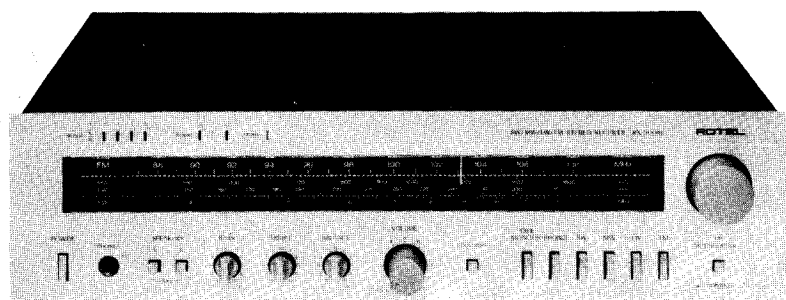


ROTEL®

Technical Manual



AM/FM STEREO RECEIVER

RX-500

SW/MW/LW/FM STEREO RECEIVER

RX-500SL

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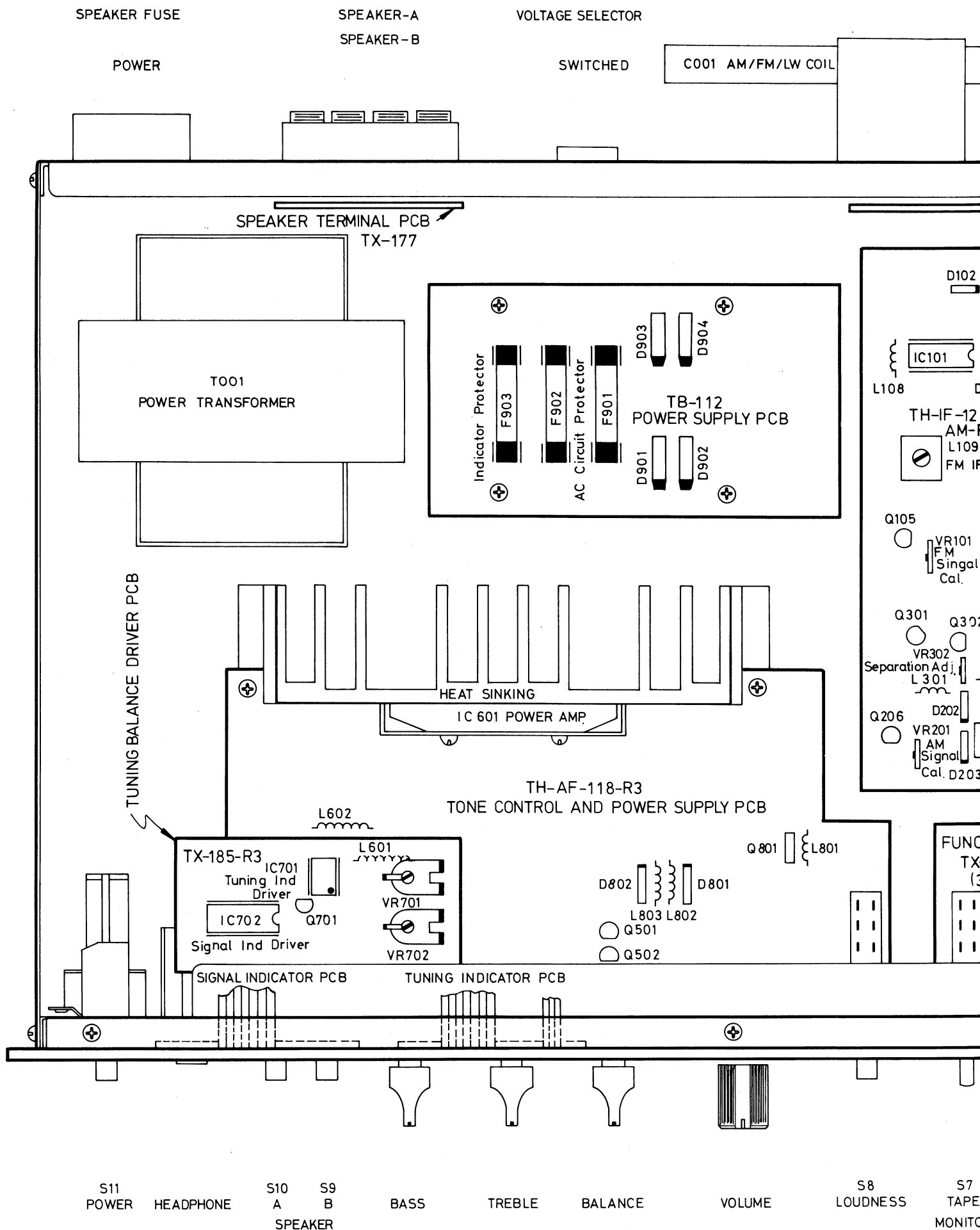
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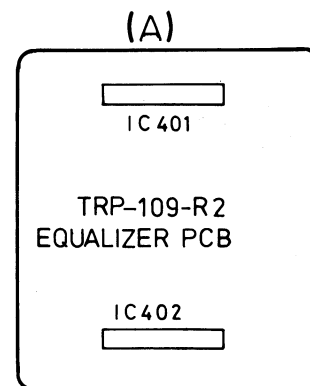
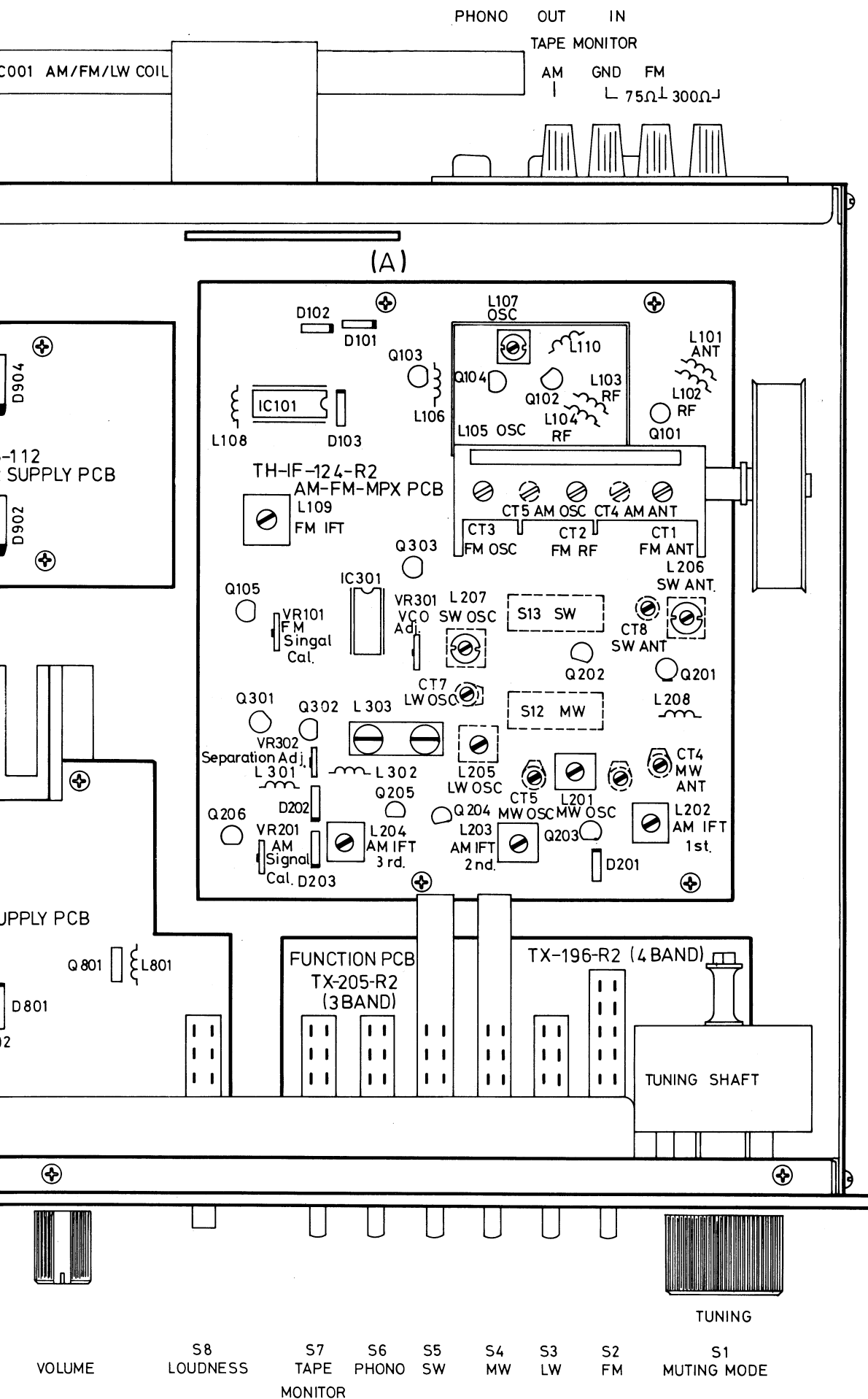
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Chassis Layout/Chassis-Anordnung/Installation de Châ





AM IF and RF Alignment/ Signal Indicator Calibration

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

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

Step	Generator		Tuning Dial setting	Adjust	Adjust for
	Coupling	Frequency			
1	Pin No. 5 (on IF board through a 0.01 mfd Capacitor)	455KHz	No interfering at low end of scale	L202, L203 and L204 (on IF board)	Maximum reading on AC VTVM.

MW RF Alignment (AM/FM, SW/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)	
3	(Input 100mV)	1000KHz	1000KHz	VR201	5 LEDs just light up. (Signal strength indicator.)

LW RF Alignment (SW/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	L205 (OSC) and L001 (ANT) against the lead line side	Maximum reading on AC VTVM.
2		330KHz	330KHz	CT7 (OSC) and CT6 (ANT)	

SW RF Alignment (SW/MW/LW/FM only)

Step	Generator		Tuning Dial setting	Adjust	Adjust for
	Coupling	Frequency			
1	Antenna terminal	4MHz	4MHz	L207 (OSC) and CT9 (ANT)	Maximum reading on AC VTVM.
2		12MHz	12MHz	L206 (ANT) and CT8 (ANT)	

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	L105 (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 (RF)	
6		98MHz	98MHz	L107 (OSC)	
7	Repeat steps 4 and 5 unit no further improvement is noticed.				
8	Antenna terminal (1mV Input)	98MHz	98MHz	L109 (upper core)	Minimum reading on H.D. Analyzer.
9			No interfering	L109 (low core)	Tuning Meter to "Center" position.
10			98MHz	VR101	5 LEDs just light up. (Signal strength indicator)
11			98MHz-50KHz	VR701	Left LED just light up (FM Tuning indicator)
12			98MHz+50KHz	VR702	Right LED just light up. (FM Tuning indicator)

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/ MW-Signalstärkeanzeige-Eichung

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

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

Schritt	Messender		Abstimmskalen Einstellung	Abgleich	Abgleich auf
	Anschluss	Frequenz			
1	Steckerstift 5 (auf ZF-leiter- platte ueber 0.01 MF Kon- densator)	455KHz	Kine Interfenz am unteren ska- lenende	L202, L203 und L204 (auf ZF- Leiterplatte)	Maximalanzeige am Roehrevoltmeter

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

Schritt	Messender		Abstimmskalen 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)	
3	(Antennenkl- ennenspannung 1mV)	1000KHz	1000KHz	VR201	fünf LEDS leuchtet recht auf. (Signalstärkeanzeige)

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

Schritt	Messender		Abstimmskalen Einstellung	Abgleich	Abgleich auf
	Anschluss	Frequenz			
1	Mess-Signal mit Schleife in Fe- rrit antenna einspeisen	160KHz	160KHz	L205 (OSZ) und L001 (ANT) gegen Lotleine- Seite	Maximalanzeige am Roehrevoltmeter
2		330KHz	330KHz	CT7 (OSZ) und CT6 (ANT)	

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

Schritt	Messender		Abstimmskalen Einstellung	Abgleich	Abgleich auf
	Anschluss	Frequenz			
1	Antennenkl- emmen anschlie- ssen	4MHz	4MHz	L207 (OSZ) und CT9 (ANT)	Maximalanzeige am Roehrevoltmeter
2		12MHz	12MHz	L206 (ANT) und CT8 (ANT)	

UKW-ZF und HF-Einstellung/Ratiomitteanzeige und Signalstärkeanzeige-Eichung

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

Schritt	Messender		Abstimmskalens Einstellung	Abgleich	Abgleich auf
	Anschluss	Frequenz			
1	Antennenkl- emmen	90MHz	90MHz	L105 (OSZ)	Maximalanzeige am Roehrenvoltmeter
2	anschliessen	106MHz	106MHz	CT3 (OSZ)	
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 Roehrenvoltmeter
5		106MHz	106MHz	CT1 (ANT) and CT2 (HF)	
6		98MHz	98MHz	L107 (OSZ)	
7	Schritt 4 und 5 wiederholen, bis kein weitere Verbesserung eintritt.				
8	Antennenkl- emmen ansch- liessen (Antennenkl- emmen ens- pannung 1mV	98MHz	98MHz	L109 (upper core)	Minimalanzeige am Klirrfaktormesser
9			KEINE Inter- ferenz	L109 (low core)	Abstimmmanzeiger auf "center" stellen.
10			98MHz	VR101	fünf LEDS leuchtet recht auf. (Signalstärkeanzeige)
11			98MHz-50KHz	VR701	Links-LED leuchtet recht auf. (UKW-Ratiomitt- eanzeige)
12			98MHz+50KHz	VR702	Rechts-LED leuchtet recht auf. (UKW-Ratiomitt- eanzeige)

UKW MPX-Einstellung

Instrumente: UKW-stereo Messender, Roehrevoltmeter und Oszillograph.

Schritt	Messender		Abstimmskalens Einstellung	Abgleich	Abgleich auf
	Anschluss	Frequenz			
1	Antennenkl- emmen anschliessen	98MHz Piloton.....10%	98MHz	VR301	Stereoanzeige leuchtet auf.
2		1KHz..... 90% Moduliert.		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, SW/MW/LW/FM)

Point	Générateur		Ecran d'accord	Réglage	Réglage pour
	Couplage	Fréquence			
1	Brouche No. 5 (Sur IF plaque- tte par l'inter- médiaire d'un condensateur de 0.01 mfd.	455KHz	Non interférence a l'extrémité de l'échelle	L202, L203 et L204 (sur la pla- quette IF)	Lecture maximum sur le voltmètre électronique AC VTVM.

Alignement MW RF (AM/FM, SW/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)	
3	(absorbé 100mV)	1000KHz	1000KHz	VR201	5 LEDS allument seule- ment. (Indicateur de force du signal)

Alignement LW RF (SW/MW/LW/FM senlement)

Point	Générateur		Ecran d'accord	Réglage	Réglage pour
	Couplage	Fréquence			
1	Boucle de mesure Envoyée le signal sur ferribe à boucle	160KHz	160KHz	L205 (OSC) et L001 (ANT) contre le côté de ligne de connex- ion	Lecture maximum sur AC VTVM.
2		330KHz	330KHz	CTF (OSC) et CT6 (ANT)	

Alignement SW RF (SW/MW/LW/FM senlement)

Point	Générateur		Ecran d'accord	Réglage	Réglage pour
	Couplage	Fréquence			
1	Borne d'antenne	4MHz	4MHz	L207 (OSC) et CT9 (ANT)	Lecture Maximum sur AC VTVM.
2		12MHz	12MHz	L206 (ANT) et CT8 (ANT)	

Alignement FM IF et HF/Indicateur de syntonisation et de force du signal

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

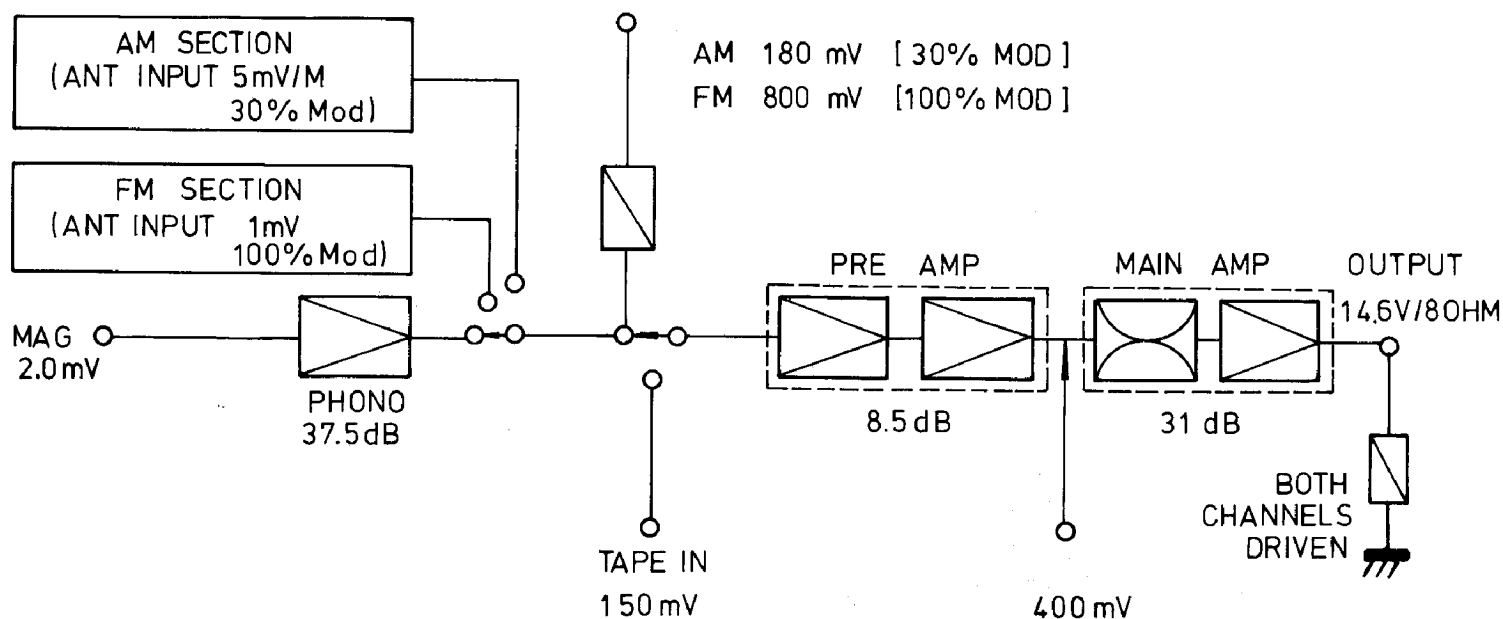
Point	Générateur		Ecran d'accord	Réglage	Réglage pour
	Couplage	Fréquence			
1	Borne d'antenne	90MHz	90MHz	L105 (OSC)	Lecture maximum sur AC VTVA
2		106MHz	106MHz	CT3 (OSC)	
3	Répéter les points 1 et 2 jusqu'aucun perfectionnement est marqué.				
4	Borne d'antenne	90MHz	90MHz	L101, L102, L103 et L104 (RF)	Lecture maximum sur AC VTVM.
5		106MHz	106MHz	CT1 (ANT) et CT2 (RF)	
6		98MHz	98MHz	L107 (OSC)	
7	Répéter les points 4 et 5 jusqu'aucun perfectionnement est marqué				
8	Borne d'antenne (1mV absorbée)	98MHz	98MHz	L109 (Nogan haut)	Lecture maximum sur AC VTVM.
9			non interférence	L109 (Nogan bas)	Lecture de syntonisation à la position "centrole".
10			98MHz	VR101	5 LEDS allument seulement (Indicateur de force du signal)
11			98MHz-50KHz	VR701	LED gauche allume seulement (Indicateur de syntonisation FM)
12			98MHz+50KHz	VR702	LED droit allume seulement (Indicateur de syntonisation FM)

Alignement FM MPX

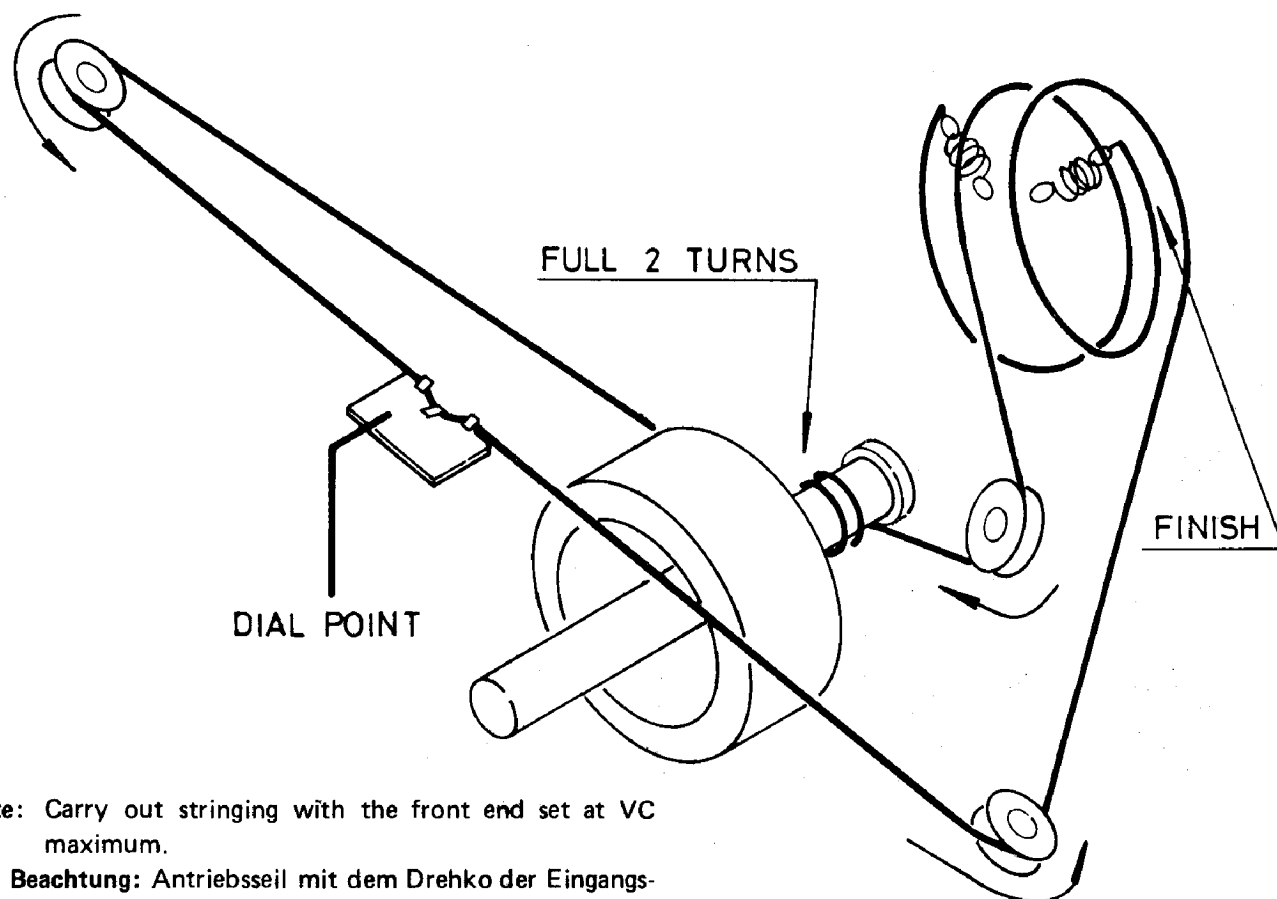
Instruments: FM stéréo Générateur, AC VTVM et Oscilloscope.

Point	Générateur		Ecran d'accord	Réglage	Réglage pour
	Couplage	Fréquence			
1	Borne d'antenne	98MHz lampe témoin 10% 1 KHz90% 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 véduite de 10% à 6%				

Gain Diagram/Verstärkungsdiagramm/ Diagramme de gain



Dial Stringing Diagram Verstaerkungsdiagramm Diagramme des câble d'entraînement



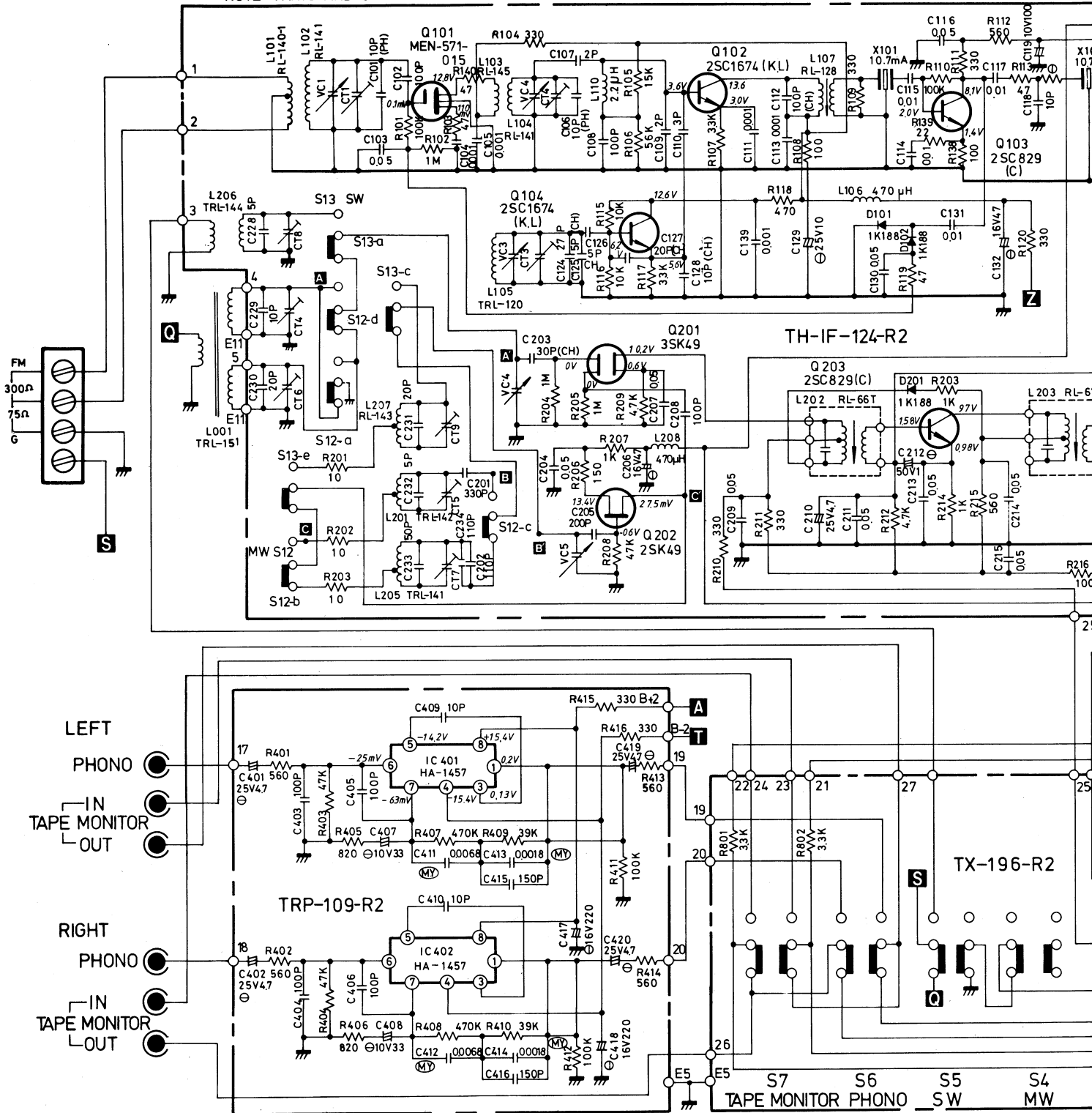
Note: Carry out stringing with the front end set at VC maximum.

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

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

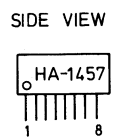
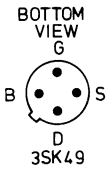
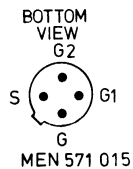
Schematic Diagram/Skalen Antriebsschema/ Diagramme

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

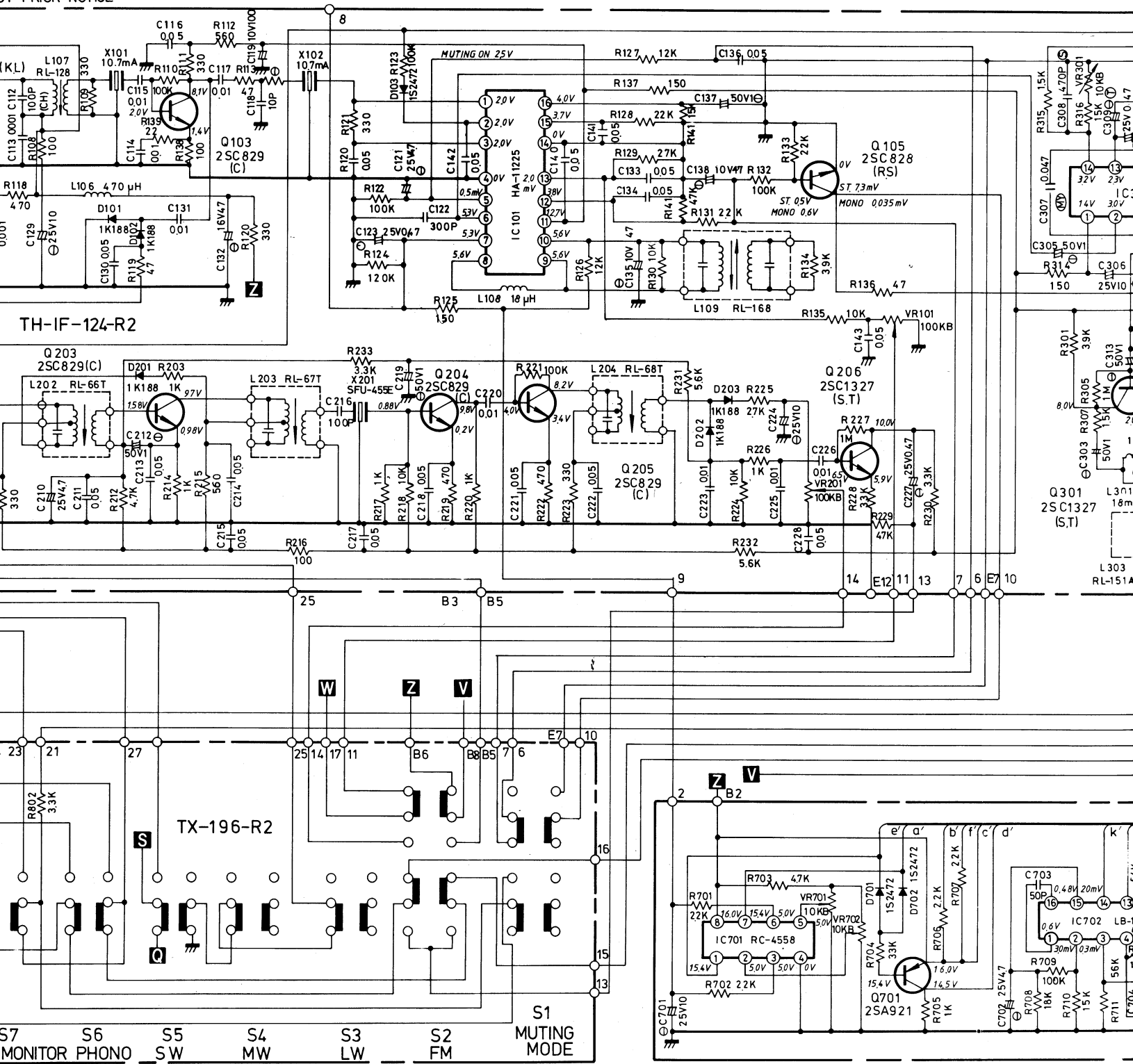


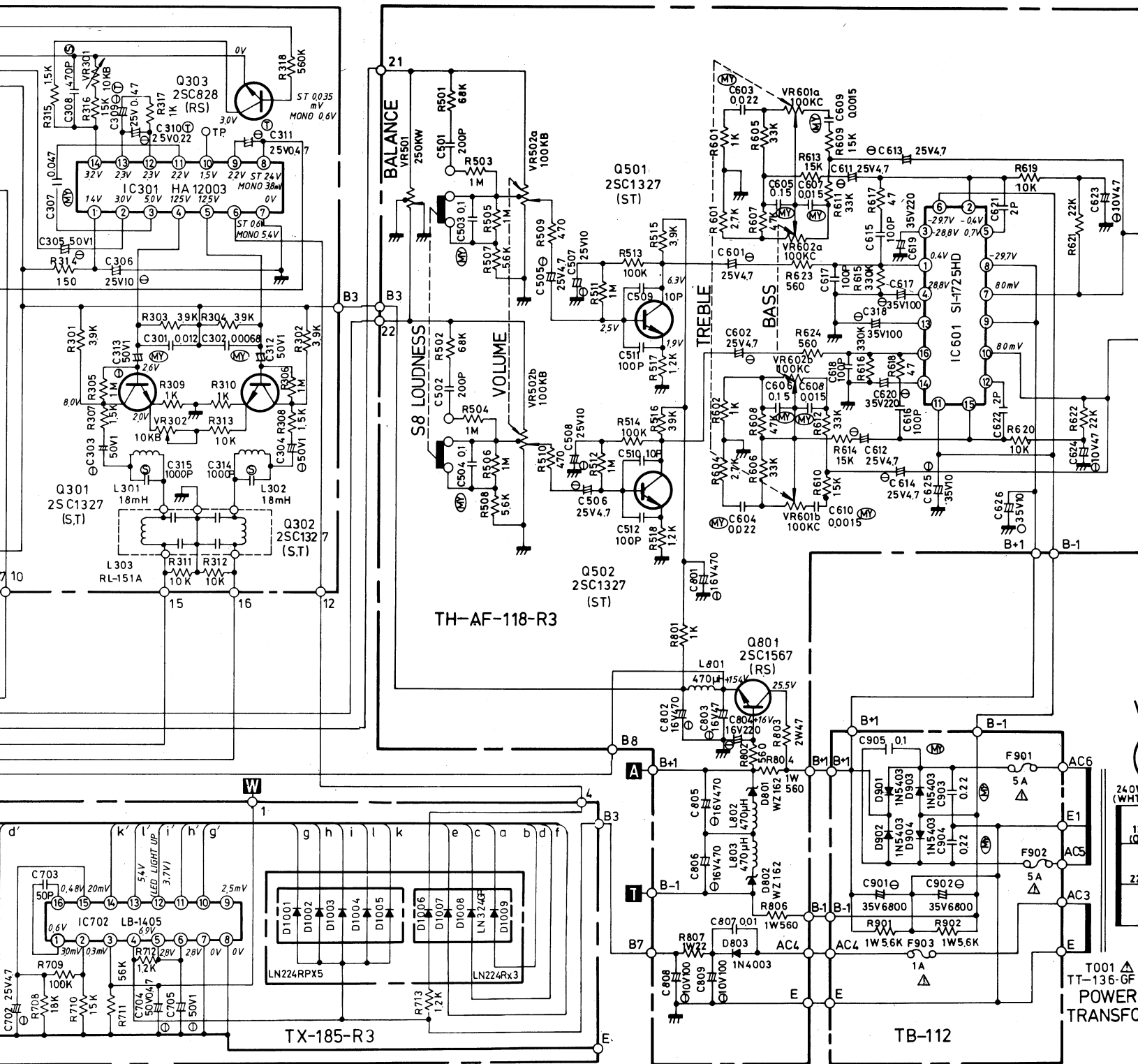
THE SCHEMATIC DIAGRAM IS AVAILABLE COMBINATION OF
SW/MW/LW/FM UNITS ONLY WHEN UNITS COMBINE
JUST AM/FM ONLY THERE WERE MADE SOME
MODIFICATIONS AS FOLLWING

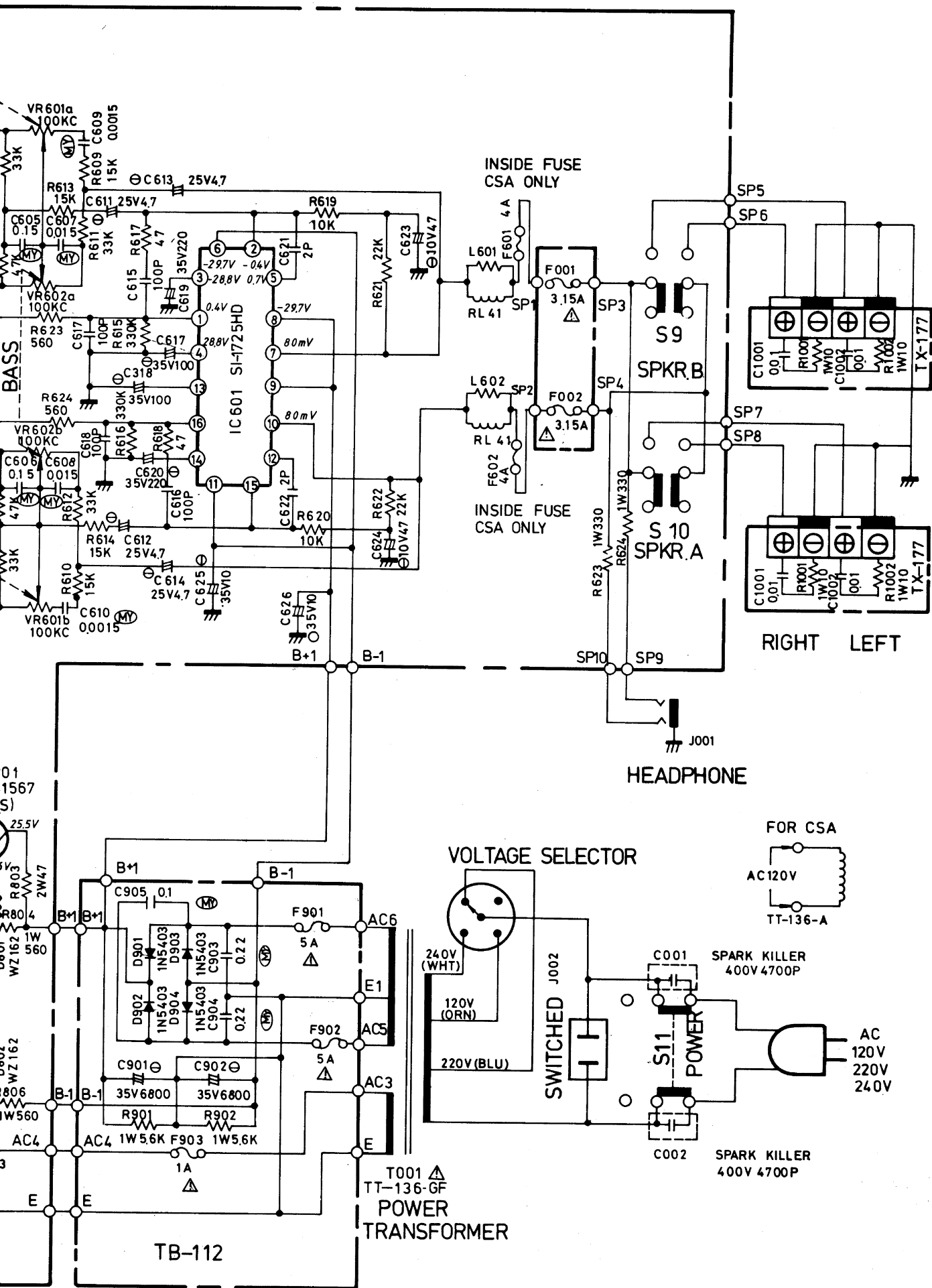
1. CHANGED ANTENNA COIL L001 FROM
TRL 151 TO TRL-150
2. CANCELED SWITCHES S12 S13
- 3 SHORTED A AND A' B AND B' C AND C'



UT PRIOR NOTICE

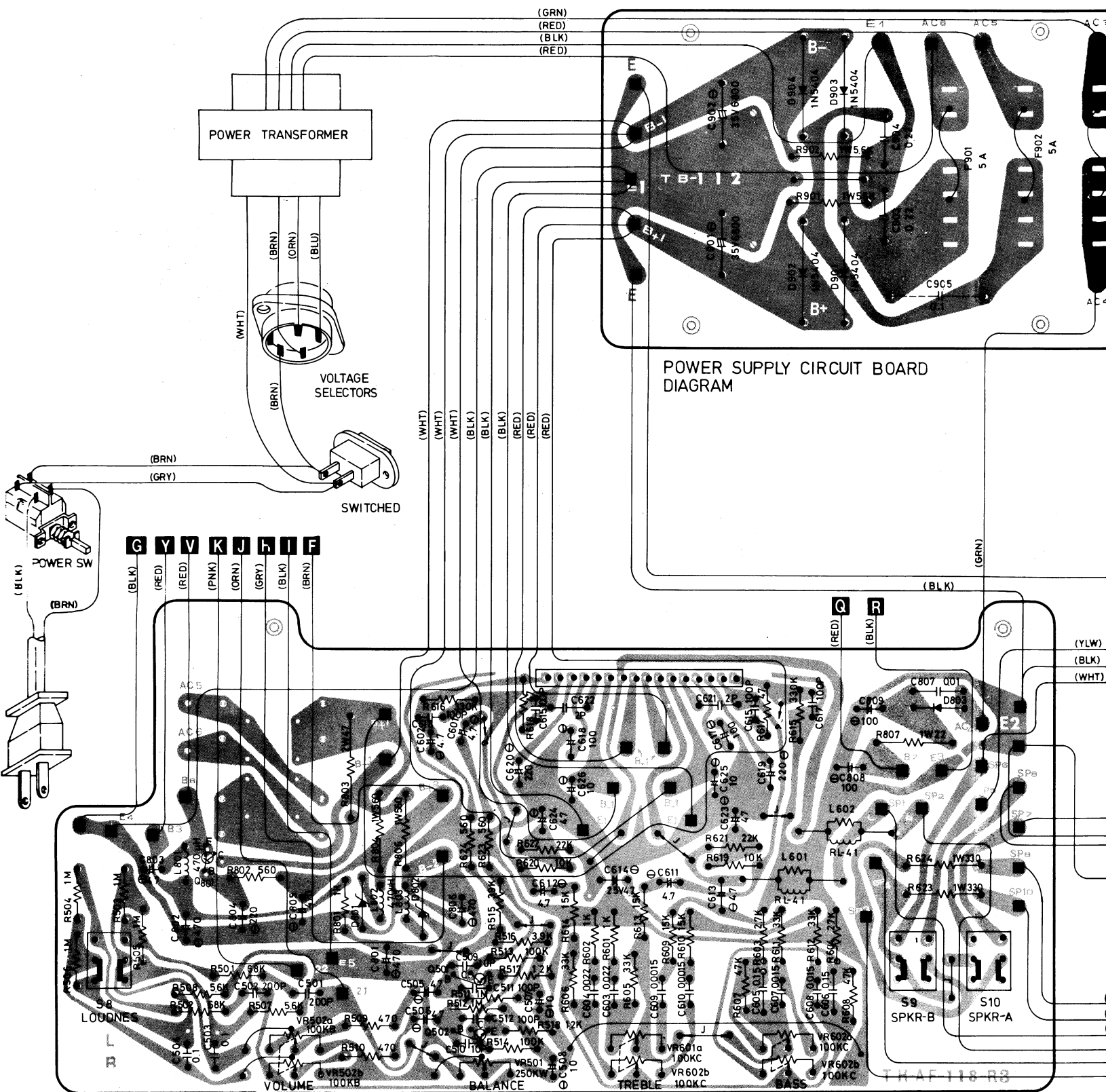




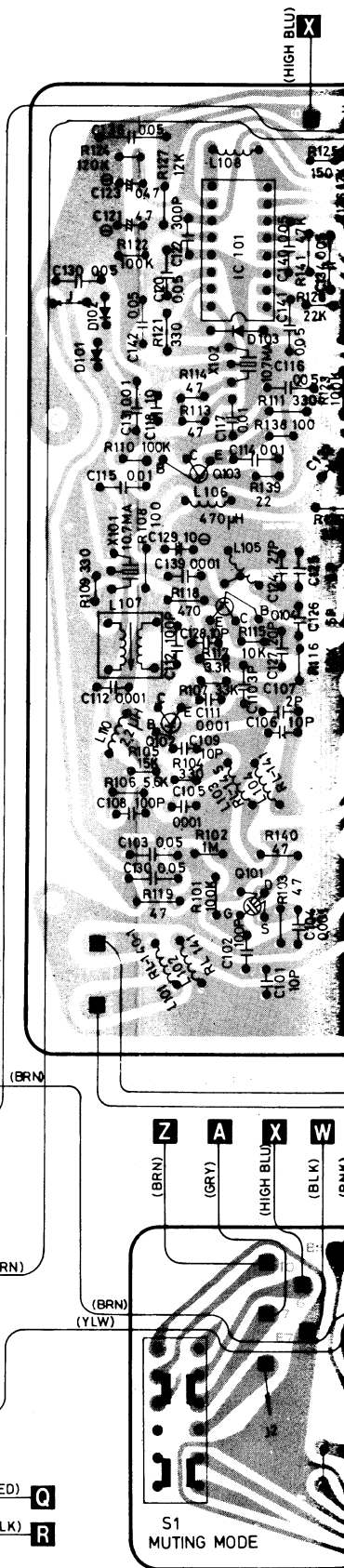
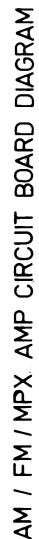
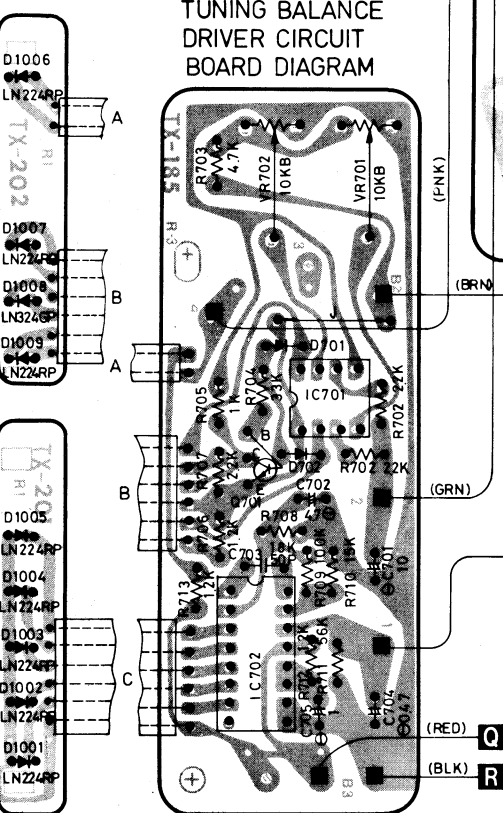
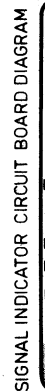
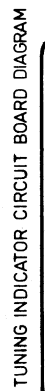
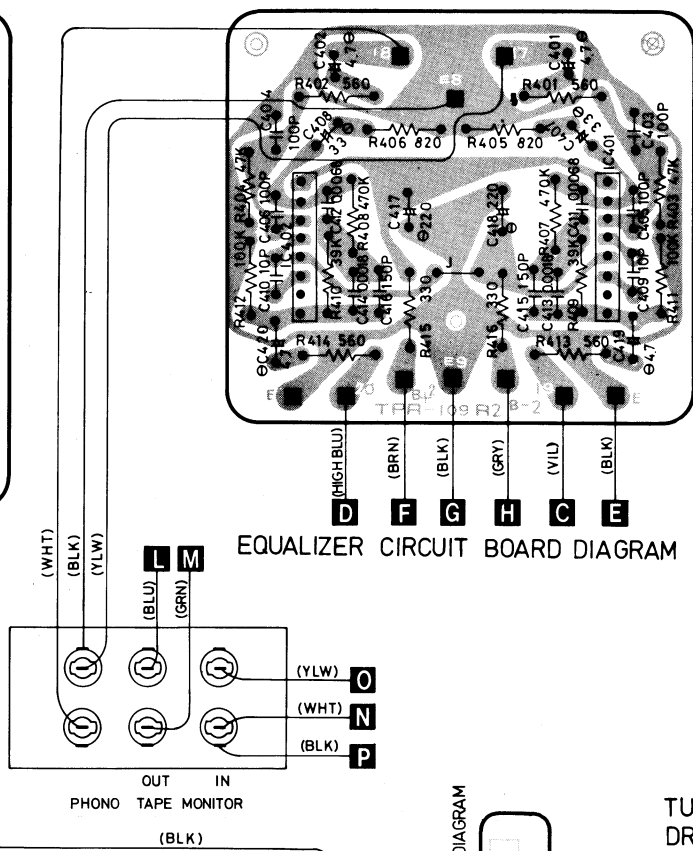
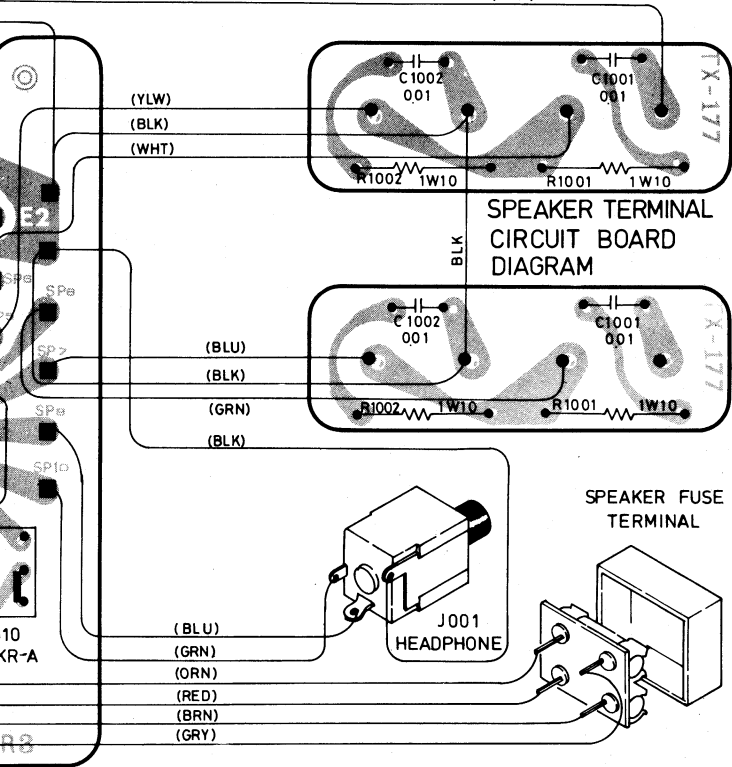


ITEM	SCHEMATIC LOCATION (LAST)	
FM IF AMP	R141	C142
LM MW SW IF AMP	R233	C234
FM MPX AMP	R318	C313
EQUALIZER	R416	C420
TONE CONTROL	R518	C512

ITEM	SCHEMATIC LOCATION (LAST)	
MAIN AMP	R622	C626
TUNING BALANCE DRIVER	R713	C705
POWER SUPPLY	R807	C809
POWER SUPPLY	R902	C905
SPEAKER TERMINAL PCB	R1002	C1002



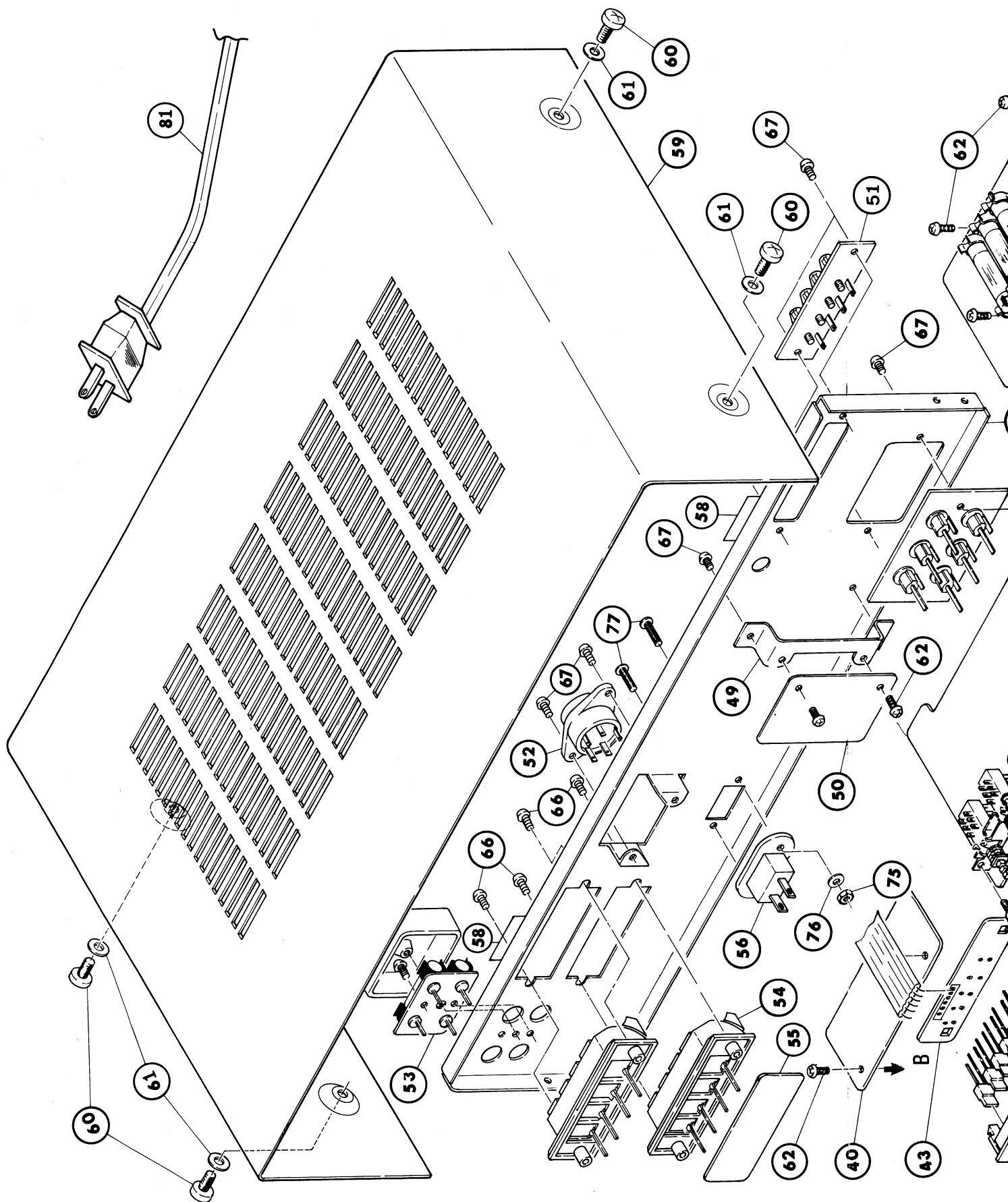
TONE CONTROL AMP AND POWER SUPPLY CIRCUIT BOARD DIAGRAM

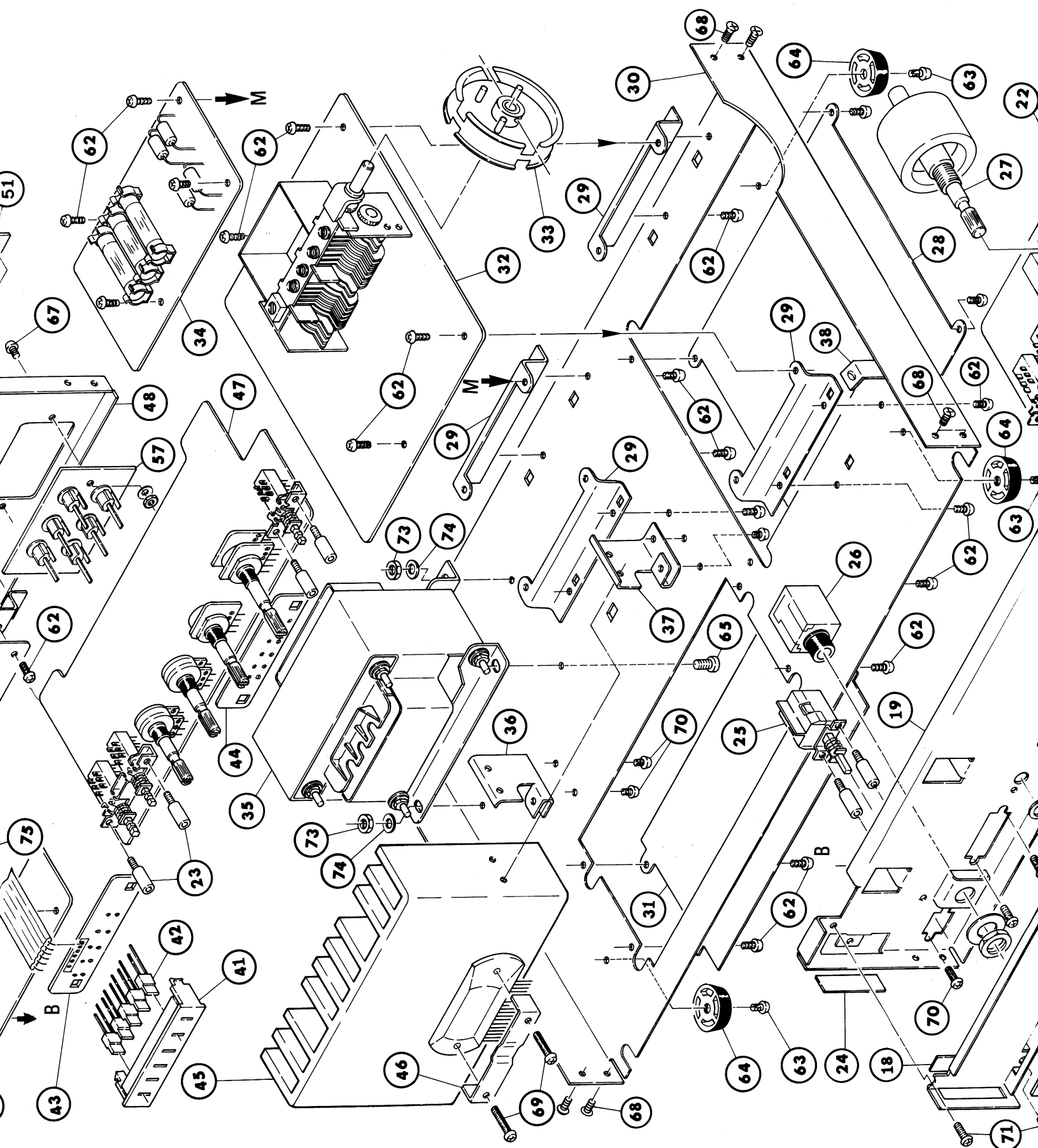


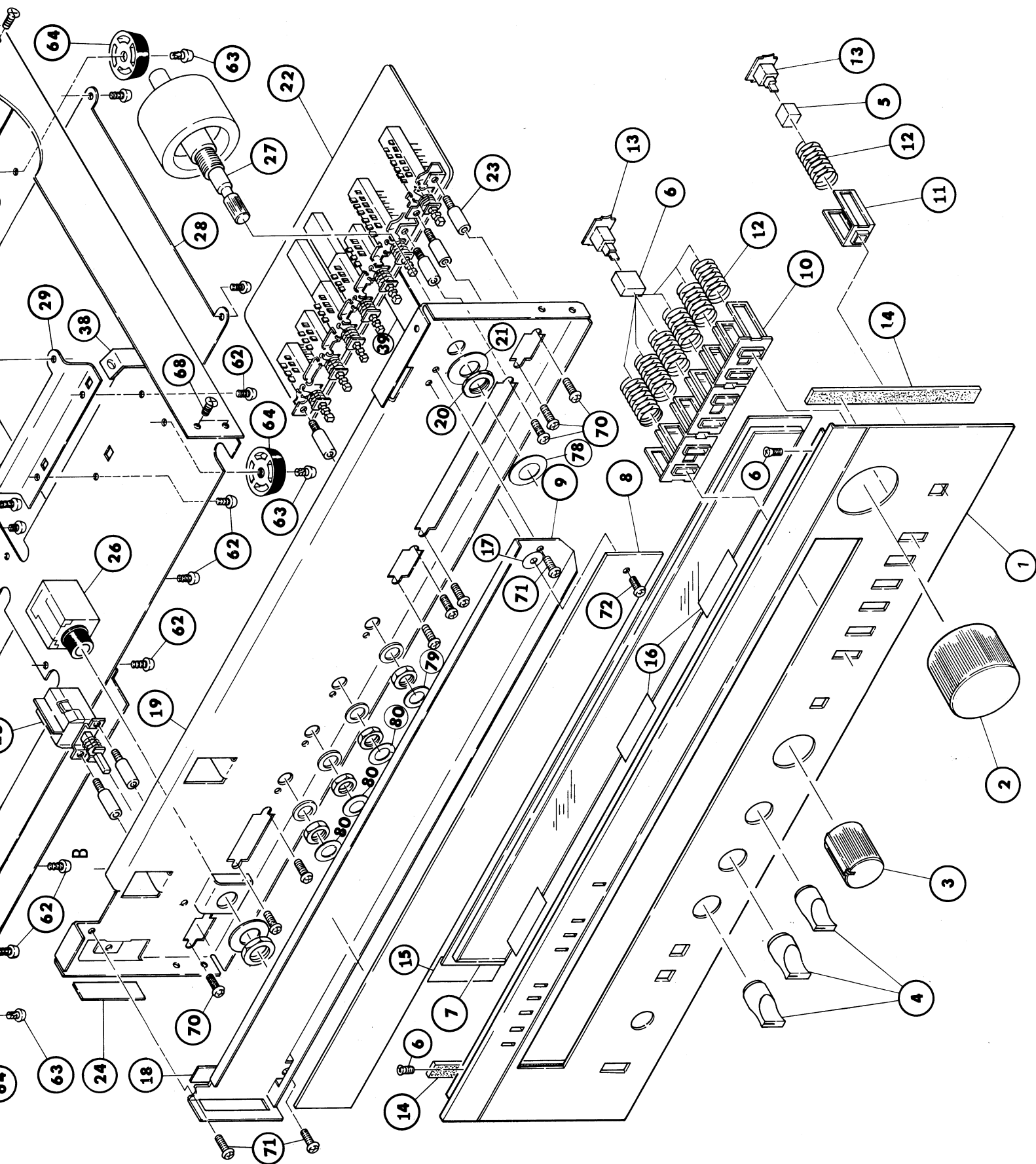
Repair Parts List/Reparaturteilliste/ Liste des pièces de rechange

Schematic Location	Parts No.	Description
TRANSISTORS, DIODES AND IC'S		
Q101	302001125	MEN571-015, FM RF Amp.
Q102,104	301201163	2SC1674 (K,L), FM MIX, OSC.
Q103	301201117	2SC829 (C), IF Amp.
Q105	301201115	2SC828 (R,S), for switching
Q201	302001126	3SK49, AM MIX
Q202	302001112	2SK49, AM OSC
Q203-205	301201117	2SC829 (C), AM IF Amp.
Q206	301201134	2SC1327 (S,T), Audio Amp.
Q501,502	301201134	2SC1327 (S,T), Audio Amp.
Q701	301001145	2SA921, Tuning Indicator Control
Q801	301201150	2SC1567, Stabilizer
D101,102	300111008	1K188, FM AGC Detector
D103	300111010	1S2472, for Switching
D201-203	300111008	1K188, AM Audio AGC
D701,702	300111010	1S2472, Ind. Switching
D801,802	300313017	WZ-162, Zener Regulator, 16V½W
D803	300919026	1N4003, Regulator
D901-904	300919028	1N5404, Rectifier
D1001-1005	300414042	LN224RP, Signal Indicator
D1006,1007	300414042	LN224RP, Tuning Indicator, Stereo Ind.
D1009		
D1008	300414040	LN224GP, Tuning Ind. (Green)
IC101	303452251	HA-11225, FM IF Amp.
IC301	303452250	HA12003, MPX Decoder
IC401,402	303452192	HA-1457, Phono Amp.
IC601	303452249	SI-1725HD, Power Amp.
IC701	303452152	RC-4558, Tuning Ind. Decoder
IC702	303452188	LB-1405, Signal Ind. Decoder
COILS AND VARIABLE RESISTORS		
L101	226501131	FM ANT Coil
L102,104	226501132	FM RF Coil
L103	226501159	FM RF Coil
L105	226501158	FM OSC Coil
L106	226501127	470μH, RF Chocke Coil
L107	225501131	FM IFT
L108	226501125	18μH, Moving Phase
L109	225501139	FM IFT Quadrature Detector
L110	226501143	2.2μH, FM IF Trap. Coil
L201	223301138	MW OSC
L202	225301131	AM IFT 1st.
L203	225301132	AM IFT 2nd.
L204	225301133	AM IFT 3rd.
L205	223301137	LW OSC
L206	226501157	SW ANT
L207	223301139	SW OSC
L208	226501127	470μH, Chocke Coil
L301,302	228641180	18mH, 38KHz Filter
L303	228641137	19KHz Filter
L801,802	226501127	470μH, Chocke Coil
VR101,201	510502149	100KB, AM FM Signal Ind. Adj.
VR301,302	510502141	10KB, FM MPX VCO Separation Adj.

Schematic Location	Parts No.	Description
VR501	515121131	250KW, Balance Control
VR502	525121146	100KBx2, Volume Control
VR601,602	525101173	100KCx2, Treble Bass Control
VR701,702	510502153	10KB, Tuning Ind. Balance Adj.
OTHERS		
CT4,CT5	490110120	MW ANT, OSC Trimer
CT6,CT7	490110121	LW ANT, OSC Trimer
CT8,CT9	490110122	SW ANT Trimer
X101,102	229101171	10.7MA, Ceramic Filter
X201	229101207	SFU-455E, Ceramic Filter
C901,902	422680435	Smoothing Capacitor
S1	614010156	Switch, Muting/Mode
S2-7	614061215	Switch, Push 6-Key, FM, LW, MW, SW, Phono and Tape Monitor
	614061216	Switch, Push 4-Key, FM, AM, Phono and Tape Monitor
S8	614010155	Switch, Loudness
S9,10	614020432	Switch, Push 2-Key, Speaker B and A
S11	614010138	Switch, Power Supply (For BEAB) △
	614010139	Switch, Power Supply (For CSA)
S12,13	615212282	Switch, Slide, MW/SW, MW/FM
F001,002	341221350	Fuse, 3.5A, Speaker Protector (Long Size)
	345222350	Fuse, 3.5A, Speaker Protector (Mini Size)
	345252315	Fuse, 3.15A, Speaker Protector (Mini Size with S D Mark) △
F003,004	341221400	Fuse, 4A, Inside, Speaker Protector (CSA only)
F901,902	341221500	Fuse, 5A, AC Circuit Protector (Long Size)
	345222500	Fuse, 5A, AC Circuit Protector (Mini Size)
	345252500	Fuse, 5A, AC Circuit Protector (Mini Sized with S D Mark) △
F903	341221150	Fuse, 1.5A, Lamp Protector (Long Size)
	345222150	Fuse, 1.5A, Lamp Protector (Mini Size)
	345252150	Fuse, 1.5A, Lamp Protector (Mini Size with S D Mark) △







Key No.	Parts No.	Description	Key No.	Parts No.	Description
1.	111911510	Front Panel Ass'y (AM/FM)	36.	120012951	Support (L), Heat Sinker
	111911509	Front Panel Ass'y (SW/MW/LW/FM)	37.	120012952	Support (R), Heat Sinker
2.	116310307	Knob, 33 ϕ (For Tuning)	38.	120012949	Support (A), Pulley
3.	116310305	Knob, 20 ϕ (For Volume)	39.	120012950	Support (B), Pulley
4.	116310304	Knob, 13 ϕ (For Bass, Treble and Balance)	40.	141811032	Tuning Indicator Decoder PCB Ass'y
5.	116210074	Push Button (For Muting/Mode)	41.	114902322	Holder, LED Indicator PCB
6.	116210073	Push Button (For Function ect.)	42.	300414042	LED, Red
7.	114902328	Dial Window		300414040	LED, Green
8.	112011379	Dial Board (AM/FM)	43.	141811033	LED, Indicator PCB Ass'y
	112011380	Dial Board (SW/MW/LW/FM)	44.	141811034	LED, PCB (4)
9.	120012948	Dial Alumium Back Board	45.	127012255	Heat Sinker
10.	114902318	Frame, Push Button	46.	120012879	Support, IC
11.	114902319	Frame, Push Button	47.	141610341	Tone Amp PCB Ass'y
12.	658601130	Spring, Frame	48.	123011537	Rear Panel Ass'y (For CSA)
13.	114902320	Shaft, Frame		123011536	Rear Panel Ass'y (For UL)
14.	990201332	Sponge, Front Panel		123011538	Rear Panel Ass'y (Generator)
15.	990201136	Felt, Dial Window	49.	120012953	Support, Equalizer PCB
16.	990201334	Felt, Front Panel	50.	141510176	Equalizer PCB Ass'y
17.	990201335	Felt, Dial Board (Round)	51.	649201115	Terminal, screw, 4P
18.	990201333	Felt, Dial Board (square)	52.	648211247	Voltage Selector
19.	122011412	Front Chassis	53.	648211157	Holder, Fuse 2P
20.	770402207	Nut, M9		648211162	Holder, Fuse 2P (CSA UL)
21.	770500019	Washer, Inner	54.	642400114	Terminal, Push 4P, Speaker A and B
22.	141811044	Function Selector P.C.B. Ass'y (AM/FM)	55.	141810939	Speaker Terminal PCB Ass'y
	141811043	Function Selector P.C.B. Ass'y (SW/MW/LW/FM)	56.	648211116	AC Outlet Socket
23.	770911263	Cylinder Bush, Inner Screw	57.	624202206	Terminal, 6P, RCA Type
24.	991001171	Fiber, Insulation, Pilot Lamp	58.	990201331	Felt, Rear Panel
25.	614010138	Switch Power, Supply (For BEAB) Δ	59.	138011309	Upper Cover
	614010139	Switch Power, Supply (For UL CSA)	60.	705220408	Screw, + M4x8
26.	626110035	Jack Headphone	61.	770500002	Washer 4 ϕ
27.	654911289	Tuning Shaft	62.	766203006	Screw, + M3x6 STV
28.	120012947	Bottom Mask A	63.	726203006	Screw, + M3x6 BTV
29.	120012936	Support, P.C.B.	64.	673402025	Plastic Foot
30.	121011351	Chassis Body	65.	765204010	Screw, + M4x10 Pan
31.	120012937	Bottom Mask B	66.	726223010	Screw, + M3x10
32.	141311391	AM/FM IF PCB Ass'y (for 50us)	67.	766223006	Screw, + M3x8 STV BK
	141311392	AM/FM IF PCB Ass'y (for 75us)	68.	722203008	Screw, + M3x8 JT20
	141311393	SW/MW/LW/FM IF PCB Ass'y	69.	703213018	Screw, + M3x18 Pan
33.	651300020	Dial Pulley	70.	726203006	Screw, + M3x6 BTV
34.	141811040	Power Supply PCB Ass'y (With Long Size Fuse)	71.	766203006	Screw, + M3x6 STV
	141811041	Power Supply PCB Ass'y (With Mini Size Fuse)	72.	766223008	Screw, + M3x8 STV BK
	141811042	Power Supply PCB Ass'y (With Mini "s" Mark Fuse)	73.	770402201	Nut, M4
35.	201001508	Transformer, Power Supply (For CSA)	74.	770500004	Washer, 4.2 ϕ x10 ϕ x0.8 ^t
	207001507	Transformer, Power Supply (For BEAB) Δ	75.	770402201	Nut, M3
			76.	770500014	Washer,
			77.	770911113	Screw, 3x10
			78.	990201330	Felt, 46 ϕ
			79.	990201329	Felt, 30 ϕ
			80.	990201328	Felt, 22 ϕ

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