

Service Manual

FM/AM Stereo Receiver

SA-616

[M], [MC]



Simulated wood cabinet

Areas

- * [M] is available in U.S.A.
- * [MC] is available in Canada.

TECHNICAL SPECIFICATIONS (Specifications are subject to change without notice for further improvement.)

(IHF '78)

■ AMPLIFIER SECTION

Rated minimum sine wave RMS power output	
20 Hz~20 kHz both channels driven	80W per channel (8 ohms)
0.005% total harmonic distortion	110W per channel (4 ohms)
0.01% total harmonic distortion	
1 kHz continuous power output	
both channels driven	90W per channel (8 ohms)
0.001% total harmonic distortion	120W per channel (4 ohms)
Dynamic headroom	1.5 dB (8 ohms)
	2.0 dB (4 ohms)
Total harmonic distortion	
rated power at 20 Hz~20 kHz	0.005% (8 ohms)
	0.01% (4 ohms)
half power at 20 Hz~20 kHz	0.005% (8 ohms)
half power at 1 kHz	0.001% (8 ohms)
SMPTE intermodulation distortion	0.01% (8 ohms)
Frequency response	
PHONO	RIAA standard curve ± 0.3 dB
AUX, TAPE	5 Hz~70 kHz, -3 dB
	20 Hz~20 kHz, +0 dB, -0.3 dB
Input sensitivity	
PHONO	0.3 mV (2.5mV, IHF '66)
AUX, TAPE	18 mV (150mV, IHF '66)

S/N (IHF, A)	
PHONO	74 dB (82 dB, IHF '66)
AUX, TAPE	79 dB (100 dB, IHF '66)
Maximum input voltage	
PHONO	140 mV (150 mV, 1 kHz)
Input impedance	
PHONO	47 kilohms
AUX, TAPE	33 kilohms
Tone controls	
bass	50 Hz, +10 dB~ -10 dB
treble	20 kHz, +10 dB~ -10 dB
Acoustic controls (at tone "0" position)	
low boost	100 Hz, +6 dB
high boost	10 kHz, +6 dB
middle boost	1 kHz, +5 dB
low cut	70 Hz, -6 dB/oct.
high cut	7 kHz, -6 dB/oct.
middle cut	1 kHz, -5 dB
Loudness control (volume at -30 dB)	50 Hz, +9 dB
Output voltage	
REC OUT	150 mV
Low frequency damping factor	50 (8 ohms)
	25 (4 ohms)
Load impedance	
MAIN or REMOTE	4~16 ohms
MAIN and REMOTE	8~16 ohms

Technics

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■ FM TUNER SECTION

Frequency range*	87.9~107.9 MHz
Sensitivity	10.3 dBf (1.8 μ V, IHF '58)
50 dB quieting sensitivity	
MONO	13.2 dBf (2.5 μ V IHF '58)
STEREO	36.2 dBf (35.4 μ V IHF '58)
Total harmonic distortion	
100 Hz	0.15% (MONO), 0.25% (STEREO)
1 kHz	0.1% (MONO), 0.15% (STEREO)
6 kHz	0.25% (MONO), 0.3% (STEREO)
S/N	
MONO	76 dB
STEREO	72 dB
Frequency response	20 Hz~15 kHz, +0.2 dB, -0.8 dB
Alternate channel selectivity	75 dB
Capture ratio	1.2 dB
Image rejection at 98.1 MHz	80 dB
IF rejection at 98.1 MHz	90 dB
Spurious response rejection at 98.1 MHz	100 dB
AM suppression	60 dB
Stereo separation	
1 kHz	45 dB
10 kHz	35 dB
Carrier leak	
19 kHz	-65 dB
38 kHz	-70 dB
Antenna terminals	
	300 ohms (balanced)
	75 ohms (unbalanced)

■ AM TUNER SECTION

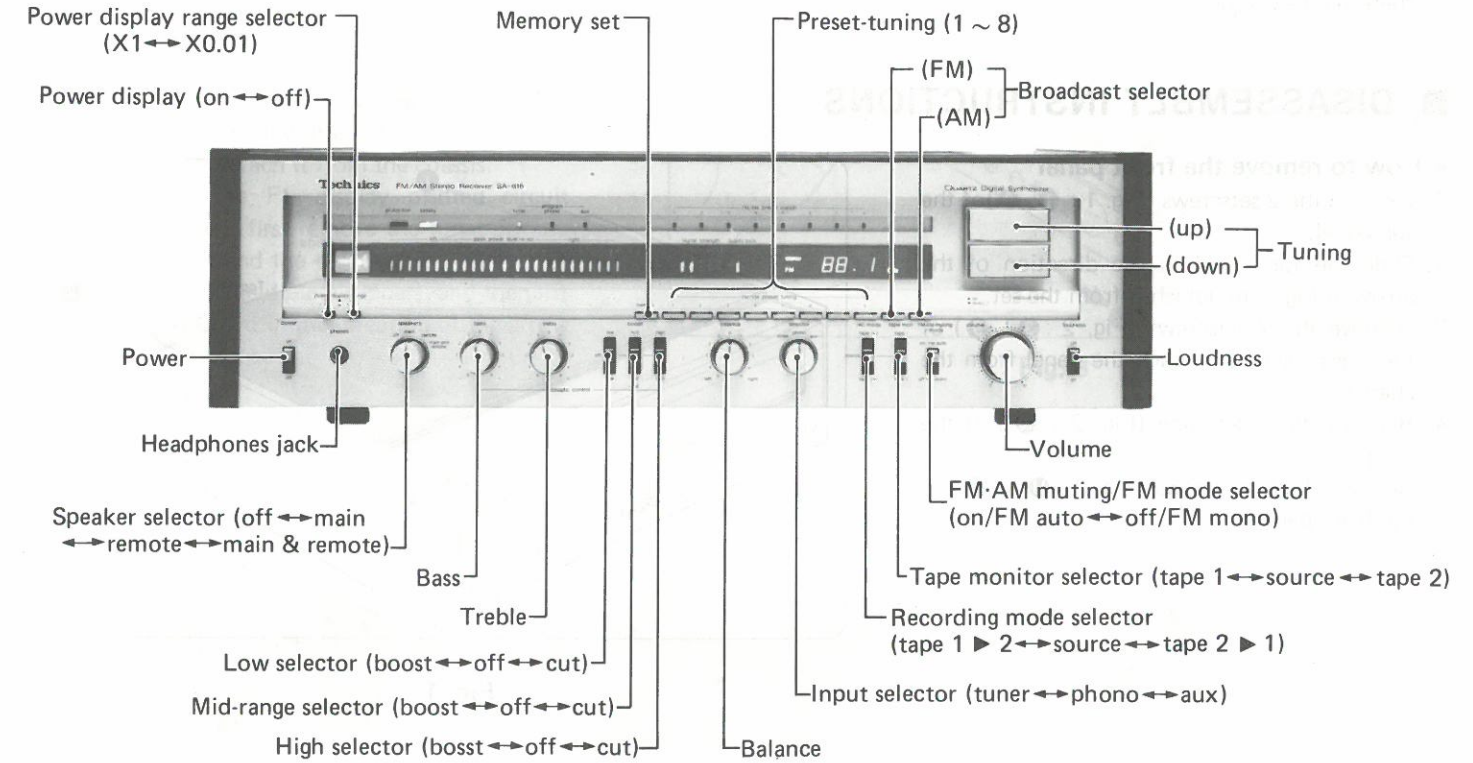
Frequency range*	530~1620 kHz
Sensitivity	30 μ V, 250 μ V/m
Selectivity	55 dB
Image rejection at 1000 kHz	50 dB
IF rejection at 1000 kHz	45 dB

■ GENERAL

Power consumption	500W, 630 VA
Power supply	AC 120V, 60 Hz
Batteries (for memory "back-up")	DC 4.5V
	3 "AA" size batteries
	Panasonic UM-3 or equivalent
Dimensions (W×H×D)	566 × 172 × 396 mm
	(22-9/32" × 6-25/32" × 15-19/32")
Weight	18.2 kg
	(40.1 lb.)

Note: Total harmonic distortion is measured by the digital spectrum analyzer (HP. 3045 system).

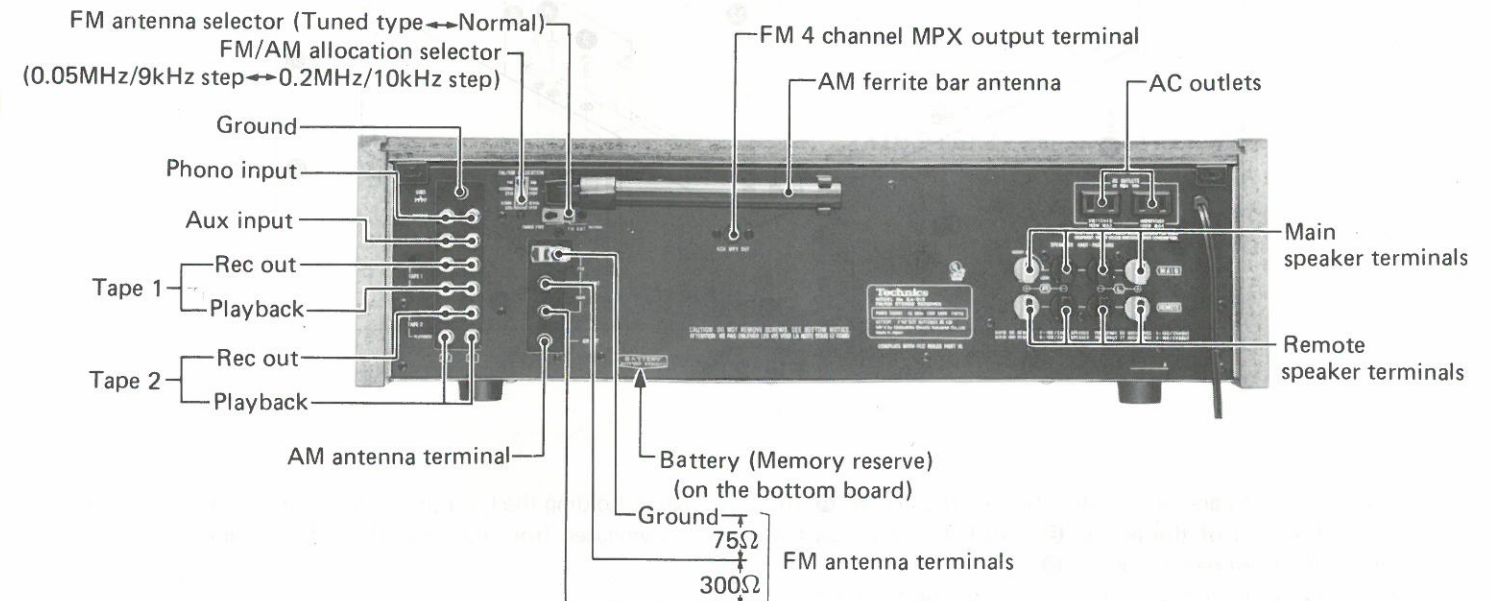
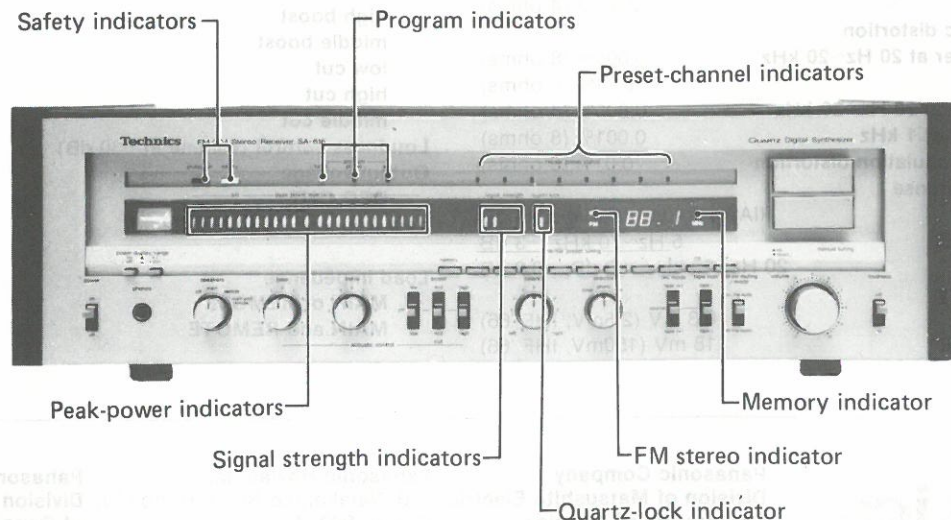
*This unit is equipped with an FM/AM allocation selector on the rear panel. The specifications shown above are correct with this selector set to the "FM 200 kHz/AM 10 kHz" position. If it is set to the "FM 50 kHz/AM 9 kHz" position, however, the FM frequency range becomes 87.5~108.0 MHz, and the AM frequency range becomes 522~1611 kHz.



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■ LOCATION OF CONTROLS



BEFORE STARTING THE REPAIRING

Before adjusting or repairing, be sure to short-circuit opposite poles of the 8200 μ F capacitors (C701 ~ 704) with a resistor approximately of "50 Ω , 5W" for discharging the charged voltage.

Short-circuiting with a screw driver and the like is not only dangerous, but may destroy transistors and diodes, and should therefore be avoided.

DISASSEMBLY INSTRUCTIONS

How to remove the front panel

1. Remove the 2 setscrews (Fig. 1 : ①, ②) of the top panel.
2. Slide the top panel in the direction of the arrow in Fig. 1 to detach it from the set.
3. Remove the 7 setscrews (Fig. 2 : ③ ~ ⑨) of the right panel to detach the panel from the chassis.
4. Remove the 1 setscrew (Fig. 2 : ⑩) of the left panel.
5. Remove the 5 setscrews (Fig. 2 : ⑪ ~ ⑮) of the front panel.

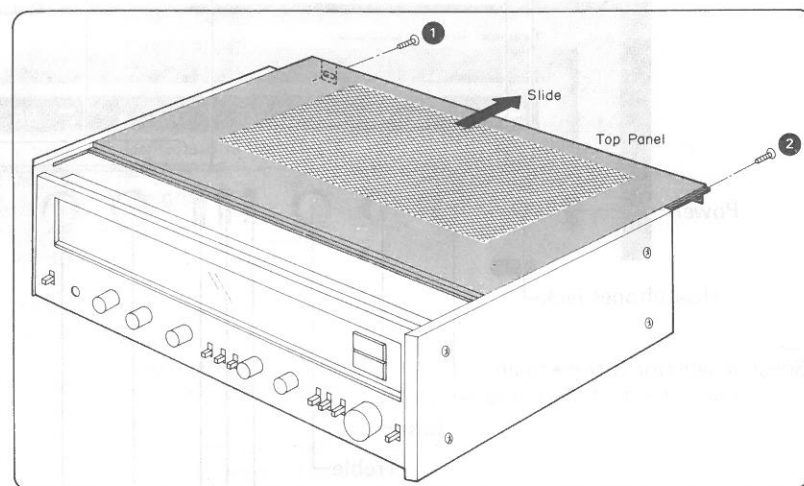


Fig. 1

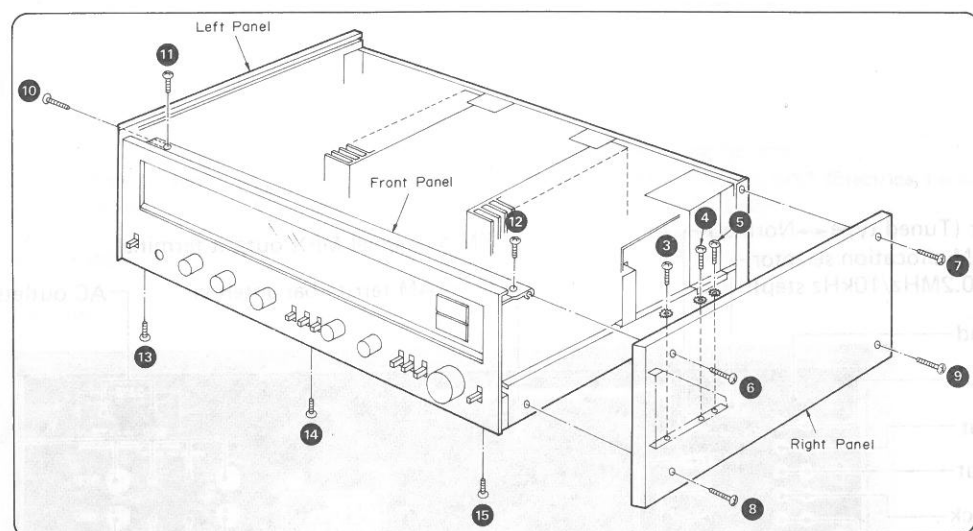


Fig. 2

6. Move the front panel in the direction of the arrow A in Fig. 3. Next, holding the left bottom of the front panel, move it in the direction of the arrow B until the power switch knob is disengaged from the hole of the front panel, and then remove the front panel. (arrow C)

Note: Take care not to give damage to the switch knobs.

7. As shown in Fig. 4, remove the setscrews ⑯, ⑰, and 5 lugs to detach the LED display printed circuit boards from the back of the front panel.

How to remove the printed circuit boards

1. Remove the front panel, and the LED display printed circuit boards secured on it. (Refer to "How to remove the front panel.")
2. Remove the 2 setscrews (Fig. 5 : ⑱, ⑲) to detach the printed circuit board (top) of the tuner circuit as shown in Fig. 5.
3. To detach the voltage regulator printed circuit board, remove the setscrews ⑳ and ㉑, then lift the board in the direction of the arrow in the Fig. 5 to detach it from the chassis.
4. To detach the FL display printed circuit board (center), first remove the tuner printed circuit board and the 4 setscrews (Fig. 6 : ㉒ ~ ㉕) of the shield plate (upper), and then lift the circuit board in the direction of the arrow in Fig. 6.

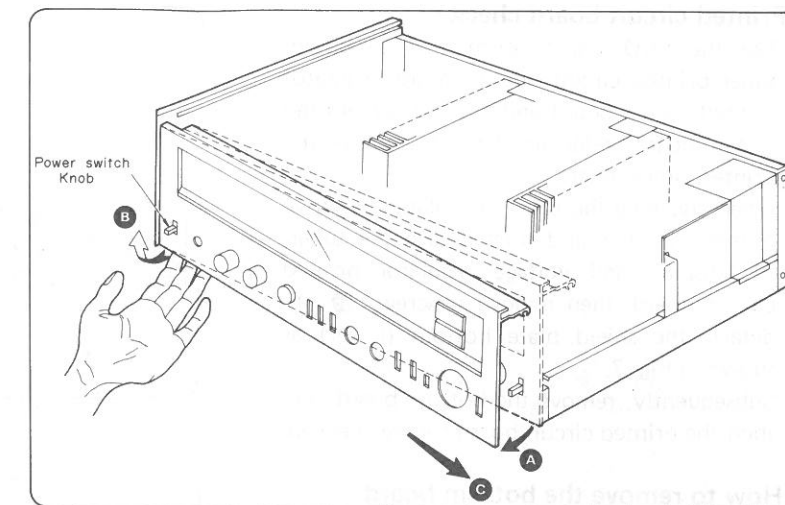


Fig. 3

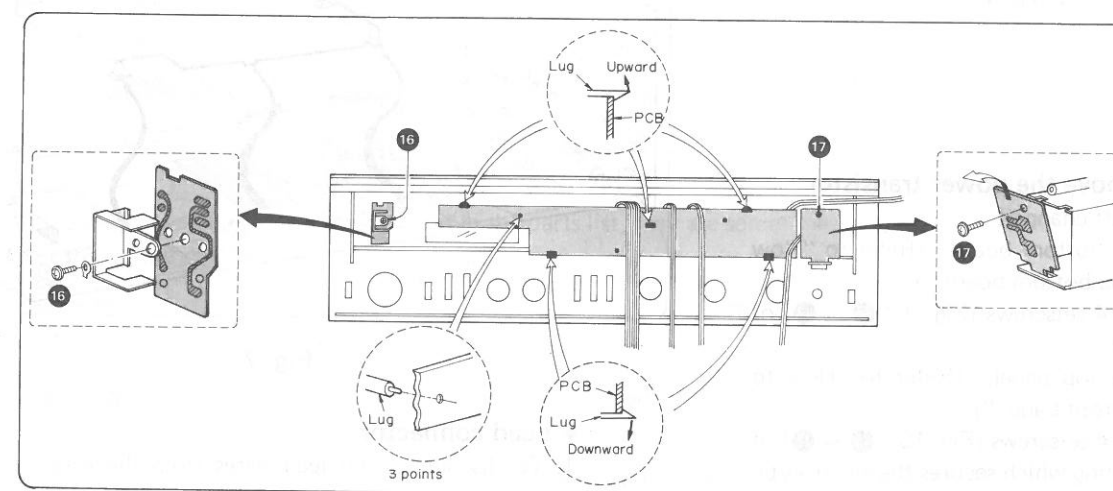


Fig. 4

Note: For ⑱ and ⑲ in Fig. 5, screw (XTB3+8BFZ1) provided with pin like A encircled by dotted line is used.

However, to replace them, use 3 x 8mm tapping screw (XTB3+8BFZ) and toothed lock washer (XWC3B) like B.

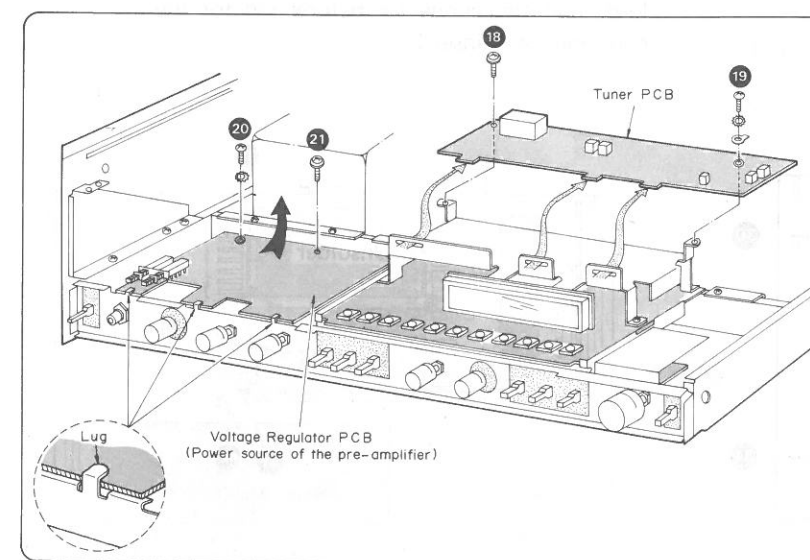
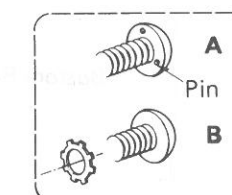


Fig. 5



Printed circuit board check

1. For the LED display printed circuit board, tuner printed circuit board, voltage regulator printed circuit board and FL display printed circuit board, refer to "How to remove the printed circuit board."
2. When checking the tone control and pre-drive printed circuit board, first detach the tuner, FL display and voltage regulator printed circuit board, then remove setscrew 26 to detach the shield plate bottom (lower) as shown in Fig. 7. Subsequently, remove the bottom board, and then the printed circuit board can be checked.

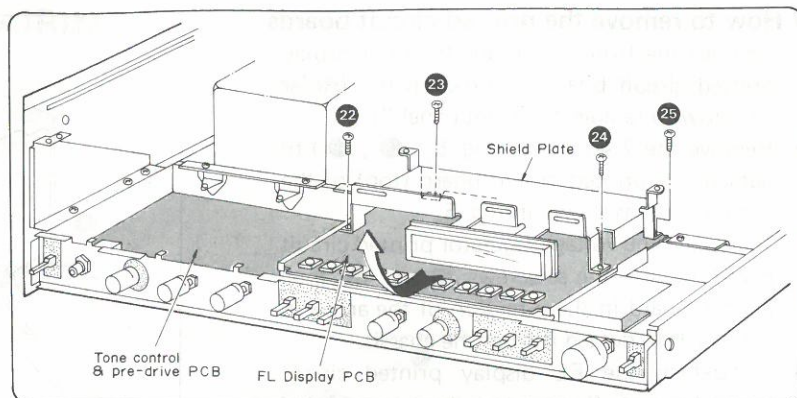


Fig. 6

How to remove the bottom board

1. Remove the 12 setscrews (Fig. 8 : 27 ~ 38) of the bottom board.
2. Remove the bottom board.

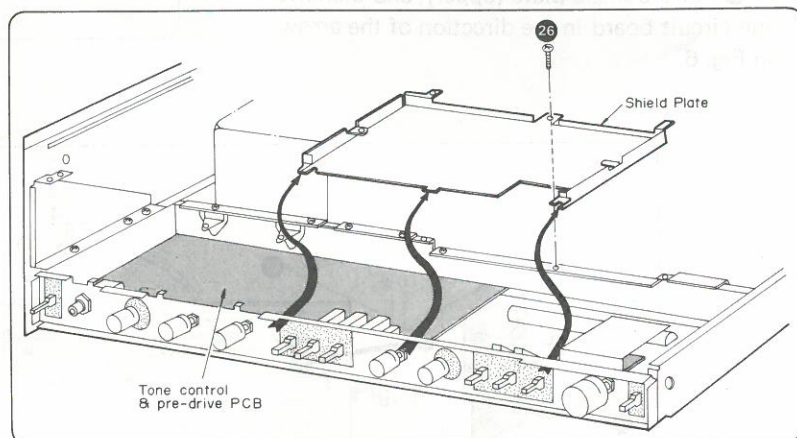


Fig. 7

How to remove the power transistor

- (Example: Left channel)
1. Remove the bottom board. (Refer to "How to remove the bottom board.")
 2. Remove the 4 setscrews (Fig. 9 : 39 ~ 42) of the heat sink.
 3. Remove the top panel. (Refer to "How to remove the front panel.")
 4. Remove the 4 setscrews (Fig. 10 : 43 ~ 46) of the metal fitting which secures the electrolytic condenser. Then the metal fitting can be removed.
 5. Unsolder the power transistor. (Fig. 9)
 6. Remove the transistor along with the heat-sink from the printed circuit board as shown in Fig. 10.
 7. When installing the power transistor onto the heat-sink, apply a heat diffusing agent to both sides of the mica plate.

Lead connector

1. To disconnect the lead wires from the lead connector, open the "lead holder" of the connector as shown in Fig. 11, and pull out the lead wires.
2. The lead wires are provided with identification colors or patterns as in Fig. 11. So, insert them into the connector in correct positions.
3. It is advisable to put pencil marks on both the leads and the connector beforehand for the convenience of insertion.

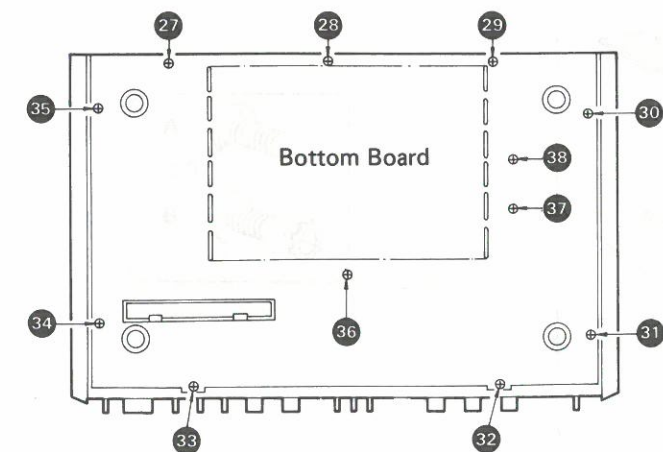


Fig. 8

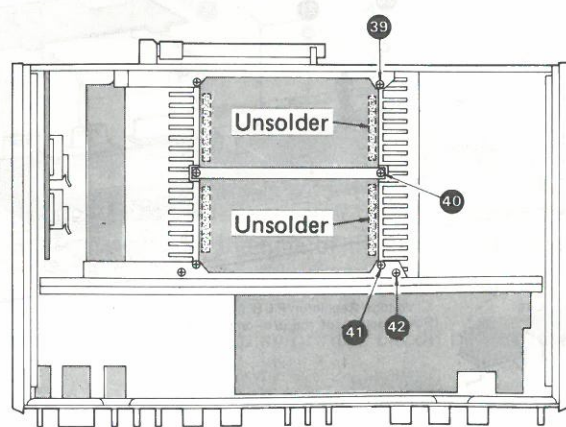


Fig. 9

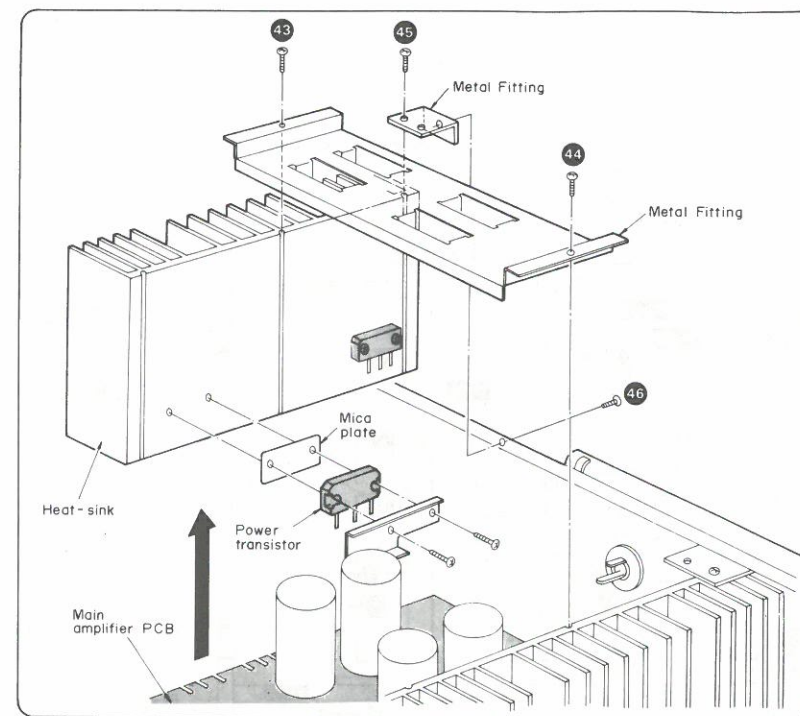


Fig. 10

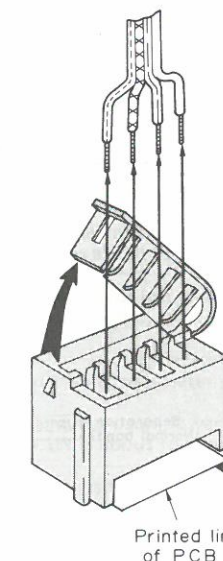


Fig. 11

• Since standardized parts are mentioned in the parts list, they are sometimes different in Part No. and Color from the product parts.

Screw No.	Type	Color	Product Part No.	Figure No.
1 ~ 2	⊕ 3 x 8mm, Tapping (With plain washer)	Black	XTW3+8HFZ	1
3 ~ 5	⊕ 4 x 10mm, Tapping	Gold	XTB4+10F	2
6 ~ 10	⊕ 4 x 25mm (With spring washer & plain washer)	Black	XYAS4+25001	2
11 ~ 15	⊕ 3 x 8mm, Tapping	Black	XTB3+8BFZ	2
16 ~ 18	⊕ 3 x 10mm, Tapping (With plain washer)	Gold	XTW3+10H	4, 5
19 ~ 20	⊕ 3 x 8mm, Tapping (With toothed lock washer)	Black	XTBS3+8BFZ1	5
21	⊕ 3 x 10mm, Tapping (With plain washer)	Gold	XTW3+10H	5
22 ~ 26	⊕ 3 x 8mm, Tapping	Gold	XTB3+8B	6, 7
27 ~ 38	⊕ 3 x 8mm, Tapping	Red	XTB3+8BFYR	8
39 ~ 42	⊕ 3 x 10mm, Tapping (With plain washer)	Red	XTW3+10HFYR	9
43 ~ 46	⊕ 3 x 10mm, Tapping	Black	XTB3+10BFZ	10

To remove the remote control switch band

1. Press the band with a screw driver in the direction shown in Fig. 12.
2. Remove the band, first at point (A) as shown in Fig. 13. (Care should be taken not to hold (C) in Fig. 12.)
3. Then remove the band at point (B).
4. When re-attaching the band start at point (B).

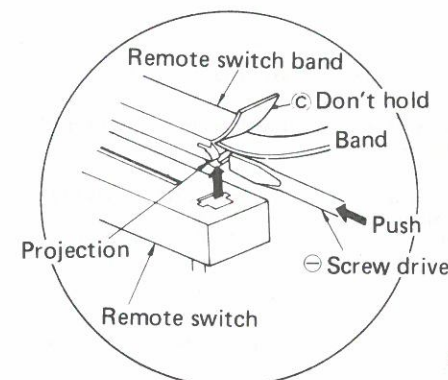


Fig. 12

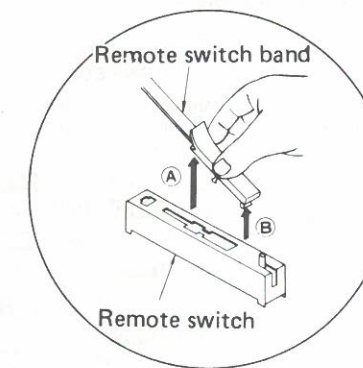
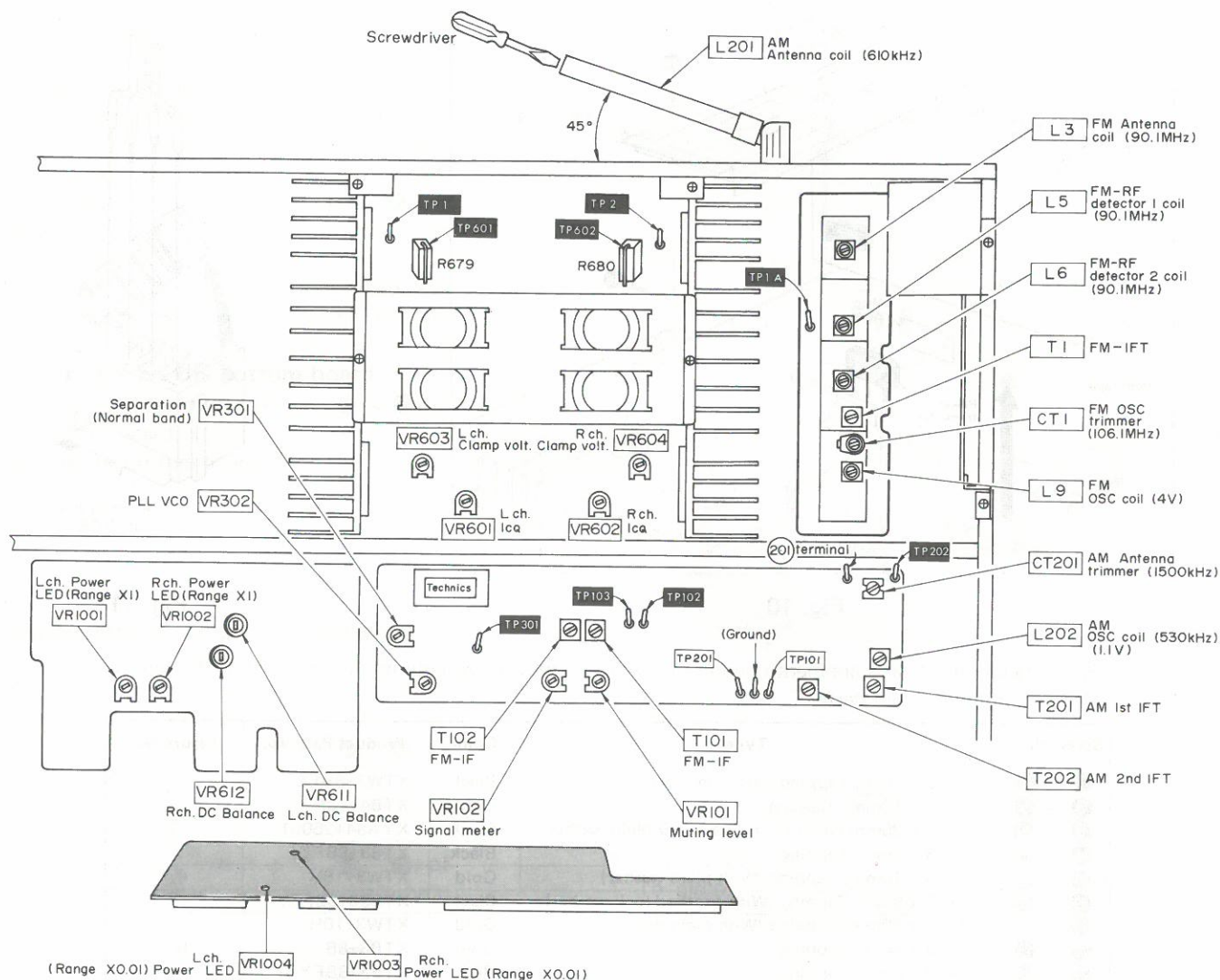


Fig. 13

ADJUSTMENT POINTS



ADJUSTING INSTRUCTIONS

Setting of controls and instruments to be used

* Before the adjustment, VR601, VR602, VR603 and VR604 should be turned to counter-clockwise direction.

1. Speaker switch Main
2. Sound volume 0 (minimum)
3. DC voltmeter (capable to measure 5mV)

AMPLIFIER ADJUSTMENT

No.	ADJUSTMENTS	DC VOLTMETER CONNECTION	PARTS ADJUSTED	ADJUSTING PROCEDURE
1	DC balance	Connect it to "Speaker" terminals of L and R channels.	VR611 (L channel) VR612 (R channel)	* Adjust it to zero (0) with as small measuring range as possible.
2	Clamp voltage	(L channel) Between TP1 and TP601 (minus probe) (R channel) Between TP2 and TP602 (minus probe)	VR603 (L channel) VR604 (R channel)	* Turn Ica semi-fixed resistors VR601, VR602 to minimum. (counter-clockwise direction) * Adjust VR603 (L ch) and VR604 (R ch) to approx. 0.5mV after ten minutes warm-up time.
3	Ica	(L channel) Between TP1 and TP601 (minus probe) (R channel) Between TP2 and TP602 (minus probe)	VR601 (L channel) VR602 (R channel)	* Adjust VR601 (L ch) and VR602 (R ch) to approx. 8 ~ 12mV after ten minutes warm-up time.

Setting

- * Connect a low frequency oscillator to the AUX input terminal, and 8-ohm load resistor and audio AC voltmeter to the speaker terminal.
- * Add 1kHz signal from the low frequency oscillator to the set.
- * Set the sound volume to the maximum point.
- * Set the power display switch to "on" position.

No.	ADJUSTMENTS	POWER DISPLAY RANGE SELECT SWITCH POSITION	PARTS ADJUSTED	ADJUSTING PROCEDURE
1	LED peak power level display	X1	VR1001 (Left channel)	1. Adjust the input level so that the AC voltmeter indicates 17V. 2. Adjust VR1001 while observing the peak power level display so that the LED at 40W is about to turn on.
2			VR1002 (Right channel)	Adjust VR1002 in the same way as for left channel. If the indication of left channel changes, re-adjust VR1001.
3		X0.01	VR1004 (Left channel)	1. Adjust the input level so that the AC voltmeter indicates 0.1V. 2. Adjust VR1004 while observing the peak power level display so that the LED at 0.1W is about to turn on.
4			VR1003 (Right channel)	Adjust VR1003 in the same way as for left channel. If the indication of left channel changes, re-adjust VR1004.

- * Set FM/AM allocation selector to "FM 0.2MHz/AM 10kHz" position.
- * Set antenna selector to "normal" position.

AM TUNER ADJUSTMENT

Setting and Equipment used

1. AC and DC electronic voltmeters (VTVM)
2. AM signal generator (AM-SG)
3. Maintaining line voltage at 120 volts.
4. Output of signal generator should be no higher than necessary to obtain an output reading.
5. Adjust the antenna coil (L201) position by using a screwdriver so that it is at approximately 45 degrees to the rear panel.
6. Set input selector to "tuner" position.
7. Use a non-metal screwdriver for the adjustment.
8. Set FM-AM muting/mode switch to "off/FM mono" position.
9. Set broadcast selector to "AM" position.
10. Set tape monitor and recording mode selector to "source" position.
11. Set speaker selector to "main & remote" position.
12. Set mode switch to "stereo" position.

Step No.	AM SIGNAL GENERATOR		DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	CONNECTION	FREQUENCY				
AM-IF ADJUSTMENT						
1	Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Powerful input)	450kHz (30% Mod. with 400Hz)	Frequency of non-interference	Connect AC VTVM or scope to "Speaker" terminals of the set.	T201 (1st IFT) T202 (2nd IFT)	* Adjust the input frequency and adjustment points so that the output becomes maximum.
AM-RF ADJUSTMENT						
2	Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Weak input)	530kHz (30% Mod. with 400Hz)	530kHz	Connect DC VTVM to TP202 terminal.	L202 (OSC Coil)	Adjust L202 to 1.1V ± 0.05V.
3		610kHz (30% Mod. with 400Hz)	610kHz	Connect AC VTVM to scope to "Speaker" terminals of the set.	L201 (ANT Coil)	1. Adjust for maximum output. 2. Adjust ferrite core of L201 by screwdriver.
4		1500kHz (30% Mod. with 400Hz)	1500kHz	Connect AC VTVM to scope to "Speaker" terminals of the set.	CT201 (ANT Trimmer)	1. Adjust for maximum output. 2. Repeat steps (3) and (4) until the frequency correctly matches the dial display.

FM TUNER ADJUSTMENT

- | | |
|---|---|
| <p>* Equipment used</p> <ol style="list-style-type: none"> 1. FM signal generator (FM-SG) 2. Stereo modulator 3. Distortion analyser 4. Oscilloscope 5. AC and DC electronic voltmeters (VTVM). 6. Frequency counter (19kHz and 108MHz measurable). 7. FM 300Ω dummy antenna (Fig. 12). | <p>* Preparation of FM signal generator (FM-SG)</p> <ol style="list-style-type: none"> 1. Connect stereo modulator to FM-SG. 2. Apply SG output to antenna terminal of the set through 300Ω FM dummy antenna. 3. The standard input of the set is 60dB (1mV), 400Hz 100% modulation (Because of using dummy antenna, SG output must be 12dB plus (IHF). That is, when input is 60dB, SG output is to be 72dB. |
|---|---|

- * Setting**
1. Set IF band selector to "normal" position.
 2. Set broadcast selector to "FM" position.
 3. Other setting are the same as in AM adjustment.

Step No.	FM SIGNAL GENERATOR		DISPLAY FREQUENCY	INDICATOR	ADJUSTMENT POINTS	REMARKS
	CONNECTION	FREQUENCY				
FM-IF ADJUSTMENT						
5	—	No-Signal	Frequency of non-interference	Connect DC VTVM between TP102 and TP103 through choke coil. (Refer to Fig. 13)	T101 (Discr. IFT)	Adjust T101 core so that voltage measured in signal mode is 0V in 300mV range.
FM RF ADJUSTMENT						
6	—	No-Signal	87.9MHz	Connect DC VTVM to TP1A terminal.	L9 (OSC Coil)	Adjust L9 (OSC Coil) to 4.0V.
7	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna.	90.1MHz (100% Mod. with 400Hz) weak input	90.1MHz	Connect scope to "Speaker" terminals of the set.	L5 (RF DET Coil 1st) L6 (RF DET Coil, 2nd) L3 (ANT Coil) T1 (FM IFT)	<ol style="list-style-type: none"> 1. Add weak input so that noise is included in the output wave form. 2. Make the adjustment so that the output wave form is vertically symmetrical. Refer to Fig. 14. 3. Repeat the steps (7) and (8) until the frequency correctly matches the broadcasts frequency display.
8		106.1MHz (100% Mod. with 400Hz)	106.1MHz	Connect scope to "Speaker" terminals of the set.	CT1 (OSC Trimmer)	
FM MONO DISTORTION ADJUSTMENT						
9	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Apply 60dB to antenna terminal)	100.1MHz (100% Mod. with 400Hz)	100.1MHz	Connect distortion analyser to "Speaker" terminals of the set.	T101, T102 (Discr. IFT)	<ol style="list-style-type: none"> 1. Set the FM muting/FM mode switch to "on/auto" and then check step (5) in no signal mode. 2. If it is deflected, readjust of T101. 3. Adjust T102 core so that distortion of right and left channels are minimized.
FM MUTING LEVEL ADJUSTMENT						
10	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Apply 16dB to antenna terminal)	100.1MHz (100% Mod. with 400Hz)	100.1MHz	Connect AC VTVM or scope to "Speaker" terminals of the set.	VR101 (Muting level)	<ol style="list-style-type: none"> 1. Set the FM muting/FM mode switch to "off/mono". 2. With the FM muting/FM mode switch set to "on/auto", adjust VR101 so that the output is given with muting condition released.
SIGNAL METER LED (Light Emitting diode) INDICATOR ADJUSTMENT						
11	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Apply 45dB to antenna terminal)	100.1MHz (100% Mod. with 400Hz)	100.1MHz	Signal meter LED	VR102 (Meter level)	Adjust VR102 while observing the signal meter LED so that the indicator at 5th is about to turn on.
FM MPX PILOT (VCO) ADJUSTMENT						
12	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Monaural signal)	100.1MHz (Non-modulated)	100.1MHz	Connect frequency counter to TP301 terminal.	VR302 (VCO)	<ol style="list-style-type: none"> 1. Set the FM muting/FM mode switch to "on/auto". 2. Adjust VR302 to 19kHz ± 30Hz.

Step No.	FM SIGNAL GENERATOR		DISPLAY FREQUENCY	INDICATOR	ADJUSTMENT POINTS	REMARKS
	CONNECTION	FREQUENCY				
STEREO DISTORTION ADJUSTMENT						
13	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1MHz (100% Mod. with 400Hz (L mode)	100.1MHz	Connect distortion analyser to "Speaker" terminals of the set.	T1 (IFT)	<ol style="list-style-type: none"> 1. Set the FM muting/FM mode switch to "on/auto". 2. Re-adjust the already adjusted T1 within ± 90° from the preset core position so that the distortion of L ch is minimized. 3. Re-check the steps 5, 9 and 10.
SEPARATION ADJUSTMENT						
14	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1MHz (100% Mod. with 1kHz) (L or R mode)	100.1MHz	Connect AC VTVM to "Speaker" terminals of the set.	VR301 (Normal IF separation)	<ol style="list-style-type: none"> 1. Set the IF band selector to "normal". 2. Set the FM muting/FM mode switch to "on/auto". 3. Adjust VR301 so that R output is minimized when stereo modulator is in L (L ch. modulation) mode and that L output is minimized in R mode.

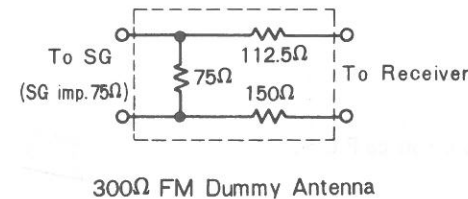


Fig. 12

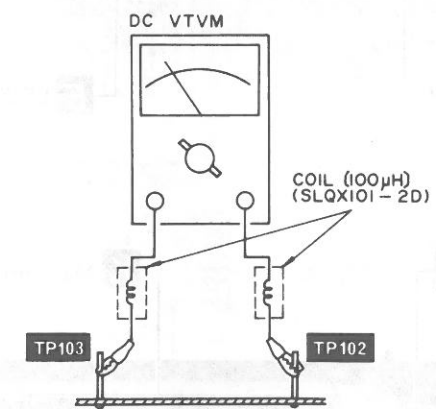


Fig. 13

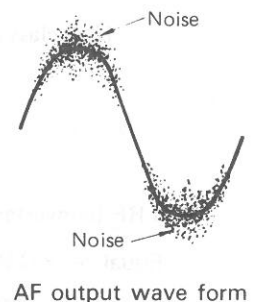


Fig. 14

FM TUNER ADJUSTMENT

- | | |
|---|---|
| <p>* Equipment used</p> <ol style="list-style-type: none"> 1. FM signal generator (FM-SG) 2. Stereo modulator 3. Distortion analyser 4. Oscilloscope 5. AC and DC electronic voltmeters (VTVM). 6. Frequency counter (19kHz and 108MHz measurable). 7. FM 300Ω dummy antenna (Fig. 12). | <p>* Preparation of FM signal generator (FM-SG)</p> <ol style="list-style-type: none"> 1. Connect stereo modulator to FM-SG. 2. Apply SG output to antenna terminal of the set through 300Ω FM dummy antenna. 3. The standard input of the set is 60dB (1mV), 400Hz 100% modulation (Because of using dummy antenna, SG output must be 12dB plus (IHF). That is, when input is 60dB, SG output is to be 72dB. |
|---|---|

- * Setting**
1. Set IF band selector to "normal" position.
 2. Set broadcast selector to "FM" position.
 3. Other setting are the same as in AM adjustment.

Step No.	FM SIGNAL GENERATOR		DISPLAY FREQUENCY	INDICATOR	ADJUSTMENT POINTS	REMARKS
	CONNECTION	FREQUENCY				
FM-IF ADJUSTMENT						
5	—	No-Signal	Frequency of non-interference	Connect DC VTVM between TP102 and TP103 through choke coil. (Refer to Fig. 13)	T101 (Discr. IFT)	Adjust T101 core so that voltage measured in signal mode is 0V in 300mV range.
FM RF ADJUSTMENT						
6	—	No-Signal	87.9MHz	Connect DC VTVM to TP1A terminal.	L9 (OSC Coil)	Adjust L9 (OSC Coil) to 4.0V.
7	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna.	90.1MHz (100% Mod. with 400Hz) weak input	90.1MHz	Connect scope to "Speaker" terminals of the set.	L5 (RF DET Coil 1st) L6 (RF DET Coil, 2nd) L3 (ANT Coil) T1 (FM IFT)	<ol style="list-style-type: none"> 1. Add weak input so that noise is included in the output wave form. 2. Make the adjustment so that the output wave form is vertically symmetrical. Refer to Fig. 14. 3. Repeat the steps (7) and (8) until the frequency correctly matches the broadcasts frequency display.
8		106.1MHz (100% Mod. with 400Hz)	106.1MHz	Connect scope to "Speaker" terminals of the set.	CT1 (OSC Trimmer)	
FM MONO DISTORTION ADJUSTMENT						
9	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Apply 60dB to antenna terminal)	100.1MHz (100% Mod. with 400Hz)	100.1MHz	Connect distortion analyser to "Speaker" terminals of the set.	T101, T102 (Discr. IFT)	<ol style="list-style-type: none"> 1. Set the FM muting/FM mode switch to "on/auto" and then check step (5) in no signal mode. 2. If it is deflected, readjust of T101. 3. Adjust T102 core so that distortion of right and left channels are minimized.
FM MUTING LEVEL ADJUSTMENT						
10	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Apply 16dB to antenna terminal)	100.1MHz (100% Mod. with 400Hz)	100.1MHz	Connect AC VTVM or scope to "Speaker" terminals of the set.	VR101 (Muting level)	<ol style="list-style-type: none"> 1. Set the FM muting/FM mode switch to "off/mono". 2. With the FM muting/FM mode switch set to "on/auto", adjust VR101 so that the output is given with muting condition released.
SIGNAL METER LED (Light Emitting diode) INDICATOR ADJUSTMENT						
11	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Apply 45dB to antenna terminal)	100.1MHz (100% Mod. with 400Hz)	100.1MHz	Signal meter LED	VR102 (Meter level)	Adjust VR102 while observing the signal meter LED so that the indicator at 5th is about to turn on.
FM MPX PILOT (VCO) ADJUSTMENT						
12	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Monaural signal)	100.1MHz (Non-modulated)	100.1MHz	Connect frequency counter to TP301 terminal.	VR302 (VCO)	<ol style="list-style-type: none"> 1. Set the FM muting/FM mode switch to "on/auto". 2. Adjust VR302 to 19kHz ± 30Hz.

Step No.	FM SIGNAL GENERATOR		DISPLAY FREQUENCY	INDICATOR	ADJUSTMENT POINTS	REMARKS
	CONNECTION	FREQUENCY				
STEREO DISTORTION ADJUSTMENT						
13	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1MHz (100% Mod. with 400Hz (L mode)	100.1MHz	Connect distortion analyser to "Speaker" terminals of the set.	T1 (IFT)	<ol style="list-style-type: none"> 1. Set the FM muting/FM mode switch to "on/auto". 2. Re-adjust the already adjusted T1 within ± 90° from the preset core position so that the distortion of L ch is minimized. 3. Re-check the steps 5, 9 and 10.
SEPARATION ADJUSTMENT						
14	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1MHz (100% Mod. with 1kHz) (L or R mode)	100.1MHz	Connect AC VTVM to "Speaker" terminals of the set.	VR301 (Normal IF separation)	<ol style="list-style-type: none"> 1. Set the IF band selector to "normal". 2. Set the FM muting/FM mode switch to "on/auto". 3. Adjust VR301 so that R output is minimized when stereo modulator is in L (L ch. modulation) mode and that L output is minimized in R mode.

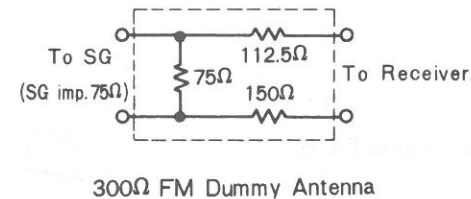


Fig. 12

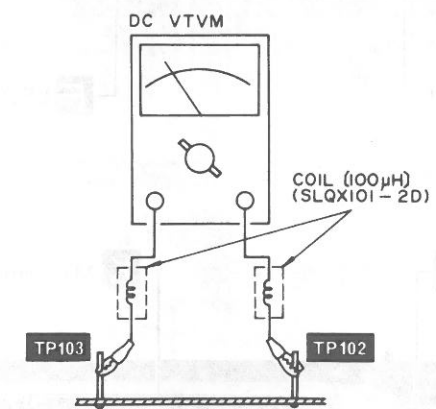


Fig. 13

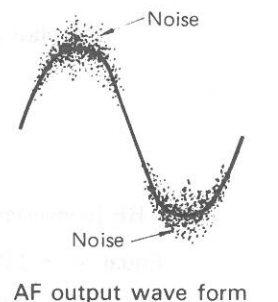
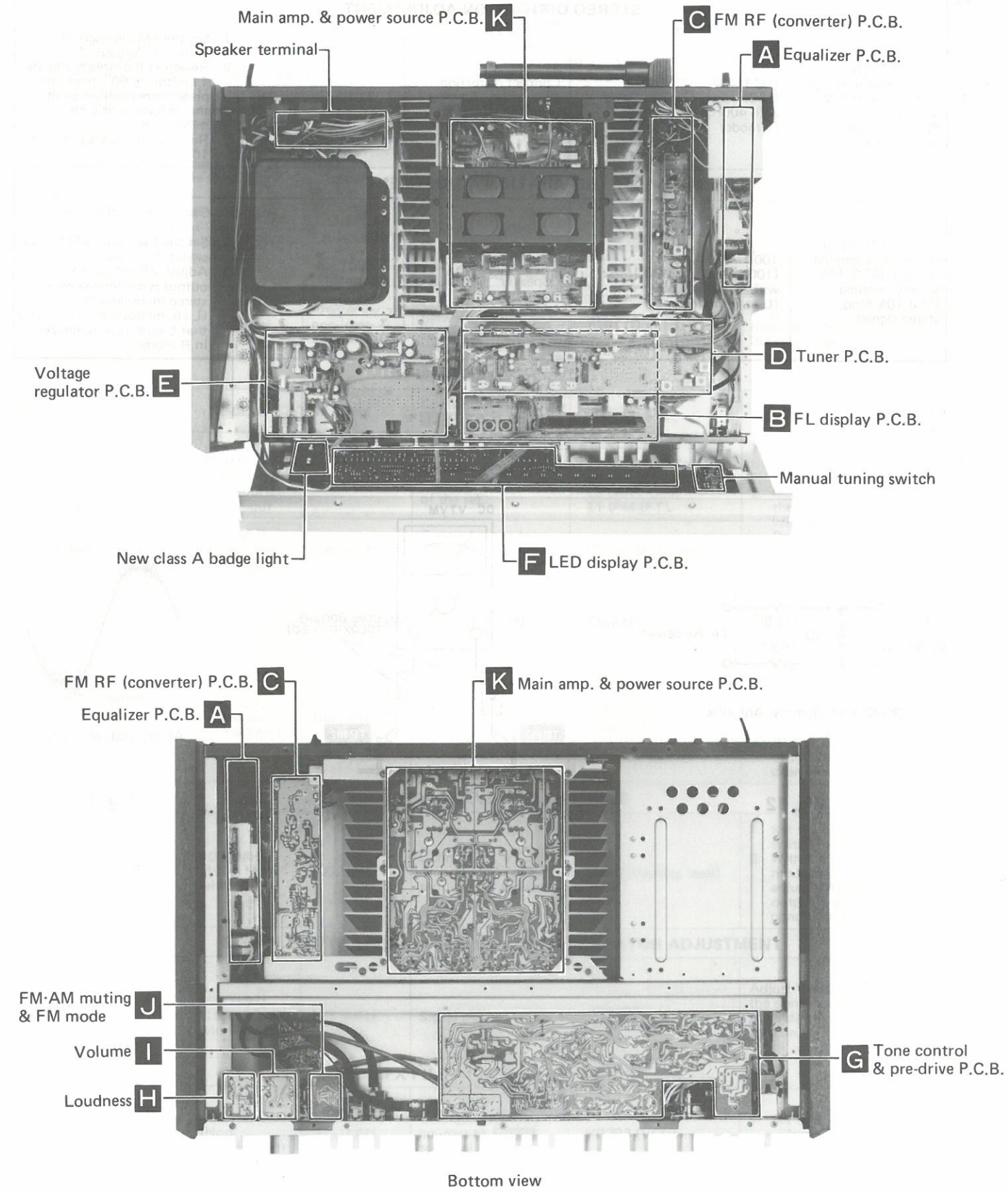
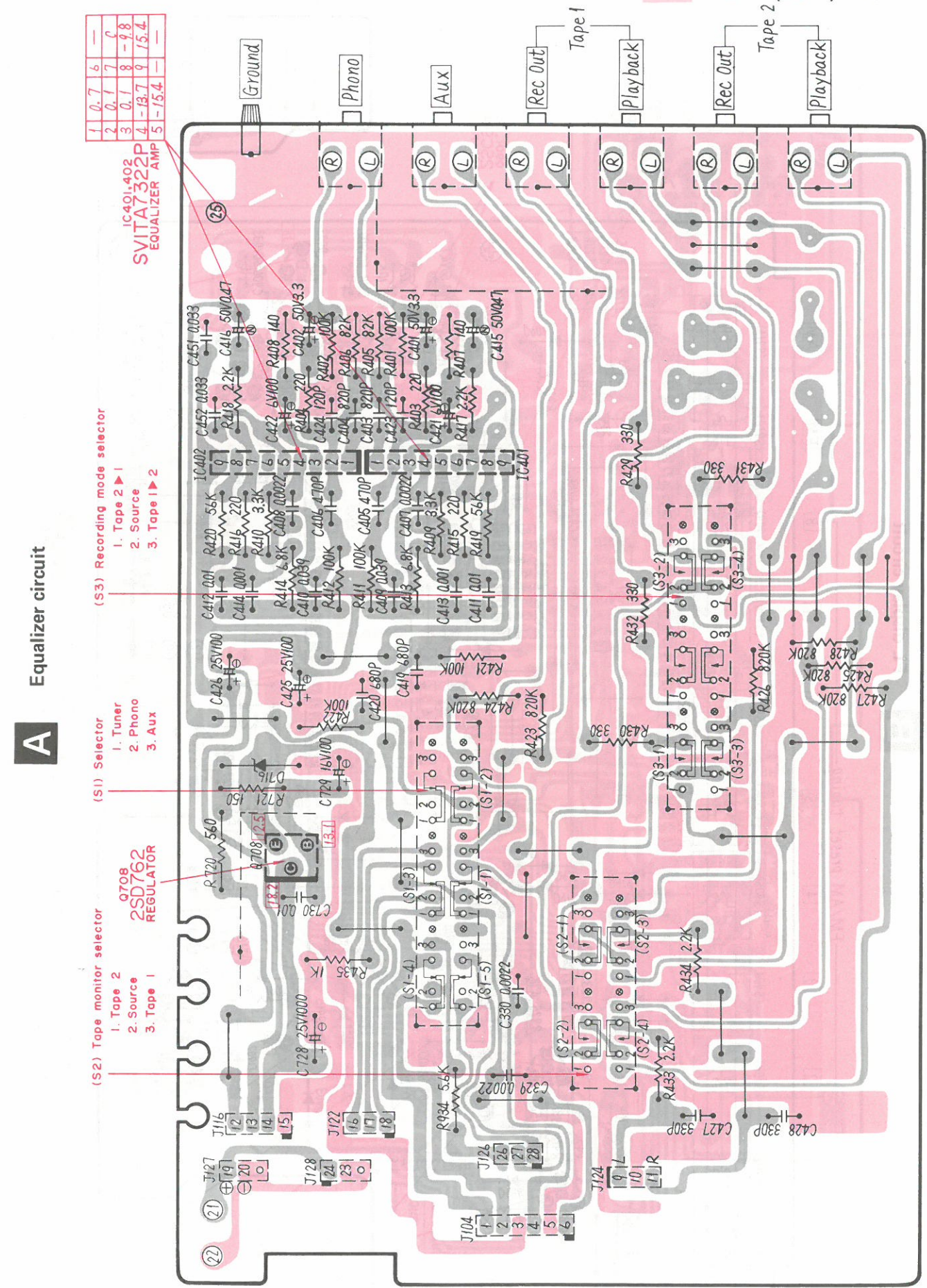


Fig. 14

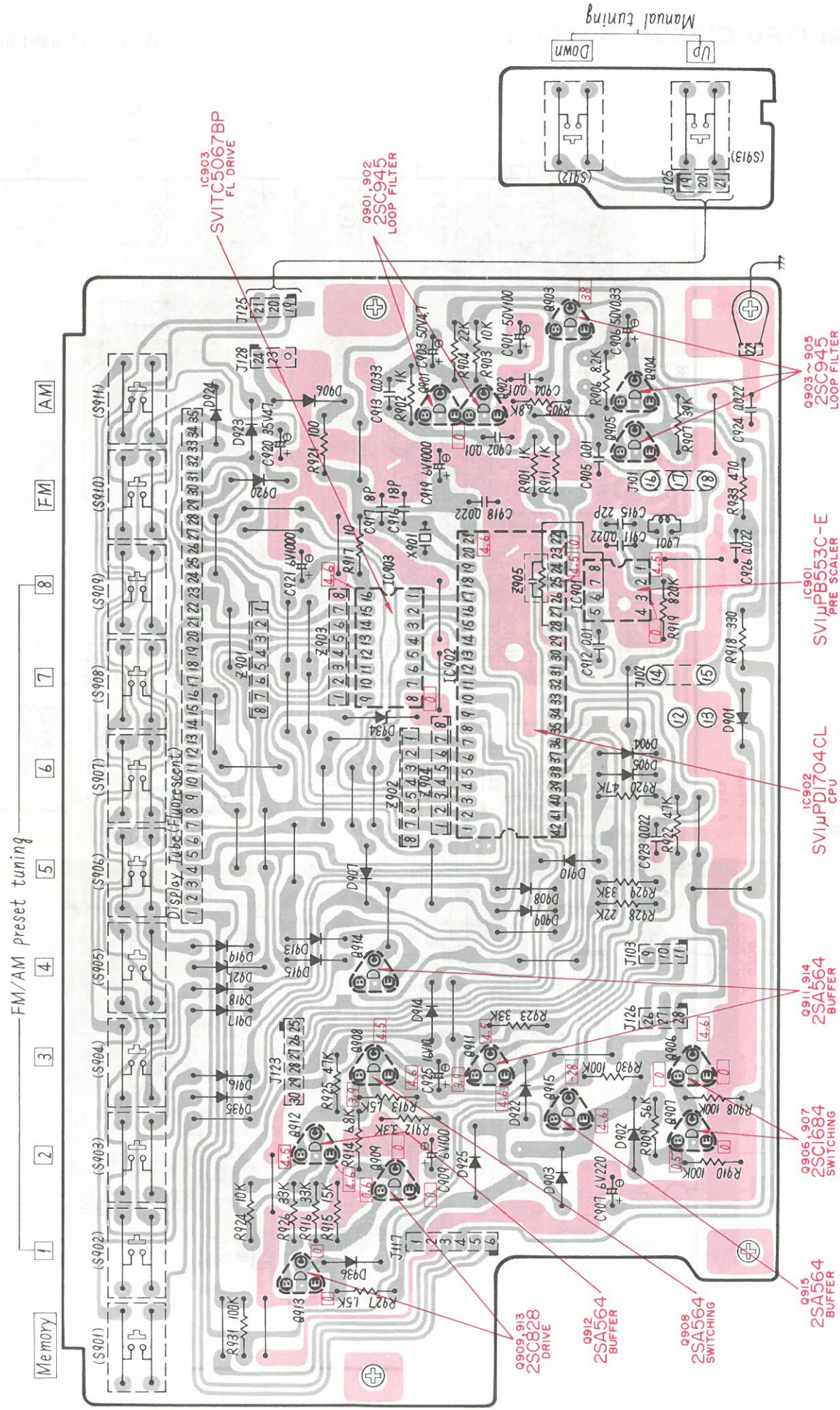
LOCATION OF P.C.B.



PRINTED CIRCUIT BOARDS

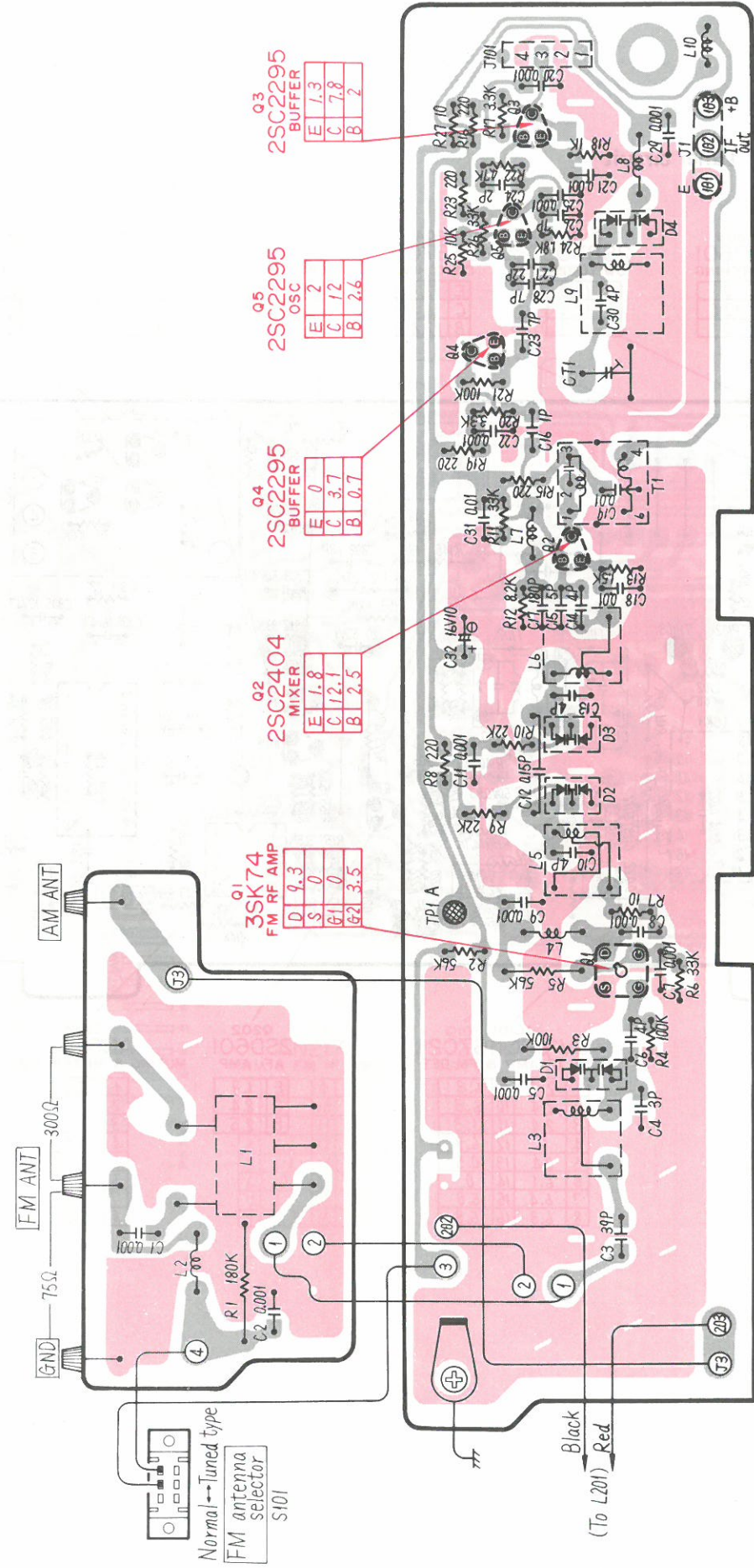


B FL display circuit

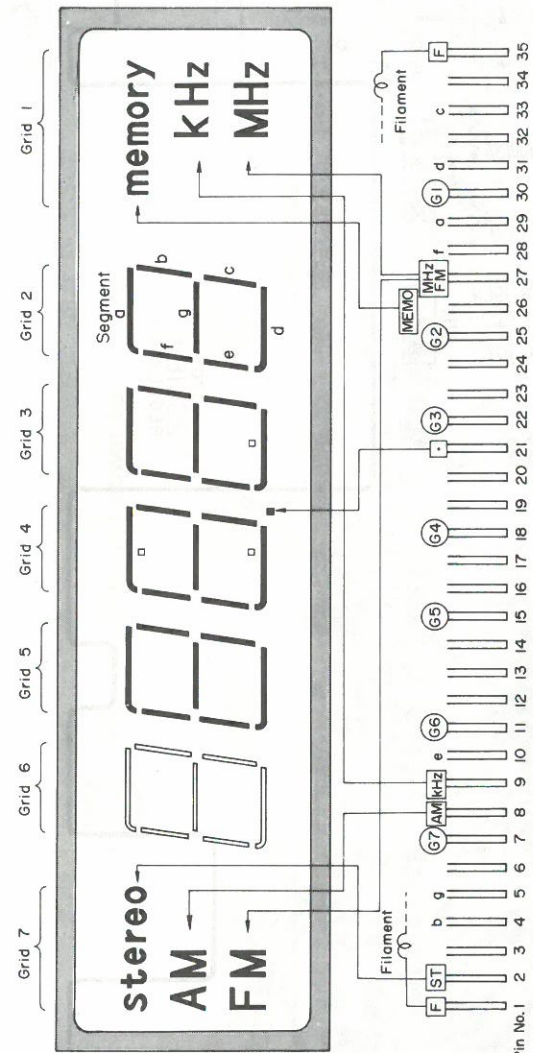


• Fluorescent Display Tube (FL)

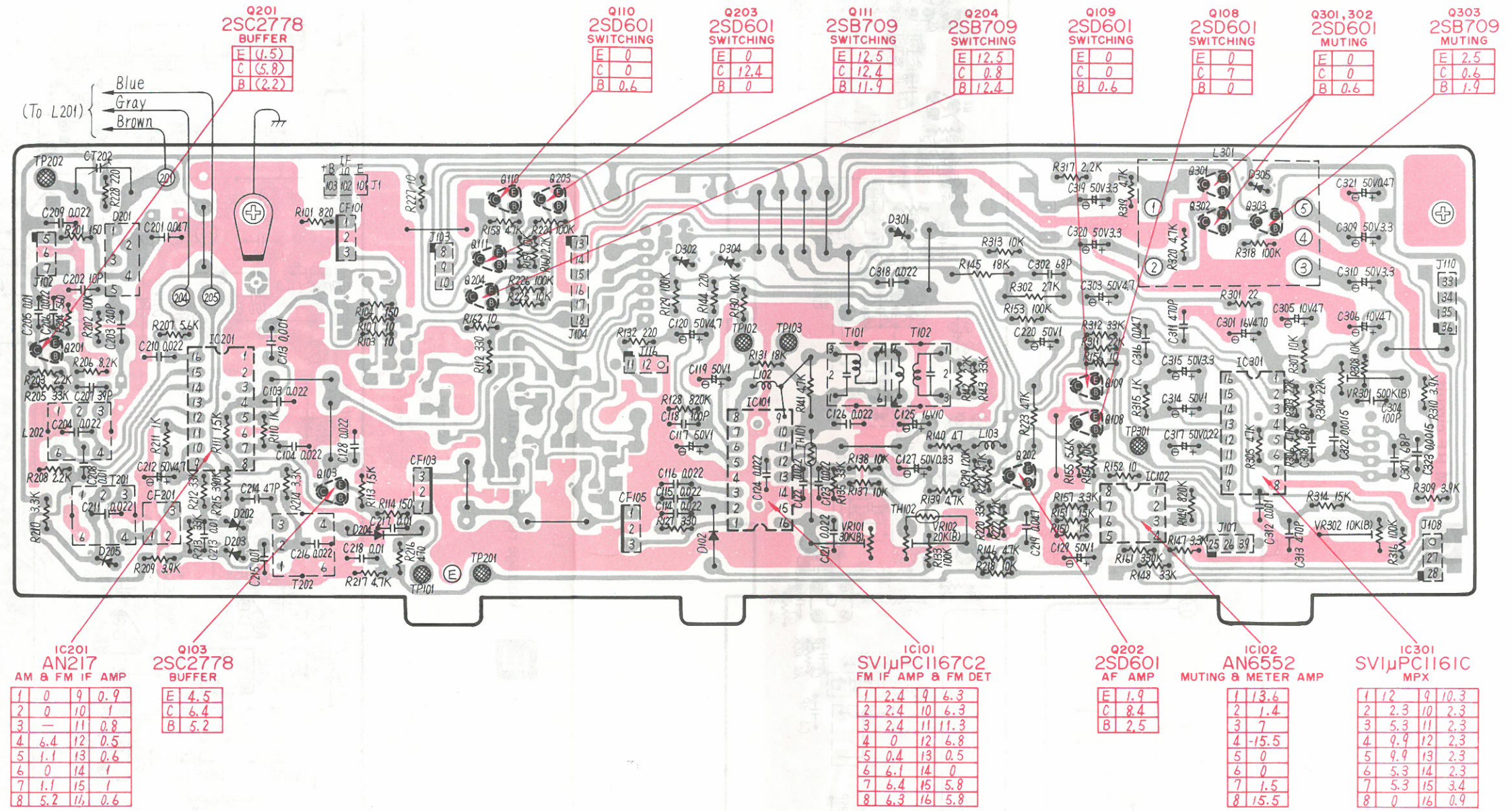
C FM RF circuit



• Fluorescent Display Tube (FL)



D Tuner circuit



Q201
2SC2778
BUFFER

E	0.5
C	5.8
B	2.2

Q110
2SD601
SWITCHING

E	0
C	0
B	0.6

Q203
2SD601
SWITCHING

E	0
C	12.4
B	0

Q111
2SB709
SWITCHING

E	12.5
C	12.4
B	11.9

Q204
2SB709
SWITCHING

E	12.5
C	0.8
B	12.4

Q109
2SD601
SWITCHING

E	0
C	0
B	0.6

Q108
2SD601
SWITCHING

E	0
C	7
B	0

Q301,302
2SD601
MUTING

E	0
C	0
B	0.6

Q303
2SB709
MUTING

E	2.5
C	0.6
B	1.9

IC201
AN217
AM & FM IF AMP

1	0	9	0.9
2	0	10	1
3	-	11	0.8
4	6.4	12	0.5
5	1.1	13	0.6
6	0	14	1
7	1.1	15	1
8	5.2	16	0.6

Q103
2SC2778
BUFFER

E	4.5
C	6.4
B	5.2

IC101
SV1μPC1167C2
FM IF AMP & FM DET

1	2.4	9	6.3
2	2.4	10	6.3
3	2.4	11	11.3
4	0	12	6.8
5	0.4	13	0.5
6	6.1	14	0
7	6.4	15	5.8
8	6.3	16	5.8

Q202
2SD601
AF AMP

E	1.9
C	8.4
B	2.5

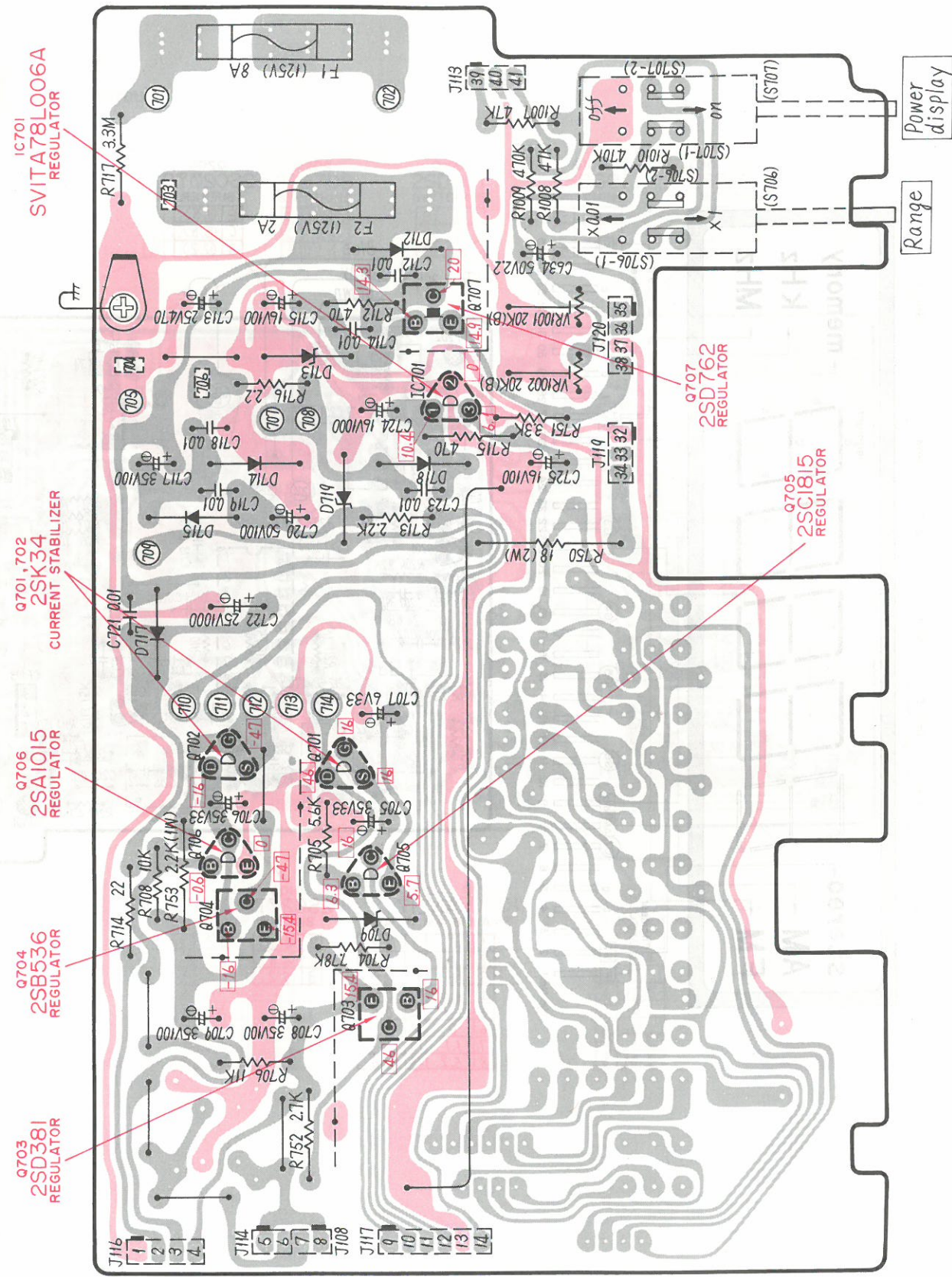
IC102
AN6552
MUTING & METER AMP

1	13.6
2	1.4
3	7
4	-15.5
5	0
6	0
7	1.5
8	15.5

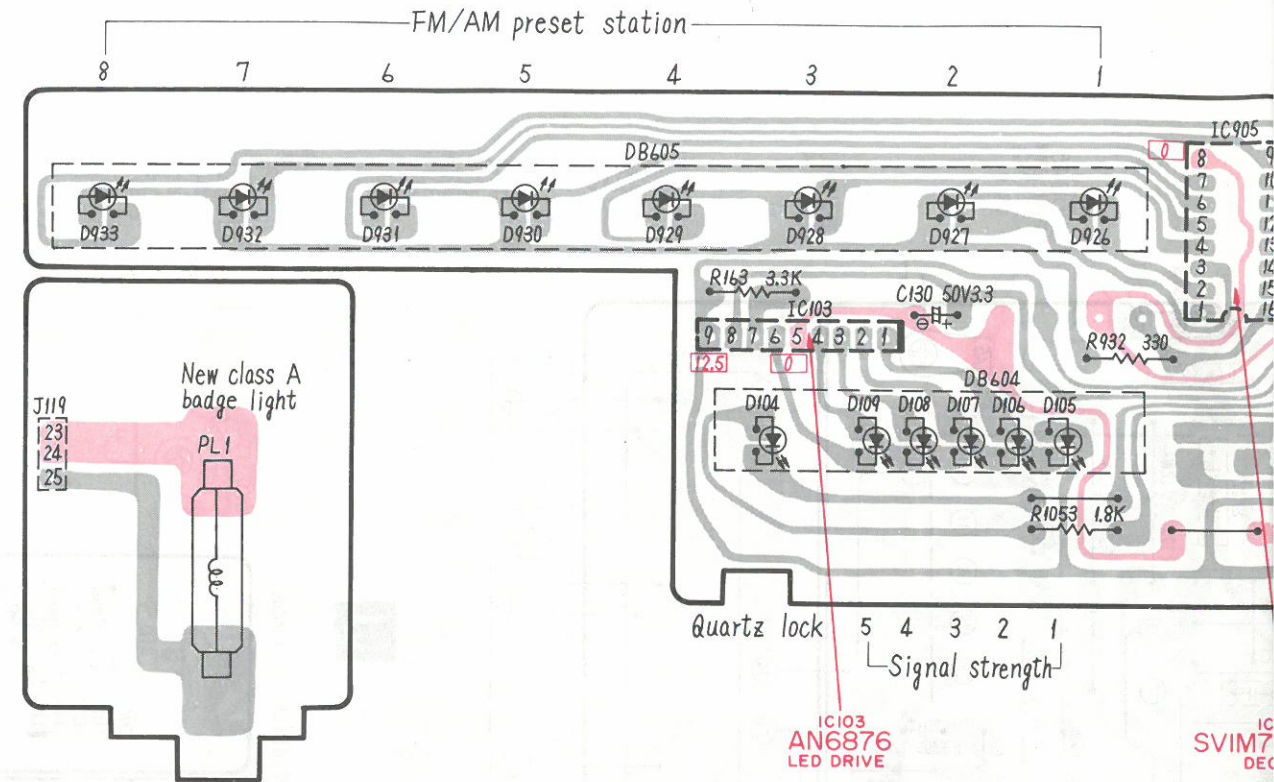
IC301
SV1μPC1161C
MPX

1	12	9	10.3
2	2.3	10	2.3
3	5.3	11	2.3
4	9.9	12	2.3
5	9.9	13	2.3
6	5.3	14	2.3
7	5.3	15	3.4
8	0	16	0.9

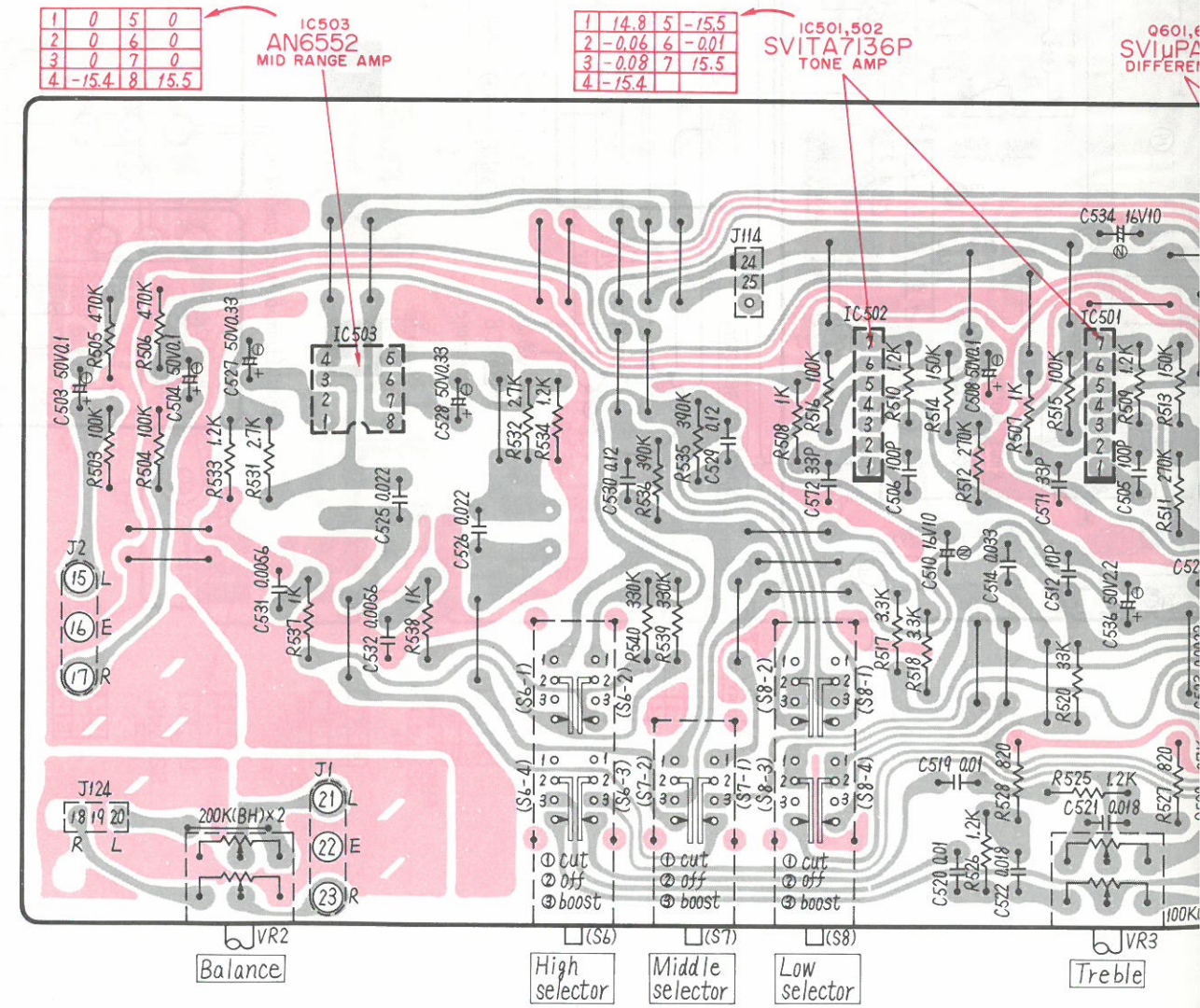
E Voltage regulator circuit for tuner and pre-amplifier

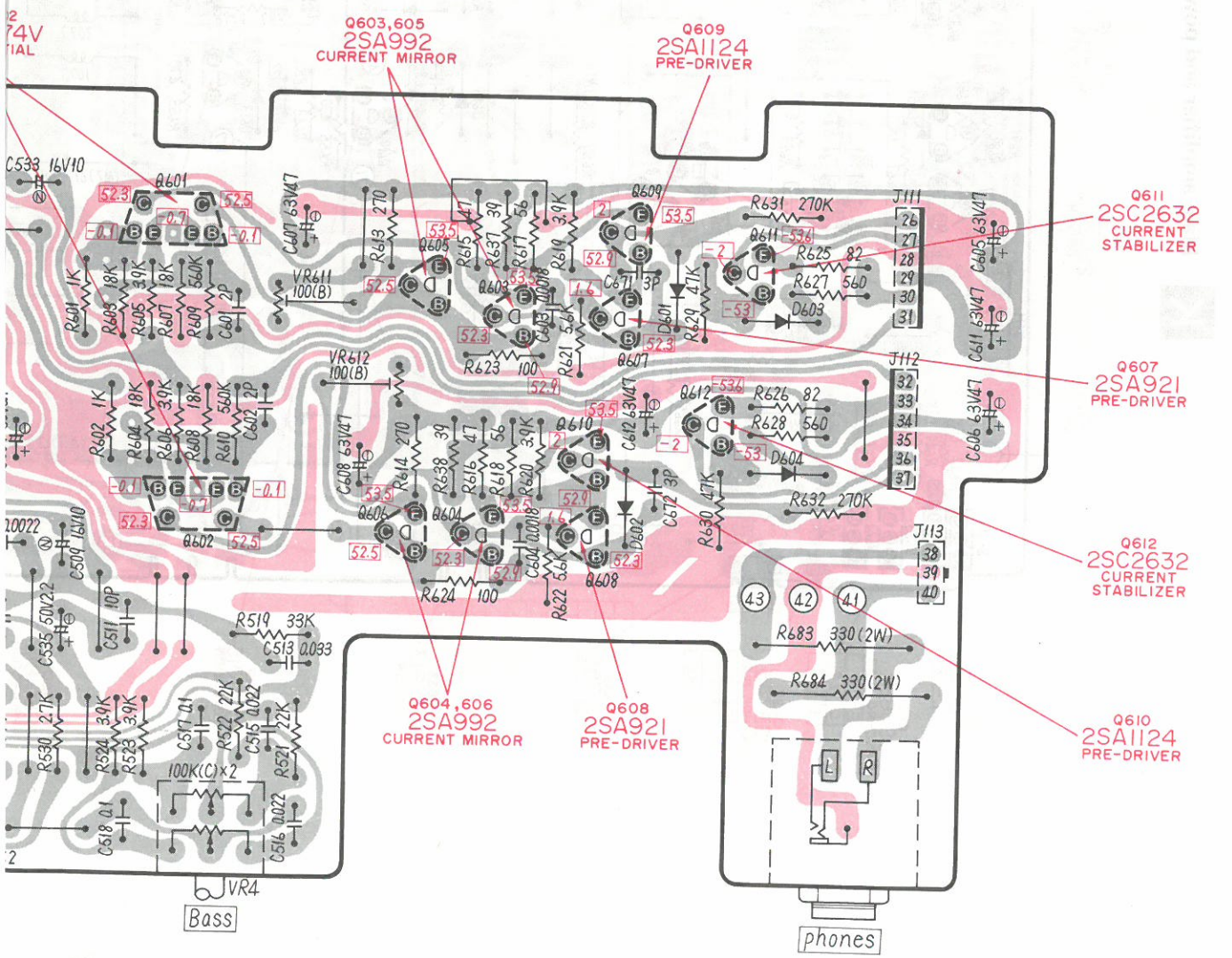
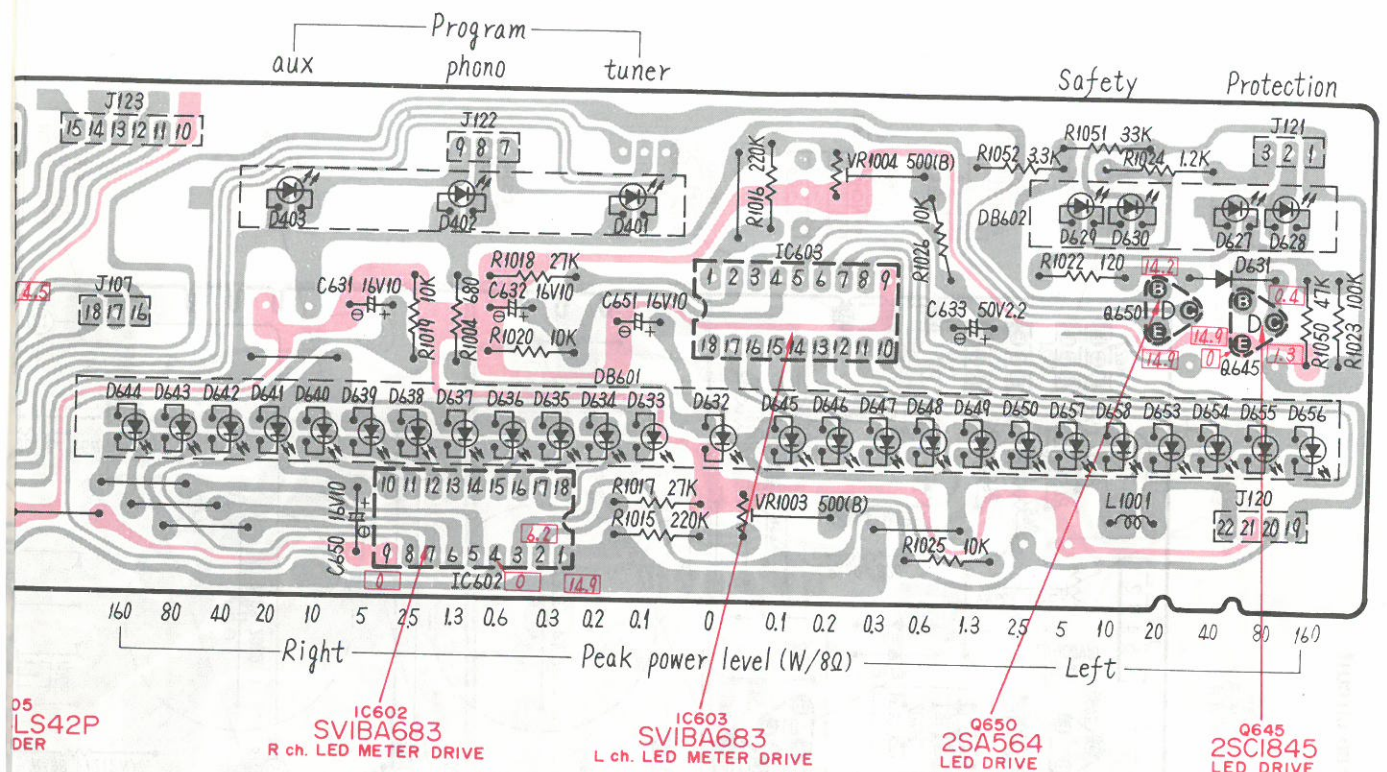


F LED display circuit

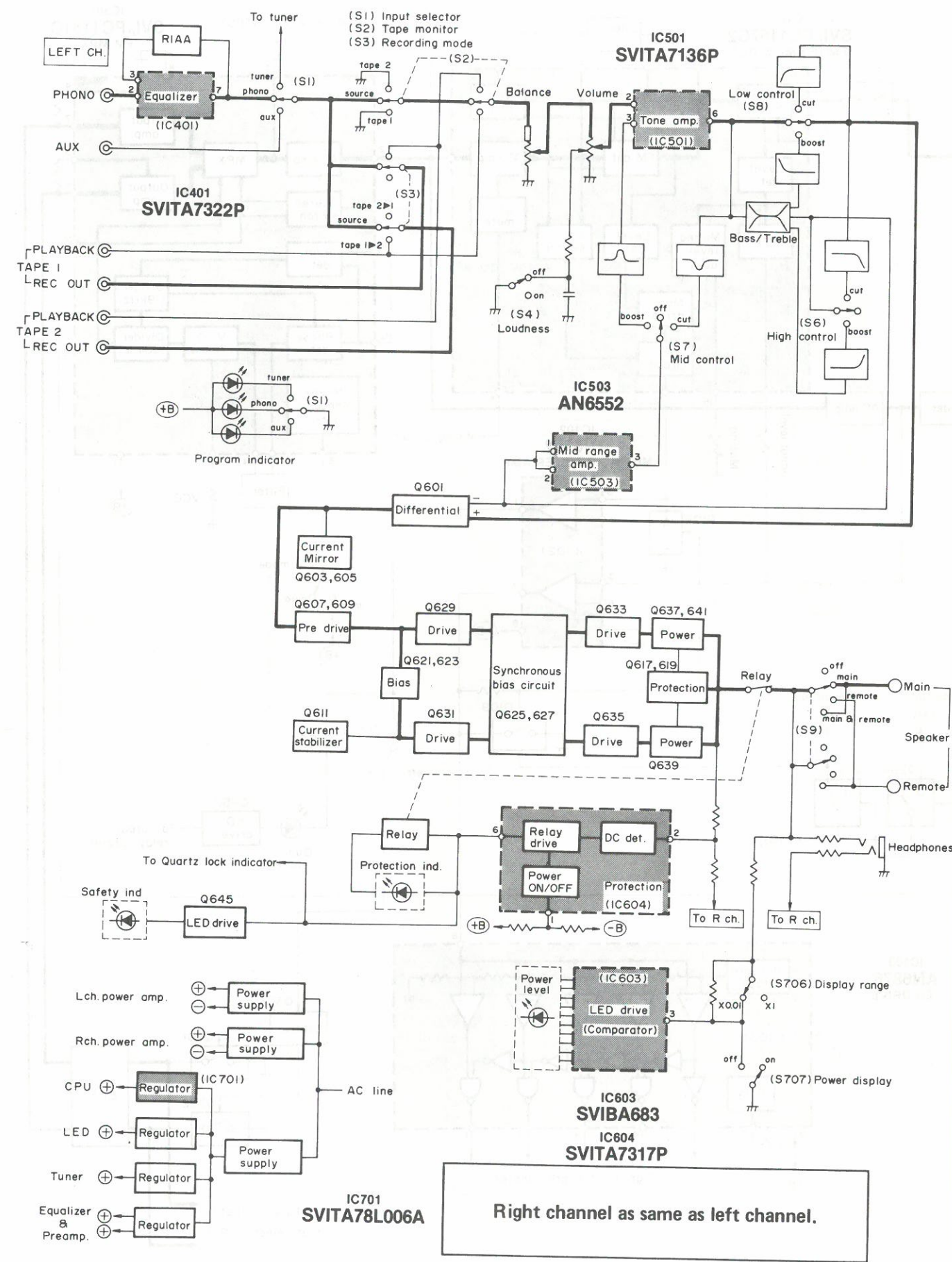


G Tone control and pre-drive circuit

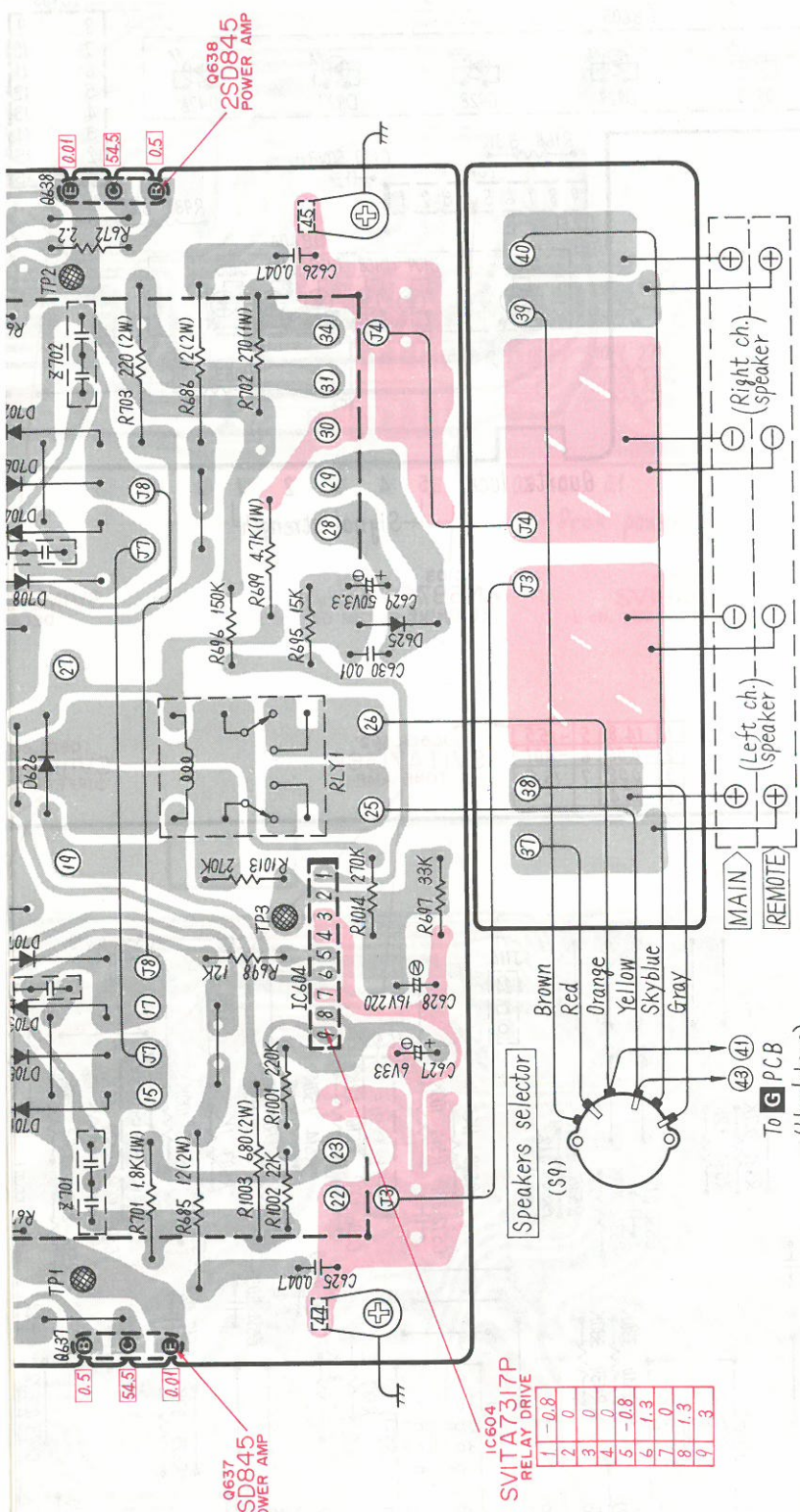




E BLOCK DIAGRAM (Amplifier and Tone control)



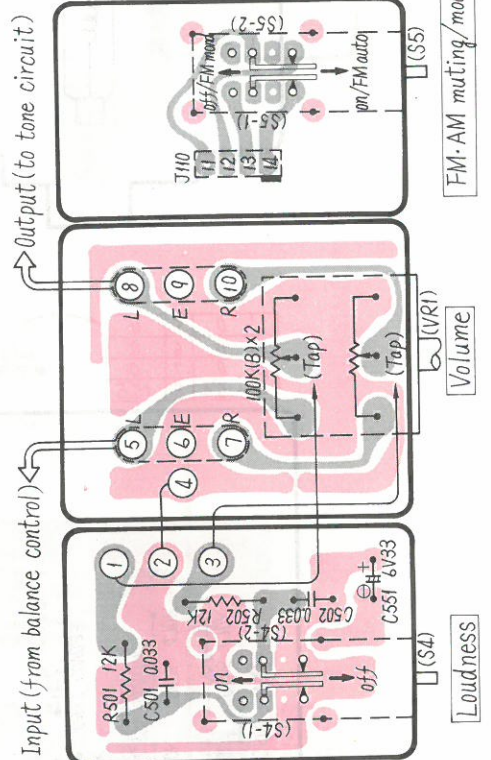
Right channel as same as left channel.



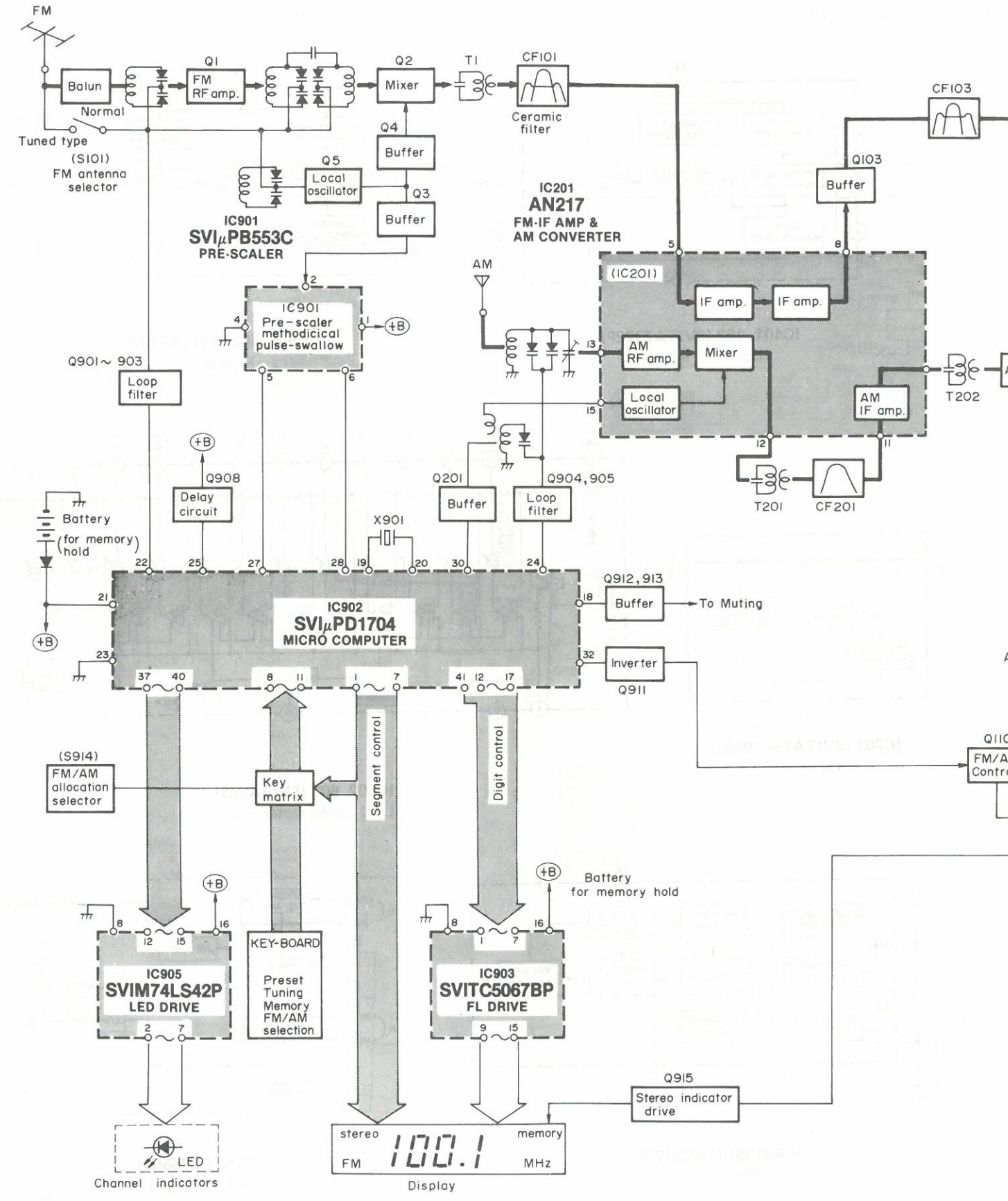
J

I

H

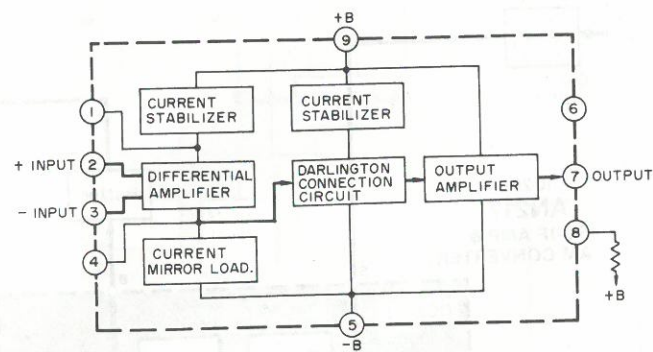


■ BLOCK DIAGRAM (Tuner and FL Display)

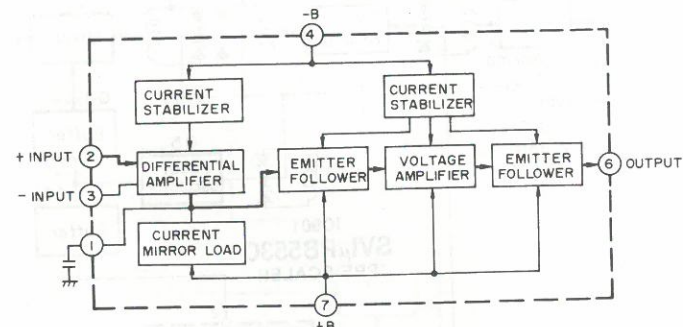


■ BLOCK DIAGRAM OF IC'S

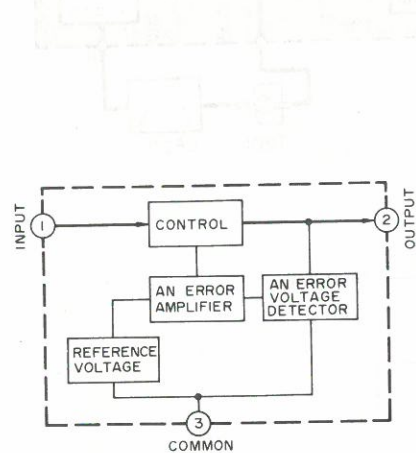
This is the basic block diagram of the inside circuit of IC. In an actual circuit, there may be sometimes idle terminals or some different functions other than the basic circuit.



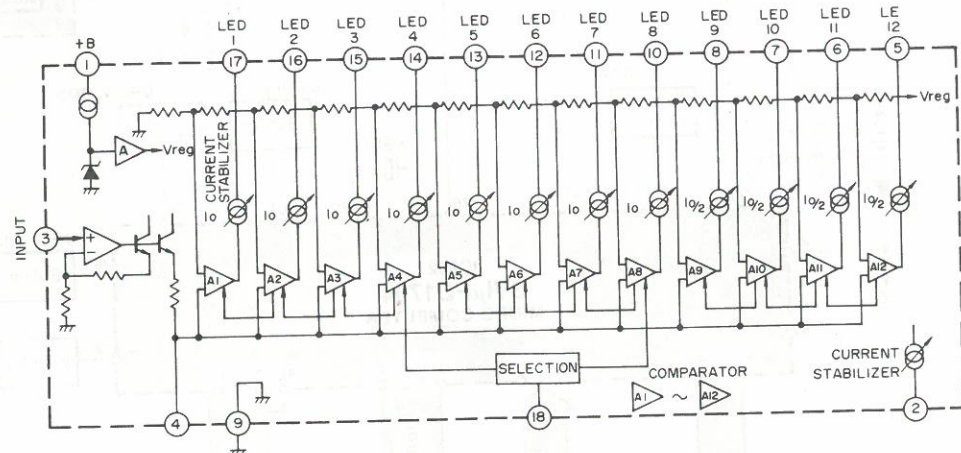
IC401, 402 (SVITA7322P)
Equalizer amp.



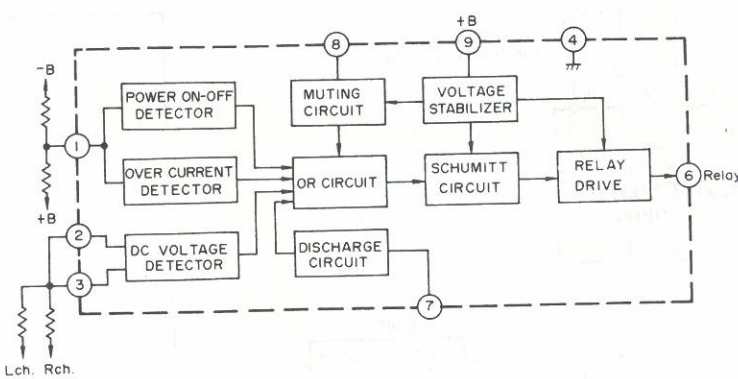
IC501, 502 (SVITA7136P)
Tone amp.



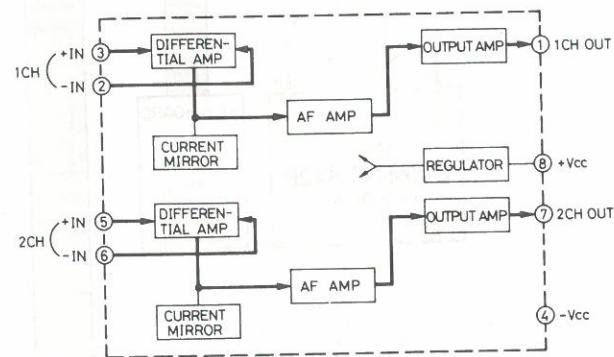
IC701 (SVITA78L006A)
Voltage regulator



IC602, 603 (SVIBA683)
LED power meter drive



IC604 (SVITA7317P)
Relay drive



IC503 (AN6552)
Mid. range amp

■ REPLACEMENT PARTS LIST Electrical Parts

- Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Δ indicates that only parts specified by the manufacturer be used for safety.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Areas
* [M] is available in U.S.A.
* [MC] is available in Canada.

Ref. No.	Part No.	Part Name & Description
INTEGRATED CIRCUITS		
IC101	SVIUPC1167C2	IC, FM IF Amp. & FM Detector
IC102	AN6552F	IC, Muting & LED Meter Amplifier
IC103	AN6876	IC, LED Driver
IC201	AN217P-BB	IC, AM & FM IF Amplifier
IC301	SVIUPC1161C	IC, FM Multiplex
IC401, 402	SVITA7322P	IC, Equalizer Amplifier
IC501, 502	SVITA7136P	IC, Tone Amplifier
IC503	AN6552F	IC, Mid Range Amplifier
IC602, 603	SVIBA683	IC, LED Power Meter Driver
IC604	SVITA7317P	IC, Relay Driver
IC701	SVITA78L006A	IC, Voltage Regulator
IC901	SVIUPB553C-E	IC, Pre-Scaler
IC902	SVIUPD1704CL	IC, Micro-Computer
IC903	SVITC5067BP	IC, FL Driver
IC905	SVIM74LS42P	IC, Decoder
TRANSISTORS		
Q1	3SK74-L1	Transistor, FM RF Amplifier [FET]
Q2	2SC2404	Transistor, FM Mixer (Chip)
Q3, 4, 5	2SC2295	Transistor, Buffer & FM Oscillator (Chip)
Q103, 201	2SC2778	Transistor, FM IF Amplifier & AM Buffer (Chip)
Q108, 109, 110, 202, 203	2SD601	Transistor, Switching & AF Amplifier (Chip)
Q111, 204, 303	2SB709	Transistor, Switching (Chip)
Q301, 302	2SD601	Transistor, Mute Switching (Chip)
Q601, 602	SVIUPA74V-P	Transistor, Differential Amplifier (Use in ranks P or F)
Q603, 604, 605, 606	2SA992	Transistor, Current Mirror
Q607, 608	2SA921-T	Transistor, Pre-Driver (Use in ranks R, S or T)
Q609, 610	2SA1124-R	Transistor, Pre-Driver (Use in ranks R or S)
Q611, 612	2SC2632-R	Transistor, Current Stabilizer (Use in ranks R or S)
Q617, 618	2SC1815-Y	Transistor, Protection (Use in ranks Y or O)
Q619, 620	2SA1015-Y	Transistor, Protection (Use in ranks Y or O)
Q621, 622, 625, 626	2SD661-S	Transistor, Ica & Synchronous Bias (Use in ranks R or S)
Q623, 624, 627, 628	2SB745-S	Transistor, Ica & Synchronous Bias (Use in ranks R or S)
Q629, 630	2SC2632-R	Transistor, Driver (Use in ranks R or S)
Q631, 632	2SA1124-R	Transistor, Driver (Use in ranks R or S) (Use pair ranks as same as Q629 ~ 631 and Q632)
Q633, 634	2SC1913-R	Transistor, Driver (Use in ranks R or Q)
Q635, 636	2SA913-R	Transistor, Driver (Use in ranks R or Q) (Use pair ranks as same as Q633 ~ 635 and Q636)
Q637, 638	2SD845-R	Transistor, Power (Use in ranks R or O)
Q639, 640	2SB755-R	Transistor, Power (Use in ranks R or O) (Use pair ranks as same as Q637, 638, 639 and Q640)
Q645	2SC1845	Transistor, LED Driver
Q650	2SA666A1-R	Transistor, LED Driver
Q701, 702	2SK34-D1	Transistor, Current Stabilizer [FET]
Q703	2SD381A-L9	Transistor, Regulator
Q704	2SB536A-L9	Transistor, Regulator
Q705	2SC1815-Y	Transistor, Regulator (Use in ranks Y or O)
Q706	2SA1015-Y	Transistor, Regulator (Use in ranks Y or O)
Q707, 708	2SD762-O	Transistor, Regulator (Use in ranks O or P)
Q901, 902, 903, 904, 905	2SC945-P2	Transistor, Loop Filter

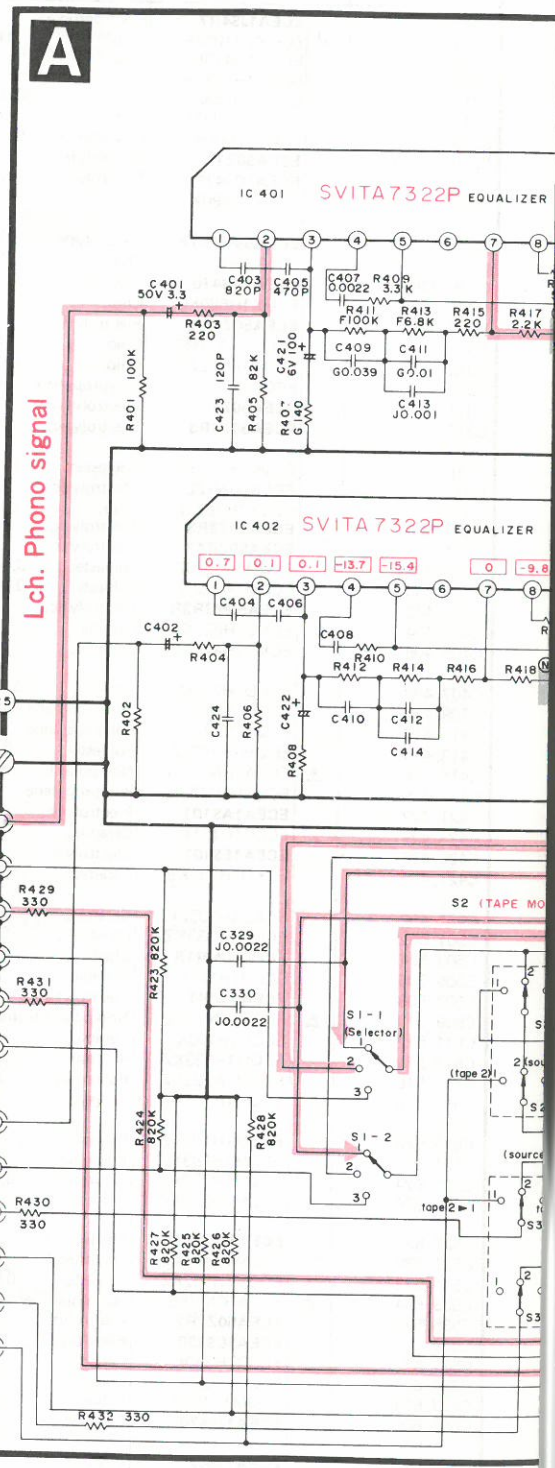
Ref. No.	Part No.	Part Name & Description
Q906, 907	2SC1684-R	Transistor, Switching
Q908, 911, 912, 914, 915	2SA666A1-R	Transistor, Switching & Buffer
Q909, 913	2SC1328-T	Transistor, Driver
DIODES		
D1, 2, 3, 4	SVDBB204	Diode, Variable Capacitor (for FM)
D203, 205, 302, 304, 305	MA151K	Diode, AGC & Switching
D102	MA162A	Diode
D201	SVDBB113	Diode, Variable Capacitor (for AM)
D202, 301	MA162A	Diode, AGC & Switching (Product Part No.: MA151A)
D104 ~ 107, 401, 402, 403, 627, 628, 641, 642, 643, 644, 653 ~ 656, 926 ~ 933	LN217RP	Light Emitting Diode, Red
D108, 109, 629, 630, 632, 633 ~ 636, 645 ~ 648	LN317GP	Light Emitting Diode, Green
D204, 906	2-OA99	Diode, AM Detector
D601, 602, 609 ~ 616, 625, 631	MA162A	Diode
D603, 604, D617 ~ 624, D626	MA27B	Diode, Current Stabilizer
D637 ~ 640, 649, 650, 657, 658	20A90	Diode, Synchronous Bias
D651, 652, D701 ~ 708	SVDSR1K2	Diode, Relay Pulse Killer
D709	LN417YP	Light Emitting Diode, Yellow
D902	SVDMZ304B	Diode, 4V Zener
D712, 714, 715, 717, 718, 925	SVDS3V40	Rectifier
D713	SVDMZ306B2	Diode, 6V Zener
D716	SVDMZ303A	Diode, 3V Zener
D719	SVDSR1K2	Rectifier
D901, 903, 904, 905, 907, 908, 909, 910, 913 ~ 920, 922, 923, 924, 935, 936	SVDEQA0115R	Diode, 15V Zener
D921	SVDEQA0113RA	Diode, 13V Zener
D934	SVDMZ336B	Diode, 36V Zener
	MA162A	Diode
	RVDRD6R2EB	Diode, 6.2V Zener
	SVDMZ327B	Diode, 27V Zener
COLIS and TRANSFORMERS		
L1	SLAA4W1-3	Coil, FM Antenna, Balun
L2, 4, 8	SLQX39G-M	Coil, Choke
L3	SLA4P43	Coil, FM Antenna
L5, 6	SLD4P43	Coil, FM RF Detector
L7	RLQY15G5-Y	Coil, Choke
L9	SLQ4P85	Coil, FM Local Oscillator
L10, 103	SLQX101-3M	Coil, Choke
L102	SLQW270-1K	Coil, Choke
L201	SLF2D69	Coil, AM Ferrite Bar Antenna
L202	SLQ2C25-P	Coil, AM Local Oscillator
L301	SLMA1Z3-Z	Coil, Low Pass Filter
L601, 602	SLQY15G-30	Coil, Choke
L901	RLQY25S2	Coil, Choke
L1001	SLQX101-3M	Coil, Choke
T1	SLI4C109	Transformer, FM IF
T101	SLI4C511-K	Transformer, FM IF, Discriminator
T102	SLI4C513-K	Transformer, FM IF, Discriminator
T201	SLI2C127	Transformer, AM IF

2SC828	2SC1328
MA150	MA162A
0A99	2-0A99
SVDS3V20	SVDS3V40
SVDMZ314	SVDEQA0115R
MA1130A	SVDEQA0113RA
MA1062	RVDRD6R2EB
MA151A	MA162A

J2
D7
D9
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D9

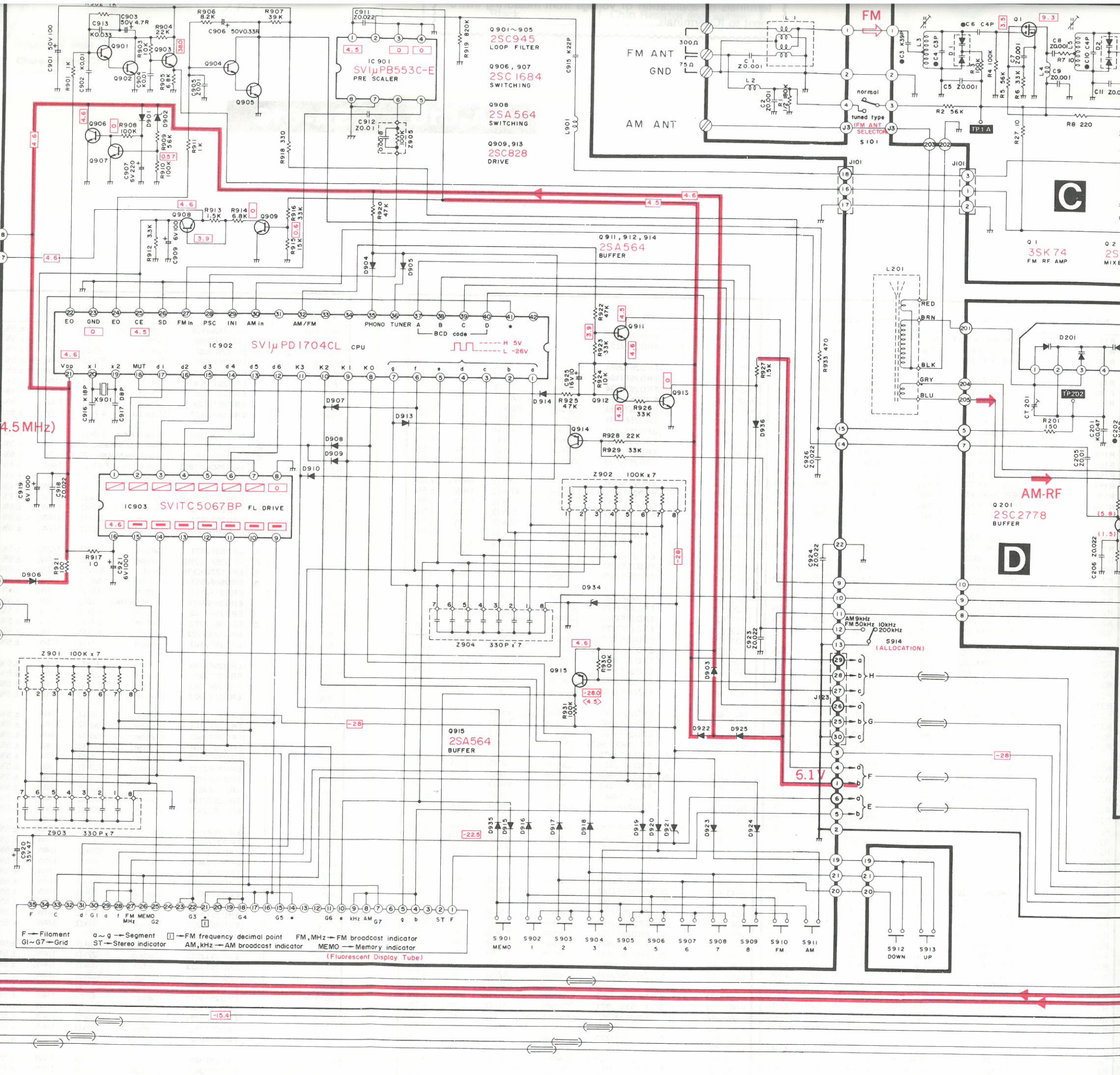
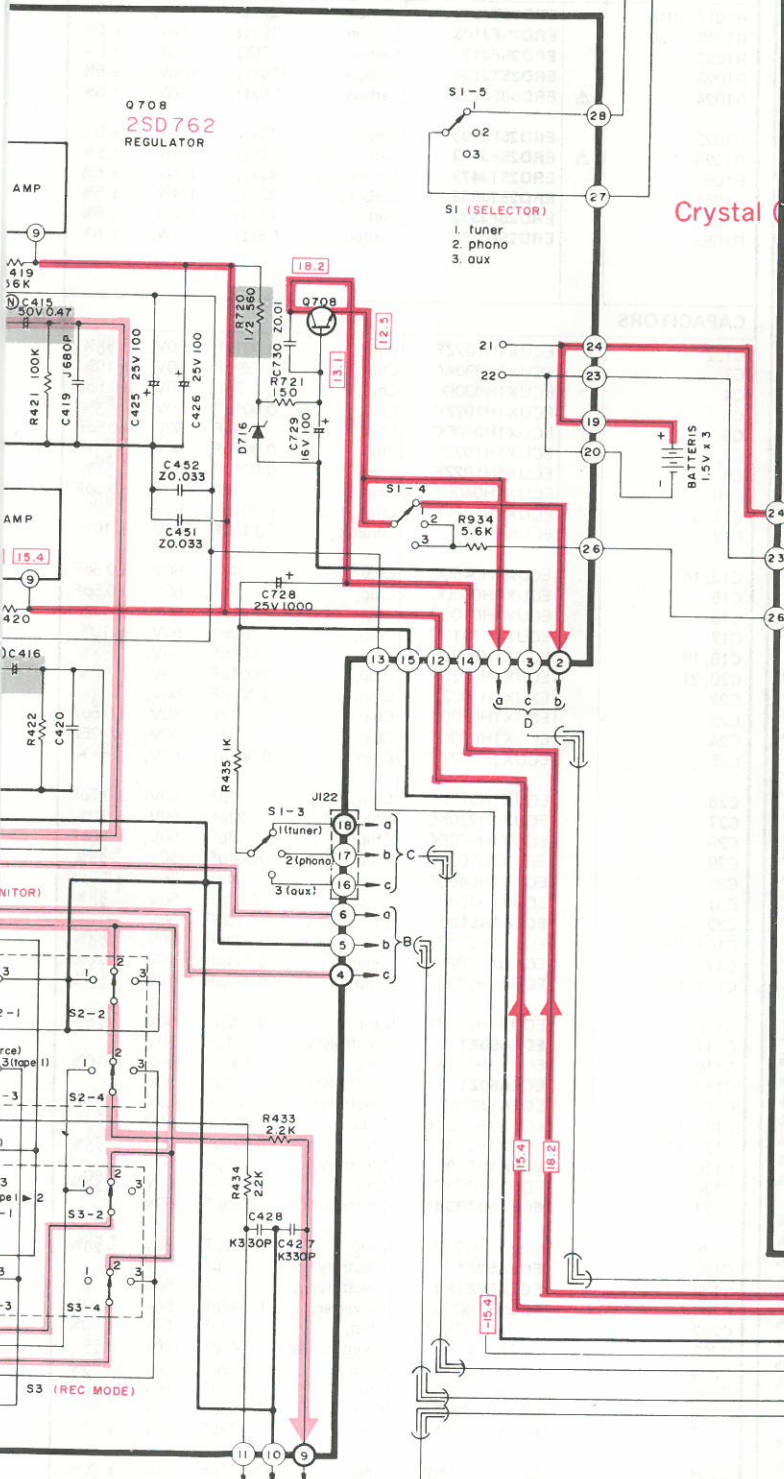


B
C
D
E
F
G



(L ch)
PHONO
AUX
TAPE 1
 REC OUT
 PLAYBACK
TAPE 2
 REC OUT
 PLAYBACK
(R ch)
PHONO
AUX
TAPE 1
 REC OUT
 PLAYBACK
TAPE 2
 REC OUT
 PLAYBACK

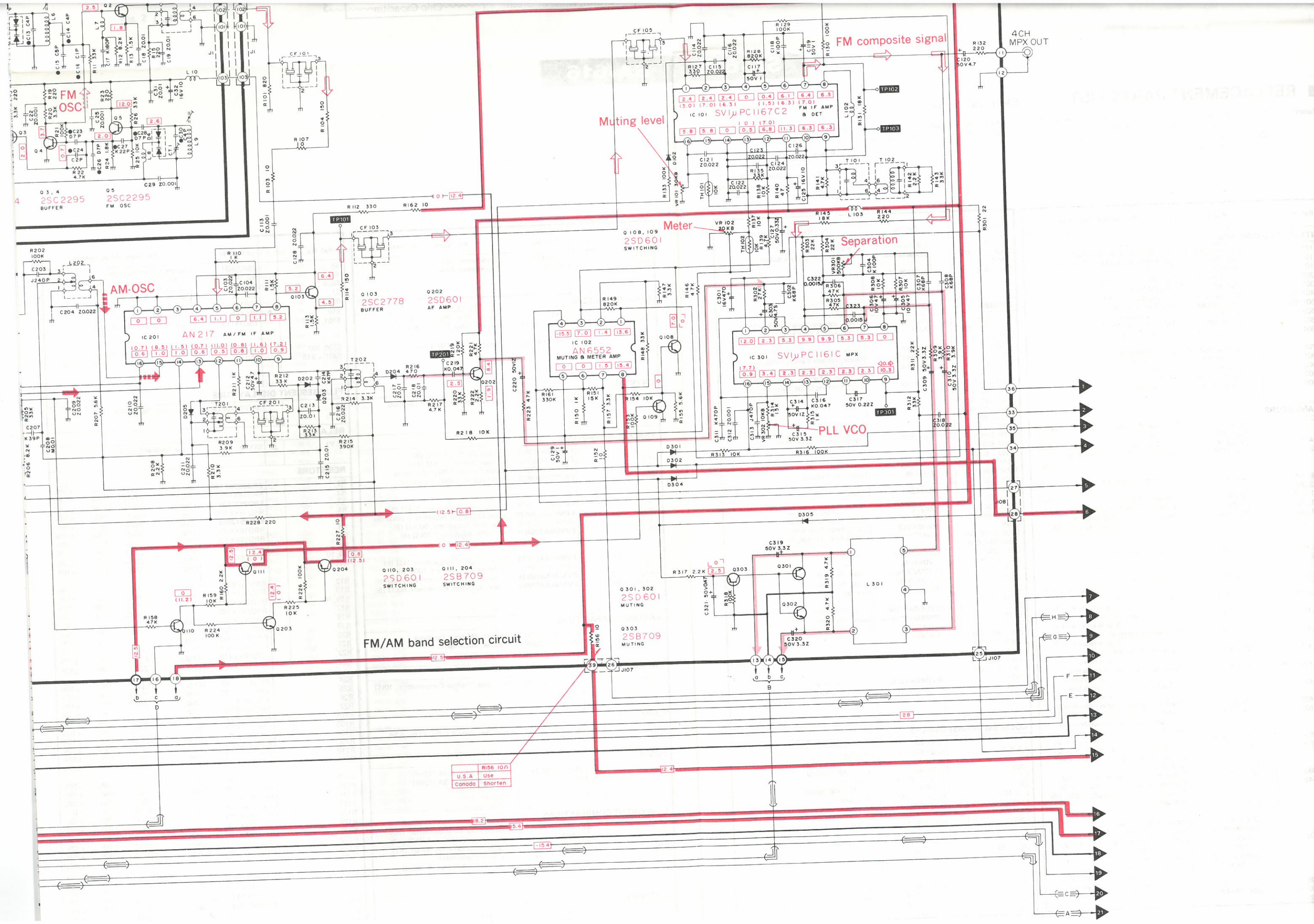
DES		
2, 3, 4	SVDBB204	FM Variable capacitor
3, 205, 302, 304	MA151K	
15	MA150	
2	SVDBB113	AM Variable capacitor
2, 301	MA151A	
4	OA99	
6	MA1130A	13V Zener
12	SVDMZ303A	3V Zener
1, 903, 904, 905	MA150	
7, 908, 909, 910		
3, 914, 915, 916		
7, 918, 919, 920		
2, 923, 924, 925		
6	OA99	
1	MA1062	6.2V Zener
5	SVDSRIK2	
4	SVDMZ327	27V Zener



F — Filament a-g — Segment □ — FM frequency decimal point FM, MHz — FM broadcast indicator
 G1-G7 — Grid ST — Stereo indicator AM, kHz — AM broadcast indicator MEMO — Memory indicator
 (Fluorescent Display Tube)

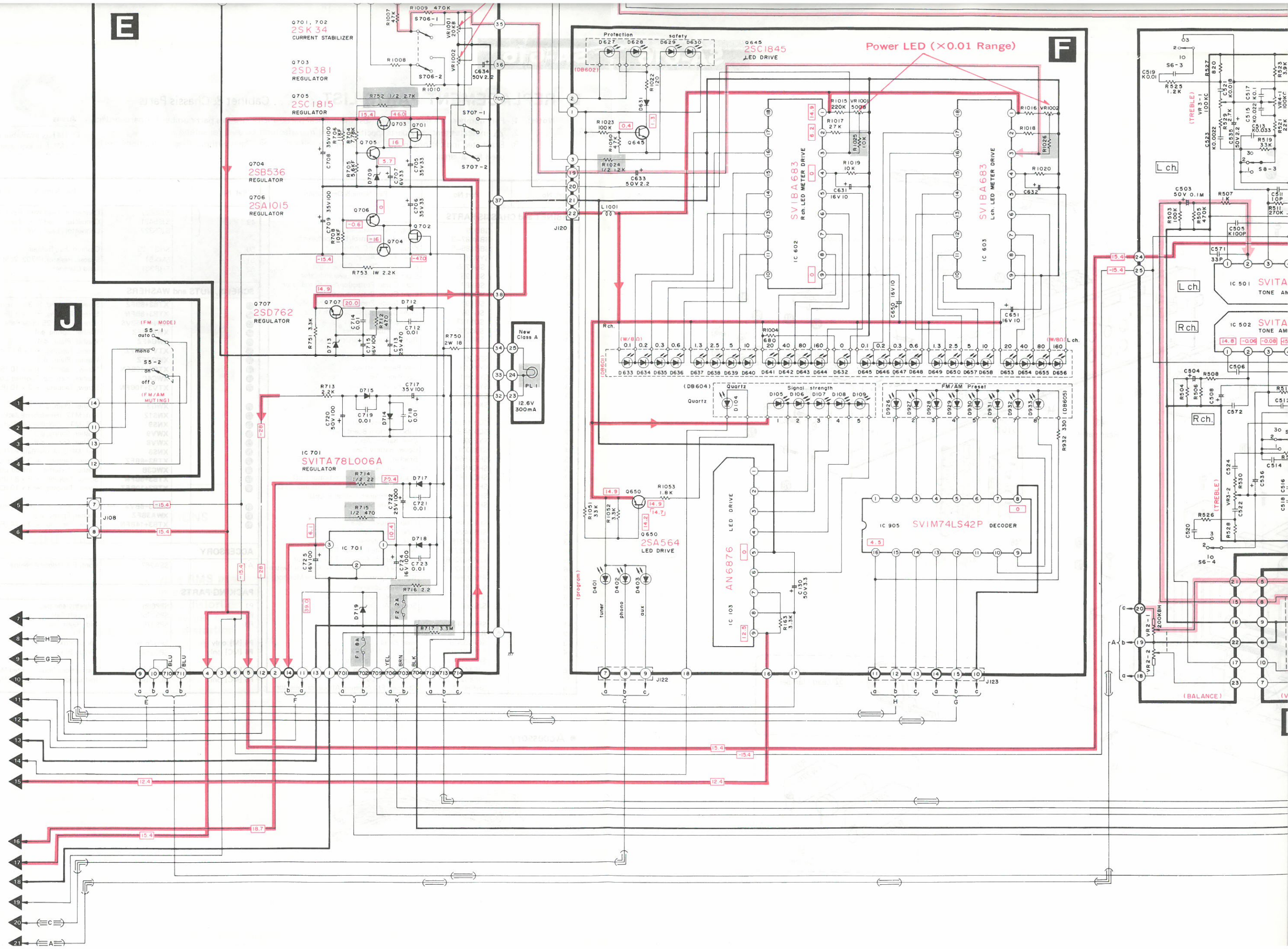
S901 MEMO S902 1 S903 2 S904 3 S905 4 S906 5 S907 6 S908 7 S909 8 S910 FM S911 AM

S912 DOWN S913 UP



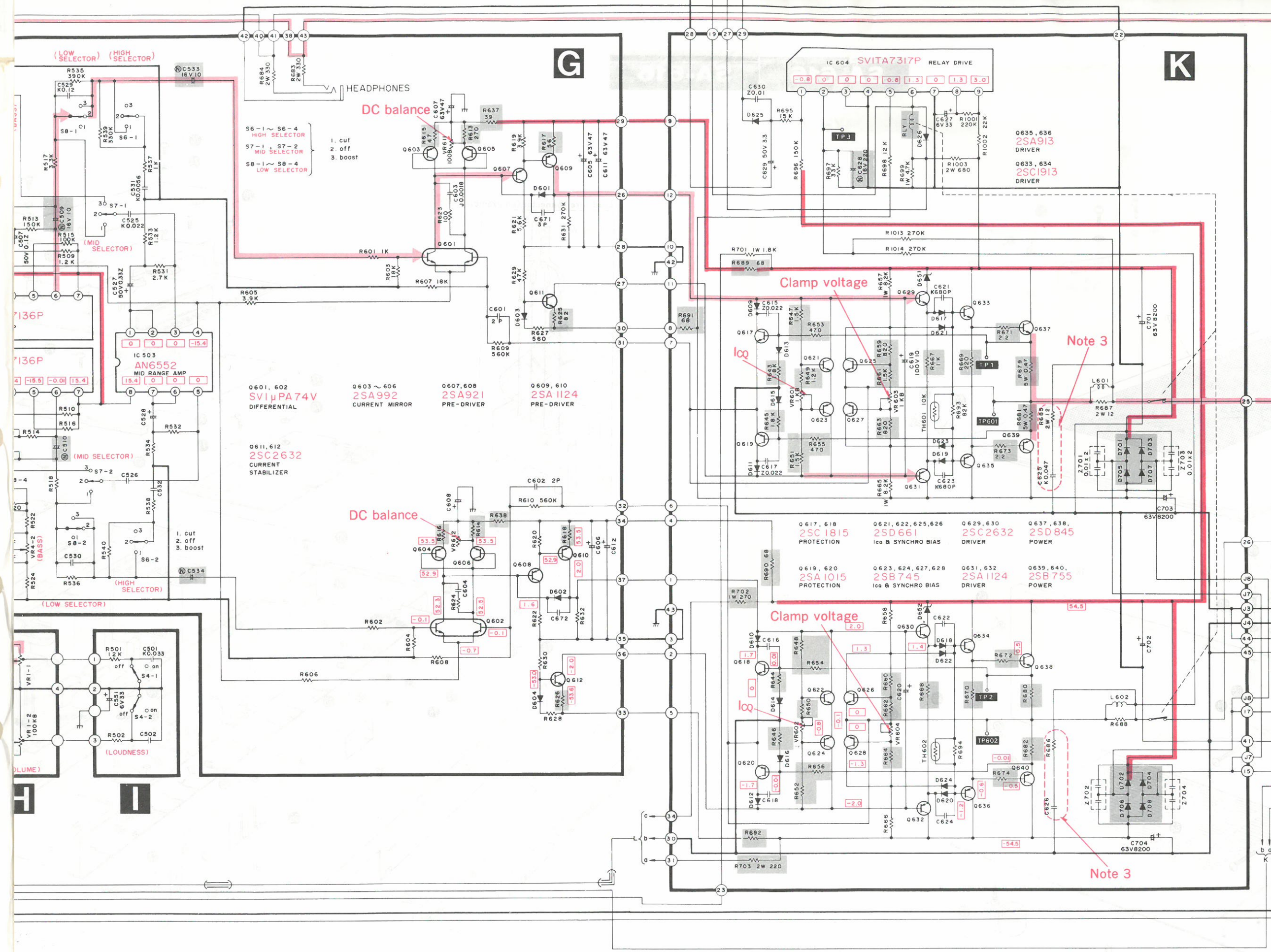
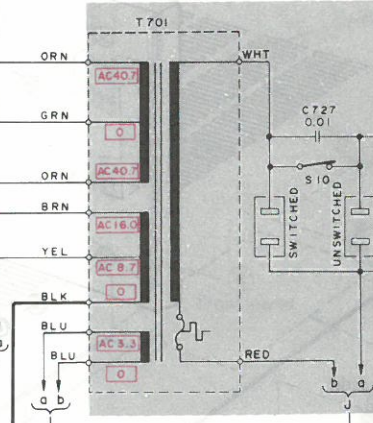
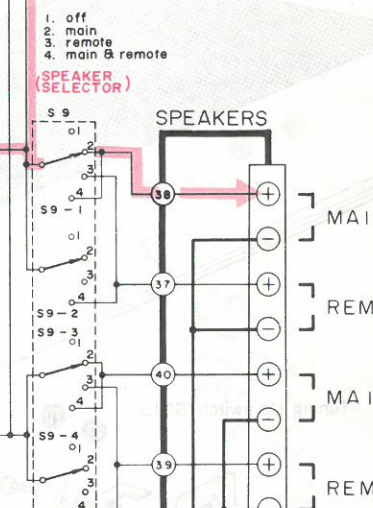
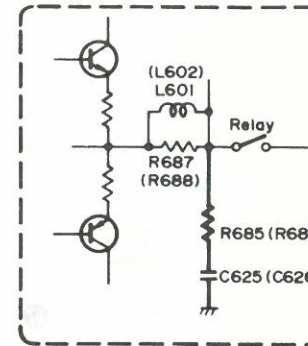
FM/AM band selection circuit

	R156 10Ω
U.S.A.	Use
Canada	Shorten



Note 3:
 • Change of schematic diagram
 () numbers : Right ch.

U.S.A. [M]



(LOW SELECTOR) (HIGH SELECTOR)

HEADPHONES

(MID SELECTOR)

(MID SELECTOR)

(MID SELECTOR)

(HIGH SELECTOR)

(LOW SELECTOR)

(LOUDNESS)

(VOLUME)

DC balance
 S6-1 ~ S6-4
 HIGH SELECTOR
 S7-1 ~ S7-2
 MID SELECTOR
 S8-1 ~ S8-4
 LOW SELECTOR

Q601, 602
 SV1 μ PA74V
 DIFFERENTIAL

Q611, 612
 2SC2632
 CURRENT STABILIZER

Q603 ~ 606
 2SA992
 CURRENT MIRROR

DC balance

Q607, 608
 2SA921
 PRE-DRIVER

Q609, 610
 2SA1124
 PRE-DRIVER

Clamp voltage

I_{CC}

Clamp voltage

I_{CC}

Note 3

Note 3

1. off
 2. main
 3. remote
 4. main B remote

SPEAKERS (SELECTOR)

MAIN

REMO

MAIN

REMO

ORN

GRN

BRN

YEL

BLK

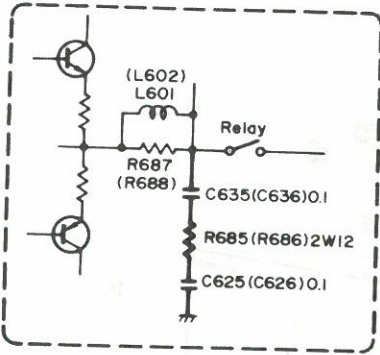
BLU

RED

SWITCHED

UNSWITCHED

Canada [MC]



1. **S4-1, S4-2** : Loudness switch in "off" position.
2. **S5-1, S5-2** : FM-AM muting/FM mode switch in "on/FM auto" position. (on/FM auto off/FM mono)
3. **S6-1 ~ S6-4** : Acoustic high selector switch in "off" position. (① high cut ↔ ② off ↔ ③ high boost)
4. **S7-1, S7-2** : Mid range selector switch in "off" position. (① mid cut ↔ ② off ↔ ③ mid boost)
5. **S8-1 ~ S8-4** : Acoustic low selector switch in "off" position. (① low cut ↔ ② off ↔ ③ low boost)
6. **S9** : Speaker selector switch in "main" position. (① off ↔ ② main ↔ ③ remote ↔ ④ main & remote)
7. **S10** : Power source switch in "on" position.
8. **S706-1, S706-2** : Power display range selector switch in "X1" position. (X1 ↔ X0.01)
9. **S707-1, S707-2** : Power display switch in "on" position.

IMPORTANT SAFETY NOTICE

The shaded area on this schematic diagram incorporates special features important for safety. When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

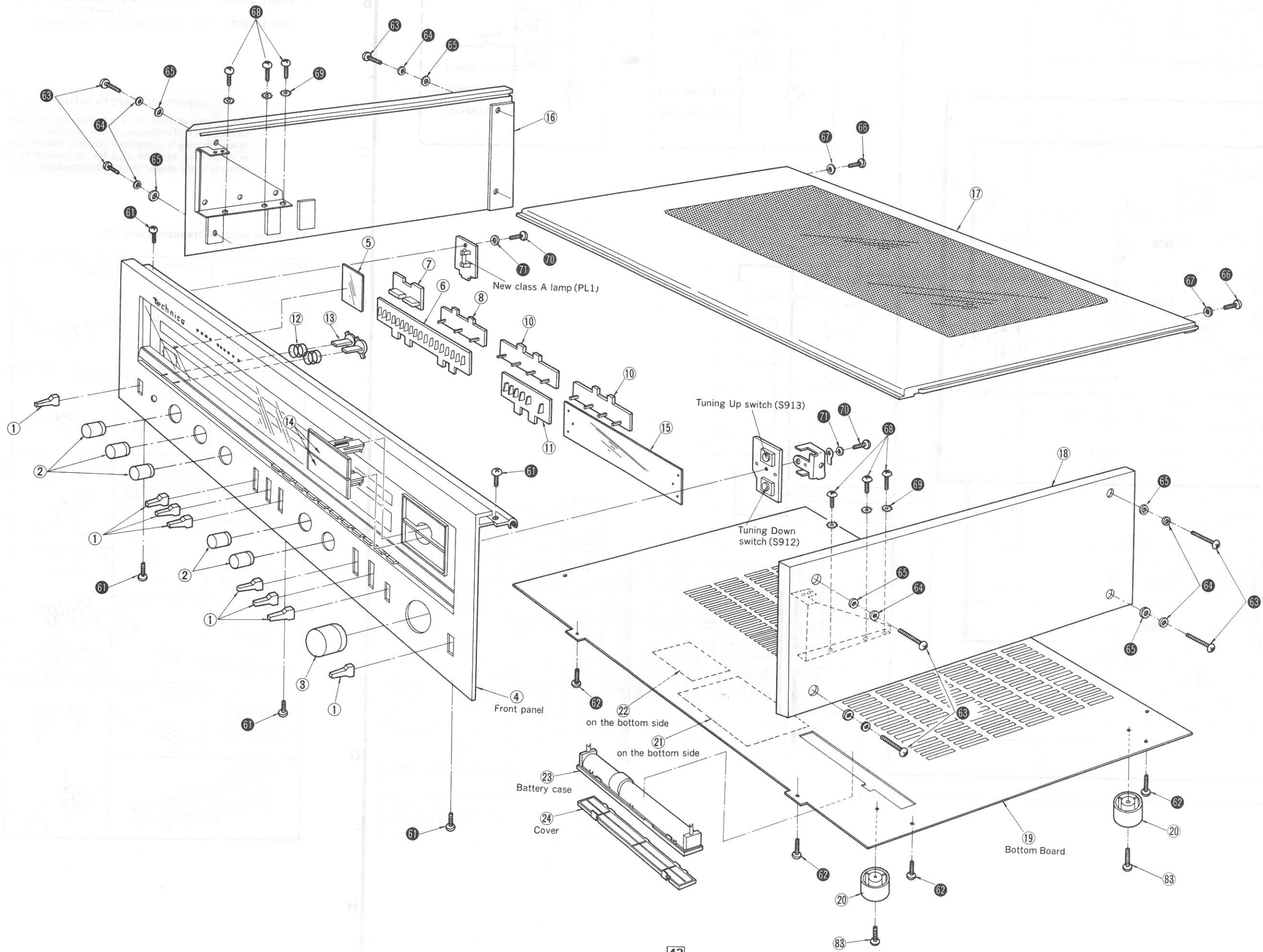
*** Terminal guide of transistors and IC's**

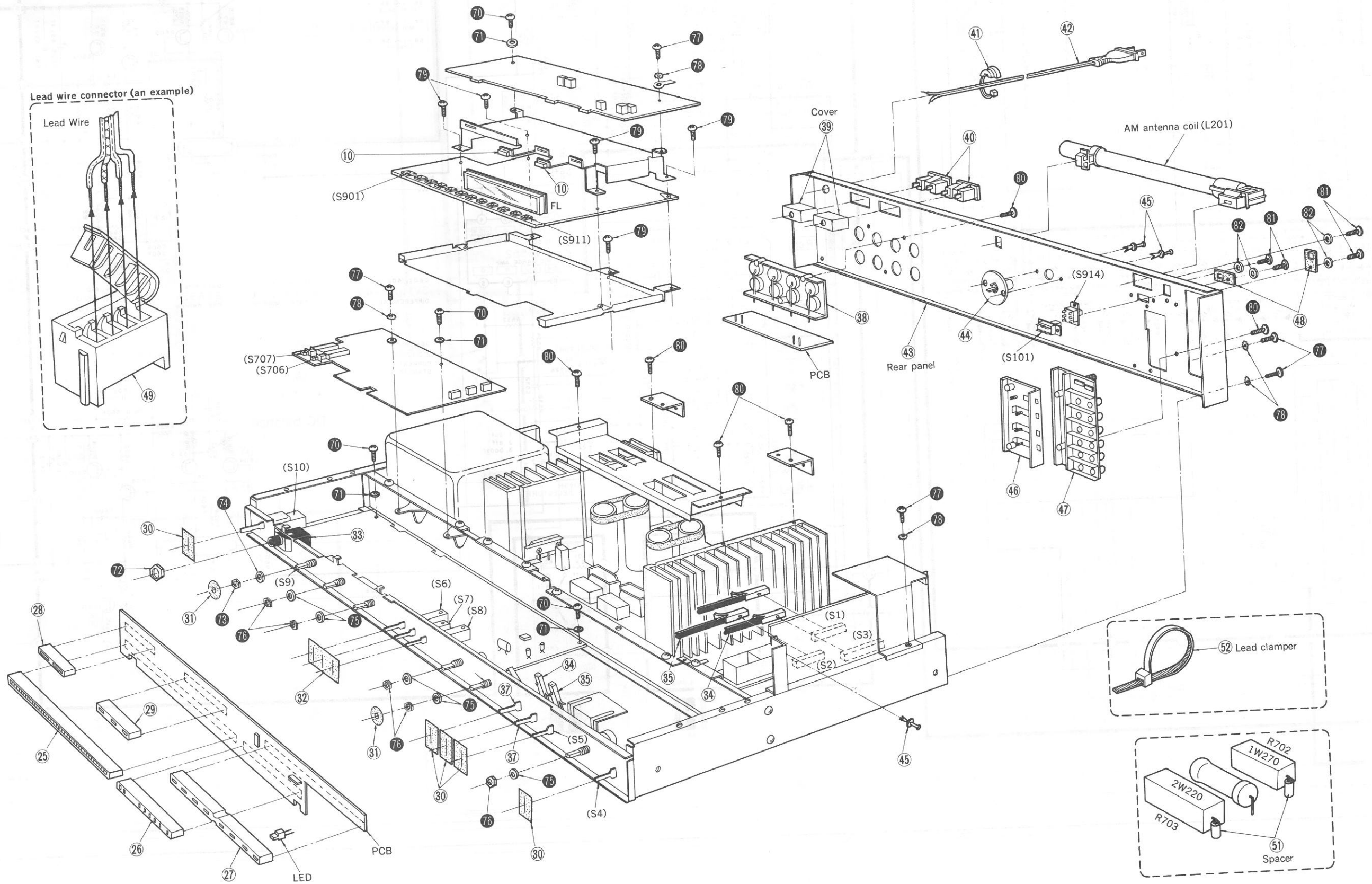
AN217P SVIM74LS42P SVITC5067BP SVI μ PCI167C SVI μ PCI161C 	SVITA78L006A 	2SB745, 2SB755 2SD845 	MA151K
AN6552 SVI μ PB553C 	2SB709, 2SC2295 2SC2404, 2SD601 2SC2778 	2SD661 	MA151A
AN6876 	2SA564, 2SA921 2SA992, 2SA1015 2SAH24 2SC828, 2SC945 2SC1815, 2SC1845 2SC2631, 2SC2632 2SC1684 	2SK34 	LN217RP, LN317GP LN417YP
SVITA7317P SVITA7322P 		SVIμPA74V 	
SVINJM4559DS 	2SB536, 2SD381 		SVDMZ
SVITA7136P 	2SA913, 2SC1913 2SD762 	3SK74 	SVDBB113
SVIμPDI704CL 			SVDBB204

DIODES

D104, 105, 106, 107	LN217RP	LED (Red)
D108, 109	LN317GP	LED (Green)
D401, 402, 403	LN217RP	LED (Red)
D601, 602, 609, 610 611, 612, 625, 631	MA150	
D605, 606, 613, 614 615, 616	MA162A	
D603, 604	MA27B	
D617, 618, 619, 620 621, 622, 623, 624	2-0A99	
D626	SVDSRIK2	
D627, 628, 641, 642 643, 644, 653, 654 655, 656	LN217RP	LED (Red)
D629, 630, 632, 633 634, 635, 636, 645 646, 647, 648	LN317GP	LED (Green)
D637, 638, 639, 640 649, 650, 657, 658	LN417YP	LED (Yellow)
D651, 652	SVDMZ304B	4V Zener
D701, 702, 703, 704 705, 706, 707, 708	SVDS3V20	
D709	SVDMZ306	6V Zener
D712, 714, 715, 717 718	SVDSRIK2	
D713	SVDMZ314	14V Zener
D719	SVDMZ336	36V Zener
D926, 927, 928, 929 930, 931, 932, 933	LN217RP	LED (Red)

EXPLODED VIEWS





REPLACEMENT PARTS LIST Cabinet & Chassis Parts

- Notes:** 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
 2. Δ indicates that only parts specified by the manufacturer be used for safety.
 3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Areas

- * [M] is available in U.S.A.
 * [MC] is available in Canada.

Ref. No.	Part No.	Part Name & Description
CABINET and CHASSIS PARTS		
1	SBD29	Knob, Lever Switches
2	SBN887-3	Knob, Tone Control/Balance/Selector
3	SBN885-5	Knob, Volume Control
4	SYW283	Panel, Front Ass'y
5	SDE255	Filter, New Class A Badge Light
6	SGL93	Light Guide, Power Level Indicator
7	SGL87	Light Guide, Protection/Safety Indicator
8	SGL89	Light Guide, Program Indicator
10	SGL91	Light Guide, Preset Station Indicator
11	SGL97	Light Guide, Signal Strength Indicator
12	SUS123-1	Spring, Push Switches
13	SBC205-3	Button, Push Switches
14	SBC275	Button, Tuning Up/Down Switch
15	SDU29	Filter, Display Window
16	SYK953	Side Panel, Left Ass'y
17	SYK951	Top Panel, Ass'y
18	SYK963	Side Panel, Right Ass'y
19	SKU8610	Bottom Board
20	SKX219-1	Foot
21	SQX4733	Label, Battery Caution
22	SQX4435-2	Label, Bottom Board Caution
23	SYE697	Case, Battery Ass'y
24	SJB9001	Cover, Battery Case
25	SHG1557	Bracket, Power Level Indicator LED
26	SHG1559	Cover, Signal Strength LED
27	SHG1561	Bracket Preset Station Indicator LED
28	SHG1565	Bracket, Protection/Safety Indicator LED
29	SHG1563	Bracket, Program Indicator LED
30	SHS2425	Fiber, Lever Switches
31	SHS6045	Fiber, Speaker/Selector
32	SHS2429	Fiber, Lever Switches
33	XCJ6P21B-A1	Jack, Headphones
34	ESA30227B	Wire, Remote Control, Rec Mode
35	ESA30225B	Wire, Remote Control, Tape Monitor
36	ESA3362B	Remote Control, With Wire, Selector Switch
37	ESA2268	Remote Control, Rec Mode/Tape Monitor
38	SJF4813	Terminal, Speakers
39	SMX13-1	Cover, AC Outlet
40	Δ SJS A66-2	Socket, AC Outlet
41	SFHK040L	Bushing, AC Cord
42	Δ RJA9Y	AC Cord
43	SGP2330B	Rear Panel
44	SJFA3101-1	Terminal, 4ch, MPX Output
45	SHR401-1	Latch, Terminal M'tg
46	SJF4419-2	Terminal, Antenna
47	SJF8023-2	Terminal, Input
48	SHR5073-1	Stopper, FM Antenna/Allocation Selector

Ref. No.	Part No.	Part Name & Description
49	SJS5627 SJS5421 SJS5327	Connector, Lead Wire, 6 pin Connector, Lead Wire, 4 pin Connector, Lead Wire, 3 pin
50	SHG1529	Cushion, FL, Rubber
51	SMX51	Spacer, Resistor (R702, 703)
52	SHR301	Lead Clamper
SCREWS, NUTS and WASHERS		
①	XTB3+8BFZ	Screw, Tapping, \oplus 3 x 8 (Front Panel)
②	XTB3+8BFN	Screw, Tapping, \oplus 3 x 8 (Bottom Board)
③	XSN4+25BVS	Screw, \oplus 4 x 25 (Side Panel)
④	XWA4BFZ	Washer, Spring, ϕ 4
⑤	XWG4FZ	Washer, Plain, ϕ 4
⑥	XTV3+8BFZ	Screw, Tapping, \oplus 3 x 8 (Top Panel)
⑦	XWG3FZ	Washer, Plain, ϕ 3
⑧	XTB4+10BFN	Screw, Tapping, \oplus 4 x 10 (Side Panel)
⑨	XWC4C	Washer, External Toothed Lock, ϕ 4
⑩	XTV3+10BFN	Screw, Tapping, \oplus 3 x 10 (P.C.B.)
⑪	XWG3	Washer, Plain, ϕ 3
⑫	XNS12	Nut, M12 (Headphone Jack)
⑬	XNS9	Nut, M9 (Speaker Selector)
⑭	XWV9	Washer, Spring, ϕ 9
⑮	XWV8	Washer, Spring, ϕ 8
⑯	XNS8	Nut, M8 (Volume/Balance/Tone/Selector)
⑰	XTB3+8BFZ	Screw, Tapping, \oplus 3 x 8 (P.C.B.)
⑱	XWC3B	Washer, External Toothed Lock, ϕ 3
⑲	XTB3+8BFN	Screw, Tapping, \oplus 3 x 8 (Shield Cover)
⑳	XTB3+10BFZ	Screw, Tapping, \oplus 3 x 10 (Chassis)
㉑	XSN3+6BVS	Screw, \oplus 3 x 6 (FM Antenna/Allocation)
㉒	XWA3BFZ	Washer, Spring, ϕ 3
㉓	XTB3+14BFN	Screw, Tapping, \oplus 3 x 14 (Feet)
ACCESSORY		
A1	SSA267	Cord, FM Indoor Antenna
PACKING PARTS		
P1	SPP655	Polyethylene Bag
P2	SPS2765	Pad, Left Side
P3	SPS2767	Pad, Right Side
P4 [M] only	SPG2639	Carton Box
P4 [MC] only	SPG2641	Carton Box
P5 [M] only	SQF10457-1	Instructions Book, Printed Matter
P5 [MC] only	SQF10459	Instructions Book, Printed Matter

● Accessory

