

# Technical Manual

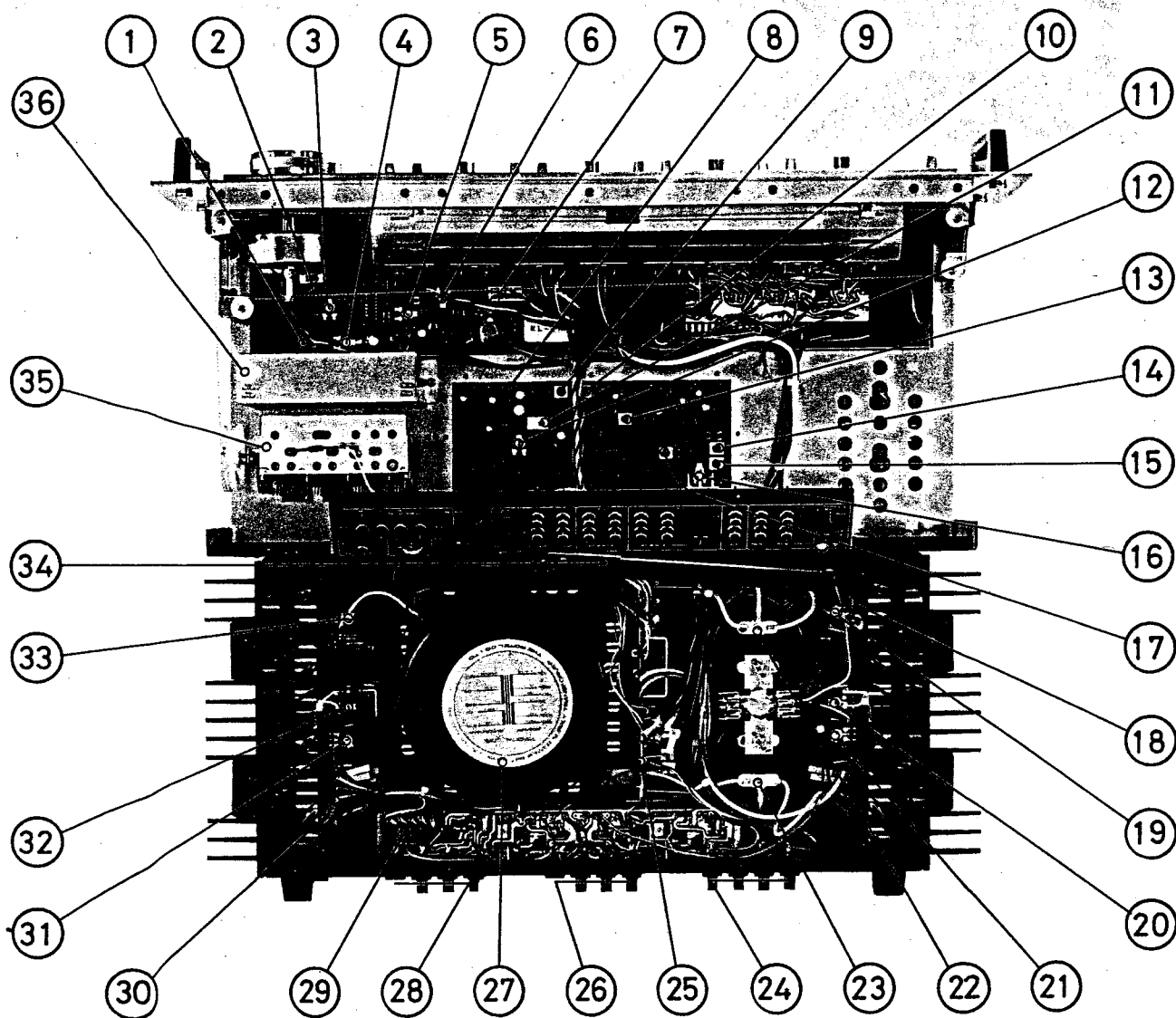
AM/FM STEREO RECEIVER  
**RX-1603**

Datasheet.Live

# CHASSIS LAYOUT (TOP VIEW)

## CHASSIS-ANORDNUNG (OBERANSICHT)

### INSTALLATION DE CHASSIS (VUE DE DESSUS)



1. MPX DECODER CIRCUIT BOARD
2. FM DE-EMPHASIS (50 $\mu$ S - 75 $\mu$ S) SWITCH
3. VR301, FM AUTO-SWITCHING LEVEL ADJ
4. VR302, MPX SEPARATION ADJ
5. VR303, MPX SEPARATION (LEAKAGE) ADJ
6. VR304, FM MUTING LEVEL ADJ
7. RY301, FM MUTING RELAY
8. AM/FM IF AMP CIRCUIT BOARD
9. L103, AM OSC COIL
10. L105, AM RF COIL
11. L102, AM IFT, 1st
12. VR101, FM SIGNAL METER CAL
13. L104, AM IFT, 2nd
14. L114, FM DISC (SEC)
15. L113, FM DISC (PRI)
16. VR102, FM DISTORTION ADJ
17. L110, FM IFT
18. L-CH, MAIN AMP CIRCUIT BOARD

19. VR601, DC BALANCE ADJ, L-CH
20. VR602, BIAS ADJ, L-CH
21. VR603, OVERLOAD LEVEL ADJ, L-CH
22. C003,  $\Phi$ B SMOOTHING CAPACITOR
23. C004,  $\Phi$ B SMOOTHING CAPACITOR
24. SPEAKER-C TERMINAL STRIP
25. POWER SUPPLY (RECTIFIER) CIRCUIT BOARD
26. SPEAKER-B TERMINAL STRIP
27. T001, POWER TRANSFORMER
28. SPEAKER-A TERMINAL STRIP
29. SPEAKER RELAY CIRCUIT BOARD
30. R-CH MAIN AMP. CIRCUIT BOARD
31. VR603', OVERLOAD LEVEL ADJ, R-CH
32. VR602', BIAS ADJ, R-CH
33. VR601', DC BALANCE ADJ, R-CH
34. L004, AM ANTENNA COIL
35. AM/FM FRONT END
36. PHONO AMP CIRCUIT BLOCK

# AM ALIGNMENT PROCEDURE

## AM-ABGLEICH

## PROCEDURE D'ALIGNEMENT AM

**Instruments:** AM Signal Generator and AC VTVM.

**Notes:** Set Function Selector switch to AM.

Input signal must be kept as low as possible to avoid AGC action.

Step	Generator		Tuning Dial Setting	Output Indicator Connected to	Adjust	Adjust for
	Coupling	Frequency				
1	Pin No. 12 (on IF board) through a 0.01 mfd capacitor.	455kHz (400Hz 30% mod.)	Non interfering at low end of scale.	AC VTVM to TAPE OUT jack.	L104 and L102 (on IF board)	Maximum reading on VTVM.
2	Test Loop Radiate signal into ferrite loop-stick antenna.	600kHz (400Hz 30% mod.)	600kHz		L103 (OSC) L105 (RF) (on IF board) and L004 ANT. Coil.	
3		1400kHz (400 Hz 30% mod.)	1400kHz		CT7 (OSC), CT6 (RF) CT5 (ANT) Trim (on Front-end)	
4	Repeat steps 2 and 3 until no further improvement is noticed.					

**Instrumente:** AM-Meßsender und Wechselstrom-Röhrenvoltmeter

**Zur Beachtung:** Funktionswählschalter auf AM stellen.

Das Eingangssignal muß so klein wie möglich gehalten werden, um Ansprechen der automatischen Schwundregelung zu vermeiden.

Schritt	Meßsender		Abstimmskaleneinstellung	Ausgangsanzeige angeschlossen an	Abgleich	Abgleich auf
	Anschluß	Frequenz				
1	Steckerstift 12 (auf ZF-Leiterplatte) über 0,01 mF-Kondensator	455 kHz (400Hz 30% moduliert)	Keine Interferenz am unteren Skalenende	Wechselstrom-Röhrenvoltmeter an Buchse TAPE OUT	L104 und L102 (auf ZF-Leiterplatte)	Maximalanzeige am Röhrenvoltmeter
2	Meßschleife. Signal in Ferritrahmenantenne einspeisen.	600kHz (400Hz 30% moduliert)	600kHz		L103 (OSZ) L105 (HF) (auf ZF-Leiterplatte) und L004 Antennenspule	
3		1400kHz (400 Hz 30% moduliert)	1400kHz		CT7 (OSZ) CT6 (HF) CT5 (Ant.) Trimmer (in der Eingangsstufe)	
4	Schritt 2 und 3 wiederholen, bis keine weitere Verbesserung eintritt.					

**struments:** Générateur de signal AM et voltmètre électronique (VTVM AC)  
**tes:** Régler le commutateur de sélecteur de fonction sur AM. Le signal d'entrée doit être maintenu aussi bas que possible afin d'éviter l'action AGC.

Point	Générateur		Ecran d'accord	Indicateur de sortie connecté à	Réglage	Réglage pour
	Couplage	Fréquence				
1	Broche No. 12 (sur le plaquette IF) par l'intermédiaire d'un condensateur de 0,01mfd.	455kHz (400Hz 30% mod.)	Non interférence à l'extrémité inférieure de l'échelle.	Voltmètre électronique sur le jack TAPE OUT.	L104 et L102 (sur le plaquette IF)	Lecture maximum sur le voltmètre électronique
2	Boucle de mesure Envoie le signal sur l'antenne ferrite à boucle.	600kHz (400 Hz 30% mod.)	600kHz		L103 (OSC) L105 (RF) (sur le plaquette IF) et L004 ANT. bobine.	
3		1400kHz (400 Hz 30% mod.)	1400kHz		CT7 (OSC) CT6 (RF) CT5 (ANT) de correction (sur l'extrémité avant)	
4	Répéter les points 2 et 3 jusqu'à ce qu'il ne puisse être remarqué d'amélioration supplémentaire.					

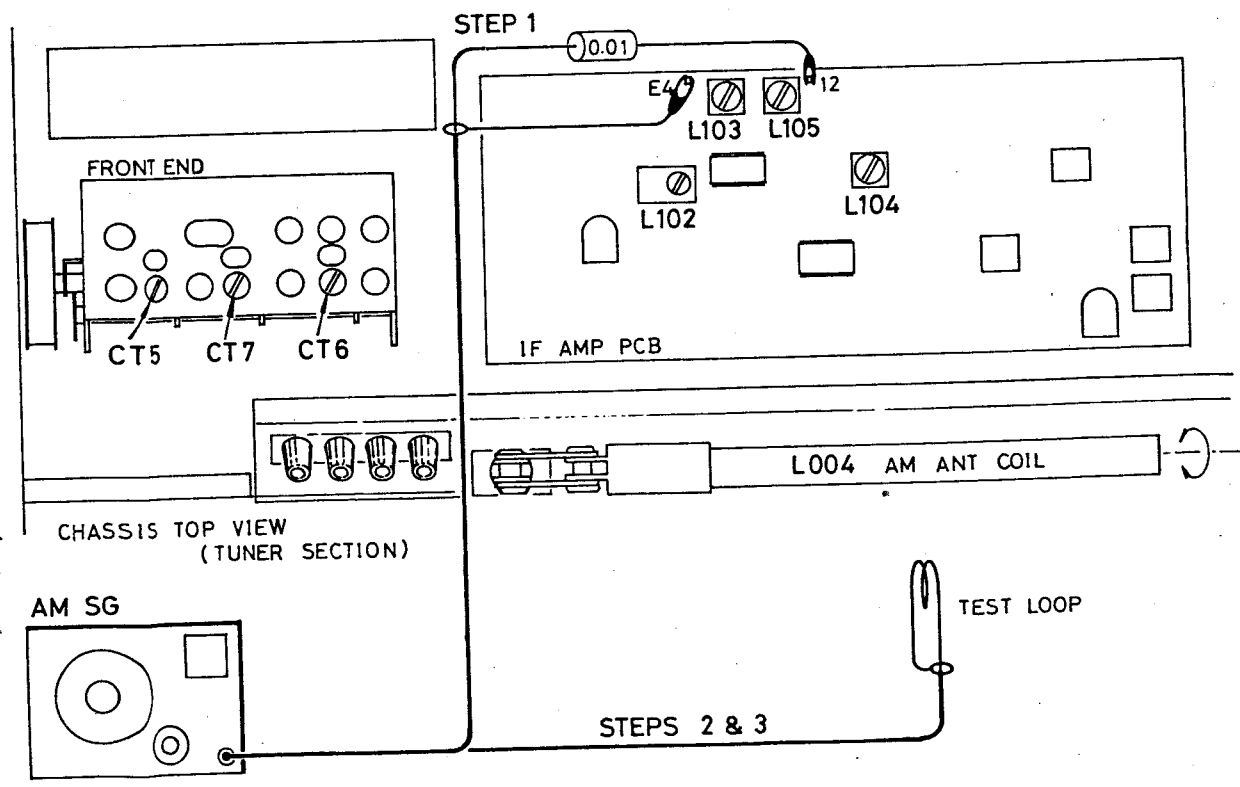


FIG. 4. AM IF AND RF ALIGNMENT HOOK-UP  
 ABB. 4. MESSANSCHLUSS ZUM AM-ZF- UND AM-HF-ABGLEICH  
 FIG. 4. SCHEMA DE MONTAGE D'ALIGNEMENT AM IF ET RF

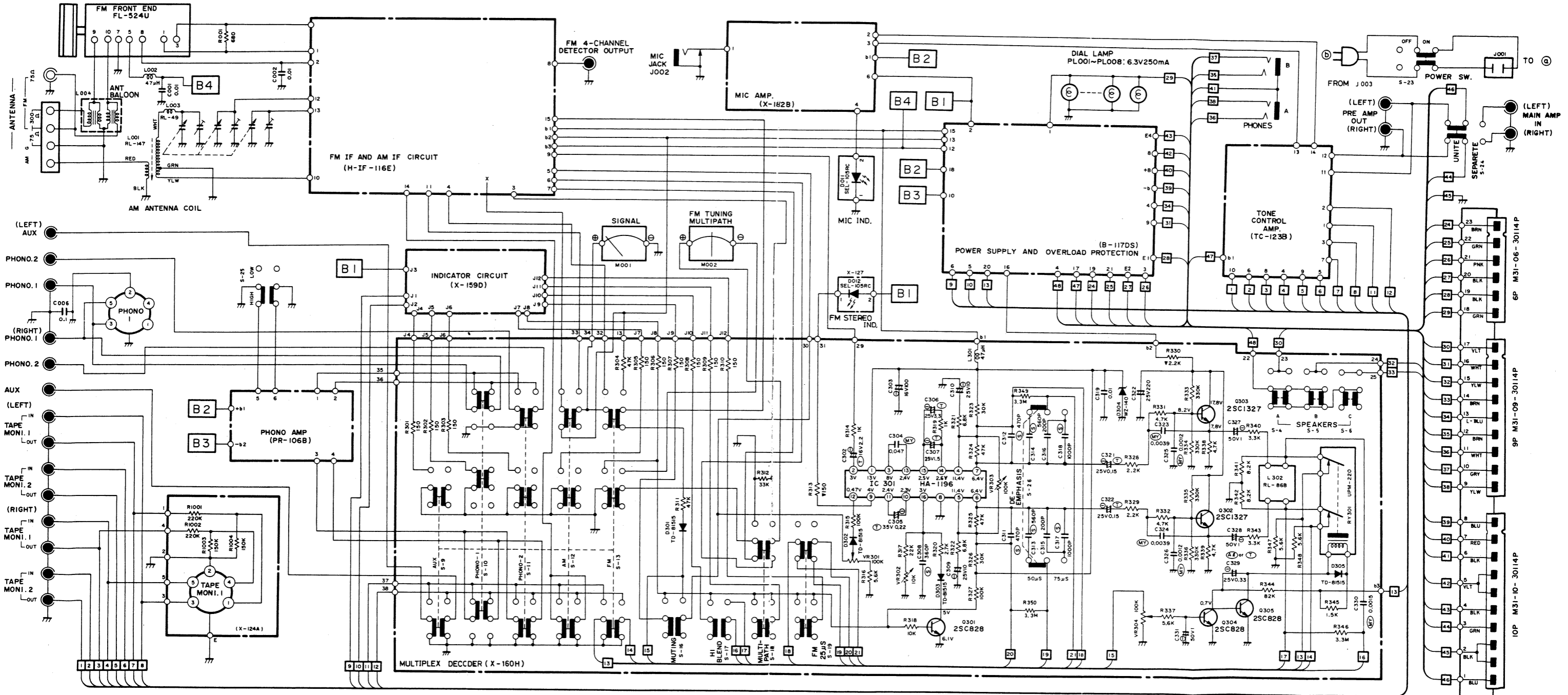
**SCHEMATIC DIAGRAM**  
**SCHALTUNGSSCHEMA**  
**DIAGRAMME SCHEMATIQUE**

**AM/FM STEREO RECEIVER**  
**RX-1603**

This Schematic Diagram is applicable to the units with the following Serial No. and onward.  
 Serial No. beginning: NA53001  
 R28056

Dieses Schaltungsschema gilt für Geräte ab folgenden Seriennummern:  
 Seriennummer, Anfang: NA53001  
 R28056

Ce diagramme schématique est applicable aux unités ayant le No. de série suivant.  
 Numéro de série commençant par: NA53001  
 R28056

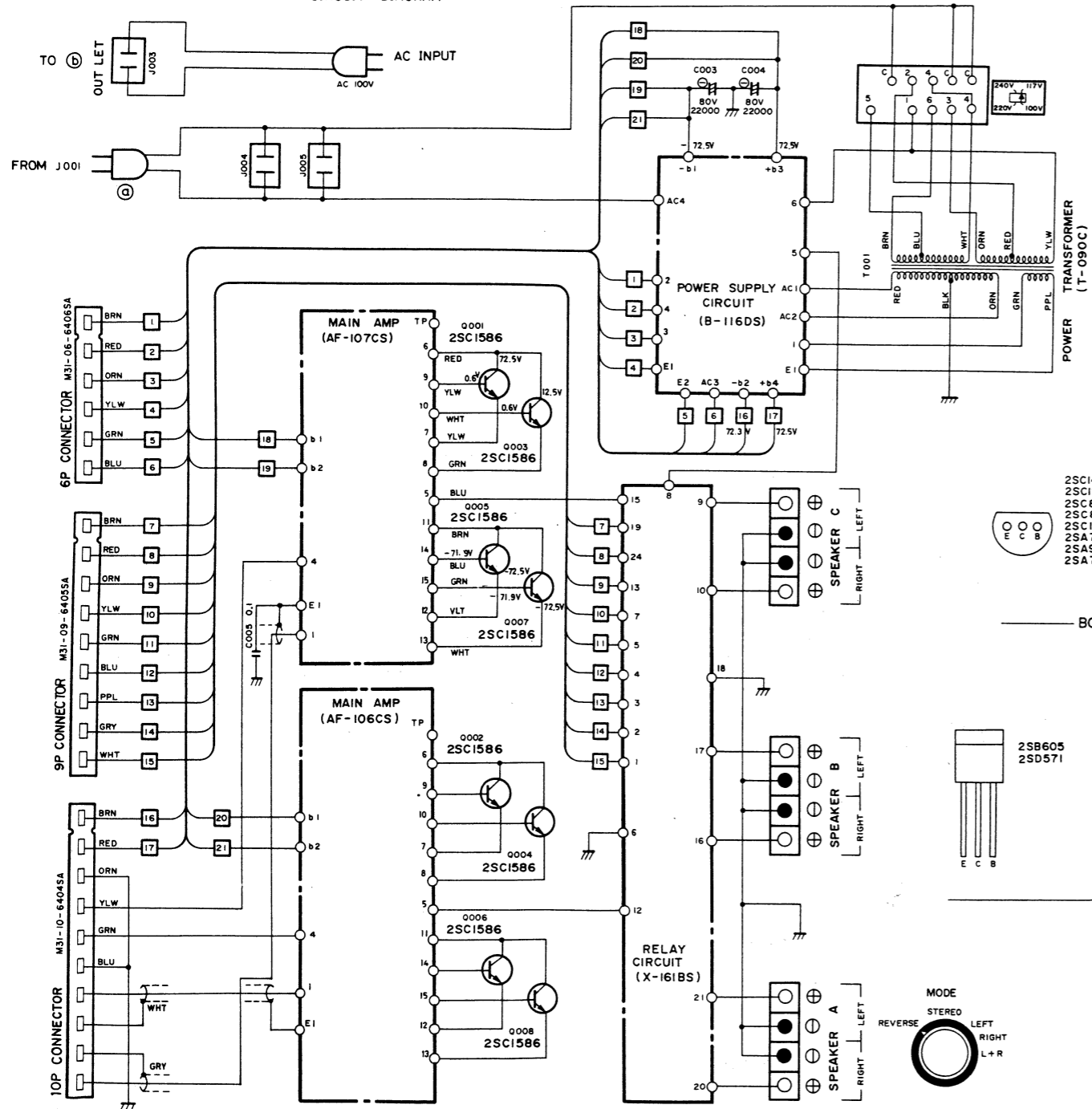


ROTEL RX-1603 TUNER / PREAMP CIRCUIT DIAGRAM.

**ROTEL**®

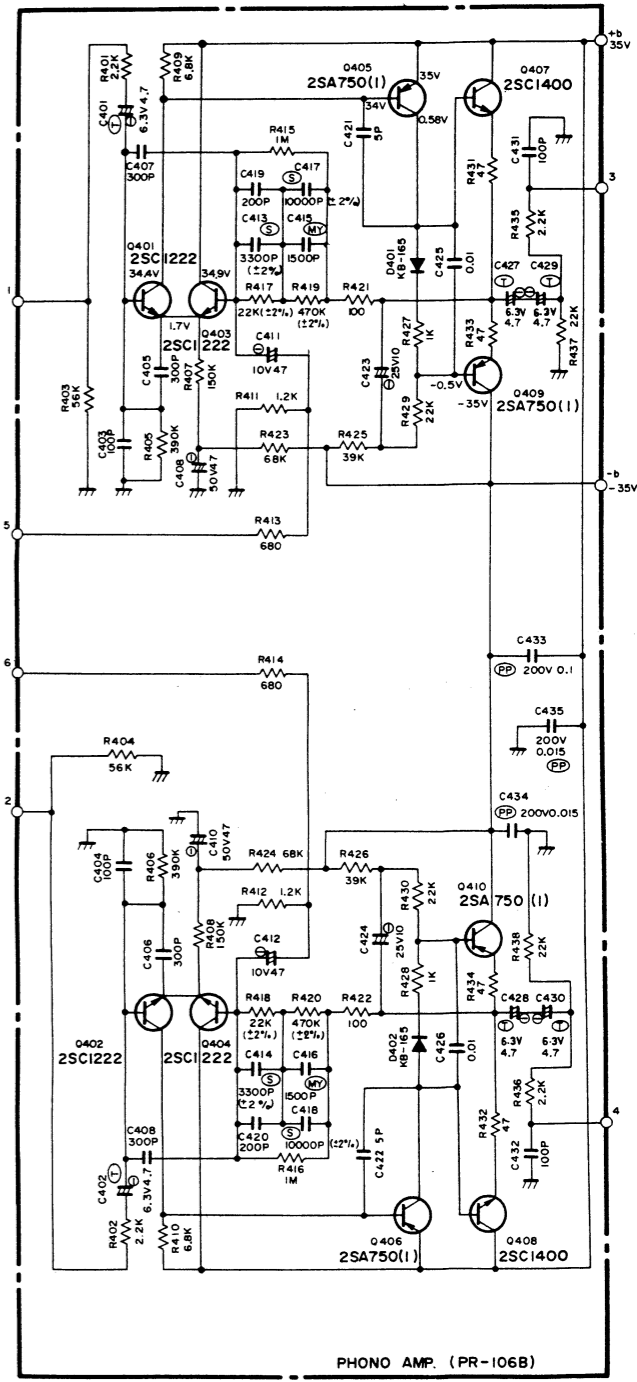
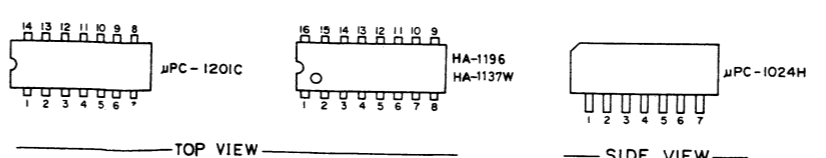
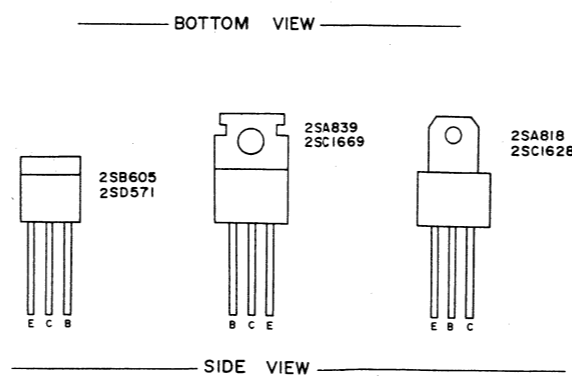
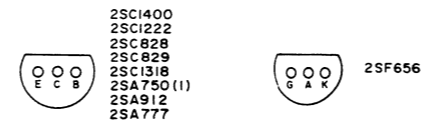
Dahl Elektronik GmbH, Postfach 70 16 29, D-2000 Hamburg 70

ROTEL RX-1603 MAIN AMP.  
CIRCUIT DIAGRAM

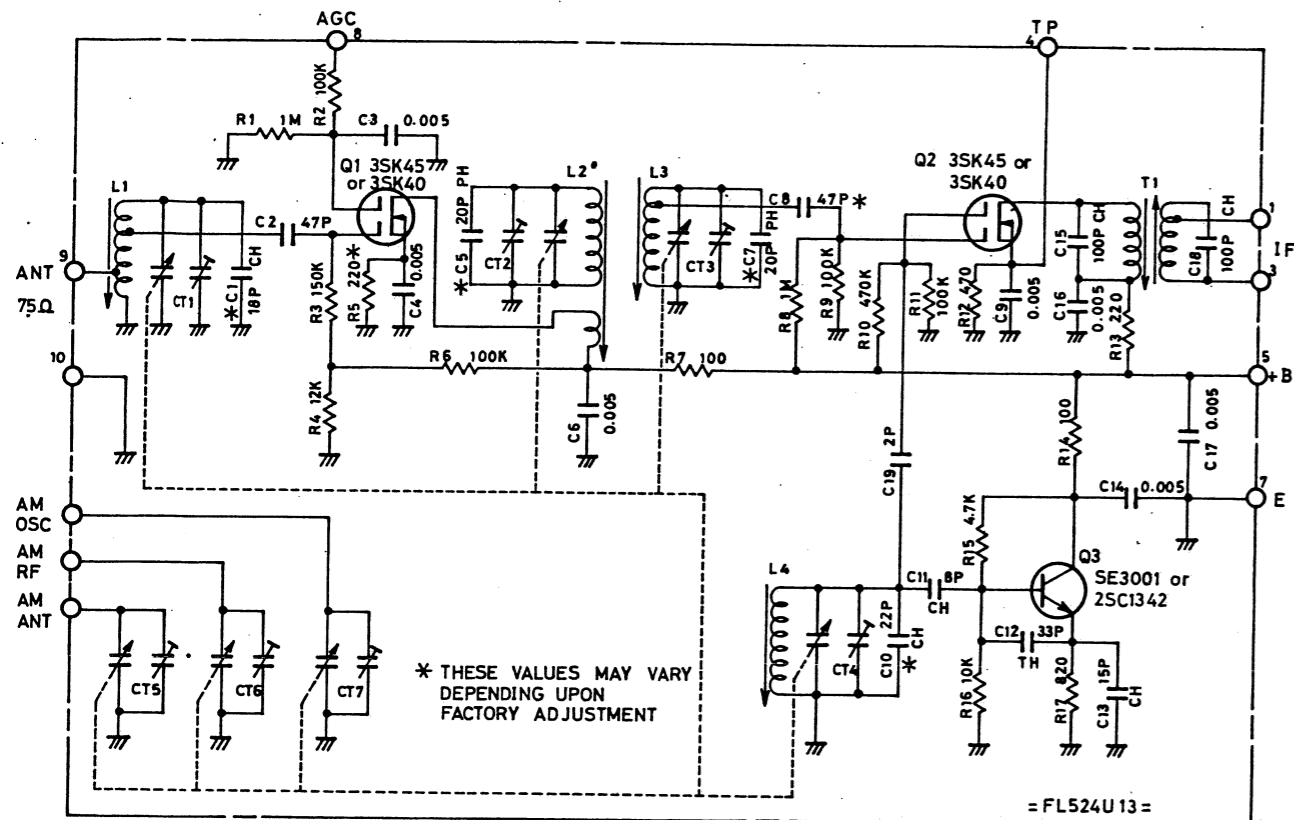


- RESISTORS**  
 5% --- TOLERANCE UNLESS OTHERWISE NOTED.  
 K --- KILO OHM.  
 M --- MEGA OHM.  
 W --- COMPOSITION RESISTORS 1/2 WATT.  
 NONMARK --- LOW NOISE TYPE CARBON RESISTORS 1/4 WATT.
- CAPACITORS**  
 (MY) --- MYLAR FILM CAPACITORS.  
 (AL) --- SINTERED ALUMINUM SOLID ELECTROLYTIC CAPACITORS (ALSICON).  
 (S) --- POLYSTYRENE FILM CAPACITORS.  
 (T) --- TANTALUM CAPACITORS.  
 (LN) --- LOW NOISE TYPE CAPACITORS.  
 (E) --- ELECTROLYTIC CAPACITORS.  
 (TC) --- TEMPERATURE COEFFICIENT CAPACITORS.  
 (C) --- CERAMIC CAPACITORS.  
 \* --- UNLESS OTHERWISE NOTED IN SCHEMATIC ALL CAPACITANCE VALUES ARE EXPRESSED IN MFD.  
 ● --- VOLTAGE READING WITH VTVM FROM THE POINT SHOWN TO THE CHASSIS GROUND (LINE VOLTAGE 120VOLT).  
 ● --- VOLTAGE READING MAY VARY ±20%.  
 (PP) --- POLYPROPYLENE FILM CAPACITORS.

ITEM	SCHMATIC LOCATION	LAST
FM IF AND AM IF CIRCUIT	R177	C168
MULTIPLEX DECODER	R350	C331
PHONO AMP.	R438	C435
TONE CONTROL AMP.	R596	C564
MAIN AMP.	R652	C614
RELAY CIRCUIT	R722	C702
MIC AMP.	R817	C816
POWER SUPPLY CIRCUIT	R949	C922
CHASSIS	RO01	CO06



**FRONT END SCHEMATIC DIAGRAM**  
**EINGANGSSTUFE-SCHALTUNGSSCHEMA**  
**DIAGRAMME SCHEMATIQUE DE L'EXTREMITÉ AVANT**

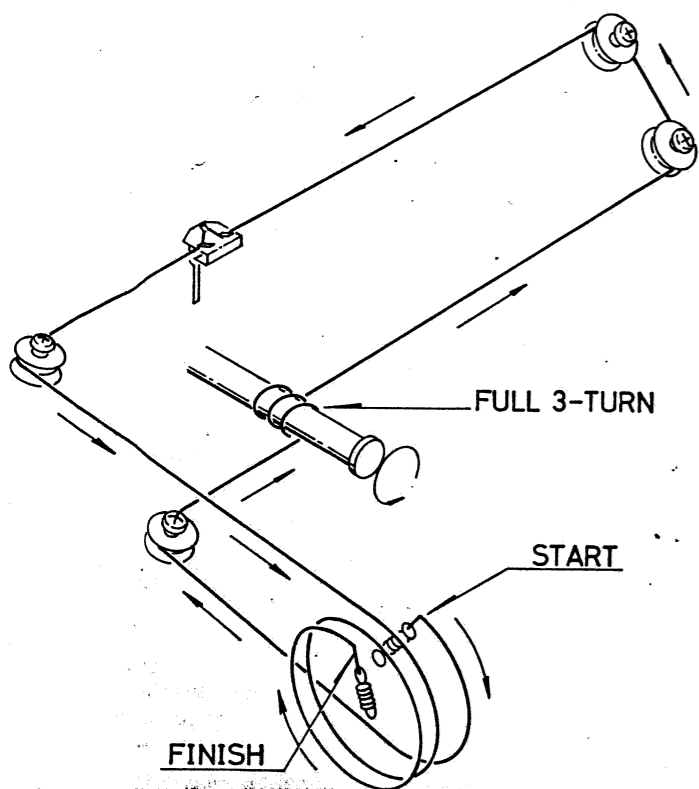


**REPAIR PARTS LIST**  
**REPARATURTEILLISTE**  
**LISTE DES PIÈCES DE RECHANGE**

Schematic Location	Part No.	Description
<b>TRANSISTORS, DIODES AND IC'S</b>		
Q101, 102, 107, 108, 301, 304, 305, 701, 905, 910, 912, 913	301201115	2SC828, AM Audio Amp, FM Muting, Overload Protection, etc.
Q103, 104, 105, 106, 109, 110, 111, 112	301201117	2SC829, FM IF Amp, etc.
Q302, 303	301201134	2SC1327, FM MPX Audio Amp
Q401, 402, 403, 404, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510	301201156	2SC1222(E), Phono Amp, Tone Amp, etc.
Q405, 406, 409, 410, 601, 602, 611, 906, 911	301001134	2SA750-1, Phono Amp, Differential Amp, etc.
Q407, 409	301201157	2SC1400, Phono Amp
Q603	301001142	2SA912, Main Amp Bias Compensator
Q604, 612, 613, 908	301301137	2SD571, Limiter, Stabilizer, etc.
Q605, 607	301201164	2SC1885, Pre-driver
Q606	301201161	2SC1628, Driver
Q608	301001138	2SA818, Driver
Q609	301201167	2SC1669, Driver
Q610	301001144	2SA839, Driver
Q702, 703, 704	301201155	2SC1318, Speaker Relay Driver
Q901, 902	301201141	2SC1444, Stabilizer
Q903	301201143	2SC1509, Stabilizer, ⊕B
Q904	301001128	2SA777, Stabilizer, ⊕B
Q914	301101123	2SB605, Power Supply Relay Driver
Q001, 002, 003, 004, 005, 006, 007, 008	301201166	2SC1586, Power Amp
D101, 102, 103, 104, 105, 108, 109, 110, 910	300111008	1K188, AM Det, FM AGC Rect, etc.
D106, 301, 302, 303, 305, 701, 702, 703, 704, 904, 906, 912	300111012	TD81515
D111, 112	300111010	1S2473, FM Det
D304	300313018	WZ-140, Regulator, 14V
D401, 402, 603	300212008	KB-165, Temperature Compensator
D107, 601, 602, 905	300212002	KB-265, Temperature Compensator, etc.
D901, 903	300313013	WZ-120, Regulator, 12V
D902	300313019	WZ-350, Regulator, 35V
D907, 908, 910	300919016	SM-1-08, Rectifier
D909	300515001	2SF656, Thyristor
D911	300919030	S15VB, Rectifier
D001, 011, 012	300414014	SEL-105RC, Mic, FM ST Ind, etc.
D002, 003, 004, 005, 006, 007, 008, 009, 010	300414015	SEL-305GC, Function Ind.
D013	300212010	SV-04F, Temperature Compensator
IC101	303452163	μPC1021C, AM Conv, and IF Amp
IC102	303452156	HA1137W, FM IF Amp
IC301	303452165	HA1196, FM MPX Decoder
IC801, 802	303452164	μPC1024H, Mic Amp

Schematic Location	Part No.	Description
<b>VARIABLE RESISTORS</b>		
VR101, 102	510502154	50KB, FM Signal Meter Cal, FM Dist Adj
VR301, 303, 304	510502155	100KB, FM Auto-Switch Adj, Muting Adj, etc.
VR302	510502153	10KB, 19kHz Adj
VR501	525101143	100KBH x 2, Balance Control
VR502	525121137	100KBT x 2 + 100KC x 2, Volume Control
VR503, 504	525101140	50KB x 2, Treble Control, Bass Control
VR601, 602	510502145	1KB, DC Balance Adj, Bias Adj
VR603	510502146	5KB, Overload Protection Level Adj
VR801 (w/S22)	525101135	50KB, Mic Level Control with Mic Switch
<b>COILS AND TRANSFORMERS</b>		
L101, 106, 107, 003	226501124	RF Choke, 2μH
L102	229101183	AM IFT, 1st, 455kHz Tune
L103	223301123	AM Local Osc Coil
L104	225301127	AM IFT, 2nd, 455kHz Tune
L105	226501130	AM RF Coil
L108	228641119	AM Whistle Filter
L109, 111, 301, 901, 902, 903, 002	226501123	RF Choke, 47μH (470)
L110	226501122	FM IFT, 10.7MHz
L112	226501137	Quadrature Coil
L113	225501125	FM Disc (Pri)
L114	225501127	FM Disc (Sec)
L302	228641118	FM Low Pass Filter
L001	222391131	AM ANT Coil Ass'y
L004	226501121	FM ANT Matching Transformer
T001	205001413	Power Transformer (Multi-voltage)
	206001413	Power Transformer (220V/240V)
	204001413	Power Transformer (100V/120V)
<b>SWITCHES</b>		
S1	601011273	Mode Selector
S2, 7	611001238	Bass Turnover, Low Cut Filter
S3, 15	611001237	Treble Turnover, Tape Monitor
S4, 5, 6 (1 set)	614030814	Speaker Selector
S8	611001242	High Cut Filter
S9, 10, 11, 12, 13 (1 set)	614051014	Function Selector
S14	611001245	Tape Copy
S16, 17, 18, 19 (1 set)	614040820	Muting, Multipath, etc.
S20, 21	611001241	Loudness, Audio Muting
S22	-	See VR801.
S23	611001247*	Power Supply
S24, 25	613000022	Pre-Main, Phono Sensitivity Selector
S26	613000024	FM Deemphasis 50/75μS Selector *611001248 for SEMKO specification.

**DIAL STRINGING DIAGRAM**  
**SKALENANTRIEBSSCHEMA**  
**DIAGRAMME DES CÂBLE D'ENTRAÎNEMENT**

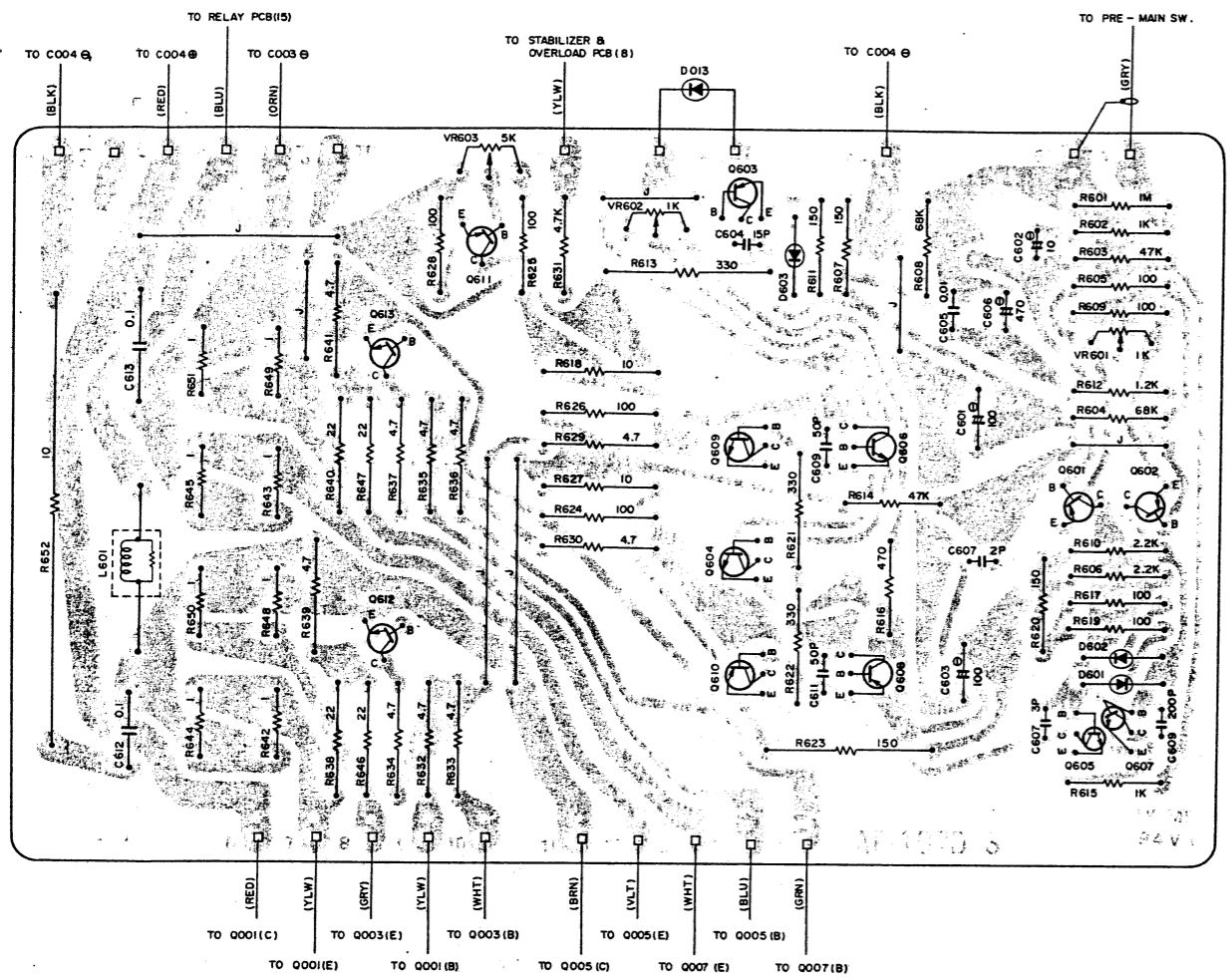


**Note:**  
 Carry out stringing with the front end set at VC minimum.

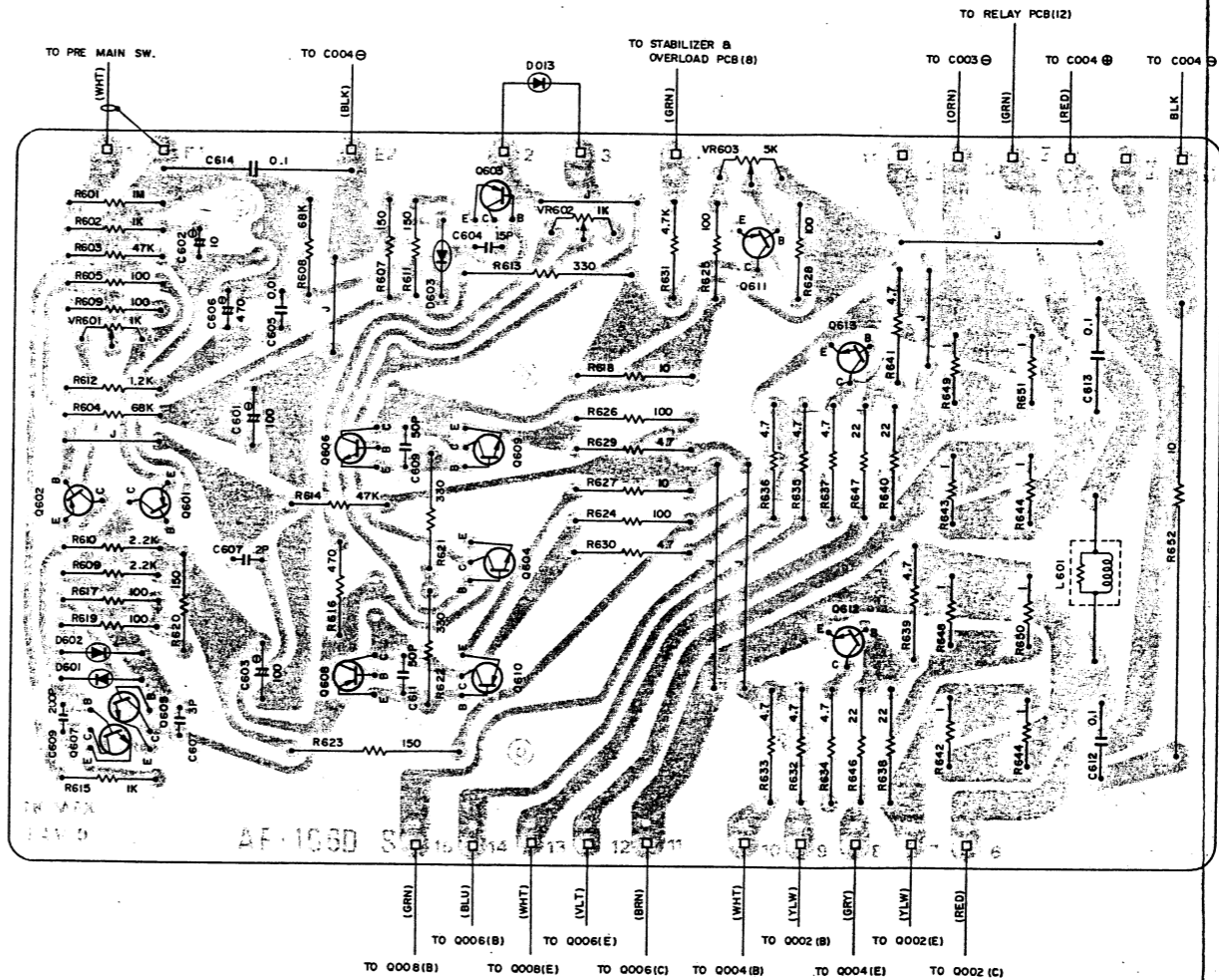
**Zur Beachtung:**  
 Antriebsseil mit dem Drehko in Minimumstellung verlegen.

**Note:**  
 Effectuer le câblage avec l'extrémité avant réglée au minimum.

**MAIN AMP (L-CH) CIRCUIT BOARD DIAGRAM**  
**SCHALTBILD DES HAUPTVERSTÄRKERS (L-KANAL)**  
**DIAGRAMME DE PLAQUETTE DE CIRCUIT DE CANAL**  
**GAUCHE DE L'AMP. PRINCIPAL**



**MAIN AMP (R-CH) CIRCUIT BOARD DIAGRAM**  
**SCHALTBILD DES HAUPTVERSTÄRKERS (R-KANAL)**  
**DIAGRAMME DE PLAQUETTE DE CIRCUIT DE CANAL**  
**DROIT DE L'AMP. PRINCIPAL**



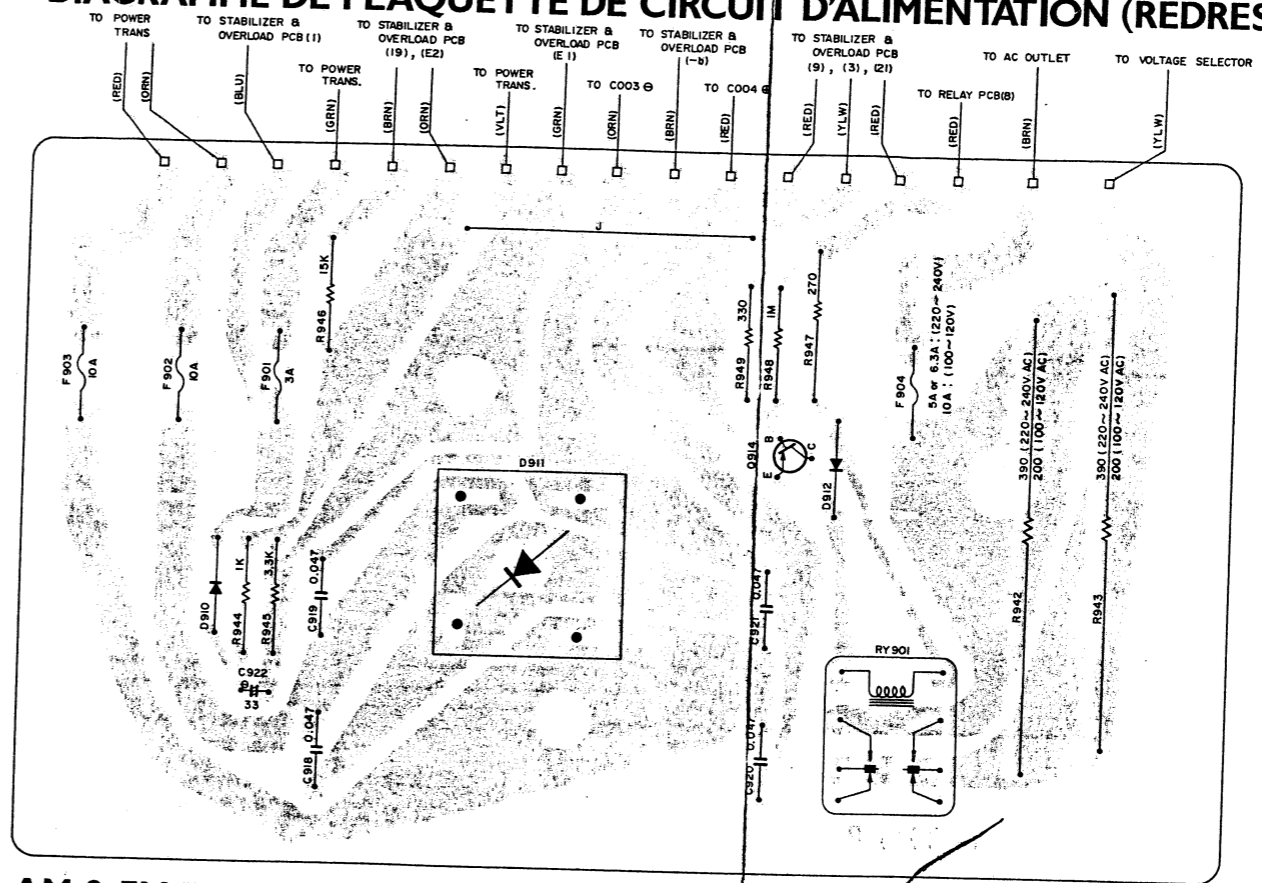
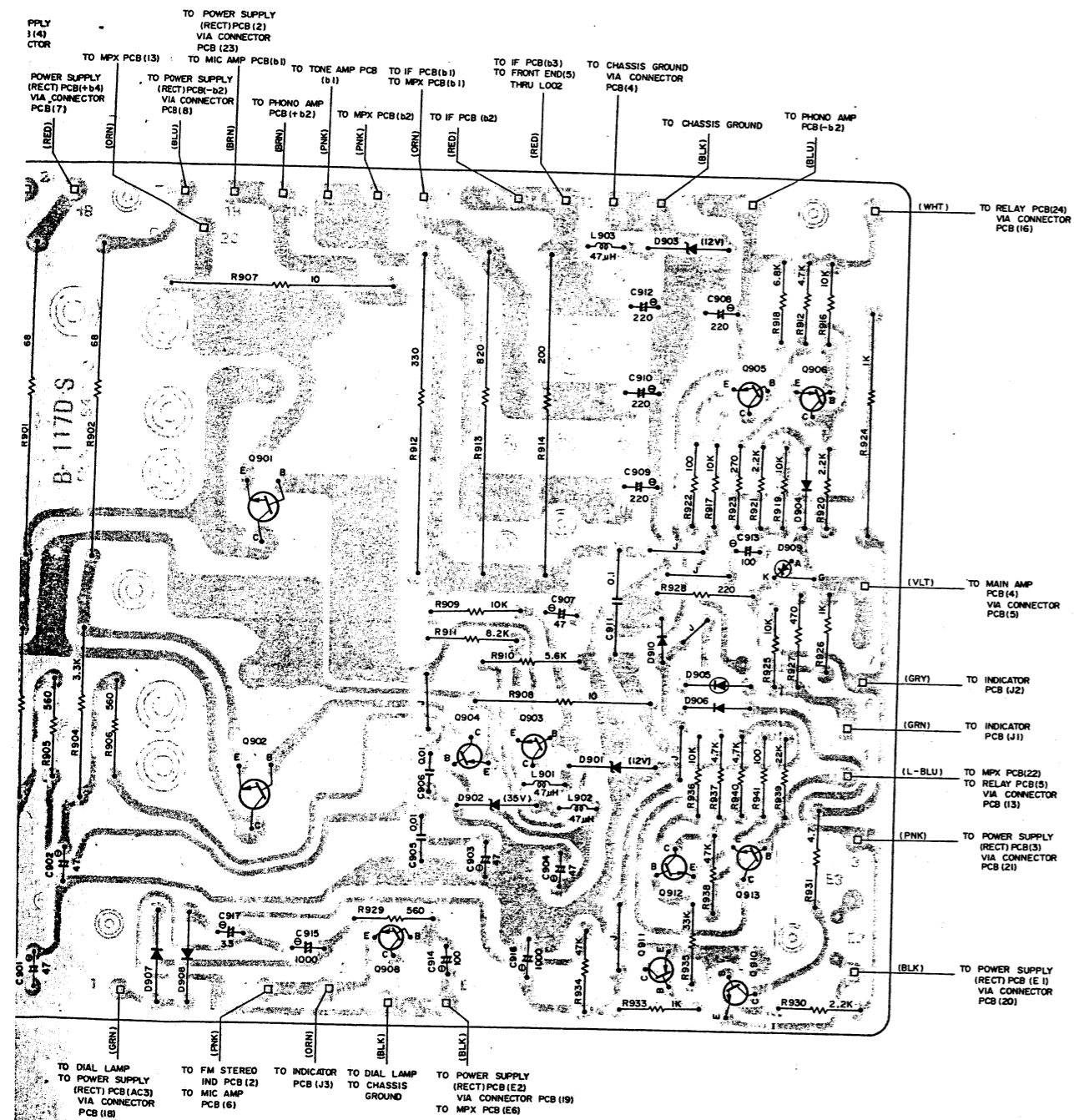
TO POW  
 (REC)  
 VIA C  
 PCB:

(GRN)

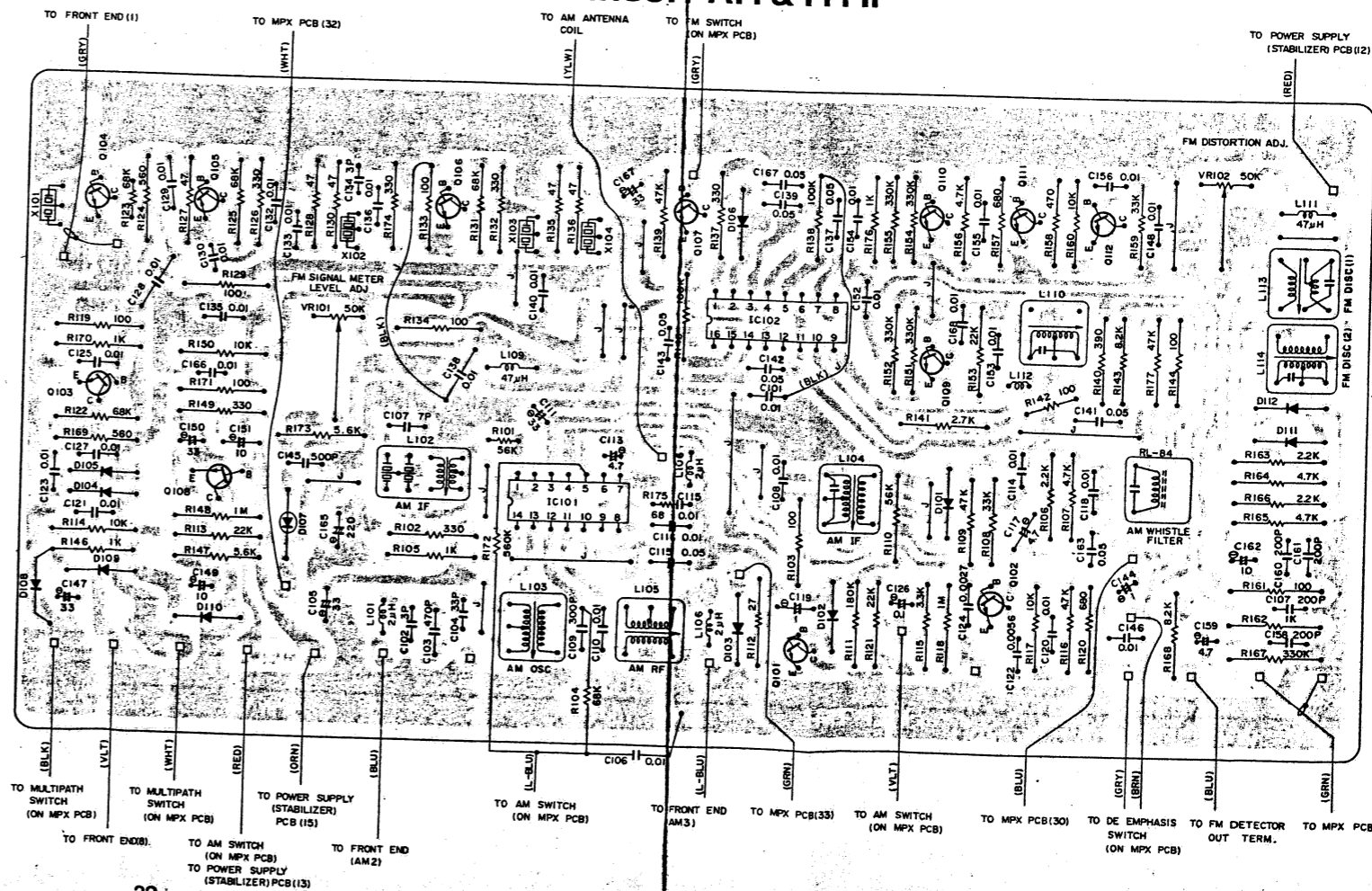


**POWER SUPPLY (STABILIZER) & OVERLOAD PROTECTION CIRCUIT BOARD DIAGRAM**  
**ALTBILD DES NETZTEILS (STABILISATOR) & ÜBERLASTUNGSSCHUTZ-SCHALTUNG**  
**GRAMME DE PLAQUETTE DE CIRCUIT D'ALIMENTATION (STABILISATEUR)**  
**PROTECTION CONTRE LA SURCHARGE**

**POWER SUPPLY (RECTIFIER) CIRCUIT BOARD DIAGRAM**  
**SCHALTBILD DES NETZTEILS (GLEICHRICHTER)**  
**DIAGRAMME DE PLAQUETTE DE CIRCUIT D'ALIMENTATION (REDRESSEUR)**



**AM & FM IF CIRCUIT BOARD DIAGRAM**  
**SCHALTBILD DES MW/UKW-ZF-VERSTÄRKERS**  
**DIAGRAMME DE PLAQUETTE DE CIRCUIT AM & FM IF**

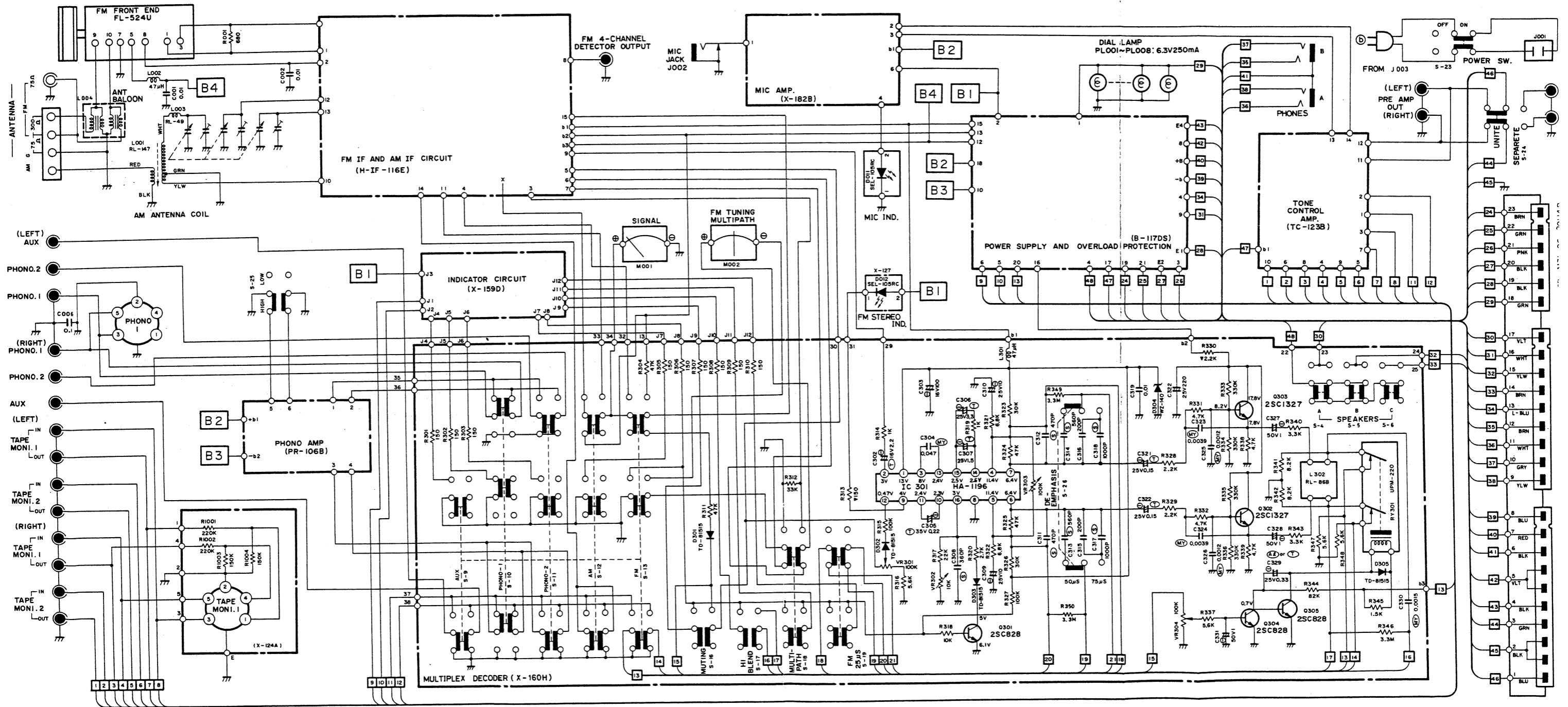


**SCHEMATIC DIAGRAM**  
**SCHALTUNGSSHEMA**  
**DIAGRAMME SCHEMATIQUE**

This Schematic Diagram is applicable to the units with the following Serial No. and onward.  
 Serial No. beginning: NA53001  
 R28056

Dieses Schaltungsschema gilt für Geräte ab folgenden Seriennummern:  
 Seriennummer, Anfang: NA53001  
 R28056

Ce diagramme schématique est applicable aux unités ayant le No. de série suivant.  
 Numéro de série commençant par: NA53001  
 R28056



ROTEL RX-1603 TUNER / PREAMP CIRCUIT DIAGRAM

Rotel RX 1603

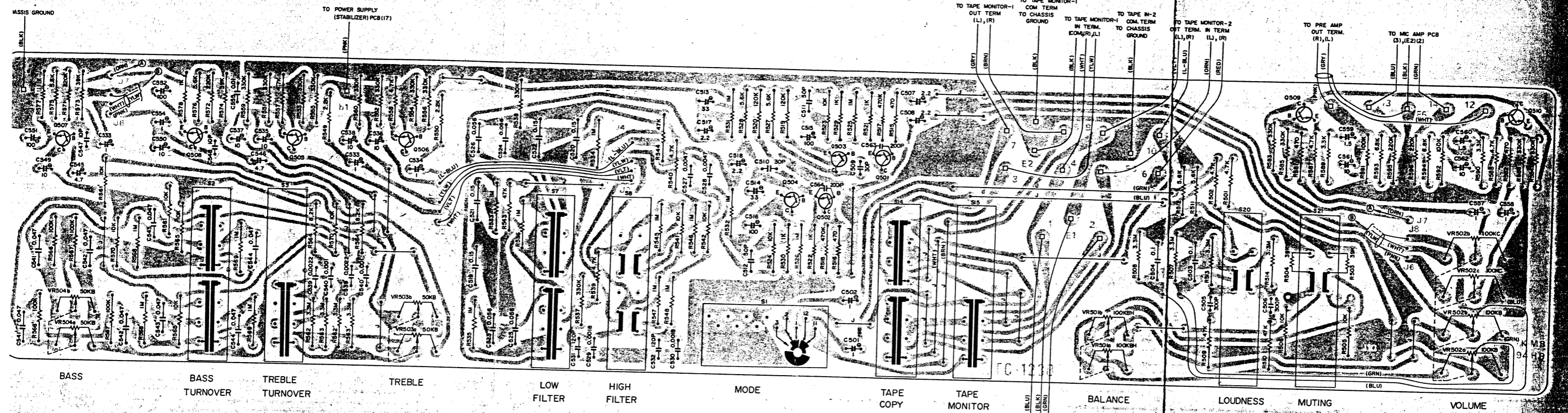




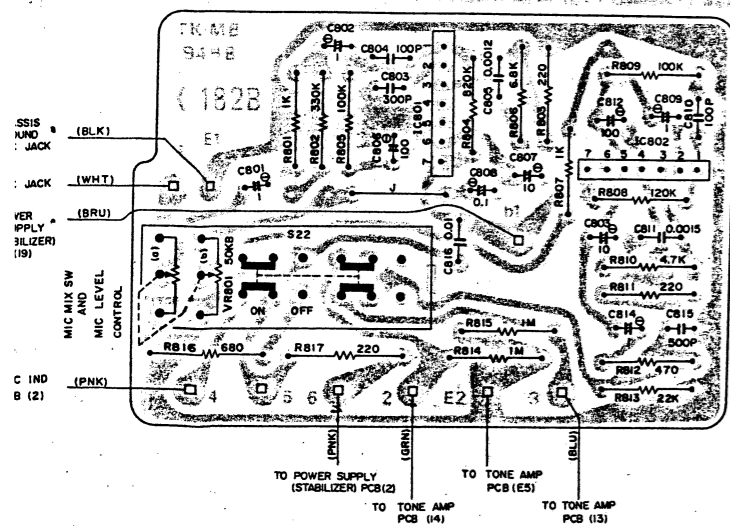




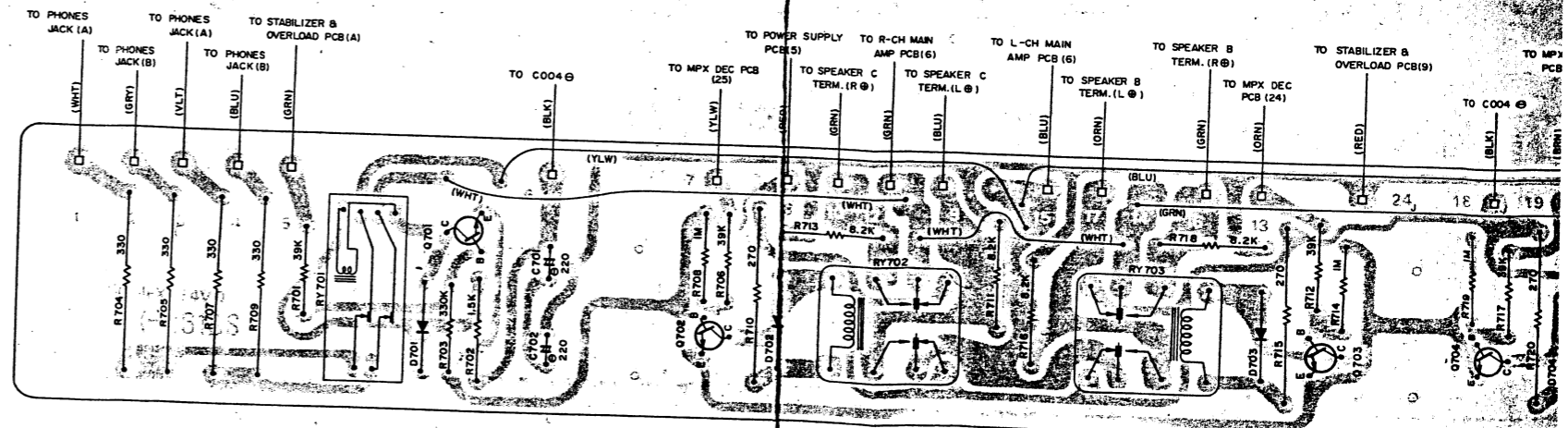
**ONE CONTROL AMP CIRCUIT BOARD DIAGRAM**  
**CHALTBILD DES KLANGREGELVERSTÄRKERS**  
**DIAGRAMME DE PLAQUETTE DE CIRCUIT DE CORRECTEUR DE TONALITE**



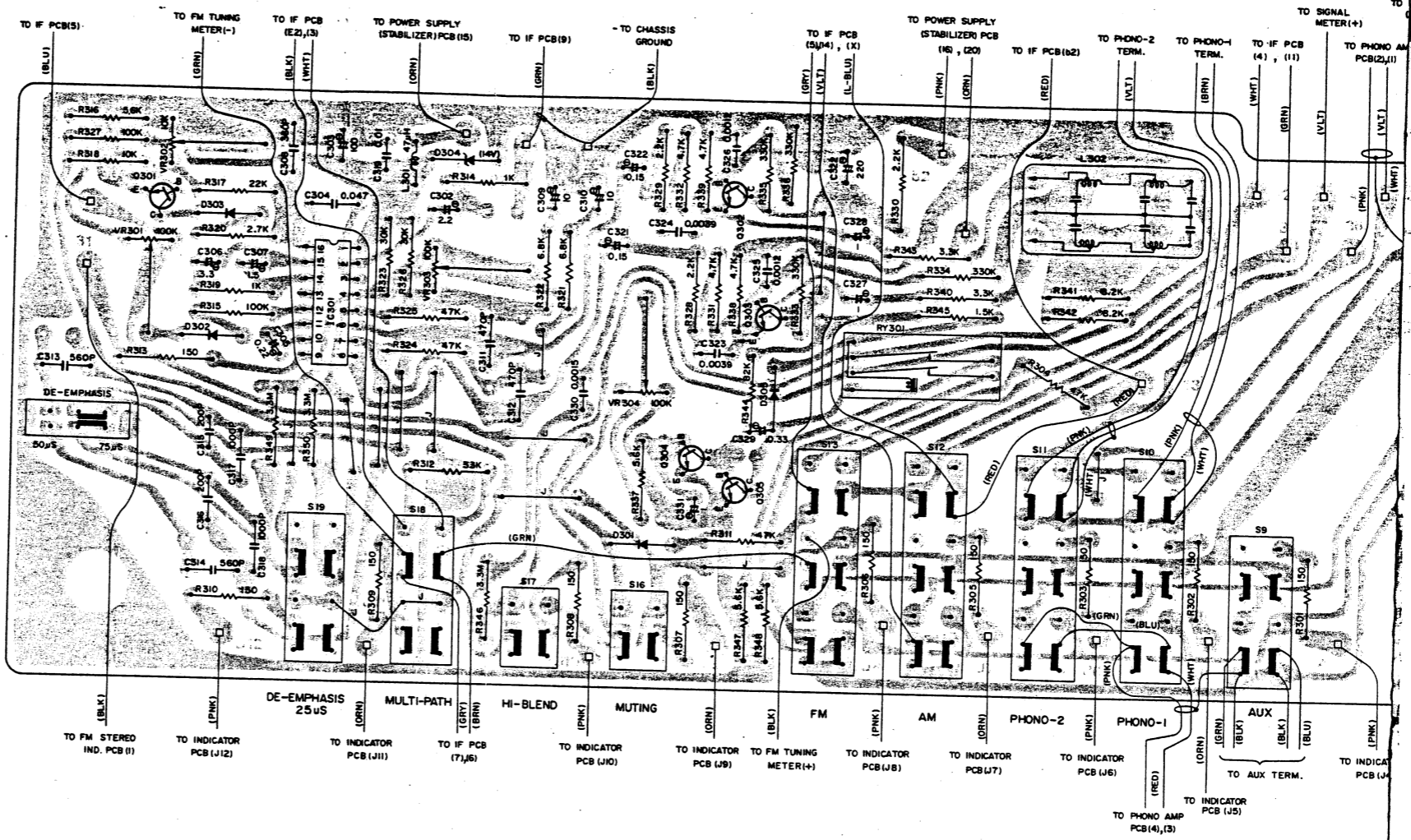
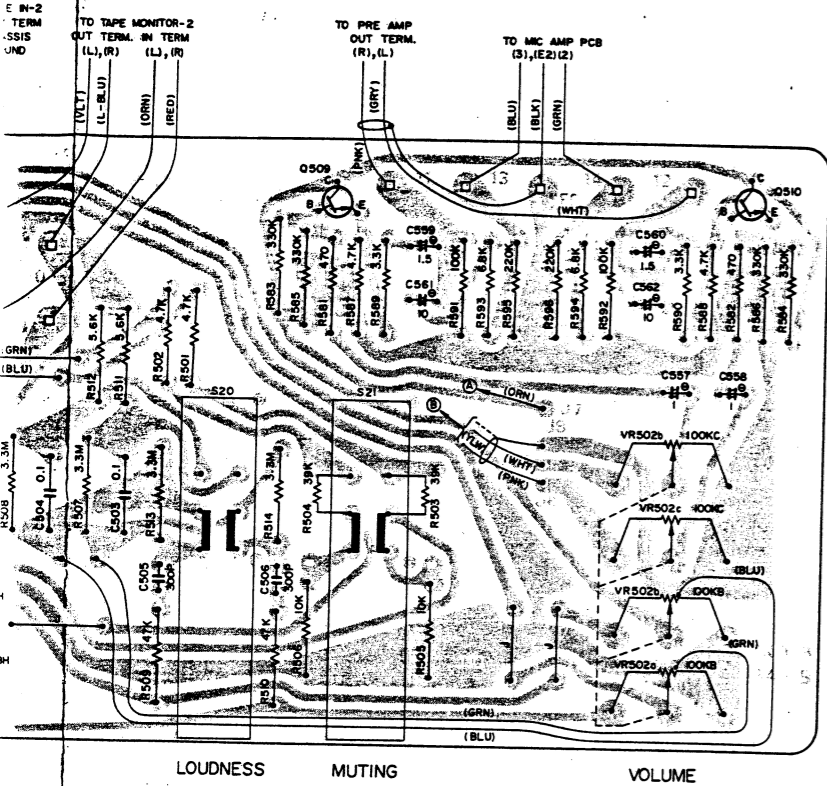
**MIC MIXING AMP CIRCUIT BOARD DIAGRAM**  
**HALTBILD DES MIKROFONMISCHVERSTÄRKERS**  
**DIAGRAMME DE PLAQUETTE DE CIRCUIT D'AMP. DE MIXAGE DE MIC.**



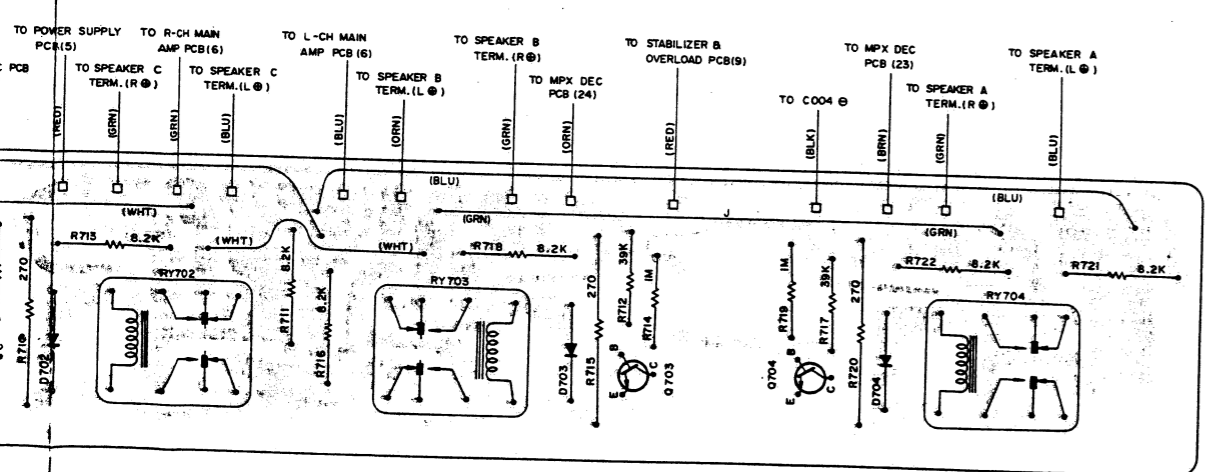
**RELAY CIRCUIT BOARD DIAGRAM**  
**RELAIS-SCHALTBILD**  
**DIAGRAMME DE PLAQUETTE DE CIRCUIT A RELAIS**



FM MULTIFLEX DECODER AND FUNCTION SELECTOR CIRCUIT BOARD DIAGRAM  
 SCHALTBILD DES UKW-MULTIPLEX-DECODERS UND FUNKTIONSWÄHLERS  
 DIAGRAMME DE PLAQUETTE DE CIRCUIT DE DECODEUR MULTIPLEX FM ET  
 DE SELECTEUR DE FONCTION



A RELAIS

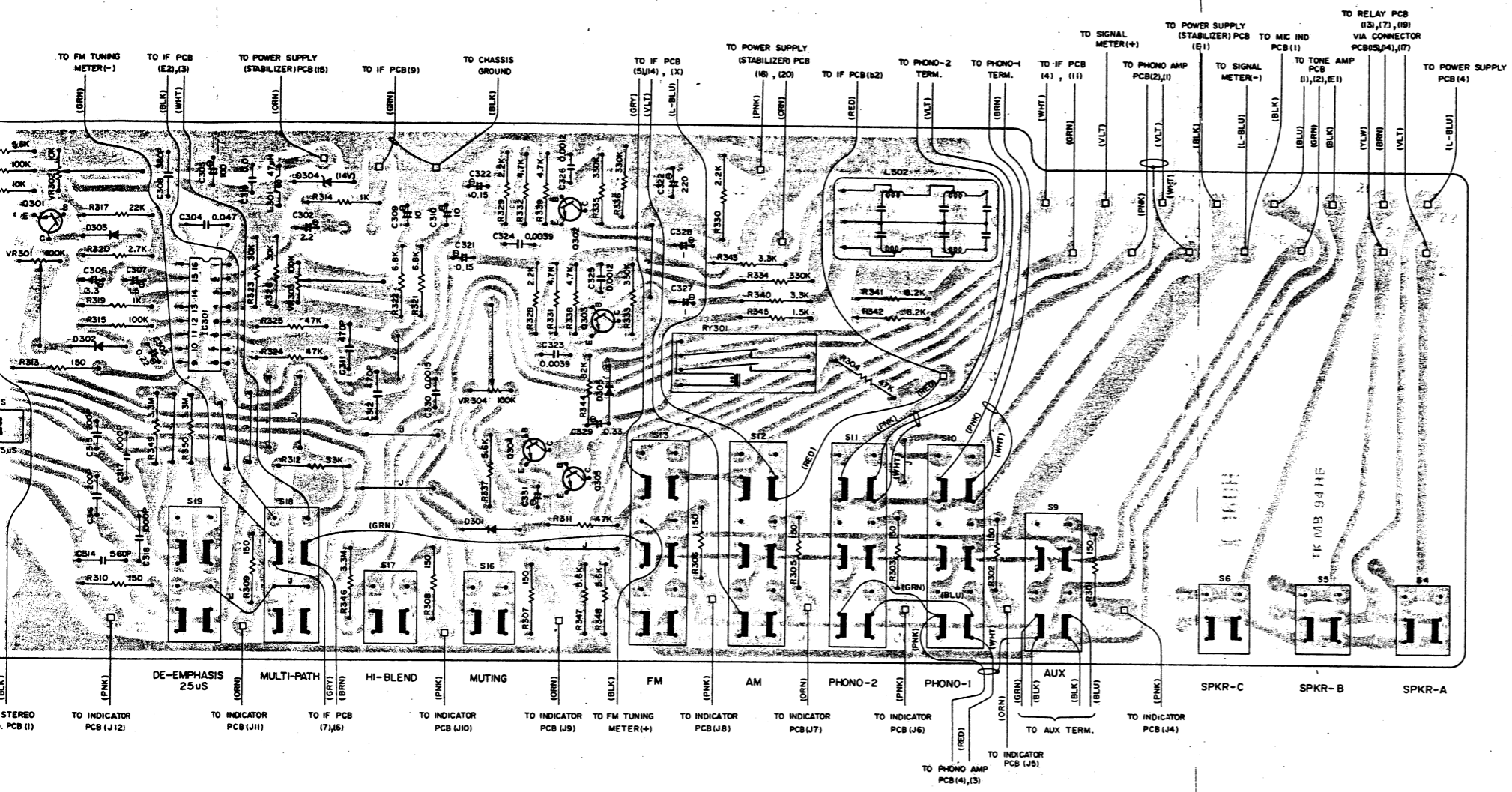


Rotel RX 1603

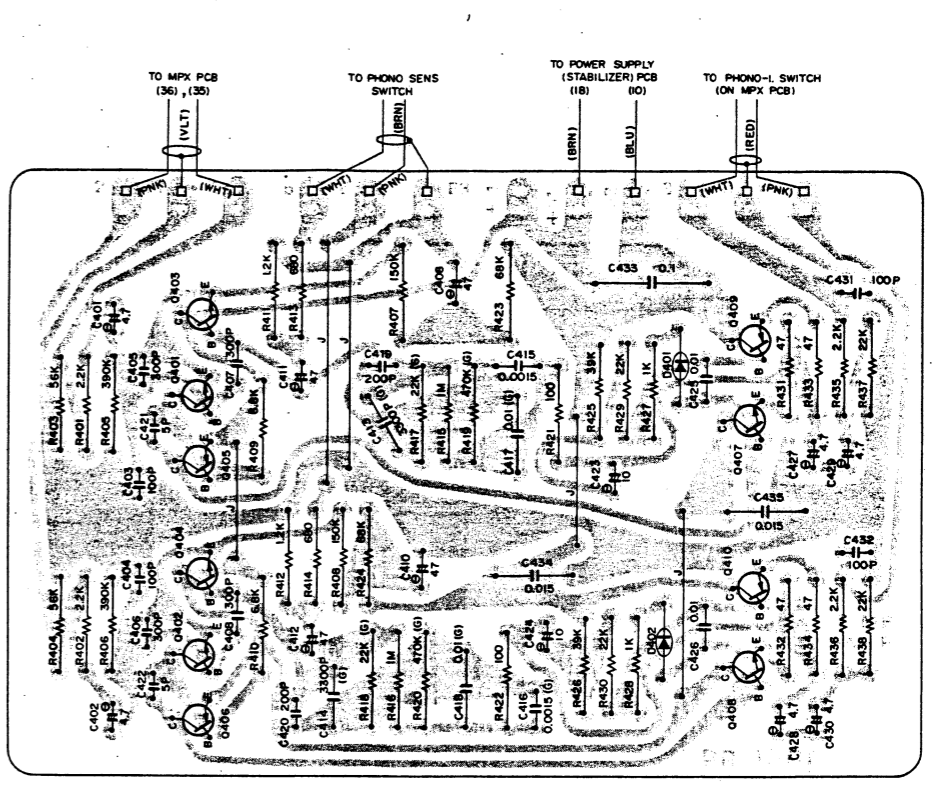
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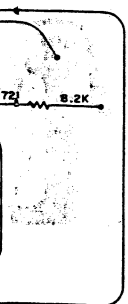
**LTIPLEX DECODER AND FUNCTION SELECTOR CIRCUIT BOARD DIAGRAM**  
**TBILD DES UKW-MULTIPLEX-DECODERS UND FUNKTIONSWÄHLERS**  
**AMME DE PLAQUETTE DE CIRCUIT DE DECODEUR MULTIPLEX FM ET**  
**ELECTEUR DE FONCTION**



**PHONO AMP CIRCUIT BOARD DIAGRAM**  
**SCHALTBILD DES PHONOVERSTÄRKERS**  
**DIAGRAMME DE PLAQUETTE DE CIRCUIT**  
**D'AMP. PHONO**



ER A  
 (L 6)



Rotel RX1603