

Justeringsforskrift - Alignment Instruction

TANDBERG Hi-Fi FM

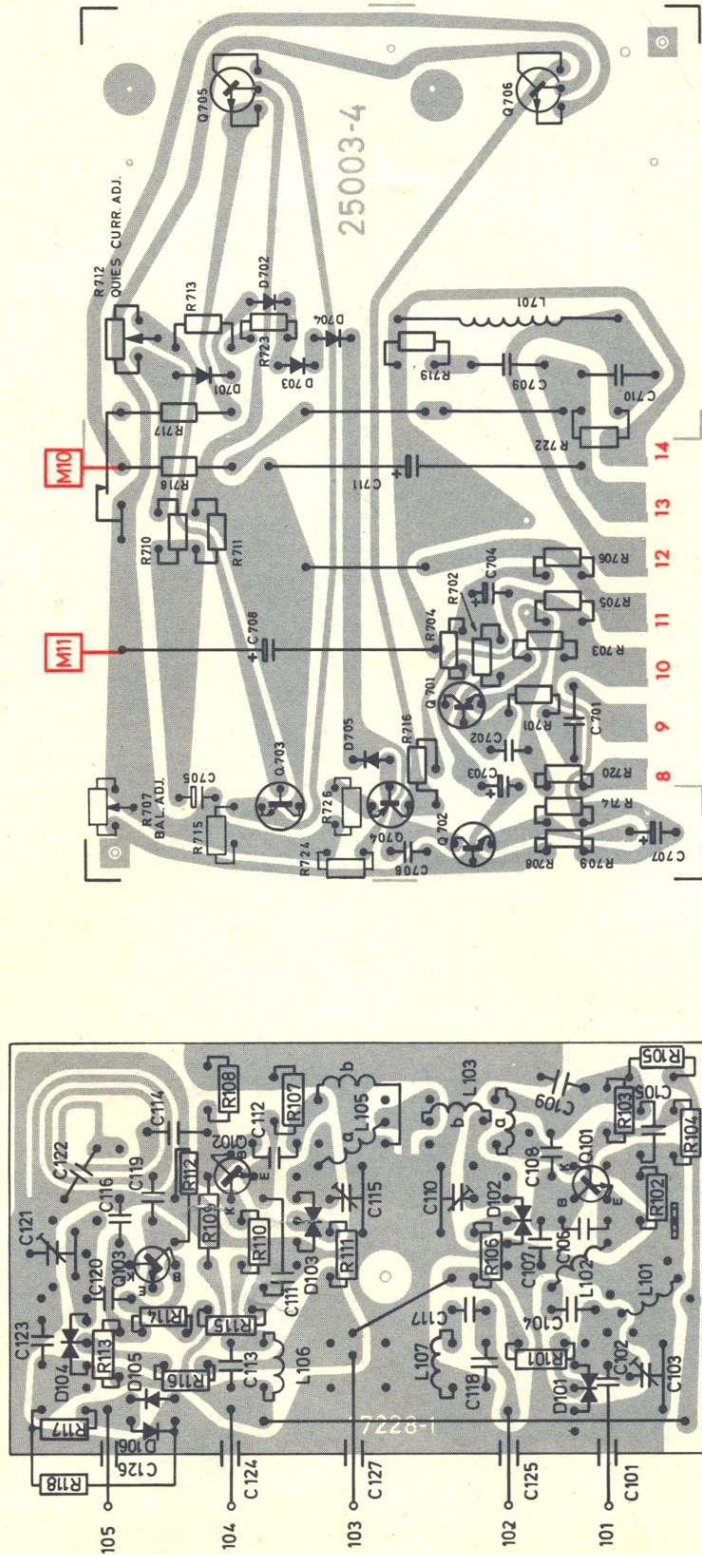


Fig. 1. FM-tuner, sett fra foliesiden.
FM-tuner, printed side.

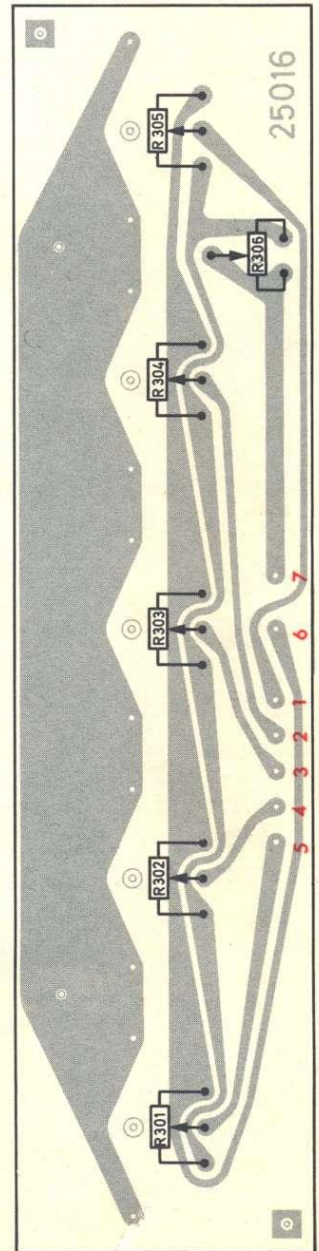


Fig. 2. LF-utgangsplate, sett fra foliesiden.
AF-output amplifier board, printed side.

Fig. 3. FM-potmeterplate, sett fra foliesiden.
FM-potmeter board, printed side.

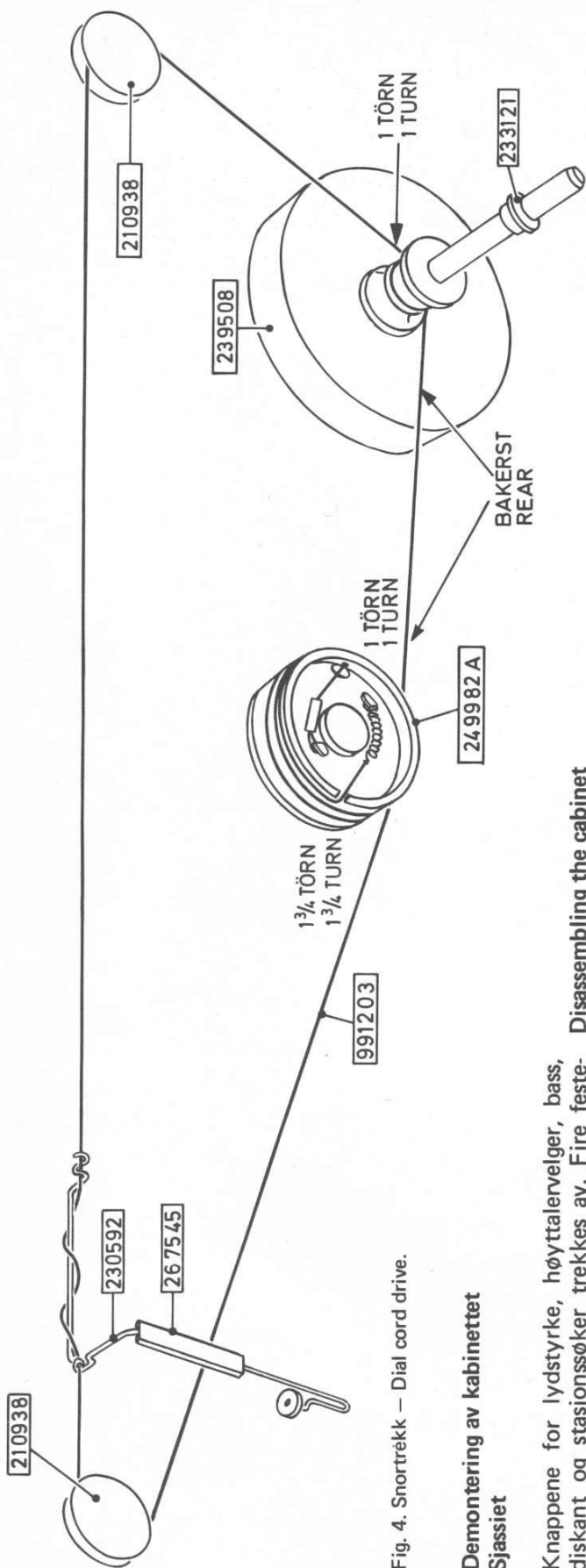


Fig. 4. Snortrekk — Dial cord drive.

Demontering av kabinettet Sjassiet

Knappene for lydstyrke, høyttalerverlger, bass, diskant og stasjonssøker trekkes av. Fire festeskruer fra kabinettets underside skrues ut og sjassiet kan nå trekkes bakover og ut.

Merk: Når sjassiet er tatt ut for service sitter skalafronten igjen i kabinettet. For å gjøre det mulig å innstille bestemte frekvenser under trimming har støttelisten for knappene 5 markeringer for de aktuelle frekvenser: Skalaens venstre ytterpunkt, 90 MHz, 95 MHz, 100 MHz og 105 MHz, se fig. 5.

Skalafront

To festeskruer under i front av kabinettet skrues ut. Skalafronten vippes ut i bunnen og trekkes ned.

Disassembling the cabinet Chassis

Pull off the knobs for volume control, speaker selector, bass, treble and FM-tuning. After removing four screws underneath the cabinet, the chassis can be pulled backwards and released.

Note: When the chassis is removed for servicing, the front panel remains in the cabinet. To enable tuning without dial, the following trimming cabinet.

frequencies are indicated by grooves on the supporting list for the operating controls: Left end position, 90 MHz, 95 MHz, 100 MHz and 105 MHz, see fig. 5.

Chassis front

Remove the two screws in front underneath the tuning without dial, the following trimming cabinet. Pull the lower part of the front forward.

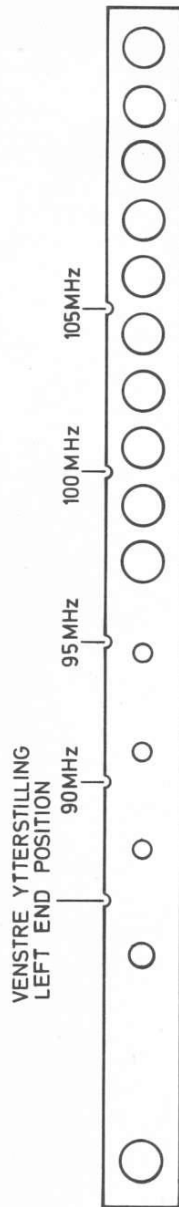


Fig. 5. Støttelist — Supporting list.

Mekaniske deler

Part nr.	Artikkel
261555	Arm vender
252489	Boks, MF 10, 7
254170	Boks, diskriminator
208530	Boss, svinghjul, messing
218688	Bryter, mikro
263236	Deksel, FM-potmeter
239508	Drev, svinghjul
213030	Fjær, deksel FM-potmeter
201878	Fjær, indikator
204112	Fjær, skalasnor
249982A	Hjul, snortrekk
214925	Holder, skalalampe
249837	Holder, sikring
263681	Instrument, indikator
259881	Jack, hodetelefon
232387	Klammer, nettleddning, delrin
232123	Klammer, nettleddning
262589	Knapp, trykknappvender
263386	Knapp, volum, høyre kanal
261705	Knapp, volum, venstre kanal
262567	Knapp, søker
266719	Knapp, høyttalervender
264248	Knapp, tonekontroller
270763	Kontakt, antenne 300 Ω
272911	Kontakt, antenne 75 Ω
263085	Kontakt, bånd/gram.
254262	Kontakt, høyttaler
230636	Kontakt, FM-decoder
264486	Kontakt, LF-plate
233121	Lager, svinghjul, plast
210507	Lampe, stereoindikator, 7 V-0,05 A
269406	Lampe, strømbegrenser, 12 V-3 W
200363	Lampe, skala 24 V-1,2 W
202806	Lampe, skala 6.3 V-0.32 A
203250	Ledning, nett 220 V, m/støpsel
202080	Ledning, nett 115 V, m/støpsel
266712	List, knappestøtte, turbonitt
250456	Lokk, diskriminator
248243	Plate, kjøle
268321	Plate, bakvegg
267545	Plate, viser
249795	Plate, avst. stykk., trykknappvender
262229	Plate, bunn FM-sats
261719	Plate diskriminatorboks

991200	-HiFi-FM	Plate, FM-potmeter, komplett
991201	-HiFi-FM	Plate, utgang LF, komplett
991202	-HiFi-FM	Plate, FM-tuner, komplett
265010	-HiFi-FM	Skala, m/frekvens
269865	-HiFi-FM	Skala, m/symboler
260118	-HiFi-FM	Skinne, front
991203	-HiFi-FM	Snor, skala, silke, lang, komplett
991204	-HiFi-FM	Snor, skala, wire, komplett
991205	-HiFi-FM	Snor, skala, silke, kort
261397	-HiFi-FM	Trafo, nett
210938	-HiFi-FM	Trinse, skala
236232	-HiFi-FM	Vender, høyttaler
264399	-HiFi-FM	Vender, trykknappvender
262826	-HiFi-FM	Vender, nett
260499	-HiFi-FM	Vender, pickup
216599	-HiFi-FM	Vinkel, transistorkjøler Q603, Q703, Q802
236073	-HiFi-FM	Vinkel, sjassi, høyre side
232359B	-HiFi-FM	Vinkel, sjassi, venstre side
260226	-HiFi-FM	Vinkel, indikatorholder
261907	-HiFi-FM	Vinkel, potmeter R1
230592	-HiFi-FM	Viser, skala

Mechanical parts

Part nr.	Part	
261555	-HiFi-FM	Arm, switch
233121	-HiFi-FM	Bearing, flywheel
232359B	-HiFi-FM	Bracket, chassis, left side
236073	-HiFi-FM	Bracket, chassis, right side
260226	-HiFi-FM	Bracket, indicator
261907	-HiFi-FM	Bracket, potentiometer R1
208530	-HiFi-FM	Bushing, flywheel, brass
266159	-HiFi-FM	Bushing, headset
223387	-HiFi-FM	Caster, dial cord
210938	-HiFi-FM	Clamp, mains cord, delrin
232123	-HiFi-FM	Clamp, mains cord
270763	-HiFi-FM	Connector, aerial 300 Ω
272911	-HiFi-FM	Connector, aerial 75 Ω
230636	-HiFi-FM	Connector, FM-MX-decoder
254262	-HiFi-FM	Connector, loudspeaker
264486	-HiFi-FM	Connector, power amplifier
263085	-HiFi-FM	Connector, tape/disc
991203	-HiFi-FM	Cord, dial, silk, long, compl.
991204	-HiFi-FM	Cord, dial, wire
991205	-HiFi-FM	Cord, dial, silk, short

250456	-HiFi-FM	Cover, discriminator
268321	-HiFi-FM	Cover, rear
265010	-HiFi-FM	Dial, frequencies
269865	-HiFi-FM	Dial, symbols
239508	-HiFi-FM	Flywheel
216599	-HiFi-FM	Heat sink, Q603, Q703, Q802
259881	-HiFi-FM	Jack, headset
264248	-HiFi-FM	Knob, bass and treble control
262589	-HiFi-FM	Knob, function selector
266719	-HiFi-FM	Knob, speaker selector
262567	-HiFi-FM	Knob, tuning
263386	-HiFi-FM	Knob, volume control, inner
261705	-HiFi-FM	Knob, volume control, outer
269406	-HiFi-FM	Lamp, current limiter, 12V, 3W
200363	-HiFi-FM	Lamp, dial ill. 24V, 1.2W
202806	-HiFi-FM	Lamp, dial ill. 6.3V-0.32A
210507	-HiFi-FM	Lamp, stereo indicator 7V-0.05A
263236	-HiFi-FM	Lid, hinged for FM-potentiometers
266712	-HiFi-FM	List, support for knobs
203250	-HiFi-FM	Mains cord w/plug 220V, 7 feet
202008	-HiFi-FM	Mains cord w/plug 115V, 7 feet
263681	-HiFi-FM	Meter, indicator
260118	-HiFi-FM	Panel, front
267545	-HiFi-FM	Plate, pointer
230592	-HiFi-FM	Pointer, dial
991201	-HiFi-FM	Printed circuit board, power amplifier, compl.
991200	-HiFi-FM	Printed circuit board, FM preset, compl.
991202	-HiFi-FM	Printed circuit board, FM-tuner, compl.
254170	-HiFi-FM	Shielding box, discriminator
252489	-HiFi-FM	Shielding box, FM-IF
214925	-HiFi-FM	Socket, dial lamp
249837	-HiFi-FM	Socket, fuse
204112	-HiFi-FM	Spring, dial cord
213020	-HiFi-FM	Spring, hinged lid FM preset
201878	-HiFi-FM	Spring, indicator
264399	-HiFi-FM	Switch, function selector
236232	-HiFi-FM	Switch, loudspeaker
262826	-HiFi-FM	Switch, mains
218688	-HiFi-FM	Switch, micro
260499	-HiFi-FM	Switch, pickup
261719	-HiFi-FM	Transformer, mains 115, 220, 240V
249982a	-HiFi-FM	Wheel, dial cord

TRANSISTORER, TRANSISTORS

Ref. nr.	Type	Alt. type
Q101-HiFi-FM	BF 200	Ikke alt, no alt.
Q102-HiFi-FM	BF 194	BF 195, BF 115
Q103-HiFi-FM	BF 195	BF 194, BF 115
Q201-HiFi-FM	BF 195	
Q202-HiFi-FM	BF 195	
Q203-HiFi-FM	BF 195	
Q204-HiFi-FM	BF 195	BF 115 — BF 194
Q205-HiFi-FM	BC 149B	
Q401-HiFi-FM	BC 149B	
Q402-HiFi-FM	BC 149B	
Q403-HiFi-FM	BC 149B	BC 109B, BC 149C, BC 109C, BC 173B
Q501-HiFi-FM	BC 149B	BC 173C
Q502-HiFi-FM	BC 149B	
Q503-HiFi-FM	BC 149B	
Q701-HiFi-FM	BC 149B	
Q702-HiFi-FM	BC 147B	BC 107B, BC 171B
Q703-HiFi-FM	BC 144	MPS U05
Q704-HiFi-FM	BC 139	MPS U55
Q705-HiFi-FM	2N 5492	2N 5496
Q706-HiFi-FM	2N 5492	2N 5496
Q801-HiFi-FM	BC 149C	BC 109C
Q802-HiFi-FM	BC 140-10	BC 144, MPS U05
Q803-HiFi-FM	BC 149C	BC 109C

Potmeter

Ref. nr.	Beskrivelse — Description
R1	100 kohm
R2	47 kohm
R233-HiFi-FM	47 kohm
R236-HiFi-FM	5 kohm
R301-HiFi-FM	100 kohm
R302-HiFi-FM	100 kohm
R303-HiFi-FM	100 kohm
R304-HiFi-FM	100 kohm
R305-HiFi-FM	100 kohm
R306-HiFi-FM	5 kohm
R420-HiFi-FM	2 x 100 kohm
R520-HiFi-FM	2 x 10 kohm
R421-HiFi-FM	2 x 10 kohm
R521-HiFi-FM	2 x 10 kohm

R427-HiFi-FM	2 x 10 kohm	Diskant. Treble
R527-HiFi-FM	470 kohm	Midtpunktspenning. Center voltage
R707-HiFi-FM	1 kohm	Hvilestrøm. Quiescent current
R712-HiFi-FM	1 kohm	+ 25 V justering. + 25 V adj.
R803-HiFi-FM	1 kohm	

LF-justeringer

Midtpunktspenning

Midtpunktspenning for utgangstrinnet målt i M 11 skal være 17 V. Eventuell justering foretas med R607, R707. Deres som justeringen foretas med oscilloskop tilkopleet over høyttalerutgangen, justeres R607, R707 til symmetrisk klipping.

Justering av hvilestrøm

Hvilestrømmen kontrolleres ved å måle spenningen over R618, R718 (M10). Med nedskrudd volumkontroll og kalde transistorer skal spenningen være 19 mV. Eventuell justering foretas med R612, R712.

AF-adjustments

Center voltage adjustment

Connect a DC VTVM from chassis to the positive terminal of C608, C708. The meter should read 17 V. If necessary, adjust R607, R707.

Quiescent current

Note: This adjustment is to be performed with cold transistors. Connect a DC VTVM across the emitter resistor R618, R718 (M 10). With the volume control in zero position, adjust R612, R712 for meter reading of 19 mV. The quiescent current may also be adjusted with an oscilloscope connected to the speaker output. Adjust R612, R712 for symmetrical clipping.

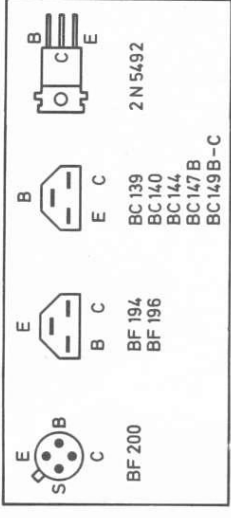

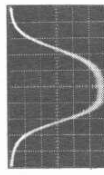
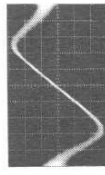


Fig. 6. Transistorene sett fra undersiden. The transistors seen from underneath.

FM-trimmeprosedyre - FM-alignment procedure

Trimmerkøfølge Alignment procedure	Mottaker Receiver		Generator		Oscilloskop Oscilloscope		Kretser Circuits	Oscillogrammer Oscillograms	Merknader og data for oscillogrammene. Remarks and specifications for the oscillograms.
	Frekvens Frequency	Frekvens Frequency	Devisjon Deviation	Tilkoplet Applied	Tilkoplet Connected to				
4. FM-MF 3. FM-IF 2. 10,7 MHz 1. 10,7 MHz	90 MHz	10,7 MHz 90 MHz	± 200 kHz	M2 via 0,1 µF M 1	M 5 via diodeprobe fig. 8	L205-L206 L203-L204 L201-L202 L106-L107	 FM-MF FM-IF	Signal: $U_{in} = 200 \mu V/75 \Omega$, $f = 10,7 \text{ MHz}$, dev. $\pm 200 \text{ kHz}$, tilført (applied to) M 2 via 0,1 µF. Oscilloscope: Vert.: 0,1 V/div. Hor.: 40 kHz/div, tilkoplek (connected to) M 5 via diodeprobe (fig. 8).	
FM-oscillator									AFC-knapp inntrykket AFC-button depressed
25 V for varicap.						R 803			Meter tilkoplek (connected to) M 12. Justér til + 25 V. Adjust to + 25 V reading.
FM-osc (FM)	90 MHz 105 MHz	90 MHz 105 MHz	± 22,5 kHz ± 22,5 kHz	M 1 M 1	M 5 via diodeprobe	R 2 C 121			Check 90-95-100-105 MHz
FM-preset (P 1)	87,5 MHz 105 MHz	87,5 MHz 105 MHz	± 22,5 kHz ± 22,5 kHz	M 1 M 1	M 5 via diodeprobe	R306			Check P2 - P3 - P4 - P5 Check P2 - P3 - P4 - P5
Forkrets Antenna circuits	90 MHz 105 MHz	90 MHz 105 MHz	± 200 kHz	M 1	M 5 via diodeprobe	L 101, L103, L105, C103, C110, C115		 Selektivitet FM Selectivity FM	Signal: $U_{in} = 10 \mu V/75 \Omega$, $f = 90 \text{ MHz}$, dev. $\pm 200 \text{ kHz}$, tilført (applied to) M 1 via ant. plug. Oscilloscope: Vert.: 0,05 V/div, tilkoplek (connected to) M 5 via diodeprobe (fig. 8).
Diskriminator Discriminator	90 MHz	90 MHz	± 200 kHz	M 1	M 6	L207-C208		 Diskriminator Discriminator	Signal: $U_{in} = 2 \mu V/75 \Omega$, $f = 90 \text{ MHz}$, dev. $\pm 200 \text{ kHz}$, tilført (applied to) M 1 via ant. plug. Oscilloscope: Vert.: 0,1 V/div, Hor.: 40 kHz/div, tilkoplek (connected to) M 6.
AFC	90 MHz	90 MHz	± 75 kHz	M 1	M 5 via diodeprobe	R233			Kurven skal ikke flytte seg på skopet når AFC-knappen utløses. The curve should remain stationary when AFC-button is released

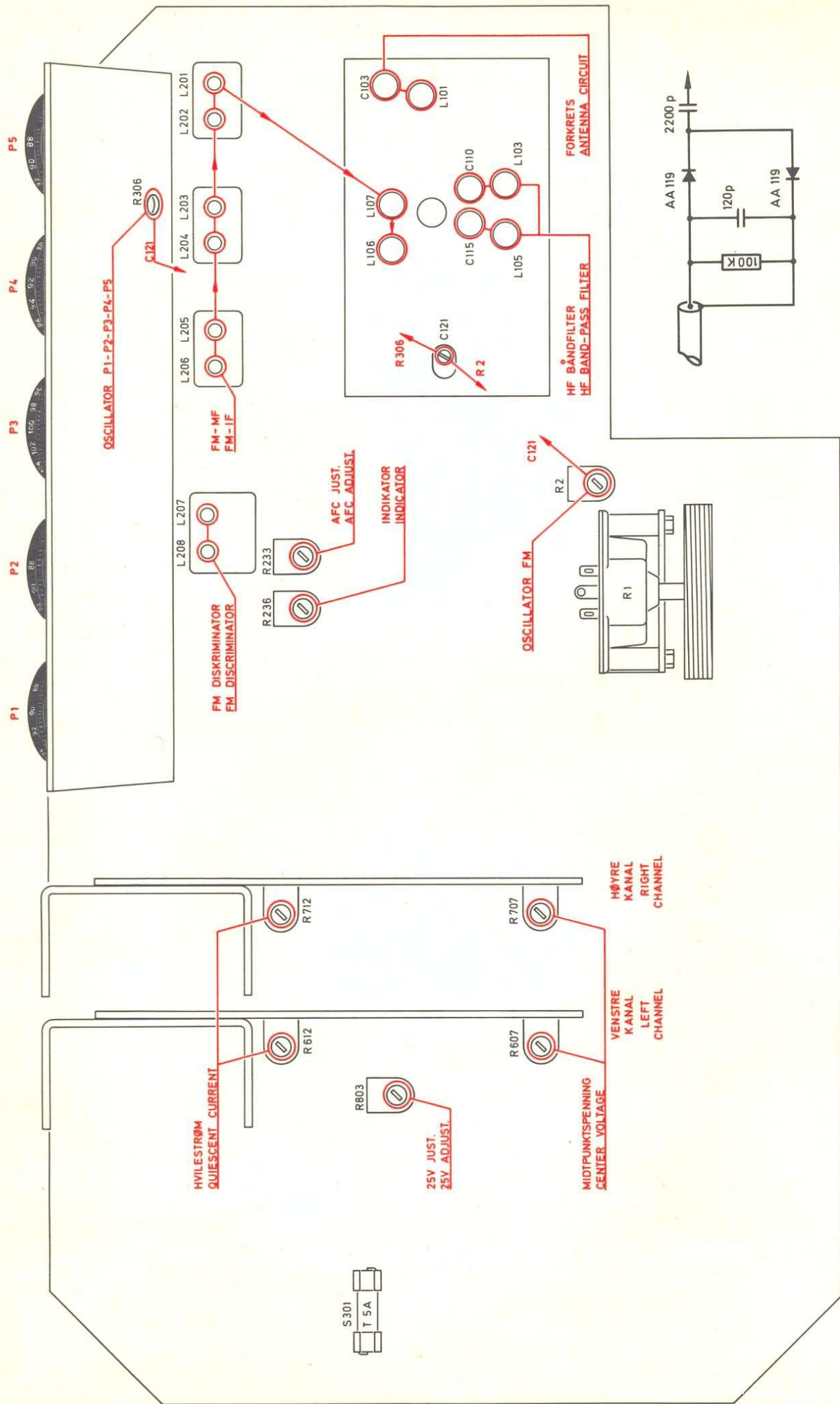
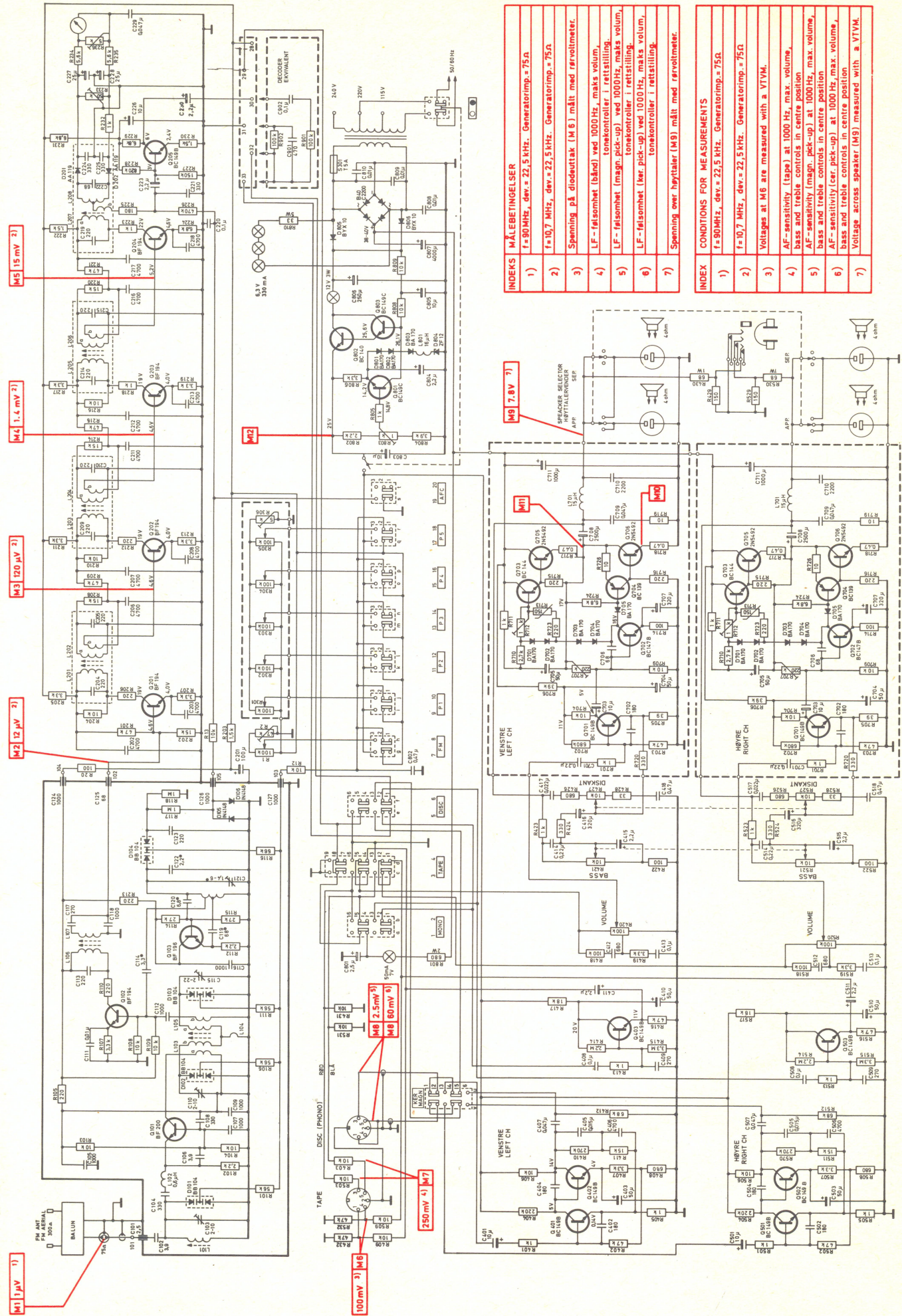


Fig. 7. Trimmepunkter, Alignment points

Fig. 8. Diodeprobe



INDEKS MÅLEPUNKTSEL

- 1) $f = 90 \text{ MHz}$, dev. = 22.5 KHz. Generatorimp. = 75Ω
- 2) $f = 10.7 \text{ MHz}$, dev. = 22.5 KHz. Generatorimp. = 75Ω
- 3) Spøtning på diodauttak (M 6) målt med revolvimeter.
- 4) LF-følsomhet (bånd) ved 1000 Hz, maks volum, tonekontroller i retstilling.
- 5) LF-følsomhet (mag. pick-up) ved 1000 Hz, maks volum, tonekontroller i retstilling.
- 6) LF-følsomhet (kr. pick-up) ved 1000 Hz, maks volum, tonekontroller i retstilling.
- 7) Spøtning over høytaler (M9) målt med revolvimeter.

INDEX CONDITIONS FOR MEASUREMENTS

- 1) $f = 90 \text{ MHz}$, dev. = 22.5 KHz. Generatorimp. = 75Ω
- 2) $f = 10.7 \text{ MHz}$, dev. = 22.5 KHz. Generatorimp. = 75Ω
- 3) Voltages at M6 are measured with a VTVM.
- 4) AF-sensitivity (tape) at 1000 Hz, max. volume, bass and treble controls in centre position.
- 5) AF-sensitivity (mag. pick-up) at 1000 Hz, max. volume, bass and treble controls in centre position.
- 6) AF-sensitivity (cr. pick-up) at 1000 Hz, max. volume, bass and treble controls in centre position.
- 7) Voltage across speaker (M9) measured with a VTVM.

Fig. 9. Skjema for HiFi-FM Schematic HiFi-FM

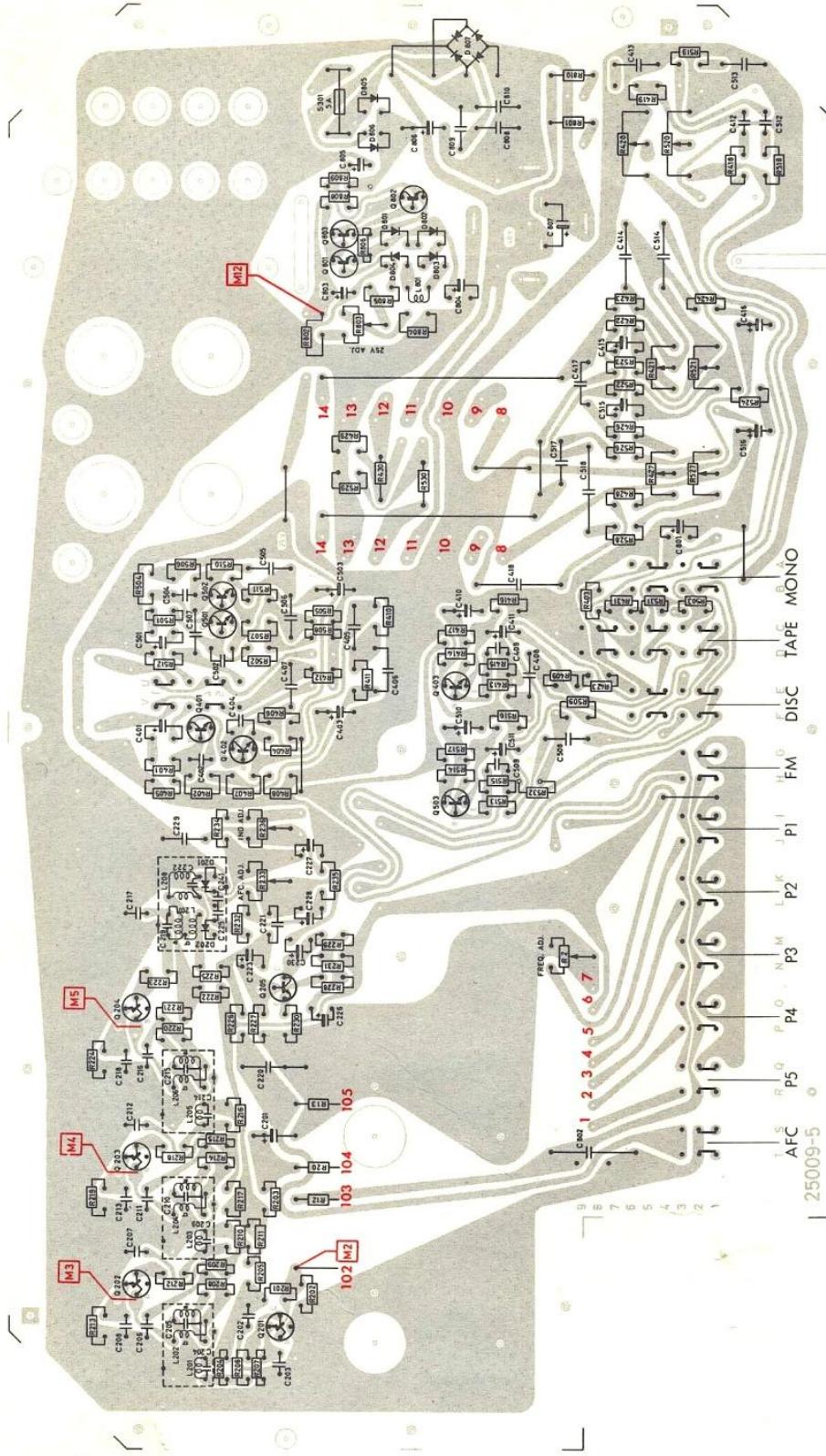


Fig. 10. Hovedplate, sett fra foliesiden.
The main circuit board, printed side.