ROTEL

Technical Manual

AM/FM STEREO TUNER

RT-1025

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INHALTSVERZEICHNIS

TABLE DES MATIERES

Serial No. Beginning
NB09518

THE ROTEL CO., LTD. 1-36-8 OHOKAYAMA, MEGURO-KU, TOKYO 152, JAPAN
ROTEL ELECTRONICS CO., LTD. 310 SEC. 5, NANKING E. ROAD, TAIPEI, TAIWAN
ROTEL OF AMERICA, INC. 1055 SAW MILL RIVER ROAD, ARDSLEY, N.Y. 10502, U.S.A.

Instruments: AM Signal Generator and AC VTVM.

Notes: Set 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. 6 (on IF board) through a 0.01mfd capacitor.	455kHz (400Hz 30% mod.)	Non interfering at low end of scale.	AC VTVM to FIXED-OUT jack.	L206 (on IF board)	Maximum reading on VTVM.
2	Connect to short loop of wire. Radiate signal into ferrite loopstick antenna.	600kHz (400Hz 30% mod.)	600kHz		L204 (OSC) L205 (RF) (on IF board) and L003 ANT coil	
3		1,400kHz (400Hz 30% mod.)	1,400kHz		CT201 (OSC trim), CT203 (RF trim) & CT202 (ANT trim) (on IF pcb)	
4	Repeat steps 2 and 3 until no further improvement is noticed.					
5	Same as above Step 2. Set antenna input level to 5mV/m.	1,000kHz (400Hz 30% Mod.)	1,000kHz	Same as above	VR201 on IF pcb	Signal Meter indicates "9".

FM IF and RF Alignment

Instruments: FM Signal Generator, Oscilloscope and HD Analyzer

- Set Function Selector to FM position.
- Set potentiometer VR101 and 102 counterclockwise.
- Set potentiometer VR103 to its mid-position.

1. Connect Oscilloscope and HD Analyzer to Fixed Output jack. Connect FM Signal Generator (FM SG) to FM antenna terminals and receive 90MHz signal from FM SG. Set antenna input level to 10μV, by controlling attenuator of FM SG. Adjust FM IFT T1 on Front End to obtain maximum reading on Signal Meter.
2. Next tune the dial to a position where no broadcasting signal is coming in and receive clean noise. Adjust FM IFT L108 on IF pcb so that pointer needle rests at center of FM Tuning Meter.
3. Change Function Selector to AM position and check to see that the FM Tuning Meter pointer needle remains at the center as adjusted in step 2. If not, repeat adjustment of step 2.
   * The pointer needle tends to deviate because FM adjustment is done with the set erected or upside down.
4. Receive 90MHz signal from FM SG and adjust FM IFT L104 and L105 alternately and repeatedly so that the distortion is minimized. if the distortion of the monaural signal cannot be reduced by adjusting L104 and L105, slightly turn potentiometer VR101 on IF pcb clockwise. (Usually, there is no need to move VR101 from the formerly set position.)
5. Reduce the antenna input level to around 2μV. Tune the receiver to 90MHz on dial scale, and adjust FM OSC Coil LO on Front End to obtain maximum deflection on scope. At the same time, adjust RF Coil LR3, LR2, LR1 and LA on Front End to maximize sensitivity.
6. Then switch frequency of FM SG to 106MHz and adjust FM OSC trimmer capacitor TCO on Front End for correct reception with the dial tuned to 106MHz. At the same time adjust RF trimmer capacitor TCR3, TCR2, TCR1 and TCA on Front End to maximize sensitivity.
7. Repeat the steps 5 and 6 to obtain correct tracking and balanced sensitivity.
8. Receive 90MHz signal from FM SG, and set antenna input level to 1mV by controlling attenuator of FM SG. Adjust potentiometer VR103 on IF pcb so that Signal Meter indicates "9".

Caution:

Bandpass Filters (X101, 102, 103 and 104) incorporated in FM IF circuit are classified into 3 divisions according to their center frequencies. It is thus necessary to use the same frequency division when replacing Bandpass Filters. Divisions of bandpass frequencies are indicated by colored dots as shown in the following chart.

Color	Center Frequency	Tolerance
Red	10.70MHz	±30kHz
Blue	10.67MHz	
Orange	10.73MHz	

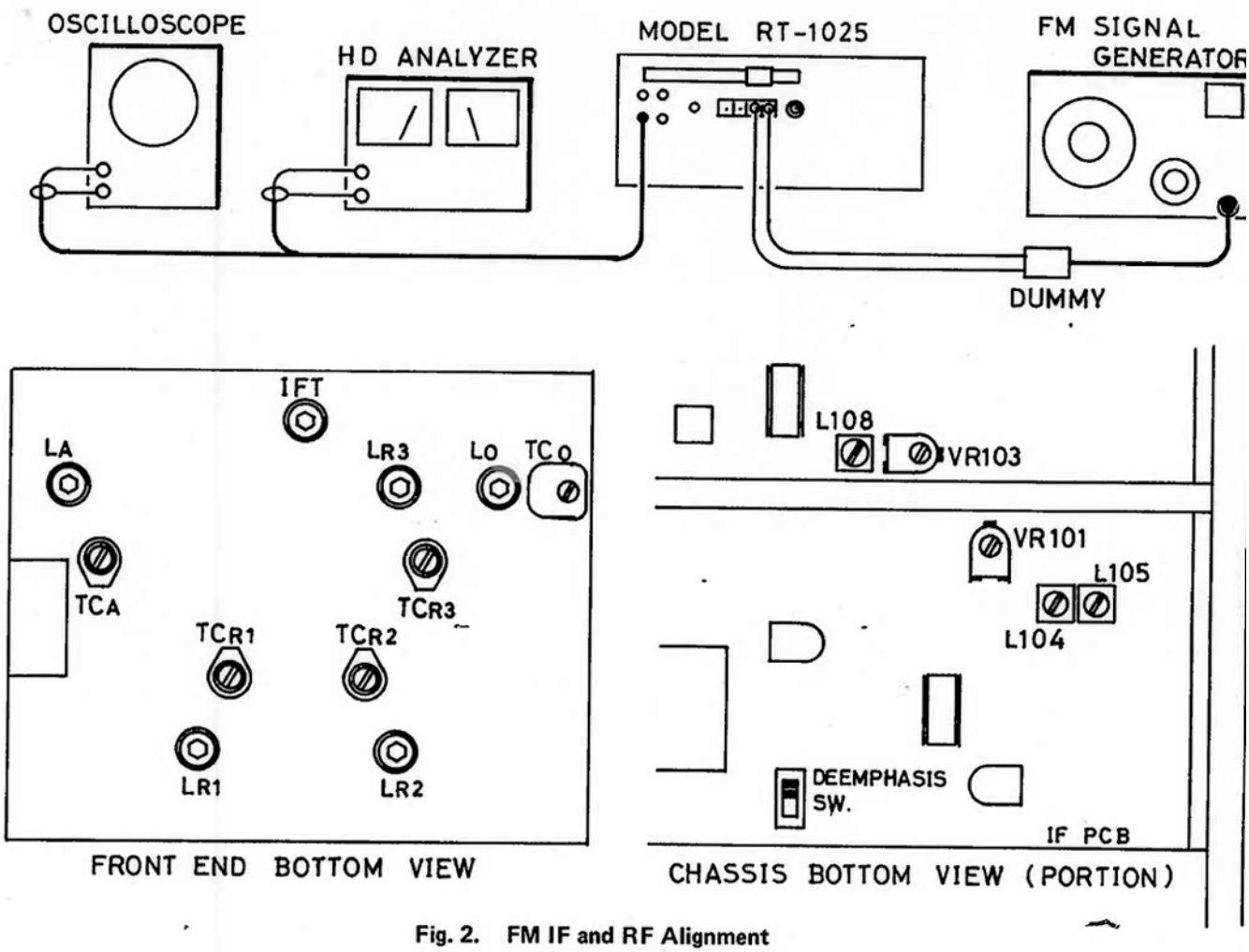


Fig. 2. FM IF and RF Alignment
Abb. 2. UKW-ZF- und HF-Einstellung
Fig. 2. Alignement FM IF et HF

FM MPX and Muting Level Alignment

Note: FM IF alignment must be completed before attempting this MPX alignment. Poor FM IF alignment will result in poor MPX alignment.

Instruments: FM Stereo Generator, AC VTVM, Oscilloscope and HD Analyzer.

- Set Function Selector to FM-AUTO.
- Set Muting and Hi-Blend Switch to OFF.
- Set potentiometer VR301 and 302 to their mid-position.

1. Connect oscilloscope and HD analyzer to R-ch Fixed Output jack. Connect FM Stereo Signal Generator to FM antenna terminals. Set the modulation of Stereo Generator to sub channel only. Set the antenna input level to 1mV by controlling the attenuator of Stereo Generator. Set frequency at 98MHz.
2. Receiving the signal, adjust potentiometer VR301 on IF pcb to the position where MPX circuit functions in stereo (Stereo indicator lights up). Usually, set the potentiometer at mid-position of Stereo range (see Fig. 3).
3. Adjust Coil L106 and potentiometer VR102 to obtain minimum distortion on HD Analyzer.
   (Adjust L106 and VR102 alternately and repeatedly.)
4. Disconnect HD Analyzer and connect AC VTVM in parallel with oscilloscope.
   Change Generator modulation from Sub Channel Only to Stereo Main + Sub.
   Pilot Tone 9%
   Audio Signal 1,000Hz (L-ch only) 90%
   Then, adjust potentiometer VR302 so that the leakage of signal into R-ch is minimum.
5. Switch the modulation of Stereo Generator from left to right, and reconnect oscilloscope and AC VTVM to L-ch Fixed Output jack. Then, make certain that the level of signal leakage into L-ch is equal to that into R-ch in preceding two items. If there is a great difference between leak-free effects of both channels, slightly adjust VR302 so that the levels of signal leakage of both channels are equal.
   Separation subsequent to adjustment is as follows:
   35dB* or over at 100Hz
   38dB* or over at 1,000Hz
   33dB* or over at 10kHz
   *Limit Spec.
6. Next, change the modulation of Pilot Tone of Stereo

certain that MPX circuit functions in Stereo.

7. Reduce the antenna input level to 30μV and set Muting Switch to 30μV position. Adjust potentiometer VR801 on muting switch pcb so that the output

8. Change the muting switch to 10μV position, and set the antenna input level to 10μV. Adjust potentiometer VR802 so that the output waveform on scope just disappears.

teur de sous-canal seul à principal et sous-canal stéréo.

Signal d'identification 9%

Signal audio 1.000Hz (canal gauche seul) . . .90%

Régler ensuite le potentiomètre VR302 de manière à ce que la fuite de signal dans le canal droit soit au minimum.

5. Commuteur la modulation du générateur stéréo de gauche à droite et rebrancher l'oscilloscope et le voltmètre électronique AC au jack de sortie fixe du canal gauche. Vérifier que le niveau de fuite de signal dans le canal gauche est égal à celui dans le canal droit pour les deux points précédents. S'il subsiste une grande différence entre les effets sans-fuite des deux canaux, régler légèrement VR302 de manière à ce que les niveaux de fuite de signal des deux canaux soient égaux.

35dB* ou au dessus pour 100Hz

38dB* ou au dessus pour 1.000Hz

33dB* ou au dessus pour 10kHz

*Caractéristique limite

6. Passer ensuite la modulation du signal d'identification du générateur stéréo de 9% à 5% et vérifier que le circuit MPX fonctionne en stéréo dans cette circonstance.
7. Réduire le niveau d'entrée de l'antenne à 30μV et placer la touche de sourdine sur la position 30μV. Régler le potentiomètre VR801 sur la plaquette de la touche de sourdine de facon à ce que la forme de l'onde de sortie disparaisse de sur l'écran.
8. Passer la touche de sourdine sur la position 10μV et régler le niveau d'entrée de l'antenne à 10μV. Régler le potentiomètre VR802 de manière à ce que la forme de l'onde de sortie disparaisse de sur l'écran.

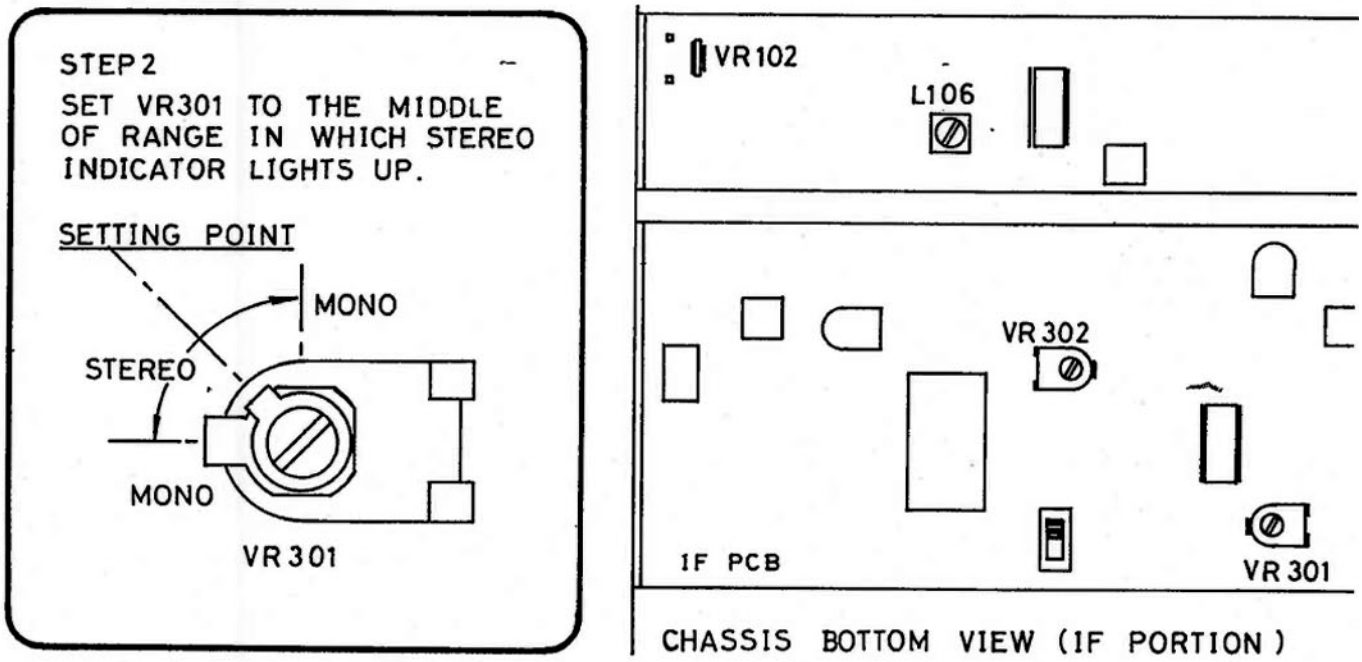


Fig. 3. FM MPX Alignment
Abb. 3. UKW-MPX-Einstellung
Fig. 3. Alignement FM MPX

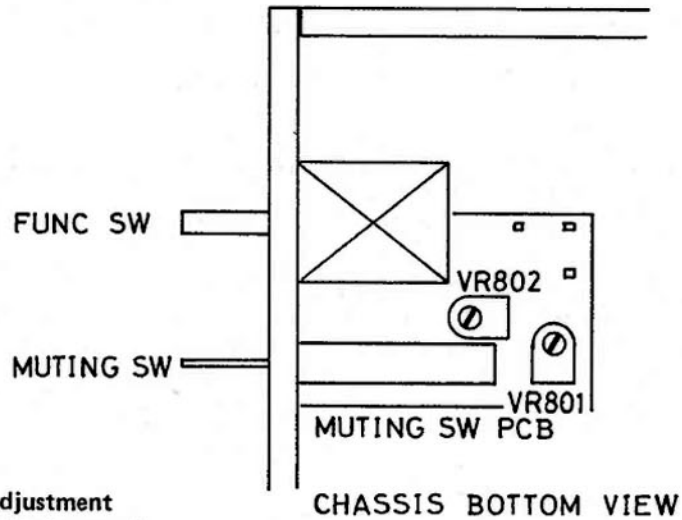
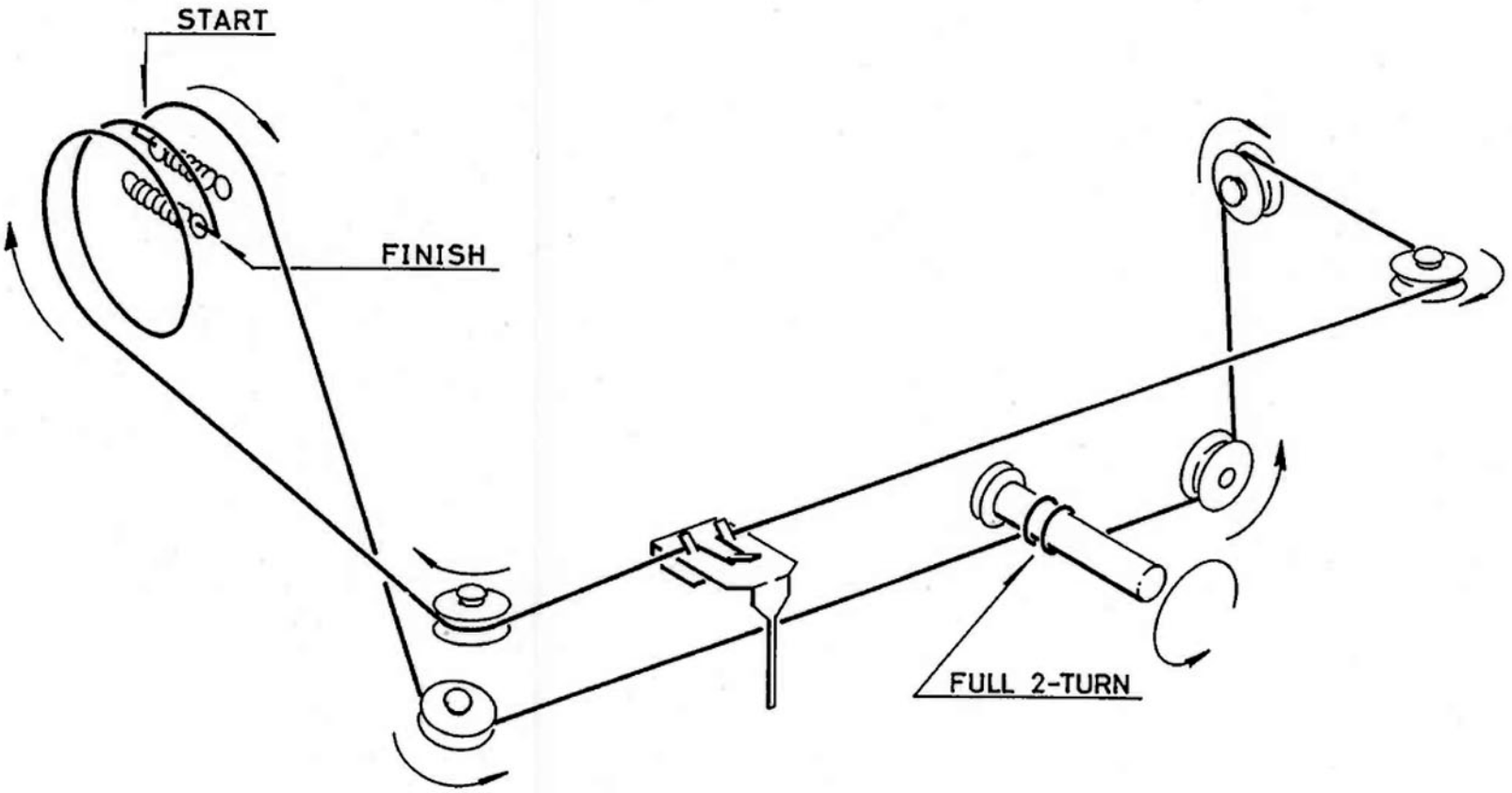


Fig. 4. Muting Level Adjustment
Abb. 4. Einstellung des Mutingpegels
Fig. 4. Réglage du niveau de sourdine

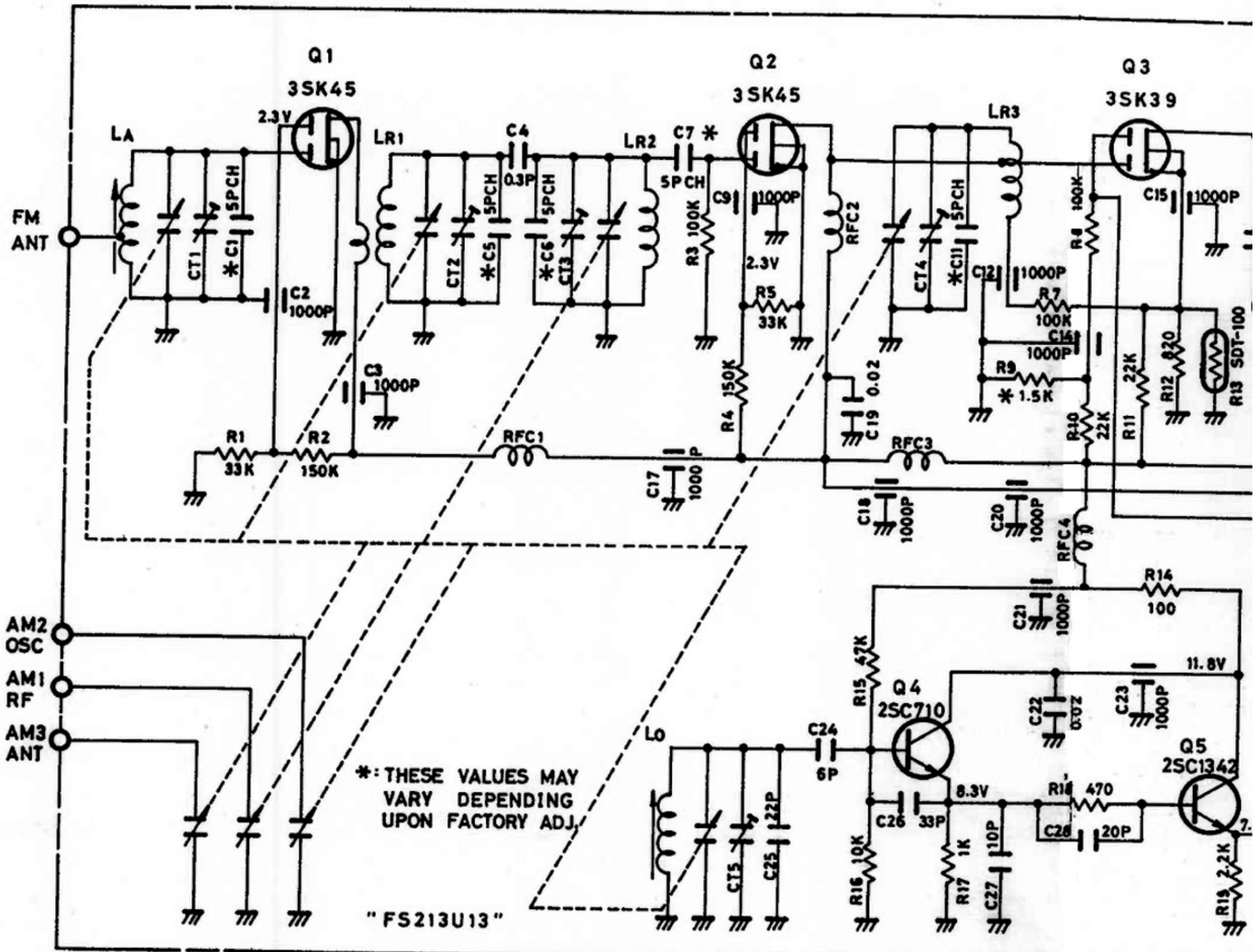
Dial Stringing Diagram

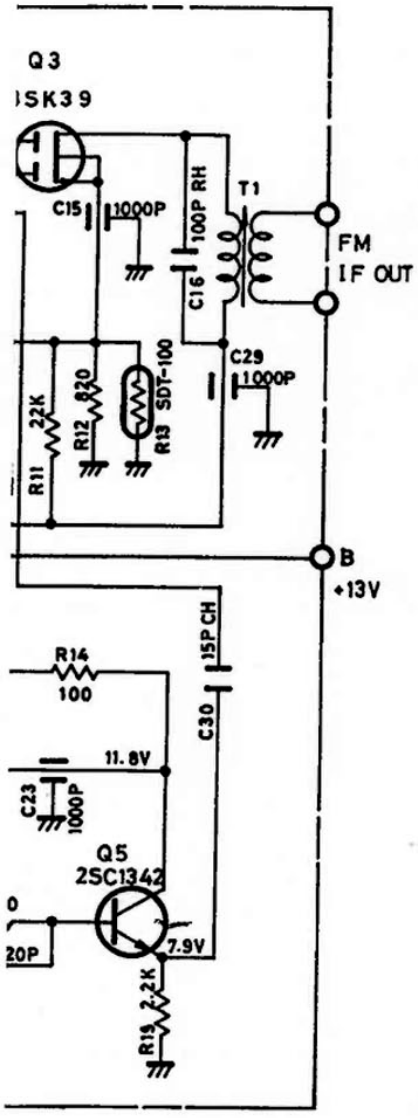


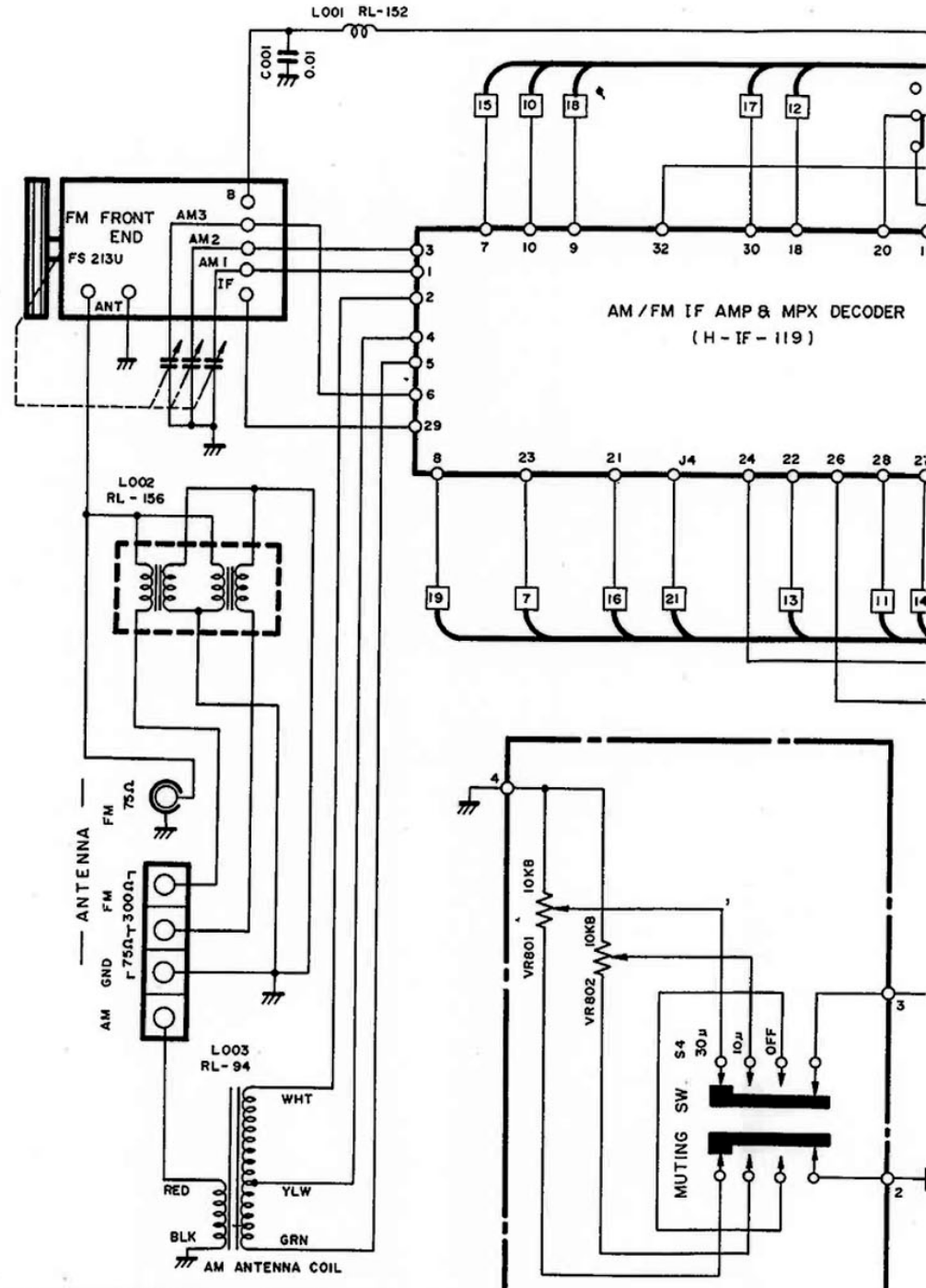
Note: Carry out stringing with the front end set at VC maximum.

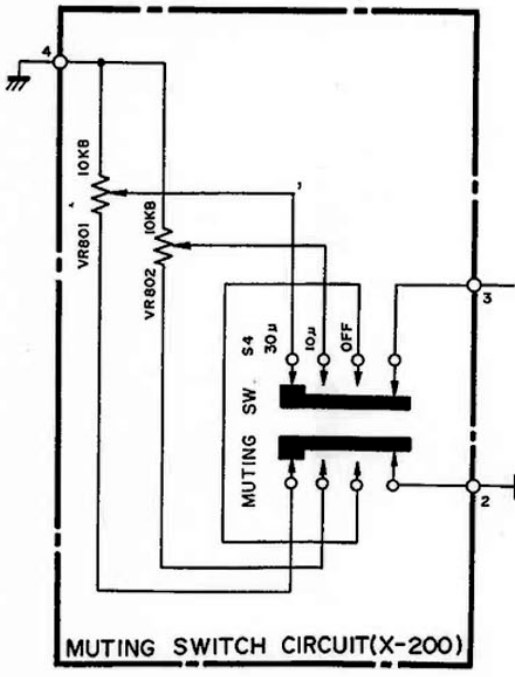
Schematic Location	Part No.	Description
TRANSISTORS, DIODES AND IC'S		
Q101, 109, 110, 111, 112, 113, 201, 302, 305, 306	301201115	2SC828, Multipath Amp, etc.
Q102, 103, 104, 105, 106, 107, 108	301201117	2SC829, FM IF Amp
Q202, 301, 303, 304, 601, 602 603, 604, 605 606	301201134	2SC1327, Composite Amp, Phones Amp, etc.
Q607, 608	301301134	2SD571, Phones Power Amp
Q609, 610	301101124	2SB605, Phones Power Amp
Q901	301301131	2SD526, (or 2SC1826 Part No. 301201169) Stabilizer
D101, 102, 103, 201	300111008	1K188, Multipath Rect, AM S-meter Rect
D104, 105	300111010	1S2473, FM Det
D106	300212002	KB265, FM S-meter
D107, 108, 301, 302, 303, 304, 305, 601, 602	300212004	KB269, FM Muting Bias, Phones Amp Bias, etc.
D901	300313016	WZ-210, Regulator, 21V, 0.5W
D902, 903	300919024	SR1K-4, Rectifier
D002	300414005	SEL-102S, FM Stereo Ind
IC101	303452146	HA-1137W, FM IF Amp
IC201	303452157	μPC-30C, AM Conv & IF Amp
IC301	303452151	HA-1156W, MPX Decoder
COILS AND TRANSFORMERS		
L101	226501137	Quadrature Coil
L102, 103, 107, 901, 001	226501141	47μH, RF Choke
L104	225501125	FM IFT, Discriminator (Pri)
L105	225501127	FM IFT, Discriminator (Sec)
L106, 108	226501122	FM IFT, 10.7MHz, Tune
L201, 202, 203	226501124	2μH, RF Choke
L204	223301131	AM OSC Coil
L205	226501130	AM RF Coil
L206	229101183	AM IFT, 455kHz Tune
L207	228641119	AM Low Pass Filter
L301	228641118	FM Low Pass Filter
L002	226501140	FM Antenna Matching Trans
L003	222391130	AM Antenna Coil Ass'y
T001	205001414	Power Transformer (Multi-voltage)
	207001414	Power Transformer (120/220/240V)
	201001414	Power Transformer (117V only)
VARIABLE RESISTORS		
VR101, 103	510502154	50KB, FM Dist. Adj, FM S-meter Adj
VR102	510502166	500B, FM Stereo Dist Adj
VR201	510502155	100KB, AM S-meter Adj
VR301, 302	510502153	10KB, FM Stereo Adj, Separation Adj
VR601	525101148	50KAx2, Output Level Control
VR602	525101139	50KBx2, Phones Level Control

Schematic Location	Part No.	Description
OTHERS		
CT201, 202, 203	490110115	24pF max Trimmer Capacitor
X101, 102, 103 104	229101171	FM Bandpass Filter, 10.7MHz
M001	231310065	FM Multipath Meter
M002	231310064	FM Tuning Meter
M003	231310063	Signal Strength Meter
S1	601011286	Function Selector
S2, 3, 7	611001241	Lever Switch, Hi-Blend, Multipath, etc.
S4	611001239	Lever Switch, Muting
S5	614010127	Power Switch
S6	613000024	Deemphasis (50μS-75μS) Switch
	321304383	AM/FM Front End
PL001 ~004	352126030	Lamp, Dial Light
	648211135	Bracket, Dial Lamp
	626110025	Headphones Receptacle
	624200204	Pin Jack, 4P
	624200101	Pin Jack, 1P
	642400110	Antenna Terminal
	648211141	AC Outlet
	628111111	Socket, FM 75-ohm
	141311379	AM/FM IF Circuit Board Ass'y
	141810741	Variable Output Amp Circuit Board Ass'y
	141810740	Phones Amp Circuit Board Ass'y
	141810742	Power Supply Circuit Board Ass'y with Long Fuse
	141810743	Power Supply Circuit Board Ass'y with Midget Fuse
	141810744	Power Supply Circuit Board Ass'y (CSA Approved)
	111911385	Front Panel Ass'y with Handles
	116310166	Knob, Tuning
	116310160	Knob, Function, etc.
	116310147	Knob, Muting, Hi-Blend, etc.
	116210030	Button, Power
	138011269	Bonnet
	124011276	Bottom Cover
	670101111	Handle
	673501118	Foot
	791001125	FM Indoor Antenna
	791001112	Connection Cord
	654911293	Tuning Shaft Ass'y
	725223008	Screw, 3 x 8mm (BLK) Bonnet Mtg
	716224008	Screw, 4 x 8mm (BLK) with Washer, Bonnet Mtg
	725214008	Screw, 4 x 8mm, Bottom Cover Mtg
	705216014	Screw, 6 x 14mm, Handle Mtg
	701213006	Screw, 3 x 6mm, Front Panel Mtg
	756001060	Spring Washer, ø6.2, Handle Mtg
	761911144	Nut, Stabilizer Transistor Mtg
	992001111	Isolating Washer, Stabilizer Transistor Mtg
	151691126	Dial Pointer
	787121125	Dial String, 2.1m
	651300015	Dial Pulley
	658601121	Dial Spring
	648211146	Fuse Clip, Long Fuse Mtg
	648211147	Fuse Clip, Midget Fuse Mtg


Q1
3SK45
Q2
3SK45
Q3
3SK39
Q4
2SC710
Q5
2SC1342
FM ANT
AM2 OSC
AM1 RF
AM3 ANT
LA
LR1
LR2
LR3
2.3V
11.8V
8.3V
*: THESE VALUES MAY VARY DEPENDING UPON FACTORY ADJ.
"FS213U13"







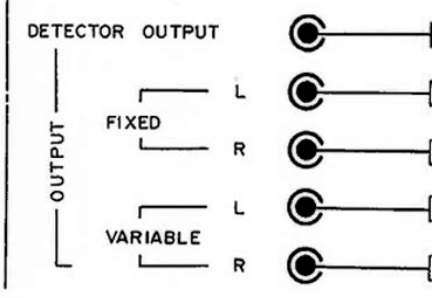
RESISTORS

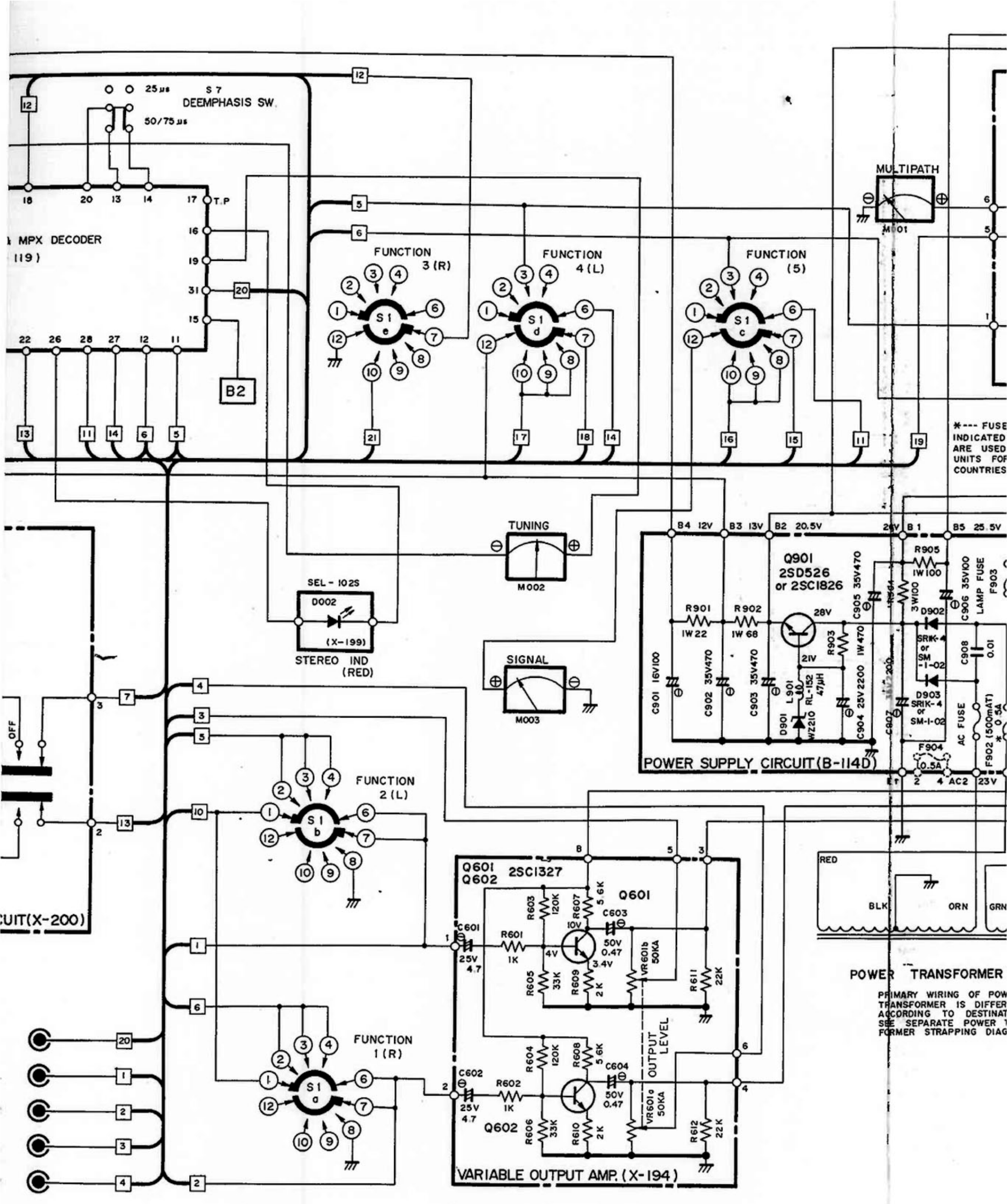
5 % TOLERANCE UNLESS OTHERWISE NOTED
K ---KILO OHM
M ---MEGA OHM
▼---COMPOSITION RESISTORS 1/2 WATT
NONMARK--- LOW NOISE TYPE CARBON RESISTORS 1/4 WATT

CAPACITORS

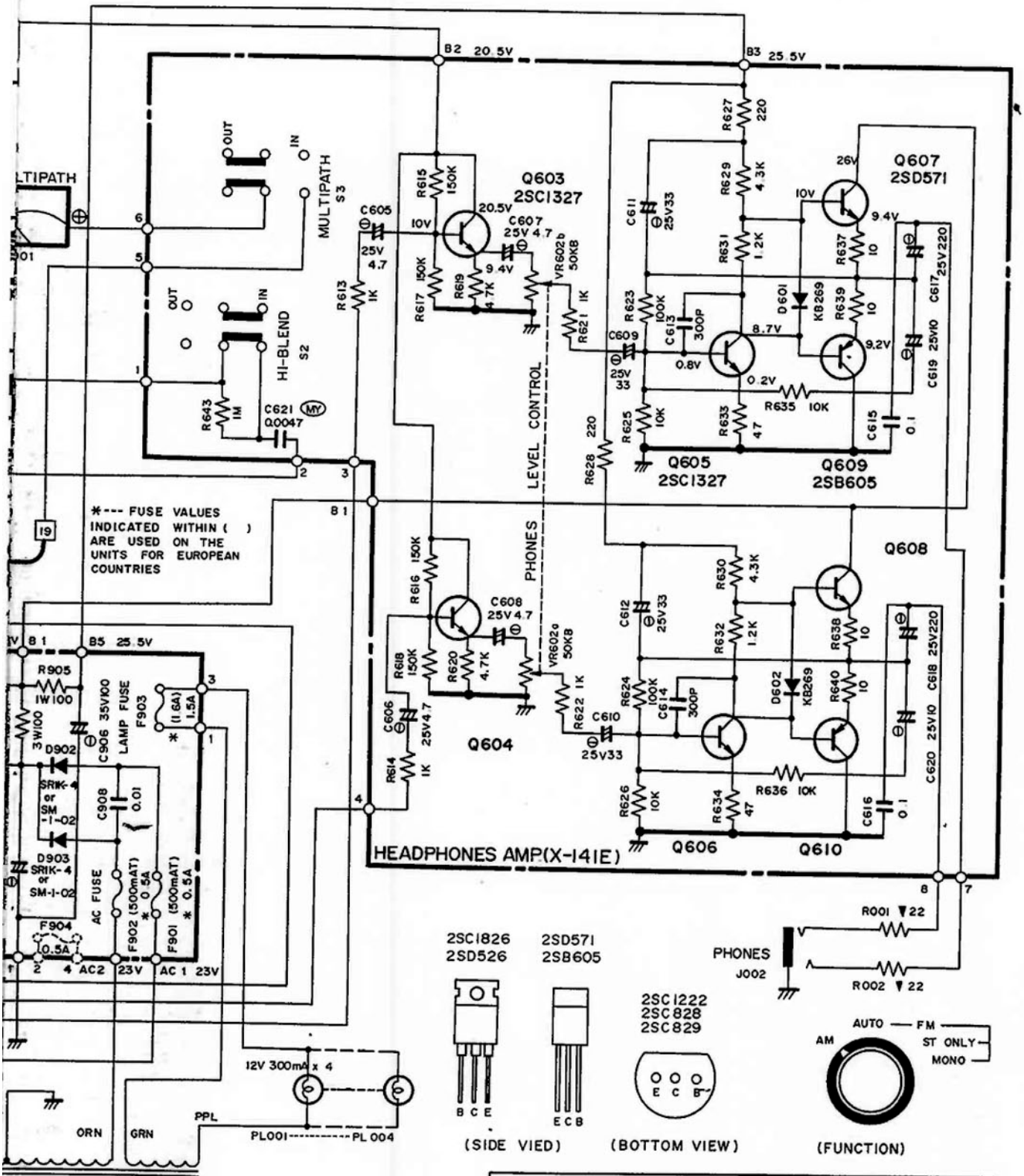
(MY)--MYLAR FILM CAPACITORS
(AL)--SINTERED ALUMINUM SOLID ELECTROLYTIC (ALSICON)
(S)--POLYSTYRENE FILM CAPACITORS
(T)--TANTALUM CAPACITORS
(N)--LOW NOISE TYPE CAPACITORS
⊣⊢--ELECTROLYTIC CAPACITORS
★--TEMPERATURE COEFFICIENT CAPACITORS
NONMARK-- CERAMIC CAPACITORS

- UNLESS OTHERWISE NOTED IN SCHEMATIC ALL CAPACITANCE VALUES ARE EXPRESSED IN MFD.
- VOLTAGE READING WITH VTVM FROM THE POINT SHOWN TO THE CHASSIS GROUND.
- VOLTAGE READING MAY VARY ± 20%.





25µs
S 7
DEEMPHASIS SW.
50/75µs
MPX DECODER
T.P
FUNCTION 3 (R)
FUNCTION 4 (L)
FUNCTION (5)
MULTIPATH
M001
B2
*--- FUSE
INDICATED
ARE USED
UNITS FOR
COUNTRIES
TUNING
M002
B4 12V
B3 13V
B2 20.5V
26V B1
B5 25.5V
R905
1W100
Q901
2SD526
or 2SC1826
C905 35V470
C906 35V100
LAMP FUSE
F903
D902
SRIK-4 or SM-1-02
R901
1W22
R902
1W68
28V
21V
R903
1W470
C908
0.01
SEL-102S
D002
(X-199)
STEREO IND
(RED)
SIGNAL
M003
C901 16V100
C902 35V470
C903 35V470
L901 RL-152 47µH
D901 WZ210
C904 25V2200
C907
D903
SRIK-4 or SM-1-02
AC FUSE
F902 (500mAT) * 0.5A
F904
0.5A
AC2
23V
POWER SUPPLY CIRCUIT (B-114D)
FUNCTION 2 (L)
RED
BLK
ORN
GRN
CUIT(X-200)
Q601
Q602
2SC1327
R603 120K
R607 5.6K
C603
50V 0.47
VR601b 50KA
C601
25V 4.7
R601 1K
10V
4V
3.4V
R605 33K
R609 2K
R611 22K
POWER TRANSFORMER
PRIMARY WIRING OF POW
TRANSFORMER IS DIFFER
ACCORDING TO DESTINAT
SEE SEPARATE POWER T
FORMER STRAPPING DIAG
OUTPUT LEVEL
FUNCTION 1 (R)
R604 120K
R608 5.6K
C604
50V 0.47
C602
25V 4.7
R602 1K
Q602
VR601a 50KA
R606 33K
R610 2K
R612 22K
VARIABLE OUTPUT AMP. (X-194)

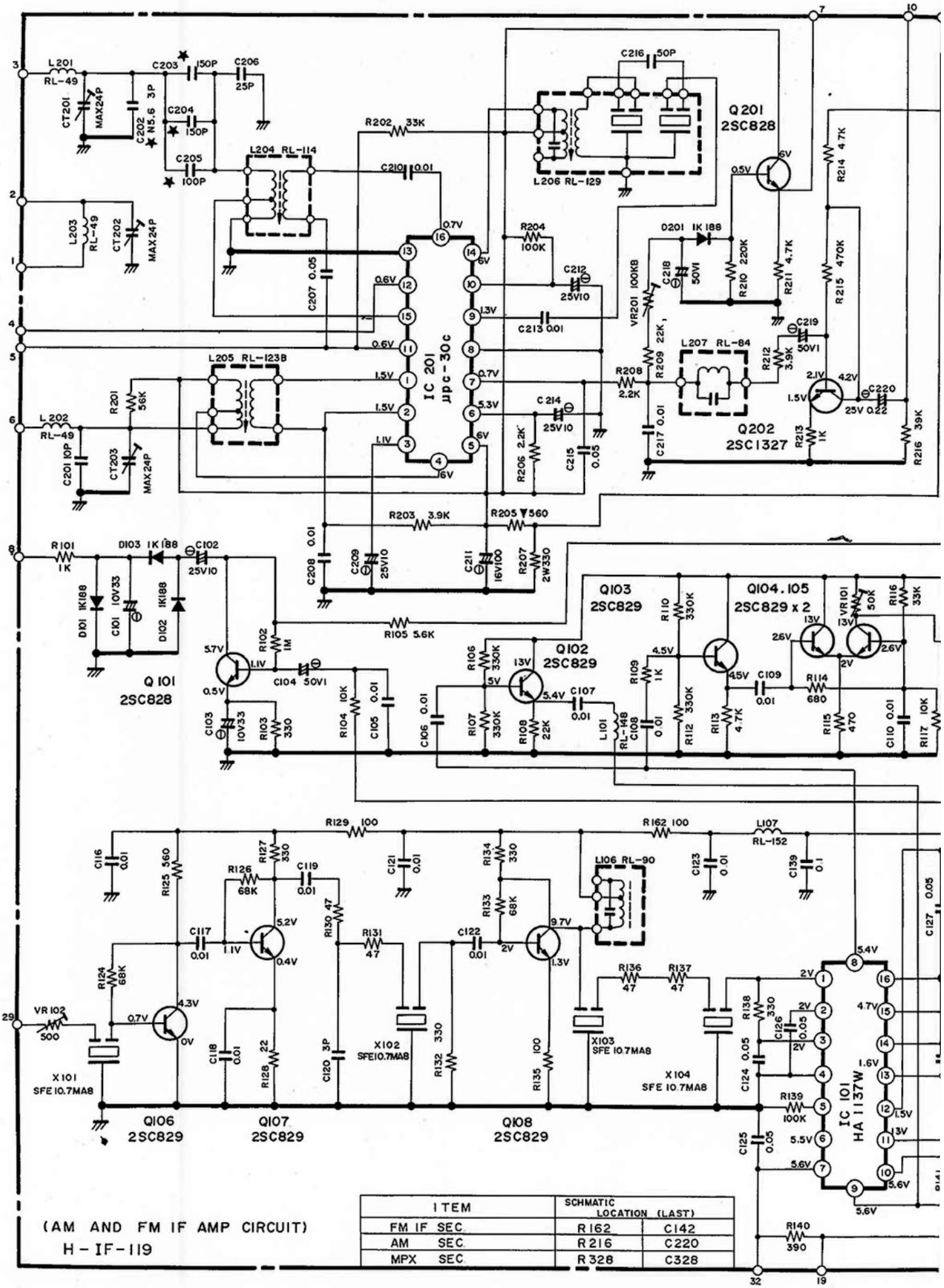


TRANSFORMER (T-078)

MARY WIRING OF POWER
NSFORMER IS DIFFERENT
CORDING TO DESTINATION.
SEPARATE POWER TRANS-
MER STRAPPING DIAGRAM.

ITEM	SCHMATIC LOCATION (LAST)	
VRIABLE OUTPUT AMP.	R612	C604
HEADPHONES AMP	R640	C620
MUTING SW.	R801	——
POWER SUPPLY CIRCUIT	R905	C908
CHASSIS	R003	C003

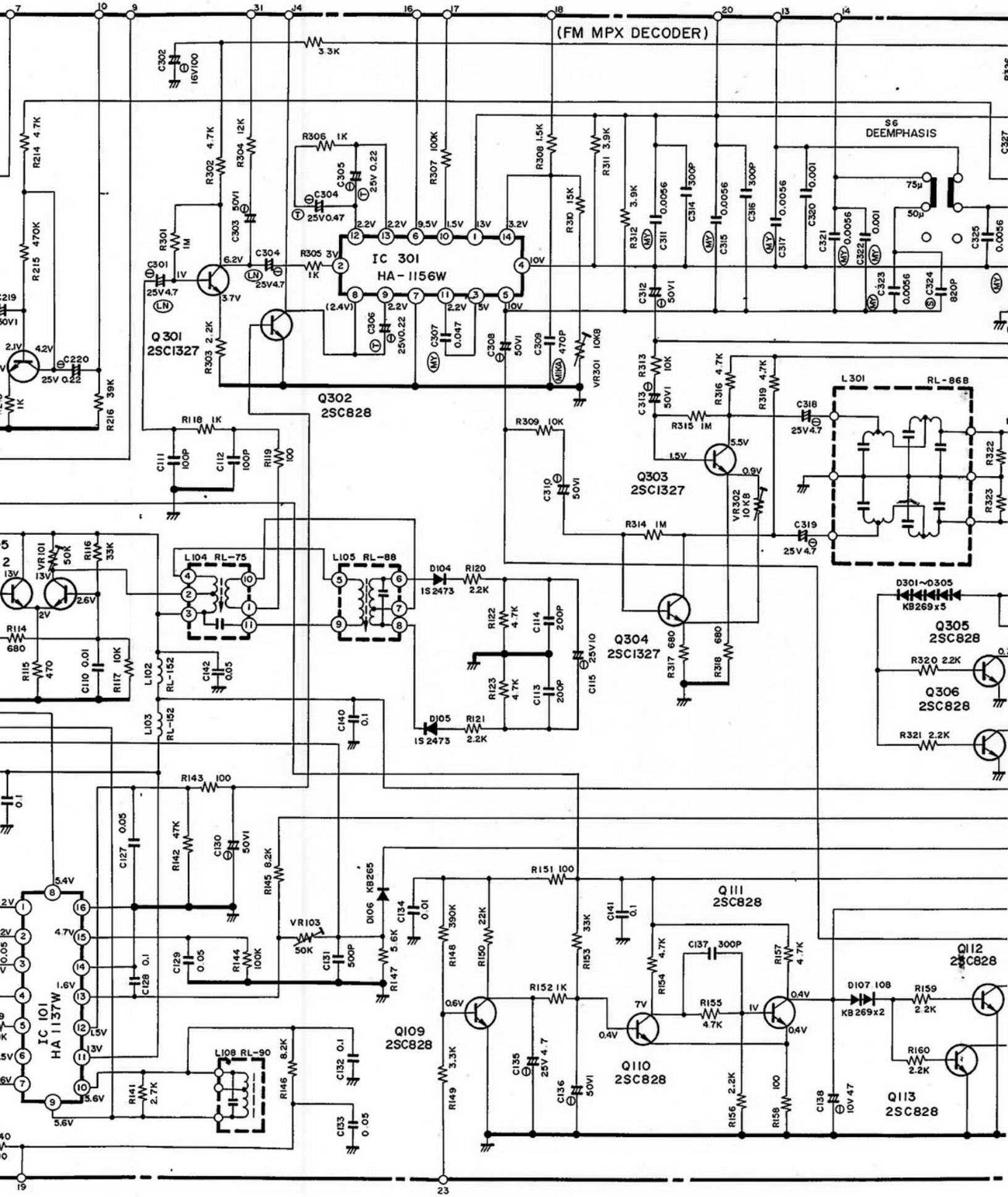
MODEL RT-1025 SCHEMATIC DIAGRAM



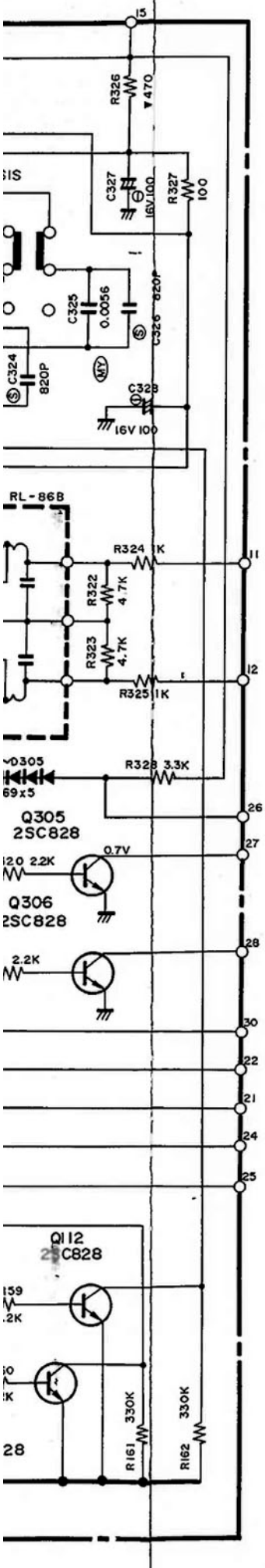
(AM AND FM IF AMP CIRCUIT)

H-IF-119

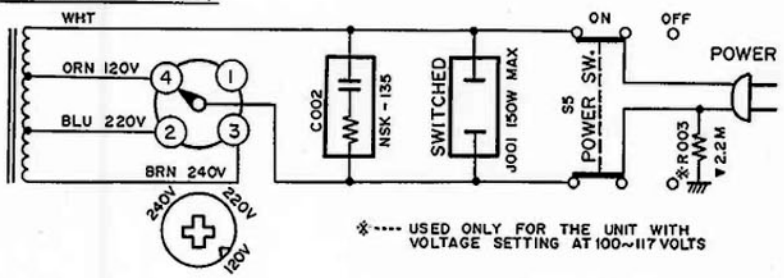
ITEM	SCHMATIC LOCATION (LAST)	
FM IF SEC.	R162	C142
AM SEC.	R216	C220
MPX SEC.	R328	C328


(FM MPX DECODER)
IC 301
HA-1156W
IC 101
HA 1137W
Q301
2SC1327
Q302
2SC828
Q303
2SC1327
Q304
2SC1327
Q305
2SC828
Q306
2SC828
Q109
2SC828
Q110
2SC828
Q111
2SC828
Q112
2SC828
Q113
2SC828
S6
DEEMPHASIS
L101 RL-86B
L102 RL-152
L103 RL-152
L104 RL-75
L105 RL-88
L108 RL-90
D104 IS2473
D105 IS2473
D106 KB265
D107 108
KB269x2
D301~D305
KB269x5
VR101 50K
VR103 50K
VR301 10KB
VR302 10KB

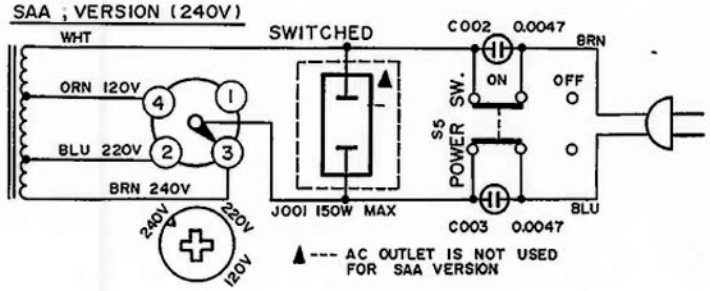
MODEL RT-1025 SCHEMATIC DIAGRAM



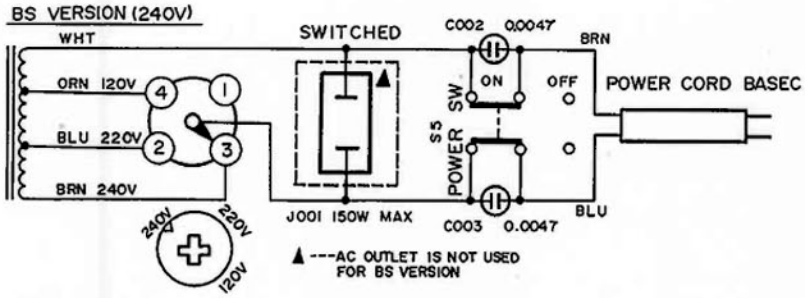
STANDARD (120V)



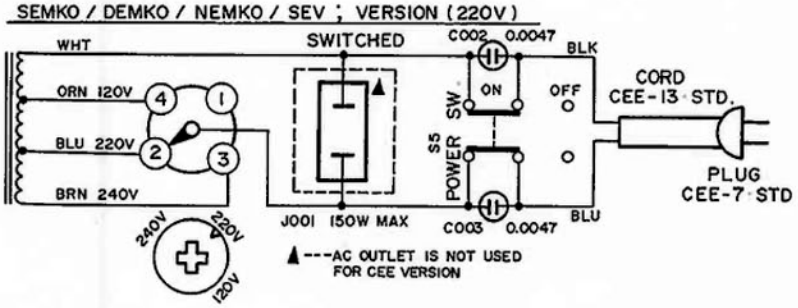
SAA ; VERSION (240V)



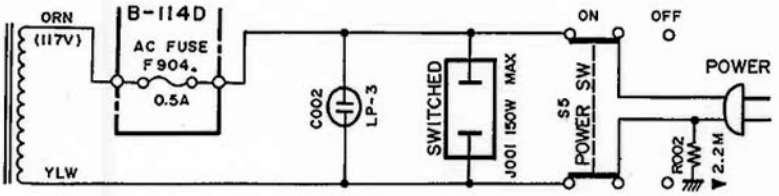
BS VERSION (240V)



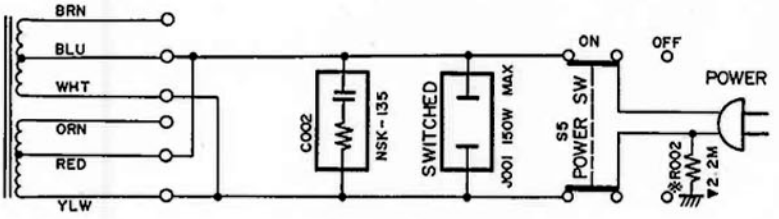
SEMKO / DEMKO / NEMKO / SEV ; VERSION (220V)

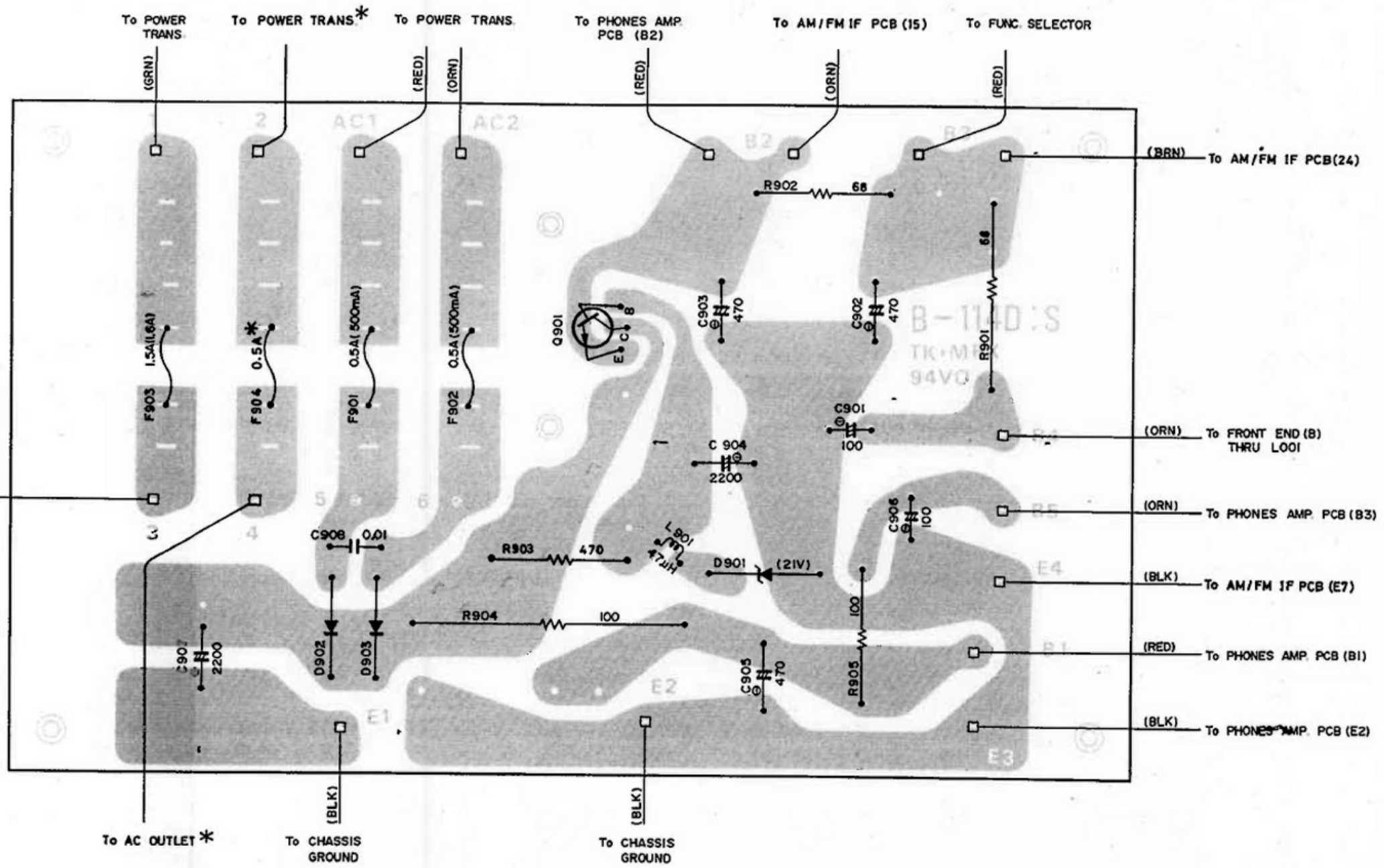


CSA (117V)



C-TYPE (100V)





* USED ONLY FOR CSA APPROVED UNITS