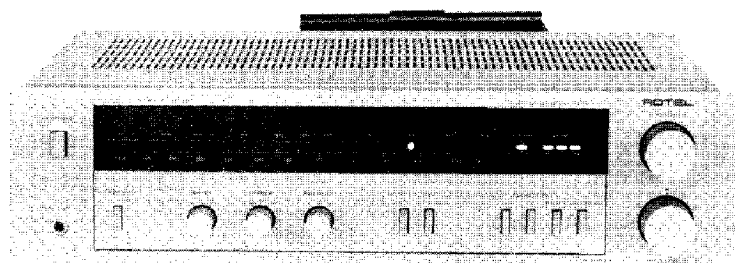


Quality Uncompromised

ROTEL®

Technical Manual



AM/FM STEREO RECEIVER

RX-820

MW/LW/FM STEREO RECEIVER

RX-820L

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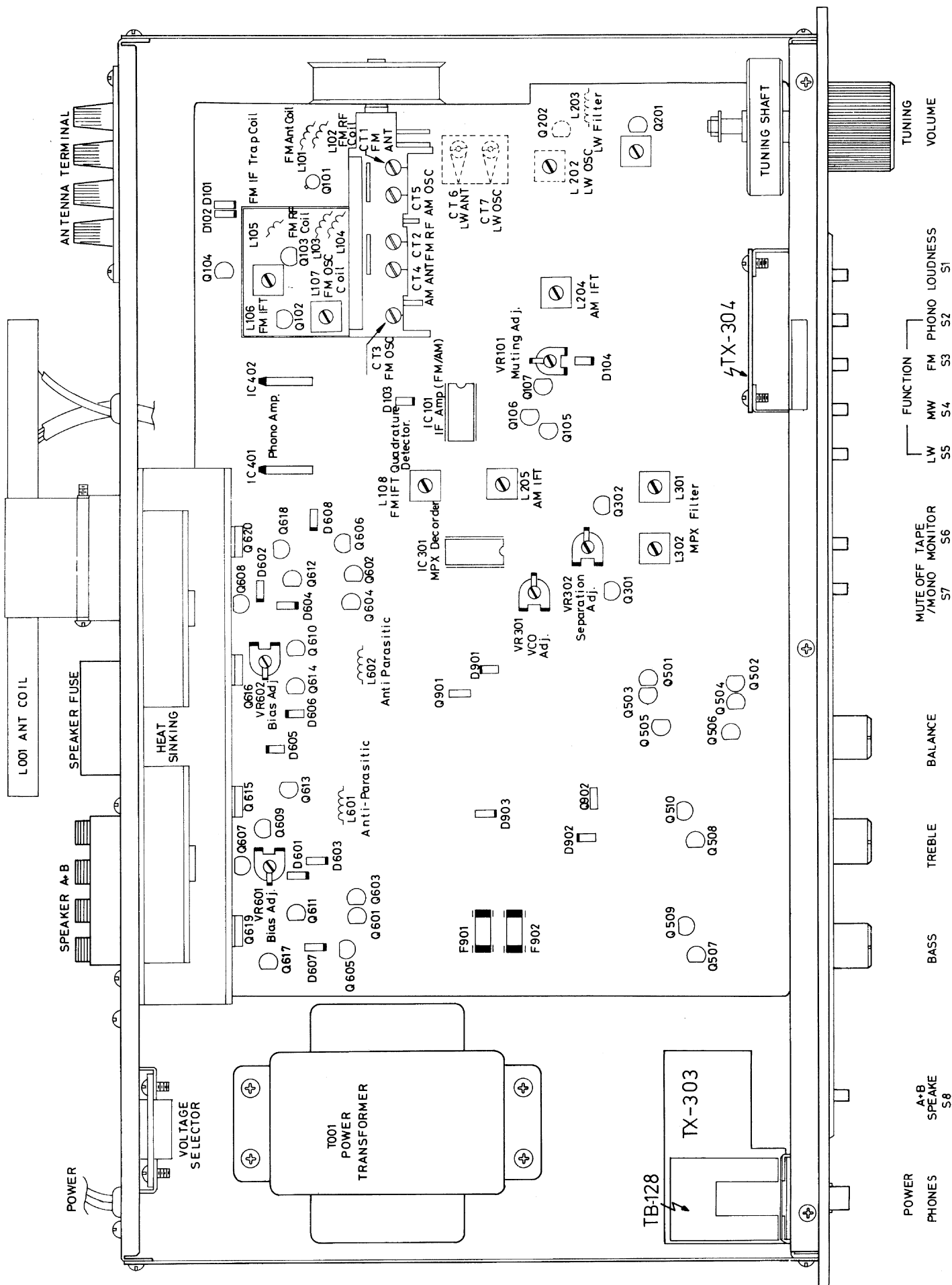
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Chassis Layout / Chassis-Anordnung / Installation de Chassis



AM IF and RF Alignment / Signal Indicator Calibration

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

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

Step	Generator		Tuning Dial setting	Adjust	Adjust for
	Coupling	Frequency			
1	Pin No. 6 (on IF board through a 0.01 mfd Capacitor)	455KHz	No interfering at low end of scale	L204, 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 FR 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	L202 (OSC) and L001 (ANT) against the lead line side	Maximum reading on AC VTVM.
2		330KHz	330KHz	CT7 (OSC) and CT6 (ANT)	

Power Amplifier Bias Adjustment

instruments: DC milli-voltmeter

Notes: Prior to Bias Adjustment, run about 5 minutes with rated output (8 ohm) and warm up Power Transistor and Heat Sink.
Set Volume Control to Minimum.

Step	Coupling		Adjust	Adjust for
	Plus Lead	Minus Lead		
1	TP3	TP1	VR601	DC milli-voltmeter reads 4.4mV.
2	TP4	TP2	VR602	

FM IF and RF Alignment / Tuning and Signal Indicator Calibration

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	L107 (OSC)	Maximum reading on AC VTUM.
2		106MHz	106MHz	CT3 (OSC)	
3	Repeat steps 1 and 2 unit 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 (FR)	
6		98MHz	98MHz	L106 (OSC)	
7	Repeat steps 4 and 5 unit no further improvement is noticed.				
8	Antenna terminal (1mV Input)	98MHz	98MHz	L108	Minimum reading on H.D. Analyzer.
9			No interfering	L108	

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% 1KHz..... 90% Mod.	98MHz	VR301	Stereo indicator light up.
2				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 / MW-Signalstärkeanzeige-Eichung

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

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

Schritt	Messender		Abstimmskalen Einstellung	Abgleich	Abgleich auf
	Anschluss	Frequenz			
1	Steckerstift 6 (auf ZF-Leiterplatte über 0.01 MF Kondensator)	455KHz	Kine Interferenz am unteren skalenende	L204, L205 (auf ZF-Leiterplatte)	Maximalanzeige am Röhrenvoltmeter

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

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

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

Schritt	Messender		Abstimmskalen Einstellung	Abgleich	Abgleich auf
	Anschluss	Frequenz			
1	Mess-Signal mit Schleife in Ferrit antenna einspeisen	160KHz	160KHz	L202 (OSZ) und L001 (ANT) gegen Lotleine-Seite	Maximalanzeige am Röhrenvoltmeter
2		330KHz	330KHz	CT7 (OSZ) und CT6 (ANT)	

Endverstärker-Vorspannung-Einstellung

Instrumente: DC-Gleichstrom-millivoltmeter

Anmerkung: Vor Einstellung der Vorspannung ist das Gerät etwa 5 Minuten mit Nennleistung unter 8 Ohm Belastung zu betreiben, um die Leistungstransistoren und Kühlbleche warm werden zu lassen.
Lautstärkeregelung Volumenkontrolle auf Minimum stellen.

Schritt	Anschluss		Abgleich	Abgleich auf
	Prüfstift	Minuspol		
1	TP3	TP1	VR601	DC-Gleichstrom-millivoltmeter auf 4,4mV einstellen.
2	TP4	TP2	VR602	

UKW-ZF und HF-Einstellung / Signalstärkeanzeige-Eichung

Instrumente: UKW-Messenger (400Hz 100% Moduliert), Klirrfaktormesser, Oszillograph, Wechselstrom-Roehrevoltmeter

Schritt	Messender		Abstimmungsskalen Einstellung	Abgleich	Abgleich auf
	Anschluss	Frequenz			
1	Antennenkl- emmen	90MHz	90MHz	L107 (OSZ)	Maximalanzeige am Roehrevoltmeter
2		anschiessen	106MHz	106MHz	
3	Schritt 1 und 2 wiederholen, bis kein weitere Verbesserung eintritt.				
4	Antennekl- emmen ansch- liessen	90MHz	90MHz	L101, L102, L103 and L104 (HF)	Maximalanzeige am Roehrevoltmeter
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	98MHz	98MHz	L108	Minimalanzeige am Klirrfaktormesser
9	(Antennenkl- emmen ens- pannung 1mV		KEINE Inter- ferenz	L108	

UKW MPX-Einstellung

Instrumente: UKW-stereo Messenger, Roehrevoltmeter und Oszillograph

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

Alignement AM IF et HF / Indicateur de niveau de signal

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. 6 (Sur IF plaque- tte par l'inter- médiaire d'un condensateur de 0.01 mfd.	455KHz	Non interférence à l'extrémité de l'échelle	L204, L205 (sur la pla- quette IF)	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 seulement)

Point	Générateur		Ecran d'accord	Réglage	Réglage pour
	Couplage	Fréquence			
1	Boucle de mesure Envoyée le signal sur ferrite à boucle	160KHz	160KHz	L202 (OSC) et L001 (ANT) contre le côté de ligne de connex- ion	Lecture maximum sur AC VTVM.
2		330KHz	330KHz	CT7 (OSC) et CT6 (ANT)	

Reglage de la polarisation de l'amplificateur de puissance

Instrument: DCmilli-voltmètre

Note: Avant le réglage de la polarisation, passer à peu près 5 minutes avec une proportion de la sortie du courant (8 ohm) et réchauffer le transistor de puissance et le snk.

Mettre le contrôle de l'étendue au minimum.

Point	Couplage		Réglage	Réglage pour
	Positif	Moins		
1	TP3	TP1	VR601	DC-millivoltmeter lit 4.4mV.
2	TP4	TP2	VR602	

Alignement FM IF et HF /

Indicateur de force du signal

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	L107 (OSC)	Lecture maximum sur AC VTVA
2		106MHz	106MHz	CT3 (OSC)	
3	Répéter les points 1 et 2 jusqu'aucun 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'aucun perfectionnement est marqui				
8	Brone d'antenne (1mV absorbée)	98MHz	98MHz	L108	Lecture maximum sur AC VTVM.
9			non interférence	L108	

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	Eraminer l'indicateur stéréo peut être opéré normalement lorsque le signal de lampe témoin est véduite de 10% à 6%				

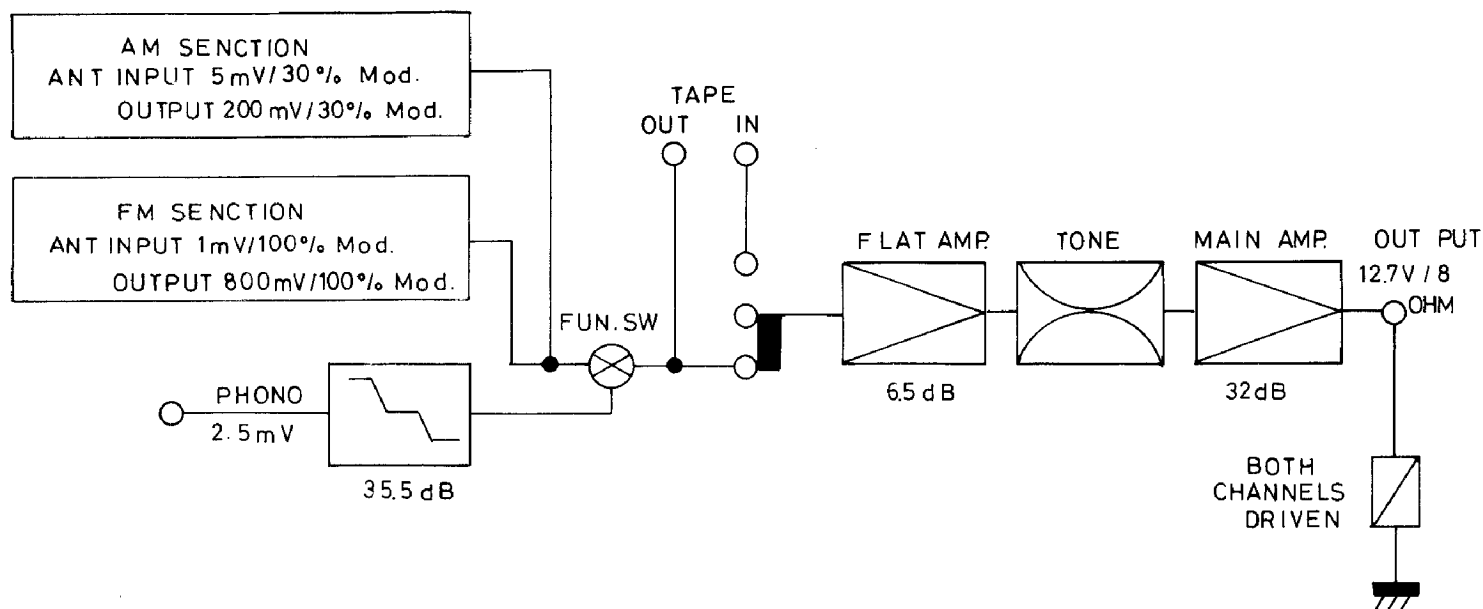
Repair Parts List/Reparaturteilliste/ Liste des pièces de rechange

Schematic Location	Parts No.	Description
TRANSISTORS, DIODES AND IC'S		
Q101	032MEN571-015	MEN571-015, FM RF Amp.
Q102,103	032LC1674	LC1674, FM MIX OSC
Q104	032LC1675-KL	LC1675(K,L), FM IF Amp.
Q105-107	032LC945-PK	LC945(P,K), for Mute
Q201	032LC1675-KL	LC1675(K,L), MW OSC
Q202	032LC1675-KL	LC1675(K,L), LW OSC
Q301,302	0332SC1570-EF	2SC1570(E,F), Audio Amp.
Q501,502	0332SA929-EF	2SA929(E,F), Flat, Tone Amp.
Q503,504	0332SC1570-EF	2SC1570(E,F), Flat, Tone Amp.
Q505-510	0332SA929-EF	2SA929(E,F), Flat, Tone Amp.
Q601,602	0332SA1016-EF	2SA1016(E,F), Differential Amp.
605,606		
Q603,604	0332SA1016-EF	2SA1016(E,F), Constant Current
Q607,608	0332SA929-EF	2SA929(E,F), Main Amp. Bias Compensator
Q609,610	0332SB764-DE	2SB764(D,E), Main Amp. Bias Compensator
Q611,612	0332SC1570-EF	2SC1570(E,F), Pre-Driver
Q613,614	0332SD863-DE	2SD863(D,E), Driver
Q615,616	0332SD313-DE	2SD313(D,E), Power Amp.
Q617,618	0332SB764-DE	2SB764(D,E), Driver
Q619,620	0332SB507-DE	2SB507(D,E), Power Amp.
Q701-703	032LC945-PK	LC945(P,K), Signal Ind. Driver
Q901	0332SD600-DE	2SD600(D,E), Stabilizer
Q902	0332SB631-DE	2SB631(D,E), Stabilizer
D101,102	0341N60P	1N60P, FM AGC Detector
D103	0341N4148	1N4148, Switching Rectifier
D104	0341N60P	1N60P, Switching Rectifier
D601-604	0341N4148	1N4148, Bias Compensator
D605-608	0341N4003	1N4003, Protection Diode
D701-704	034C-3953	Stereo and Signal Ind. (G/RRR)
D705,706	0341N60P	1N60P, Bias
D901,902	034HZ16-2	WZ-162, Zener Regulator, 16V½W

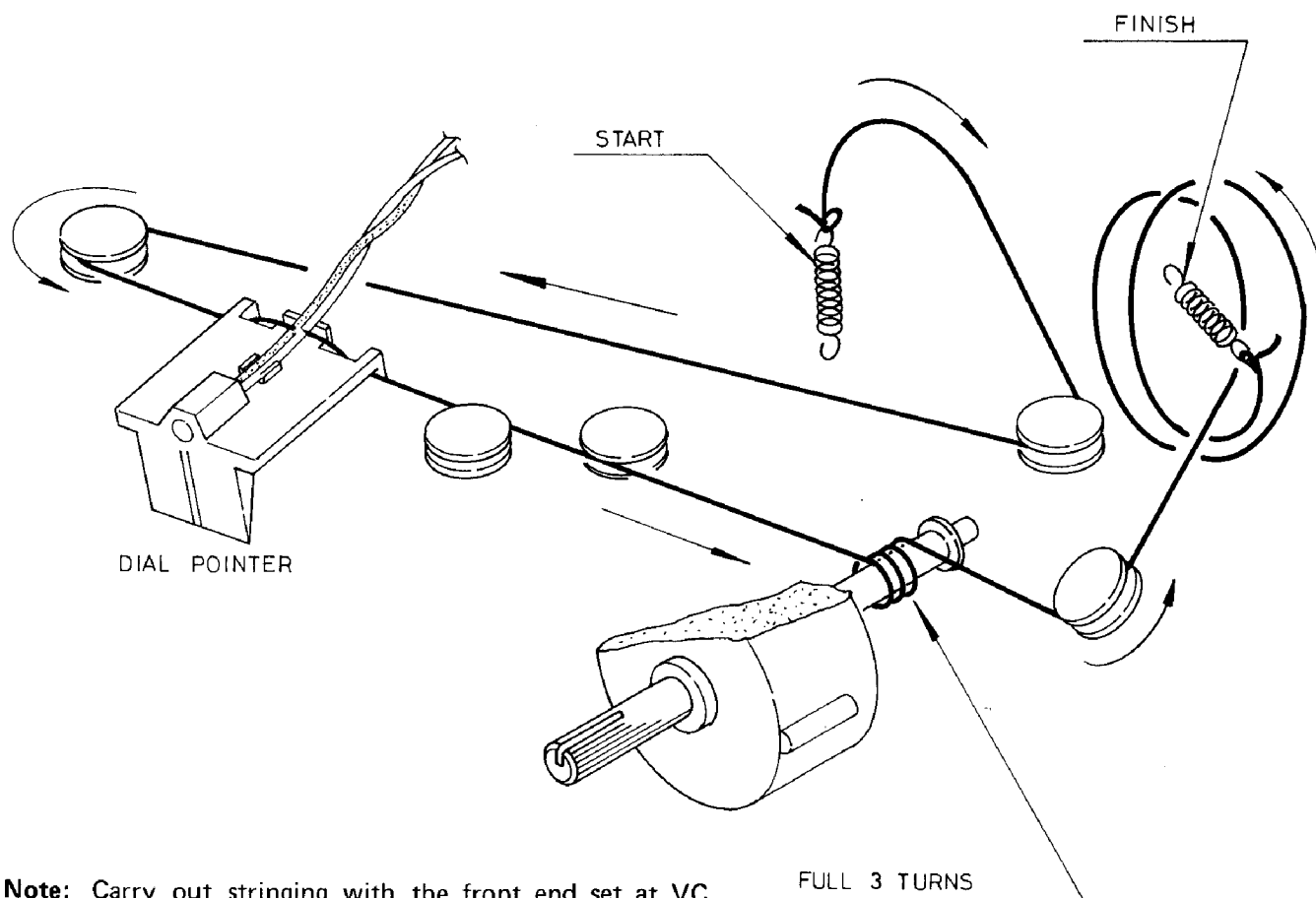
Schematic Location	Parts No.	Description
D903	034KBL-02	KBL-02, Rectifier
D001	034LN224-RP	LN224RP, Power Ind. (Red LED)
D002	034LN25RP	LN25RP, Dial Pointer Ind.
IC101	031HA12413	HA-12413, IF Amp. (FM/AM)
IC301	031HA12026	HA-12026, MPX Decoder
IC401,402	031TA7136P	TA-7136P, Phone Amp.
VR101	0518-1-401-10K	10KB, Muting Adj.
VR301	0518-1-401-10K	10KB, VCO Adj.
VR302	0518-1-401-10K	10KB, Separation Adj.
VR501	0514TR-1532	50KAx2, VOLUME Control
VR502,503	0514TR-685	50KBx2, BASS/TREBLE Control
VR504	0514TR-1572	20KWx1, BALANCE Control
VR601,602	0518-1-401-100	100ohm, Bias Adj.
COILS AND VARIABLE RESISTORS		
L001	021TRL-214-AS1	MW Ant. Coil (TRL-214)
	021TRL-215-AS1	MW/LW Ant. Coil (TRL-215)
L101	021RL-140	FM Ant. Coil
L102-104	021RL-141	FM RF Coil
L105	021TRL-239	2.2uH, FM IF Trap Coil
L106	021TRL-158	FM IFT
L107	021TRL-189	FM OSC Coil
L108	021TRL-172A	FM IFT Quadrature Detector
L201	021TRL-193	MW OSC
L202	021TRL-199	LW OSC (MW/LW/FM only)
L203	021RL-97	2mH, LW Filter (MW/LW/FM only)
L204	021TRL-196	AM IFT
L205	021TRL-173	AM IFT
L301,302	021TRL-194	MPX Filter
L601,602	021RL-41	Anti-Parasitic

Schematic Location	Parts No.	Description
SWITCHES AND OTHERS		
S1-7	0614TR-1565	Switch, Push 8-key, LOUDNESS/PHONO/FM/AM/TAPE MONITOR/MUTE MODE
S1-7(9)	0614TR-1566	Switch, Push 8-Key, LOUDNESS/PHONO/FM/MW/LW/TAPE MONITOR/MUTE MODE (CLICK NOISE)
S8	0614TR-1564	Switch, Push 1-Key, SPEAKER A+B
S10	061C-3700	Power Switch, (for UL, CSA)
	061C-3600A	Power Switch, (for BEAB. . .)
T001	022TT-159-AF	Power Transformer, (120 only)
	022TT-159-GF	Power Transformer, (Multi Type)
F001,002	036L-250V2.5A	Fuse, 2.5A, Speaker Protector (Long Size)
	036ASG3-250V2.5A	Fuse, 2.5A, Speaker Protector (Long Size UL)
	036M2.5A	Fuse, 2.5A, Speaker Protector (Mini Size)
	036(S)F2.5A	Fuse, F2.5A, Speaker Protector (Mini Size "S" "D" mark)
F901,902	036L-250V4A	Fuse, 4A, AC Circuit Protector (Long Size)
	036ASG3-250V4A	Fuse, 4A, AC Circuit Protector (Long Size UL)
	036M4A	Fuse, 4A, AC Circuit Protector (Mini Size)
	036(S)F4A	Fuse, F4A, AC Circuit Protector (Mini Size "S" "D" mark)

Gain Diagram/Verstärkungsdiagramm/ Diagramme de gain



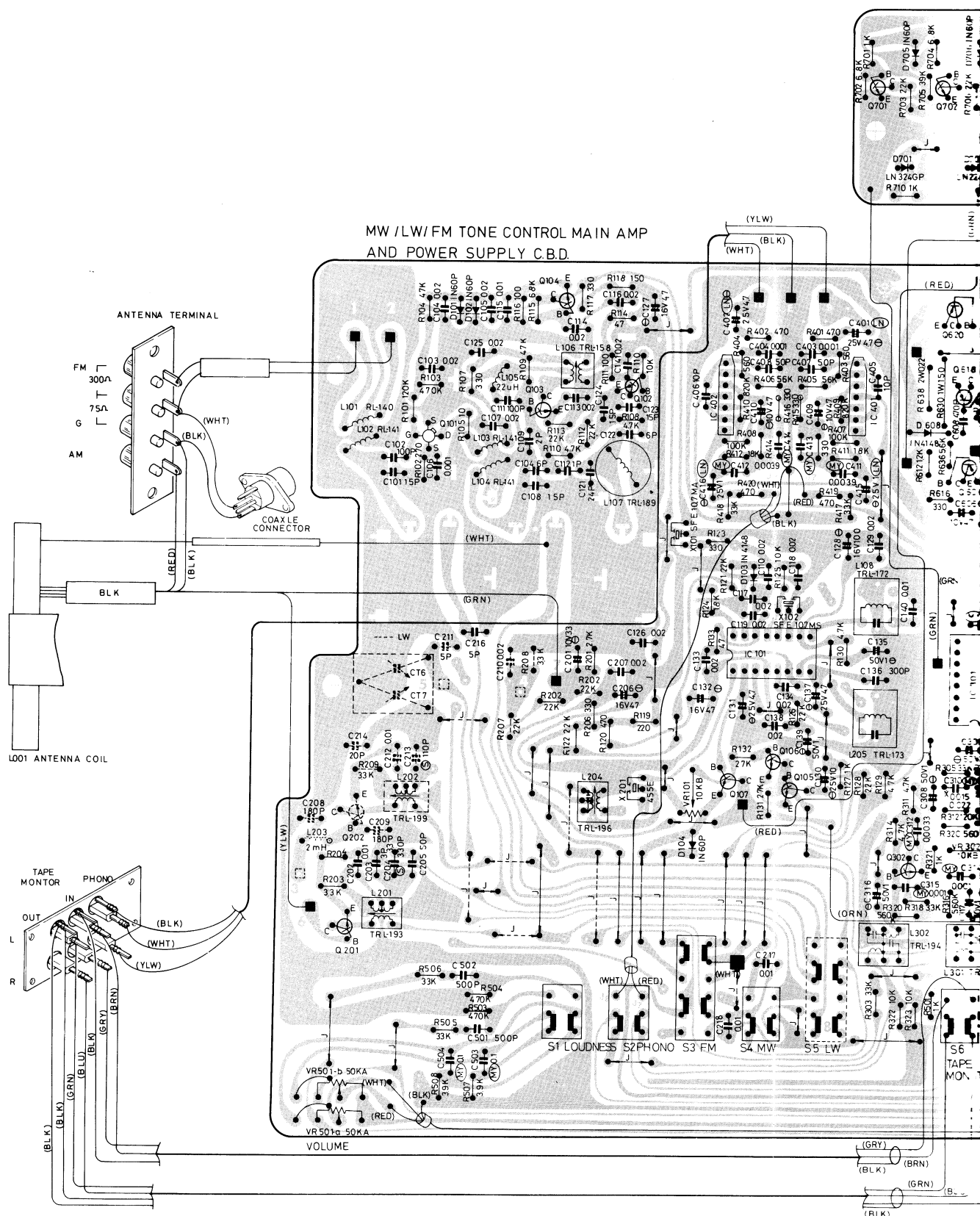
Dial Stringing Diagram Skalenantriebsschema Diagramme des cable d'entrainement

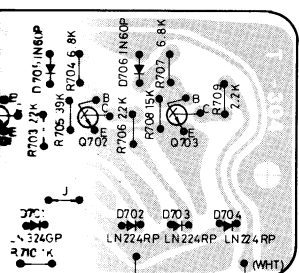


Note: Carry out stringing with the front end set at VC maximum.

Zur Beachtung: Antriebsseil mit dem Drehko der Eingangs-Stufe in Maximumstellung verlegen.

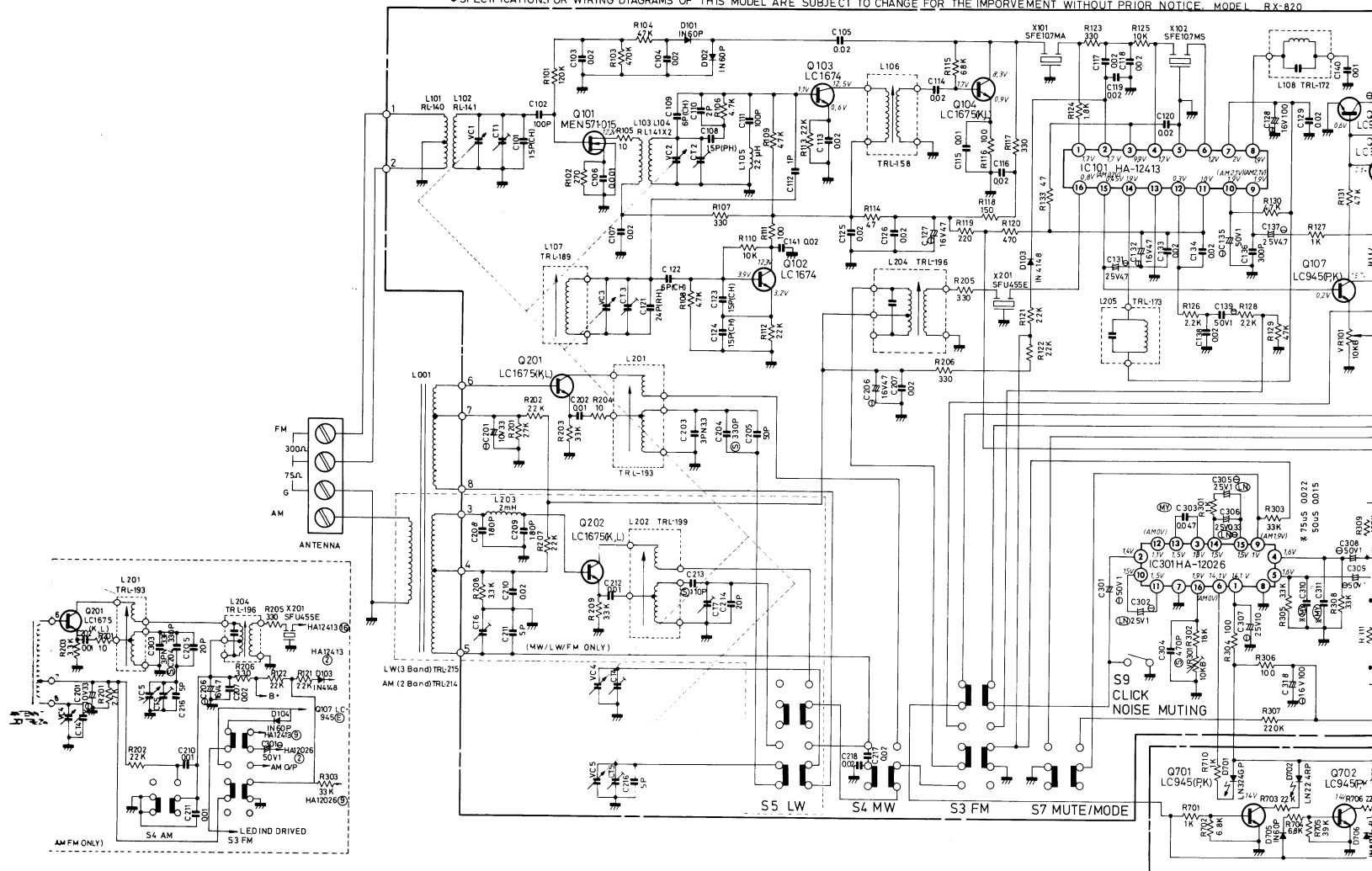
Note: Effectuer le câblage avec le condensateur réglable de l'entrée réglé au maximum.



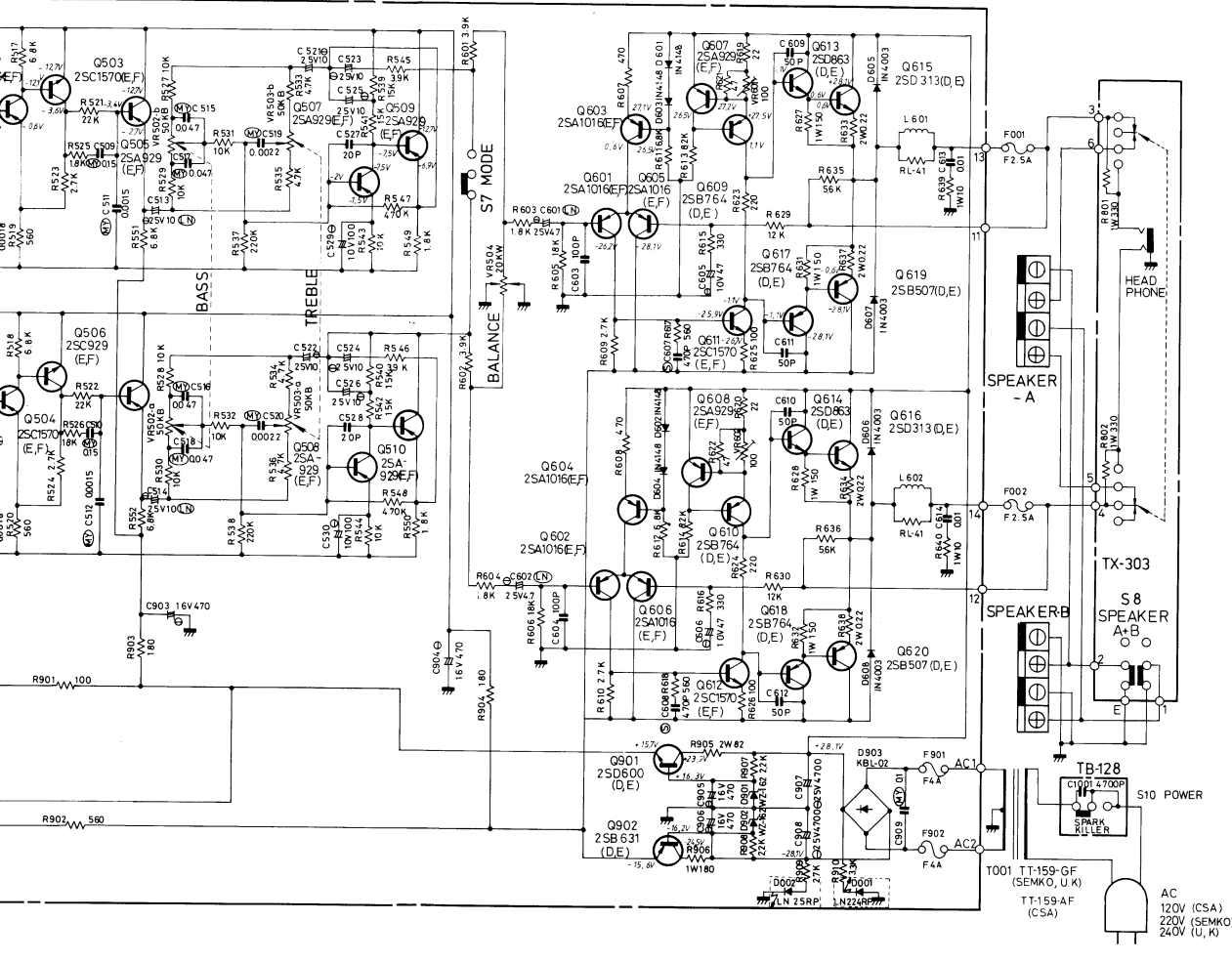


Schematic Diagram/Schaltungsschema/Diagramme schéma

● SPECIFICATIONS OR WIRING DIAGRAMS OF THIS MODEL ARE SUBJECT TO CHANGE FOR THE IMPROVEMENT WITHOUT PRIOR NOTICE. MODEL RX-820







ITEM	SCHEMATIC	LOCATION(LOST)
FM IF AMP	R133	C141
MW LW IF AMP	R205	C218
FM MPX AMP	R323	C318
EQUALIZER	R420	C416
TONE CONTROL	R552	C530
MAIN AMP	R640	C614
REC PB AMP	R710	—
HEADPHONE JACK	R802	—
POWER SUPPLY	R909	C910
SPARK SW P.C.B.	—	C1001

RESISTOR

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

CAPACITOR

—LOW NOISE ELECTROLYTIC CAPACITORS
 —MILAR FILM CAPACITORS
 —POLYSTYRENE FILM CAPACITORS
 —ELECTROLYTIC CAPACITORS
 —NON MARK CERAMIC CAPACITORS
 UNLESS OTHERWISE NOTED SCHEMATIC ALL
 CAPACITANCE VALUES ARE EXPRESSED

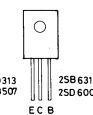
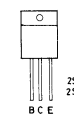
BOTTOM VIEW



MEN 571-015

LC1674 25A929
25C1570 LC945
LC1675 25A1016
25B764 25D863

SIDE VIEW

BCE
25D313
25B507
25B631
25D600
ECB
1A7136P
1 4 7

TOP VIEW

HA42413
HA12016

Disassembly Diagram/Illustration des Auseinandernehmen

ITEM	SCHEMATIC LOCATION(LOST)	
FM IF AMP	R133	C141
MW LW IF AMP	R205	C218
FM MPX AMP	R323	C318
EQUALIZER	R420	C416
TONE CONTROL	R552	C530
MAIN AMP	R640	C514
REC PB AMP	R710	—
HEADPHONE JACK	R802	—
POWER SUPPLY	R909	C910
SPARK SW PCB	—	C1001

RESISTOR

5%--TOLERANCE UNLESS OTHERWISE NOTED
 K---KILO OHM
 M---MEGA OHM
 ---COMPOSITION RESISTORS 1/2 WATT
 RSU METAL OXIDE FILM RESISTORS
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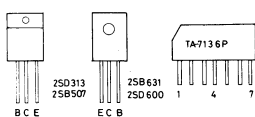
CAPACITOR

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

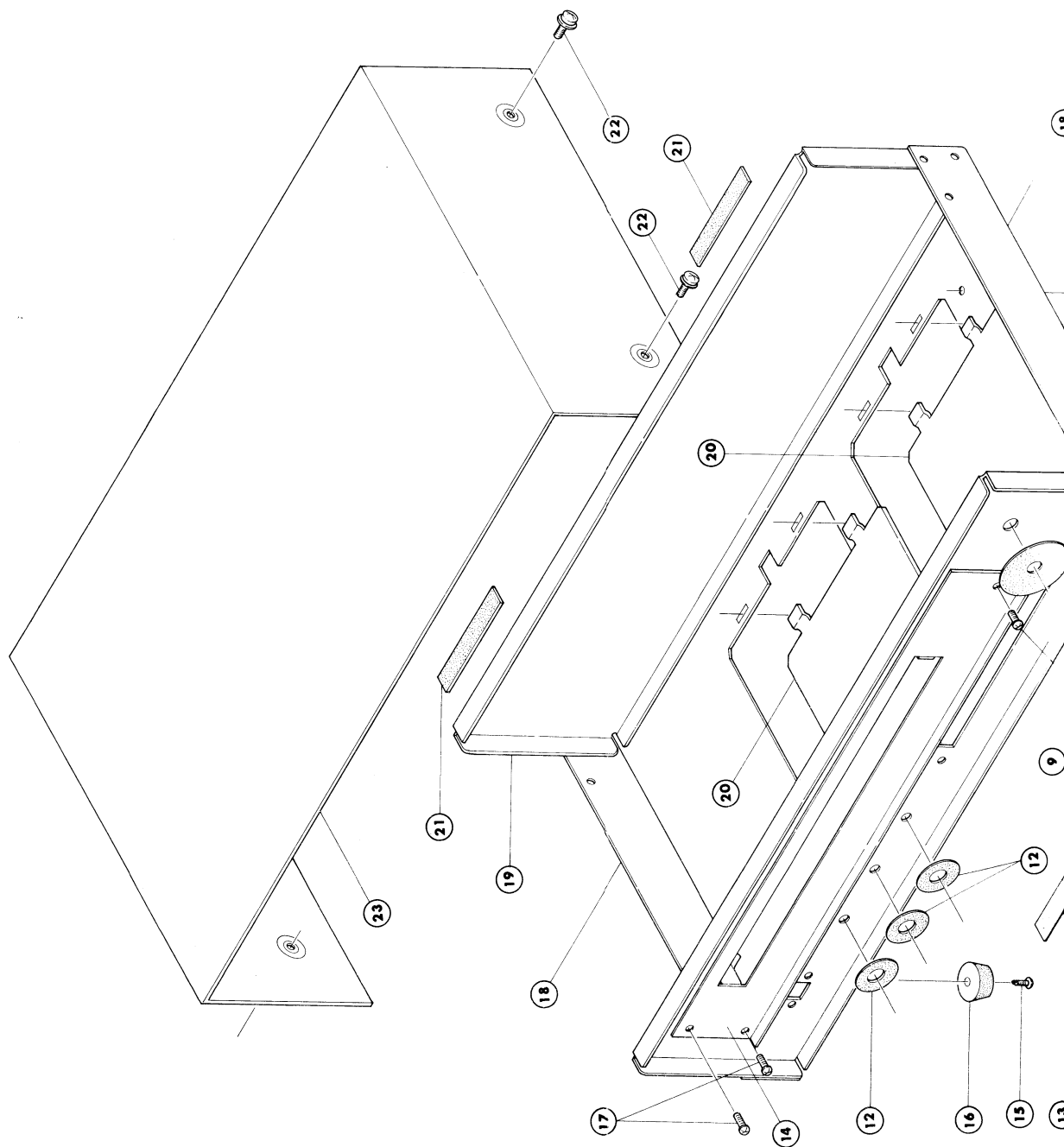
BOTTOM VIEW



SIDE VIEW

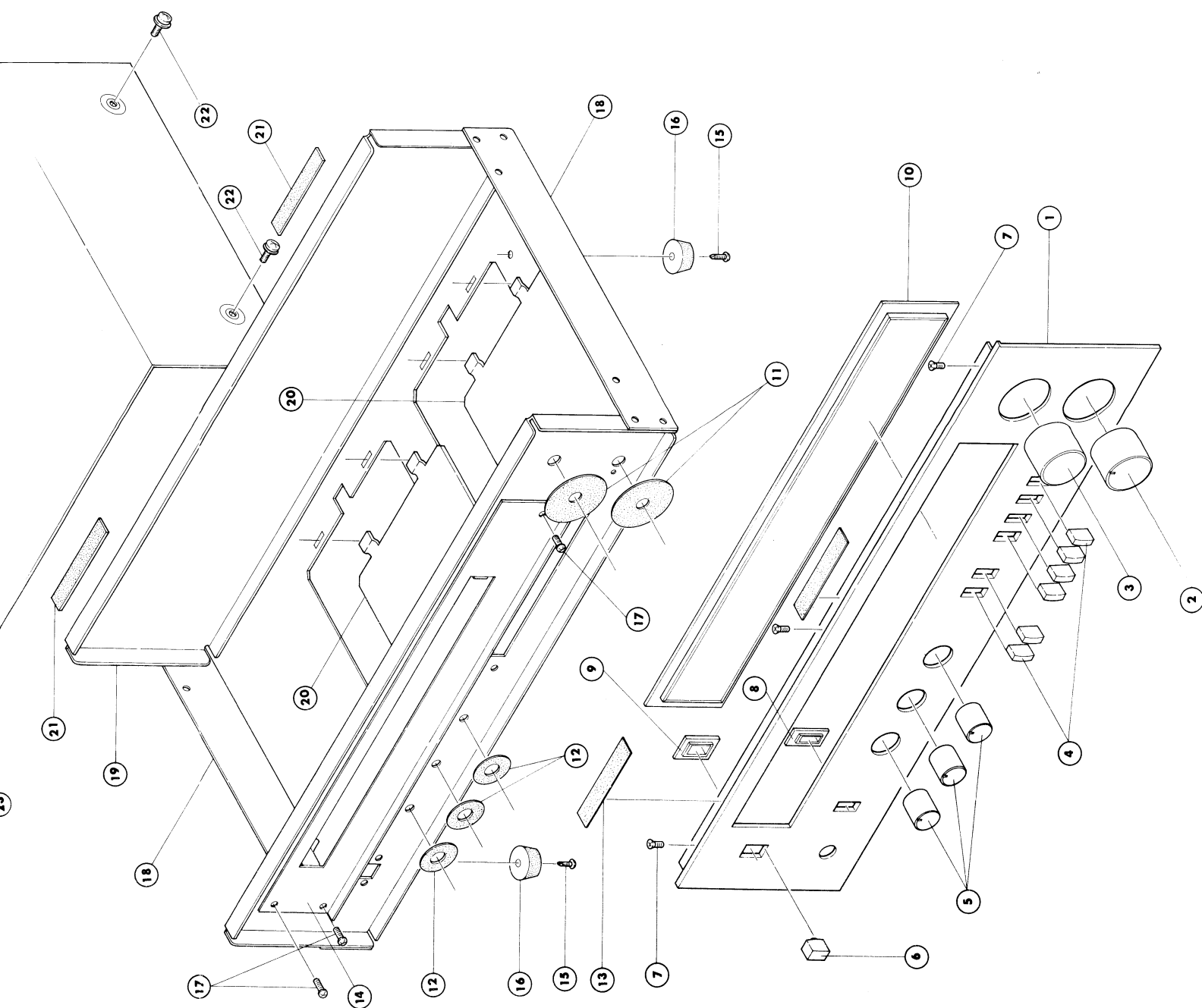


TOP VIEW



Key No.	Parts No.	Description
1	0112TWC-1 #1	Front Panel
	0112TWC-1 #2	Front Panel
2	012C-3871-T	Knob, 30
3	0124TR-1536	Knob, 30
4	012C-3372 #1	Push Button
5	0124TR-1540	Knob, 15
6	012C-3982	Push Button
7	071SA3x6N	Screw, M
8	019C-3546-T	Push Ring
9	0194TR-1087	Push Ring
10	0143TWD-6 #1	Dial Window
11	0194TR-1083B #2	Felt
12	0194TR-1083B #1	Felt
13	0194TR-1087	Felt

m/Illustration des Auseinanderbaus/Schéma de démontage



Key No.	Parts No.	Description
1	0112TWC-1 #1	Front Panel (AM/FM)
	0112TWC-1 #2	Front Panel (MW/LW/FM)
2	012C-3871-T	Knob, 30¢
3	0124TR-1536	Knob, 30¢ (TUNING)
4	012C-3372 #1	Push Button
5	0124TR-1540	Knob, 15¢
6	012C-3982	Push Button (POWER)
7	071SA3x6N	Screw, MF3x6Ni
8	019C-3546-T	Push Ring
9	0194TR-1087	Push Ring
10	0143TWD-6 #1	Dial Window
11	0194TR-1083B #2	Felt
12	0194TR-1083B #1	Felt
13	0194TR-1087	Felt

Key No.	Parts No.	Description
14	015TDB-186A	Dial Board (AM/FM)
	015TDB-185A	Dial Board (MW/LW/FM)
15	071NBTP3x8Z	Screw, TPV3x8Ni
16	0194TR-1257A	Plastic Foot
17	07WBTP3x6B	Screw, TPV3x6BK
18	0132TWC-9	Chassis Body
19	015RP-271	Printed Rear Chassis (TRP-271)
	015RP-272	Printed Rear Chassis (TRP-272)
	015RP-273	Printed Rear Chassis (TRP-273)
20	0133TXF-9	Bottom Cover
21	0194TR-1087	Felt
22	071NBW4x6N	Screw, MPW4x6Ni
23	0142TWE-5 #4	Upper Cover