO05CC/80E
 FM trimmere 1-9p CSa 788-2
 De angivne spændinger er negative i forhold til stel, hvis andet er angivet, er de målt uden signal.
 Modstande uden angivelse 500 Ω eller 1/2 Watt.
 Kondensatorer markeret St 125V Styroflex
 Pe 125V Polyester
 K - High K
 BL - Barrier-layer
 Falskondensator er målt ved 50 mW output.
 24 30% M 600 Hz FM - af 27,5 kHz
 A: 1µV (444 kHz)
 0,8µV (1m Hz)
 25µV (10,7 mHz)
 B: 7µV (444 kHz)
 250µV (10,7 mHz)
 C: 230µV (444 kHz)
 35mV (10,7 mHz)
 D: 40mV 400 Hz gennem 0,1µF
 E: 30mV 400 Hz
 F: 140mV 400 Hz
 G: 10mA-100mA (tætning)
 H: 50mA-180mA

AM trimmingskondensatorer 27pCO05CC/30E, 50pCO05CC/80E
 FM trimmingskondensatorer 1-9p CSa 788-2
 De angivne spændinger er negative i forhold til chassis. Hvis andet er angivet, er de målt uden signal.
 Resistorer uden angivelse 500 Ω eller 1/2 Watt
 Kondensatorer markeret St 125V Styroflex
 Pe 125V Polyester
 K - High K
 BL - Barrier-layer
 Sensibiliteter er målt ved 50 mW output
 AM 30% M 400 Hz FM af 27,5 kHz
 A: 1µV (444 kHz)
 0,8µV (1m Hz)
 25µV (10,7 mHz)
 B: 7µV (444 kHz)
 250µV (10,7 mHz)
 C: 230µV (444 kHz)
 35mV (10,7 mHz)
 D: 40mV 400 Hz gennem 0,1µF
 E: 30mV 400 Hz
 F: 140mV 400 Hz
 G: 10mA-100mA (Ingen signal)
 H: 50mA-180mA

AM Abgleichkondensator: 27pCO05CC/30E, 50pCO05CC/80E
 UKW Abgleichkondensator 1-9p CSa 788-2
 Die angegebenen Spannungen sind negativ nach Masse und falls nicht anders vermerkt ohne Signal gemessen.
 Widerstände ohne Angabe: 500 Ω 1/2 Watt
 Kondensatoren markiert St: 125V Styroflex
 Pe: 125V Polyester
 K: High K
 BL: Barrier-layer
 Empfindlichkeit: AM für 30 mW 30% M 400 Hz
 FM für 50 mW af 27,5 kHz
 A: 1µV (444 kHz)
 0,8µV (1m Hz)
 25µV (10,7 mHz)
 B: 7µV (444 kHz)
 250µV (10,7 mHz)
 C: 230µV (444 kHz)
 35mV (10,7 mHz)
 D: 40mV 400 Hz durch 0,1µF
 E: 30mV 400 Hz
 F: 140mV 400 Hz
 G: 10mA-100mA (Ingen signal)
 H: 50mA-180mA

800B 257
 850 B 599



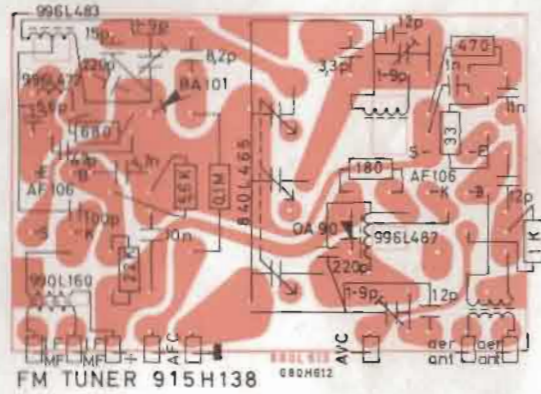
PW ENHED 915H146

PW BOARD 915H146

680C633
680C634

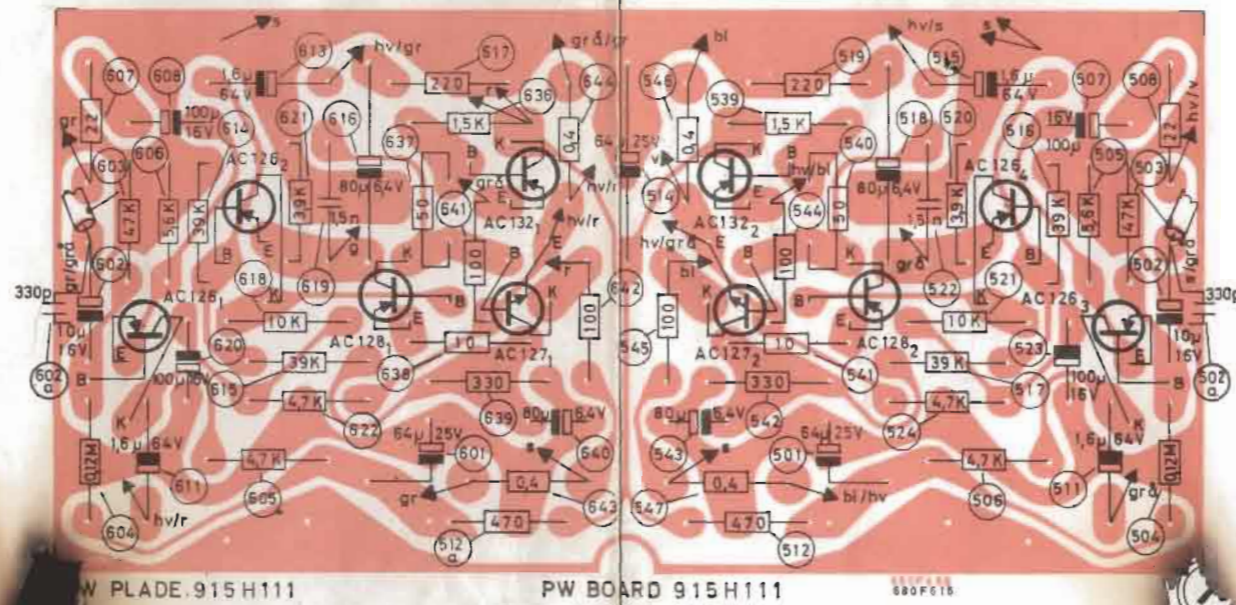
Ledningsfarver — Colour of wires — Kabelfarven

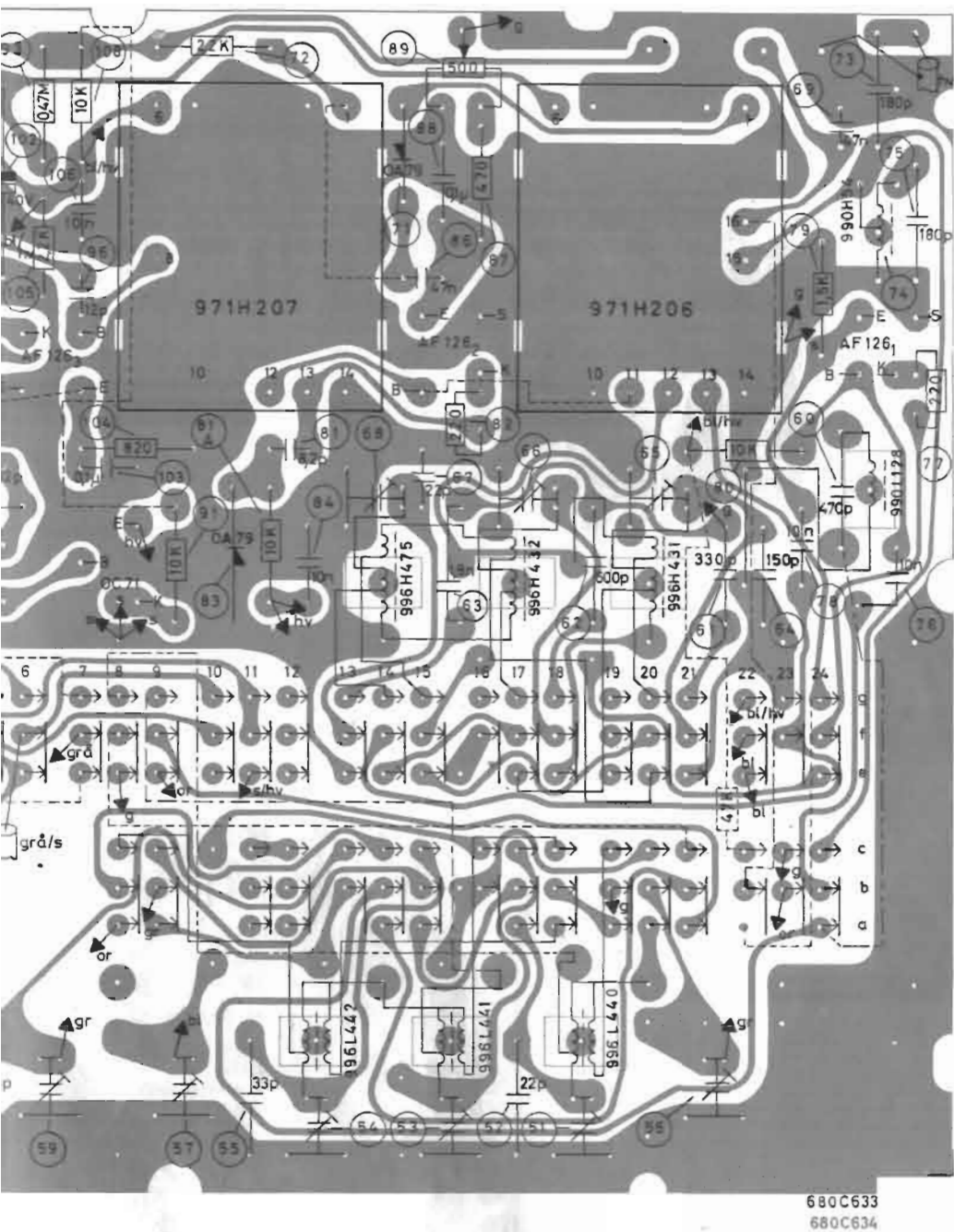
bl: blå	— blue	— blau
br: brun	— brown	— braun
g: gul	— yellow	— gelb
gr: grøn	— green	— grün
grå: grå	— grey	— grau
hv: hvid	— white	— weiss
or: orange	— orange	— orange
r: rød	— red	— rot
s: sort	— black	— schwarz
v: violet	— violet	— violett



Ledningsfarver — Colour of wires — Kabelfarben

bl: blå	— blue	— blau
br: brun	— brown	— braun
g: gul	— yellow	— gelb
gr: grøn	— green	— grün
grå: grå	— grey	— grau
hv: hvid	— white	— weiss
or: orange	— orange	— orange
r: rød	— red	— rot
s: sort	— black	— schwarz
v: violet	— violet	— violett





- wires — Kabelfarben
- c — blau
 - own — braun
 - low — gelb
 - en — grün
 - y — grau
 - ite — weiss
 - ngc — orange
 - rot
 - ck — schwarz
 - let — violett

Modification, LW Band.

Receivers numbered S.263 and higher have an LW band covering 147-350kc/s. They correspond to the circuit diagram on page 3.

Dial glass: Type 760 F 485.

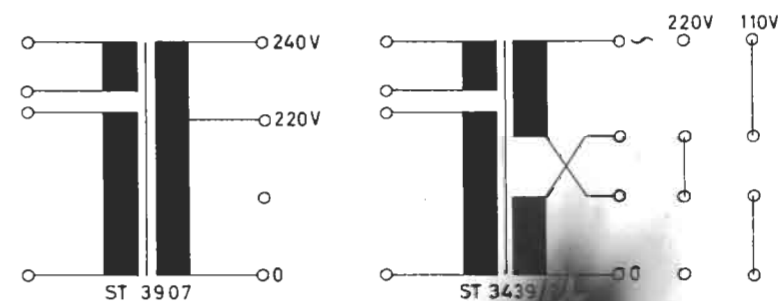
Receivers with serial numbers under S.263 have an LW band covering 147-320kc/s, and the following components differ from the circuit diagram:

- Diagram no.52 47 pF N 150.
- - 56 60 pF trimmer capacitor.
- - 61 270 pF St. 125 V.
- - 64 180 pF St. 125 V.

Dial glass: Type 760 F 484.

Power transformer:

- Standard version 220 - 240 V. ST. 3907.
- Special version 110 - 220 V. ST. 3439/2.





PARTS LIST, BEOMASTER 900 K and M.

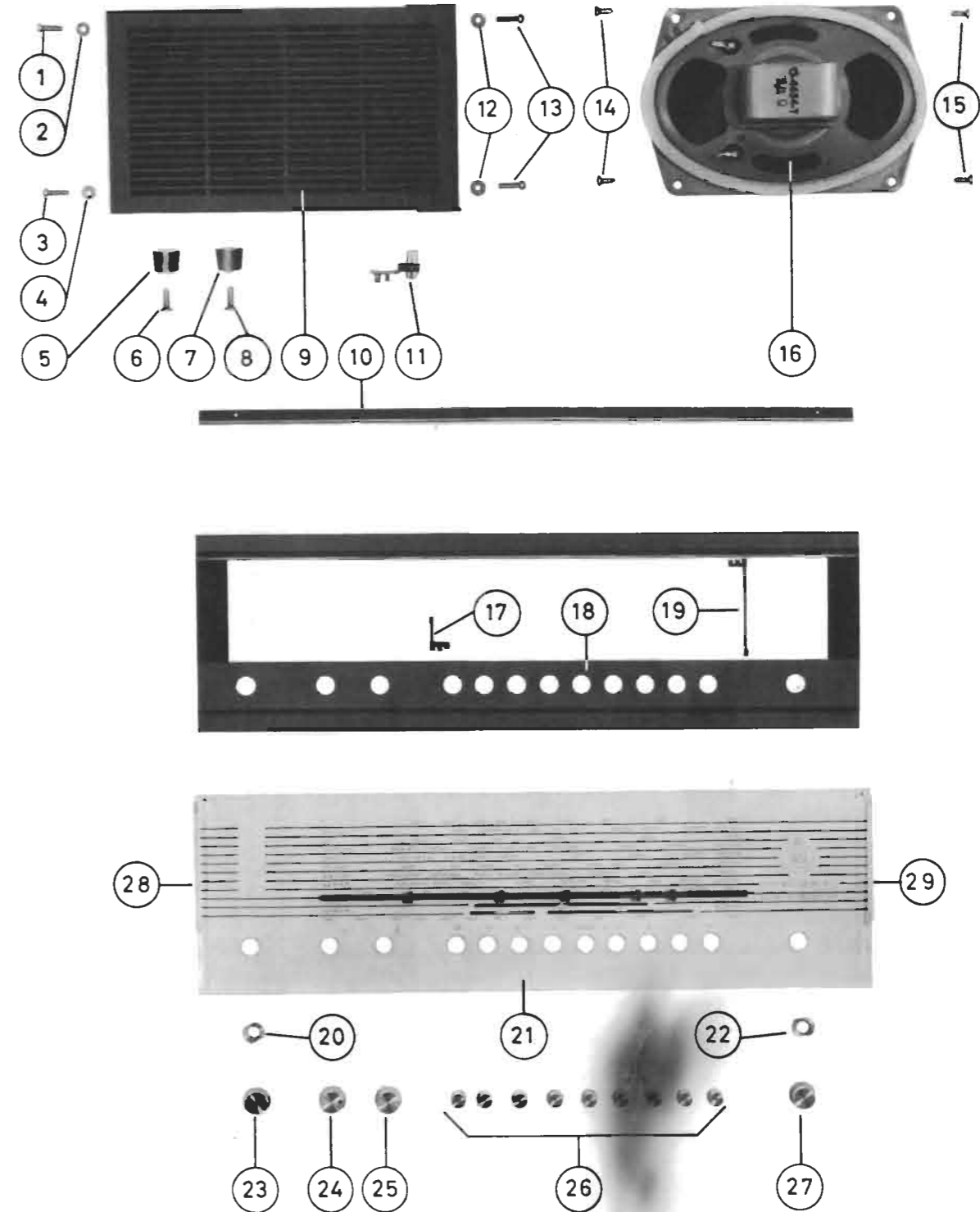
1	Screw.....	AM 3 × 12 DIN 84
2	Washer	3φ × 8φ × 0.5
3	Screw.....	AM 3 × 12 DIN 84
4	Washer	3φ × 8φ × 0.5
*5	Slide shoe.....	585 L 27
6	Screw.....	3 × 12 DIN 7997
7	Slide shoe.....	585 L 27
8	Screw.....	3 × 13 DIN 7997
*9	Speaker grille, Model K	536 F 89
	Cover plate, Model M	521 L 144
10	Angle, Model K	248 F 920
	Angle, Model M	245 F 583
11	Plug.....	No. S 5 mZ
12	Washers	3φ × 8φ × 0.5
13	Screws.....	AM 3 × 8 DIN 84
14	Screws.....	3 × 10 DIN 7997
15	Screws.....	3 × 10 DIN 7997
*16	Speaker	0-4654 Y (3.2Ω)
17	Dial pointer, FM	760 L 462
18	Dial cover plate, Model K	566 H 120
	Dial cover plate, Model M	566 H 138
19	Dial pointer, AM	760 L 461
20	Bushing.....	415 L 76
*21	Dial with slide rail and markers, Models K and M, Serial No. 263 and higher	760 F 485
	Dial, under Serial No. 263.....	760 F 484
22	Bushing.....	415 L 76
*23	Knob, volume	928 L 134
*24	Knob, bass.....	928 L 104
25	Knob, treble	928 L 104
*26	Buttons for push-button switch.....	760 L 488
*27	Knob, tuning	322 L 159
*28	Mirror for dial.....	537 L 249
29	Mirror for dial.....	537 L 249
	Bushings for mounting chassis.....	415 L 94
	Rockwool.....	75 mm(12.5 × 16 cm)

see photo on page 10

*37	Radiator	858 H 46
38	Dial rear plate	248 C 966
39	Angle.....	248 H 862
40	Dial lamp holder.....	3565
*41	Dial lamp.....	8024
*42	Cord pulley	10343/05
*43	Screws.....	BZ 2.9 × 9.5 DIN 7981
44	Nut.....	149 L 13
45	Screw.....	BZ 2.9 × 9.5 DIN 7981
*46	Dial cord	E 4

PARTS marked with an * are preferred spare parts.

Parts List to be Continued on Page 9.



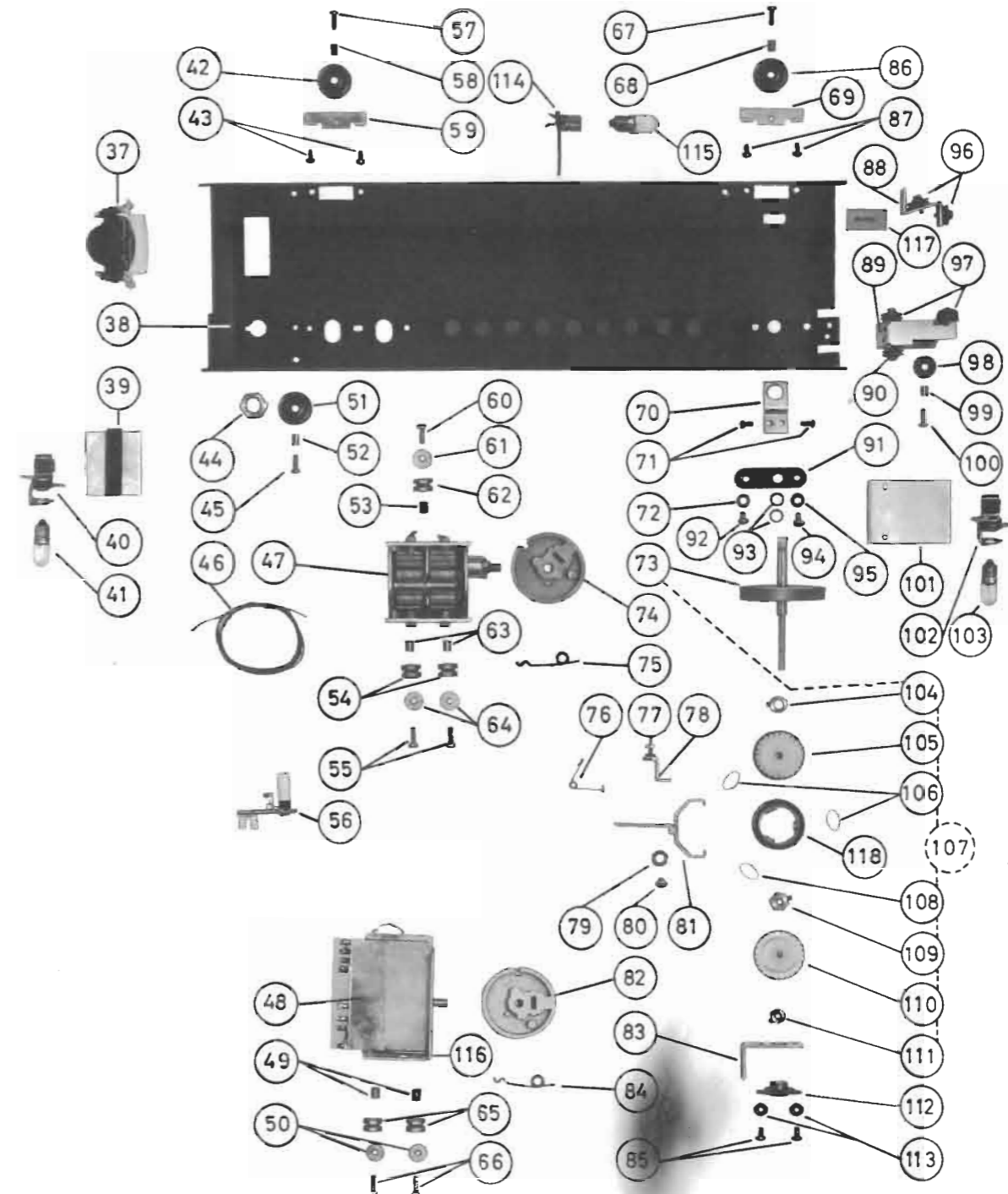


Parts List Continued from Page 7.

*47	Tuning capacitor.....	840 L 434
*48	FM tuner, complete	915 H 138
49	Bushings	410 L 273
50	Washers	286 L 185
51	Cord pulley	10343/05
*52	Bushing	410 L 165
53	Bushing	410 L 273
*54	Rubber bushings	411 L 36
55	Screws.....	AM 3 × 10 DIN 84
56	Series trap, 10.7 Mc/s	990 H 157
57	Screw.....	BZ 2.9 × 9.5 DIN 7981
58	Bushing	410 L 165
59	Bracket	245 L 520
60	Screw.....	AM 3 × 10 DIN 84
61	Washer	286 L 185
62	Rubber bushing.....	411 L 36
63	Bushings	410 L 273
64	Washers	286 L 185
65	Rubber bushings.....	411 L 36
66	Screws.....	AM 3 × 10 DIN 84
67	Screw.....	BZ 2.9 × 6.5 DIN 7981
68	Bushing	410 L 165
69	Bracket	245 L 520
70	Bracket	248 L 889
71	Screws.....	BZ 2.9 × 6.5 DIN 7981
72	Washers	4φ × 8φ × 1
73	Flywheel with shaft	760 L 434
*74	Cord wheel, AM.....	312 H 49
*75	Spring	335 L 148
76	Spring	335 L 148
77	Screw.....	AM 3 × 8 DIN 84
78	Bracket	248 L 887
79	Lock washer	286 L 200
80	Screw.....	106 L 91
81	Duplex lever	387 H 310
*82	Cord wheel, FM.....	312 H 74
83	Bracket	245 L 516
84	Spring	335 L 148
85	Screws.....	BZ 2.9 × 6.5 DIN 7981
86	Cord pulley	10343/05
87	Screws.....	BZ 2.9 × 6.5 DIN 7981
88	Bracket	249 L 240
89	Bracket	249 L 241
90	Cord Pulley.....	10163/06
91	Insulating piece, bearing	530 L 453
92	Screw.....	BZ 2.9 × 6.5 DIN 7981
93	Washers	286 L 118
94	Screw.....	BZ 2.9 × 6.5 DIN 7981
95	Washer	4φ × 8φ × 1
*96	Cord pulleys	10163/06
97	Cord pulleys	10163/06
98	Cord pulley	10163/06
99	Bushing	410 L 165

PARTS marked with an * are preferred spare parts.

Parts List to be Continued on page 11.



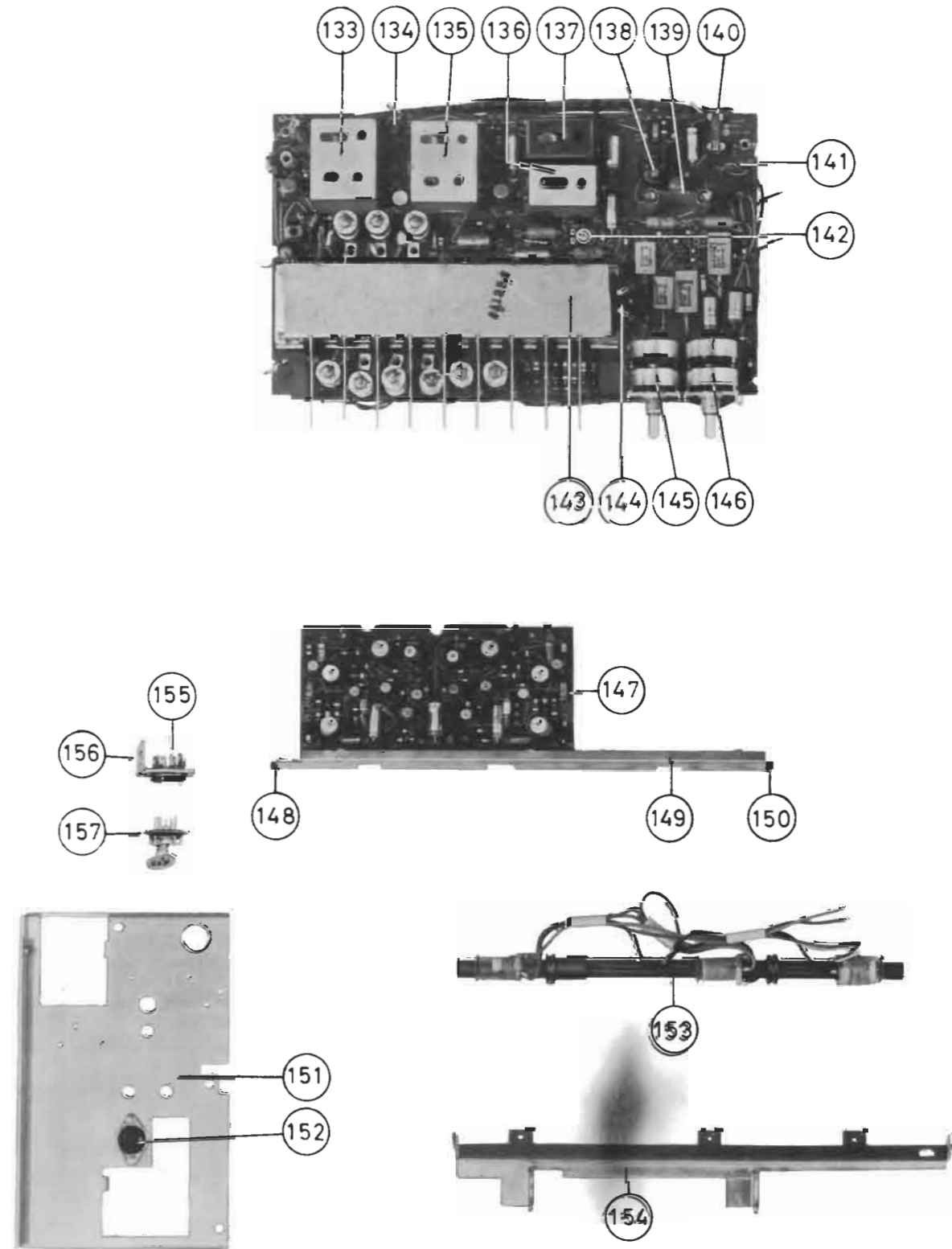


Parts List Continued from Page 9.

100	Screw.....	BZ 2.9 × 6.5 DIN 7981
101	Bracket.....	248 H 886
102	Dial lamp holder.....	3565
103	Dial lamp.....	8024
104	Stop collar.....	376 L 380
105	Coupling wheel.....	377 H 76
*106	Springs.....	335 L 156
107	Duplex dial drive, complete.....	760 H 435
108	Spring.....	335 L 156
*109	Boss.....	760 L 483
110	Coupling wheel.....	377 H 76
111	Stop collar.....	376 L 381
112	Bearing.....	400 L 31
113	Washers.....	3φ × 8φ × 0.5
114	Dial lamp holder.....	IE 259
115	Dial lamp.....	8097 D/71
116	Bracket.....	245 H 590
117	Cap, STEREO.....	521 L 147
*118	Coupling.....	760 L 491
133	1st IF transformer.....	971 H 206
134	Potentiometer.....	500Ω-S 50
135	2nd IF transformer.....	971 H 207
136	FM detector.....	971 H 225
137	AM detector.....	971 H 209
138	Potentiometer.....	2KΩ 1-8680
139	Heat sink.....	760 L 417
140	Fuse holders.....	5965
141	PW board, complete.....	915 H 146
	Aerial coil, LW.....	996 L 440
	Aerial coil, MW.....	996 L 441
	Aerial coil, FW.....	996 L 442
	Diodes.....	OA 79, four pcs.
*	Diode, Zener.....	ZF 9,1
	Socket for electrolytic capacitor.....	506 H 101
	Osc. coil, LW.....	996 H 431
	Osc. coil, MW.....	996 H 432
	Osc. coil, FW.....	996 H 475
	Coil, 444 kc/s filter.....	990 L 128
	Coil, 10.7 Mc/s, coupling.....	990 H 54
*	Transistor.....	AC 126
*	Transistor.....	AC 128
*	Transistors.....	AF 116, two pcs.
*	Transistor.....	AF 121 (2 N2654)
*	Transistor.....	OC 71
142	Potentiometer.....	2.2KΩ P 4
143	Push-button switch.....	854 F 778
*144	On/off switch.....	7255/3

PARTS marked with an * are preferred spare parts.

Parts List to be Continued on Page 13.



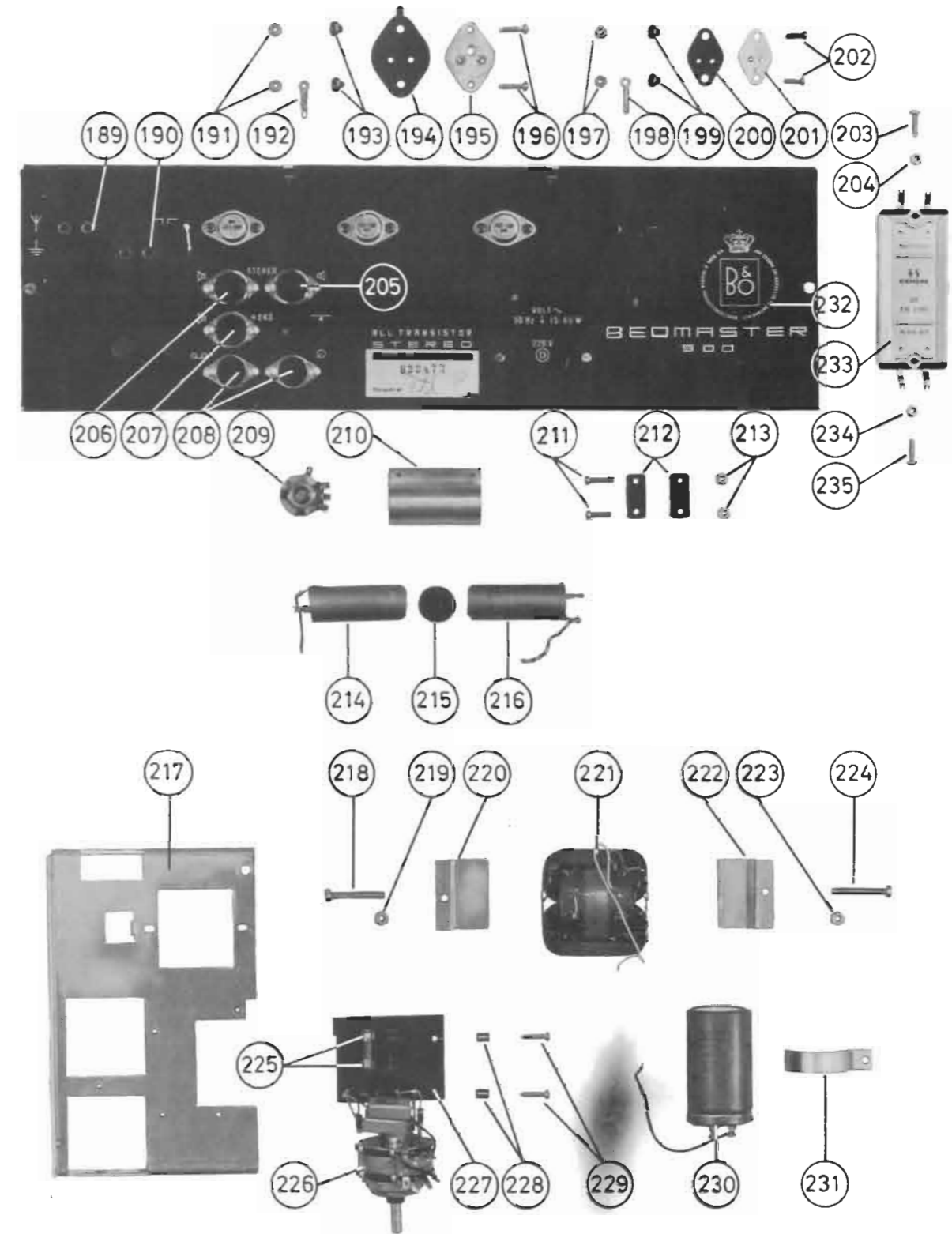


Parts List Continued from Page 11.

*145	Potentiometer.....	854 L 729
146	Potentiometer.....	854 L 729
147	AF FW-board, complete.....	915 H 111
148	Bushing	412 L 257
149	Angle	248 F 855
150	Bushing	412 L 257
151	Bracket	248 F 858
152	Connector socket.....	05 PH 1
*153	Ferrite rod, complete with coils.....	601 H 14
	Ferrite rod.....	760 L 478
154	Angle	760 F 458
155	Connector socket.....	197 M 2
156	Bracket	245 L 589
157	Connector plug.....	7496 Fu 1
189	AM aerial connector socket.....	962 L 92
190	FM aerial connector socket.....	962 L 91
191	Nuts	3 MT, hex.
192	Solder tag.....	4052
*193	Insulating bushings.....	56.201 A
*194	Mica insert.....	56.203 B
*195	Transistor.....	2N 555 (SP 1446)
196	Screws	BZ 2.9 x 13 DIN 7981
197	Nuts	3 MT hex.
198	Solder tag.....	4052
199	Insulating bushings.....	56.201 A
*200	Mica insert.....	56.203
201	Transistor.....	AD 139
202	Screws	BZ 2.9 x 9.5 DIN 7981
203	Screws	BZ 2.9 x 13 DIN 7981
204	Nut	3 MT hex.
205	Connector socket.....	034 PS/20
206	Connector socket.....	034 PS/20
207	Connector socket.....	032 P/20
208	Connector sockets.....	05 PH/1
209	Potentiometer, balance.....	854 L 731
210	Clamp.....	240 L 291
211	Screws.....	AM 3 x 12 DIN 84
212	Clamp.....	287 L 155
213	Nuts	3 MT hex.
*214	Electrolytic capacitor	800µF/25 V KNIP 832
215	Washer.....	376 L 403
216	Electrolytic capacitor	800µF/25 V KNIP 832
217	Bracket	248 F 857
218	Screw.....	AM 4 x 30 DIN 84
219	Nut	4 MT hex.
220	Screen	535 L 478
*221	Power transformer.....	ST 3907

PARTS marked with an * are preferred spare parts.

Parts List to be Continued on Page 15.





Parts List Continued from Page 13.

222	Screen.....	535 L 478
223	Nut.....	4 MT hex.
224	Screw	AM 4 × 30 DIN 84
225	Fuse holders.....	5965
*226	Potentiometer, volume.....	854 L 730
227	Mounting plate	507 L 852
228	Bushings.....	410 L 273
229	Screws	BZ 2.9 × 13 DIN 7981
*230	Electrolytic capacitor.....	1000 μ F/50 V KB 108 AT
231	Clamp.....	240 L 283
232	Mounting plate, rear wall.....	507 C 871
*233	Selenium rectifier.....	B 30 C 1600
234	Nut.....	BZ 2.9 × 13 DIN 7981

Extra Accessories:

*Connector plug, AM aerial	B.A.S. 4 or Type Z twin plug (flat contacts)
*Connector plug, FM aerial	B.A.S. 4 or Type Z twin plug (flat contacts)
*Connector plug, tape recorder	8-7506
*Connector plug, speaker	S. 34, three pcs.
Connector plug, gramophone	8-7506
*Telescopic dipole	2017

PARTS marked with an * are preferred spare parts.



DESCRIPTION

The BEOMASTER 900 radio receiver is an all-transistor AC receiver incorporating an FM tuner and two PW boards. PW board 915 H 146 comprises: Power supply section; AM-RF and IF section; FM-IF section. Unit 915 H 138 comprises: FM-RF section and tuning capacitor for FM. PW board 915 H 111 contains the audio amplifier.

FM

The signal from the aerial is applied, via the input transformer, to AF 106₁, which operates as an RF amplifier. The amplified signal is fed to the emitter of AF 106₂, which functions as a self-excited mixer. An AFC diode, BA 101, incorporated in the oscillator circuit is controlled directly from the FM detector. By means of a switch, the IF signal is applied to the base of AF 116₁, which operates as AM mixer and FM-IF amplifier. AF 116₂ and 2N2654 operate as IF amplifiers, and the signal rectifier consists of two OA79 diodes, one series resistance of which has been made variable so as to make it possible to achieve a perfectly symmetrical curve form. AVC bias voltage from the FM detector is applied to the base of AF 106₁ via 1K Ω .

AM

The receiver has a ferrite aerial for use on LW, MW, and FW, which may be deactivated by depressing the aerial push-button, thereby also connecting aerial (signal-frequency) coils for use with an external aerial. The incoming signal is applied to AF 116₁, which operates as a self-excited mixer. The output of the mixer is amplified by two IF stages, AF 116₂ and 2N2654. The signal rectifier is an OA79 diode, which also supplies AVC bias voltage. The AM detector circuit is raised -1.4 volts above chassis, and the AVC bias moves in the positive direction - that is, towards chassis potential. The bias voltage is applied to the base of AF 116₂ via 33K Ω , 6.4 μ F, and 270 Ω in the secondary circuit of the 1st AM-IF amplifier.

AF

The audio signal is fed to the stereo, gramophone, and tape-recorder switches, which connect to separate DIN connector sockets. With the MONO button released, the stereo indicator will show light in the following functions: gramophone, tape playback, and FM if a stereo decoder is installed.

The two audio amplifiers employ DC coupled driver and output stages. The output signal is fed to the speakers through capacitors.



FM STEREO

The BEOMASTER 900 is prepared for stereo broadcasts according to the FCC multiplex system, and a stereo decoder may be connected through a 9-pin miniature plug after removal of the de-emphasis network, 994 L 27.

The indicator lamp will show light on reception of the 19 kc/s pilot frequency.

The stereo decoder is supplied complete with instructions for installation under the designation 0001.

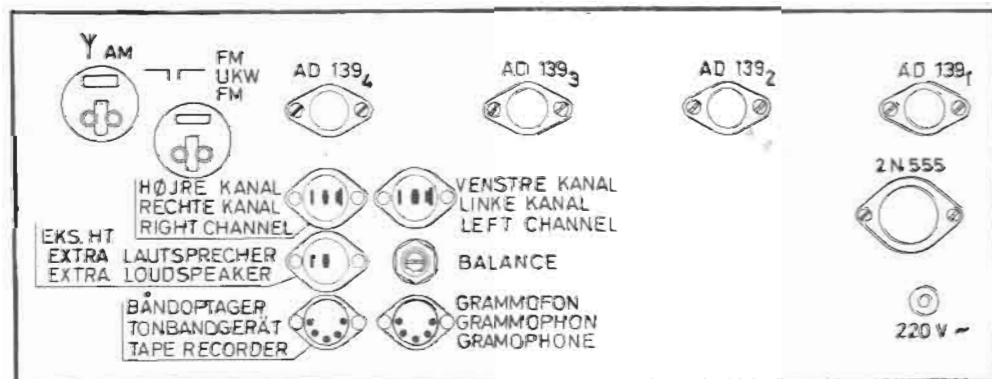
THE SPEAKERS OF THE MODEL 900 K

are mounted in the pressure-chamber cabinet, which also includes the space in the middle. It is therefore inadvisable to apply large amounts of power to the speakers with the chassis removed from the cabinet because the air damping is necessary to limit the excursions of the cone.

STABILIZED POWER SUPPLY

Because the power consumption of the output stage varies within wide limits (0.1 - 1.6 amperes), a voltage stabilization circuit has been incorporated in the power supply section. A 2N555 power transistor is controlled by a Zener diode and two driver transistors. In addition to stabilization, the circuit also provides effective filtering of the ripple frequency.

A more complete theoretical discussion of the output stage and power supply will be found on pages 18-22 of the Service Manual for the Master 610 Radio Set.



The four output transistors and the power supply transistor are insulated from the mounting plate by mica inserts and bushings. If this insulation is defective, one or more transistors and resistors will be permanently damaged.

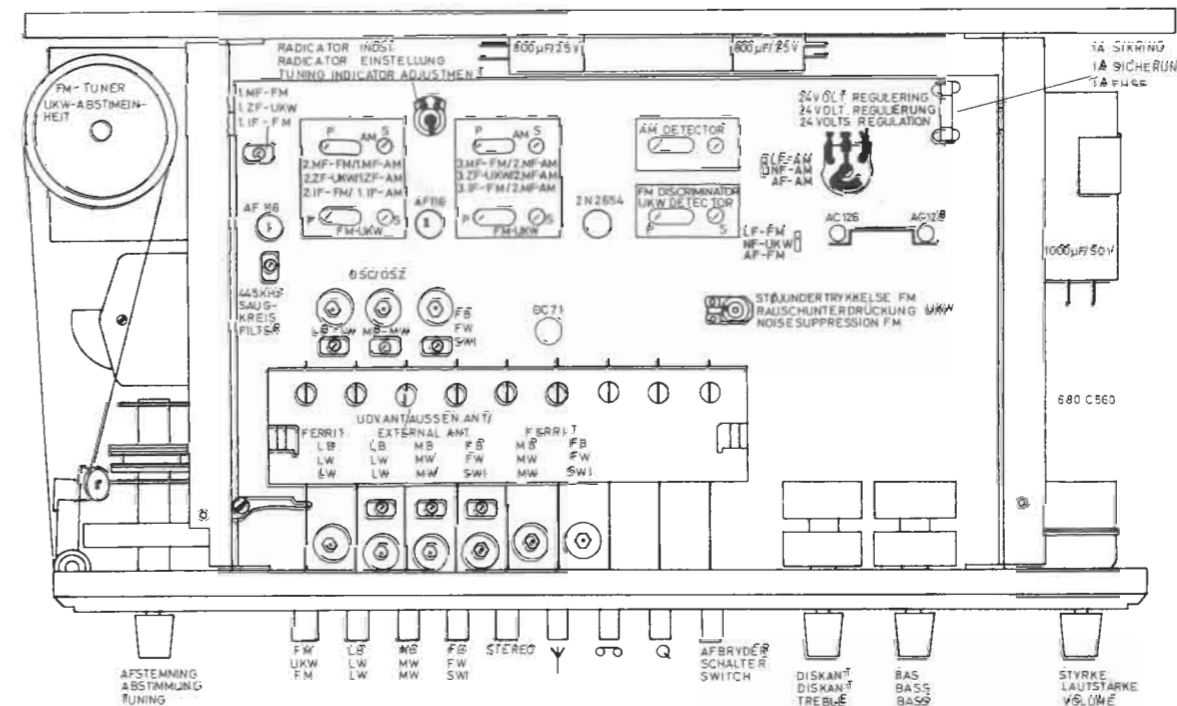
NOTE

The outer shells (collectors) of these transistors are not insulated and consequently must be protected from contact with the telescopic dipole and with cables or plugs connected to chassis or earth.

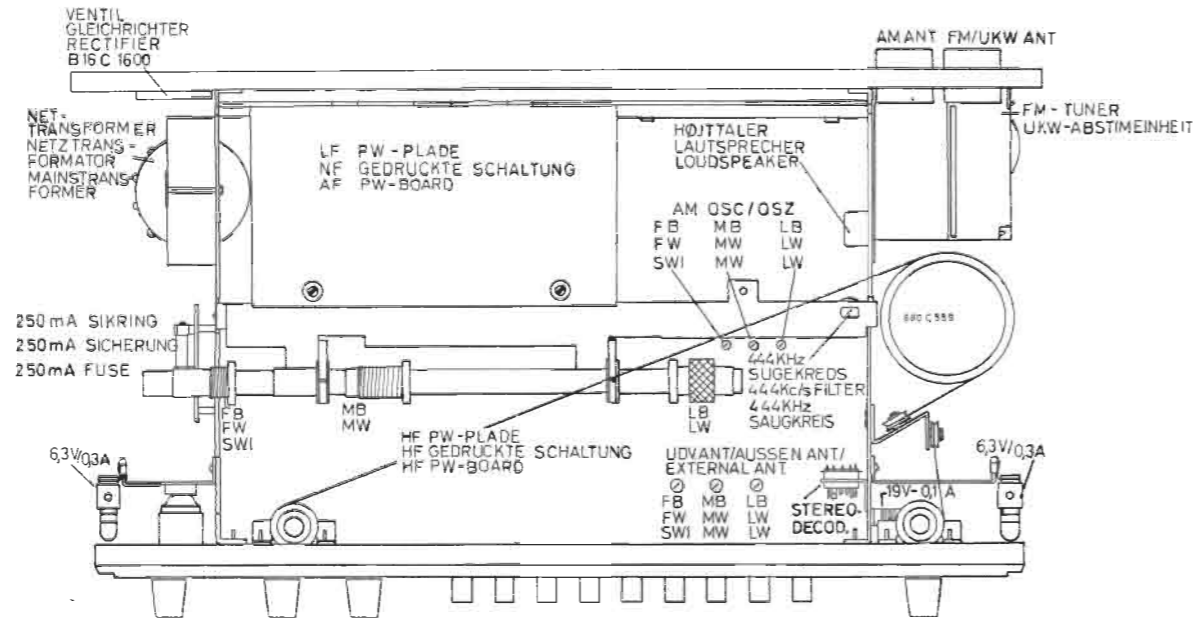


444 Kc/s IF ALIGNMENT

This alignment should be performed with the MW push-button depressed and the plates of the tuning capacitor fully meshed. The signal from the alignment oscilloscope should be applied at point A (the base of AF 116 1) through a 0.1 μF capacitor and with the tuning slug of the IF series-resonant wave trap screwed all the way out.



The signal is taken off at the tag marked AF-AM (see layout sketch), and the circuits should be tuned for maximum response and symmetrical curve form; bandwidth at 6 dB should be 5 kc/s ± 0.5 kc/s. The IF signal should thereafter be applied through the aerial connector socket and the IF series-resonant trap tuned for maximum attenuation.



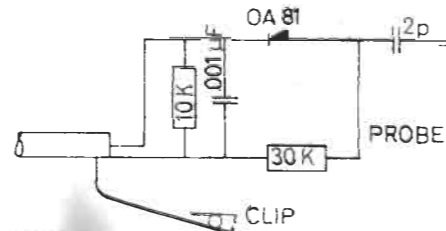
ALIGNMENT POINTS

With the tuning capacitor fully meshed, the pointers should cover the marks at the right-hand side of the dial. Sensitivities on ferrite aerial, measured in a screened room, with a signal from a frame aerial at 500 mW power output:

LW:	160 and 272 kc/s,	sensitivity 400 and 280 μ V/m.
MW:	584 and 1484 kc/s,	sensitivity 200 and 112 μ V/m.
FW:	1596 and 3750 kc/s,	sensitivity 70 and 90 μ V/m.

Sensitivities measured at the aerial connector socket at 50 mW power output:

LW:	160 and 272 kc/s,	sensitivity 5 and 5 μ V.
MW:	584 and 1484 kc/s,	sensitivity 5 and 12.5 μ V.
FW:	1596 and 3750 kc/s,	sensitivity 5 and 5 μ V.

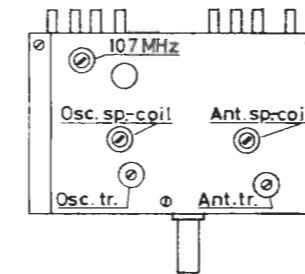


FM ALIGNMENT

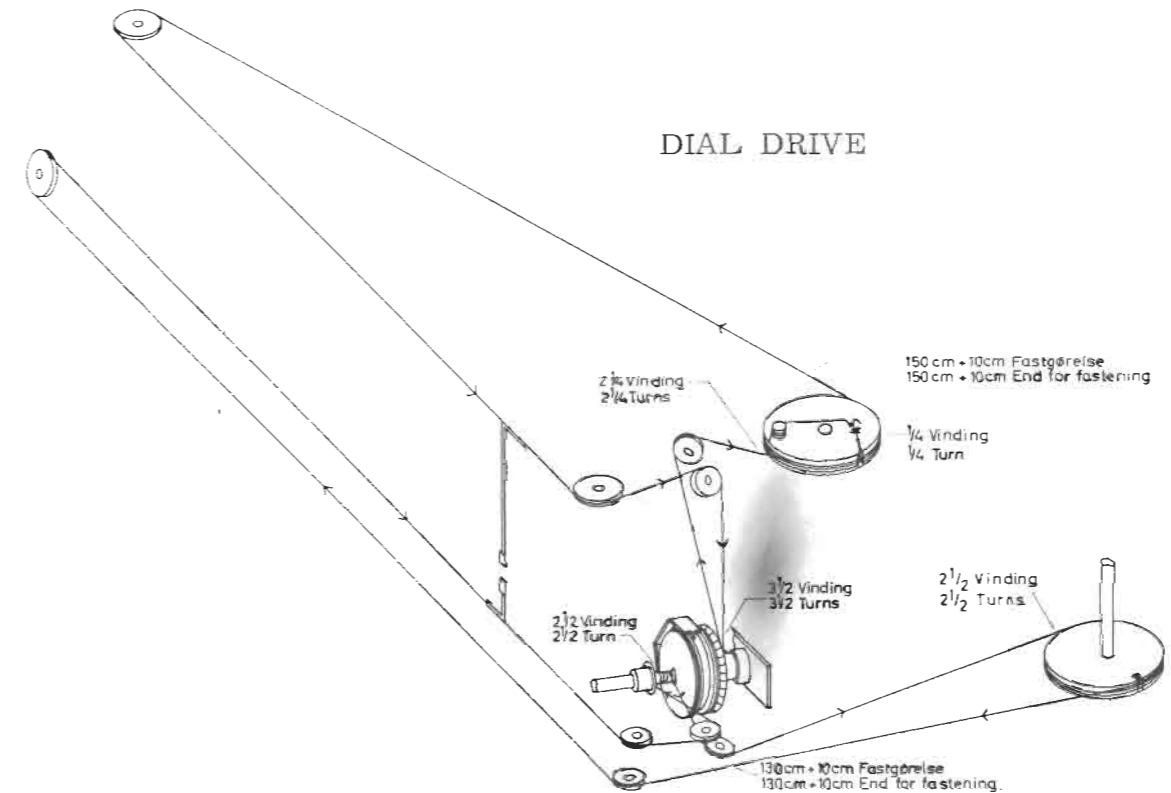
Before beginning to align the receiver, the AFC should be deactivated by depressing the aerial push-button. Alignment of the 10.7 Mc/s IF should be performed with a sweep generator. Apply a 97 Mc/s signal through the external-serial connector socket and connect the oscilloscope to the collector of the 2N2654 through a probe with a built-in diode (see sketch). Tune for maximum response and symmetrical curve-form; bandwidth at 6 dB should be 250 kc/s \pm 30 kc/s. To adjust the discriminator, connect the oscilloscope to the tag marked AF-FM (see



layout sketch) without the probe and tune for symmetrical curve-form and best noise suppression by means of the semi-variable 2 K Ω potentiometer. The 10.7 Mc/s parallel-resonant wave trap should be adjusted with a 10.7 Mc/s sweep signal applied through the external aerial connector socket. Tune for minimum curve height.



Oscillator adjustment is performed by means of the trimmer and the tuning slug in the FM unit. Adjust RF for maximum response (see layout sketch). Sensitivity at 92 Mc/s: 3.5 μ V at 500 mW power output with the bass and treble controls at maximum. 10 dB signal/noise ratio at 2 μ V, measured with the bass and treble controls at maximum.





RADICATOR

The radicator is adjusted by means of the potentiometer numbered 89 in the circuit diagram; see layout sketch on page 18. The LW and MW push-button should be depressed at the same time, and the potentiometer should be adjusted for a radicator reading of 1.

BALANCE

The potentiometer on the rear wall of the set should be adjusted at 50 mW output, for instance with a 1000 c/s frequency record and an outputmeter. At 6 watts output a 3 dB difference between the two channels is permissible.

POWER SUPPLY SECTION

The 24 volt DC supply is adjusted with the potentiometer numbered 904 in the circuit diagram in the FM position and with the volume control turned down. The vacuum-tube voltmeter should be connected at H.

HUM when the receiver is tuned to a strong FM signal

may be due to pick-up by the tuner AFC lead of the power-transformer hum field. This fault has been corrected by the use of a screened lead between the 0.1 μ F capacitor numbered 115 in the circuit diagram and the AFC point of the FM tuner.



INSTALLING A TYPE 0001 (900 H 204) STEREO DECODER.

Unscrew the two screws retaining the AF PW-board (602 L 6) and tip the board upwards.

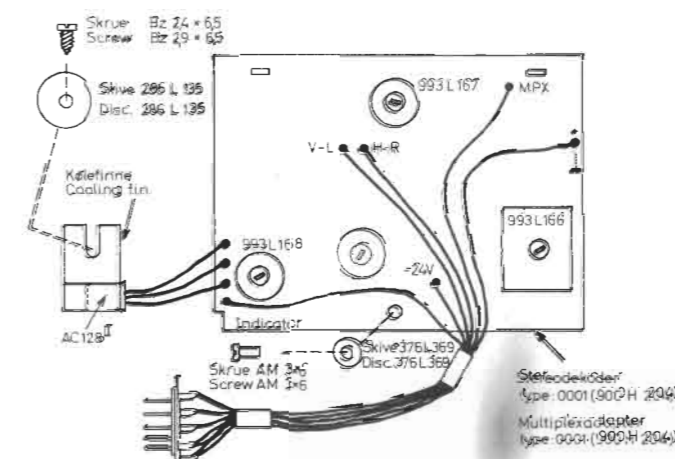
Remove the de-emphasis plug (994 L 27) from the Stereo Decoder connector socket (adjacent to the stereo indicator lamp).

Pull the plug-terminated wiring harness coming from Stereo Decoder 900 H 204 out from the place intended for the Decoder; then pull it in below the PW-board mounting strip and out to the connector socket and insert the plug.

While mounting the decoder in position, pull the cooling-fin-equipped indicator transistor, AC 128 2, down and out through the chassis (above the inside speaker connector socket) and screw it into place on the outer side of the chassis, using a self-tapping screw (Bz 2,9 \times 6,5) in the free hole on the top side of the chassis. A washer (286 L 135) is required between the screw and the cooling fin.

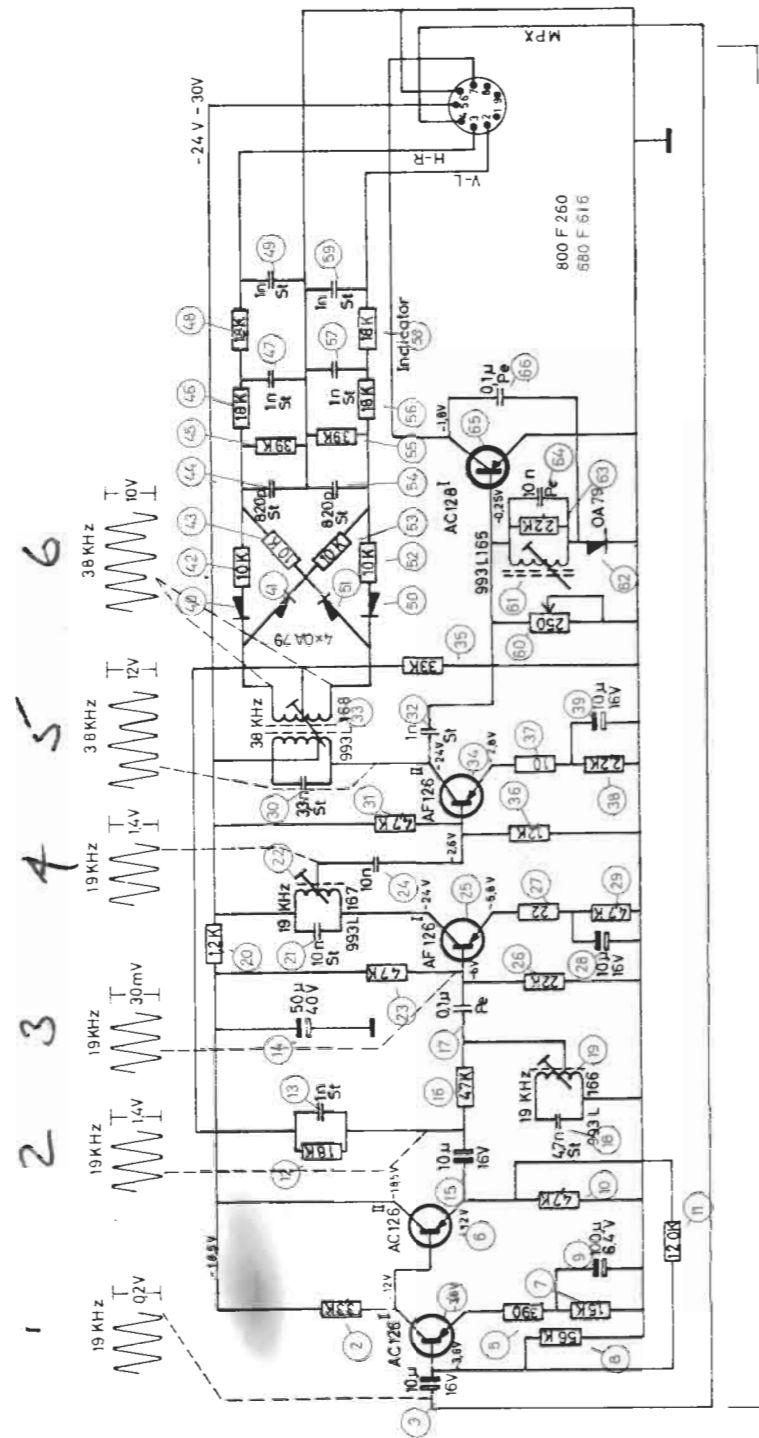
Solder the Stereo Decoder PW-board to the two studs of the bracket (in the same manner as the AF PW-board) and screw it into place on the mounting strip, using a screw (AM 3 \times 6) and a fibre washer (376 L 369).

When installing the Stereo Decoder in the BEOMASTER 900 omit one bracket (760 L 472) and one screw (AM 3 \times 6).





CIRCUIT DIAGRAM OF STEREO DECODER 0001

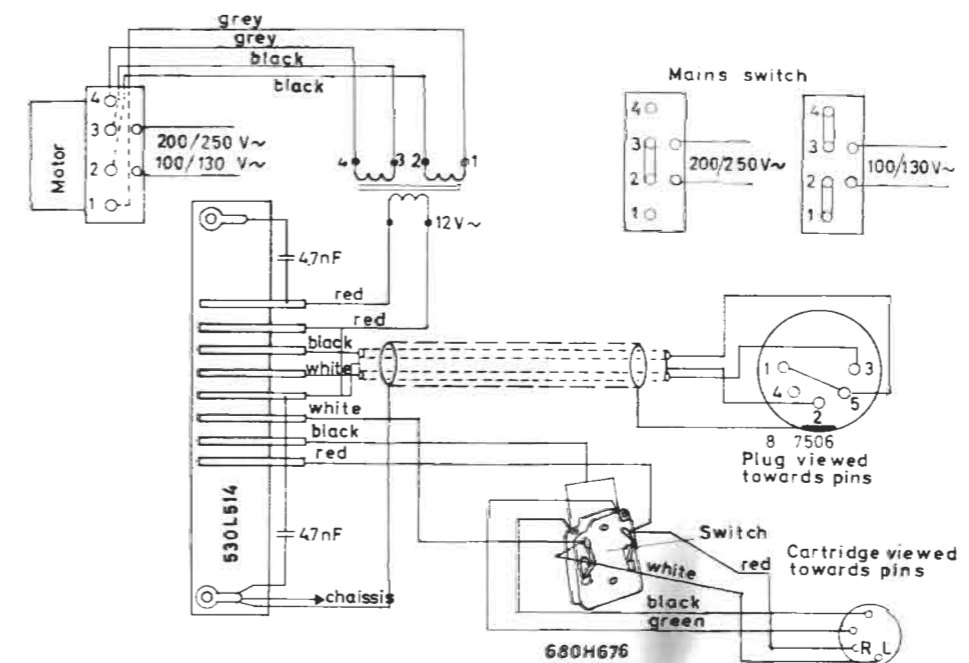


IN THE BEOMASTER 900 RG DE LUXE

a Garrard auto turntable type AT 6 MARK II has been built-in.

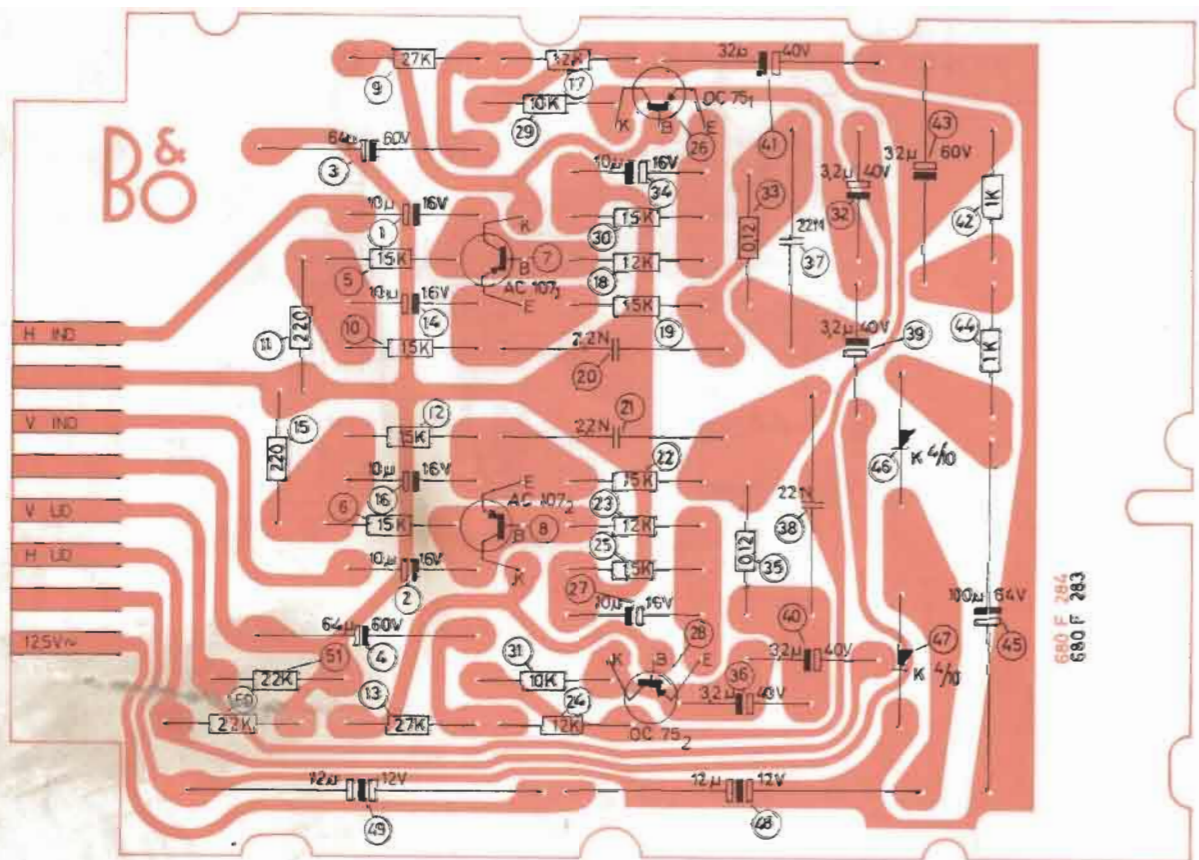
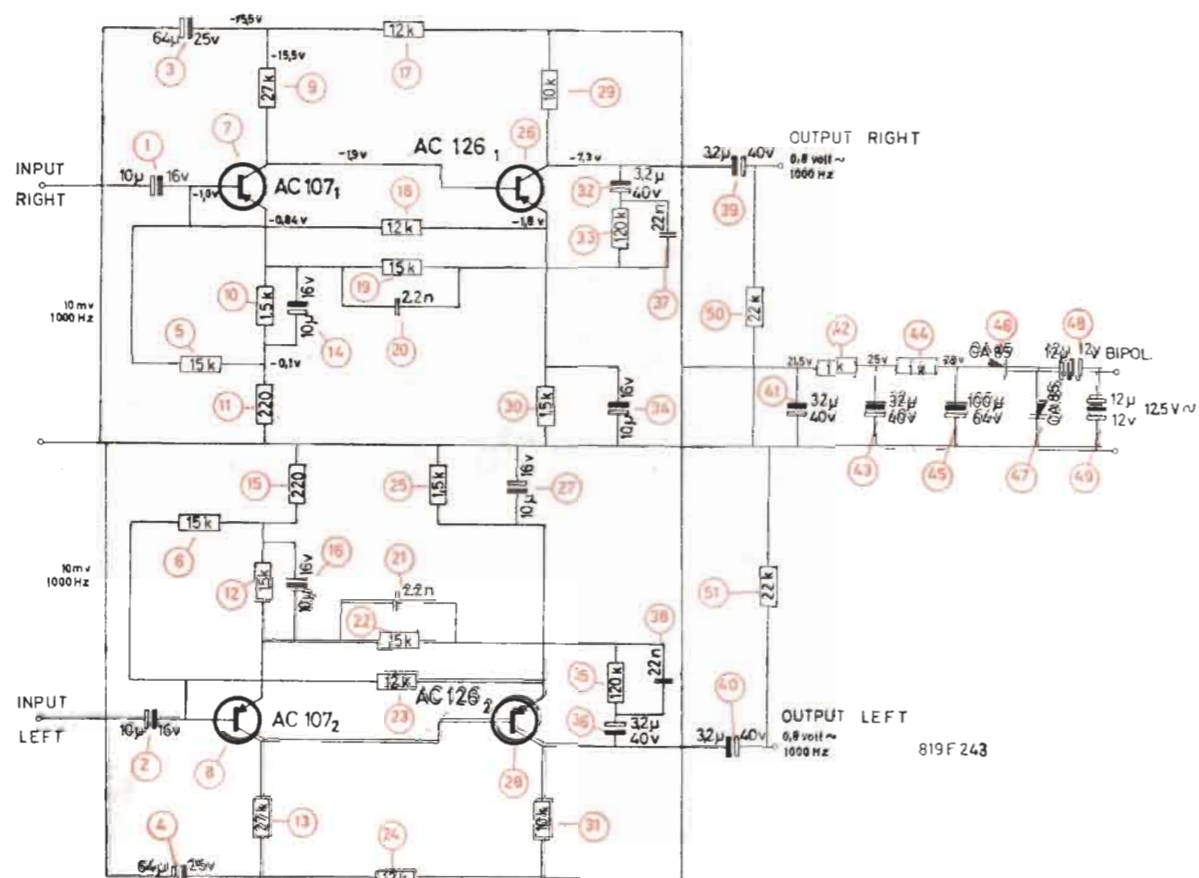
Spare parts can be ordered from GARRARD Spares Department, 50-54 Radnor Street, Swindon, Wilts, England.

GENERAL WIRING DIAGRAM





CIRCUIT DIAGRAM OF PRE-AMPLIFIER 915 H 59



Ryland Huntley
15 OLD BOND STREET, BATH, Tel. 4332
RADIO & TELEVISION

Corrections to parts list for Beomaster 900.

Parts list, Beomaster 900 type 2232-7

123	Potentiometer 2 x 10 kΩ, treble.....	5310013
124	Potentiometer 2 x 10 kΩ, bass.....	5310013
	Spiral spring for bass/treble potentiometre ..	2818002
157	Mounting plate with jacks.....	3124027
161	Jack DIN for tape recorder.....	7212006
	Jack DIN for gramophone.....	7212013
	Screen, protection front frame.....	3302010
	Cabinet, teak.....	0542451
	Cabinet, rosewood.....	0542452
	Cabinet, oak.....	0542453
	Outer carton.....	3391028
	Packing, pycofoam insert (polystyrene).....	3397012
	Operating instructions, english.....	3502048
	Mode d'emploi, français.....	3502037
	Gebruiksaanwijzing, hollands.....	3502049

Parts list, Beomaster 900 type 2233-1

39	Stereo decoder.....	8900001
	Other parts as for Beomaster 900 type 2232-7.	

Parts list, Beomaster 900 type 2236-7

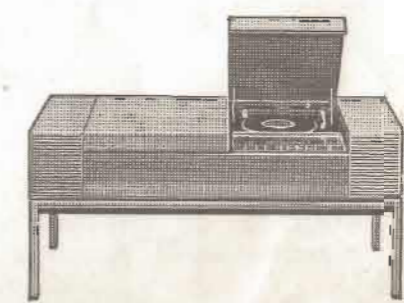
	Cabinet, teak.....	0542511
	Cabinet, rosewood.....	0542512
	Cabinet, oak.....	0542513
	Outer carton.....	3391029
	Packing, pycofoam insert (polystyrene).....	3397012
	Other parts as for Beomaster 900 type 2232-7.	

Parts list, Beomaster 900 type 2237-1

39	Stereo decoder.....	8900001
	Other parts as for Beomaster 900 type 2236-7.	

BEOMASTER 900 RG TYPE 2250

NOTE: The Beomaster 900 RG type 2250 illustrated on the front page is incorrect. The correct illustration of the Beomaster 900 RG type 2250 is shown here.





TECHNICAL DATA FOR BEOMASTER 900 RG, TYPE 2250

DIMENSIONS AND WEIGHT

Dimensions: 1293 mm wide, 586 mm high (incl. legs),
510 mm deep (50 15/16 × 23 1/16 × 20 1/16 in.)
Weight: 54 kilos (118.8 lbs.)

POWER SUPPLY

Voltage: 110 and 240 volts AC.
Frequency: 50 - 60 Hz (gramophone motor may be converted for 60 Hz).
Power Consumption: Radio section: 10 watts at 100 mW output approx. 65 watts at max. output.
Gramophone motor: Approx. 10 watts.

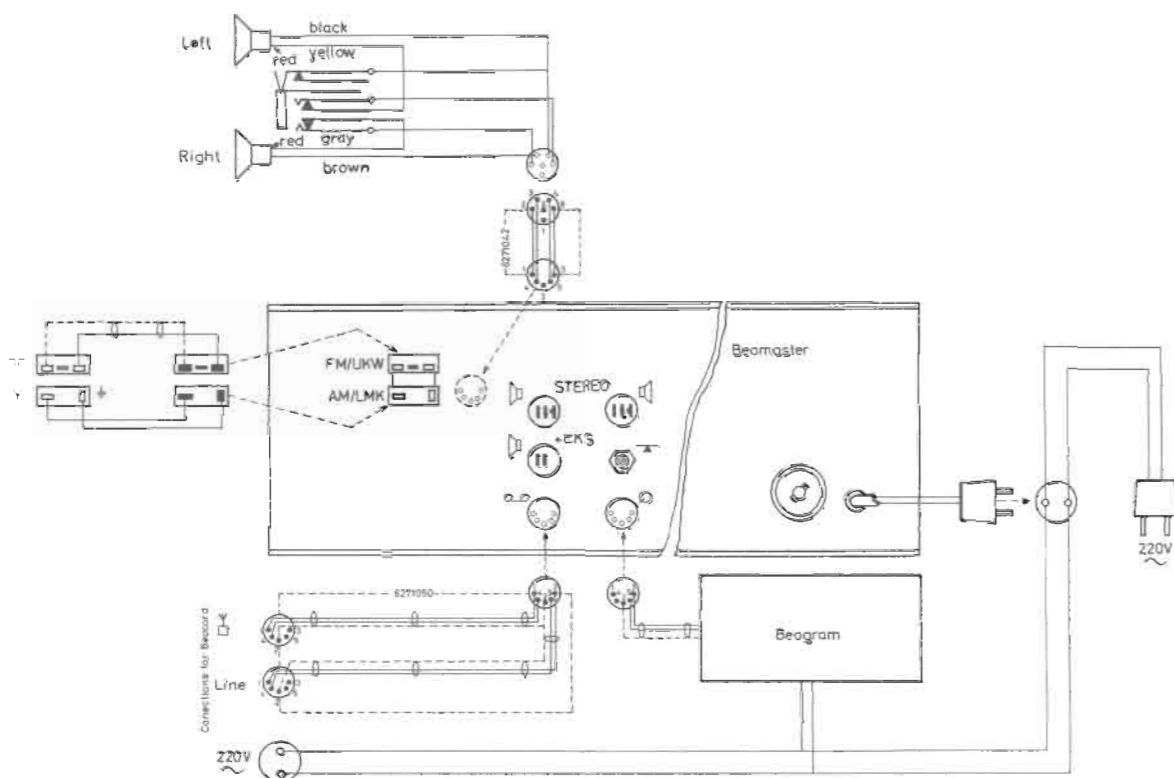
OUTPUT

Headphones: 3 - 30 Ω.

SPEAKER

Units: Two 28/17 TV 2 × D 35 - 40.

Other data as for Beomaster 900 type 2232-7 and Beogram 1000 type 5203.



BEOMASTER 900 RG, TYPE 2250

Description

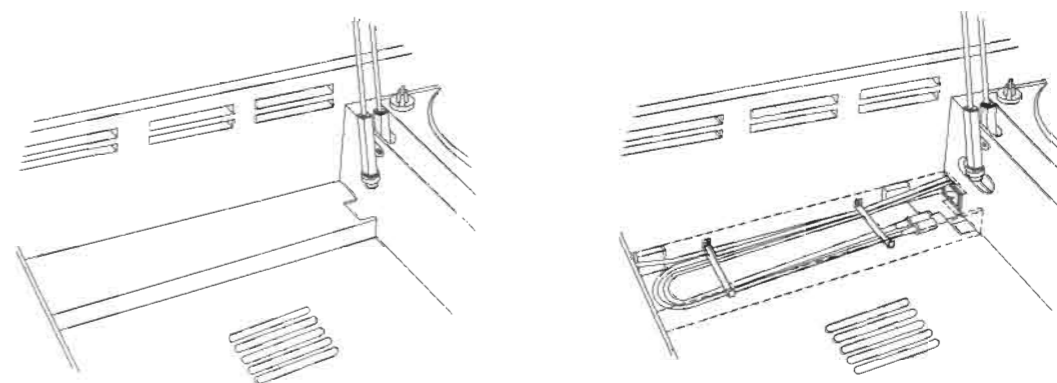
The BEOMASTER 900 RG is a radio gramophone with built-in speakers and space for placement of a Beocord.

The radio section of this combination is a Beomaster 900, Type 2232-7, described in a previous section of this manual.

The gramophone is identical with the Beogram 1000, Type 5203, except for the mounting plate. For information about functions and parts list for the gramophone section see BEOGRAM 1000 service manual.

Tape Recorder.

A DIN standardized tape recorder, with or without an output amplifier, may be inserted in the large space in the console (record storage compartment) after removal of the large cover plate. Cables for the RADIO and LINE sockets, and the power socket, are installed in the console; normally, they are concealed under a wooden panel (see sketch) which lifts off easily. After the tape recorder has been connected, the panel should be replaced; the space above it may be used for storing audio tapes. If a headphone socket is provided on the right-hand side of the tape recorder it will not be possible to use it, owing to the limited space available; the headphone socket of the radio section should be used instead.



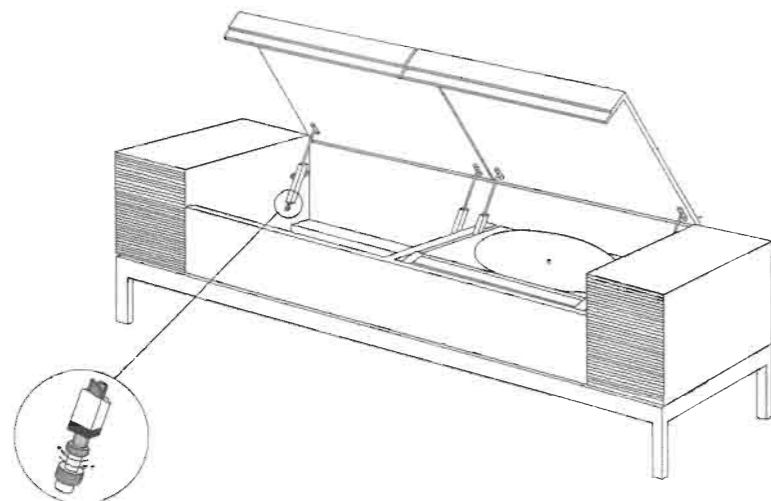
Speakers.

The built-in speakers are Type 8480042 dual-cone speakers. Extension speakers may be plugged directly into the sockets of the Beomaster 900, but the load impedance must not become lower than 4 Ω, or the amplifier output stage will be overloaded.



Headphones.

A pair of low-impedance (3 - 30 Ω) stereo headphones may be connected to the radio section through a jack socket located between the record player and the radio section. The built-in speakers are turned off automatically on insertion of the headphone plug.



Each of the two lids has a separate brake device which can be adjusted for quicker or slower lowering. Take out the large cover plate in the compartment to the left; two adjusting screws will then be accessible as shown above. The adjusting screws cannot be operated when the lids are in their top positions, when they are hidden under stop rings.

NOTE: Grease must not be used because the brake function will fail.



Disassembly.

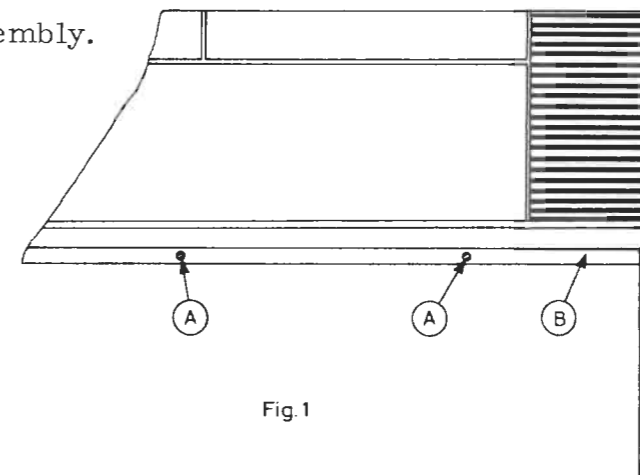


Fig. 1

1. Remove the screws marked A. Pull out the plugs from under the bottom. Now, using light pressure, push the radio section sufficiently far upwards to permit unplugging the speaker leads (5-contact DIN plugs). You may now pull the radio section entirely clear of the cabinet, following which the power plug may be pulled out.

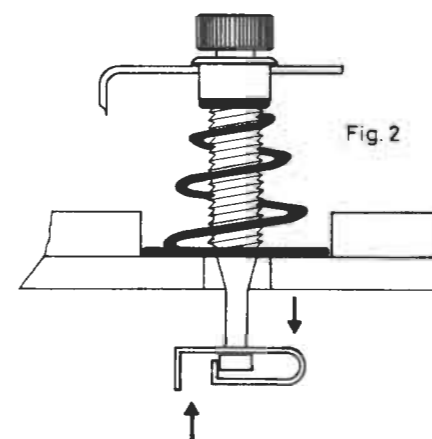


Fig. 2

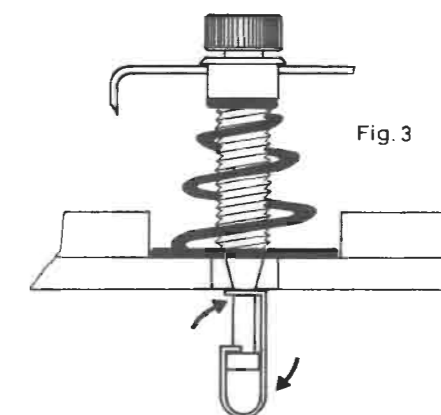


Fig. 3

2. To take out the gramophone section, turn the four spires on the transit screws in the direction of the arrow as shown in Figs. 2 and 3. The gramophone power flex is connected to the block under the motor.

NOTE: The radio section must be removed before the gramophone section.

3. To remove the speaker grille, remove the screw marked B (see Fig. 1).



TECHNICAL DATA FOR BEOMASTER 900 RG, TYPE 2250

DIMENSIONS AND WEIGHT

Dimensions: 1293 mm wide, 586 mm high (incl. legs),
510 mm deep (50 15/16 × 23 1/16 × 20 1/16 in.)
Weight: 54 kilos (118.8 lbs.)

POWER SUPPLY

Voltage: 110 and 240 volts AC.
Frequency: 50 - 60 Hz (gramophone motor may be converted for 60 Hz).
Power Consumption: Radio section: 10 watts at 100 mW output
approx. 65 watts at max. output.
Gramophone motor: Approx. 10 watts.

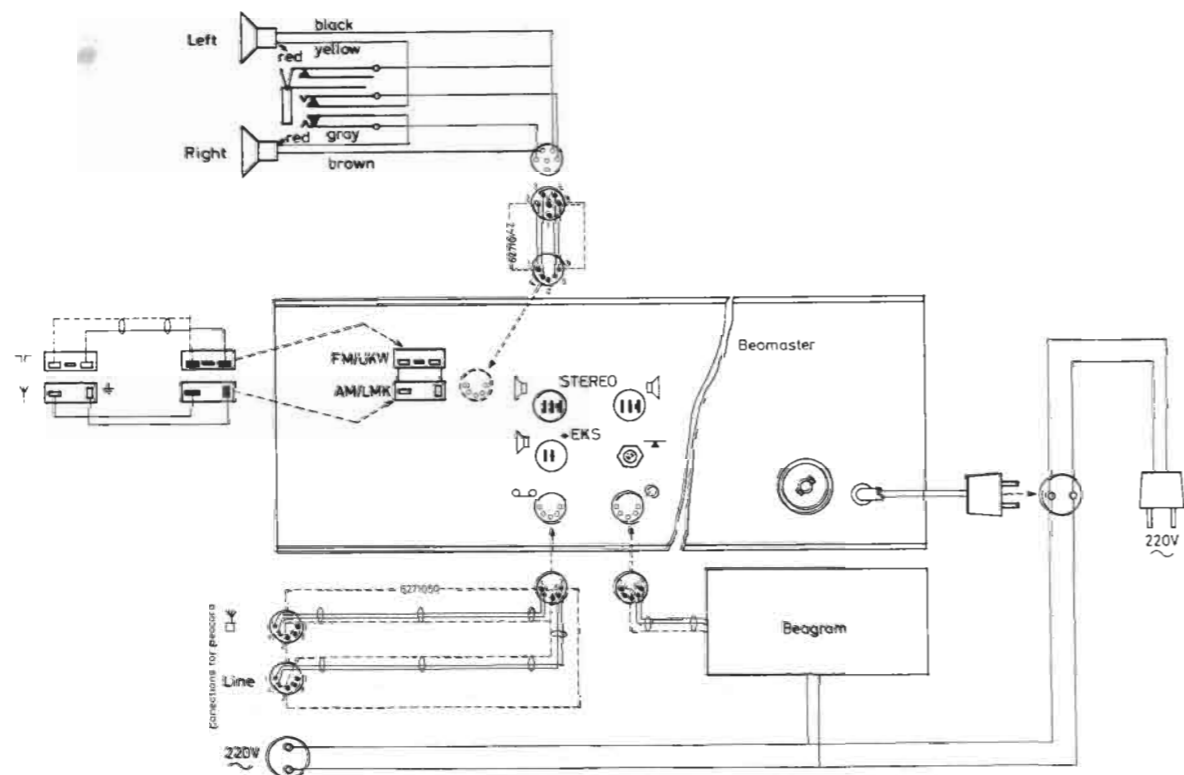
OUTPUT

Headphones: 3 - 30 Ω.

SPEAKER

Units: Two 28/17 TV 2 × D 35 - 40.

Other data as for Beomaster 900 type 2232-7 and Beogram 1000 type 5203.



BEOMASTER 900 RG, TYPE 2250

Description

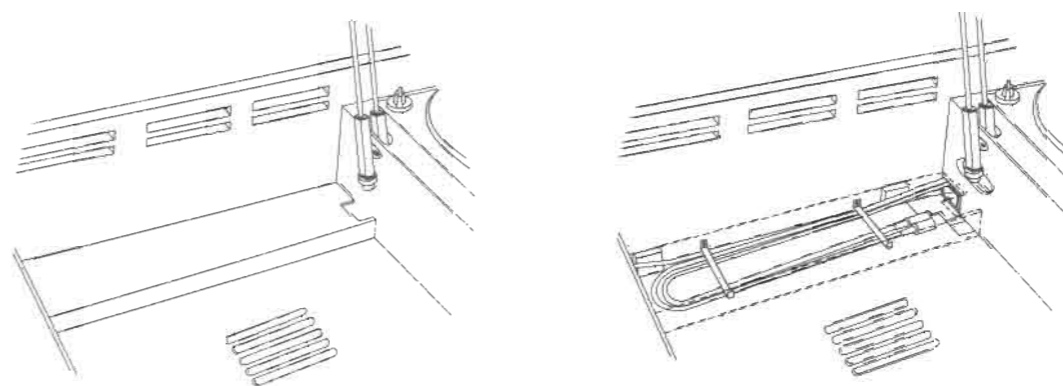
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The radio section of this combination is a Beomaster 900, Type 2232-7, described in a previous section of this manual.

The gramophone is identical with the Beogram 1000, Type 5203, except for the mounting plate. For information about functions and parts list for the gramophone section see BEOGRAM 1000 service manual.

Tape Recorder.

A DIN standardized tape recorder, with or without an output amplifier, may be inserted in the large space in the console (record storage compartment) after removal of the large cover plate. Cables for the RADIO and LINE sockets, and the power socket, are installed in the console; normally, they are concealed under a wooden panel (see sketch) which lifts off easily. After the tape recorder has been connected, the panel should be replaced; the space above it may be used for storing audio tapes. If a headphone socket is provided on the right-hand side of the tape recorder it will not be possible to use it, owing to the limited space available; the headphone socket of the radio section should be used instead.



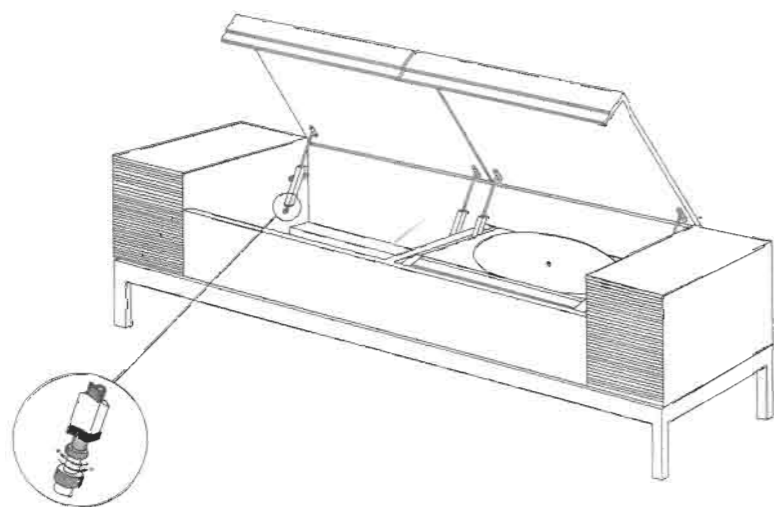
Speakers.

The built-in speakers are Type 8430042 dual-cone speakers. Extension speakers may be plugged directly into the sockets of the Beomaster 900, but the load impedance must not become lower than 4 Ω, or the amplifier output stage will be overloaded.



Headphones.

A pair of low-impedance (3 - 30 Ω) stereo headphones may be connected to the radio section through a jack socket located between the record player and the radio section. The built-in speakers are turned off automatically on insertion of the headphone plug.



Each of the two lids has a separate brake device which can be adjusted for quicker or slower lowering. Take out the large cover plate in the compartment to the left; two adjusting screws will then be accessible as shown above. The adjusting screws cannot be operated when the lids are in their top positions, when they are hidden under stop rings.

NOTE: Grease must not be used because the brake function will fail.



Disassembly.

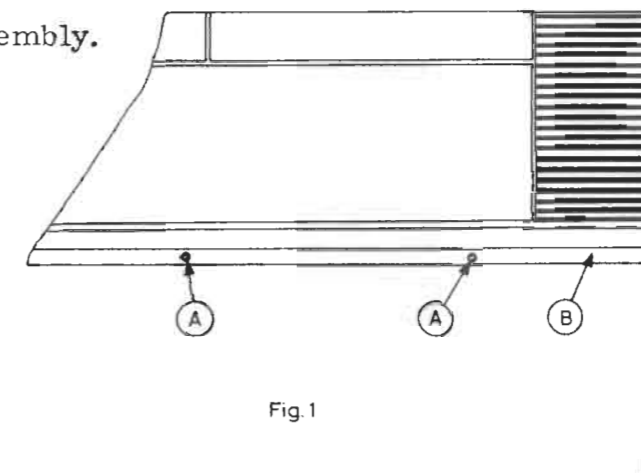


Fig. 1

1. Remove the screws marked A. Pull out the plugs from under the bottom. Now, using light pressure, push the radio section sufficiently far upwards to permit unplugging the speaker leads (5-contact DIN plugs). You may now pull the radio section entirely clear of the cabinet, following which the power plug may be pulled out.

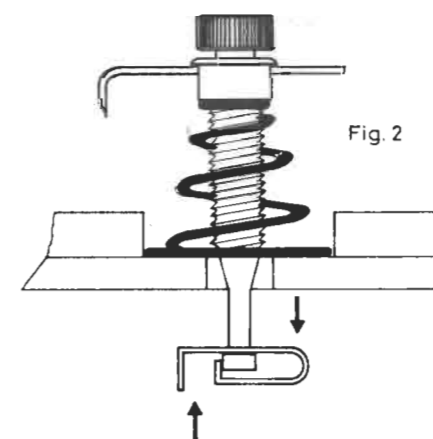


Fig. 2

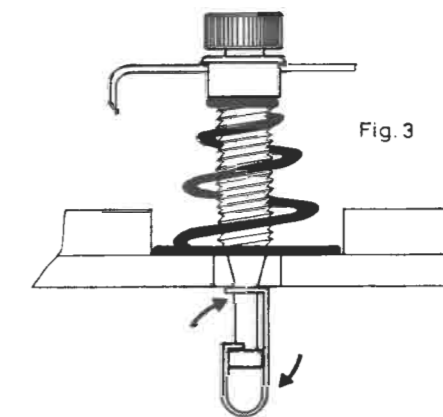


Fig. 3

2. To take out the gramophone section, turn the four spires on the transit screws in the direction of the arrow as shown in Figs. 2 and 3. The gramophone power flex is connected to the block under the motor.
NOTE: The radio section must be removed before the gramophone section.
3. To remove the speaker grille, remove the screw marked B (see Fig. 1).

B&O SERVICE INFORMATION

TECHNICAL DEPARTMENT, GLOUCESTER.

ISSUE 1.

DATE MAY 1967.

Service Information Bulletins will be published at irregular intervals as information becomes available. Centres are requested to supply information to Gloucester, which they feel may be of interest and use to other Centres. B. & O. U.K. Technical Department reserve the right of publication of any material received. The copyright of any material published belongs to Sony U.K.

BECMASTER 900.

TRANSISTOR HISS WITH VOLUME CONTROL AT MINIMUM SETTING.

Replace the AC 128's located in the output stages with AC 153's. This is a mandatory modification and applies to AC 128's in any part of the circuitry of B. & O. equipment.

RESIDUAL HUM WHEN VOLUME CONTROL AT MINIMUM.

Some 900 Chassis require screened leads to be fitted to the volume control. The most common cause, however, is loose laminations of the mains transformers, the repair being the complete replacement of these transformers with a modified version.

WHISTLE ON THE MEDIUM WAVE BAND.

Re-align IF's from 444 k.c./s. to 450 k.c./s. Make sure that the 444 k.c./s. IF trap is also correctly aligned to the new IF frequency, otherwise the medium wave will be instable at the bottom end. A further cause of instability is the screening of the last IF and in severe cases, this can may have to be soldered into position.

We have noticed that engineers are being careless when fitting replacement transistors into the heat sinks. We would like to point out that failure to get proper contact will cause these transistors to fail more frequently.

DUPLEX DRIVE MECHANISM.

To cure both pointers travelling at the same time, it is suggested that the drive cord tension is reduced by slightly stretching each spring; the reason for this drive cord being over-tight is due to the relative humidity of the area where the radio is being used. In severe cases where this will not effect a cure, it is suggested that the clutch plates be replaced. Excessive oiling of the drive spindle will merely aggravate this fault and should be avoided.

Cont'd/2.....

B&O SERVICE INFORMATION

Con'd/1.....

MOTORBOATING ON AM.

A cure may be effected by placing a .1 mfd. between the base and collector of the AC 126 transistor in the power supply. As a further precaution, remove capacitor, number 903, in the same circuit. We have noticed in a number of cases that replacement speakers for the 900K's have been wrongly wired causing them to be out of phase, the effect being drop in volume when used in the stereo position. We would therefore urge engineers to ensure that when replacing loud-speakers that they take care to note the colour coding.

It is suggested when a short circuit appears on the power supply that it is isolated (the power supply) from the rest of the circuit before any attempt to replace the transistors that may have gone short circuit is made. You can then safely switch on the radio and work on the power supply, bearing in mind that to ensure it is regulating correctly, it should be possible to vary the potentiometer, number 903, (this refers to 900 chassis) so that the voltage output varies from 18 to 30 volts and the final adjustment should be set at exactly 24 v. Before re-connecting this power supply, it is now essential to locate the short circuit in the rest of the receiver. These normally appear in the output stages and can invariably be traced to the AD139's and/or the AC128's. A quick check as to whether you have removed the shorts is to replace the load on the power supply momentarily whilst monitoring the supply and you will tell immediately if the short is still available. Do not re-connect and then switch on as this will, unfortunately blow the power supply again.

MICROPHONIC FM TUNERS (ALL MODELS).

Efficient earthing of these tuners is essential and should therefore be checked.

Should the set be generally unstable on FM, re-adjusting the potentiometer, 110, on the circuit diagram will sometimes effect a cure.

NOISY SWITCHES.

A certain number of 900 and 1200 Chassis were fitted with switches in which the plating was insufficient. A modified switch unit can be obtained from our Stereos on an advance replacement basis. The switch unit is very simple to replace, only being held in by four screws.

STEREOMASTER 610 CHASSIS.

This an early version of the 900, where facilities for the de-coder are not fitted. A modification sheet is available on request which will enable you to wire in the de-coder for stereo broadcasts. We would stress that this modification is not as complicated as it might first appear and we would urge Dealers to attempt to carry out this modification and should the re-alignment of the whole set be necessary, then under special circumstances, we would be prepared to carry out this re-alignment in the Work Shops.

Cont'd/3.....

B&O SERVICE INFORMATION

Cont'd/2.....

STEREOMASTER 610 CHASSIS. Cont'd.

It is becoming exceedingly obvious that batteries are being left in Radios when these are returned to us for repair. These Radios are accidentally being left on during transit. Subsequently, when the set is finally un-packed, the batteries have leaked and severe damage is done to the printed circuit board, battery box, etc. We would therefore urge you to make sure that batteries are removed before returning the Radio to us for repair.

611 FM.

Duplex drive troubles - cure as for 900 Chassis.

In certain models, it has been noticed that the 3rd programme reception is poor; this is due to the close proximity of the loud-speaker magnet to the oscillator coil and a replacement oscillator coil will usually cure this problem. The IF's of this receiver should be re-aligned as in the 900 Chassis.

NO AM.

A common fault is short circuit tuning gang. When this is not effective then the oscillator coupling capacitor is known to go short circuit.

POOR QUALITY A.M. (OVERLOADING).

A diode, OA79 or equivalent, between point 15 (+ end) and point 9 of diagram (see lay-out) will improve this condition.

In types 611 F.M.E. slightly more complex re-wiring, using same diode, is necessary.

LF INSTABILITY, WHEN THE BASE CONTROL IS USED IN ITS' MAXIMUM POSITION.

We suggest that C.141 on the AF Board is reduced to a lower value, this value to be selected by trial and error.

RECMASTER 1000.

MAINS ON/OFF SWITCH REFUSING TO LOCK IN THE 'ON' POSITION.

This can usually be cured by re-positioning the switch bank by loosening the fixing screws underneath the chassis and sliding the switches towards the front of the set.

2 AMP FUSES IN THE EMITTERS OF THE OUTPUT TRANSISTORS.

These have a habit of blowing, should the owner of the receiver inadvertently turn the volume control to maximum very rapidly. These fuses should be replaced with a delayed-action type and furthermore, customers should be advised to refrain from this practice.

Cont'd/4.....

B&O SERVICE INFORMATION

Cont'd/3.....

STEREO DE-CODER INDICATOR LAMP.

It has been reported that in a number of cases, that although stereo broadcasts are being received, the green indicator lamp is not operating. This is really due to the incorrect setting of potentiometer 6V in the circuit diagram and should be carefully adjusted so that the light will come on, but be careful to avoid over-adjustment; otherwise, large bursts of interference will tend to make this lamp operate.

In order to use a BM5 microphone with this amplifier, it is necessary to change the gramophone pre-amplifier, but it is pointed out that a special microphone lead will also be necessary, its' part number being 961-L25, bearing in mind that you are actually connecting into the gramophone socket.

BEOLIT 500.

Failure of buttons to lock in position.

The cure is to loosen the adjusting nut, number 0145033 a few turns; this is mounted on the shaft number 285-0000. In certain cases, re-positioning the front panel will alleviate this trouble.

RECORD 2000K.

FAILURE OF MOTOR AFTER SHORT RUNNING TIME.

This can be traced to the micro switch which changes the motor voltage from 35v. approximately to 42v. approximately when the machine is switched from normal running to fast forward, or re-wind positions. This switch is screwed to the chassis and in a number of cases has become loose due to vibration and is therefore in no contact with the operating lever. In a small number of cases, the micro switch itself has been found to be open circuit. It is essential when replacing the motor in these machines that the action of this micro switch is checked. Otherwise, the new motor will subsequently burn out.

There are a number of machines being used with inferior quality recording tapes, which leave heavy deposits on the heads. Owners of machines should be advised in their own interest to use tapes of similar quality to that supplied, i.e. either Ampex or Scotch. Frequent demagnetising of heads is also advised.

The electronics of the 2000 Tape Recorder are similar to those of the mains radio and the repair carried out to the power supply should be the same as that for the 900.

Cont'd/5.....

Cont'd/4.....

RECORD 1500.

In order that before and after monitoring, facilities may be utilised, with this machine, it is necessary to use a special supply recording lead, type 915H19. When recording from a B & O Radio (any model) all that is necessary is that the top button is de-pressed and either the FM 'gram or AM button, whichever source you are recording from. These two buttons must be pressed at the same time. It will then be possible to record from say the 900 Chassis and at the same time, play back the recording through the output stages of this Radio.

RECORD 1000 TURNTABLES.

Four speed motors for this turntable are no longer available, although three speed motors are. When ordering replacement motors, please ensure that you order the speed change knob as well.

MICRO LIFTS.

We would point out that on no occasions should any attempt be made to oil these. Should they fail to operate the only course of action is to replace the mechanism immediately in the rear of the pick-up arm. Any areas where it is known that the mains voltage is in excess of 240v., it is recommended that a 350v. 5w. Radiospares resistor is fitted in series with the mains supply.

REPLACEMENT MOTORS.

When replacing motors in these playing Decks, it is essential to ensure that the three nylon bushes are mounted correctly and it should be observed that the thick end of the collar should be mounted nearest the metal panel. When finally mounted, this motor should fly free from these bushes as they are primarily intended to limit the vertical movement of the motor and should not carry any weight, this being carried by the springs.

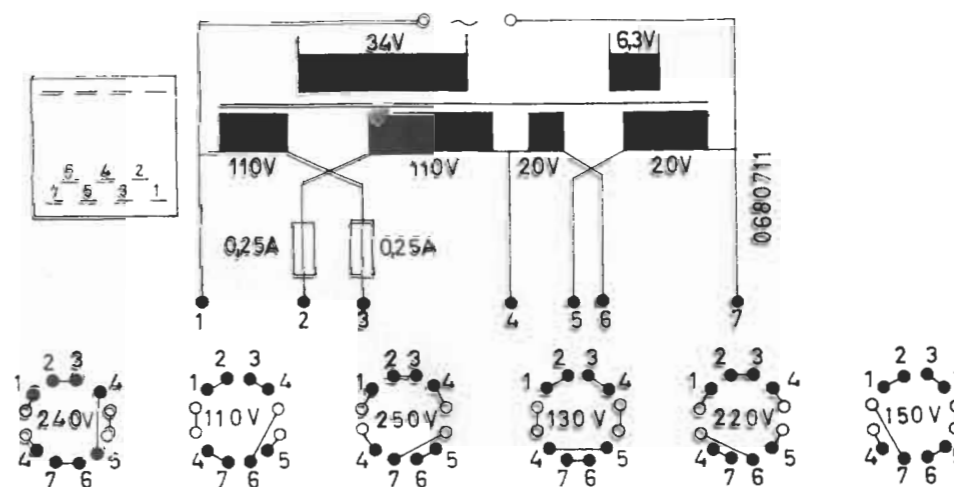
If a GF2 pre-amp is fitted (identified by a large 12 mfd. 25v.w. Capacitor) a shorting link between pins 2 and 5 on the socket should be fitted. For further reference turn to page 4 of the Service Manual.

When fitting a GF3, which is the latest type pre-amp, this link should be removed.



Supplement to Service Manual for BEOMASTER 900 K, BEOMASTER 900 M, and BEOMASTER 900 RG.

Diagram of voltage-switching circuit in types 2202, 2204, 2206, 2208, and 2212.



Parts List

Mains transformer.....	ST 3528/2
Switch	854 F 743
Fuses (two)	0.25 A IEC 127

Other parts as in BEOMASTER 900 K and BEOMASTER 900 M.

Parts List for BEOMASTER 900 RG

Type 2212

Loudspeakers (two).....	28/17 TV 2 x D 35-40
Shock absorber, left side	760 C 450
- - right -	760 C 449

Other parts as in BEOMASTER 900 K and BEOMASTER 900 M.

