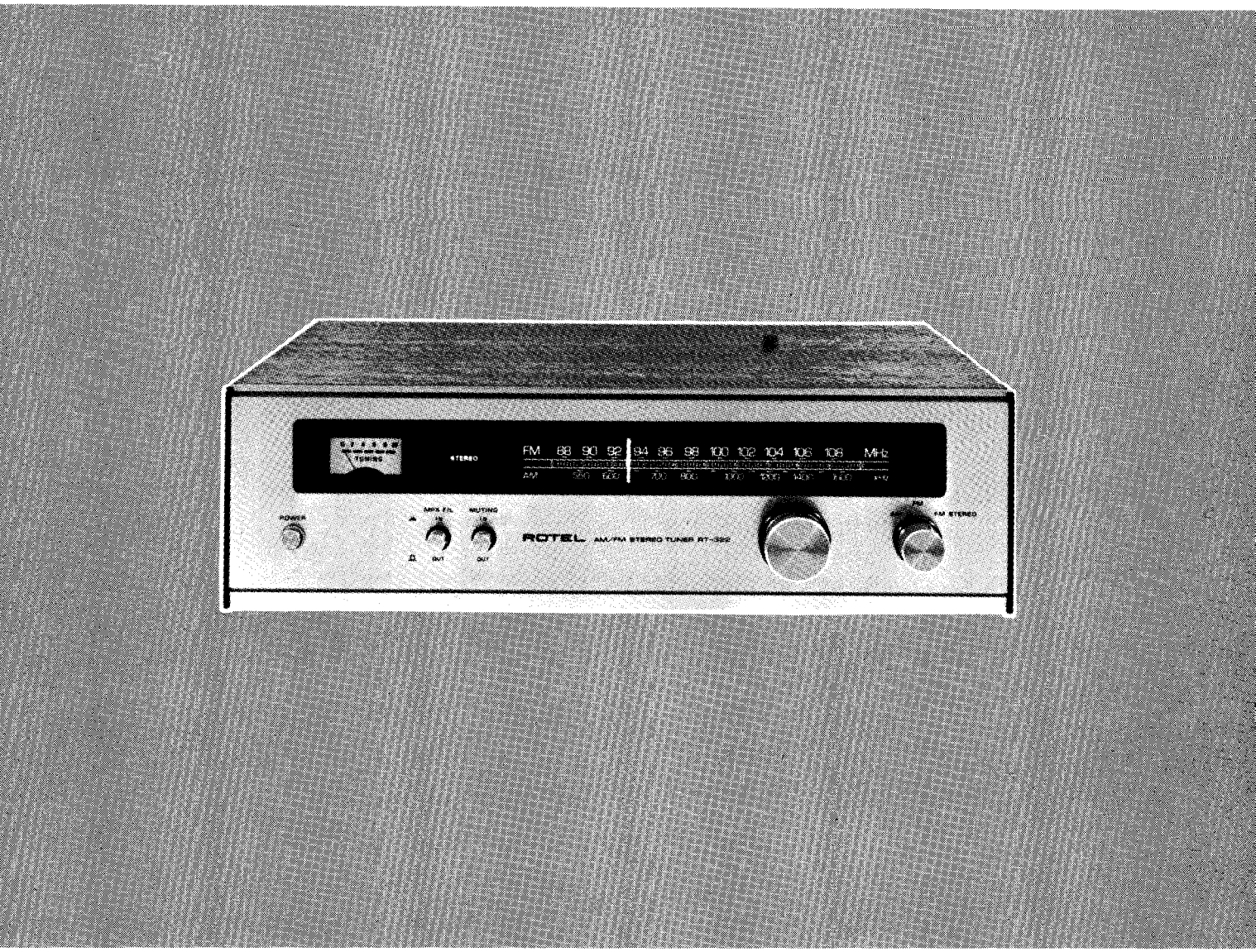
ROTEL®

RT-322

AM/FM STEREO TUNER



technical manual

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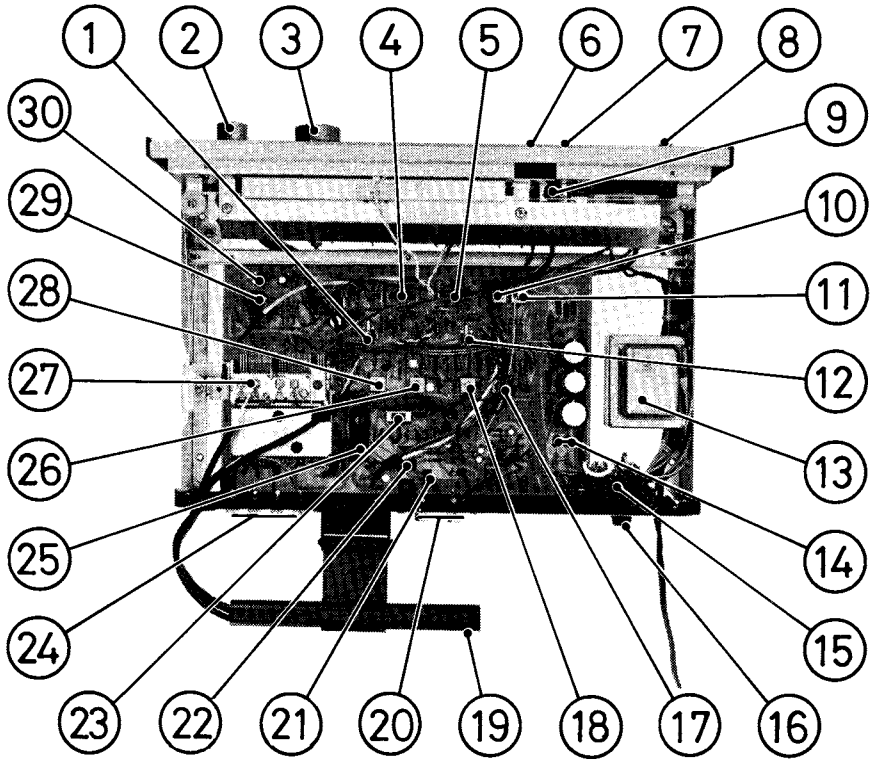
ROTEL

CHASSIS LAYOUT



1. VR802, FM Meter Level Adj.
2. Function Selector
3. Tuning Knob
4. IC101, FM IF 2nd Amp.
5. IC102, FM IF 3rd Amp.
6. S3, FM Muting Switch
7. S2, FM MPX Filter Switch
8. S4, Power Switch
9. PL8, FM Stereo Indicator Lamp
10. T101, FM IFT Ratio (PRI.)
11. T102, FM IFT Ratio (SEC.)
12. VR101, FM Mono-Stereo Switching Level Adj.
13. T001, Power Transformer
14. D701, 702, Rectifier
15. Line Voltage Selector
16. F001, AC Fuse
17. T203, AM IFT 3rd
18. T202, AM IFT 2nd
19. L002, AM Antenna Coil
20. Output Jacks
21. VR301, FM Stereo Separation Adj.
22. IC301, FM MPX Decoder
23. S5, FM De-emphasis Selector Switch
24. AM/FM Antenna Terminal Strip
25. L301, MPX Coil 19KHz/38KHz Tone
26. T202, AM IFT 1st
27. AM/FM Front end
28. L201, AM OSC Coil
29. L801, FM Muting Coil, 10.7MHz Tone
30. VR801, FM Muting Level Adj.

PRECAUTIONS

1. Always disconnect the chassis from power line when soldering. Turning the power switch OFF is not enough. Power leakage paths through the heating element may destroy transistors and IC.
2. Never attempt to do any work on the transistor amplifiers without first disconnecting the AC line cord and waiting until the power supply filter capacitors have discharged.

AM ALIGNMENT PROCEDURE

Instruments: AM Signal Generator and AC VTVM.

NOTES: Set Selector switch to AM position.

Input signal must be kept as low as possible to avoid AVC action.

Step	Generator		Turning Dial Setting	Output Indicator Connected to	Adjust	Adjust for
	Coupling	Frequency				
1	Tr202 Base through a 0.01 mfd capacitor.	455 KHz (400 Hz 30% Mod.)	Non interfering at low end of scale.	AC VTVM to OUTPUT jack.	T203, T202 and T201	Maximum reading on VTVM.
2	Connect to short loop of wire. Radiate signal into ferrite loopstick antenna.	600 KHz (400 Hz 30% Mod.)	600 KHz		L201 (OSC) L002 (ANT)	
3		1400 KHz (400 Hz 30% Mod.)	1400 KHz		CT5 (OSC) CT4 (ANT) (on Front end)	
4	Repeat steps 2 and 3 until no further improvement is noticed.					

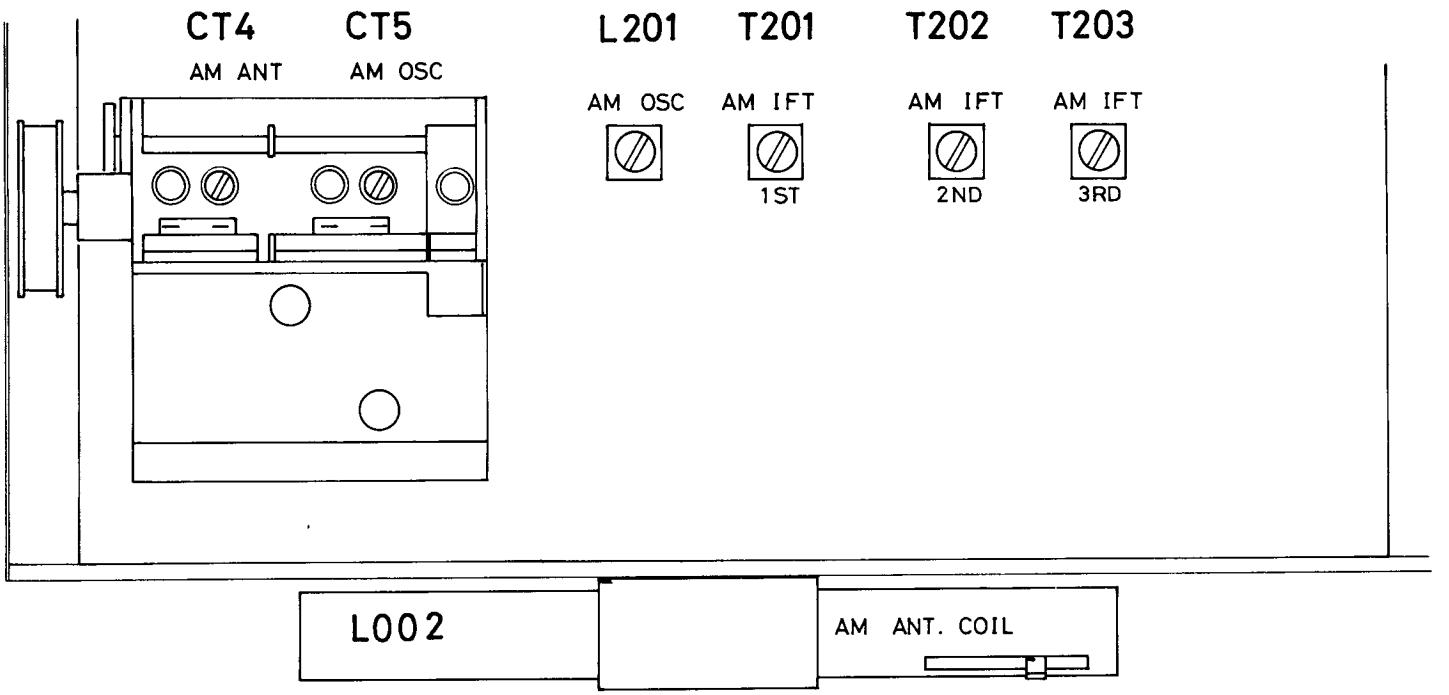


Figure 1. Chassis Top View AM Portion

FM IF & RF ALIGNMENT PROCEDURE

Instruments: FM Signal Generator, Oscilloscope and H.D. Analyzer.

- Set Selector Switch to "FM" position.
- Set Muting Switch and MPX Fil. Switch to "OFF" position.
- Set Potentiometer VR101 to **mid-position.**
- Connect FM Signal Generator to FM Antenna Terminals.
- Connect Oscilloscope and H.D. Analyzer to OUTPUT Jack.

A. FM IF Alignment

1. Set Signal Generator Frequency at 98MHz (400Hz, 100% Mod.) and adjust the receiver to maximum output point by turning the tuning knob. (The antenna terminal voltage should be 1mV).
2. Adjust oscillation to maximum point by adjusting T102 and T1 (Front end).
3. Set distortion to minimum by adjusting T101.

B. FM RF Alignment

1. Set Signal Generator frequency to 106MHz and also the receiver to 106MHz on the dial board by turning a tuning knob. Adjust CT3 to obtain maximum output level.
2. Set the receiver to 90MHz, then Signal Generator frequency to 90MHz until the output of the receiver becomes maximum. Make sure Signal Generator frequency stays within 90MHz ~ ±150KHz.
3. Sensitivity on this alignment must be attempted at 106MHz by adjusting CT1 and CT2 to obtain maximum point and fine tune to balance sensitivity at 90MHz and 106MHz.
4. Adjust Coils L3 (FM OSC) and L2 (FM RF) as described below only when tracking and sensitivity adjustments are not attained by adjusting CT1, CT2 and CT3.
   a. Fine tune Signal Generator and receiver to 90MHz and adjust L2 and L3 so that maximum output is obtained.
   b. Fine tune Signal Generator and receiver to 106MHz and adjust CT1, CT2 and CT3 so that maximum output is obtained.
   c. Repeat steps a and b to obtain enough effect.

CAUTION: Bandpass Filters (X101 and X102) incorporated in FM IF circuit are classified into 5 divisions according to their center frequencies. It is thus necessary to use the same frequency division in case of exchanging the Bandpass Filter. Divisions of bandpass frequencies are indicated by colored dots as shown in the following chart.

Red	10.70MHz	±30KHz
Blue	10.67MHz	±30KHz
Orange	10.73MHz	±30KHz
Black	10.64MHz	±30KHz
White	10.76MHz	±30KHz

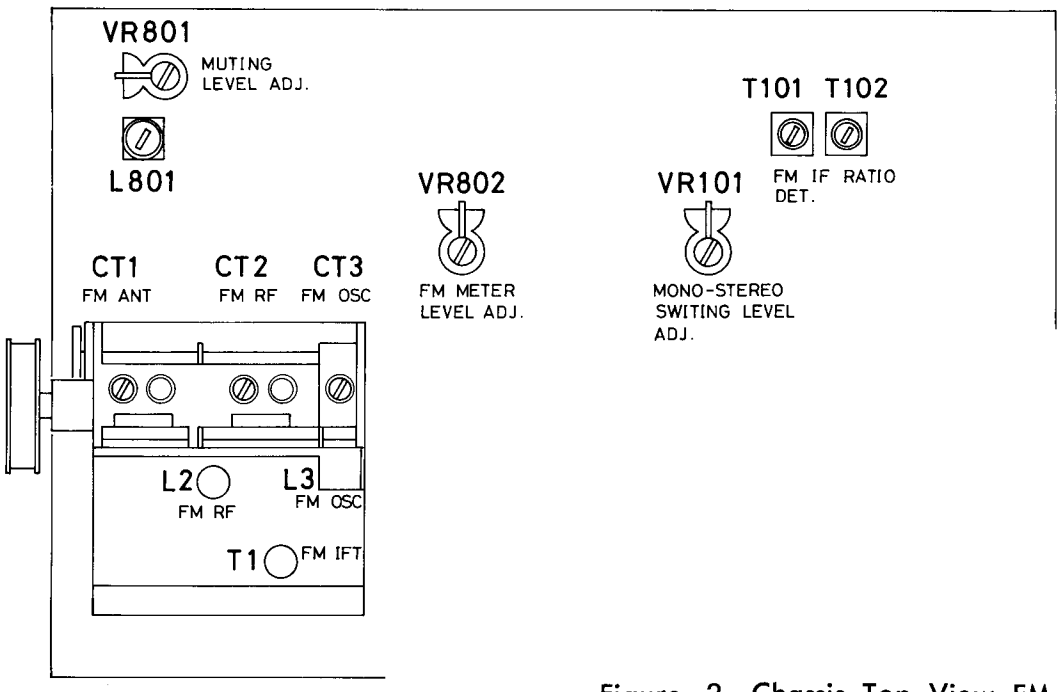


Figure 2. Chassis Top View FM Portion

FM MPX ALIGNMENT PROCEDURE

Instruments: FM Stereo Generator, AC VTVM and Oscilloscope.

NOTE: The FM IF Amplifier Alignment must be completed before attempting this FM-Stereo Alignment. Poor IF alignment will result in poor FM-Stereo Adjustment.

Set Separation Adj. VR301 to mid-position.

Set Selector switch to FM Stereo.

Connect Stereo Generator to FM antenna terminals.

Step	Stereo Generator		Output Indicator Connected to	Adjust	Adjust for
	Modulation	RF Deviation			
1	19 KHz Pilot signal only	2 – 5%	Oscilloscope to Test Point	L301 (Black, Yellow)	Maximum Amplitude on scope.
2	Composite 1 KHz signal to Left channel only	Pilot 10% Signal 70%	Oscilloscope and VTVM to Left channel OUTPUT jack.	L301 (Yellow)	Maximum and undistorted sine wave on scope.
3			Oscilloscope and VTVM to Right channel OUTPUT jack.	VR301	Minimum reading on VTVM.
4	Composite 1 KHz signal to Right channel only		Same as in step 2		
5	Repeat the steps 3 and 4 until no further improvement is noticed.				

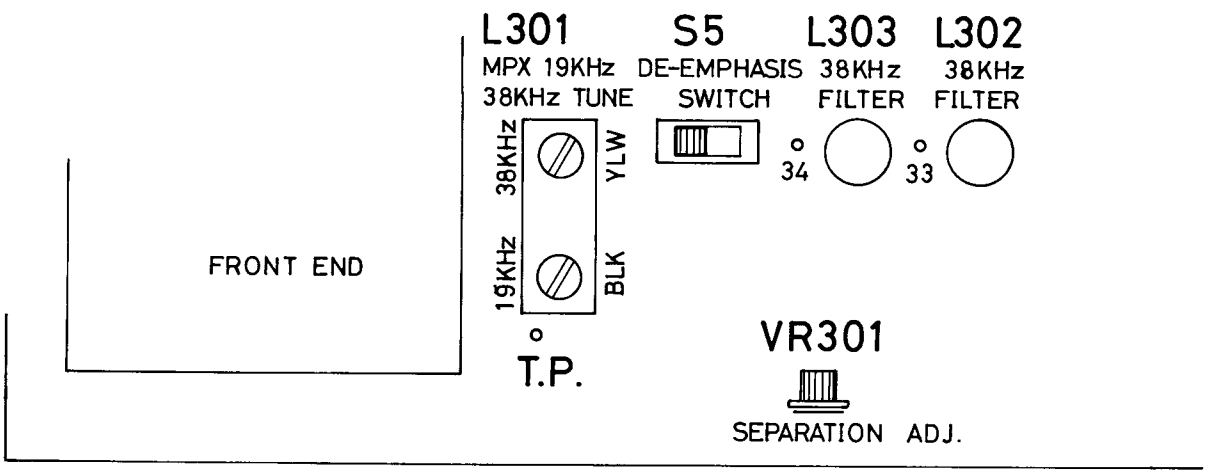


Figure 3. Chassis Top View FM MPX Portion

FM MONO-STEREO AUTOMATIC SWITCHING LEVEL ADJUSTMENT PROCEDURE

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 disrupting signal, choose another setting).
4. Set the Selector switch to FM.
5. Turn CCW the MONO – STEREO Auto-switching Level Adj. VR101; this is a condition in which Auto-switching does not function.
6. Adjust the FM MPX so that the distortion and separation will be best.
7. Adjust the VR101 so that when the antenna input level is 30μV or more, Stereo will switch in and when the input is below the 30μV level, Mono will switch in.
8. After adjustment, check to make sure that, indeed, when the antenna input level exceeds 30μV, Stereo will switch in.

FM METER LEVEL & FM MUTING LEVEL ADJUSTMENT PROCEDURE

FM METER LEVEL ADJUSTMENT

Note: The FM IF and FM RF alignment must be completed before attempting this Adjustment.

Set the antenna input level (terminal voltage) to 1-mV by controlling the Signal Generator. Adjust the potentiometer VR802 so that the Tuning Meter indicates toward "8" on the scale.

FM MUTING LEVEL ADJUSTMENT

Note: The circuit on FM IF and FM RF should be set in proper way before the following steps of muting adjustment are taken.

Instrument: FM Signal Generator and Oscilloscope.

Set Selector switch to "FM" and Muting switch to "ON" position.

Connect the FM Signal Generator to the FM antenna terminals and connect oscilloscope to the output jack (Left or Right channel).

Set the frequency at 98 MHz (when there is disrupting signal, choose another setting).

1. Rotate potentiometer VR801 (for Muting Level Adjustment) and adjust it to the point where output waveform just disappears on oscilloscope.
2. Next, adjust L801 to obtain maximum output waveform on oscilloscope.
3. Adjust Signal Generator output level to obtain antenna input level of 30μV.
4. Rotate VR801 and set it to the point where output waveform just disappears.
5. Make sure that output waveform just appears on oscilloscope when antenna input level becomes 100μV by increasing the FM Signal Generator output level, and it disappears when antenna input level becomes 30μV again by decreasing the FM Signal Generator output level.

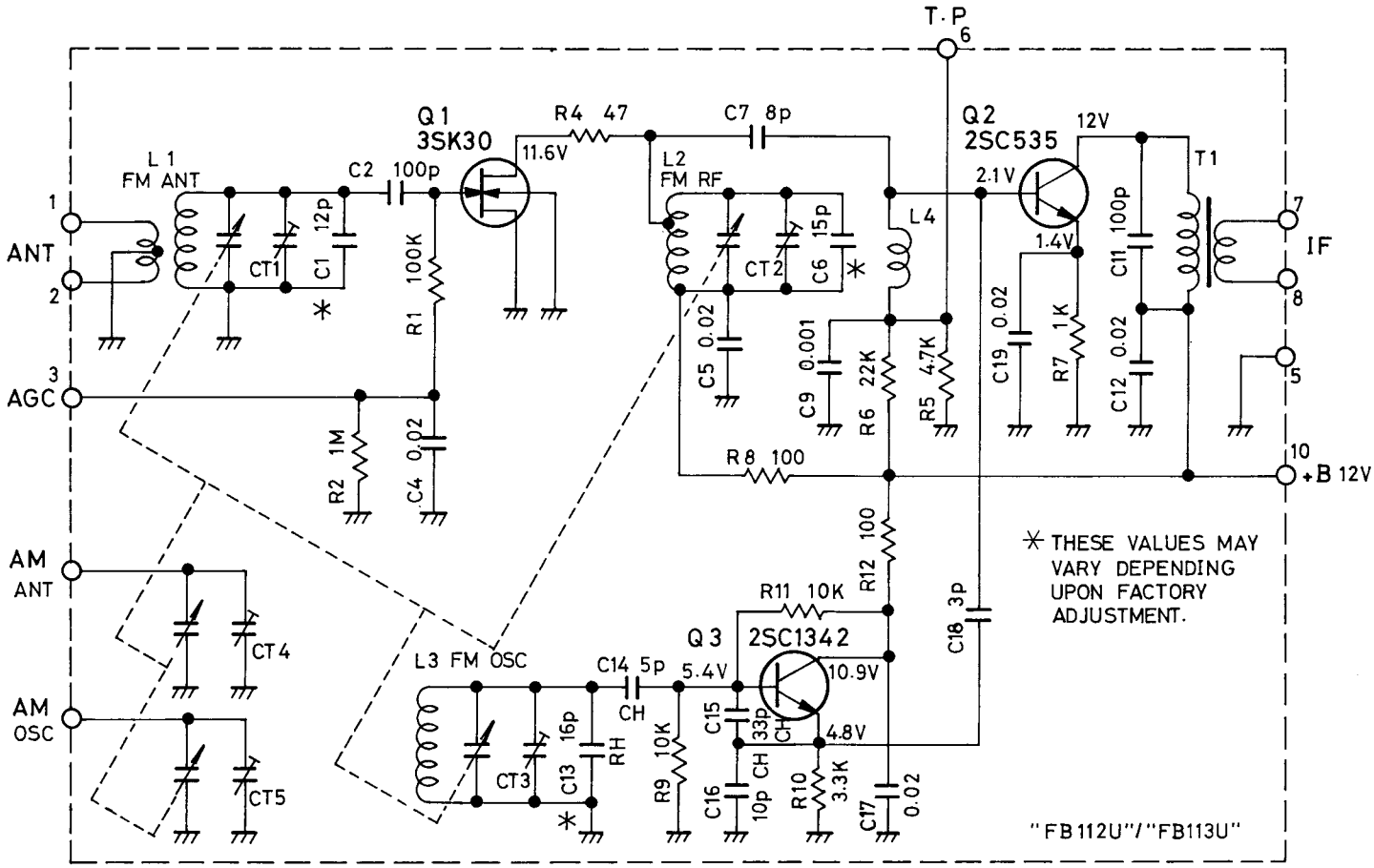
TROUBLE SHOOTING

I. Both AM and FM are inoperative,
   A. If the Dial lamps do not light, check to see if the AC fuse F001, is not blown.
      1. If AC fuse is blown,
         a. Power Transformer, T001 may be shorted out, or
         b. Capacitor, C701 or 702 may be shorted out, or
         c. Rectifier, D701 or 702 may be shorted out.
      2. If AC fuse is not blown,
         a. Power Switch, S4 may be faulty, or
         b. Fuse Connection may be faulty.
   B. If the Dial lamps do light, measure voltage at B2 (refer to circuit diagram).
      1. If there is no voltage at B1,
         a. Power Transformer may be faulty, or
         b. Capacitor, C001 may be shorted out, or
         c. Front end may be faulty.
            (+B circuit on front end may be shorted out).

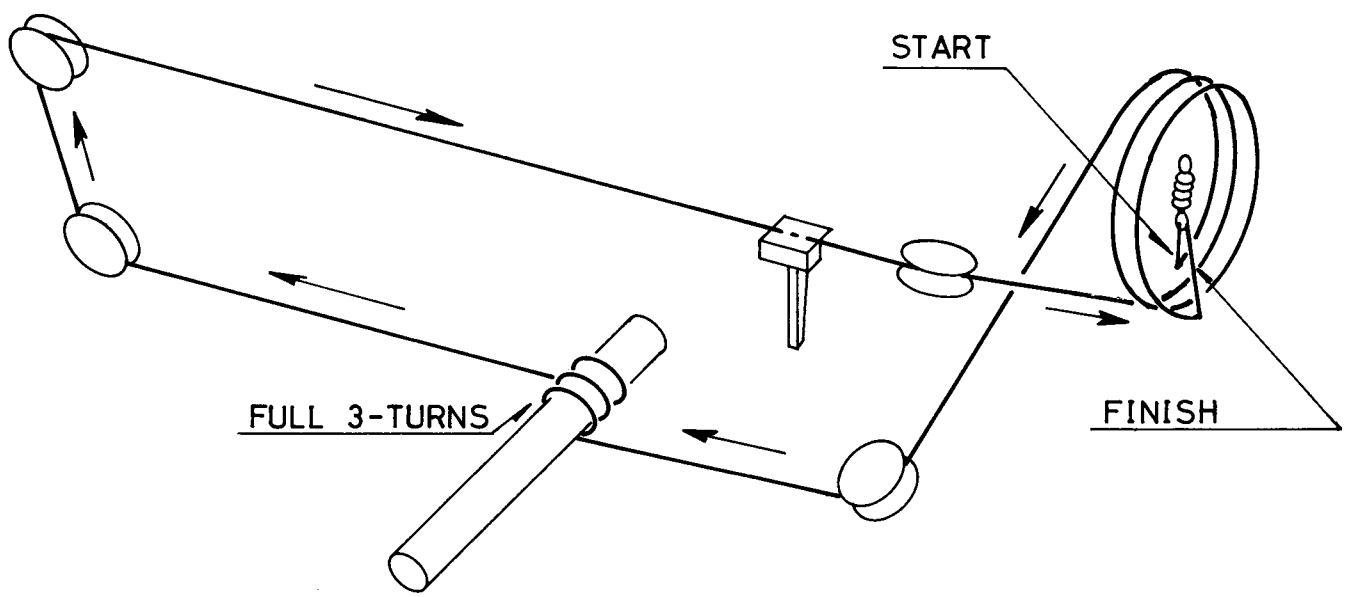
II. AM is inoperative,
   A. Measure voltage at pin No. 20 (refer circuit diagram).
      1. If there is no voltage,
         a. Selector switch connection may be faulty.
      2. If there is proper voltage,
         a. Transistor Q201, 202 or 203 may be faulty, or
         b. Coil L201 may be faulty, or
         c. IFT T201, 202 or 203 may be faulty.

III. FM is inoperative,
   A. Check to see if there is singnal at pin No. 3 of IC301.
      1. If there is no signal,
         a. IC101 or 102 may be faulty, or
         b. Transistor Q101 may be faulty, or
         c. Coil T101 or 102 may be faulty, or
         d. Capacitor C301 may be faulty, or
         e. Front end may be faulty.
      2. If there is signal, (Muting switch "OUT" position)
         a. IC301 may be faulty, or
         b. Muting switch connection may be faulty.

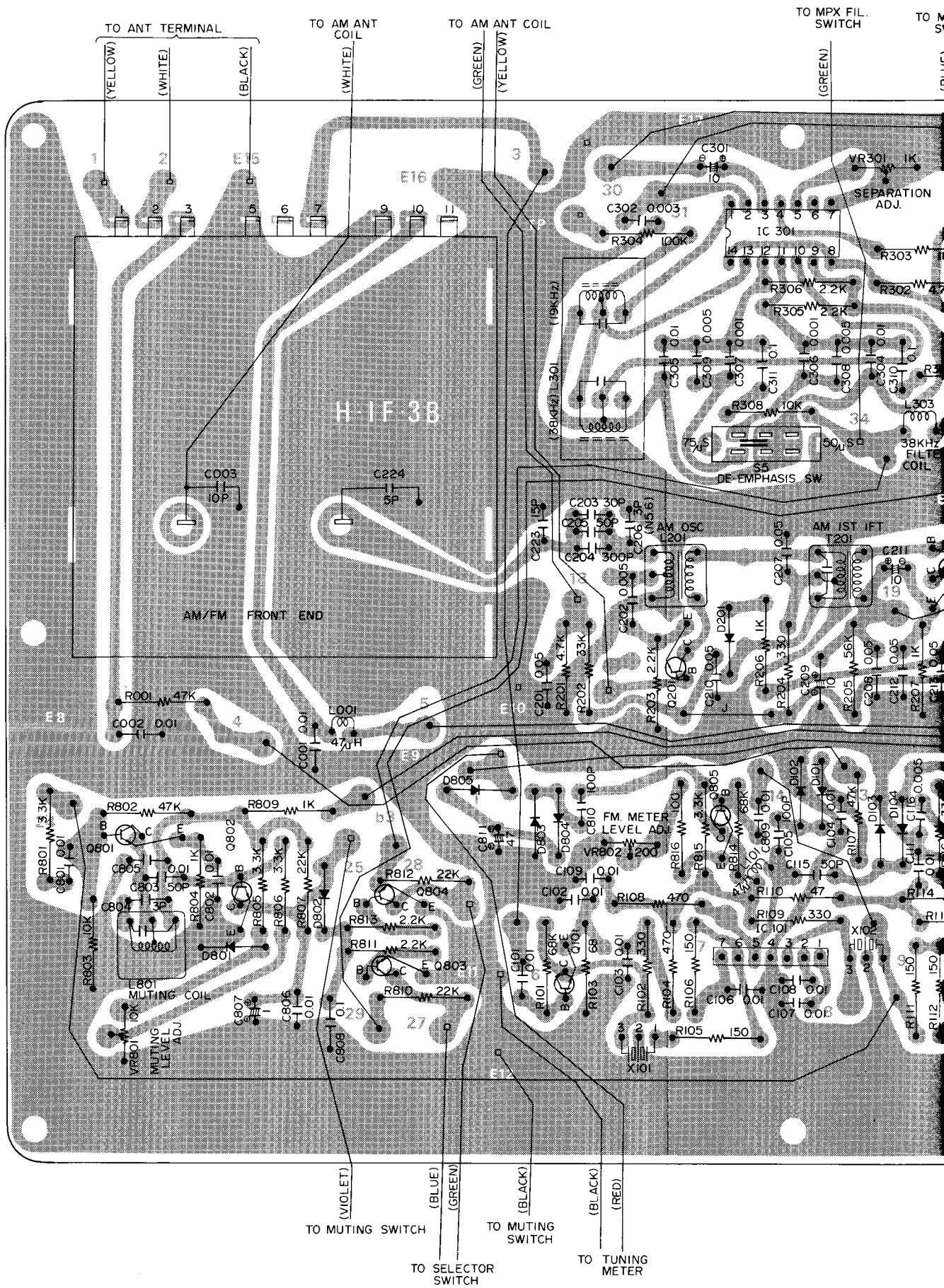
FRONT END SCHEMATIC DIAGRAM

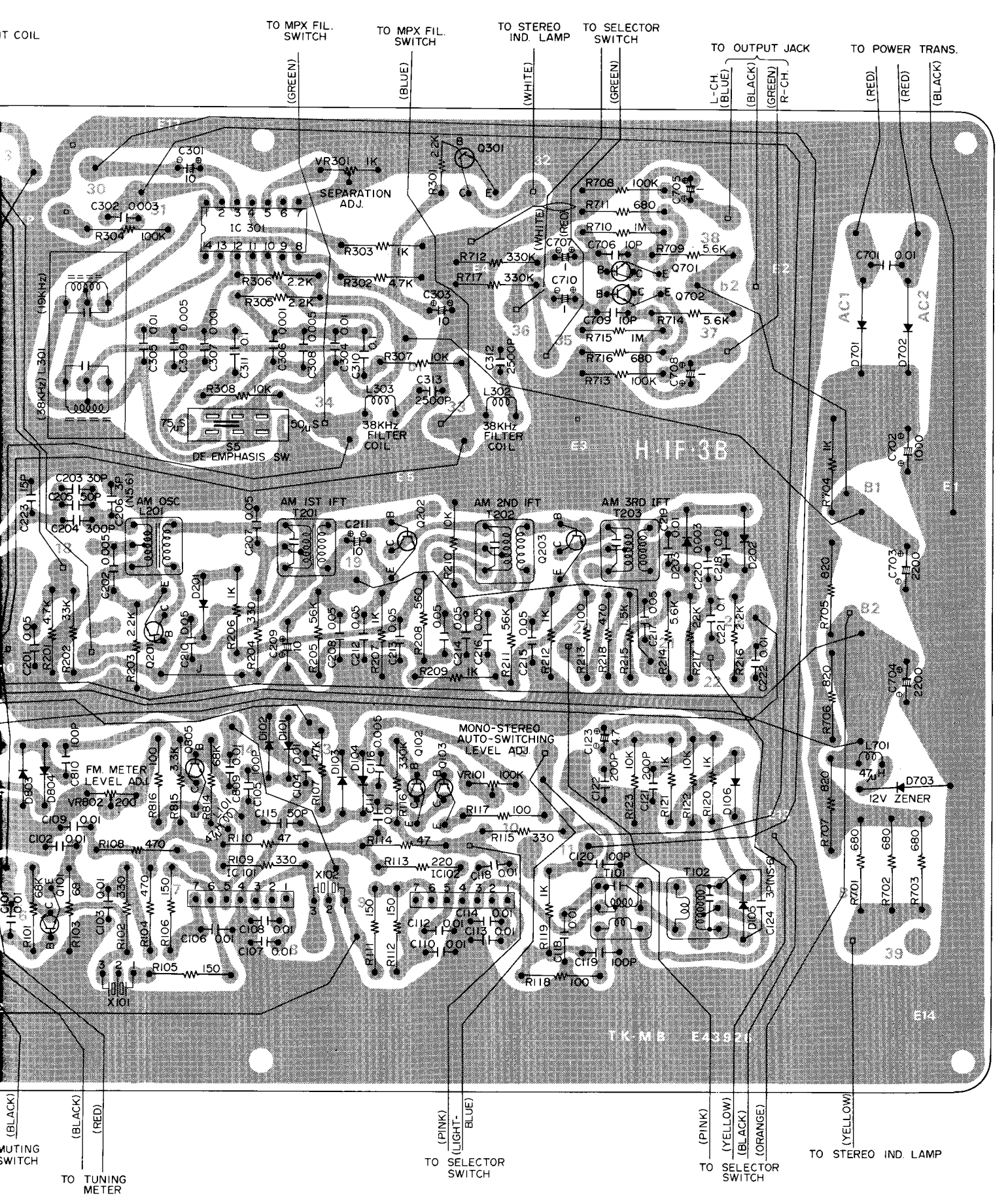


DIAL STRINGING DIAGRAM

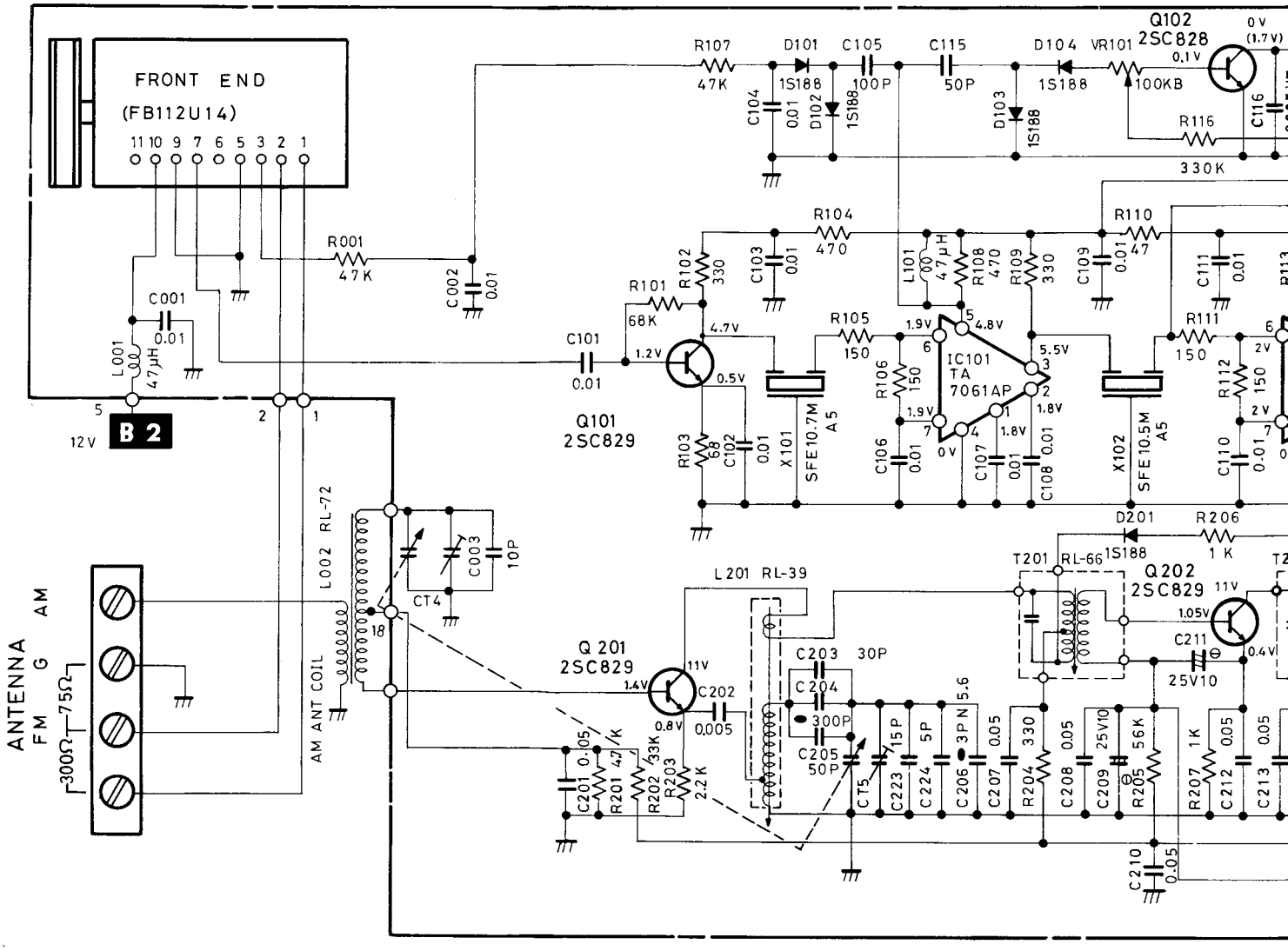


CIRCUIT BOARD DIAGRAM




TO MPX FIL. SWITCH
(GREEN)
TO MPX FIL. SWITCH
(BLUE)
TO STEREO IND. LAMP
(WHITE)
TO SELECTOR SWITCH
(GREEN)
TO OUTPUT JACK
L-CH. (BLUE)
(BLACK)
(GREEN) R-CH.
TO POWER TRANS.
(RED)
(RED)
(BLACK)
SEPARATION ADJ.
IC 301
VR301 1K
Q301
Q701
Q702
38KHz FILTER COIL
38KHz FILTER COIL
DE EMPHASIS SW
H-IF-3B
AM OSC L201
AM 1ST IFT T201
AM 2ND IFT T202
AM 3RD IFT T203
MONO-STEREO AUTO-SWITCHING LEVEL ADJ.
FM. METER LEVEL ADJ.
12V ZENER
IC101
IC102
T101
T102
X101
X102
TK-M8 E4339-21
(BLACK)
MUTING SWITCH
(BLACK)
(RED)
TO TUNING METER
(PINK)
(LIGHT-BLUE)
TO SELECTOR SWITCH
(PINK)
(YELLOW)
(BLACK)
(ORANGE)
TO SELECTOR SWITCH
(YELLOW)
TO STEREO IND. LAMP

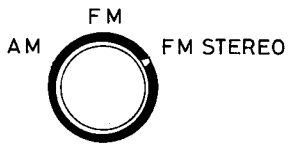
SCHEMATIC DIAGRAM



CERAMIC FILTER

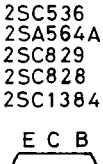
	RED (A)	BLUE (B)	ORANGE(C)
CENTER FREQ	10.7MHz ±30KHz	10.67MHz ±30KHz	10.73MHz ±30KHz

ITME \ SCHEMATIC LOCATION LAST	C	R
FM IF AMP	C124	R123
AM IF AMP	C224	R218
FM MUTING	C811	R816
FM MPX	C313	R308
AF AMP & POWER SUPPLY	C710	R717

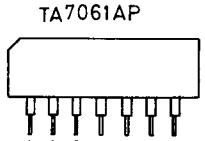


(BOTTOM VIEW)

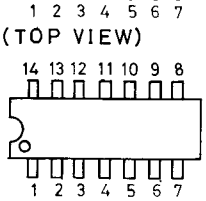
2SC536
2SA564A
2SC829
2SC828
2SC1384



TA7061AP



(TOP VIEW)



LA 3300

(RESISTORS)

5% TOLERANCE UNLESS

K---KILO OHM.

M---MEGA OHM.

▼---COMPOSITION RESIS

NON MARK--LOW NOISE

1/4 WATT.

(CAPACITORS)

MY--MYLAR FILM CAPAC

⊣⊢--ELECTROLYTIC CAP

●---TEMPERATURE COE

YE--CERAMIC CAPACITO

S---POLY STYROL CAP

NON MARK--CERAMIC

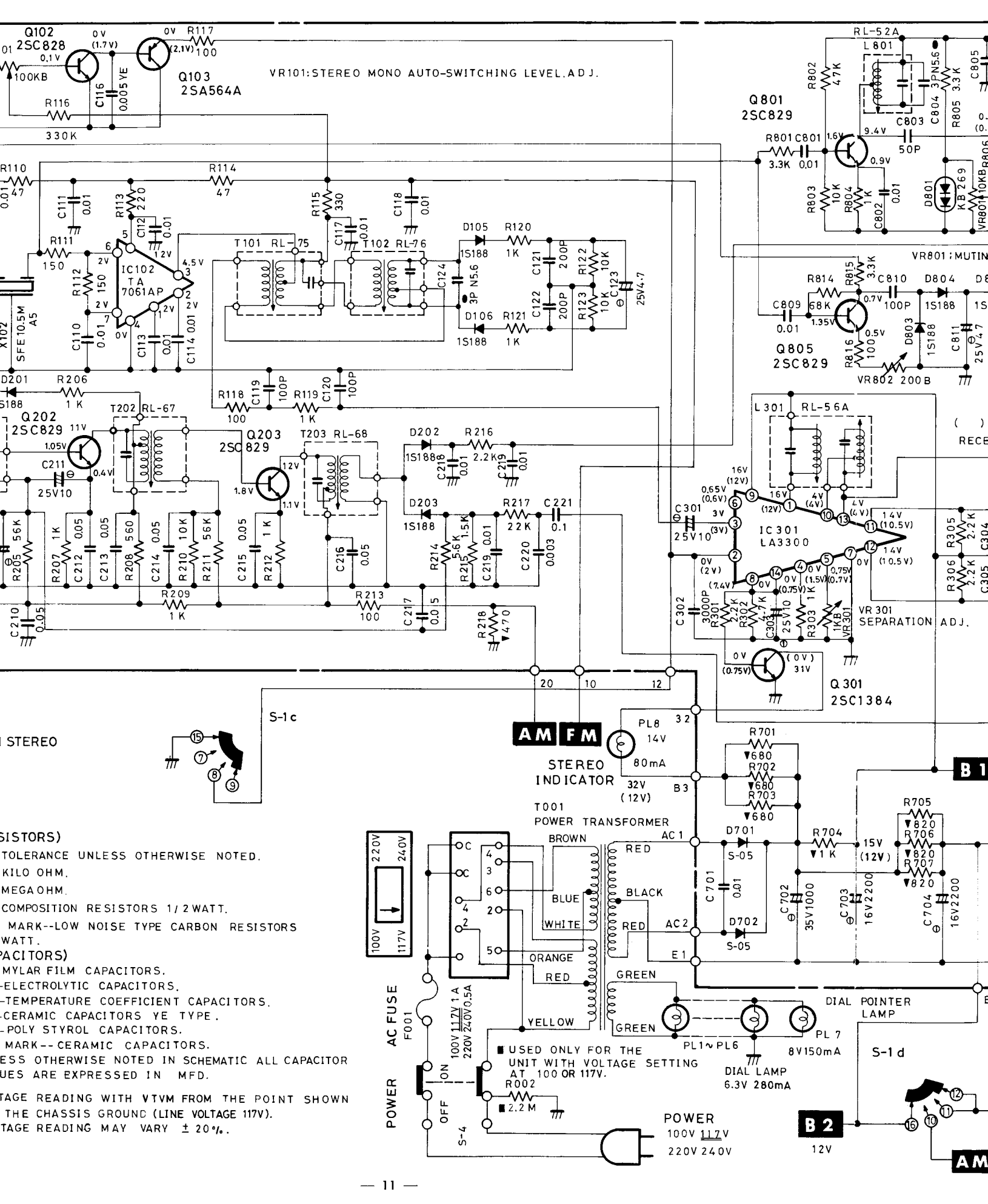
UNLESS OTHERWISE N

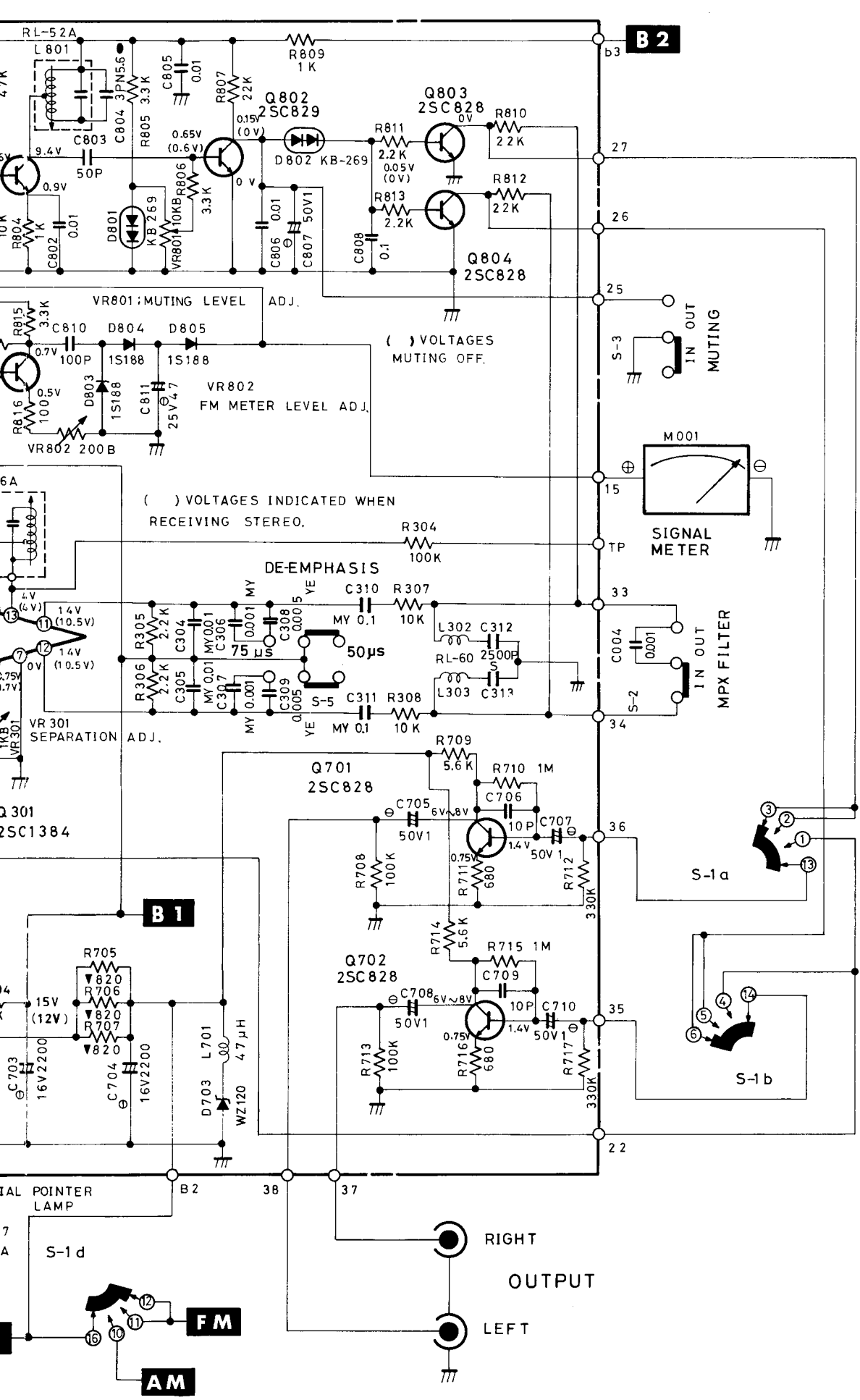
VALUES ARE EXPRESS

VOLTAGE READING WI

TO THE CHASSIS GRO

VOLTAGE READING MA


VR101:STEREO MONO AUTO-SWITCHING LEVEL ADJ.
Q102 2SC828
Q103 2SA564A
IC102 TA 7061AP
T101 RL-75
T102 RL-76
T202 RL-67
T203 RL-68
Q202 2SC829
Q203 2SC829
Q801 2SC829
Q805 2SC829
L801 RL-52A
L301 RL-56A
IC301 LA3300
VR801 : MUTIN
VR802 200B
VR 301 SEPARATION ADJ.
Q 301 2SC1384
S-1c
S-1d
STEREO INDICATOR
AM FM
PL8 14V 80mA
T001 POWER TRANSFORMER
AC FUSE F001
100V 117V 1A
220V 240V 0.5A
POWER S-4
ON
OFF
R002 2.2 M
USED ONLY FOR THE UNIT WITH VOLTAGE SETTING AT 100 OR 117V.
DIAL POINTER LAMP
PL 7 8V150mA
DIAL LAMP 6.3V 280mA
POWER 100V 117V 220V 240V
B 1
B 2
12V
AM
I STEREO
SISTORS)
TOLERANCE UNLESS OTHERWISE NOTED.
KILO OHM.
MEGA OHM.
COMPOSITION RESISTORS 1/2 WATT.
MARK--LOW NOISE TYPE CARBON RESISTORS
WATT.
PACITORS)
MYLAR FILM CAPACITORS.
-ELECTROLYTIC CAPACITORS.
-TEMPERATURE COEFFICIENT CAPACITORS.
-CERAMIC CAPACITORS YE TYPE.
-POLY STYROL CAPACITORS.
MARK--CERAMIC CAPACITORS.
ESS OTHERWISE NOTED IN SCHEMATIC ALL CAPACITOR
UES ARE EXPRESSED IN MFD.
TAGE READING WITH VTVM FROM THE POINT SHOWN
THE CHASSIS GROUND (LINE VOLTAGE 117V).
TAGE READING MAY VARY ± 20%.


RL-52A
L801
C803 50P
C804 3PN5.6
R805 3.3K
C805 0.01
R807 22K
R809 1K
Q802 2SC829
D802 KB-269
Q803 2SC828
R810 22K
R811 2.2K
R812 22K
R813 2.2K
Q804 2SC828
C808 0.1
C806 0.01
C807 50V1
D801 KB 269
R806 3.3K
VR801 10KB
R804 1K
C802 0.01
B2
b3
27
26
25
VR801 : MUTING LEVEL ADJ.
R815 3.3K
C810 100P
D804 1S188
D805 1S188
D803 1S188
C811 25V4.7
R816 100
VR802 200B
VR802 FM METER LEVEL ADJ.
( ) VOLTAGES MUTING OFF.
S-3
IN OUT
MUTING
M001
SIGNAL METER
15
( ) VOLTAGES INDICATED WHEN RECEIVING STEREO.
R304 100K
TP
DE-EMPHASIS
C310 R307
MY 0.1 10K
33
L302 C312
RL-60 2500P
L303 C313
C004 0.001
S-2
IN OUT
MPX FILTER
R305 2.2K
R306 2.2K
C304
C305
C306 MY 0.001
C307 MY 0.01
C308 0.005 YE
C309 0.005 YE
75 µs
50µs
S-5
C311 R308
MY 0.1 10K
34
VR 301 SEPARATION ADJ.
Q 301 2SC1384
R709 5.6K
R710 1M
Q701 2SC828
C705 50V1
C706 10P
C707 50V1
R708 100K
R711 680
R712 330K
36
S-1a
R714 5.6K
R715 1M
Q702 2SC828
C708 50V1
C709 10P
C710 50V1
R713 100K
R716 680
R717 330K
35
S-1b
22
B1
R705 820
R706 820
R707 820
15V (12V)
C703 16V2200
C704 16V2200
L701 47µH
D703 WZ120
38
37
B2
IAL POINTER LAMP
S-1d
FM
AM
RIGHT
OUTPUT
LEFT

PARTS LIST

Schematic Location	Part No.	Description
	RESISTORS	
R101	552068322	Carbon Film, 68K ±5%, 1/4W
R102, 109, R115	552033122	Carbon Film, 330 ±5%, 1/4W
R103	552068022	Carbon Film, 68 ±5%, 1/4W
R104, 108	552047122	Carbon Film, 470 ±5%, 1/4W
R105, 106, R111, 112	552015122	Carbon Film, 150 ±5%, 1/4W
R107	552047322	Carbon Film, 47K ±5%, 1/4W
R110, 114	552047022	Carbon Film, 47 ±5%, 1/4W
R113	552022122	Carbon Film, 220 ±5%, 1/4W
R116	552033422	Carbon Film, 330K ±5%, 1/4W
R117, 118	552010122	Carbon Film, 100 ±5%, 1/4W
R119, 120, R121	552010222	Carbon Film, 1K ±5%, 1/4W
R122, 123	552010322	Carbon Film, 10K ±5%, 1/4W
VR101	510502130	Potentiometer, 100K, Mono-Stereo Auto-switching Level Adj.
R201	552047222	Carbon Film, 4.7K ±5%, 1/4W
R202	552033322	Carbon Film, 33K ±5%, 1/4W
R203, 216	552022222	Carbon Film, 2.2K ±5%, 1/4W
R204	552033122	Carbon Film, 330 ±5%, 1/4W
R205, 211	552056322	Carbon Film, 56K ±5%, 1/4W
R206, 207, R209, 212	552010222	Carbon Film, 1K ±5%, 1/4W
R208	552056122	Carbon Film, 560 ±5%, 1/4W
R210	552010322	Carbon Film, 10K ±5%, 1/4W
R213	552010122	Carbon Film, 100 ±5%, 1/4W
R214	552056222	Carbon Film, 5.6K ±5%, 1/4W
R215	552015222	Carbon Film, 1.5K ±5%, 1/4W
R217	552022322	Carbon Film, 22K ±5%, 1/4W
R218	551047133	Composition, 470 ±10%, 1/2W
R301, 305, R306	552022222	Carbon Film, 2.2K ±5%, 1/4W
R302	552047222	Carbon Film, 4.7K ±5%, 1/4W
R303	552010222	Carbon Film, 1K ±5%, 1/4W
R304	552010422	Carbon Film, 100K ±5%, 1/4W
R307, 308	552010322	Carbon Film, 10K ±5%, 1/4W
VR301	510502119	Potentiometer, 1K, Separation Adj.
R701, 702, R703	551068133	Composition, 680 ±10%, 1/2W
R704	551010233	Composition, 1K ±10%, 1/2W
R705, 706, R707	551082133	Composition, 820 ±10%, 1/2W
R708, 713	552010433	Carbon Film, 100K ±5%, 1/4W
R709, 714	552056222	Carbon Film, 5.6K ±5%, 1/4W
R710, 715	552010522	Carbon Film, 1M ±5%, 1/4W
R711, 716	552068122	Carbon Film, 680 ±5%, 1/4W
R712, 717	552033422	Carbon Film, 330K ±5%, 1/4W
R801, 805, R806, 815	552033222	Carbon Film, 3.3K ±5%, 1/4W
R802	552047322	Carbon Film, 47K ±5%, 1/4W
R803	552010322	Carbon Film, 10K ±5%, 1/4W
R804, 809	552010222	Carbon Film, 1K ±5%, 1/4W
R807, 810, R812	552022322	Carbon Film, 22K ±5%, 1/4W
R808		Not used
R811, 813	552022222	Carbon Film, 2.2K ±5%, 1/4W
R814	552068322	Carbon Film, 68K ±5%, 1/4W
R816	552010122	Carbon Film, 100 ±5%, 1/4W
VR801	510502126	Potentiometer, 10K, Muting Level Adj.
VR802	510502129	Potentiometer, 200, FM Meter Level Adj.
	CAPACITORS	
C101, 102, C103, 104, C106, 107, C108, 109, C110, 111, C112, 113, C114, 117, C118	440100985	Ceramic, 0.01mfd, 250V
C105, 119, C120	440101183	Ceramic, 100pF ±10%, 250V
C121, 122	440201183	Ceramic, 200pF ±10%, 250V
C123	402470729	Electrolytic, 4.7mfd, 25V
C115	440501283	Ceramic, 50pF ±10%, 250V
C116	442501033	Ceramic, 0.005mfd ±10%, 50V
C201, 207, C208, 210, C212, 213, C214, 215, C216, 217	440500935	Ceramic, 0.05mfd, 50V
C202	440501085	Ceramic, 0.005mfd, 250V
C203	440301283	Ceramic, 30pF ±10%, 250V
C204	441301130	Ceramic, 300pF, NPO, 50V
C205	440501283	Ceramic, 50pF ±10%, 250V
C206	441301336	Ceramic, 3pF, N5.6, 50V
C209, 211	402100629	Electrolytic, 10mfd, 25V
C218, 219, C222	440100985	Ceramic, 0.01mfd, 250V
C220	442301033	Ceramic, 0.003mfd ±10%, 50V
C221	440100835	Ceramic, 0.1mfd, 50V
C223	440151283	Ceramic, 10pF ±10%, 250V
C224	440501388	Ceramic, 5pF ±0.5pF, 250V
C301, 303	402100629	Electrolytic, 10mfd, 25V
C302	442301033	Ceramic, 0.003mfd ±10%, 50V
C304, 305	450100933	Mylar Film, 0.01mfd ±10%, 50V
C306, 306	450101033	Mylar Film, 0.001mfd ±10%, 50V
C308, 309	450501033	Mylar Film, 0.005mfd ±10%, 50V
C310, 311	450100933	Mylar Film, 0.1mfd ±10%, 50V
C312, 313	454251033	Polystyrene Film, 2500pF ±10%, 50V
C701	440100985	Ceramic, 0.01mfd, 250V
C702	402100439	Electrolytic, 1000mfd, 35V
C703, 704	402220419	Electrolytic, 2200mfd, 16V

Schematic Location	Part No.	Description
C705, 707, C708, 710	402100749	Electrolytic, 1mfd, 50V
C706, 709	440101283	Ceramic, 10pF ±10%, 250V
C801, 802, C805, 806, C809	440100985	Ceramic, 0.01mfd, 250V
C803	440501283	Ceramic, 50pF ±10%, 50V
C804	441301336	Ceramic, 3pF, N5.6, 50V
C807	402100749	Electrolytic, 1mfd, 50V
C808	440100835	Ceramic, 0.1mfd, 50V
C810	440101183	Ceramic, 100pF ±10%, 250V
C811	402470629	Electrolytic, 47mfd, 25V
	TRANSISTORS AND DIODES	
Q101	301201117	2SC829C, FM IF 1st Amp.
Q102	301201115	2SC828, Stereo Auto-switching Amp.
Q103	301001117	2SA564A, Stereo Auto-switching Amp.
IC101, 102	303452146	TA7061AP, FM IF Amp.
D101, 102, D103, 104, D105 106	300111008	1S188, FM Det., AGC Rect., etc.
Q201, 202, Q203	301201117	2SC829C, AM Conv. & IF Amp.
D201, 202, D203	300111008	1S188, AM Det., Overload Protector
Q301	301201132	2SC1384, FM Stereo Ind. Driver
IC301	303452145	LA3300, FM MPX Decoder
Q701, 702	301201115	2SC828, Audio Amp.
D701, 702	300919008	S-05-02, Rectifier
D703	300313003	WZ120, Zener Regulator, 12V, 0.5W
Q801, 802, Q805	301201117	2SC829C, FM Muting, FM Meter Amp.
Q803, 804	301201115	2SC828, FM Muting
D801, 802	300212004	KB-269, FM Muting
	COILS AND TRANSFORMERS	
T101	225501125	FM IFT, Ratio Det., RL-75
T102	225501126	FM IFT, Ratio Det., RL-76
X101, 102	229101134	Bandpass Filter, 10.7MHz, SFE10.7MA5 (Red Mark).
L101	220001121	RF Choke, 47 micro-Henry
T201	225301125	AM IFT, 1st, RL-66
T202	225301126	AM IFT, 2nd, RL-67
T203	225301127	AM IFT, 3rd, RL-68
L201	223301124	AM OSC, RL-39
L301	225601129	MPX 19KHz/38KHz tune, RL-56A
L302, 303	228641114	MPX 38KHz Filter, RL-60
L701	220001121	RF Choke, 47 micro-Henry
L801	226501115	Muting 10.7MHz tune, RL-52A
L001	220001121	RF Choke, 47 micro-Henry

Schematic Location	Part No.	Description
	RESISTOR	
R001	552047322	Carbon Film, 47K ±5%, 1/4W
	CAPACITORS	
C001, 002	440100985	Ceramic, 0.01mfd, 250V
C003	440101283	Ceramic, 10pF ±10%, 250V
	321304368	AM/FM Front end
S5	613000024	Switch, De-emphasis
	651300013	Dial Pulley
	770101225	Pin, Terminal
	140300346	Printed Circuit Board "H-IF-3"
	141311351	AM/FM Circuit Board Assembly
	131011245	Cabinet
	111911278	Front Panel
	116310054	Knob, Tuning
	116310053	Knob, Function Selector
	116210012	Button, Power switch
	116210008	Button, Muting & MPX Filter switch
	112011262	Dial Board
	151691121	Dial Pointer w/lamp (PL7)
T001	205001344	Power Transformer (100-120-220-240V)
L002	222391121	AM Antenna Coil
R002*	551022533	Resistor, Composition, 2.2M ±10%, 1/2W
C004	442101033	Capacitor, Ceramic, 0.001mfd ±10%, 50V
M001	231310019	Meter, Tuning
PL1, 2, 3, PL4, 5, 6,	352063028	Lamp, 6.3V, 0.28A, Dial Illumination
PL7	351080015	Lamp, 8V, 0.15A, Dial Pointer Light
PL8	351140008	Lamp, 14V, 80mA, FM Stereo Indicator
F001	341220010	Fuse, 1A-3AG, (100-120V area)
	341220005	Fuse, 0.5A-3AG, (220-240V area)
S1	601011247	Switch, Function Selector
S2, 3 (1 set)	614020402	Switch, Push 2-keys, Muting & MPX Fil.
S4	614010106	Switch, Push 1-key, Power Supply
	648211115	Bracket, Dial Lamp
	648211127	Bracket, Fuse
	648211121	Voltage Selector
	624100102	Pin Jack, 2P, Output
	641200104	Antenna Terminal Strip, 4P
	796301115	Power Supply Cord (UL/CSA)
	791001111	FM Indoor Antenna, T type, 300-ohm
	791001112	Shield Wire w/plug
	812001232	Packing Case
	811001222	Filter
	815001218	Styroform Molding
	855003560	Vinyl Bag, Packing

*used only for the unit with voltage setting at 100 – 120V.