ROTEL®

RT-624 RT-824

RT-624

RT-824

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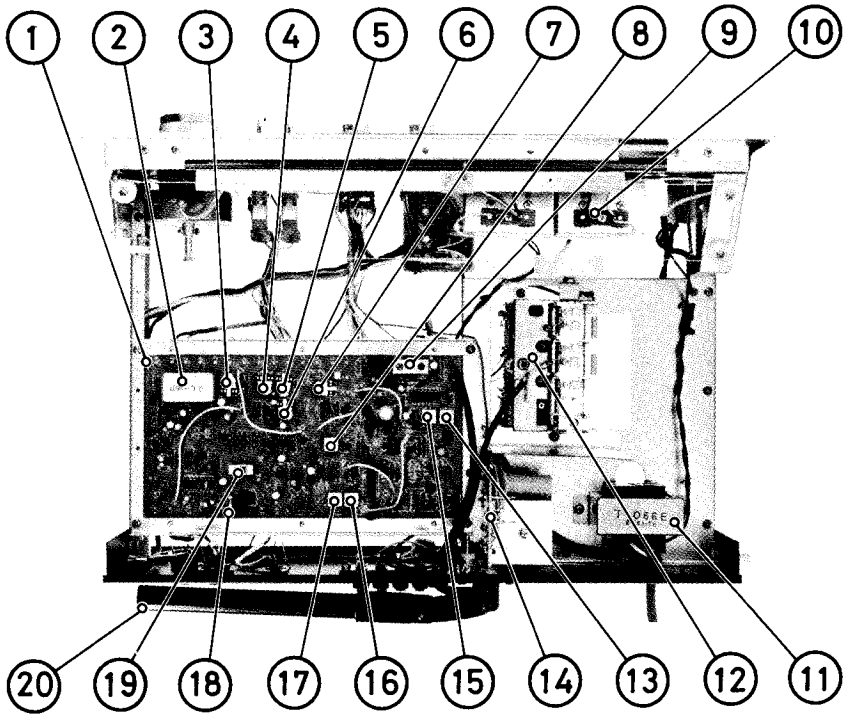

CHASSIS BOTTOM VIEW

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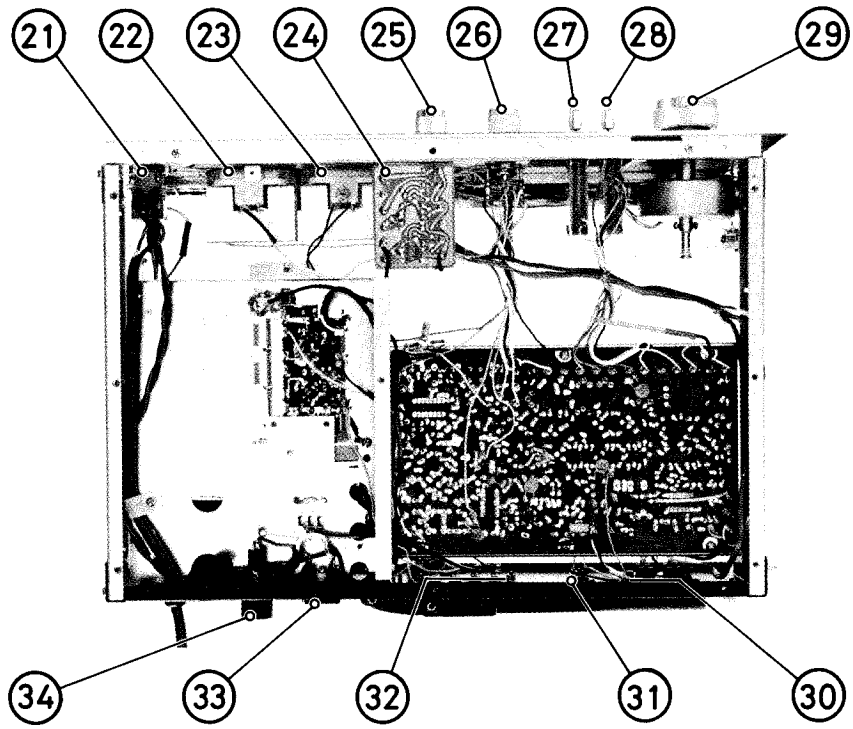

RT824 CHASSIS LAYOUT

CHASSIS TOP VIEW

1. VR802, FM Muting Level (30μV) Adj.
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28. L105, FM Low Pass Filter
29. VR102, FM Stereo Auto-Switching Level Adj.
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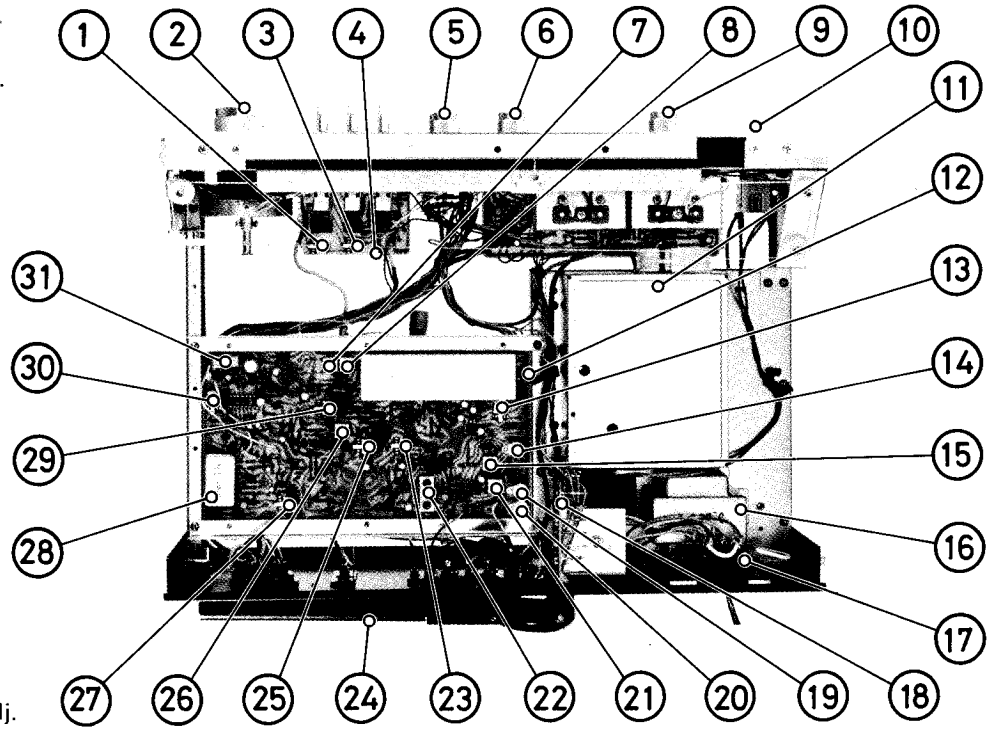
31. S6, FM De-emphasis Switch



CHASSIS BOTTOM VIEW

32. Audio Amp. Circuit Board
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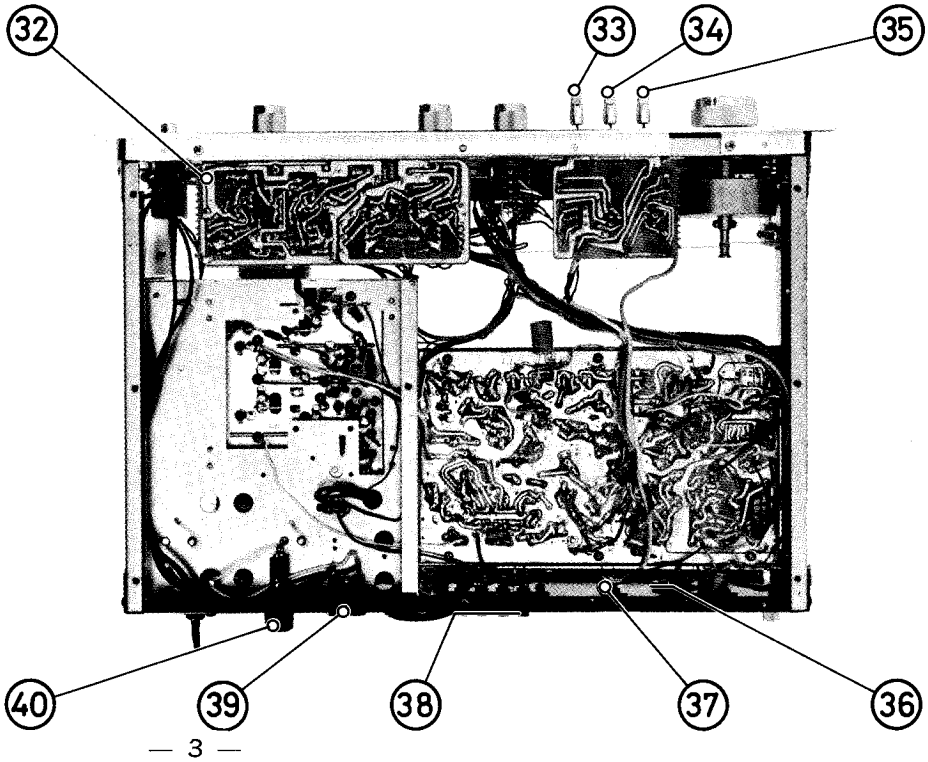
36. Output Jack
37. FM 4-ch. Signal Output Jack
38. Antenna Terminal Strip
39. AC Outlet
40. AC Fuse



AM IF & RF ALIGNMENT PROCEDURE

Instruments: AM Signal Generator and AC VTVM.
Notes: Set Function Selector to AM position.
Input signal must be kept as low as possible to avoid AVC action.

Step	Generator		Tuning Dial Setting	Output Indicator	Adjust	Adjust for
	Connected to	Frequency		Connected to		
1	Pin No.3 = RT-624, Pin No.4 = RT-824, (on IF pcb) thru a 0.01 mfd capacitor	455 kHz (400 Hz 30% Mod.)	Non interfering at at low end of scale	AC VTVM to OUTPUT jack	L105 and 104 = RT-624, L206 = RT-824, (on IF pcb)	Maximum reading on AC VTVM.
2	Test Loop Radiate signal into ferrite loopstick antenna	600 kHz (400 Hz 30% Mod.)	600 kHz on Dial scale		L103 (OSC) and 004 (ANT) coil = RT-624 L205, (OSC), L204 (RF) and 003 (ANT) coil = RT-824	
3		1400 kHz (400 Hz 30% Mod.)	1400 kHz on Dial scale		CT6 (OSC) and CT5 (ANT) = RT-624, CT203 (OSC), CT202 (RF) and CT201 (ANT) = RT-824	
4	Repeat steps 2 and 3 until further improvement is noticed.					

AM SIGNAL METER ADJUSTMENT (RT-824 ONLY)

1. Adjust the potentiometer VR202 so as to indicates "0" point at no signal input.
2. Then adjust the potentiometer VR201 so as to indicates "8" point at 1,000 kHz 50mV/m signal input.

AM ALIGNMENT HOOK-UP (RT624)

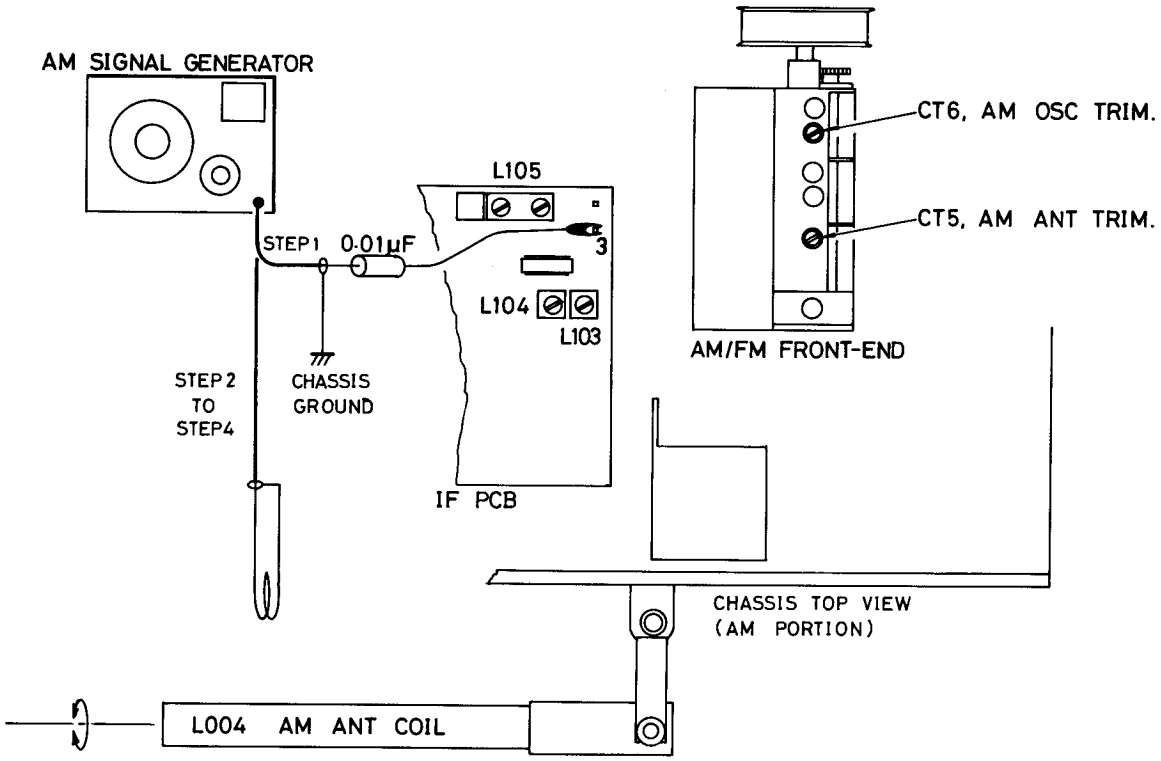


Fig.1-1

AM ALIGNMENT HOOK-UP (RT824)

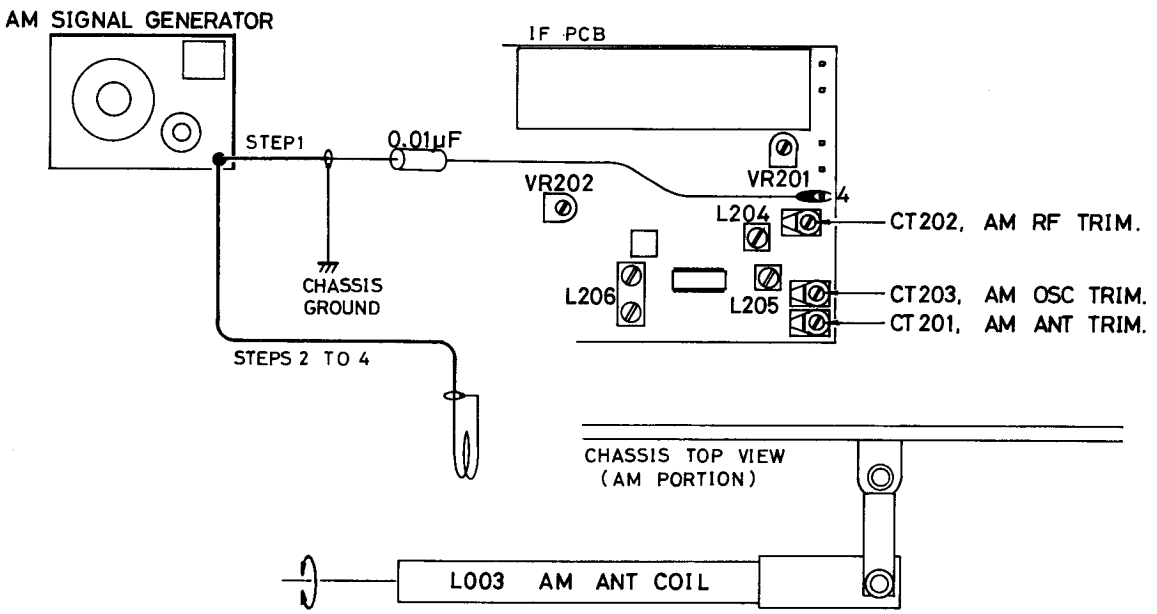


Fig.1-2

FM IF & RF ALIGNMENT PROCEDURE

Instruments: FM Signal Generator and H.D. Analyzer
Set Function Selector to "FM" (RT-624); "FM AUTO" (RT-824).

Step	Generator		Tuning Dial Setting	Output Indicator	Adjust	Adjust for
	Connected to	Frequency		Connected to		
1	No signal input		Non interfering appears on band	FM Tuning Meter (M002)	L102 = RT-624, L104 = RT-824 (on IF pcb)	FM Tuning Meter indicates the Center of the scale
2	FM Signal Generator		FM Tuning Meter indicates the center of the scale	H.D. Analyzer	T1 (on Front-end)	Maximum reading on level meter of H.D. Analyzer
	To FM antenna terminals	98 MHz (400 Hz 100% Mod.)		To output jack		
3					L101 = RT-624, L103 = RT-824, (on IF pcb)	Minimum reading on Distortion meter of H.D. Analyzer
Note: When the indication of FM Tuning meter is off from the center of the scale in spite of the above adjustment Step 3, fine adjust L102 = RT-624, L104 = RT-824, so that the FM Tuning meter just indicates center point.						
4	FM Signal Generator		90 MHz on dial scale	H.D. Analyzer	L4 (OSC), L3, 2 (RF) and L1 (ANT) = RT-624 L0 (OSC), LR3, LR2, LR1 (RF) and LA (ANT) Coil = RT-824	Maximum reading on level meter of H.D. Analyzer
	To FM antenna terminals Note: Signal strength must be kept-3dB of limiter satulation	90 MHz (400 Hz 100% Mod.)		To output jack		
5		106 MHz (400 Hz 100% Mod.)	106 MHz on dial scale		CT4 (OSC), CT3, 2 (RF) and CT1 (ANT) Trim. = RT-624 CT5 (OSC), CT4, 3, 2 (RF) and CT1 (AUT) Trim. = RT-824 (on Front-end)	
6	Repeat the above steps 4 and 5 until no further improvement is noticed.					

FM SIGNAL METER LEVEL ADJUSTMENT

Set Signal Generator frequency to 90 MHz, and set the FM antenna input level to 1mV by controlling the ATT of Signal Generator.

Receive the signal from Signal Generator, and adjust potentiometer, VR303 = RT-624, VR101 = RT-824, (on IF pcb) so that the Signal Meter indicates toward "9" on the scale.

FM MUTING LEVEL ADJUSTMENT

Instruments: FM Signal Generator and Oscilloscope.

1. Connect FM Signal Generator to FM antenna terminals. Set Signal Generator frequency to 90 MHz and adjust attenuator to obtain the antenna input level of 30μV.
2. Receiving the signal, adjust FM IFT, L301 = RT-624, L101 = RT-824, to obtain maximum reading on Signal Meter (M001). Then, set Muting switch to "30μV" position, and adjust potentiometer, VR302 = RT-624, VR802 = RT-824, until the waveform on the oscilloscope vanishes.
3. Change the Muting switch to "10μV" position. Set the antenna input level to 10μV and adjust potentiometer, VR301 = RT-624, VR801 = RT-824, until the waveform on the oscilloscope vanishes.

RT-624 & RT-824 FM IF & RF ALIGNMENT HOOK UP

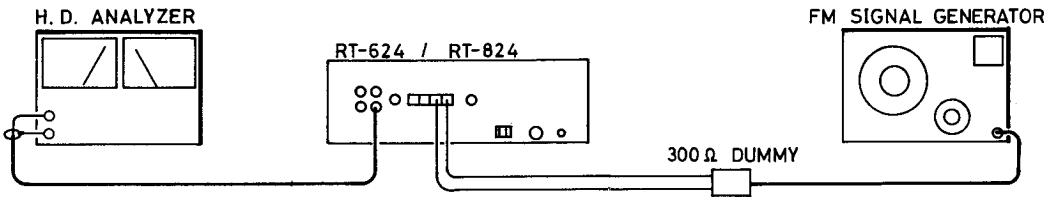


Fig.2-1

RT-624 IF PCB AND FRONT-END LAYOUT

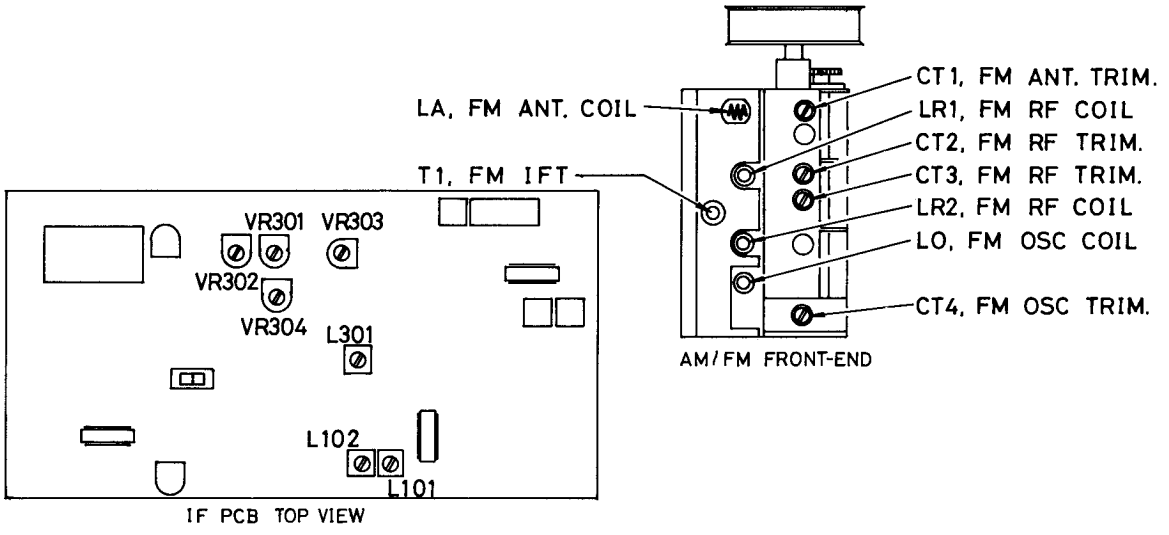


Fig.2-2

RT-824 IF PCB AND FRONT-END LAYOUT

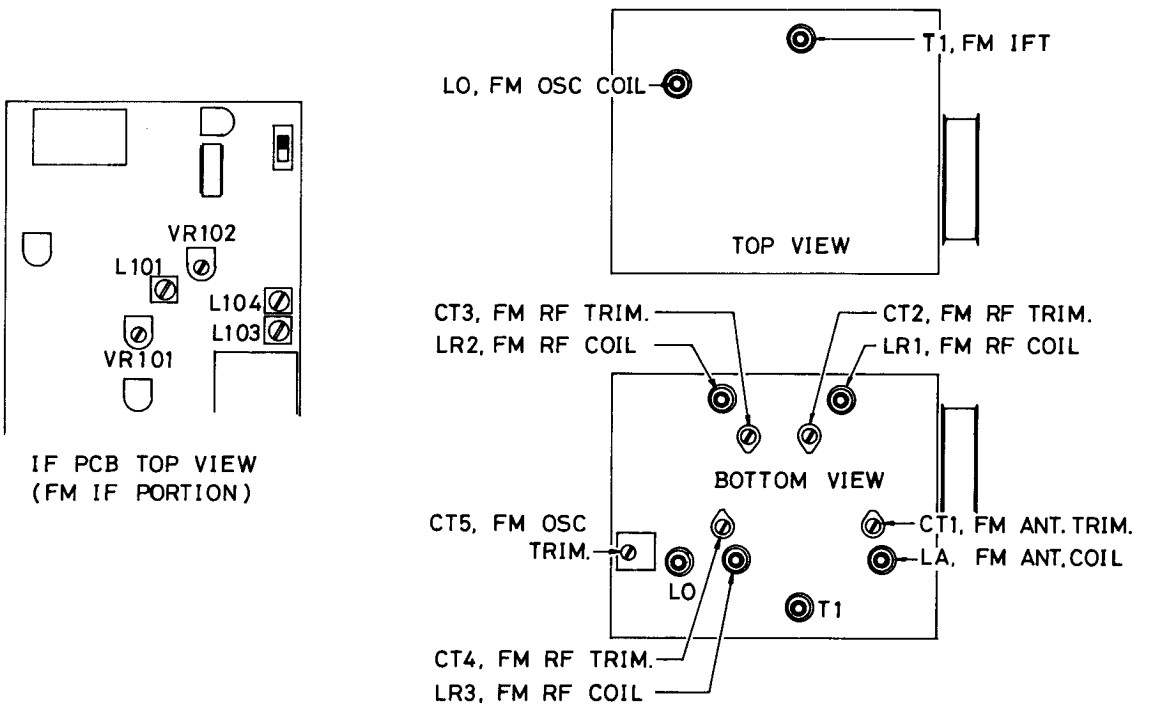


Fig.2-3

FM MPX ALIGNMENT PROCEDURE (RT-624·RT-824)

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

Instruments: FM Stereo Generator, AC VTVM and Oscilloscope.

a. Set Function Selector to "FM Stereo" = RT-624, "FM AUTO" = RT-824,
b. Set Muting and Hi-Blend switch to "OFF".
c. Connect FM Stereo Generator to FM antenna terminals, and set the frequency at 98 MHz (if a disrupting signal appears, select another frequency).
d. FM Stereo Generator modulation is as follows:
   Pilot Signal 10%
   Modulation frequency 1 kHz (L-ch.) 90%

1. Connect Oscilloscope and AC VTVM to OUTPUT (Right channel) jack. Receiving FM Stereo Generator signal, rotate and set the potentiometer, VR305 = RT-624, VR103 = RT-824, at the middle of range in which Stereo Indicator lights up.
2. Then rotate and adjust potentiometer, VR306 = RT-624, VR104 = RT-824, so that the leakage of signal into Right channel is minimum.
3. Switch the modulation of FM Stereo Generator from Left to Right, and reconnect oscilloscope and AC VTVM to OUTPUT (Left channel) jack. Then make certain the level of signal leakage into Right channel is equal to that into Left channel in preceding two items. If there is an excessive difference between leak-free effects of both channels, slightly adjust VR306 = RT-624, VR104 = RT-824, so that the levels of signal leakage of both channels are equal.
   Separation subsequent to adjustment is as follows:

Frequency	RT-624	RT-824
1 kHz	33dB or more	35dB or more
100 Hz	30dB or more	30dB or more
10 kHz	20dB or more	28dB or more

4. After reducing the modulation of pilot signal of Stereo Generator to zero, increase it gradually and make certain the Stereo indicator lights up when the modulation degree comes to 5%.

FM MONO-STEREO AUTO-SWITCHING LEVEL ADJUSTMENT PROCEDURE (RT-624·RT-824)

1. Connect a VTVM and Oscilloscope to the OUTPUT jack (LEFT or Right).
2. Feed the FM signal whose MPX has been varied into the FM ANT terminals.
   MPX VARIATION:
   Pilot 10%
   Modulation Frequency 1KHz Left or Right
   RF Deviation ±45KHz
3. Set the frequency at 98 MHz (when there is a disrupting signal, choose another setting).
4. Set Function Selector "FM Stereo"=RT-624, "FM AUTO"=RT-824.
5. Set potentiometer, VR304=RT-624, VR102=RT-824, to mid-positions.
6. Adjust the FM MPX so that the distortion and separation will be best.
7. Adjust the VR304=RT-624, VR102=RT-824; so that when the antenna input level is 5μV, Stereo will switch in and when the input is below the 5μV level, Mono will switch in.
8. After adjustment, check to make sure that, indeed, when the antenna input level exceeds 5μV, Stereo will switch in.

FM MPX ALIGNMENT HOOK-UP (RT-624/RT-824)

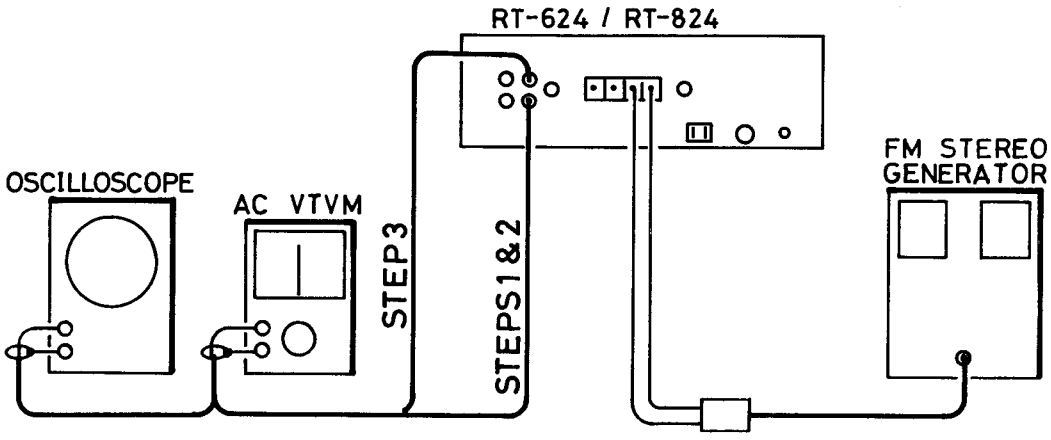
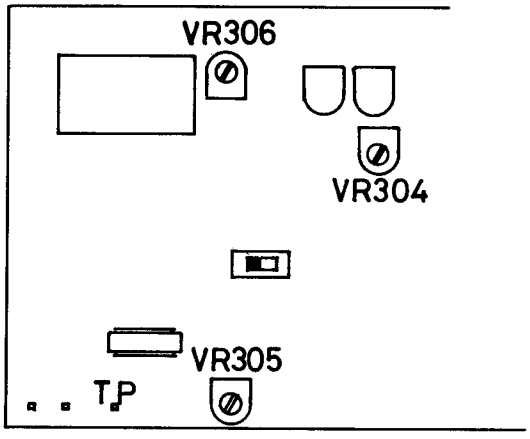


Fig. 3-1

IF PCB LAYOUT (MPX PORTION)

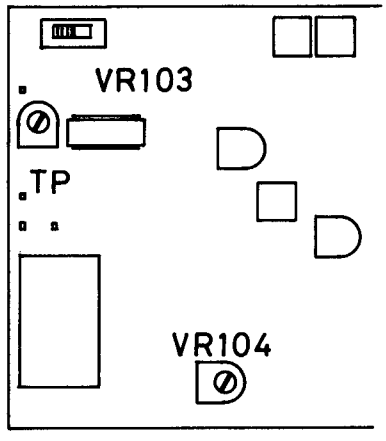
RT-624



IF PCB TOP VIEW (MPX PORTION)

Fig. 3-2

RT-824



IF PCB TOP VIEW
(MPX PORTION)

Fig.3-3

FM MPX ALIGNMENT PROCEDURE (RT-624/RT-824)

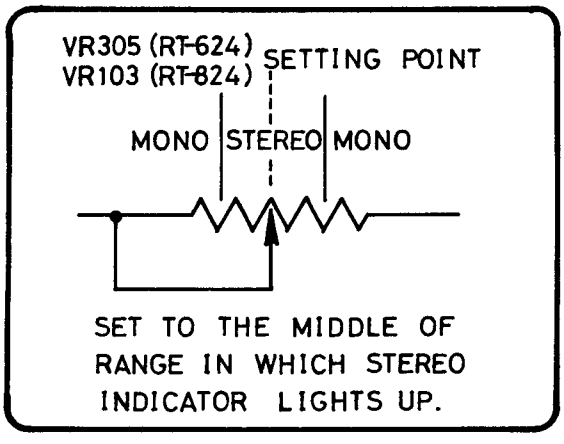
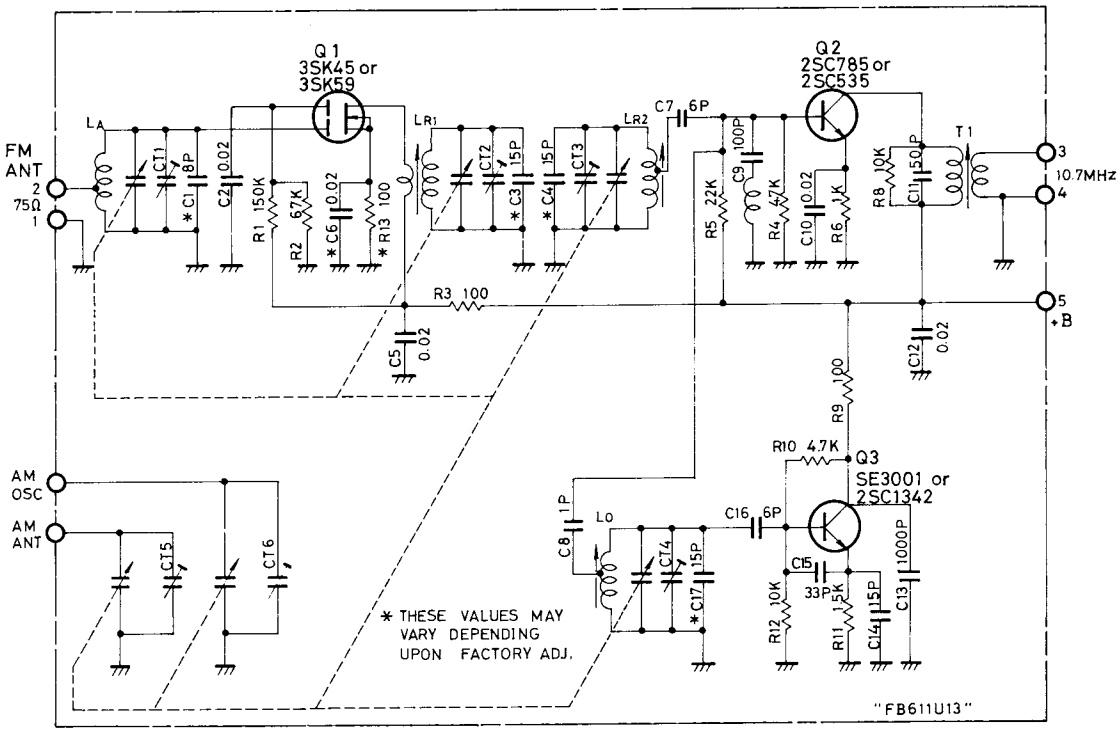


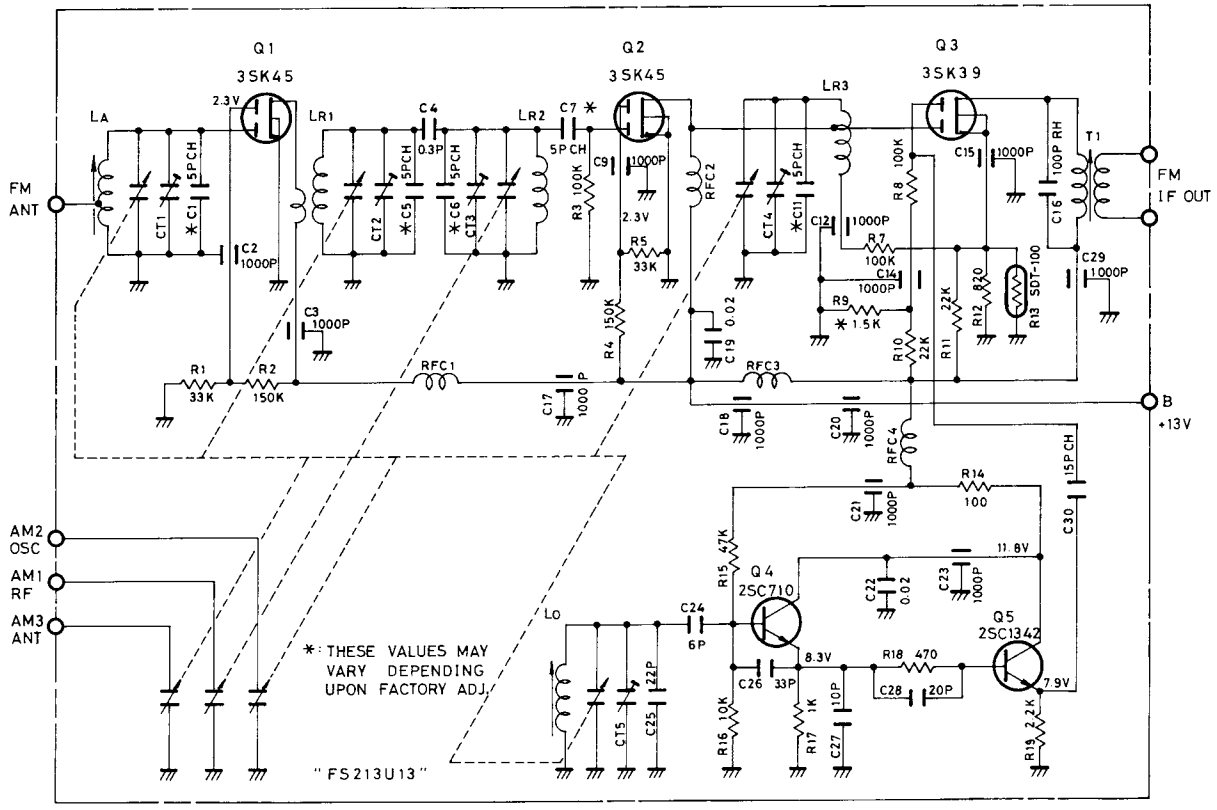
Fig. 3-4

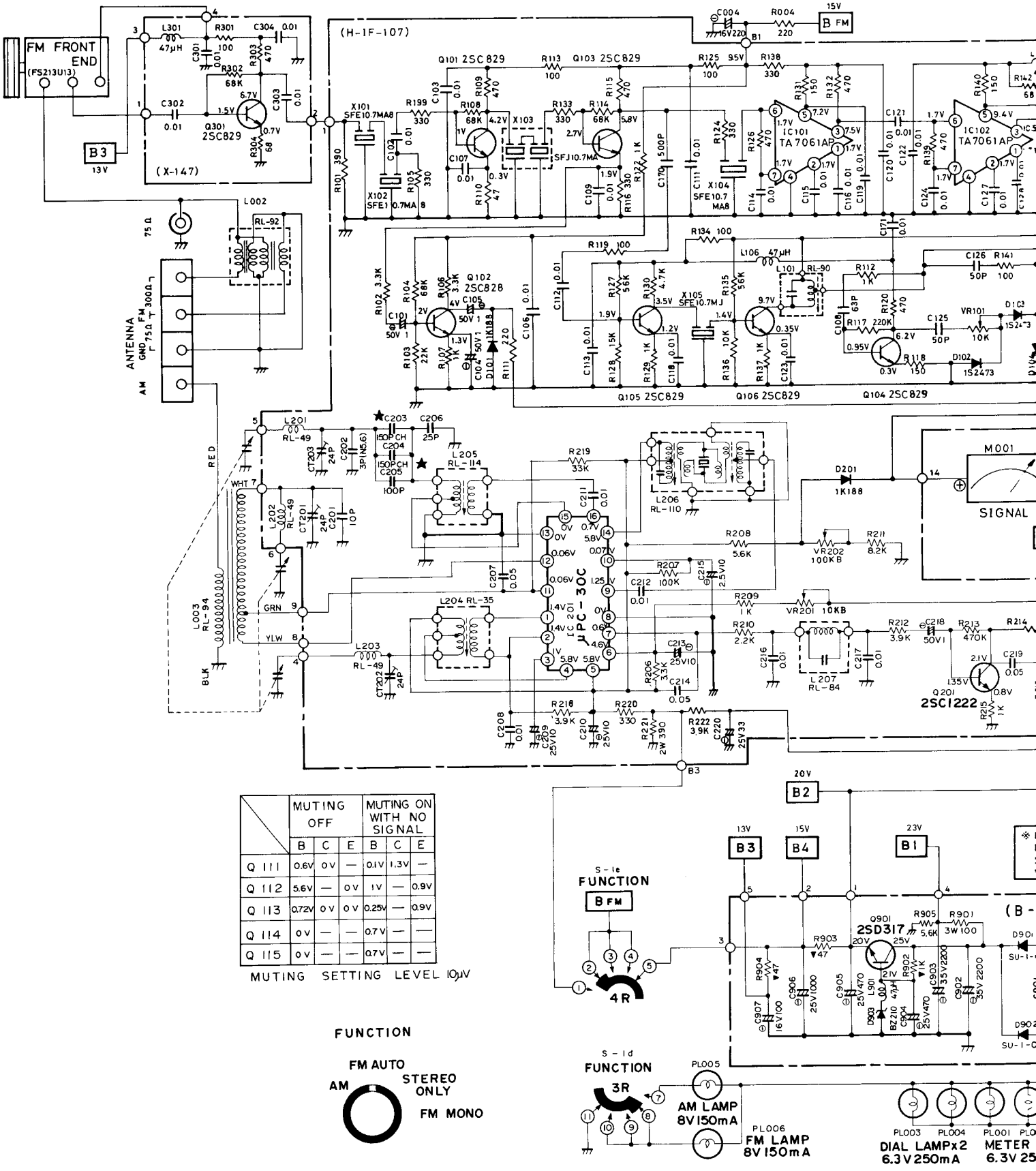
FRONT-END SCHEMATIC DIAGRAM

RT-624



RT-824

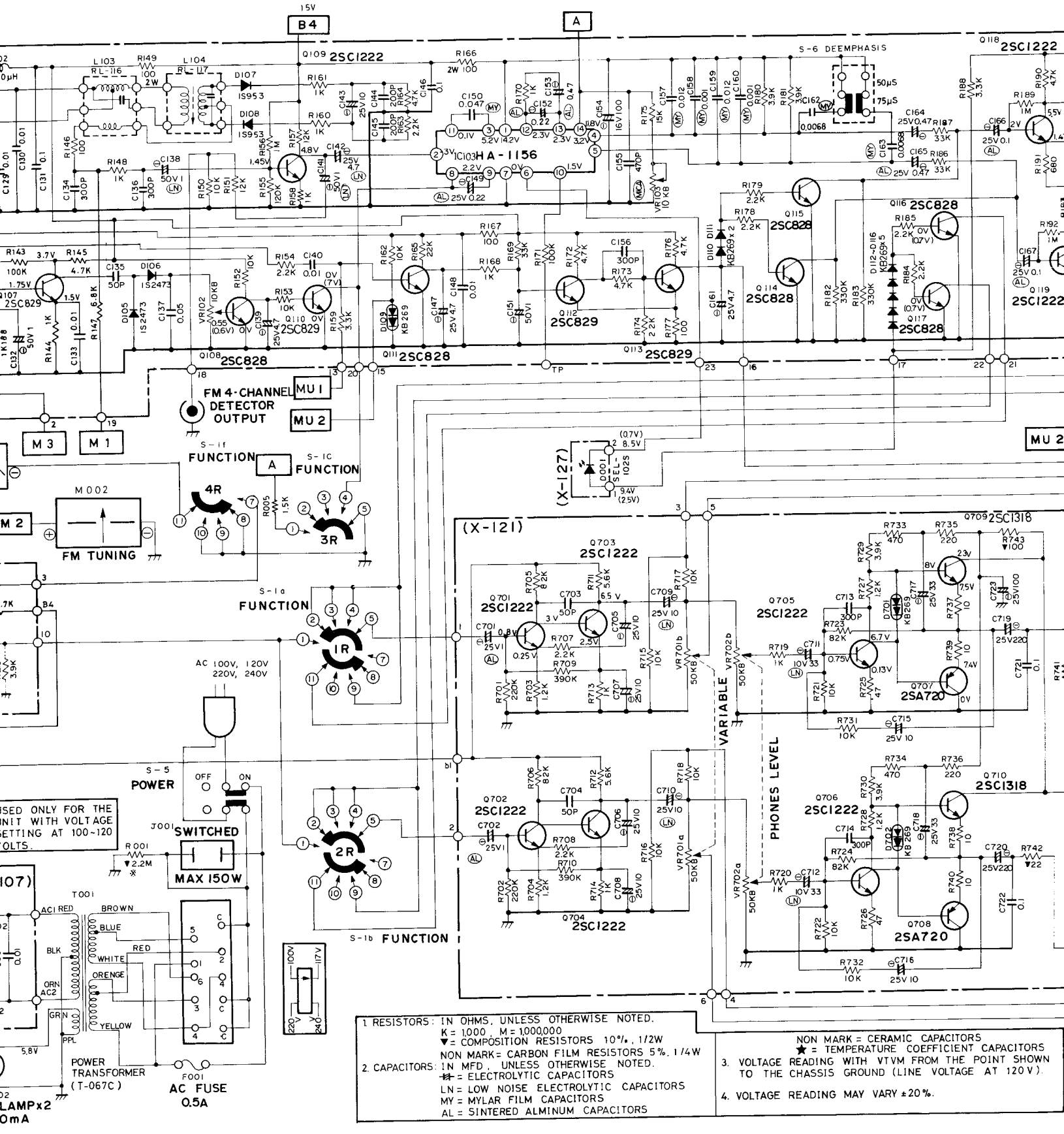


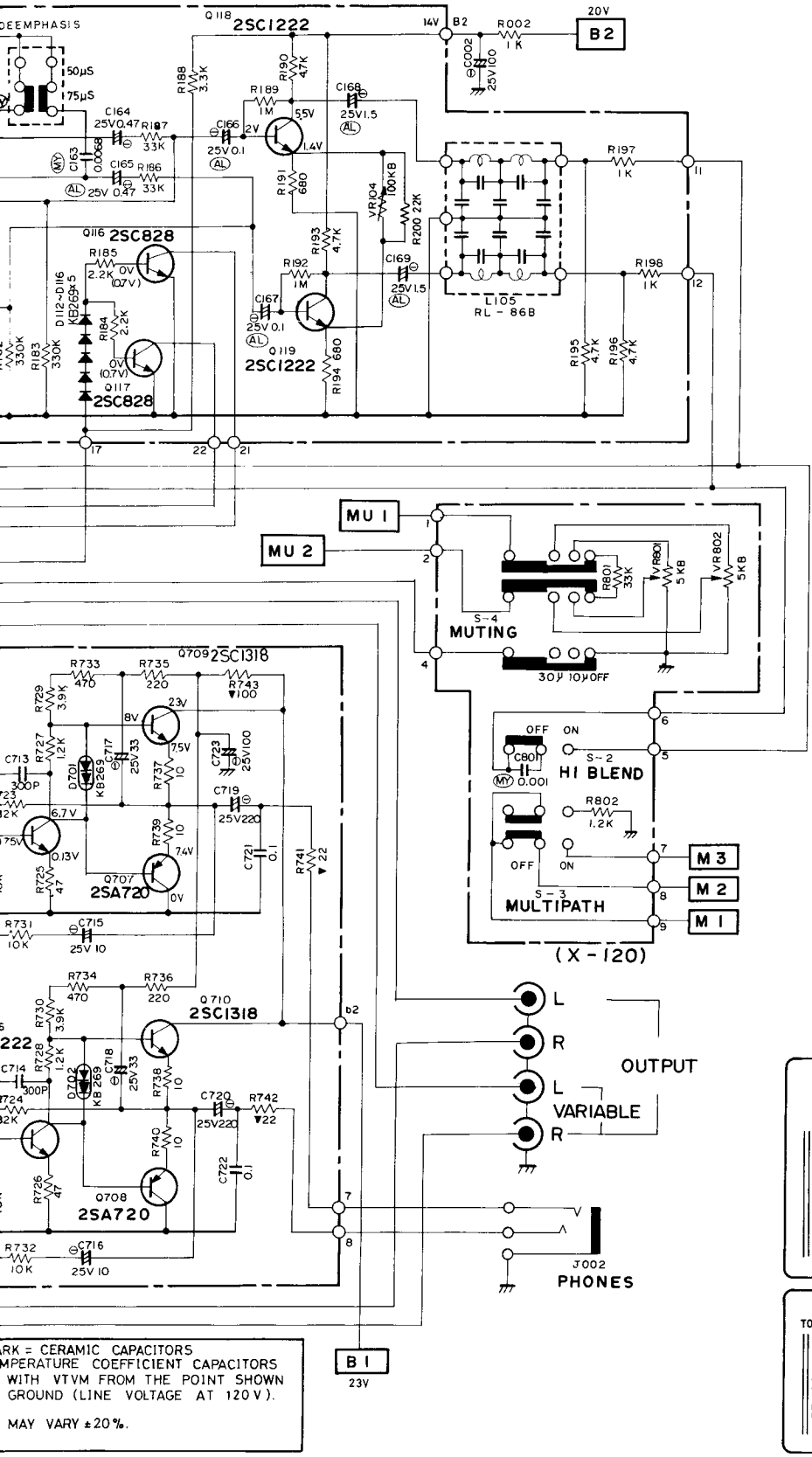


	MUTING OFF			MUTING ON WITH NO SIGNAL		
	B	C	E	B	C	E
Q 111	0.6V	0V	—	0.1V	1.3V	—
Q 112	5.6V	—	0V	1V	—	0.9V
Q 113	0.72V	0V	0V	0.25V	—	0.9V
Q 114	0V	—	—	0.7V	—	—
Q 115	0V	—	—	0.7V	—	—

MUTING SETTING LEVEL 10μV

SCHEMATIC DIAGRAM RT824

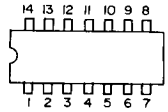




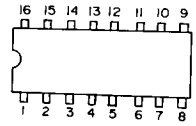
ARK = CERAMIC CAPACITORS
MPERATURE COEFFICIENT CAPACITORS
WITH VTVM FROM THE POINT SHOWN
GROUND (LINE VOLTAGE AT 120V).

MAY VARY ±20%.

ITEM	SCHEMATIC LOCATION (LAST)
FM SECTION	R 200
	C 171
AM SECTION	R 222
	C 220
FM IF PREAMP.	R 304
	C 304
AUDIO AMP.	R 743
	C 723
CONTROL	R 802
	C 801
POWER SUPPLY	R 905
	C 907
CHASSIS	R 005
	C 004

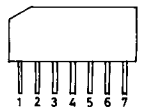


HA-1156

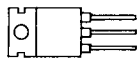


μPC-30C

(TOP VIEW)

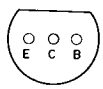


TA7061AP



2SD317

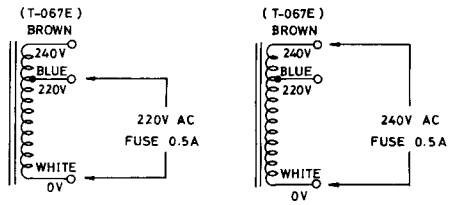
(SIDE VIEW)



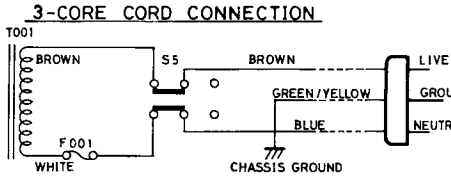
2SA720
2SC828
2SC829
2SC1222
2SC1318

(BOTTOM VIEW)

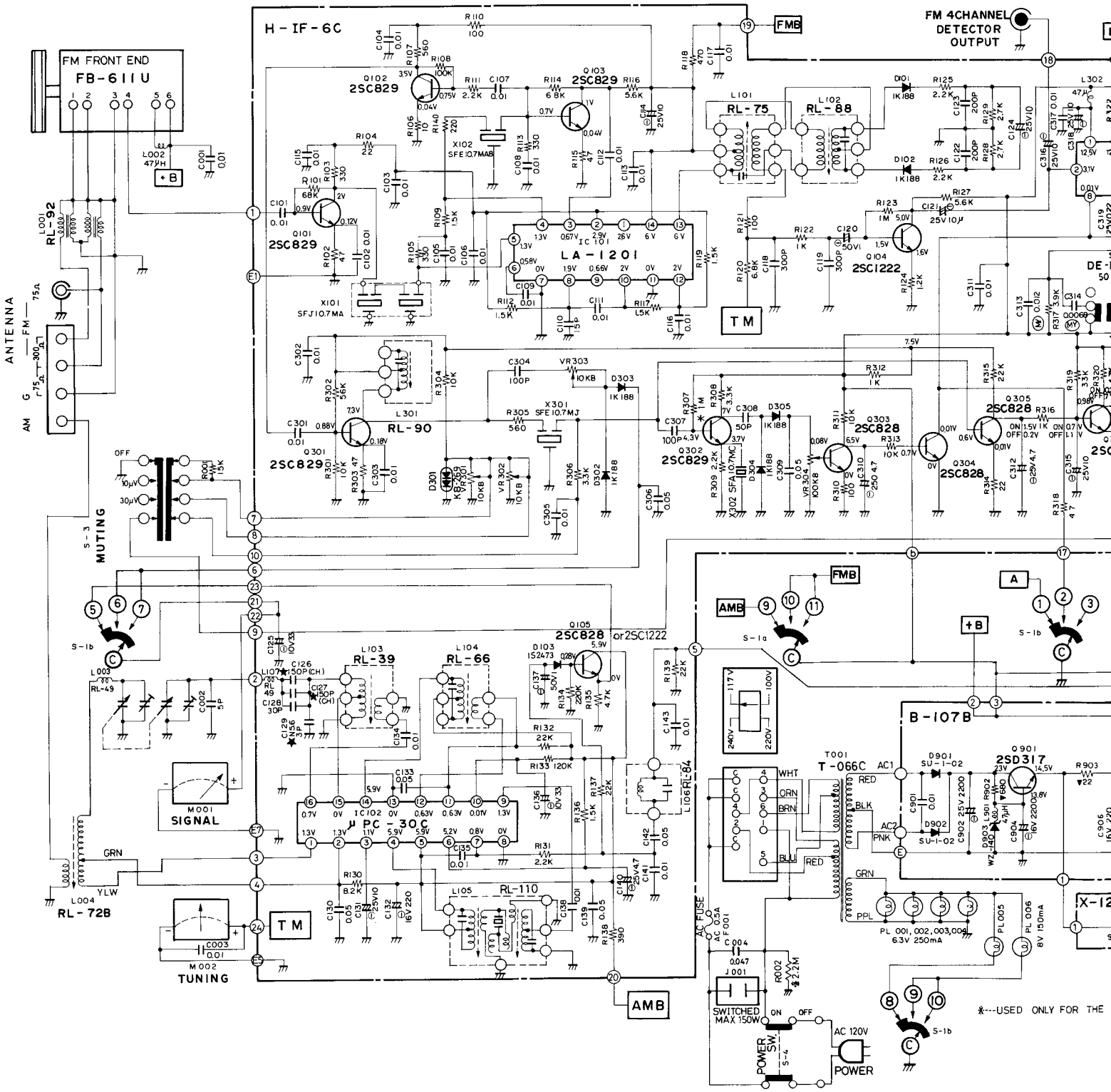
POWER TRANSFORMER STRAPPING

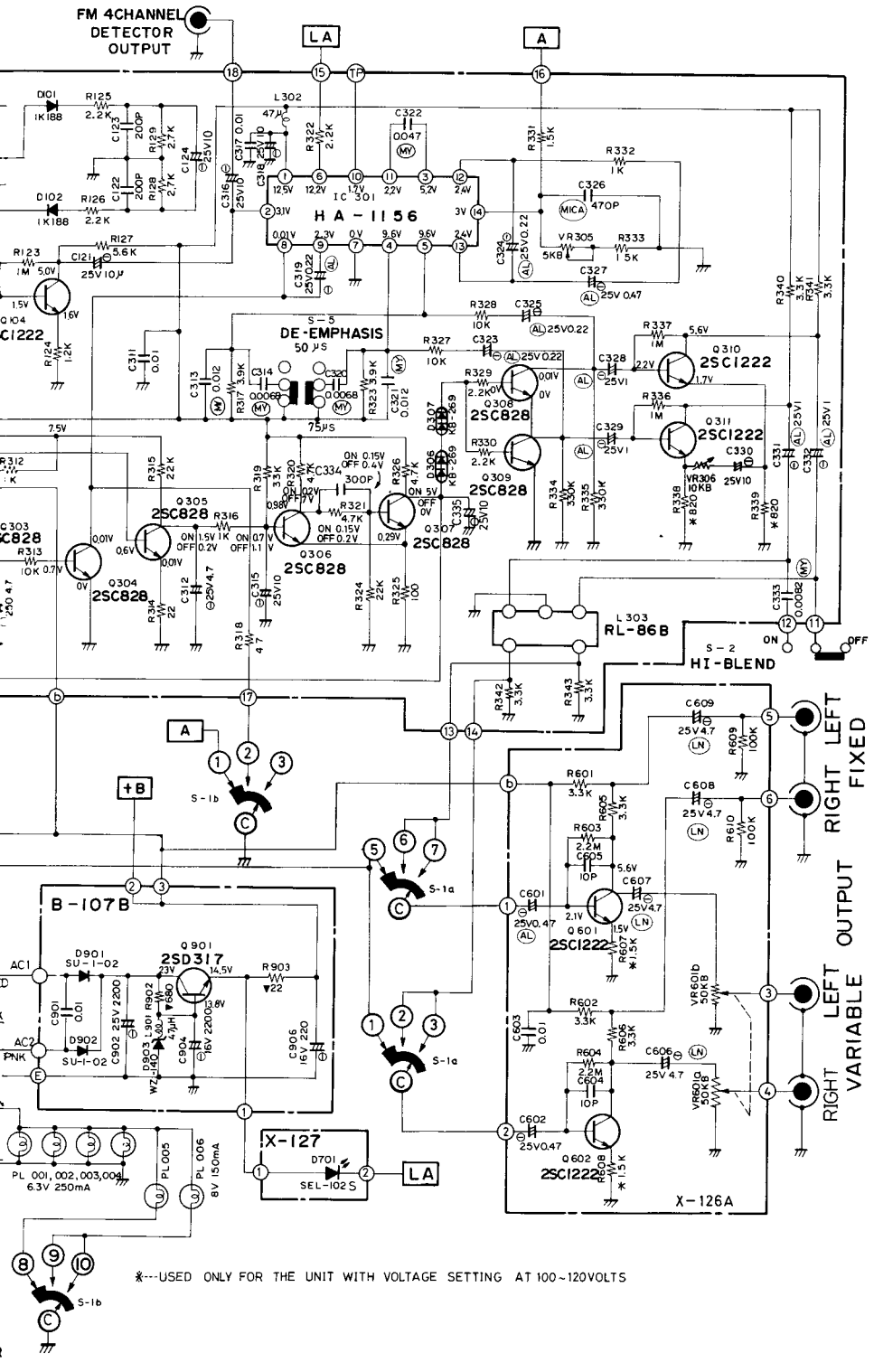


3-CORE CORD CONNECTION



SCHEMATIC DIAGRAM RT624





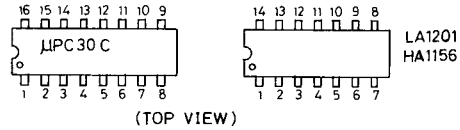
※---USED ONLY FOR THE UNIT WITH VOLTAGE SETTING AT 100~120VOLTS

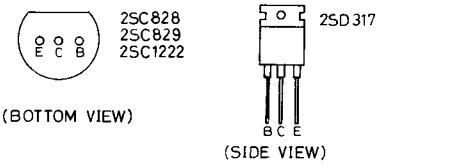
(RESISTORS)
5% TOLERANCE UNLESS OTHERWISE NOTED
K---KILO OHM
M---MEGA OHM
▼---COMPOSITION RESISTORS ½WATT
NON MARK---LOW NOISE TYPE CARBON RESISTORS ¼WATT

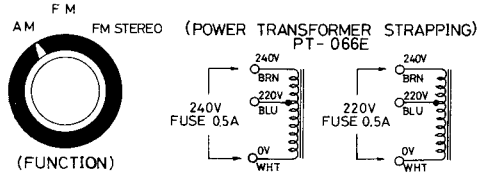
(CAPACITORS)
(MY)--MYLAR FILM CAPACITORS
(AL)--SINTERED ALUMINUM SOLID ELECTROLYTIC CAPACITORS (ALSICON)
(LN)--LOW NOISE TYPE CAPACITORS
⊣⊢---ELECTROLYTIC CAPACITORS
★--TEMPERATURE COEFFICIENT CAPACITORS
NON MARK---CERAMIC CAPACITORS

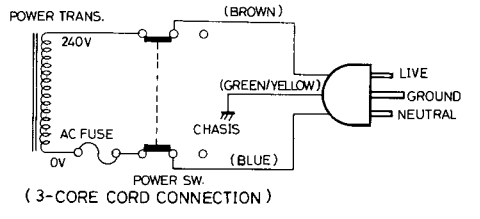
- UNLESS OTHERWISE NOTED IN SCHEMATIC ALL CAPACITANCE VALUES ARE EXPRESSED IN MFD.
- VOLTAGE READING WITH VTVM FROM THE POINT SHOWN TO THE CHASSIS GROUND (LINE VOLTAGE 120 VOLT).
- VOLTAGE READING MAY VARY ±20%.
- THESE VALUES MAY VARY DEPENDING UPON FACTORY ADJUSTMENT.

ITEM	SCHMATIC LOCATION (LAST)	
AM FM IF AMP	R140	C143
FM MPX DECODER	R343	C335
MAIN AMP	R610	C609
POWER SUPPLY	R903	C906
CHASSIS	R002	C004

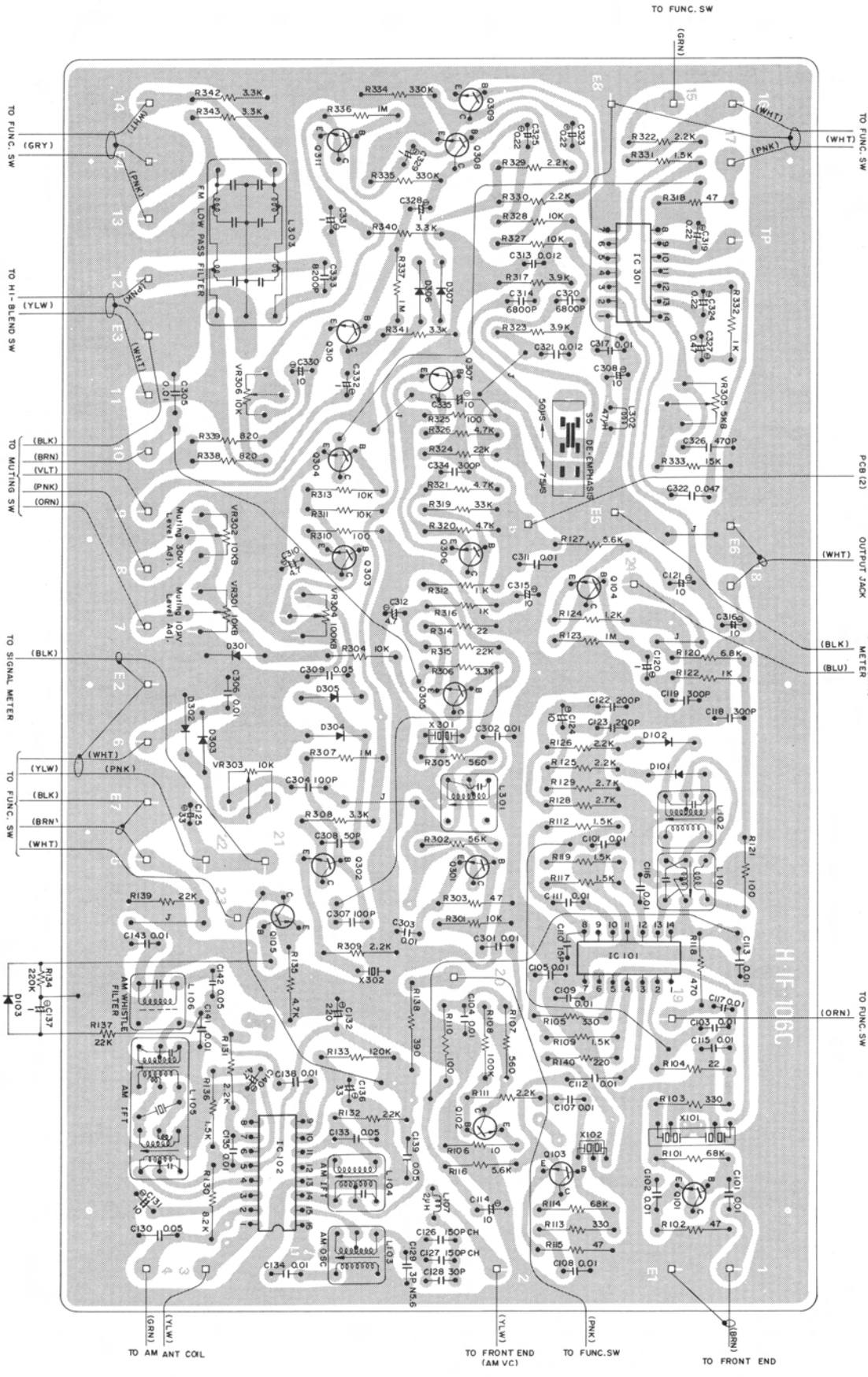




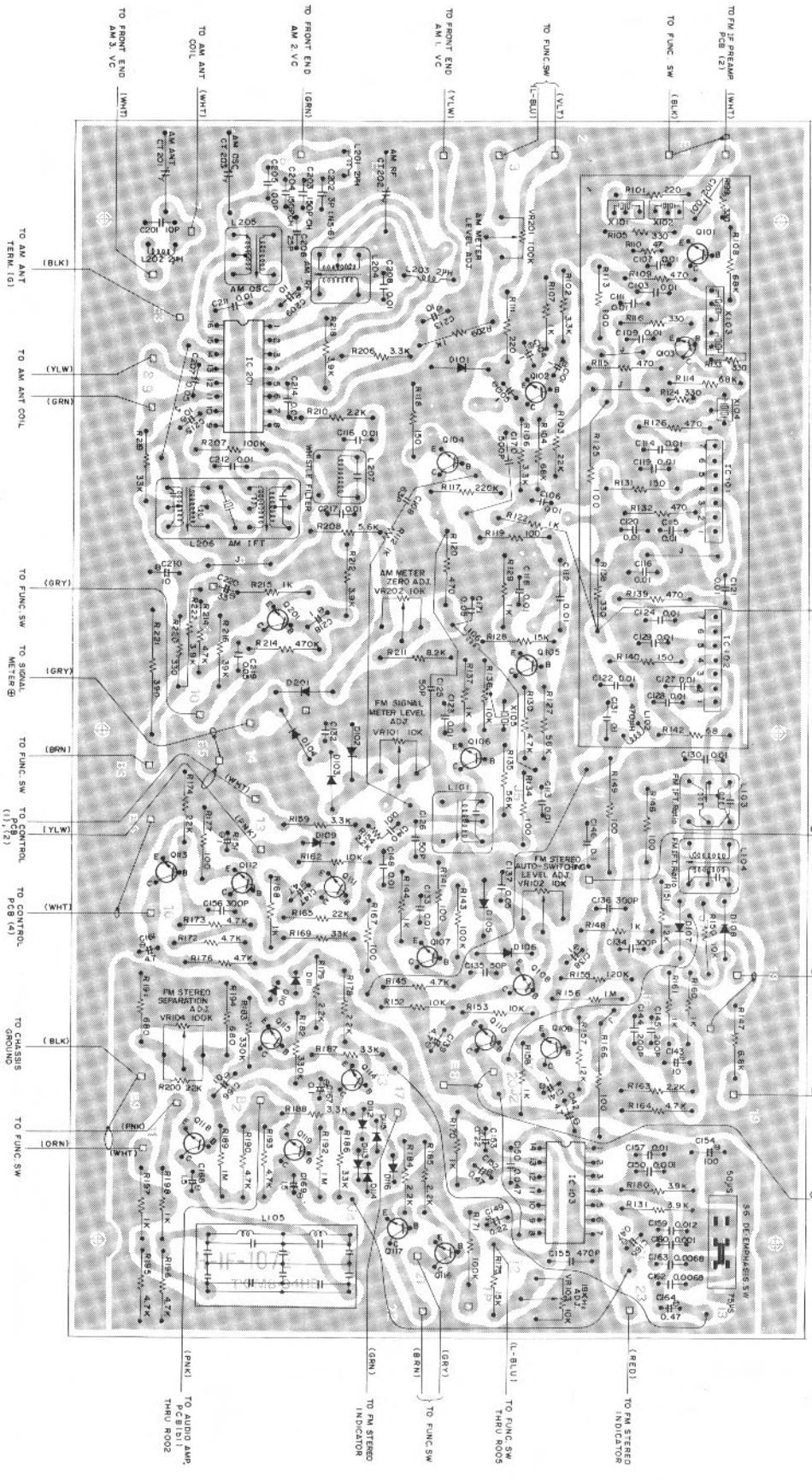




RT624 AM/FM IF/MPX CIRCUIT BOARD DIAGRAM

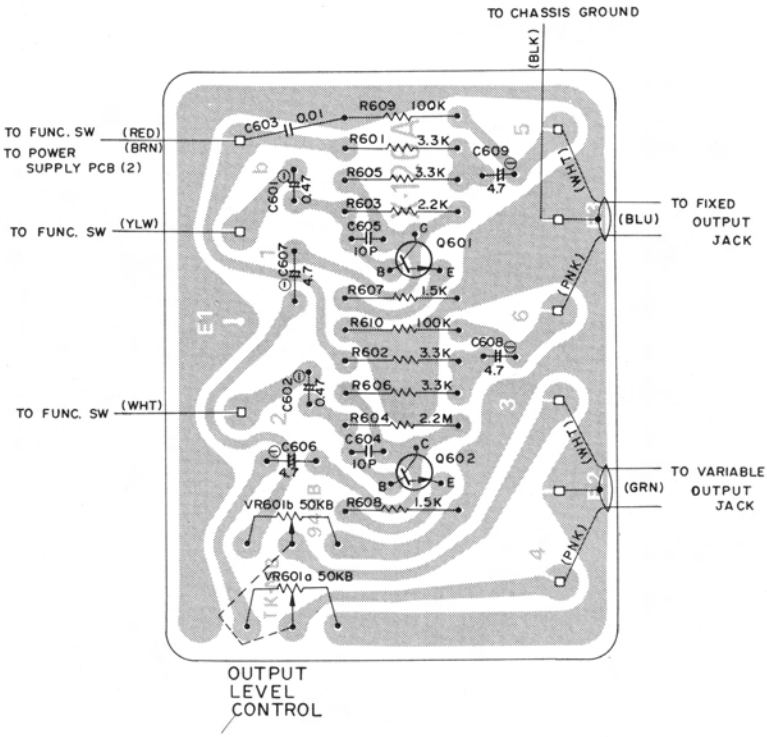


RT824 AM/FM IF/MPX CIRCUIT BOARD DIAGRAM

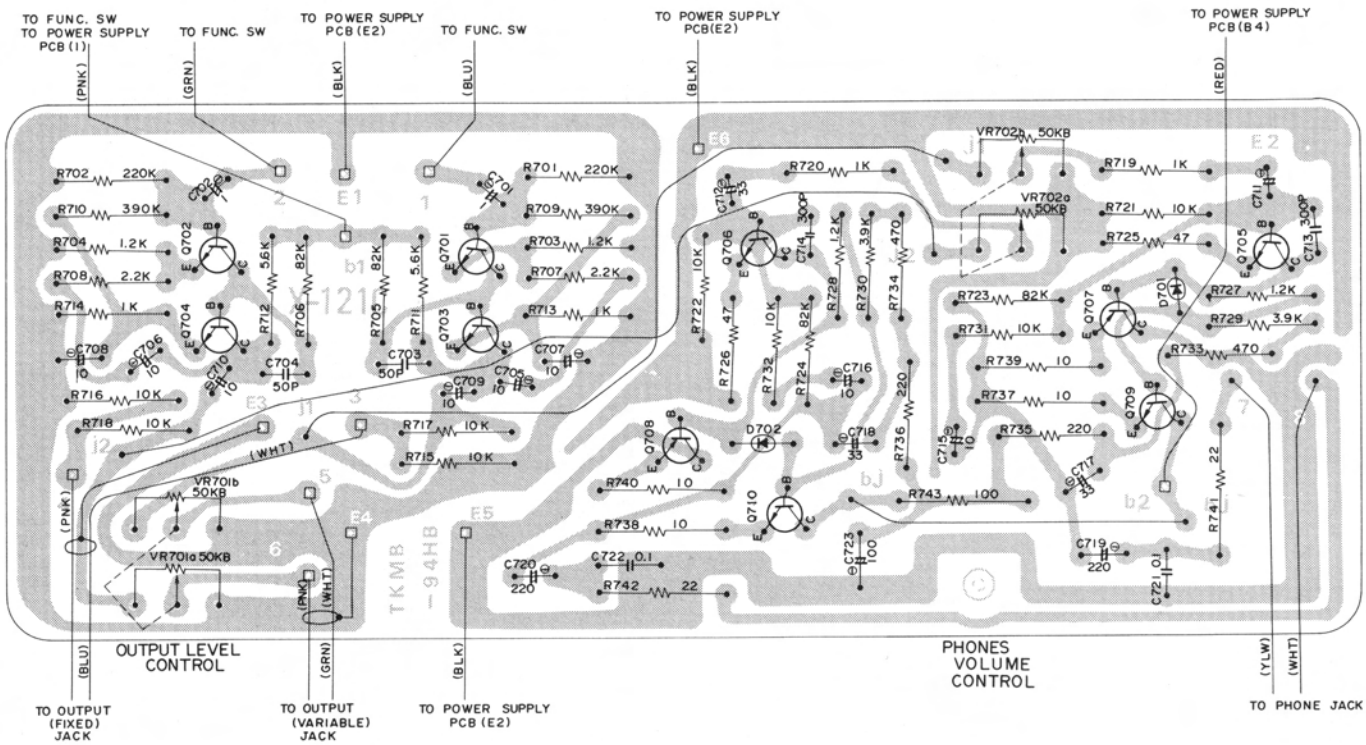


AUDIO AMP CIRCUIT BOARD DIAGRAM

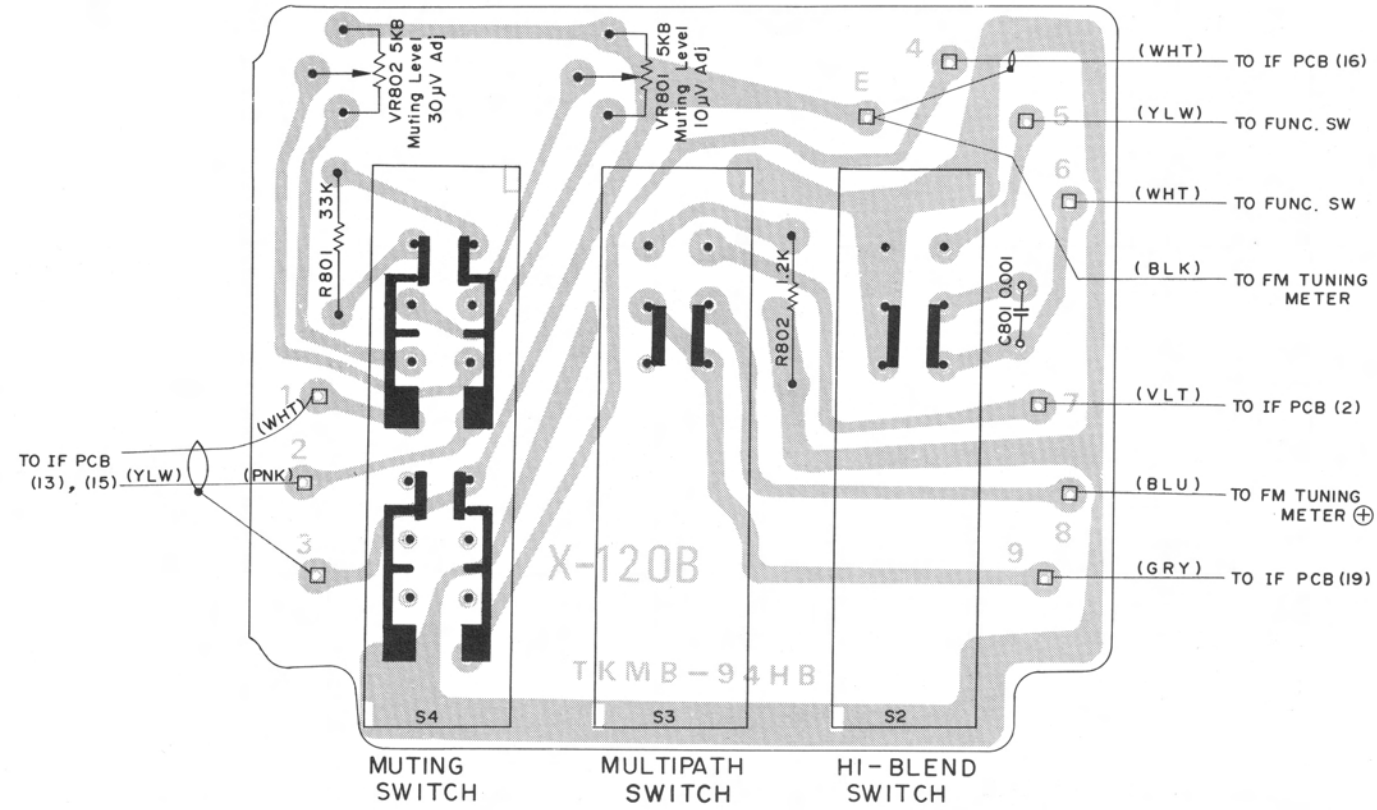
RT-624



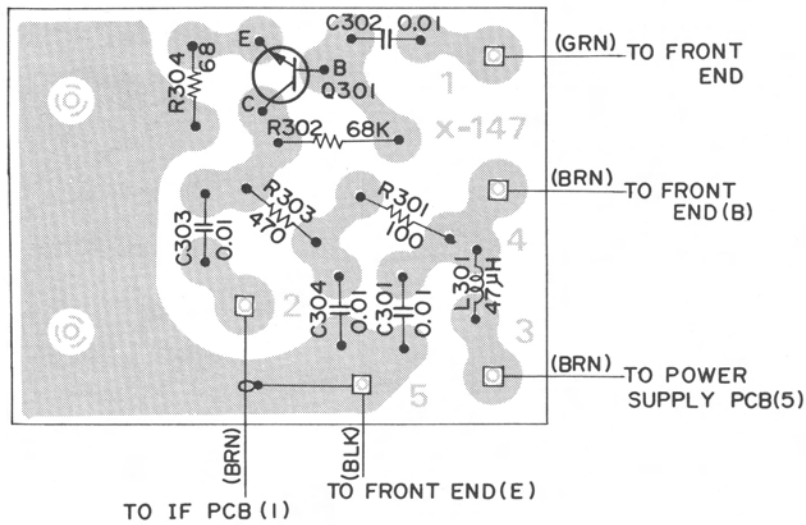
RT-824



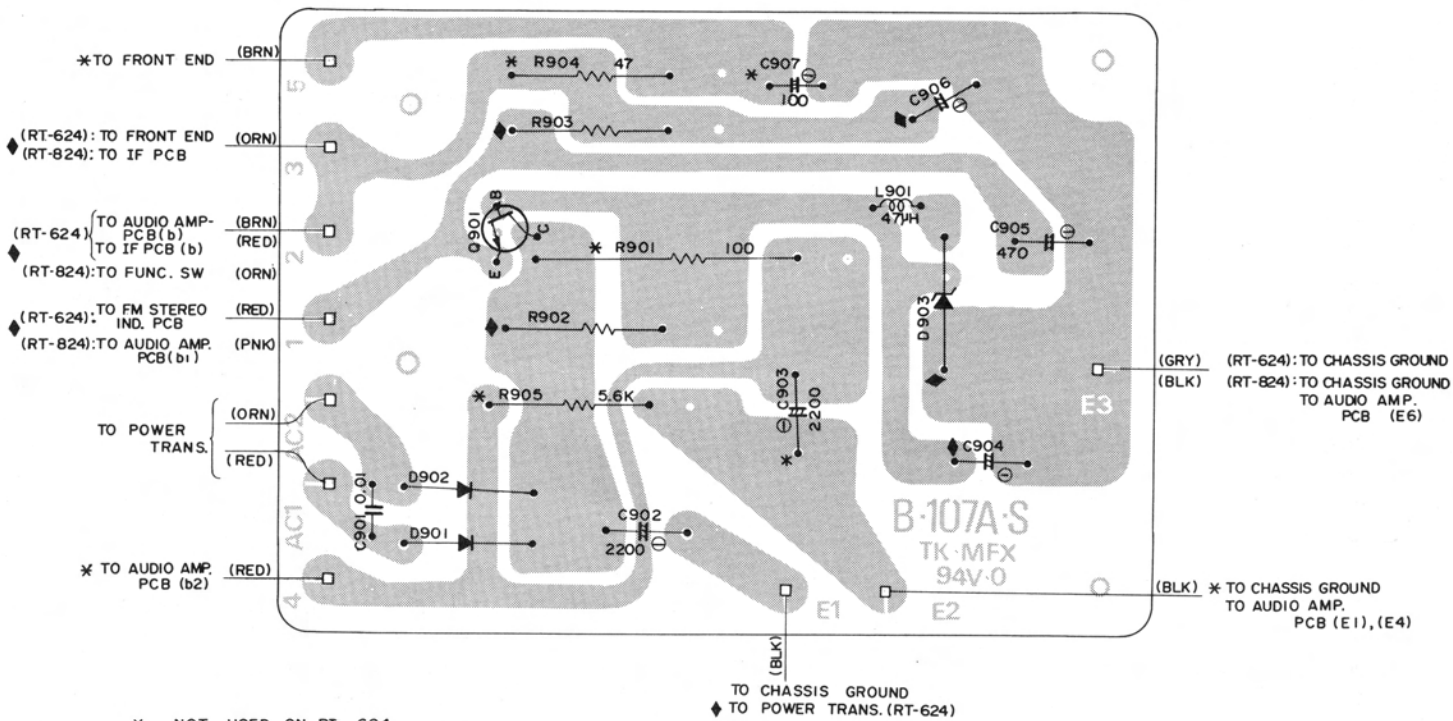
CONTROL CIRCUIT BOARD DIAGRAM (RT-824 ONLY)



FM IF PREAMP CIRCUIT BOARD DIAGRAM (RT-824)



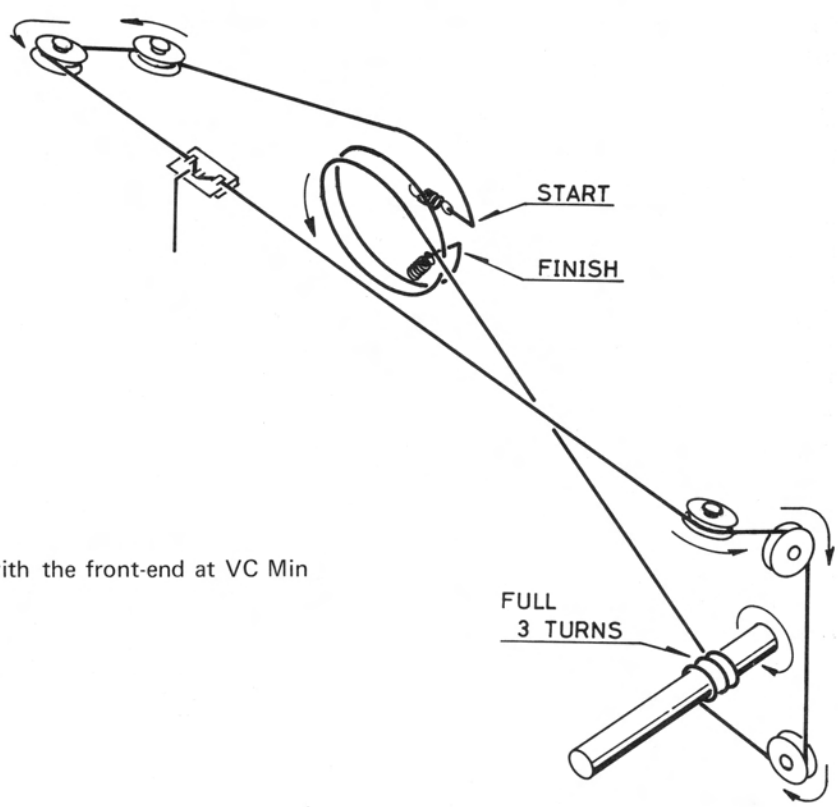
POWER SUPPLY CIRCUIT BOARD DIAGRAM (RT-624) (RT-824)



* NOT USED ON RT-624

♦	RT-624	RT-824	♦	RT-624	RT-824
C906	220	1000	R902	680	1K
C904	2200	470	D903	(14V)	(21V)
R903	22	47			

DIAL STRINGING DIAGRAM (RT-624) (RT-824)



Note:

1. Proceed dial stringing with the front-end at VC Min position.

REPAIR PARTS LIST RT-624

Schematic Location	Part No.	Description
TRANSISTORS, DIODES and IC'S		
Q101,102 Q103,301 Q302	301201117	2SC829(C), FM IF Amp., FM Muting, etc.
Q104,310 Q311,601 Q602	301201156	2SC1222(E), FM Composite Amp., Audio Amp., etc.
Q105,303, Q304,305 Q306,307 Q308,309	301201115	2SC828(R), FM Auto-switching Amp., FM Muting, etc.
Q901,	301301125	2SD317, Stabilizer
D101,102 D302,303 D304,305	300111008	1K188, FM Det., FM Meter Rect., etc.
D103	300111010	1S2473, AM Meter Rect.
D301,306 D307	300212004	KB-269, FM Muting Bias
D701	300414005	SEL-102S, FM Stereo Indicator
D901,902	300919008	SM-1-02, Rectifier
D903	300313018	WZ-140, Zener Regulator, 14V
IC101	303452148	LA-1201, FM IF Amp.
IC102	303452157	μPC-30C, AM Conv. & AM IF Amp.
IC301	303452151	HA-1156W, FM MPX Decoder
COILS and TRANSOFRMERS		
L101	225501125	FM IFT, Ratio (Pri.)
L102	225501127	FM IFT, Ratio (Sec.)
L103	223301124	AM OSC Coil
L104	225301125	AM IFT, 1st
L105	229101176	AM IFT,2nd
L106	228641119	AM Whistle Filter
L107,003	226501124	RF Choke, 2μH
L301	226501122	FM Muting Coil, 10.7 MHz Tune
L302,901 L002	226501123	RF Choke, 47μH (470)
L303	228641118	FM Low Pass Filter
T001	205001391	Power Transformer (Multi-voltage)
	204001391	Power Transformer (100V–120V)
	206001391	Power Transformer (220V–240V)
L001	226501121	FM Antenna Matching Transformer
L004	222391122	AM Antenna Coil (Assembly)

Schematic Location	Part No.	Description
VARIABLE RESISTORS		
VR301,302 VR303,306	510502126	10KB, FM Muting Level Adj.
VR304	510502130	100KB, FM Stereo Auto-switching Level Adj.
VR305	510502128	5KB, FM Stereo Separation Adj.
VR601	525101128	50KBx2, Output Level Control
OTHERS		
X101	229101166	FM IF Bandpass Filter, 1st
X102	229101171	FM IF Bandpass Filter, 2nd
X301	229101139	FM IF Bandpass Filter
X302	229101177	Ceramic Resonator, 10.7MHz
M001	231310049	Meter, Signal AM/FM
M002	231310051	Meter, FM Tuning
	321304381	Front-end, AM/FM
S1	601011278	Switch, Function Selector
S2	611001632	Switch, Hi-Blend
S3	611001637	Switch, Muting
S4	614010118	Switch, Power
S5	613000024	Switch, De-emphasis
PL001,002 PL003,004	352063025	Lamp, 6.3V, 0.25A, Dial Light
PL005,006	351080015	Lamp, 8V, 0.15A, AM, FM Indicator
	141311362	AM, FM and MPX Circuit Board Assembly
	141810617	Audio Amp. Circuit Board Assembly
	141810621	Power Supply Circuit Board Assembly

REPAIR PARTS LIST RT-824

Schematic Location	Part No.	Description
TRANSISTORS, DIODES and IC'S		
Q101,103 Q104,105 Q106,107 Q110,112 Q113	301201117	2SC829(C), FM IF Amp., FM Muting, etc.
Q102,108 Q111,114 Q115,116 Q117	301201115	2SC828(R), FM Muting, Multi-path, etc.
Q109,118 Q119,201 Q701,702 Q703,704 Q705,706	301201156	2SC1222(E), FM Composite Amp., etc.
Q707,708	301001139	2SA720, Audio Amp.
Q709,710	301201155	2SC1318, Audio Amp.
Q901	301301125	2SC317, Stabilizer
D101,104 D201	300111008	1K188, FM Meter Rect., etc.
D102,103 D105,106	300111010	1S2473, FM Stereo Auto-switching Rect.
D107,108	300111011	1S953, FM Det.
D109,110 D111,112 D113,114 D115,116 D701,702	300212004	KB-269, Varistor
D901,902	300919008	SM-1-02, Rectifier
D903	300313016	BZ-210, Zener Regulator, 21V
D001	300414005	SEL-102S, FM Stereo Indicator
IC101,102	033452146	TA7061AP, FM IF Amp.
IC103	303452151	HA-1156W, FM MPX Decoder
IC201	303452157	μPC-30C, AM Conv. and AM IF Amp.
COILS and TRANSFORMERS		
L101	226501122	FM Muting, 10.7 MHz Tune
L102	226501127	RF Choke, 470 μH (471)
L103	225501129	FM IFT, Ratio (Pri.)
L104	225501130	FM IFT, Ratio (Sec.)
L105	228641118	FM Low Pass Filter
L201,202, L203	226501124	RF Choke, 2μH
L204	223301131	AM OSC Coil
L205	226501112	AM RF Coil
L206	229101176	AM IFT
L207	228641119	AM Whistle Filter
L001	226501123	RF Choke, 47μH
L002	226501121	AM ANT Coil (Assembly)

Schematic Location	Part No.	Description
T001	205001397	Power Transformer (Multi-Voltage)
	204001397	Power Transformer (100V–120V)
	206001397	Power Transformer (220V–240V)
VARIABLE RESISTORS		
VR101,102 VR104	510502126	10KB, FM Signal Meter Level Adj., etc.
VR103,801 VR802	510502128	5KB, FM MPX, 19kHz Adj., etc.
VR201,202	510502130	100KB, AM Signal Meter Level Adj., etc.
VR701	525101128	50KBx2, Output Level Control
VR702	525101134	50KBx2, Phones Volume Control
OTHERS		
CT201,202 CT203	490110115	Capacitor, Trim., 24pF max, AM Tracking Adj.
X101,102, X104	229101171	FM IF Bandpass Filter
X103	229101166	FM IF Bandpass Filter
X105	229101139	FM IF Bandpass Filter
M001	231310049	Meter, Signal, AM/FM
M002	231310052	Meter, FM Tuning and Multi-path
	321304383	Front-end, AM/FM
S1	601011282	Switch, Function Selector
S2,3	611001632	Switch, Hi-Blend, Multi-path
S4	611001638	Switch, FM Muting
S5	614010118	Switch, Power
PL001,002 PL003,004	352063025	Lamp, 6.3V, 0.25A, Dial Light
PL005,006	351080015	Lamp, 8V, 0.15A, AM, FM Indicator
	141311363	AM/FM/MPX Circuit Board Assembly
	141810622	Audio Amp. Circuit Board Assembly
	141810623	Control Circuit Board Assembly
	141810624	Power Supply Circuit Board Assembly
	141810636	FM IF Preamp Circuit Board Assembly