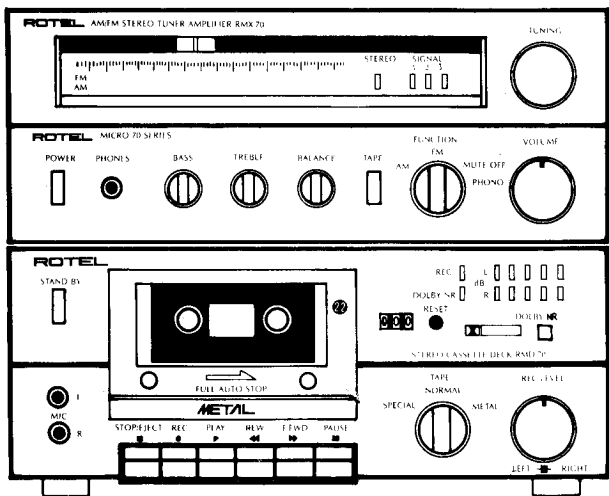


Quality Uncompromised

ROTEL®

Technical Manual



AM/FM STEREO TUNER AMPLIFIER

RMX-70

AM/LW/FM STEREO TUNER AMPLIFIER

RMX-70L

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INHALTSVERZICHMIS

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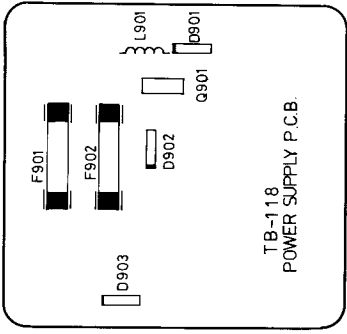
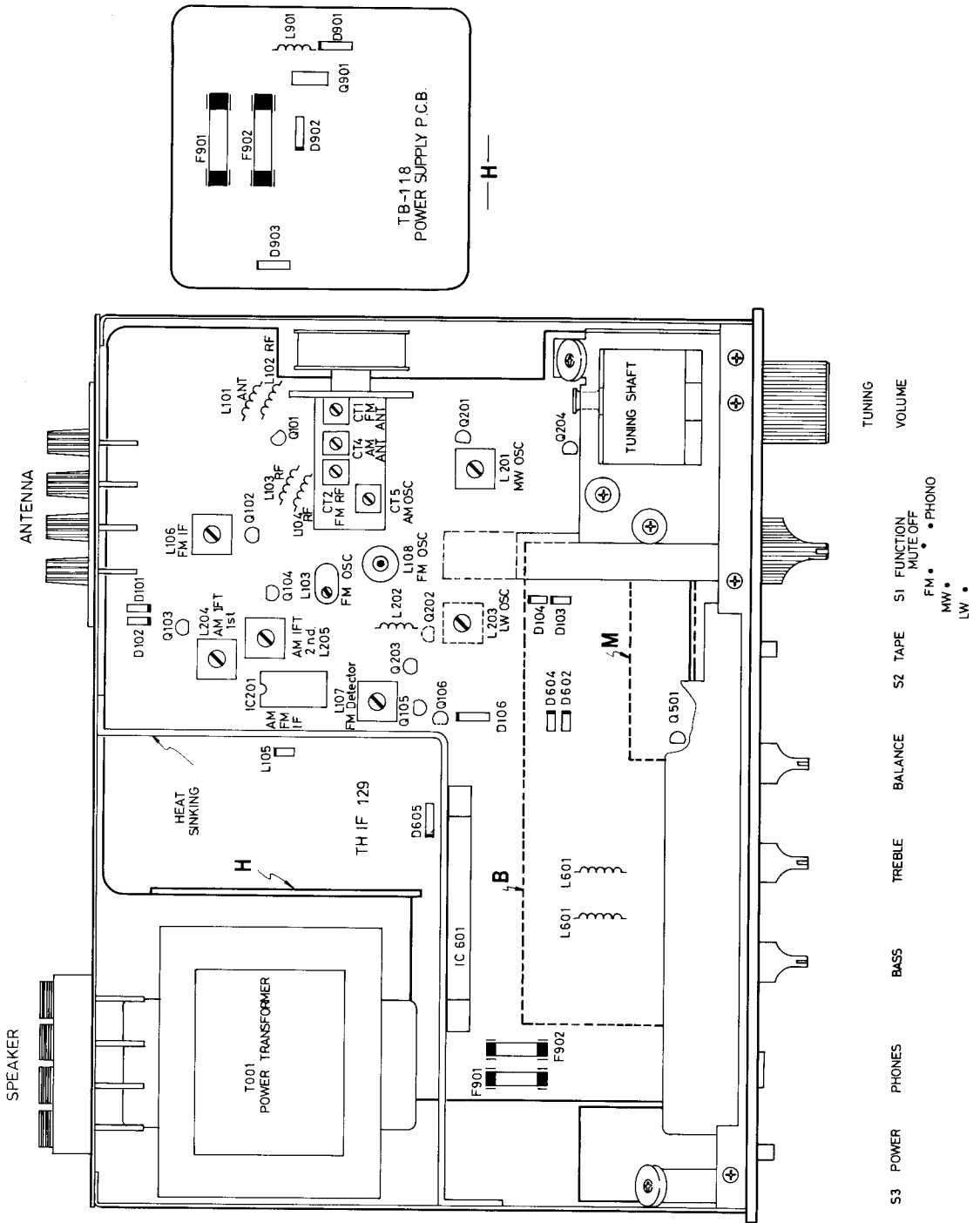
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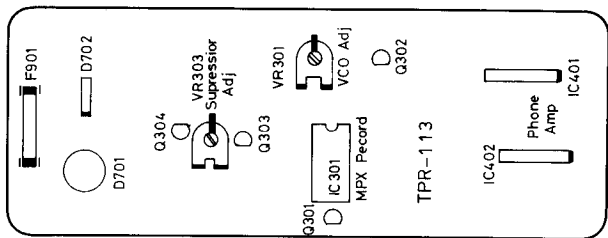
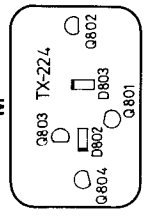
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ROTEL ELECTRONICS CO., LTD.
ROTEL OF AMERICA, INC.
ROTEL HI FI LIMITED.

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 13518 SO. NORMANDIE, GARDENA, CALIF. 90249, U.S.A.
 2-4 ERICA ROAD, STACEY BUSHES, MILTON KEYNES,
 BUCKINGHAMSHIRE, ENGLAND

Chassis Layout/Chassis Anordnung/ Installation de Châssis



- S3 POWER
- PHONES
- BASS
- TREBLE
- BALANCE
- S2 TAPE
- S1 FUNCTION
- MUTE OFF
- PHONO
- MW •
- LW •
- TUNING
- VOLUME



AM IF and RF Alignment/

Instruments: AM Signal Generator (400Hz 30% Modulated), AC VTVM and Oscilloscope.

AM IF Alignment (AM/FM, MW/LW/FM)

Step	Generator		Tuning Dial setting	Adjust	Adjust for
	Coupling	Frequency			
1	Pin No. 3 (on IF board through a 0.01 mfd Capacitor)	455KHz	No interfering at low end of scale	L204 and L205 (on IF Board)	Maximum reading on AC VTVM.

MW RF Alignment (AM/FM, MW/LW/FM)

Step	Generator		Tuning Dial setting	Adjust	Adjust for
	Coupling	Frequency			
1	Test Loop Radiate signal into ferrite loop-stick antenna.	600KHz	600KHz	L201 (OSC) and L001 (ANT) lead line side	Maximum reading on AC VTVM.
2		1400KHz	1400KHz	CT5 (OSC) and CT4 (ANT)	

LW RF Alignment (MW/LW/FM only)

Step	Generator		Tuning Dial setting	Adjust	Adjust for
	Coupling	Frequency			
1	Test Loop Radiate signal into ferrite loop-stick antenna.	160KHz	160KHz	L203 (OSC) and L001 (ANT) against the lead line side	Maximum reading on AC VTVM.
2		330KHz	330KHz	CT7 (OSC) and CT6 (ANT)	

FM IF and RF Alignment

Instruments: FM Signal Generator (400Hz, 100% Modulated), H.D. Analyzer, Oscilloscope, AC VTUM and Tuning Meter.

Step	Generator		Tuning Dial setting	Adjust	Adjust for
	Coupling	Frequency			
1	Antenna terminal	90MHz	90MHz	L109 (OSC)	Maximum reading on AC VTUM.
2		106MHz	106MHz	CT3 (OSC)	
3	Repeat steps 1 and 2 until no further improvement is noticed.				
4	Antenna terminal	90MHz	90MHz	L101, L102, L103 and L104(RF)	Maximum reading on AC VTUM.
5		106MHz	106MHz	CT1 (ANT) and CT2 (RF)	
6		98MHz	98MHz	L106 (OSC)	
7	Repeat steps 4 and 5 until no further improvement is noticed.				
8	Antenna terminal (1mV Input)	98MHz	98MHz	L107 (upper core)	Minimum reading on H.D. Analyzer.

FM MPX Alignment

Instruments: FM Stereo Generator, AC VTVM and Oscilloscope.

Step	Generator		Tuning Dial setting	Adjust	Adjust for
	Coupling	Frequency			
1	Antenna terminal	98MHz Pilot.....10%	98MHz	VR301	Stereo indicator light up.
2		1KHz.....90% Mod.		VR302	best separation
3	Check the stereo indicator can be operated normally when pilot signal is reduce from 10% to 6%.				

MW-ZF und HF-Einstellung

Instrumente: MW-Messender (400Hz 30% moduliert), Wechselstrom-Roehrevoltmeter und Oszillograph.

MW-ZF Einstellung (MW/UKW, MW/LW/UKW)

Schritt	Messender		Abstimmskalens Einstellung	Abgleich	Abgleich auf
	Anschluss	Frequenz			
1	Steckerstift 3 (auf ZF-leite- platte ueber 0.01 MF Kon- densator)	455KHz	Kine Interferenz am unteren ska- lenende	L204 und L205 (auf ZF-Leiterplatte)	Maximalanzeige am Roehrevoltmeter

MW-HF Einstellung (MW/UKW, MW/LW/UKW)

Schritt	Messender		Abstimmskalens Einstellung	Abgleich	Abgleich auf
	Anschluss	Frequenz			
1	Mess-Signal mit Schleife in Fe- rrit antenna einspeisen.	600KHz	600KHz	L201 (OSZ) und L001 (ANT) Lotleine-Seite	Maximalanzeige am Roehrevoltmeter
2		1400KHz	1400KHz	CT5 (OSZ) und CT4 (ANT)	

LW-HF Einstellung (MW/LW/UKW nur)

Schritt	Messender		Abstimmskalens Einstellung	Abgleich	Abgleich auf
	Anschluss	Frequenz			
1	Mess-Signal mit Schleife in Fe- rrit antenna einspeisen	160KHz	160KHz	L203 (OSZ) und L001 (ANT) gegen Lotleine- Seite	Maximalanzeige am Roehrevoltmeter
2		330KHz	330KHz	CT7 (OSZ) und CT6 (ANT)	

UKW-ZF und HF-Einstellung

Instrumente: UKW-Messender (400Hz 100% Moduliert), Klirrfaktormesser, Oszillograph, Wechselstrom-Roehrvoltmeter

-Schritt	Messender		Abstimmskalens Einstellung	Abgleich	Abgleich auf
	Anschluss	Frequenz			
1	Antennenkl- emmen	90MHz	90MHz	L109 (OSZ)	Maximalanzeige am Roehrvoltmeter
2	anschiessen	106MHz	106MHz	CT3 (OSZ)	
3	Schritt 1 und 2 wiederholen, bis kein weitere Verbesserung eintritt.				
4	Antennenkl- emmen ansch- liessen	90MHz	90MHz	L101, L102, L103 and L104 (HF)	Maximalanzeige am Roehrvoltmeter
5		106MHz	106MHz	CT1 (ANT) and CT2 (HF)	
6		98MHz	98MHz	L106 (OSZ)	
7	Schritt 4 und 5 wiederholen, bis kein weitere Verbesserung eintritt.				
8	Antennenkl- emmen ansch- liessen (Antennenkl- emmen ensp- annung 1mV	98MHz	98MHz	L107 (upper core)	Minimalanzeige am Klirrfaktormesser

UKW MPX-Einstellung

Instrumente: UKW-stereo Messender, Roehrvoltmeter und Oszillograph.

Schritt	Messender		Abstimmskalens Einstellung	Abgleich	Abgleich auf
	Anschluss	Frequenz			
1	Antennenkl- emmen	98MHz Pilotton.....10%	98MHz	VR301	Stereoanzeige leuchtet auf.
2	anschiessen	1KHz..... 90% Moduliert.		VR302	beste Trennung
3	Einwandfreier Stereoanzeigebetrieb muss auch noch gewährleistet sein, wenn der Stereopilotton von 10% auf 6% reduziert wird.				

Alignement AM IF et HF

Instruments: Générateur de signal AM (400Hz 30! modulé) AC VTVM et Oscilloscope.

ALIGNEMENT AM IF (AM/FM, MW/LW/FM)

Point	Générateur		Ecran d'accord	Réglage	Réglage pour
	Couplage	Fréquence			
1	Brouche No. 3 (Sur IF plaquette par l'intermédiaire d'un condensateur de 0.01 mfd.	455KHz	Non interférence a l'extrémité de l'échelle	L204 et L205 (Sur la plaquette)	Lecture maximum sur le voltmètre électronique AC VTVM.

Alignement MW RF (AM/FM, MW/LW/FM)

Point	Générateur		Ecran d'accord	Réglage	Réglage pour
	Couplage	Fréquence			
1	Boucle de mesure Envoyée le signal sur ferrite à boucle	600KHz	600KHz	L201 (OSC) et L001 (ANT) Côté de ligne de connexion	Lecture maximum sur AC VTVM.
2		1400KHz	1400KHz	CT5 (OSC) et CT4 (ANT)	

Alignement LW RF (MW/LW/FM senlement)

Point	Générateur		Ecran d'accord	Réglage	Réglage pour
	Couplage	Fréquence			
1	Boucle de mesure Envoyée le signal sur ferrite à boucle	160KHz	160KHz	L203 (OSC) et L001 (ANT) contre le côté de ligne de connexion	Lecture maximum sur AC VTVM.
2		330KHz	330KHz	CT7 (OSC) et CT6 (ANT)	

Alignement FM IF et HF

Instruments: (400Hz, 100% modulé) Analyseur H.D., Oscilloscope, AC VTVM et Compteur de syntonisation.

Point	Générateur		Ecran d'accord	Réglage	Réglage pour
	Couplage	Fréquence			
1	Borne d'antenne	90MHz	90MHz	L109 (OSC)	Lecture maximum sur AC VTVA
2		106MHz	106MHz	CT3 (OSC)	
3	Répéter les points 1 et 2 jusqu'à ce que le perfectionnement est marqué.				
4	Borne d'antenne	90MHz	90MHz	L101, L102, L103 et L104 (RF)	Lecture maximum sur AC VTVM.
5		106MHz	106MHz	CT1 (ANT) et CT2 (RF)	
6		98MHz	98MHz	L106 (OSC)	
7	Répéter les points 4 et 5 jusqu'à ce que le perfectionnement est marqué				
8	Borne d'antenne (1mV absorbée)	98MHz	98MHz	L107 (Nogan bas)	Lecture maximum sur AC VTVM.

Alignement FM MPX

Instruments: FM stéréo Générateur, AC VTVM et Oscilloscope.

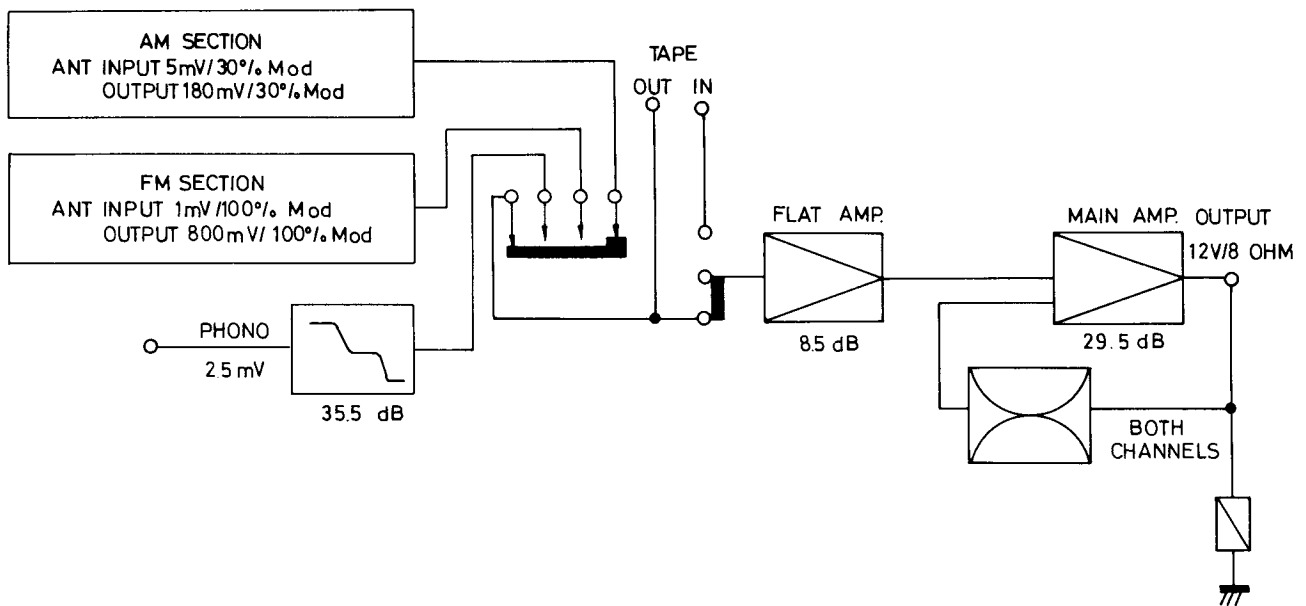
Point	Générateur		Ecran d'accord	Réglage	Réglage pour
	Couplage	Fréquence			
1	Borne d'antenne	98MHz lampe témoin 10% 1 KHz 90! Mod.	98MHz	VR301	Indicateur stéréo allume
2				VR302	Séparation la plus meilleure
3	Examiner l'indicateur stéréo peut être opéré normalement lorsque le signal de lampe témoin est réduite de 10% à 6%				

Repair Parts List/Reparaturteilliste/ Liste des pièces de rechange

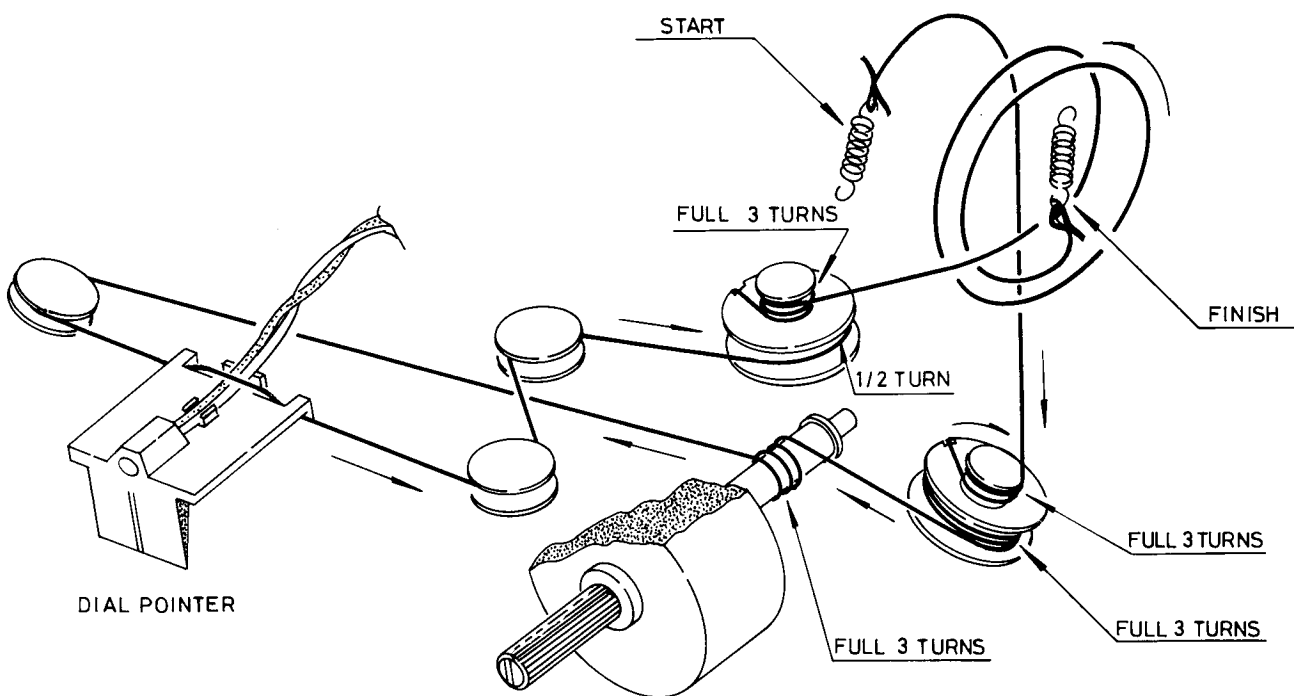
Schematic Location	Parts No.	Description
TRANSISTORS, DIODES AND IC'S		
Q101	302001112	2SK49 (F,H), FM RF Amp.
Q102,104	301201163	2SC1674 (K,L), FM MIX OSC.
Q103	301201117	2SC829 (C), FM IF Amp.
Q105,106	301001145	2SA921 (S,T), FM Muting.
Q201	301201117	2SC829 (C), MW OSC.
Q202	301201117	2SC829 (C), LW OSC (LW/MW/FM Only)
Q203	301201115	2SC828 (R,S), Audio Amp.
Q204	301901134	LC1675, For Switching
Q301,302	301201115	2SC828 (R,S), For Switching, VCO, Stop Control.
Q303,304	301201134	2SC1327 (S,T), Audio Amp.
	301301134	2SC1571, Audio Amp.
Q501,502	301201134	2SC1327 (S,T), Flat Amp.
Q801-804	301201115	2SC828 (R,S), Signal Driver.
Q901	301201169	2SC1826 (O,Y), Stabilizer.
D101,102	300111008	1K188, FM AGC Detector, POP Provention.
D103,104	300111008	1K188, Rectifier.
D105	300919026	IN4003, POP Provention.
D106	300111088	IN4148, POP Provention.
D601-604	300111088	IN4148, POP Provention.
D701	300919011	W-02, Rectifier.
D702	300919026	IN4003, Rectifier.
D801,802	300111008	1K188, Rectifier.
D901	300313017	WZ-162, Zener Regulator, 16V ½W.
D902,903	300919028	IN5404, Rectifier.
D904	300919027	KBP-02, Rectifier.
D1001-1004	300414042	LN224RP, Signal Ind.
IC101	303452278	HA12413, AM/FM, IF Amp.
IC301	303452277	LA3361, MPX Recorder.
IC401	303452154	TA7136, Phono Amp.
IC601	303452280	STK460, Power Amp.

Schematic Location	Parts No.	Description
COILS AND VARIABLE RESISTORS		
L001	222391155	AM ANT Coil (AM/FM).
	222391165	MW/LW ANT Coil (MW/FM).
L101	226501131	FM ANT Coil.
L102-104	226501132	FM RF Coi..
L105	226501143	2.2uH, FM IF Trap Coi.
L106	225501142	FM IFT.
L107	225501149	FM Moving Phase.
L109	226501161	FM OSC Coil.
L201	223301127	MW OSC.
L202	226501142	2.2MH, LW Filter (MW/LW FM Only).
L203	223301129	LW OSC (MW/LW/FM Only).
L204	225301131	AM IFT 1st.
L205	225351145	AM IFT 2nd
VR301,302	510502195	10KB, MPX/VCO Adj.
VR501	525121131	250KW, Balance Control.
VR502	525121154	100KBx2, Volume Control.
VR503	525101173	100KCx2, Treble Control.
VR504	525101173	100KCx2, Bass Control.
SWITCHES AND OTHERS		
S1	601011353	Switch, Function Selector (AM/FM)
	601011354	Switch, Function Selector (MW/LW/FM).
S2	614010171	Switch, Push 1-Key, Tape.
S3	614010168	Switch, Power Supply.
	614010165	Switch, Power Supply, (For RUK).
T001	207001533	Transtormer, Power Supply.
F701	341221100	Fuse, 1A, DC Supply Protector (Long Size)
	345222100	Fuse, 1A, DC Supply Protector (Mini Size)
	345252100	Fuse, 1A, DC Supply Protector (Mini With "S'D" Mark)
F901,902	341221400	Fuse, 4A, AC Circuit Protector (Long Size)
	345222400	Fuse, 4A, AC Circuit Protector (Mini Size)
	345252400	Fuse, 4A, AC Circuit Protector (Mini Size)

Gain Diagram/Verstärkungsdiagramm/ Diagramme de gain



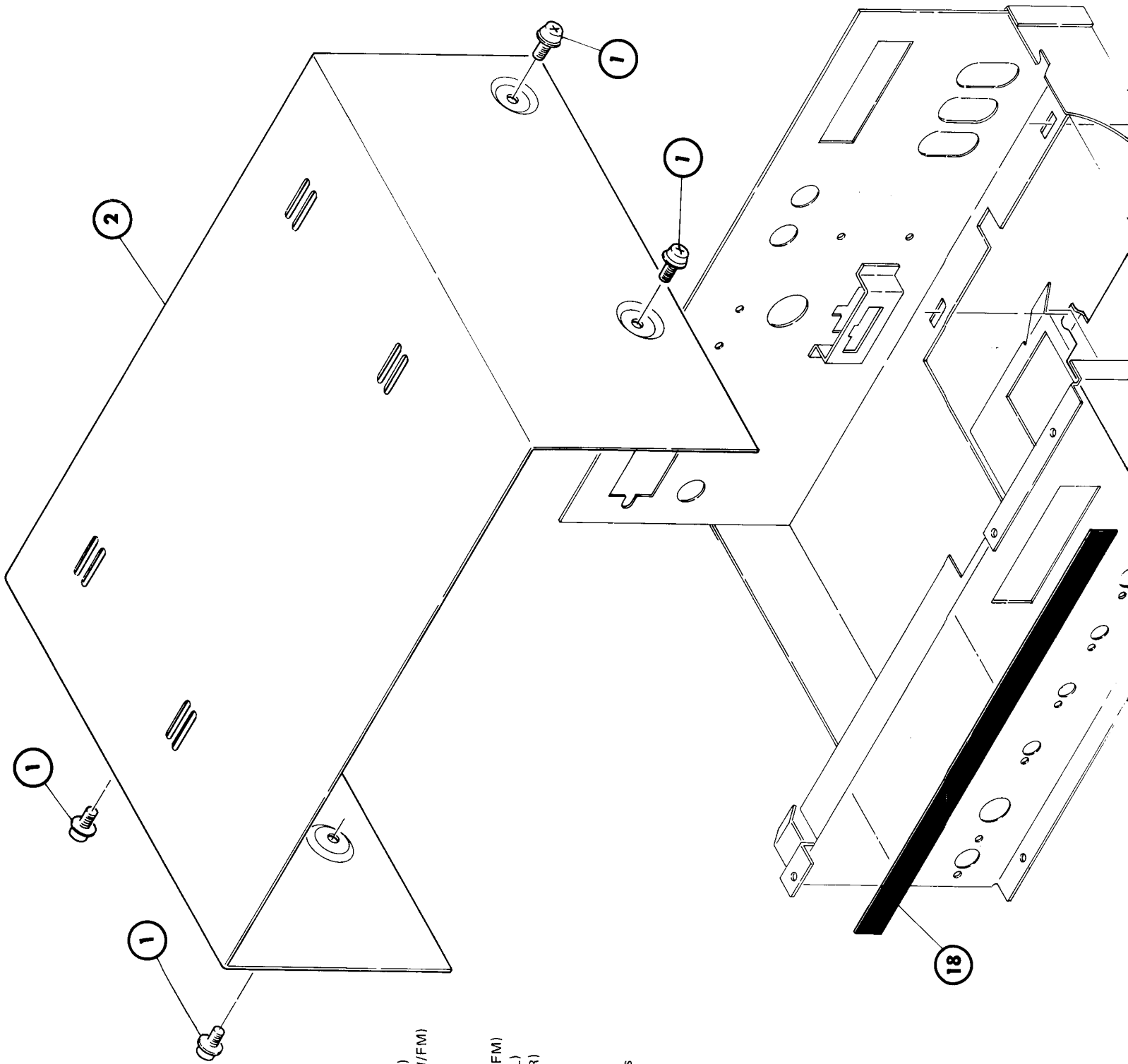
Dial Stringing Diagram Skalenantriebsschema Diagramme des câble d'entraînement



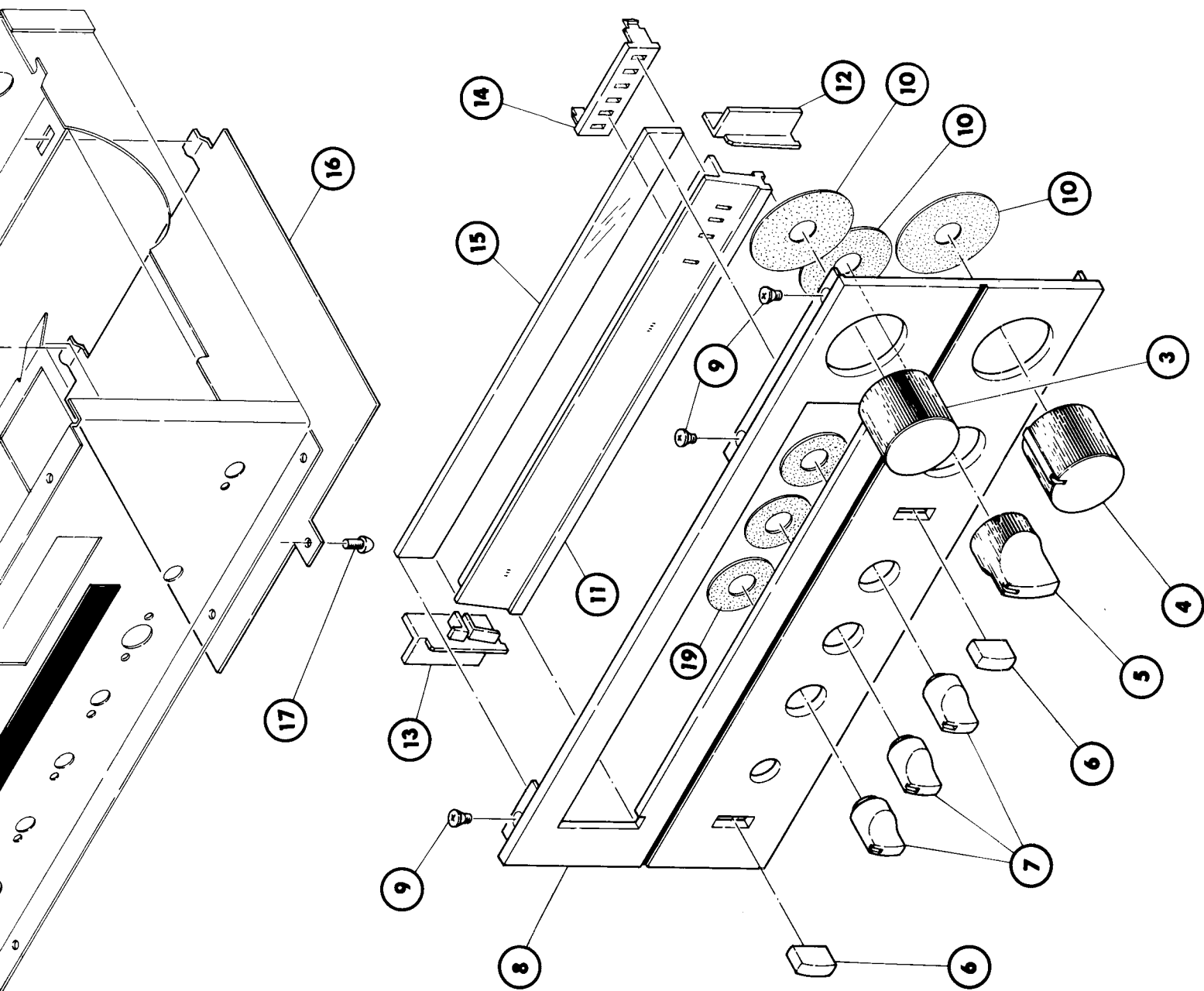
Note: Carry out stringing with the front end set at VC maximum.

Zur Beachtung: Antriebsseil mit dem Drehko der Eingangsstufe in Maximumstellung verlegen.

Note: Effectuer le câblage avec le condensateur réglable de l'entrée réglé au maximum.



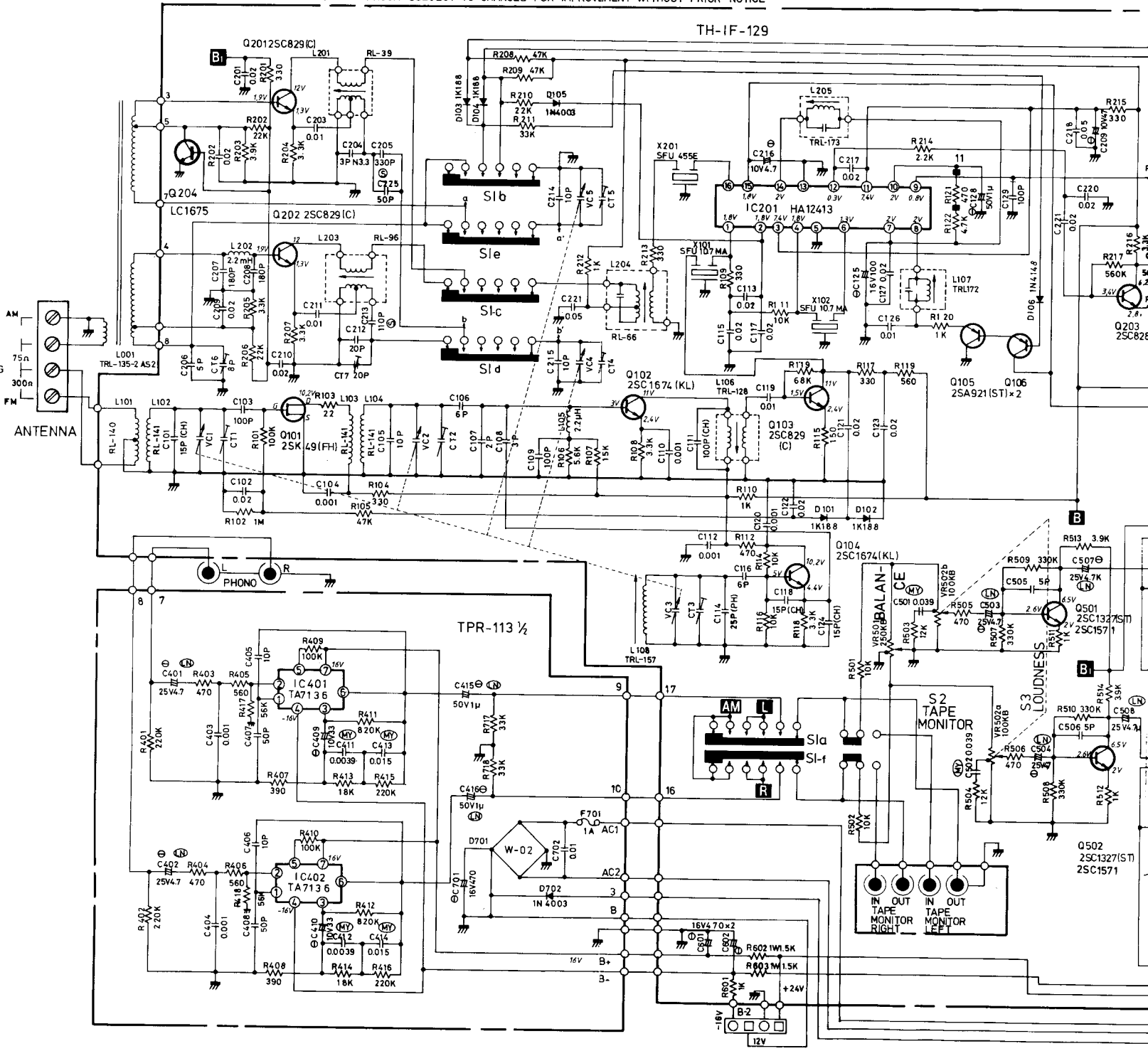
Key No.	Parts No.	Description
1.	766223006	Screw, MV 3x6 BK
2.	138011329	Upper Cover
3.	116310335	Knob, 20φ
4.	116310347	Knob, 25φ
5.	116310346	Knob, 25φ
6.	116210073	Push Button
7.	116210304	Knob
8.	111911578	Front Panel (AM/FM)
9.	111911579	Front Panel (MW/LW/FM)
10.	701203006	Screw, MF 3x6 Ni
11.	990201330	Felt, 39φ
12.	112011398	Dial Board (AM/FM)
13.	112011399	Dial Board (MW/LW/FM)
14.	114902358	Holder, Dial Board (L)
15.	114902359	Holder, Dial Board (R)
16.	114902322	LED Holder
17.	114902379	Dial Window
18.	120013058	Bottom Cover
19.	726203006	Screw, TPV 3x6 Ni
20.	880001283	Sticker, Front Chassis
21.	990201328	Felt, 18φ



Schematic Diagram / Schaltungsschema / Diagramme schém

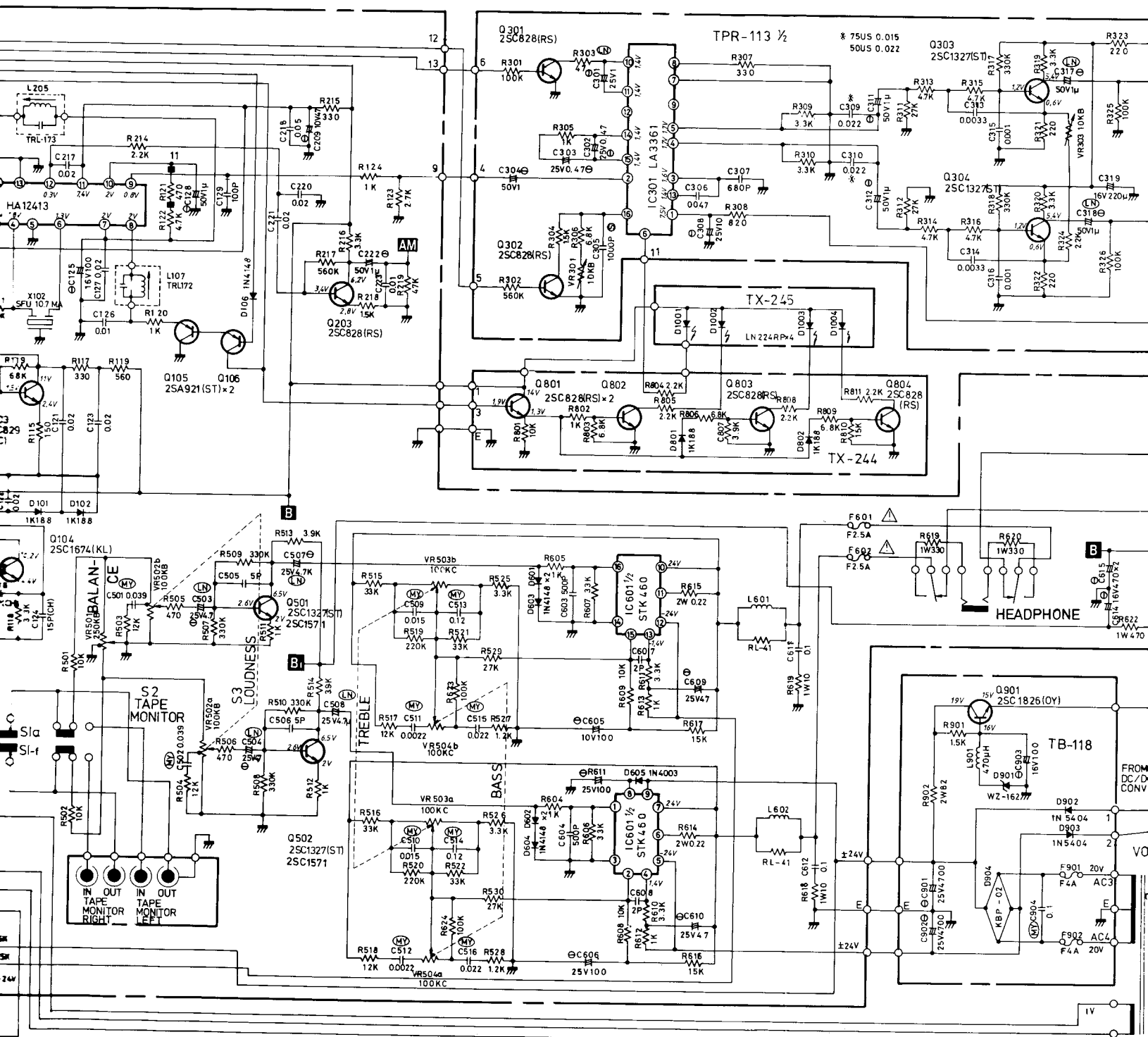
NOTE: PARTS AND CIRCUIT SUBJECT TO CHANGES FOR IMPROVEMENT WITHOUT PRIOR NOTICE

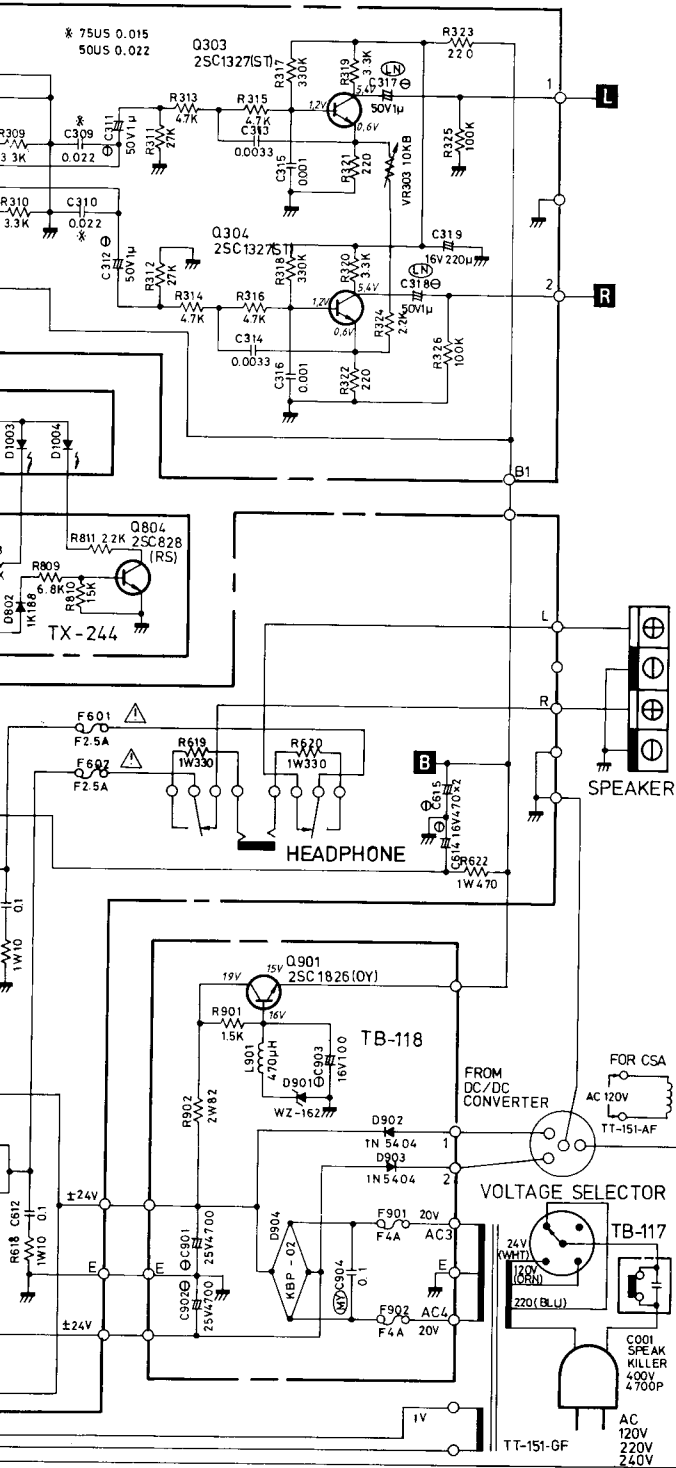
TH-IF-129



TO RMD-70

Diagramme schématique





THIS SCHEMATIC DIAGRAM IS AVAILABLE FOR THE UNIT THAT COMBINES LW/MW/FM. WHEN THE UNIT ONLY COMBINES AM/FM, THERE ARE SOME MODIFICATIONS AS FOLLOWING:

1. CHANGE ANTENNA COIL L001 FROM TRL-135-2 AS1 TO RL-72B-1 AS1
2. CHANGE FUNCTION SWITCH FROM 5 POSITION TYPE TO 4 POSITIONS TYPE
3. CANCEL C212, C213, C7, C207, C208, C76, C211, R207, L202, L203, Q202, WIRE Jd.
4. ADD Q204, C202, R203, WIRE Ja, Jb, Jc.



SIDE VIEW 25C 1826



BOTTOM VIEW 25K 49



25C1327
25C1674
25C 828
25C 829
25A 921
BOTTOM VIEW

RESISTOR

- 5%--TOLERANCE UNLESS OTHERWISE NOTED
- K---KILO OHM
- M---MEGA OHM
- COMPOSTION RESISTORS 1/2 WATT
- RSU--METAL OXIDE FILM RESISTORS
- NON--MARK LOW NOISE TYPE CARBON RESISTORS

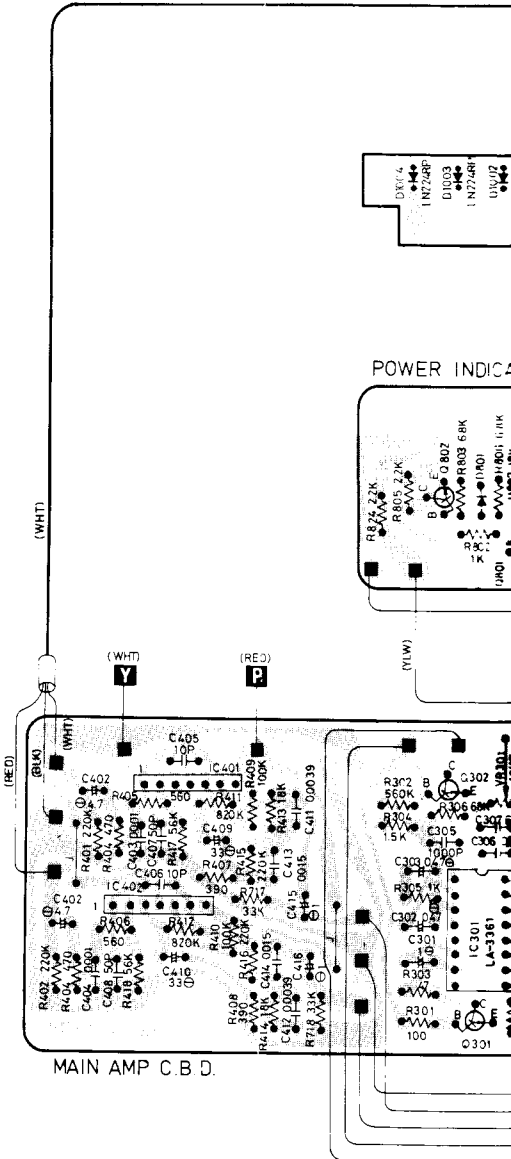
CAPACITORS

- ⊕---LOW NOISE ELECTROLYTIC
- ⊙---MYLAR FILM CAPACITORS
- ⊖---POLYSTYRENE FILM CAPACITORS
- ⊖---ELECTROLYTIC CAPACITORS
- NON MARK CERAMIC CAPACITORS
- UNLESS OTHERWISE NOTED IN SCHEMATIC ALL CAPACITANCE VALUES ARE EXPRESSED IN MFD

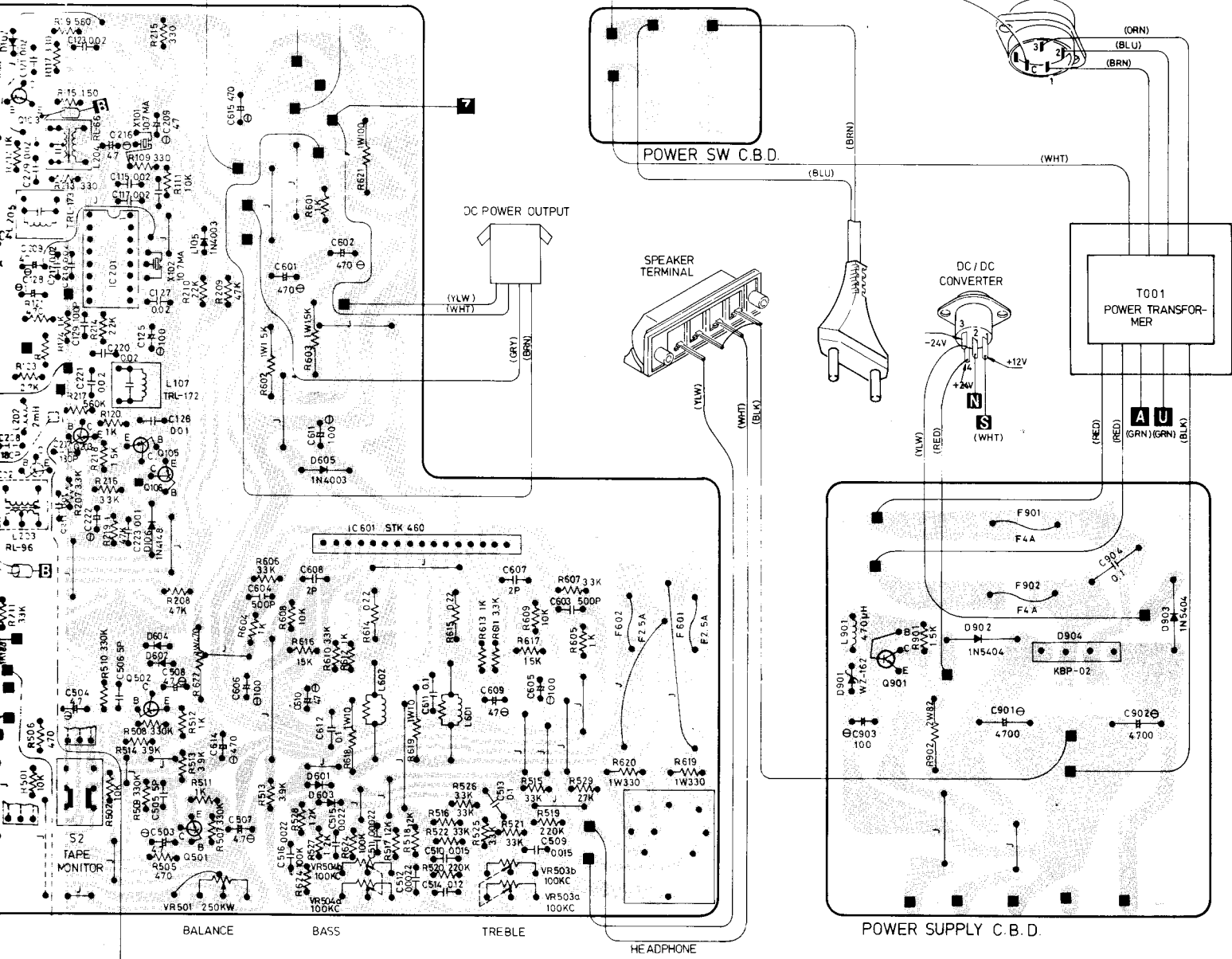
THIS SCHEMATIC DIAGRAM IS AVAILABLE COMBINATION OF MW/LW/FM ONLY WHEN UNITS COMBINE JUST AM /FM ONLY THERE WERE MADE SOME MODIFICATION AS FOLLOW:

- 1 CHANGED ANTENNA COIL L001 FROM TRL 135 2AS2 TO RL 72
 - 2 SHORTED a AND a' b AND b'
 - 3 CANCELLED RESISTORS R205 206 AND 207
- CAPACITORS C206 207 208 209 211 212 AND 213
COILS L202 AND 203 TRANSISTOR Q202
TRIMMER CT6 AND CT7

ITEM	SCHEMATIC LOCATION (LOST)	
FM SECTION	R124	C129
AM SECTION	R219	C223
MPX SECTION	R326	C319
PHONO SECTION	R419	C417
STONE SECTION	R530	C516
POWER AMP	R622	C615
POWER SUPPLY		C702
SIGNAL INDICATOR DRIVER	R811	
POWER SUPPLY	R902	C903
CHASSIS		C001



P N Y



BALANCE

BASS

TREBLE

HEADPHONE

POWER SUPPLY C.B.D.

DC POWER OUTPUT

POWER SW C.B.D.

SPEAKER TERMINAL

DC/DC CONVERTER

T001 POWER TRANSFORMER

VOLTAGE SELECTOR