

31-1969

REALISTIC[®]

Service Manual

STA-700

AM/FM STEREO RECEIVER

Catalog Number:31-1969



CUSTOM MANUFACTURED FOR RADIO SHACK, A DIVISION OF TANDY CORPORATION

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1. ELECTRICAL PERFORMANCE SPECIFICATIONS

AM SECTION

- NOTES:** 1. Output readings are taken across a non-reactive 47 k ohm load termination.
 2. Output is measured at TAPE OUT terminals.
 3. The Generator output shall terminate in an IRE loop antenna.
 4. Standard modulation: 400 Hz, 30 % modulation .

ITEM	Measured at (kHz)	UNIT	NOMINAL	LIMIT
Frequency coverage		kHz	510—1,650	520—1,620
Intermediate Frequency		kHz	455	
Sensitivity for 20 dB Quieting	600	$\mu\text{V}/\text{m}$	200	500
	1000	$\mu\text{V}/\text{m}$	200	500
	1400	$\mu\text{V}/\text{m}$	200	500
Sensitivity at antenna terminal	1000	μV	20	—
S/N Ratio at 5 mV/m input	1000	dB	40	34
Selectivity at 20 dB S/N input, ± 10 kHz	1000	dB	28	20
Band width at 6 dB down	1000	kHz	5.5	4.5—7.0
A.G.C. Figure of merit	1000	dB	45	38
IF rejection ratio	600	dB	32	27
Image rejection ratio	1400	dB	42	35
T.H.D. at 5 mV/m input 30 % mod.	1000	%	1.0	3.0
Overload Distortion at 100 mV/m input 80 % mod.	1000	%	1.5	10.0
Electrical audio fidelity Ref. freq.=1 kHz, -6 dB down, 5 mV/m input	1000	Hz	20—3 k	50—2.5 k
Beat Freq. modulation at 1 mV/m (2nd) at 50 mV/m (3rd) at 1 mV/m (3rd) at 50 mV/m	910	%	8	15
	910	%	8	15
	1365	%	8	15
	1365	%	8	15
Frequency Calibration	600	kHz	0	± 25
	1400	kHz	0	± 50
Spurious response from 1,650—30,000 kHz	1000	dB	50	45
Tape out level, at 1 kHz 5 mV/m, RCA Jack **5 mV/m, DIN Jack (3.3 k Ω terminated)	1000	mV	200	200 \pm 2.5 dB
	1000	mV	3.3	3.3 \pm 3 dB
The oscillator shall not drift more than 10 kHz starting at 25 degrees C (77 degrees F) and through range up to 50 degrees C (122 degrees F), at 1000 kHz.				
Meter Sensitivity at 1st LED at 2nd LED at 3rd LED at 4th LED at 5th LED	1000	mV/m	0.5	
	1000	mV/m	0.76	
	1000	mV/m	0.95	
	1000	mV/m	1.5	
	1000	mV/m	20.0	

**European and Australian models only.

FM SECTION

- NOTES:** 1. Output readings are taken across a non-reactive 47 k ohm load termination.
 2. Output is measured at TAPE OUT terminals.
 3. The signal voltage in this specification appearing across the tuner input terminals (IHF).
 4. Standard modulation: 1000 Hz, 75 kHz deviation.

ITEM	Measured at (MHz)	UNIT	NOMINAL	LIMIT
Frequency coverage		MHz	*86.5—108.5	88—108
Intermediate Frequency		MHz	10.7	
IHF (Useable) Sensitivity	90/98/106	μ V	2.8	5.0
	90/98/106	dBf	14.17	19.2
50 dB Quieting Sensitivity	90/98/106	μ V	6.0	9.0
	90/98/106	dBf	20.8	24.3
Limiting Sensitivity (-3 dB)	98	μ V	2.8	5.0
S/N Ratio at 1 mV input	98	dB	65	58
Frequency response ± 2.5 dB range, at 1 mV input	98	Hz	30—15 k	40—12 k
Distortion at Quieting sens. at 1000 Hz	98	%	0.7	
Distortion at 1 mV input	at 100 Hz	98	%	0.2
	at 1000 Hz	98	%	0.1
	at 6000 Hz	98	%	0.15
Capture ratio	98	dB	2.5	5.0
Alternate channel Selectivity at input 100 μ V	98	dB	45	30
Spurious response ratio	98	dB	70	
Image response ratio	106	dB	55	45
IF response ratio	90	dB	80	70
AM suppression at 100 μ V input	98	dB	48	40
AFC holding range at 100 μ V input	98	kHz	± 250	± 300
Calibration accuracy	90/98/106	kHz	0	500
Tapeout level, 1 mV input at RCA, 75 k dev.	98	mV	550	550 ± 2.5 dB
Meter sensitivity	at 1st LED	98	μ V	6.0
	at 3rd LED	98	μ V	45
	at 5th LED	98	μ V	250
Max. signal handling Capacity	98	mV	200	100
Auto-M Range at 1 mV Input	98	kHz	± 1200	± 800

*European models must not be able to tune below 87.5MHz.

FM STEREO SECTION

- NOTES:** 1. Output readings are taken across a non-reactive 47 k ohm load termination.
 2. Output is measured at TAPE OUT terminals.
 3. Signal Voltage in this specification is the voltage appearing across the tuner input terminals (IHF).
 4. Standard modulation: Main carrier (L + R)—33.75 kHz (45 %) dev.
 Sub carrier (L - R)—33.75 kHz (45 %) dev.
 Pilot (19 kHz)—6 kHz (8 %) dev.
 Modulation Frequency—1000 Hz

ITEM	Measured at (MHz)	UNIT	NOMINAL	LIMIT
Stereo beacon switching and muting Threshold	98	μV	10	20
	98	dBf	25.22	31.25
Stereo 50 dB quieting sensitivity	90/98/106	μV	55	
	90/98/106	dBf	40.03	
S/N ratio, at 1 mV input	98	dB	65	58
Stereo distortion at 1 mV input at 1 kHz	98	%	0.6	2.0
Stereo separation at 1 mV input at 100 Hz at 1 kHz at 10 kHz	98	dB	35	26
	98	dB	40	30
	98	dB	27	22
Sub carrier product rejection	98	dB	55	48
SCA rejection	98	dB	80	
Tapeout level, at 1 kHz, 1 mV input	98	mV	500	500 \pm 2.5 dB

AUDIO SECTION

NOTE: All units are measured at SPEAKER Terminals with non-reactive rated load (8 ohms) unless otherwise indicated.

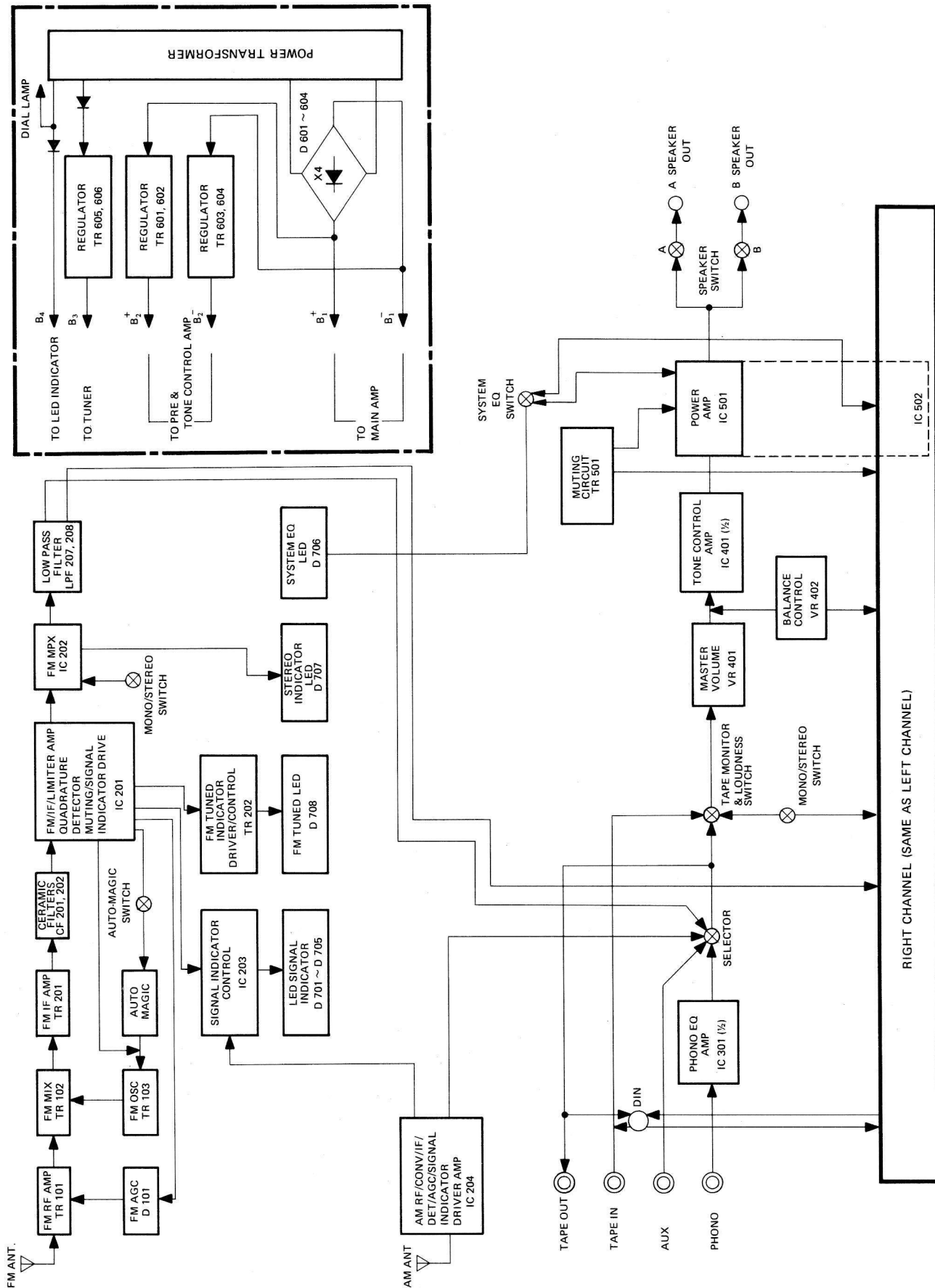
Rated Power: 10 W (RMS) Rated THD: 0.5 %

ITEM		UNIT	NOMINAL	LIMIT
Power Output, from 20 Hz to 20 kHz under rated THD. Both channels driving 8 Ω load. (RMS)		W	12	10
Input Impedance at 1 kHz	PHONO/AUX/TAPE IN	k Ω	50	
Sensitivity for rated power	PHONO	mV	2.2	2.2 \pm 2 dB
	AUX/TAPE IN	mV	160	160 \pm 2 dB
Total Harmonic Distortion from 20 Hz to 20 kHz, at rated power	at 20 Hz	%	0.2	0.5
	at 1 kHz	%	0.08	0.5
	at 20 kHz	%	0.3	0.5
Max. Input Signal at rated THD 0.5 % (measured at Tape out)	PHONO	mV	140	100
	AUX/TAPE IN	mV	infinite	

ITEM	UNIT	NOMINAL	LIMIT
Frequency Response from 20 Hz to 20 kHz	±dB	1	2
S/N Ratio PHONO	dB	70	64
A-weighted 1 W Reference (IHF) AUX/TAPE IN	dB	80	73
S/N Ratio A-weighted, PHONO (10 mV Input & shorted)	dB	82	76
Rated Power Reference AUX/TAPE (Input shorted)	dB	90	84
Dynamic Headroom	dB	0.5	
Clipping Headroom	dB	1.0	
Loudness Contour ch. at 100 Hz	dB	+6.0	+6±2.5
at 10 kHz	dB	+4.5	+4.5±2.5
Tone Control Response Bass Control Action at 100 Hz	dB	±10	±10±2.5
Treble Control Action at 10 kHz	dB	±10	±10±2.5
Crosstalk at AUX at 1 kHz	dB	46	40
IM Distortion (SMPTE) at rated power	%	0.3	0.7
Transient Overload Recovery Time	mSec	1.5	
Slew Factor		1.5	
Channel Balance at VR max	dB	0	±2
DC Balance at No Signal and Output	mV	0	±70
Tape out Level at RCA Jacks Phono (Input=2.2 mV)	mV	130	130±2 dB
(47 kΩ terminated) AUX (Input=160 mV)	mV	140	140±2 dB
Hum and Noise at Volume control setting min.	mV	1	3
Phono Eq. (RIAA) ch. from 20 Hz to 20 kHz (measured at Tape out)	dB	0	±2
Freq. Response at "System EQ" position AUX in, 100 Hz, 1 kHz reference	dB	+6.5	+6.5±2

- NOTES:**
1. The supply voltage is 120 volts AC, 60 Hz (U.S.A., Canadian models), (220/240 volts AC, 50 Hz for European and 240 volts AC, 50 Hz for Australian models) from a regulated power supply.
 2. All measurement shall be taken under IHF measurement method unless otherwise specified.
 3. The power source must be insulated from other equipment, connected to antenna or output.
 4. Room temperature is 25 degrees C (77 degrees F).
 5. Nominal Specs represent the design specs; all units should be able to approximate these—some will exceed and some may drop slightly below these specs.
Limit Specs represent the absolute worst condition which still might be considered acceptable; in no case should a unit perform to less than within any Limit Spec.

2. BLOCK DIAGRAM



3. DISASSEMBLY INSTRUCTIONS

1. To remove the Cabinet

- a. Remove two screws from each side of Cabinet (Figure 3-1).
Be careful not to lose the washers when the screws are removed.

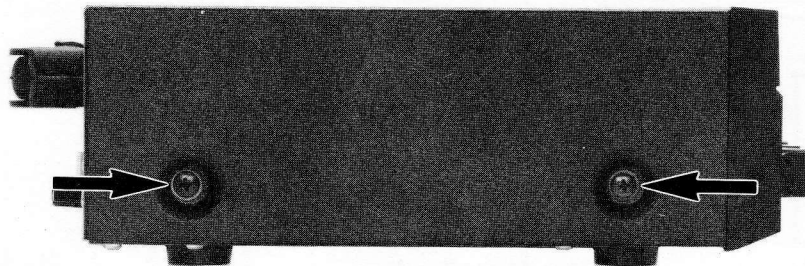


Figure 3-1

- b. Remove three screws from upper Back Panel (Figure 3-2).

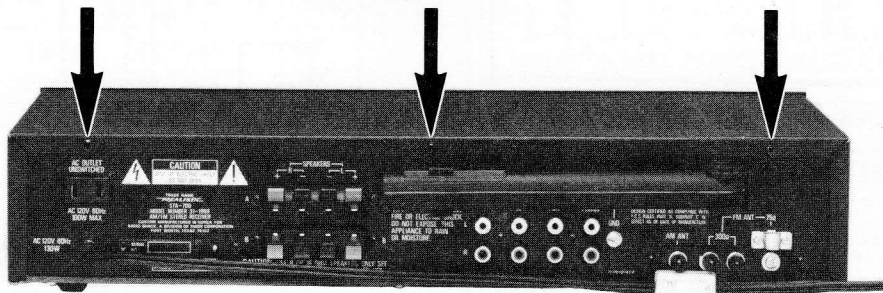


Figure 3-2

2. To remove the Bottom Cover.

- a. Turn the Receiver upside down and remove eleven screws from the bottom (Figure 3-3).
Lift the Bottom Cover off.

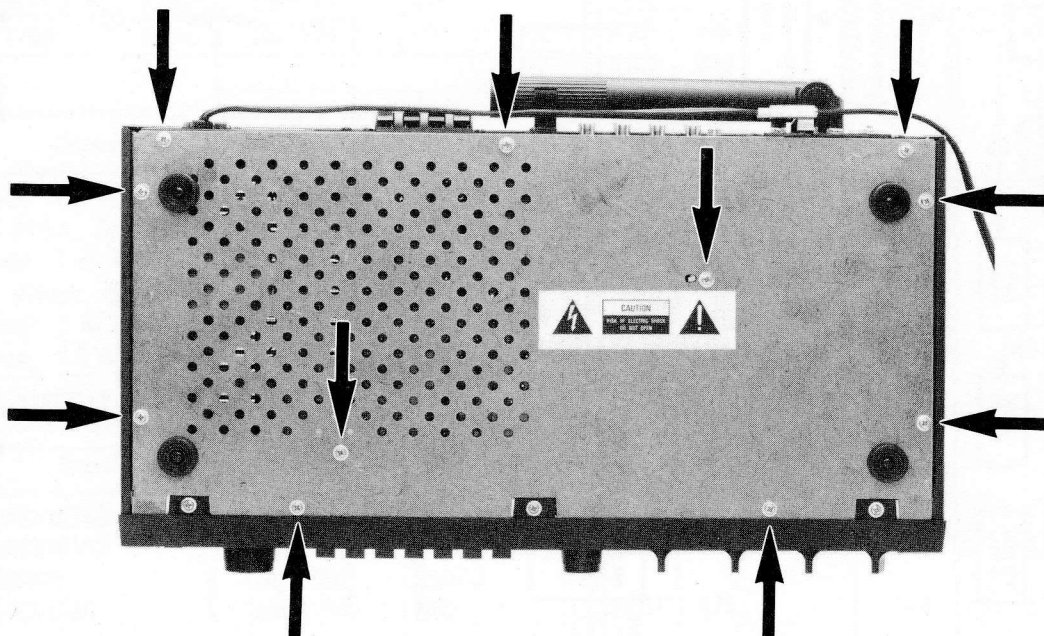


Figure 3-3

3. To remove the Front Panel (Plastic Panel)

- a. Remove the Cabinet and Bottom Cover as described in 1. and 2.
- b. Remove two screws from top of Front Panel (Figure 3-4).

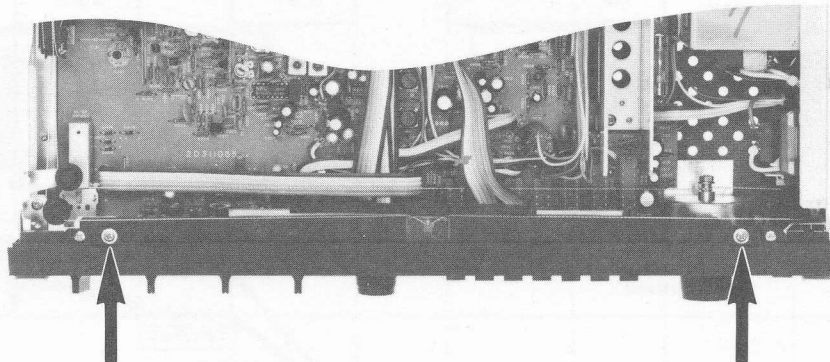


Figure 3-4

- c. Remove three screws from bottom of Front Panel (Figure 3-5).

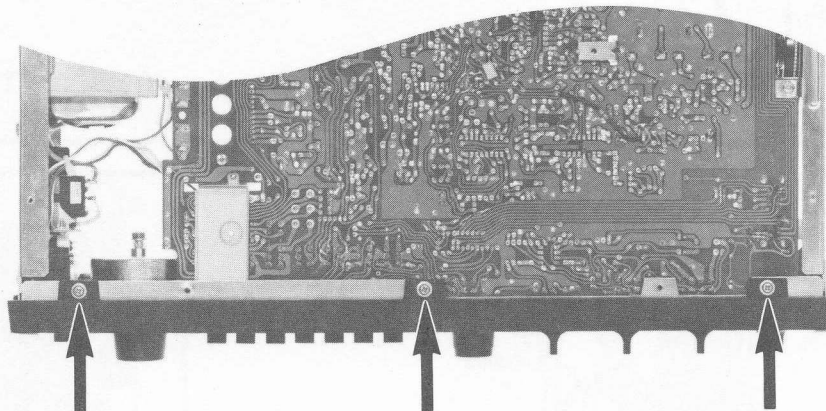


Figure 3-5

- d. Remove the TUNING (a), VOLUME (b), BALANCE (c), TREBLE (d), BASS (e), and Selector Knob (f). Now you can remove the Front Panel (Figure 3-6).

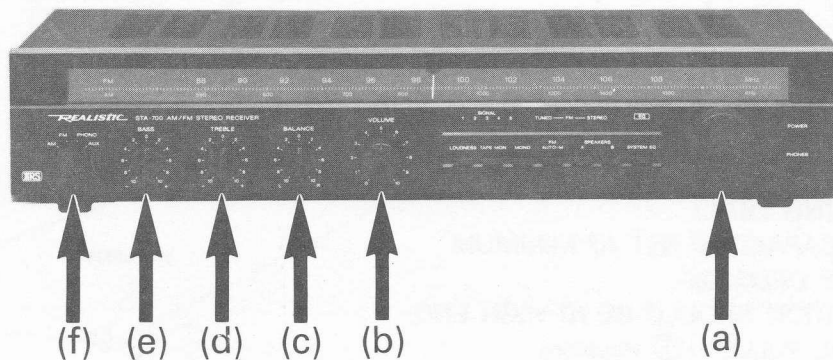
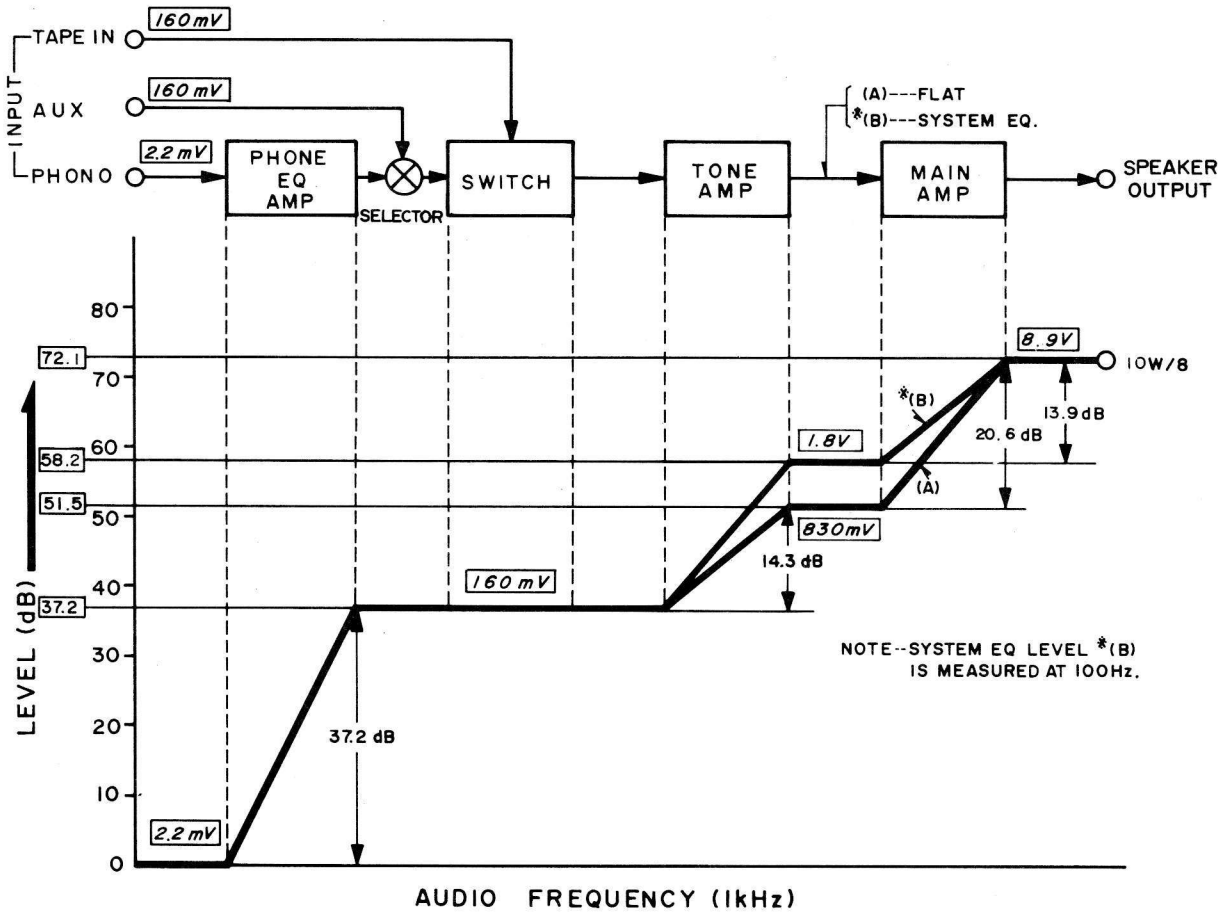
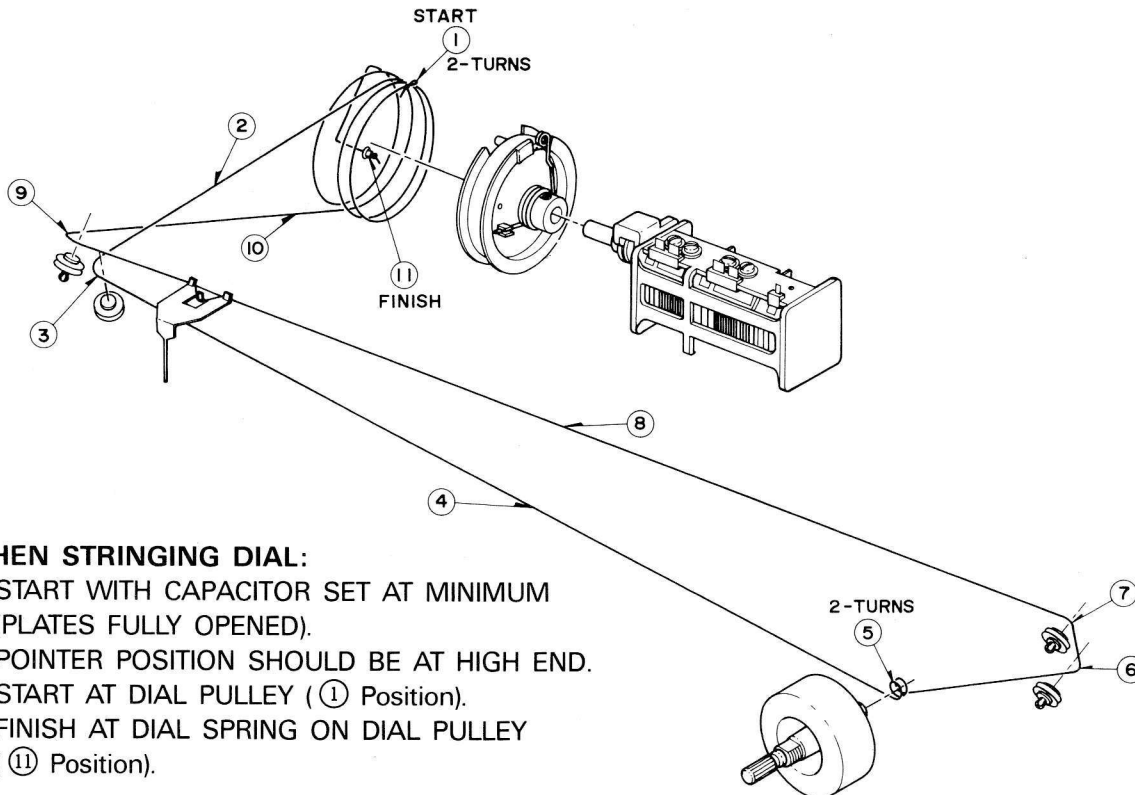


Figure 3-6

4. LEVEL DIAGRAM



5. DIAL STRINGING DIAGRAM

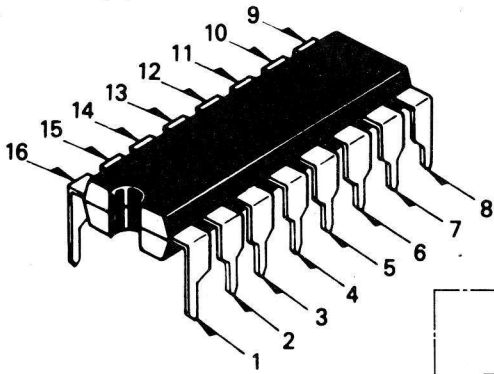


WHEN STRINGING DIAL:

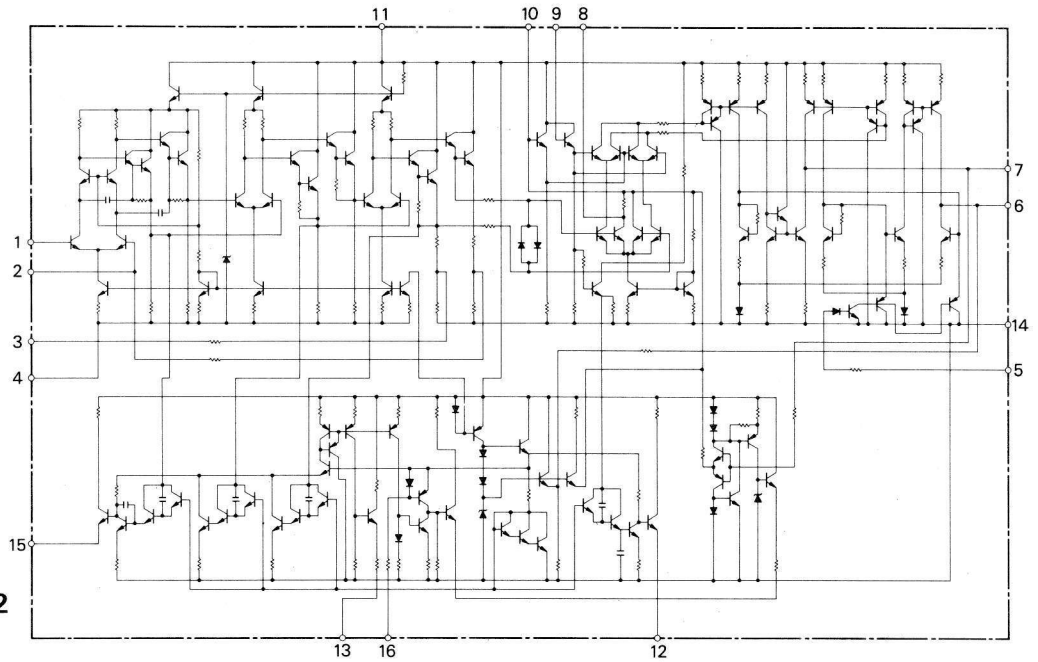
- START WITH CAPACITOR SET AT MINIMUM (PLATES FULLY OPENED).
- POINTER POSITION SHOULD BE AT HIGH END.
- START AT DIAL PULLEY (① Position).
- FINISH AT DIAL SPRING ON DIAL PULLEY (⑪ Position).

6. IC LEAD IDENTIFICATION & INTERNAL DIAGRAM

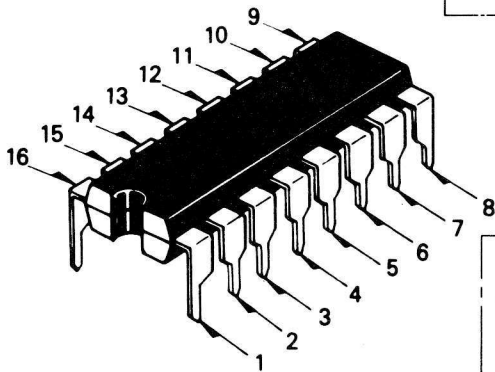
1) μ PC1167C2.....IC201



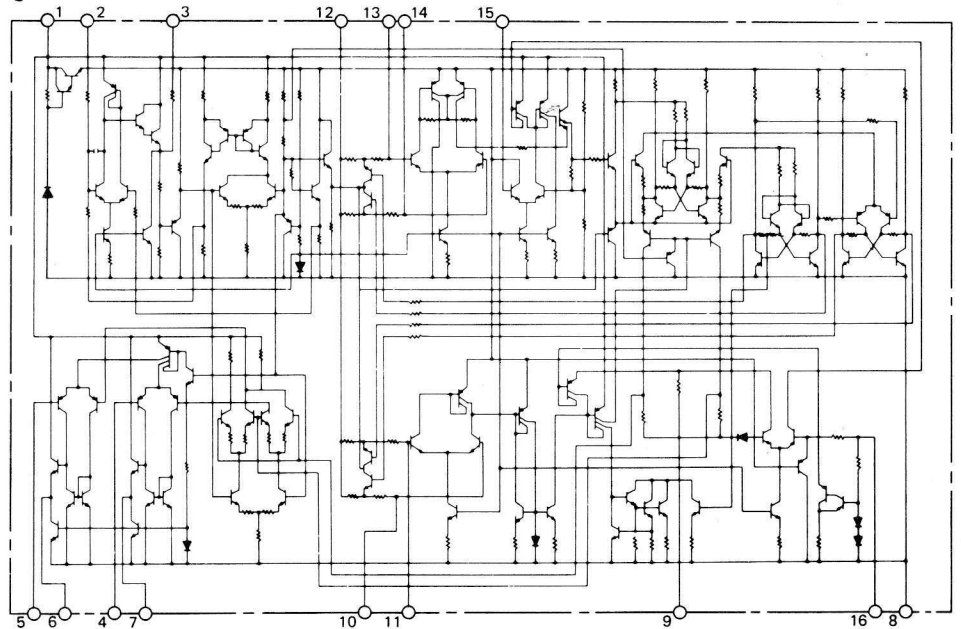
EQUIVALENT CIRCUIT DIAGRAM



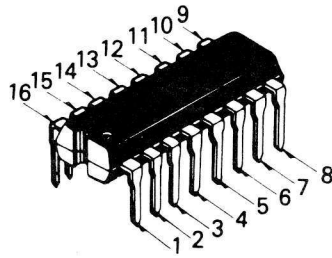
2) μ PC1161C3.....IC202



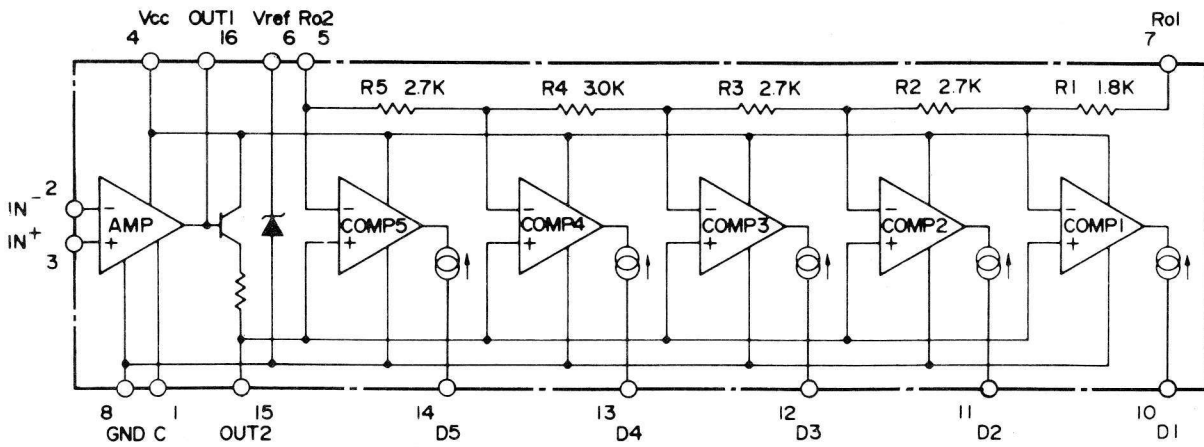
EQUIVALENT CIRCUIT DIAGRAM



3) LB1405.....IC203

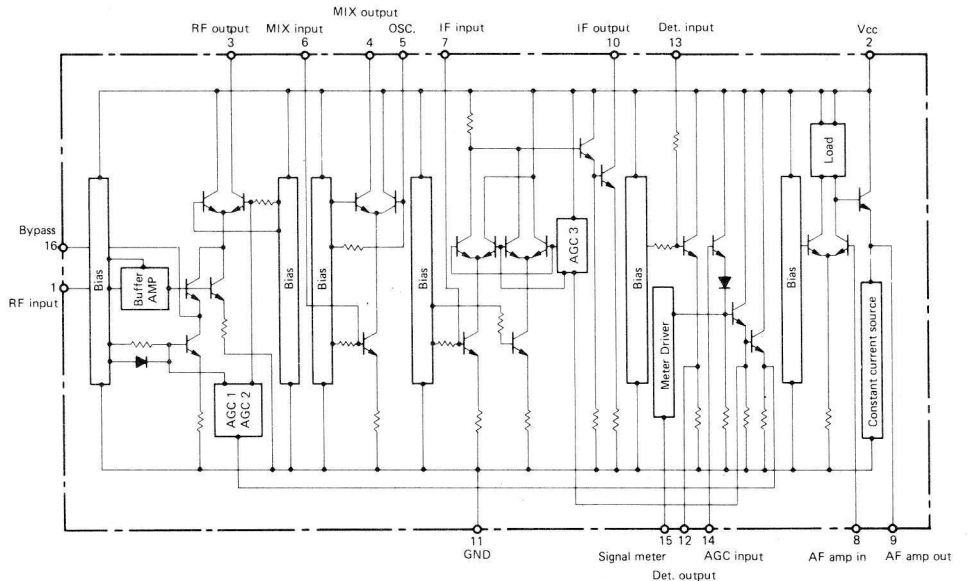
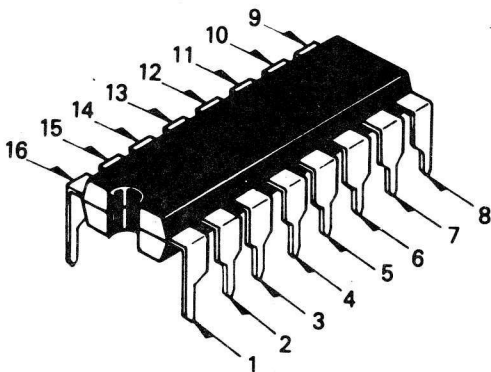


BLOCK DIAGRAM

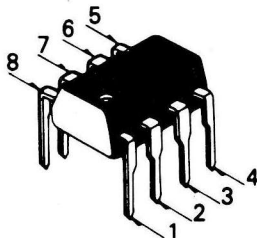


4) μ PC1178C.....IC204

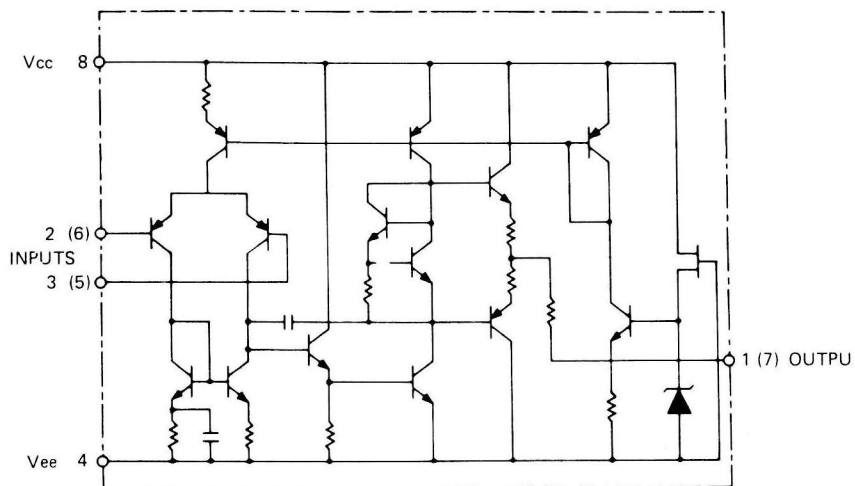
EQUIVALENT CIRCUIT DIAGRAM



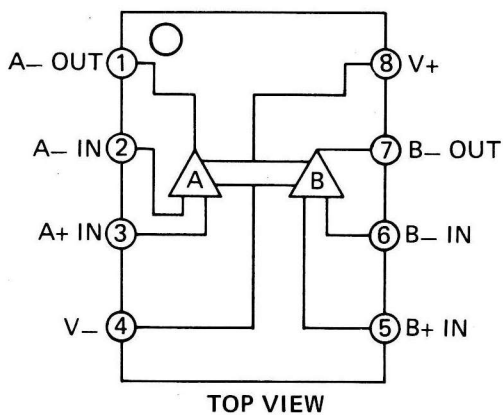
5) NJM4558DX, LA6458DX, or TL4558PB.....IC301, IC401



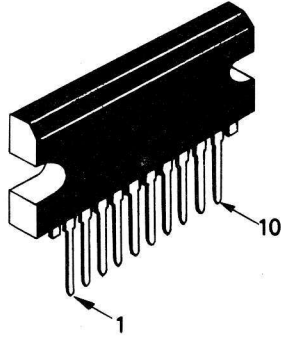
EQUIVALENT CIRCUIT DIAGRAM



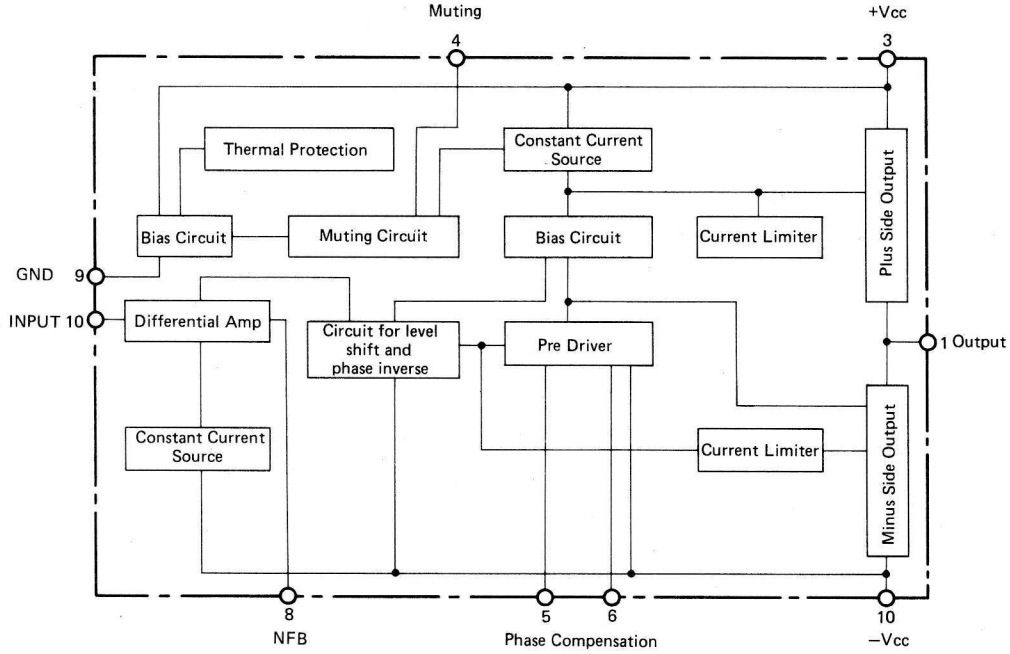
PIN CONFIGURATION



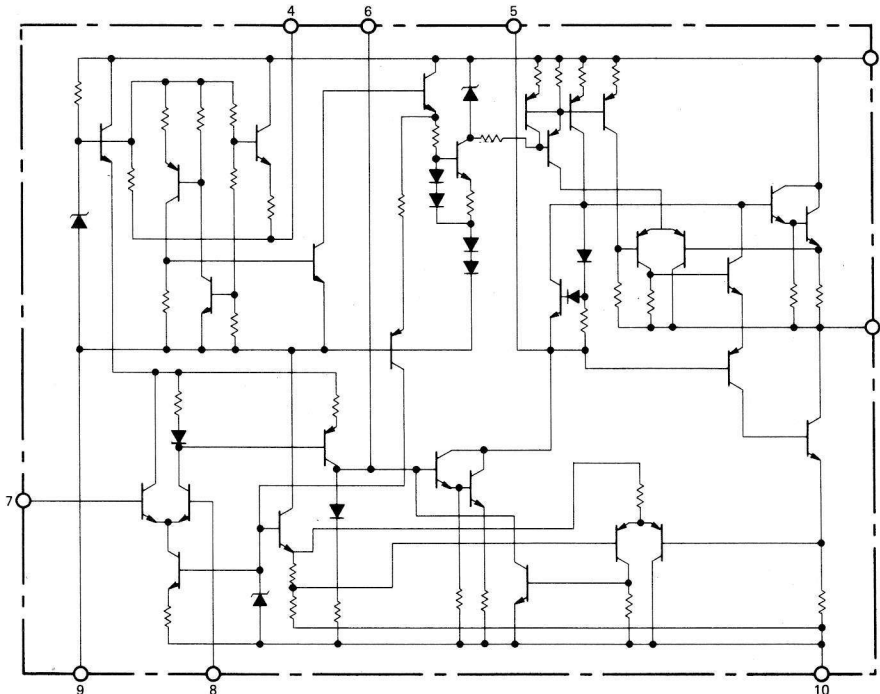
6) μ PC1188H.....IC501, 502



BLOCK DIAGRAM




EQUIVALENT CIRCUIT DIAGRAM




7. TRANSISTOR LEAD IDENTIFICATION

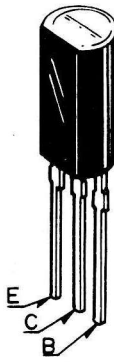
NOTE: The symbol numbers without Parentheses are used principally, and with Parentheses are used supplementary.




2SK41F	TR101
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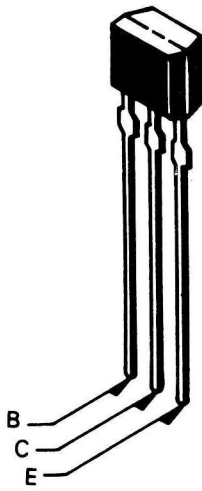
2SB605	TR604
2SD571	TR601, 605




2SA965	(TR604)
2SB560	(TR604)
2SC1844	(TR601), (605)
2SD438	(TR601), (605)
2SC2235	(TR601), (605)



2SA659	TR603
2SC536	TR202, 501, 606
2SC1175	(TR602)



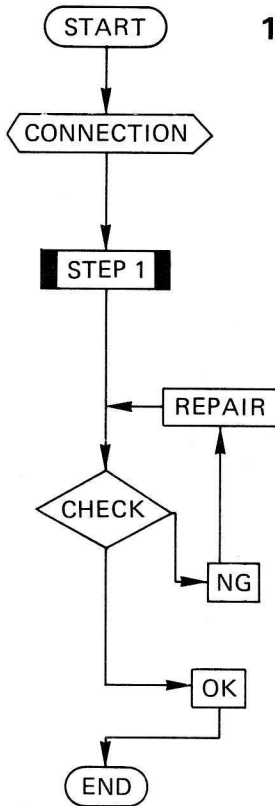
2SC2786	(TR102), (103)
	(TR201)



2SA991	TR603
2SA1015	(TR603)
2SC1674	TR102, 103, 201
2SC1815	(TR602)
2SC1840	(TR202), (501), (606)
2SC1844	(TR602)

8. OPERATION CHECK FOR CIRCUITS

1) POWER SUPPLY OPERATION CHECK



- Connect AC Cord to standard AC power source.
- Power Switch "ON" and Dial lamp should light.

Check the Power Supply Voltages.

Figure 8-1

- (1) Check Power Supply circuit on TUNER/AUDIO P.C.B., Fuse, and Power Transformer.
- (2) See TROUBLESHOOTING on Page 33.

DC Voltages are not correct.

DC Voltages are correct.

Proceed to next section.

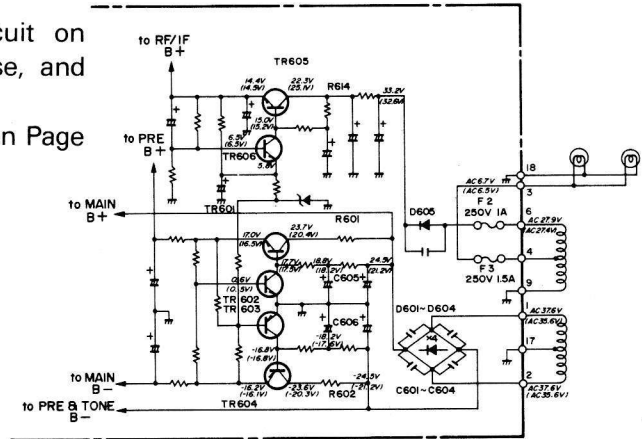
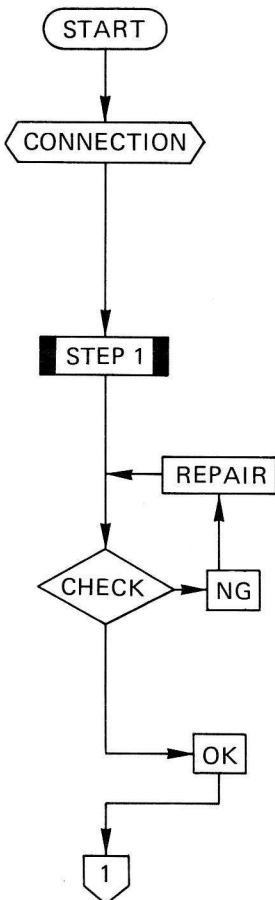


Figure 8-1

2) AUDIO SECTION OPERATION CHECK

(1) MAIN AMP OPERATION CHECK



- Connect 8 Ω Load to Speaker Output.
- Connect DC Voltmeters to C605 (Minus [-] to Ground) and C606 (Plus [+]) to Ground) of Main Amp circuits on TUNER AUDIO P.C.B.

Check Power Supply Voltage with No Input.

**Must be $\pm 24V \pm 0.5V$ **

- (1) Check D601 - D604, C605, C606
- (2) Check for short-circuits.
- (3) See TROUBLESHOOTING on page 33.

DC Voltage is not $\pm 24V \pm 0.5V$.

DC Voltage is $\pm 24V \pm 0.5V$.

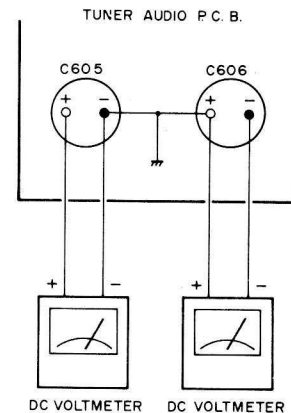
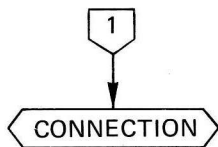


Figure 8-2



- Press A Speaker button.
- Connect DC Voltmeter to + and - terminal of Left Speaker.
- Connect DC Voltmeter to + and - terminals of Right Speaker.

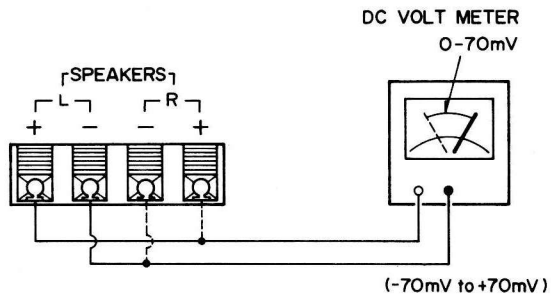


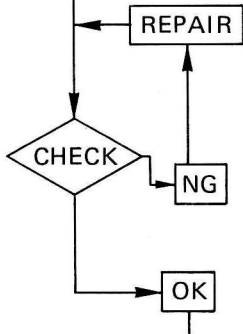
Figure 8-3

STEP 2

Check for balance of DC voltage at L and R channel output terminals.

with in ± 70 mV

- (1) Check IC501 (L), IC502 (R).



DC Voltage over ± 70 mV.

DC Voltage within ± 70 mV.

CONNECTION

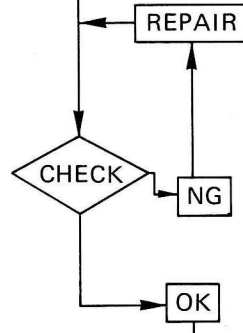
Connect 8Ω Load to Speaker Output.

STEP 3

Check Muting circuit included in MAIN Amp IC501 (L ch), IC502 (R ch).

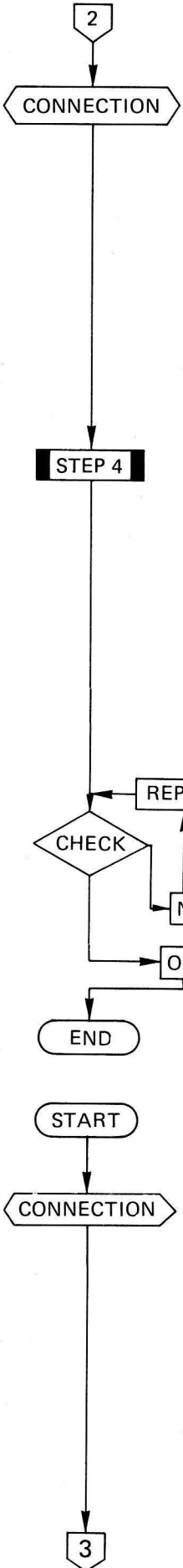
*Unit activates about 2-3 seconds after Power is Switched "ON".**

- (1) Check MAIN Amp IC501/502.
- (2) Check TR501, C521, and C522.



Muting circuit does not work.

Muting circuit works.



- Connect 8 Ω Load to Speaker Output.
- Connect Audio Osc. to AUX input.
- Connect V.T.V.M. to Speaker terminals. (Figure 8-4)

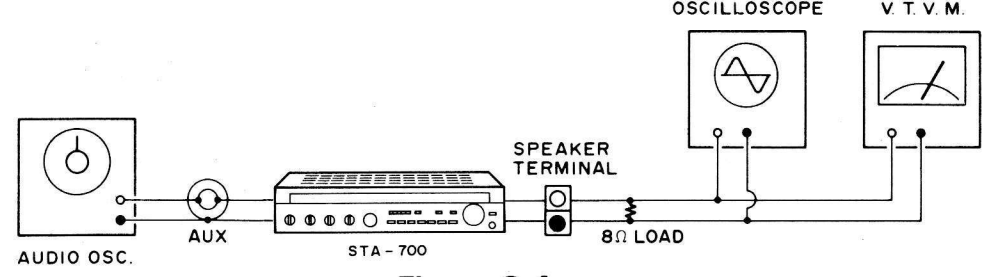


Figure 8-4

Check Equalization Response in "SYSTEM EQ" position at 100 Hz input.

Must be $+6.5 \pm 2$ dB.

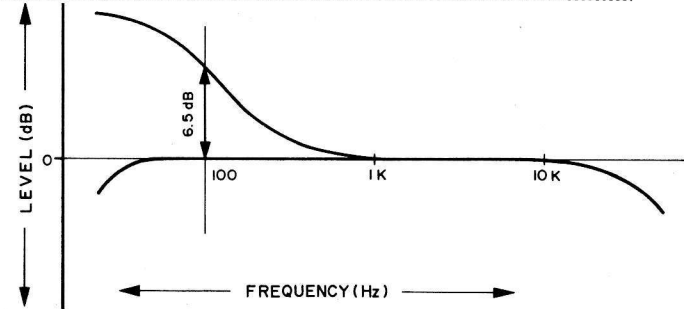


Figure 8-5

- (1) Check the SYSTEM EQ circuit.
- (2) See TROUBLESHOOTING on page 35.

Equalization Response at 100 Hz does not boost over $+6.5 \pm 2$ dB.

Equalization Response at 100 Hz boosts over $+6.5 \pm 2$ dB.

Proceed to next section.

(2) PRE-AMP OPERATION CHECK

- Connect Audio Osc. to PHONO Input.
- Connect Oscilloscope and V.T.V.M. to TAPE OUT Jack. (See Figure 8-6)
- Set SELECTOR Switch to PHONO.

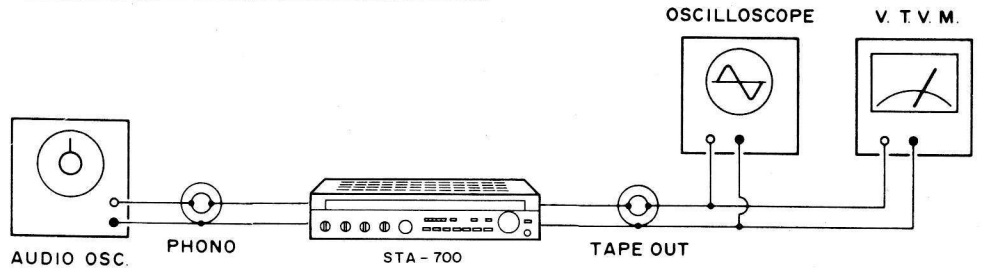
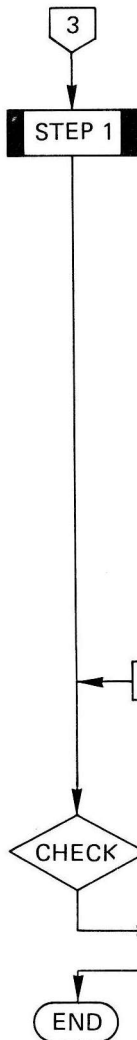


Figure 8-6



Check for proper PHONO Equalization Curve response.

****RIAA Curve****
 (100 Hz — +12.9dB)
 (1 kHz — 0 dB)
 (10 kHz — -13.7dB)

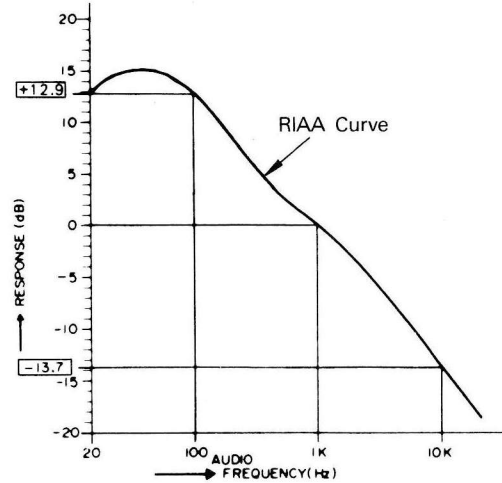


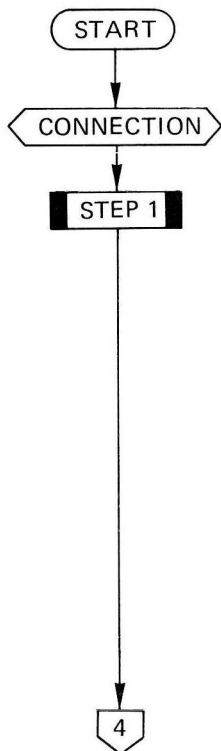
Figure 8-7

- (1) Check IC301.
- (2) Check C305, C307, R307, R309 (Lch) and C306, C308, R308, R310 (R ch).
- (3) Check Pre-Amp circuit.

Equalization Response at 100 Hz does not effect within $+12.9 \pm 2$ dB and at 10 kHz does not effect within -13.7 ± 2 dB.

Equalization Response effects within $+12.9 \pm 2$ dB at 100 Hz and -13.7 ± 2 dB at 10kHz.

Proceed to next section.



(3) TONE CONTROL OPERATION CHECK

Same Equipment Connection as Figure 8-4.

Check BASS Action at 100 Hz.

****TONE CONTROL Curve****

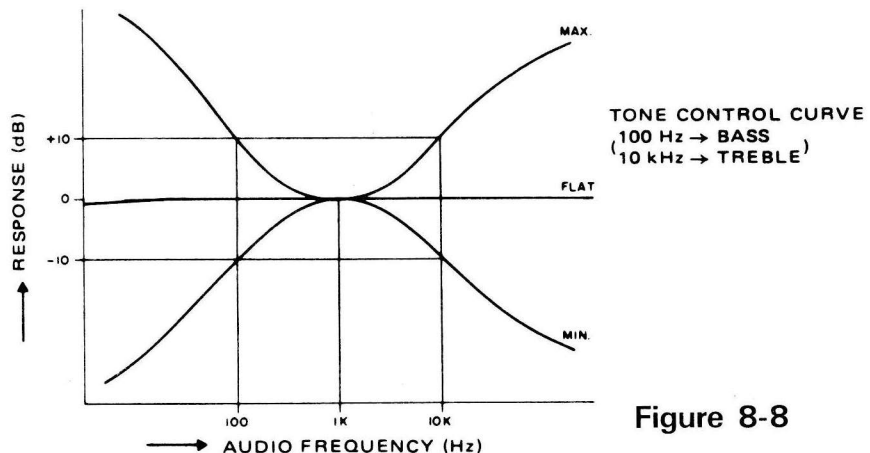
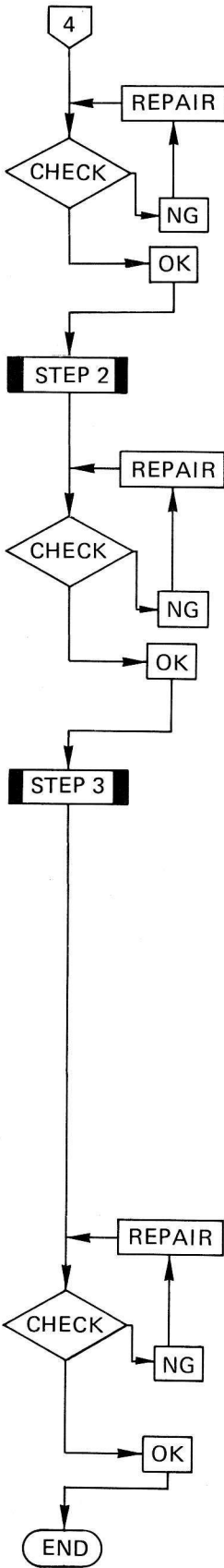


Figure 8-8



- (1) Check Bass Control circuit on TONE CONTROL P.C.B.
- (2) See TROUBLESHOOTING on page 35.

Frequency Response does not effect within $\pm 10 \pm 2.5$ dB.
 Frequency Response effects within $\pm 10 \pm 2.5$ dB.

Check TREBLE Action at 10 kHz.

TONE CONTROL Curve

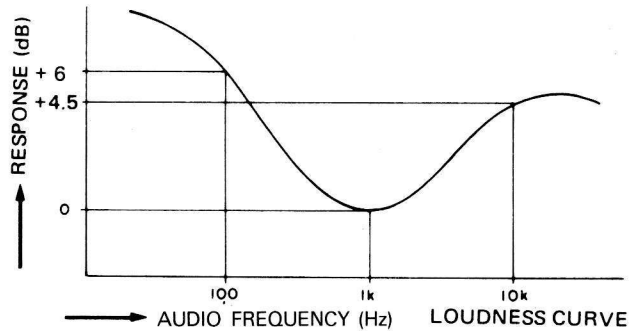
- (1) Check Treble Control circuit on TONE CONTROL P.C.B.
- (2) See TROUBLESHOOTING on page 35.

Frequency Response does not effect within $\pm 10 \pm 2.5$ dB.
 Frequency Response effects within $\pm 10 \pm 2.5$ dB.

Check LOUDNESS compensation with Volume set for 48 mV RMS output level (-30 dB from rated power.)

LOUDNESS Curve

Figure 8-9



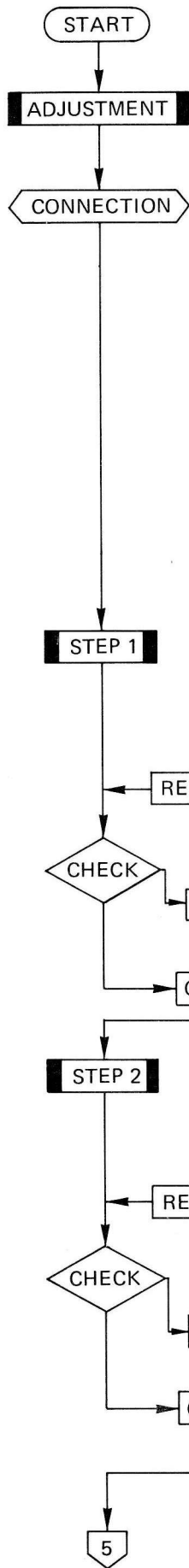
- (1) Check Loudness circuit.
- (2) See TROUBLESHOOTING on page 35.

Loudness compensation does not effect within $+6 \pm 2.5$ dB at 100 Hz and $+4.5 \pm 2.5$ dB at 10 kHz.

Loudness compensation effects within $+6 \pm 2.5$ dB at 100 Hz and $+4.5 \pm 2.5$ dB at 10 kHz.

Proceed to next section.

3) AM RF/IF OPERATION CHECK



Adjust AM IF/RF Alignment if required. (See AM Alignment Section on page 27.)

- Connect Standard Loop Antenna to AM SG and radiate signal into the AM Ferrite Antenna L201.
- Connect Oscilloscope, Distortion Meter and V.T.V.M. to TAPE OUT jack on set.
- Set SELECTOR Switch to AM.

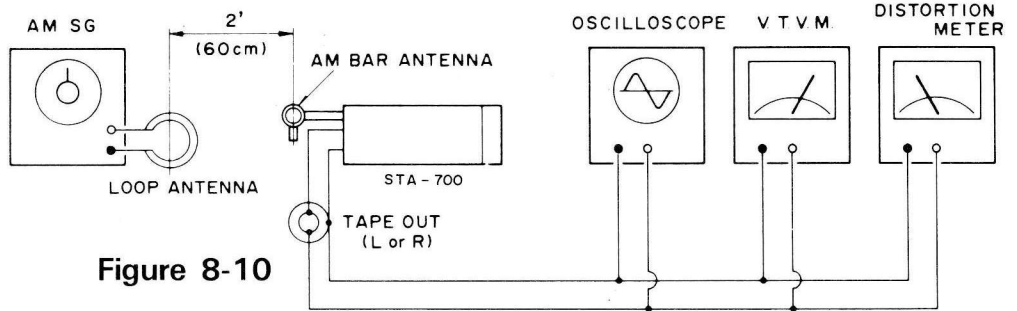


Figure 8-10

Check AM coverage

The lowest dial pointer setting should be under 520kHz and highest position should be over 1620 kHz.

(1) Readjust AM coverage. (See AM IF & RM Alignment on page 27.)

Coverage is less than 520 kHz—1620 kHz.

Coverage is at least 520 kHz—1620 kHz.

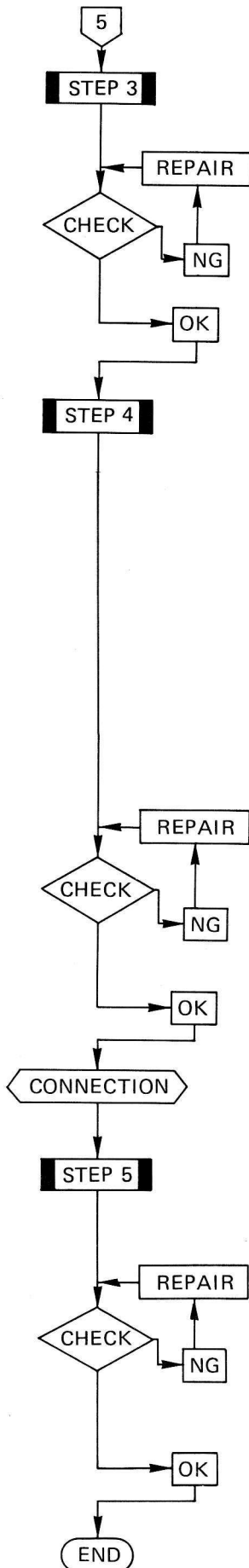
Check the Antenna Sensitivity for S/N 20 dB point at 600/1000/1400 kHz.

**Must be lower than 500 $\mu\text{V}/\text{m}$ **

(1) Readjust AM tracking (See AM IF & RF Alignment on page 27.)

AM Sensitivity is higher than 500 $\mu\text{V}/\text{m}$.

AM Sensitivity is lower than 500 $\mu\text{V}/\text{m}$. (Nominal Sensitivity is 200 $\mu\text{V}/\text{m}$.)



Check AM Distortion (Input level set to 5 mV/m.)
 Must be less than 3.0%

- (1) Readjust AM IF/RF Alignment on page 27.
- (2) Check IC204.

Distortion is higher than 3.0%.
 Distortion is lower than 3.0%.

Check the AM SIGNAL Strength LEDs.
 No signal=LEDs does not light at all
 40 mV/m Input=All LEDs light up
 (See Figure 8-11)

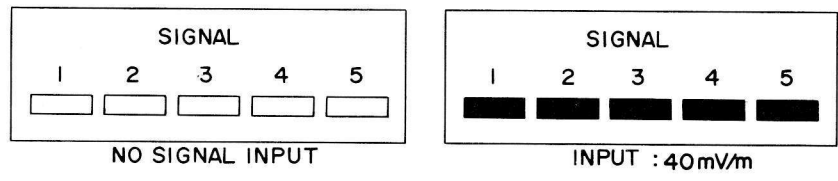


Figure 8-11

- (1) Verify LEDs function on FM; return to AM.
- (2) Adjust VR206 and check the value of R258, for all LED lit at 40 mV/m input.
- (3) Check IC204.
- (4) See TROUBLESHOOTING on page 35.

SIGNAL Strength LEDs do not indicate correctly.
 SIGNAL Strength LEDs indicate correctly.

Same equipment connection as Figure 8-10 and set Input level to 5 mV/m.

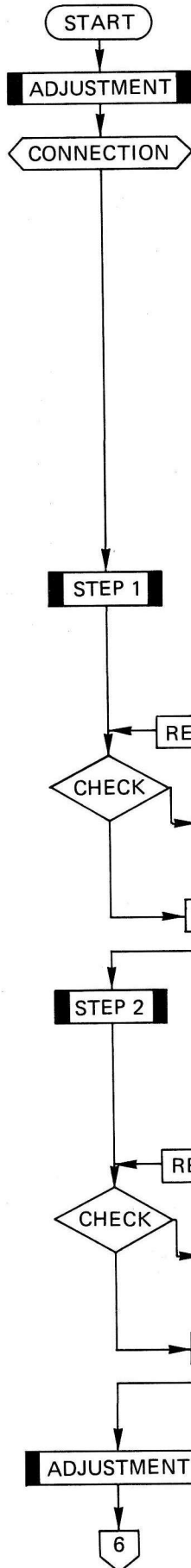
Check AM TAPE OUT Level.

- (1) Check the value of R253 and R254.

TAPE OUT Level does not effect within 200 mV±2.5 dB.
 TAPE OUT Level effects within 200 mV±2.5 dB.

Proceed to next section.

4) FM RF, IF OPERATION CHECK



Adjust FM Alignment, if required. (See FM Alignment Section on page 28.)

- Connect FM SG (1000 Hz, 75 kHz dev.) to FM 300 Ω Antenna Terminal.
- Connect Oscilloscope, Distortion meter and V.T.V.M. to TAPE OUT Jack. (See Figure 8-12.)
- Set SELECTOR Switch to FM.

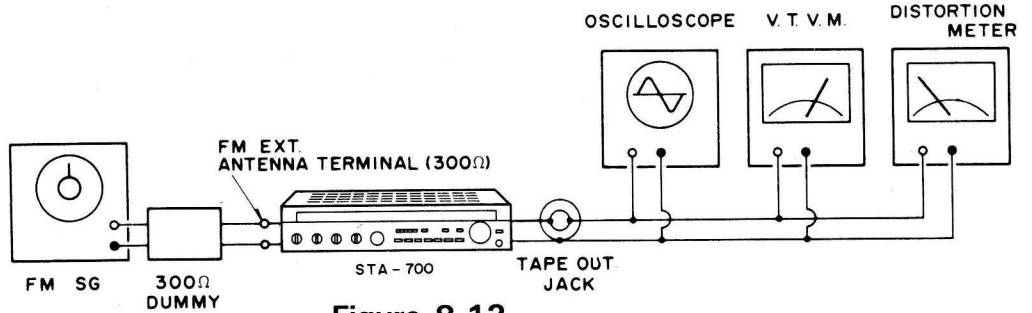


Figure 8-12

Check FM coverage:

Lowest pointer position should be under 88 MHz and highest end should be over 108 MHz

(*European models must not be able to tune below 87.5 MHz.)

- (1) Readjust FM coverage. (See FM IF/RM Alignment on page 28.)
- (2) Check FM RF circuit.

Coverage is less than 88 MHz—108 MHz.

Coverage is at least 88 MHz—108 MHz.

Check IHF Sensitivity at 90, 98 and 106 MHz.

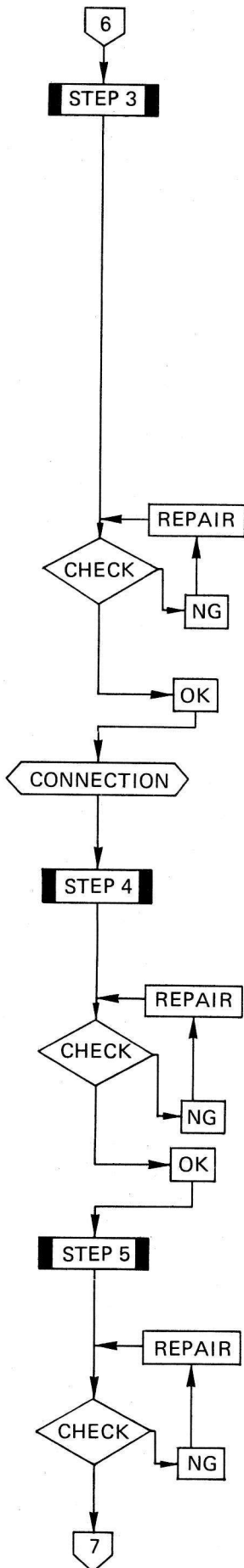
Should be lower than 5 μV

- (1) Readjust FM tracking. (See FM IF/RF Alignment on page 28.)
- (2) Check the FM RF and IF circuits.

FM IHF Sensitivity is higher than 5 μV.

FM IHF Sensitivity is lower than 5 μV. (Nominal Sensitivity is 2.8 μV.)

- Same equipment connection as Figure 8-12.
- Set Dial Pointer to 98 MHz (Minimum Distortion point).



Check the FM SIGNAL Strength LEDs.

No signal=LEDs does not light at all.
 500 μ V/m Input=all LEDs light up.

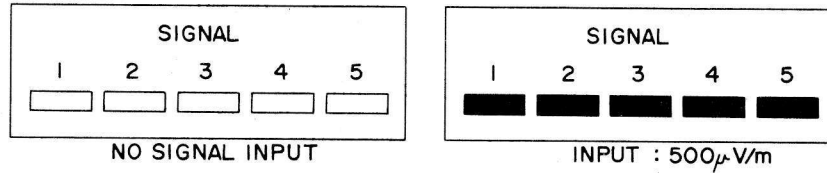


Figure 8-13

- (1) Verify LEDs function on AM; return to FM.
- (2) Readjust VR202, for all LED lit at 500 μ V/m input.
- (3) Check IC201.

SIGNAL Strength LEDs do not indicate correctly.

SIGNAL Strength LEDs indicate correctly.

- Same equipment connection as Figure 8-12.
- Set FM SG to 98 MHz, 1 mV input.
- MODE Switch to STEREO.

Check FM TAPE OUT Level.

Must be 550 mV \pm 2.5 dB

- (1) Adjust value of R232 (L ch) and/or R233 (R ch).

TAPE OUT Level is not 550 mV \pm 2.5 dB.

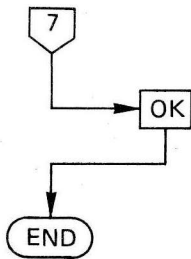
TAPE OUT Level is 550 mV \pm 2.5 dB.

Check T.H. Distortion for Mono. signal.

Must be lower than 0.5%

- (1) Readjust FM RF/IF Alignment on page 28.

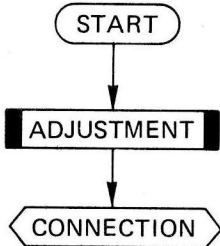
T.H. Distortion is higher than 0.5%.



T.H. Distortion is lower than 0.5 %.

Proceed to next section.

5) FM MPX OPERATION CHECK



Adjust for FM STEREO Alignment on page 30.

- Same equipment connection as Figure 8-12.
- Connect FM Stereo SG to FM SG. (Figure 8-14)
- Stereo Modulation
- MAIN & SUB—90 % (67.5 kHz dev.)
- Pilot—8 % (6 kHz dev.)
- Frequency 98 MHz, 1 kHz mod.
- Input 1 mV.

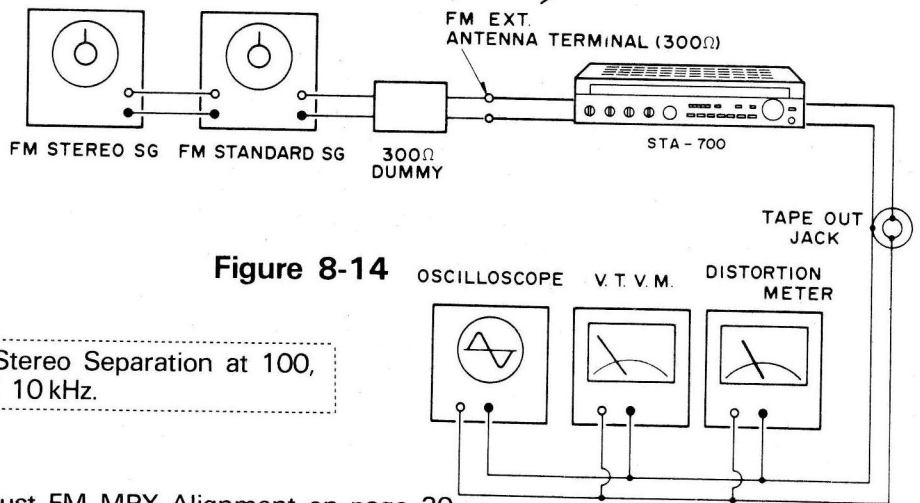


Figure 8-14

Check Stereo Separation at 100, 1 k and 10 kHz.

- (1) Readjust FM MPX Alignment on page 30.
- (2) Check the FM MPX circuits.

Stereo Separation is worse than 26 dB at 100Hz, 30 dB at 1 kHz and 22 dB at 10 kHz.

Stereo Separation is better than 26 dB at 100Hz, 30 dB at 1 kHz and 22 dB at 10 kHz.

Check the Stereo Indicator Sensitivity.

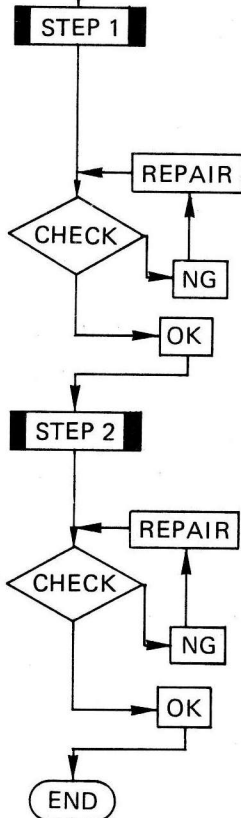
(input: near 10 μ V)

- (1) Adjust value of VR201.
- (2) Check FM MPX circuits.

Stereo Beacon Sens. is worse than 20 μ V.

Stereo Beacon Sens. is better than 20 μ V. (Nominal sensitivity: 10 μ V)

Proceed to Alignment section.



9. ALIGNMENT INSTRUCTIONS

FM COIL & TRIMMER LOCATION (TUNER, AUDIO P.C.B.)

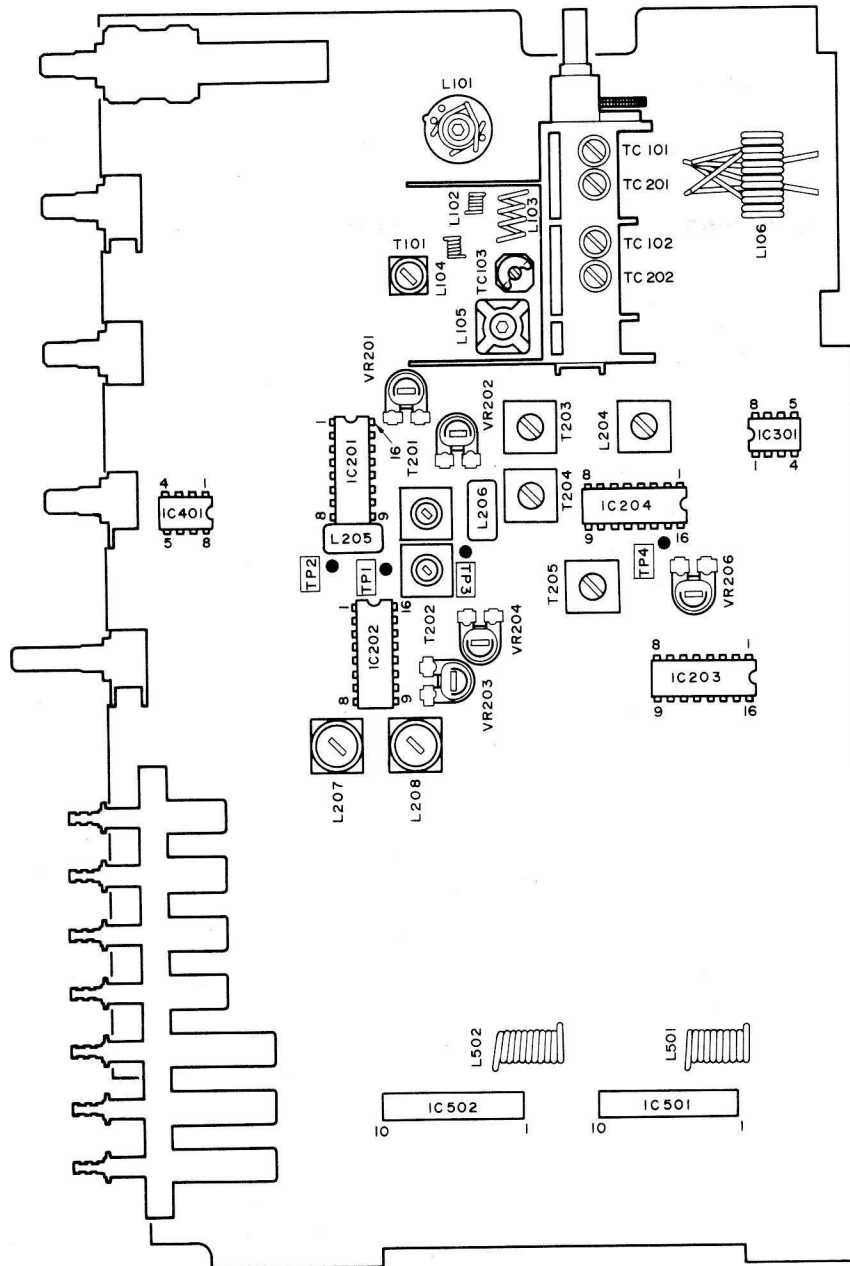


Figure 9-1

1) AM IF & RF ALIGNMENT

<EQUIPMENT REQUIRED>

1. AM Standard Signal Generator
2. Standard Loop Antenna
3. Oscilloscope
4. AC Voltmeter
5. Distortion Meter

- Notes:
- Signal Generator output should be no higher than necessary to obtain an output reading.
 - Maintain voltage at 120 volts AC, 60 Hz (U.S.A., Canada) (Use 220/240 volts AC, 50 Hz for European and 240V volts AC, 50 Hz for Australian models.)

- Set SELECTOR Switch to AM.
- Set BASS, TREBLE, BALANCE to Center, and VOLUME to Min.

<SET-UP>

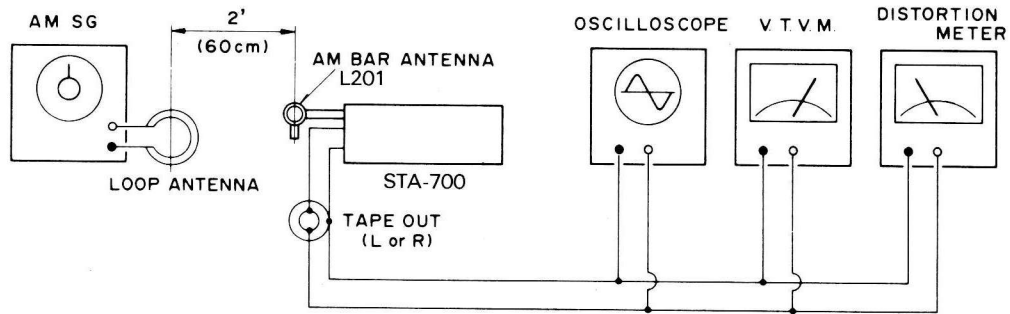


Figure 9-2

- Connect Standard Loop Antenna to Signal Standard Generator and radiate signal into the AM Antenna.
- Connect Oscilloscope, AC Voltmeter and Distortion Meter to TAPE OUT Jack.

<ADJUSTMENT CHECK>

STEP	SIGNAL GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUSTMENT	REMARKS
1	455 kHz (400 Hz, 30% mod.)	Point of non-interference (near 600 kHz)	• AC Voltmeter • Oscilloscope • Distortion Meter	T203, 204, 205 (AM IFT)	Adjust for maximum reading on meter.
2	510 kHz (400 Hz, 30% mod.)	Tuning Gang fully closed.	• AC Voltmeter • Oscilloscope • Distortion Meter	L204 (AM OSC Coil)	Adjust for maximum reading on meter.
3	1650 kHz (400 Hz, 30% mod.)	Tuning Gang fully opened.	• AC Voltmeter • Oscilloscope • Distortion Meter	T202 (AM OSC Trimmer)	Adjust for maximum reading on meter.
4	600 kHz (400 Hz, 30% mod.)	600 kHz	• AC Voltmeter • Oscilloscope • Distortion Meter	L201 (AM ANT. Coil)	Adjust for maximum reading on meter.
5	1400 kHz (400 Hz, 30% mod.)	1400 kHz	• AC Voltmeter • Oscilloscope • Distortion Meter	T201 (AM ANT. Trimmer)	Adjust for maximum reading on meter.
6	Repeat STEPs 4 and 5 until no further change is noticed.				
7	1 kHz Input: 0.3-0.8 mV	1 kHz	SIGNAL STRENGTH LED	VR206	Adjust so that first LED on Receiver lights
8	1 kHz Input: 0.5-1.8 mV	1 kHz	SIGNAL STRENGTH LED	VR206	Adjust so that up to third LED on Receiver lights
9	1 kHz Input: 10-40 mV	1 kHz	SIGNAL STRENGTH LED	VR206	Adjust so that all LED on Receiver light

2) FM RF & IF ALIGNMENT

<EQUIPMENT REQUIRED>

1. Standard Signal Generator
2. FM Dummy Antenna
3. Oscilloscope
4. AC Voltmeter
5. Distortion Meter
6. Center Tuning Meter
(1.2 k Ω , 200 μ A)

Notes: • Signal Generator output should be no higher than necessary to obtain an output reading.

- Maintain Line voltage at 120 volts AC, 60 Hz (U.S.A., Canada). (Use 220/240 volts AC, 50 Hz for European, 240 volts AC, 50 Hz for Australian models.)

- Set SELECTOR Switch to FM.
- Set MODE Switch to Stereo.

<SET-UP>

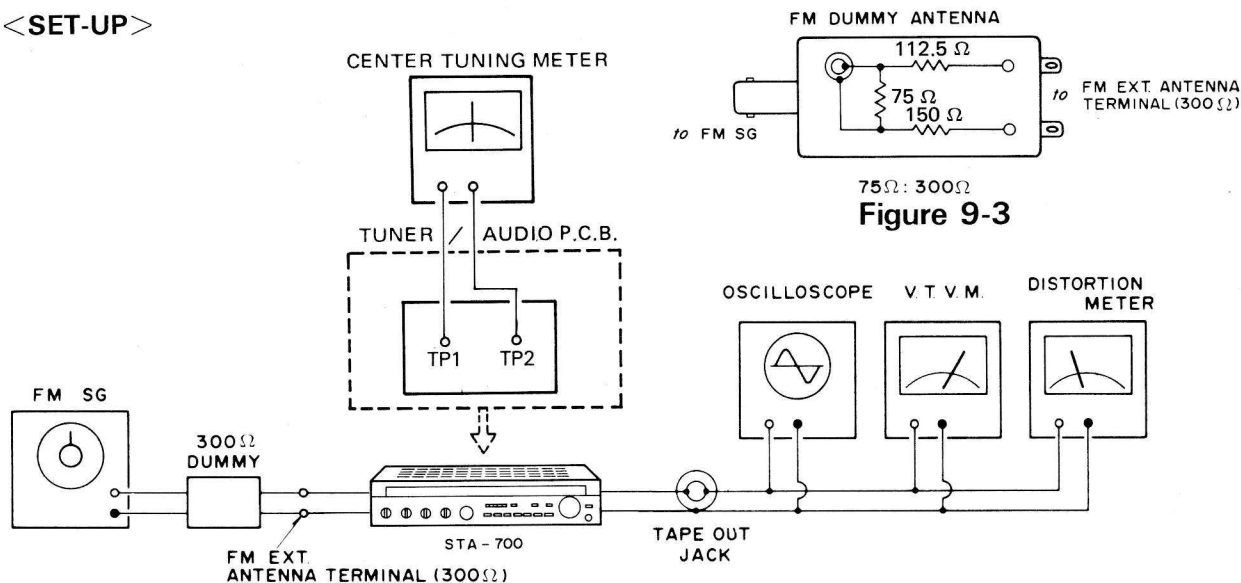


Figure 9-4

- Connect Standard Signal Generator to FM Antenna Terminal (300 Ω) through FM Dummy Antenna (300 Ω).
- Connect Oscilloscope, AC Voltmeter and Distortion Meter to TAPE OUT Jack.
- Connect Center Tuning Meter (1.2 k Ω , 200 μ A) to TP1 and TP2 on TUNER/AUDIO P.C.B.

<ADJUSTMENT CHECK>

STEP	GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUSTMENT	REMARKS
1	98 MHz (1000 Hz, 75 kHz dev.) Input: 3—4 μ V	98 MHz	<ul style="list-style-type: none"> • AC Voltmeter • Oscilloscope • Distortion Meter 	T101 (FM IF)	Adjust for maximum reading on meter.
2	98 MHz Input: no input	98 MHz	<ul style="list-style-type: none"> • Center Tuning Meter 	T201 (Primary)	Adjust for Center point on Center Tuning Meter.
3	98 MHz (1000 Hz, 75 kHz dev.) Input: 1 mV	98 MHz	<ul style="list-style-type: none"> • AC Voltmeter • Oscilloscope • Distortion Meter 	T202 (Secondary)	Adjust for Minimum Distortion (about 0.1 %).
4	Repeat STEPs 1, 2 and 3 until no further improvement is noticed.				

STEP	GENERATOR FREQUENCY	DIAL SETTING	INDICATOR	ADJUSTMENT	REMARKS
5	86.5 MHz* (1000 Hz, 75 kHz dev.) Input: 1 mV	86.5 MHz*	• AC Voltmeter (• Oscilloscope • Distortion Meter)	L105 (FM OSC. Coil)	Adjust for maximum reading on meter.
6	108.5 MHz (1000 Hz, 75 kHz dev.)	108.5 MHz	• AC Voltmeter (• Oscilloscope • Distortion Meter)	TC103 (FM OSC. Trimmer)	Adjust for maximum reading on meter.
7	Repeat STEPs 5 and 6 until no further improvement is noticed.				
8	90 MHz (1000 Hz, 75 kHz dev.) Input: 2-3 μ V	90 MHz	• AC Voltmeter (• Oscilloscope • Distortion Meter)	L101 (FM Antenna Coil) L103 (FM RF Coil—stretch or squeeze)	Adjust for maximum reading on meter.
9	106 MHz (1000 Hz, 75 kHz dev.) Input: 2-3 μ V	106 MHz	• AC Voltmeter (• Oscilloscope • Distortion Meter)	TC101 (FM Antenna Trimmer) TC102 (FM RF Trimmer)	Adjust for maximum reading on meter.
10	Repeat STEPs 8 and 9 until no further improvement is noticed.				
11	98 MHz (1000 Hz, 75 kHz dev.) Input: 7.9-12.6 μ V	98 MHz	• AC Voltmeter (• Oscilloscope • Distortion Meter)	VR201 (Mute Threshold Adj.)	Adjust VR201 to TUNED LED lights until.
12	98 MHz (1000 Hz, 75 kHz dev.) Input: 3-18 μ V	98 MHz	SIGNAL STRENGTH LED	VR202	Adjust so that first LED on Receiver lights.
13	98 MHz (1000 Hz, 75 kHz dev.) Input: 22-89 μ V	98 MHz	SIGNAL STRENGTH LED	VR202	Adjust so that up to third LED on Receiver light.
14	98 MHz (1000 Hz, 75 kHz dev.) Input: 90-500 μ V	98 MHz	SIGNAL STRENGTH LED	VR202	Adjust so that up to third LED on Receiver light.

*European models must not be able to tune below 87.5 MHz.

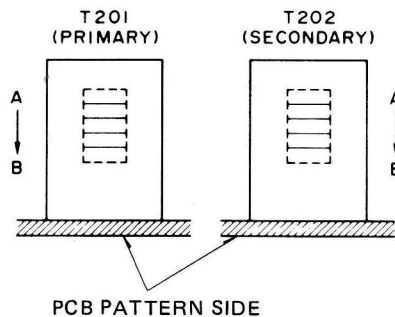


Figure 9-5

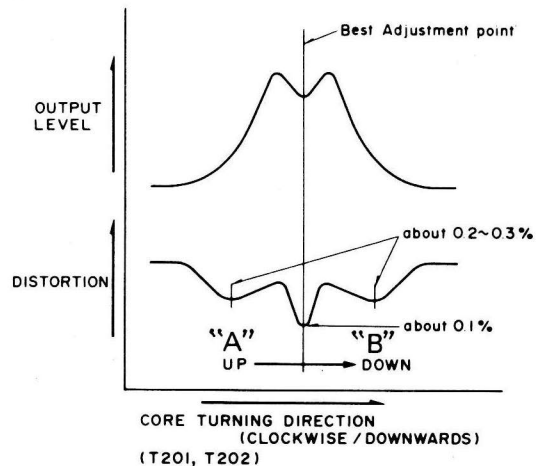


Figure 9-6

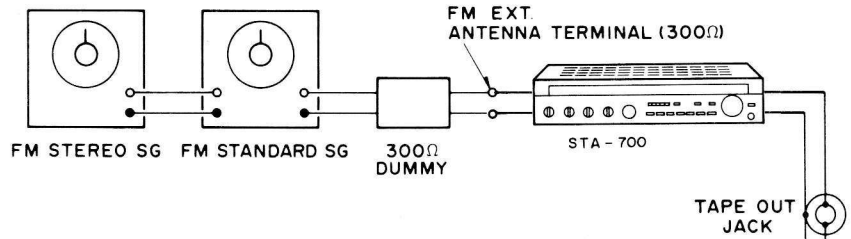
3) FM STEREO (MULTIPLEX & SEPARATION) ALIGNMENT

<EQUIPMENT REQUIRED>

1. Stereo Modulator...
Modulation Level of 19 kHz
Pilot Signal...9 %
2. FM Signal Generator...
Output Level 1 mV
Frequency—Approximately
98 MHz
Deviation—75 kHz, 100 %
deviation
3. Audio Generator of composite
signal
4. AC Voltmeter
5. Oscilloscope
6. Distortion Meter
7. Frequency Counter

- Notes:
- Signal Generator output should be no higher than necessary to obtain an output reading.
 - Maintain voltage at 120 volts AC, 60 Hz (U.S.A., Canada). (Use 220/240 volts AC, 50 Hz for European, and 240V volts AC, 50 Hz for Australian models.)

• Set SELECTOR Switch to FM STEREO.



<SET-UP>

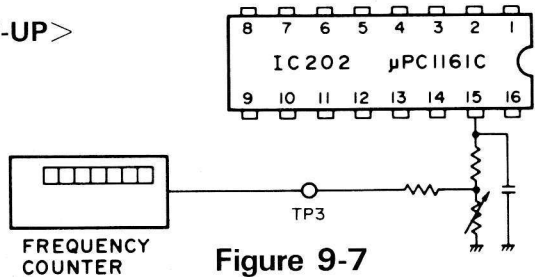


Figure 9-7

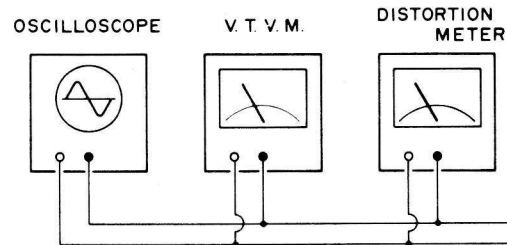


Figure 9-8

- Connect Standard Modulator to EXT. Mod. terminal of FM Signal Generator.
- Connect to FM Antenna terminal through FM Dummy Antenna (300 Ω). (See Figure 9-3 Dummy Antenna)
- Connect Oscilloscope, AC Voltmeter and Distortion Meter to TAPE OUT Jack.
- Connect Counter to GOURND and TP3 of IC202 (Pin No. 15).

<ADJUSTMENT CHECK>

STEP	STEREO MODULATION	INDICATOR	ADJUSTMENT	REMARKS
1	Mono. 1 kHz (1 kHz, No. Mod.) Input: 1 mV	• Counter	VR204 (76 kHz adj.)	Adjust for 76 kHz ± 50 Hz on Counter.
2	Composite MPX Signal 1 kHz on Left channel ONLY	• AC Voltmeter (TAPE OUT Jack of Right channel)	VR203 (Separation)	Adjust for minimum reading on meter.
3	Composite MPX Signal 1 kHz on Right channel ONLY	• AC Voltmeter (TAPE OUT Jack of Left channel)	VR203 (Separation)	Adjust for minimum reading on meter.
4	Repeat STEPs 2 and 3 until AC Voltmeter reading is at least -30 dB re same channel output. (i.e. 30 dB separation) Nominal: 4C dB			
5	Composite MPX Signal 1 kHz	• AC Voltmeter	—	With 10 μV antenna input signal, Stereo indicator LED (D707) should come on.
6	Composite MPX Signal 1 kHz	• Distortion Meter	—	With 1 mV antenna input signal, Stereo Distortion should be less than 2.0 %

10. CIRCUIT DESCRIPTIONS

— MAIN AMP IC μ PC1188H —

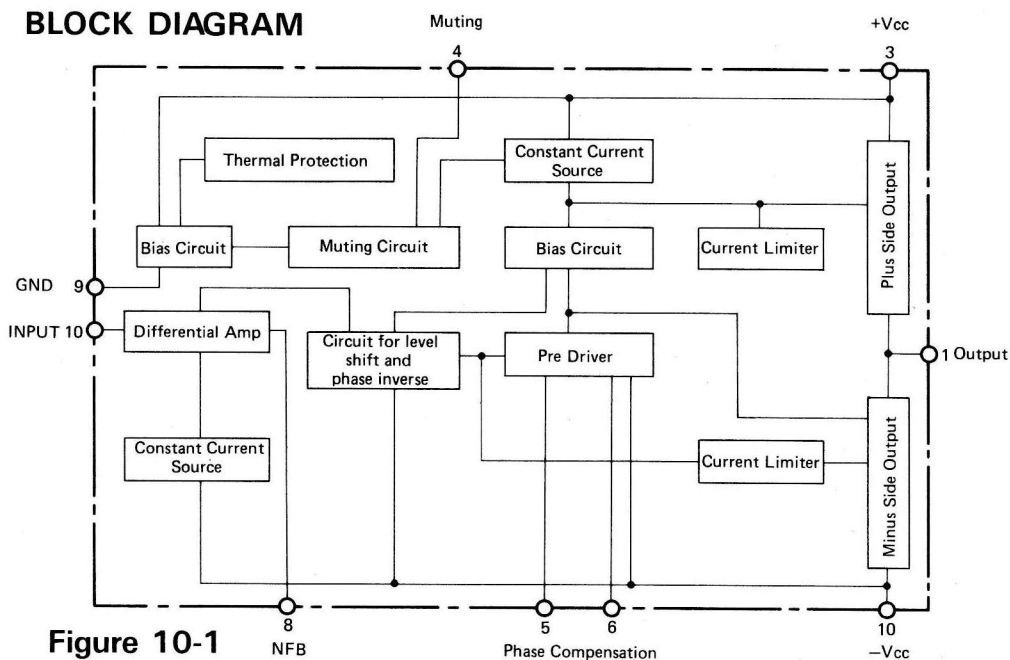


Figure 10-1

1) Current Limiter

If speaker terminals are shorted, the output line is grounded and excessively high current flows through the Output stage in the IC. This high current is sensed by the Current Limiter circuit in the IC and decreases the output current (because of output current limiting). If this should occur, turn off Receiver. When problem is corrected, turn the Receiver on again.

2) Thermal shut-down circuit

If the Power IC temperature reaches approximately 150 degrees C (302 degrees F), the output power and current drain are automatically reduced to protect the devices.

3) Muting circuit

- Signal is provided to the Speaker Output Terminal from Pin No. 1 of IC501 (L), IC502 (R) after a few seconds the Power Switch is turned ON.
- With Power Switch ON, Transistor TR501 will turn ON for a moment with Transient Current through C522, R533, R531 and R532.
- After this Transient Current, TR501 turns OFF and IC501 (L), IC502 (R) will activate.

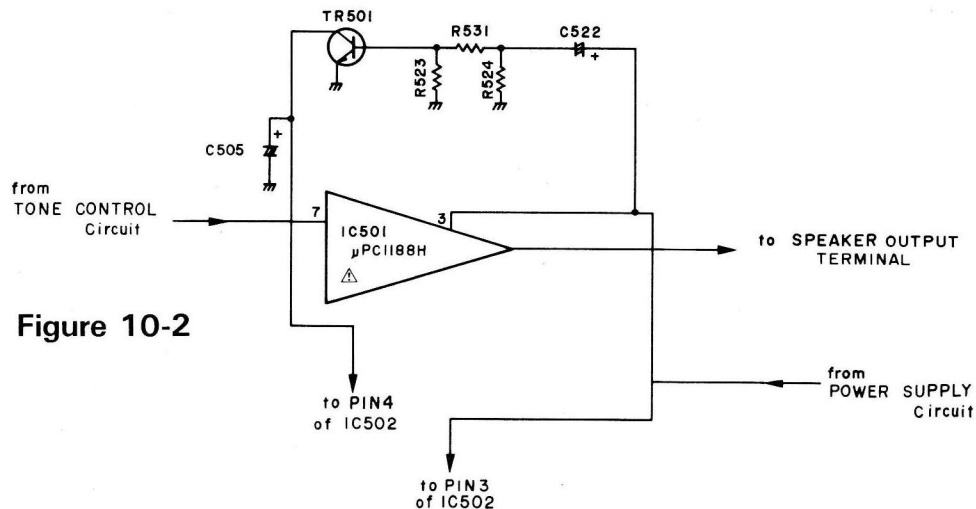


Figure 10-2

— FM AUTO-MAGIC TUNING CIRCUIT —

The FM AUTO-Magic circuit simplifies fine-tuning for FM stations, widening the bandwidth of the built-in AFC circuitry.

The AFC (Automatic Frequency Control) circuit consists of an oscillator circuit and a controlled DC voltage from the discriminator circuit.

A varicap diode is included in the resonant circuit of the Front-End oscillator and controlled by the direct voltage derived from the audio frequency output of the FM discriminator, and this voltage automatically controls the frequency.

In AUTO MAGIC OFF position, the 5.7 V DC voltage at Pin 10 in IC201 is provided to the AFC circuit of Front-End via R218 and MAGIC TUNE Switch. (See Figure 10-3).

The voltage at Pin 10 is held constant due to a built-in regulator circuit in IC201, a constant voltage is provided to the AFC circuitry and the IF bandwidth is fixed (10.7 MHz \pm 300 kHz). (See Figure 10-3 and Figure 10-4).

In AUTO MAGIC ON position, the 5.7 V \pm 0.5 V DC voltage of Pin 7 is provided to the AFC circuitry via R211.

Since the voltage at Pin 7 varies from 5.2 to 6.2 V, the 10.7 MHz IF bandwidth will vary \pm 1.2 MHz as shown in Figure 10-4.

As a result, AUTO-Magic automatically fine-tunes the station and locks it in for drift-free listening.

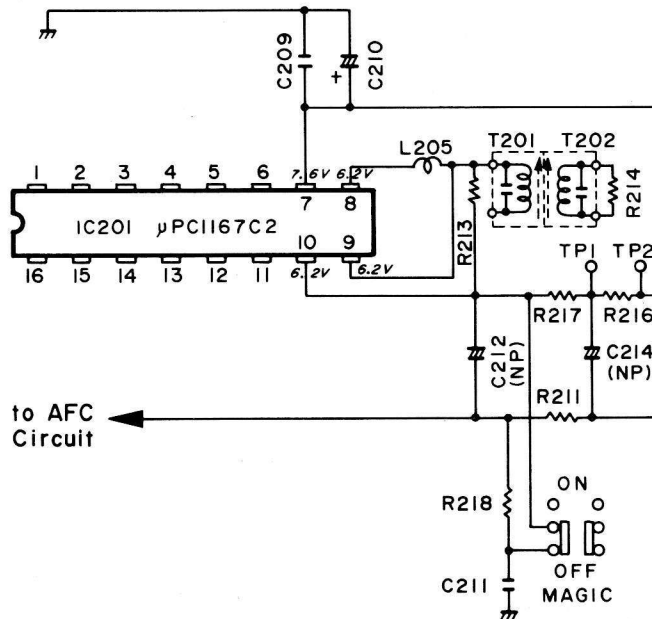


Figure 10-3

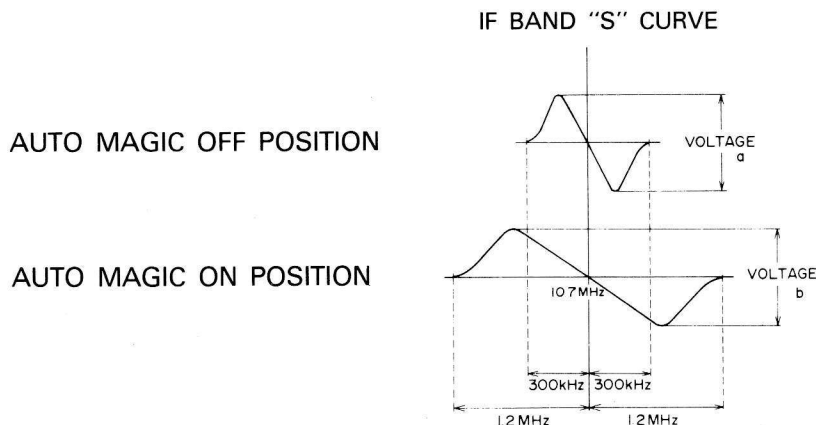


Figure 10-4

NOTE Voltage at "a" is equal to "b"

11. TROUBLESHOOTING

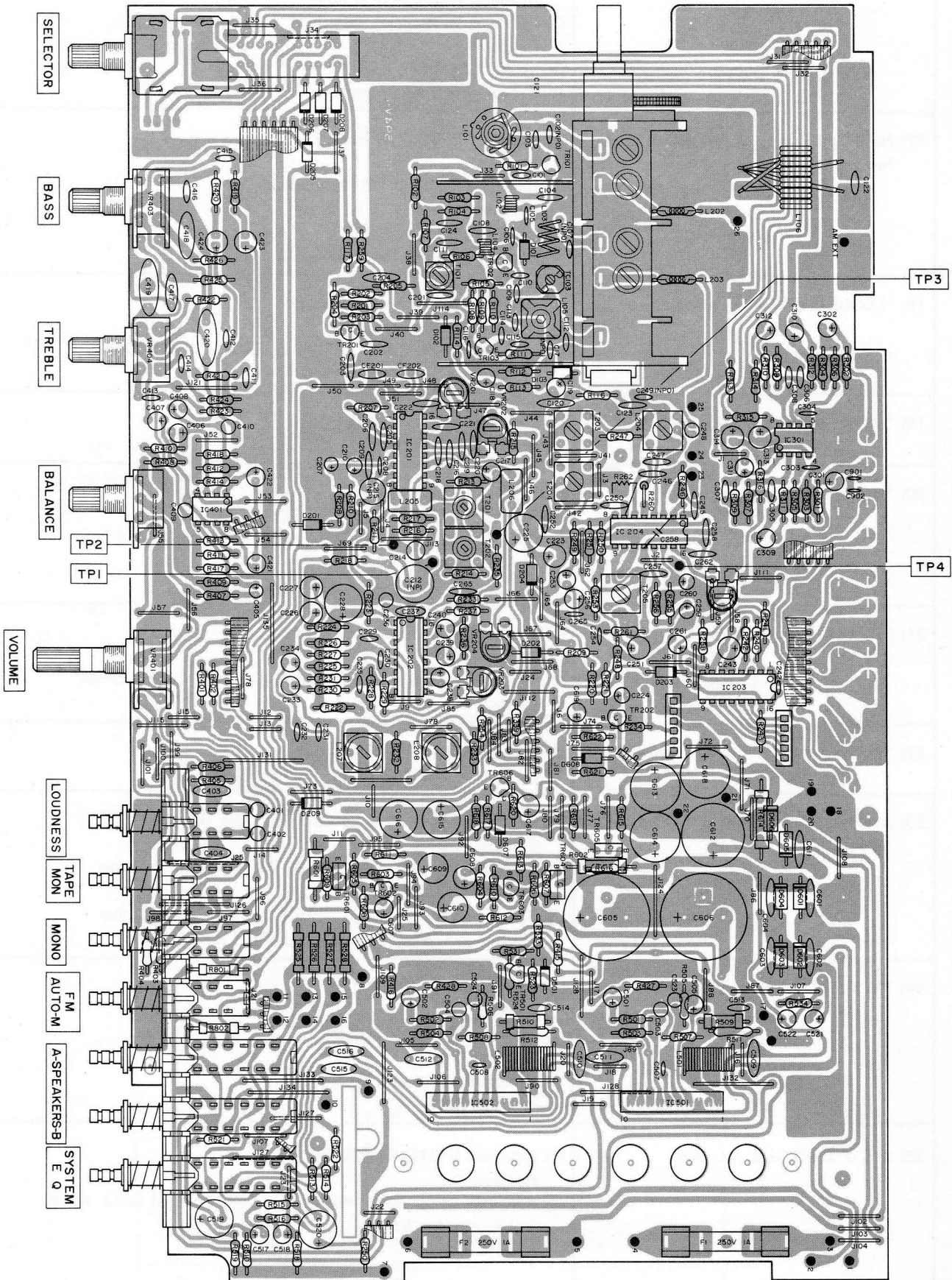
SYMPTOM	CAUSE AND REMEDY
1) No output	(1) Faulty AC power cord Replace. (2) Defective POWER switch Replace. (3) Broken wire in the Power Transformer Replace. (4) Blown primary Fuse Replace. (5) Defective D601-D604 or diodes, transistor(s) in Power Supply circuit on TUNER/AUDIO P.C.B. Replace the defective part(s).
2) Blows Fuse	(1) Defective Rectifier D601-D604 Replace. (2) Short-circuit in the rectifier circuit. Remove the short. (3) Short-circuit in Power IC 501 or 502. Repair circuit and/or replace the defective IC(s).
3) "A" or "B" Speakers do not work.	(1) Speaker Selector Switch is poor contact or defective Repair or replace. (2) Poor contact in Speaker Output Terminals Replace or repair.
4) No output from one channel with VOLUME at maximum and BALANCE at center, when a test signal is applied to the terminal of non-operating channel of the BALANCE control VR402.	(1) Defective IC401, IC501, IC502. Replace the defective IC(s). (2) Defective resistor or capacitor of TONE and MAIN AMP circuit Replace the defective part(s).
5) No output when a test signal is applied to the input terminals, except PHONO input.	(1) Defective TAPE MONitor Switch Repair or replace. (2) Defective SELECTOR Switch Replace.
6) No output when a test signal is applied to the PHONO input terminals.	(1) Defective resistor or capacitor of PHONO EQ AMP circuit Replace the part(s). (2) Defective TAPE MONitor Switch. Repair or replace. (3) Defective SELECTOR Switch Replace. (4) Defective IC301 Replace.
7) DC not balanced within ± 70 mV at output or L/R channel	(1) Defective IC501(L) or IC502(R). Replace the IC(s).
8) Speakers work normally but Headphones do not work.	(1) Defective R801 (Left) or R802 (Right) Change defective resistor(s). (2) Headphone plug does not mate with jack. Replace the plug.

SYMPTOM	CAUSE AND REMEDY
9) All the inputs work normally except "AUX" input.	(1) Poor contact in "AUX" input jack Repair or replace. (2) Poor contact in SELECTOR Switch Repair or replace the switch.
10) "PHONO" input inoperative	(1) Poor contact in "PHONO" input jack Repair or replace. (2) Faulty SELECTOR Switch Repair or replace.
11) "TAPE OUT" inoperative	(1) Poor contact in "TAPE OUT" output jack Repair or replace. (2) Defective TAPE Monitor Switch Replace.
12) "TAPE IN" inoperative	(1) Poor contact in "TAPE IN" input jack Repair or replace the jack. (2) Defective TAPE Monitor Switch Replace.
13) No AM or FM (Tuner B ⁺ voltage is not 12-14V.)	(1) Open secondary winding in the Power Transformer Replace the Transformer. (2) Defective Diode D605. Replace. (3) Faulty capacitor C612 or C613. Replace the defective capacitor(s). (4) Faulty resistor R614. Replace. (5) Defective transistor TR605, TR606 Replace the transistor(s). (6) Short-circuit in Tuner B ⁺ circuit Repair the short. (7) Poor contact in SELECTOR Switch Repair or replace.
14) No FM	(1) Poor contact in SELECTOR Switch Repair or replace. (2) IC, transistor, diode, resistor, capacitor, inductor or IFT of FM IF circuit defective. Replace the defective part(s). (3) FM Front End defective Replace the defective part(s). (4) Faulty FM Antenna lead-in/circuitry Repair or replace the Antenna lead-in/circuitry.
15) No AM	(1) Poor contact in SELECTOR Switch Repair or replace. (2) IC, transistor, diode, resistor, capacitor or IFT of AM IF circuit defective. Replace the defective part(s). (3) Bar-Antenna Coil defective Repair or replace.

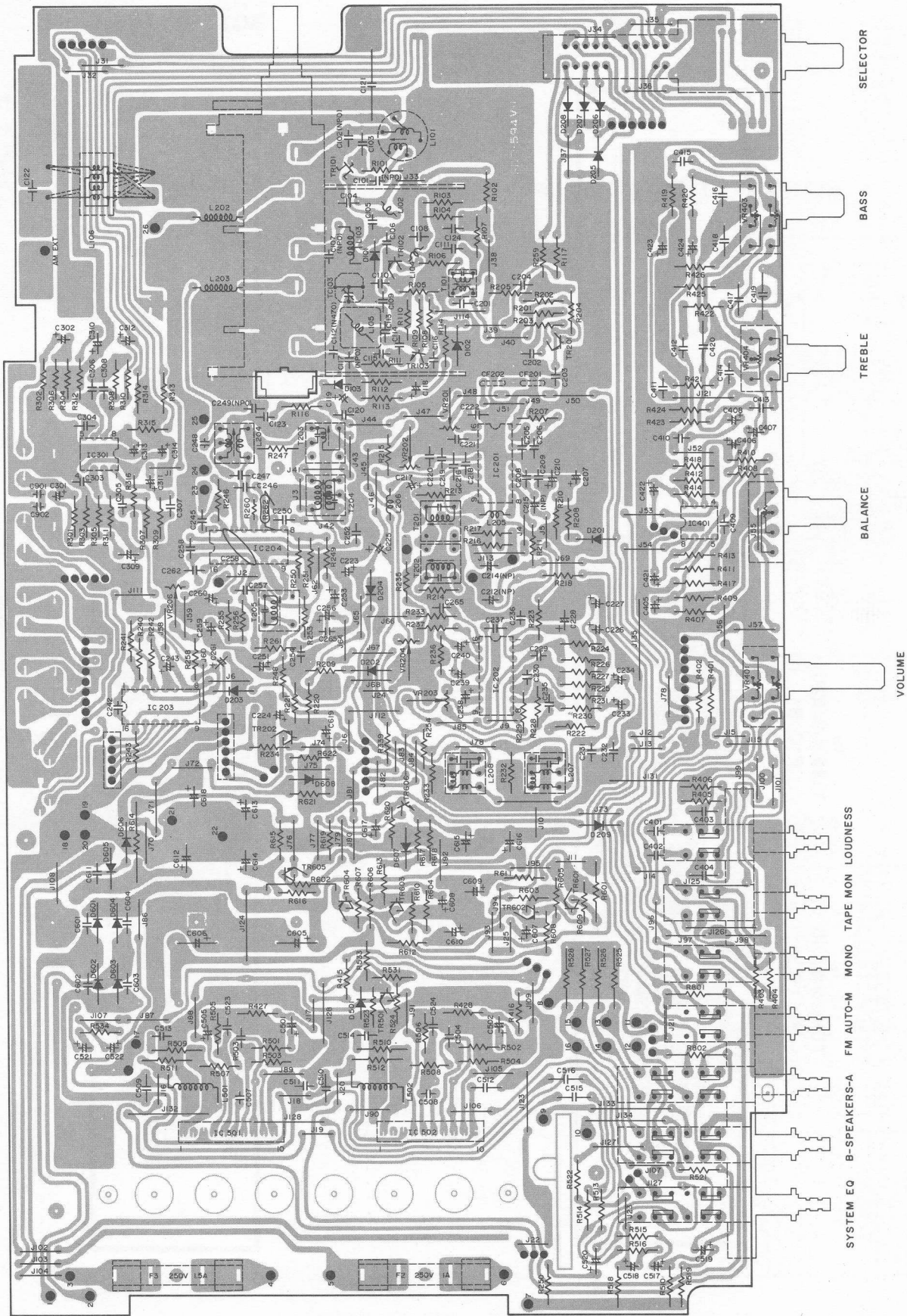
SYMPTOM	CAUSE AND REMEDY
16) No FM MPX Separation	(1) Improper adjustment Readjust VR203 and VR204. (2) IC202 of MPX circuit defective Replace. (3) VR203, VR204 defective Replace the Trimer Resistor(s).
17) No STEREO light or FM Stereo does not work.	(1) Broken STEREO Indicator LED. D707 Replace. (2) Defective IC202 of FM MPX circuit Replace the defective IC. (3) VR203, 204 defective Replace the defective Trimmer Resistors.
18) "LOUDNESS" has no effect.	(1) Defective "LOUDNESS" Switch Replace. (2) Defective C401, C403, R405(L) or C402, C404, R406(R) Replace the defective part(s).
19) "Stereo-MONO" not effective	(1) Defective Stereo-MONO Switch Repair or replace.
20) "BASS" has no effect.	(1) VR403 (100 K ohm control) defective Replace it. (2) Defective R419, R420, R425, R426 or C415-C420 of Tone Control circuit Replace the defective part(s).
21) "TREBLE" has no effect.	(1) Faulty VR404 (100 K ohm control) Replace it. (2) Defective C411-C414 or R412-424 of Tone Control circuit Replace the defective part(s).
22) "TAPE MONitor" does not operate.	(1) Defective TAPE Monitor Switch Replace or repair.
23) AM/FM SIGNAL Strength LEDs not Functioning.	(1) Defective AM/FM Signal Strength LEDs D701-D705 Replace. (2) For FM reception, IC201, D202, D203, VR202 defective Replace the defective part(s). (3) For AM reception, IC204, VR206, R258 C261 defective Replace the defective part(s).
24) FM TUNED LED not functioning	(1) Defective LED D708 Replace. (2) Defective transistor TR202 Replace. (3) Improper adjustment Readjust T201, T202.
25) SYSTEM EQ does not work	(1) Defective SYSTEM EQ Switch. Replace. (2) Defective R513, R515, R517, C515, C517(L) and R514, R516, R518, C516, C518(R) Replace.

12. TUNER AUDIO P.C.B. (TOP & BOTTOM VIEWS)

TOP VIEW

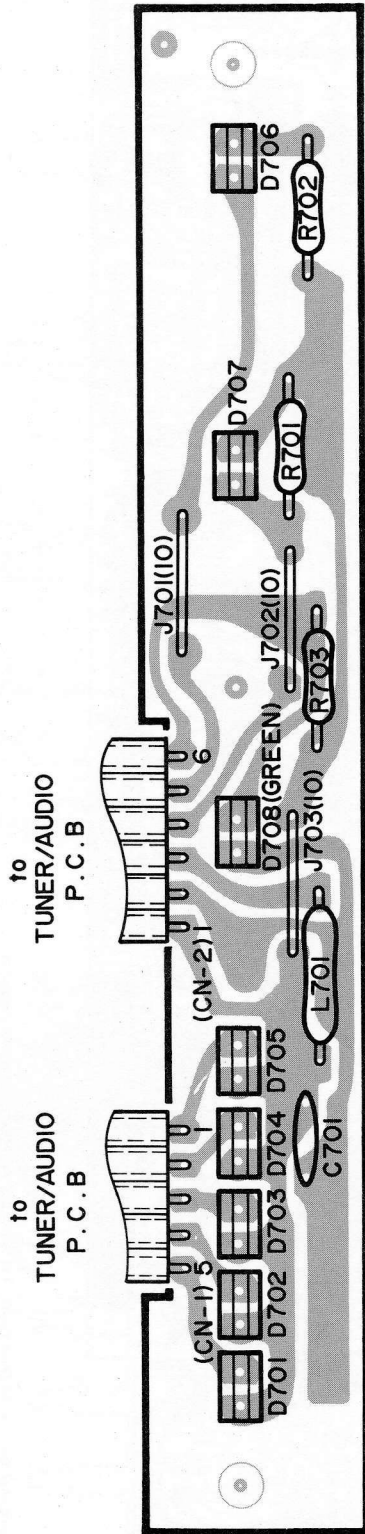


BOTTOM VIEW

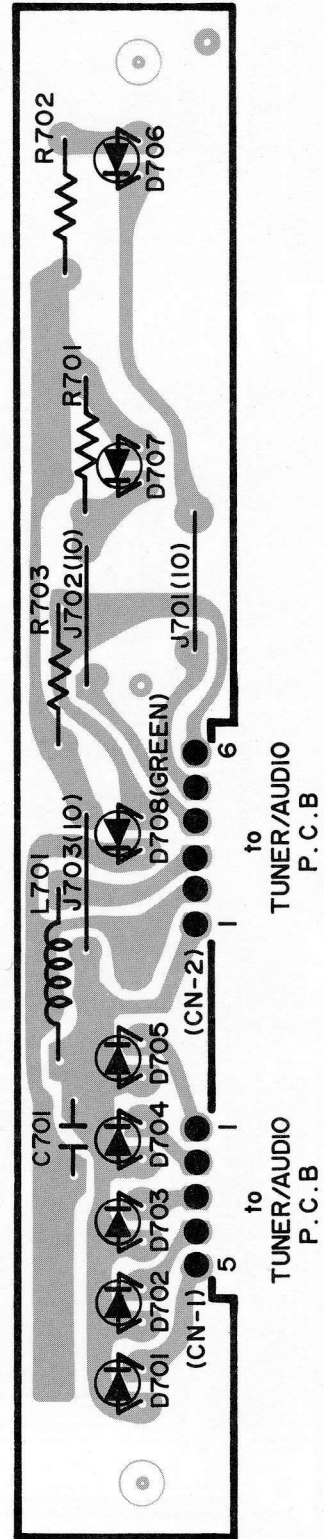


13. LED INDICATOR P.C.B. (TOP & BOTTOM VIEWS)

TOP VIEW

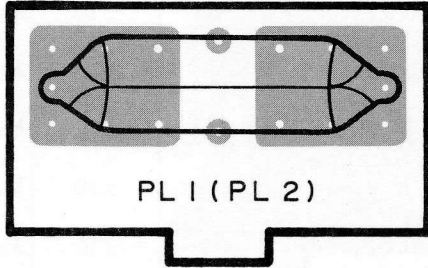


BOTTOM VIEW

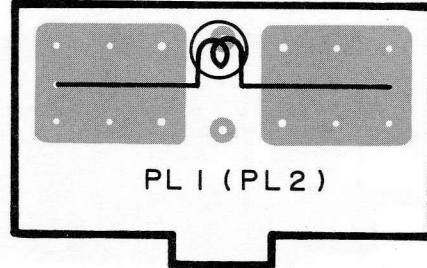


14. LAMP P.C.B. (TOP & BOTTOM VIEWS)

TOP VIEW

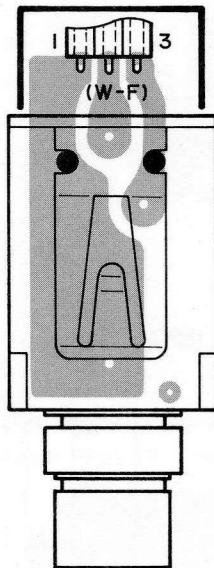


BOTTOM VIEW

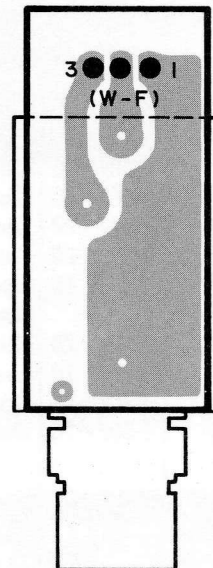


15. HEADPHONE JACK P.C.B. (TOP & BOTTOM VIEWS)

TOP VIEW



BOTTOM VIEW



16. ELECTRICAL PARTS LIST

CAPACITORS					Ref. No.	Value (F)	Voltage (V)	Tolerance (%)	Material
Ref. No.	Value (F)	Voltage (V)	Tolerance (%)	Material					
C101	1 p (NPO)	50	±0.25 pF	Ceramic	C226	10 μ	25	+50/-10	Electrolytic
C102	18 p (NPO)	50	±5	Ceramic	C227	10 μ	25	+50/-10	Electrolytic
C103	30 p	50	±5	Ceramic	C228	470 μ	16	+50/-10	Electrolytic
C104	0.01 μ	50	+80/-20	Ceramic	C229	100 p	50	±5	Polystyrene
C105	30 p	50	±5	Ceramic	C230	0.0022 μ	50	±10	Mylar
C106	10 p	50	±0.5 pF	Ceramic		(U.S.A., Canada)			
C107	18 p (NPO)	50	±5	Ceramic	C230	0.0015 μ	50	±10	Mylar
C108	150 p	50	±5	Ceramic		(Europe, Australia)			
C109	1 p (NPO)	50	±0.25 pF	Ceramic	C231	0.0022 μ	50	±10	Mylar
C110	0.022 μ	50	+80/-20	Ceramic		(U.S.A., Canada)			
C111	0.01 μ	50	+80/-20	Ceramic	C231	0.0022 μ	50	±10	Mylar
C112	12 p (N470)	50	±5	Ceramic		(Europe, Australia)			
	(U.S.A., Canada)				C232	0.0022 μ	50	±10	Mylar
C112	15 p (N470)	50	±5	Ceramic		(U.S.A., Canada)			
	(Europe, Australia)				C232	0.0022 μ	50	±10	Mylar
						(Europe, Australia)			
C113	10 p (NPO)	50	±0.5 pF	Ceramic	C233	2.2 μ	50	+75/-10	Electrolytic
C114	15 p (NPO)	50	±5	Ceramic	C234	2.2 μ	50	+75/-10	Electrolytic
C115	18 p (NPO)	50	±5	Ceramic	C235	0.0022 μ	50	±10	Mylar
C116	0.0047 μ	50	±10	Ceramic		(U.S.A., Canada)			
C117	12 p (NPO)	50	±5	Ceramic	C235	0.0015 μ	50	±10	Mylar
C118	1 μ	50	+75/-10	Electrolytic		(Europe, Australia)			
C119	0.47 μ	50	+75/-10	Electrolytic	C236	470 p	50	±5	Polystyrene
C120	0.047 μ	50	+80/-20	Ceramic	C237	0.047 μ	50	±10	Mylar
C121	0.01 μ	50	+80/-20	Ceramic	C238	0.22 μ	50	+75/-10	Electrolytic
C122	10 p	50	±0.5 pF	Ceramic		(Low Noise)			
C123	0.022 μ	50	+80/-20	Ceramic	C239	1.5 μ	50	+75/-10	Electrolytic
C124	0.01 μ	50	+80/-20	Ceramic		(Low Noise)			
					C240	3.3 μ	50	+75/-10	Electrolytic
						(Low Noise)			
C201	0.01 μ	50	+80/-20	Ceramic	C241	470 p	50	±5	Polystyrene
C202	0.022 μ	50	+80/-20	Ceramic	C242	0.0047 μ	50	±10	Ceramic
C203	0.01 μ	50	+80/-20	Ceramic	C243	10 μ	25	+50/-10	Electrolytic
C204	0.047 μ	50	+80/-20	Ceramic	C244	(Not Used)			
C205	0.022 μ	50	+80/-20	Ceramic	C245	0.022 μ	50	+80/-20	Ceramic
C206	0.022 μ	50	+80/-20	Ceramic	C246	0.022 μ	50	+80/-20	Ceramic
C207	1 μ	50	+75/-10	Electrolytic	C247	0.01 μ	50	+80/-20	Ceramic
C208	100 p	50	±5	Ceramic	C248	340 p	50	±2	Polystyrene
C209	0.022 μ	50	+80/-20	Ceramic	C249	15 p (NPO)	50	±5	Ceramic
C210	0.47 μ	50	+75/-10	Electrolytic	C250	0.022 μ	50	+80/-20	Ceramic
C211	0.022 μ	50	+80/-20	Ceramic	C251	47 μ	16	+50/-10	Electrolytic
C212	33 μ	16	+50/-10	Electrolytic	C252	0.022 μ	50	+80/-20	Ceramic
	(Non-Polar)				C253	2.2 μ	50	+75/-10	Electrolytic
C213	(Not Used)				C254	0.015 μ	50	±10	Mylar
C214	0.47 μ	50	+75/-10	Electrolytic	C255	0.022 μ	50	±10	Mylar
	(Non-Polar)				C256	0.47 μ	50	+75/-10	Electrolytic
C215	10 μ	16	+50/-10	Electrolytic	C257	0.022 μ	50	+80/-20	Ceramic
	(Non-Polar)				C258	0.01 μ	50	±10	Mylar
C216	0.022 μ	50	+80/-20	Ceramic	C259	10 μ	25	+50/-10	Electrolytic
C217	10 μ	25	+50/-10	Electrolytic	C260	1 μ	50	+75/-10	Electrolytic
C218	0.022 μ	50	+80/-20	Ceramic	C261	0.47 μ	50	+75/-10	Electrolytic
C219	0.022 μ	50	+80/-20	Ceramic	C262	0.022 μ	50	+80/-20	Ceramic
C220	0.022 μ	50	+80/-20	Ceramic	C263	(Not Used)			
C221	0.022 μ	50	+80/-20	Ceramic	C264	0.022 μ	50	+80/-20	Ceramic
C222	0.022 μ	50	+80/-20	Ceramic	C265	0.027 μ	50	±10	Mylar
C223	3.3 μ	50	+75/-10	Electrolytic					
C224	1 μ	50	+75/-10	Electrolytic	C301	0.47 μ	50	+75/-10	Electrolytic
C225	470 μ	16	+50/-10	Electrolytic		(Low Noise)			

Ref. No.	Value (F)	Voltage (V)	Tolerance (%)	Material
C302	0.47 μ (Low Noise)	50	+75/-10	Electrolytic
C303	100 p	50	± 5	Ceramic
C304	100 p	50	± 5	Ceramic
C305	0.0047 μ	50	± 5	Mylar
C306	0.0047 μ	50	± 5	Mylar
C307	0.018 μ	50	± 5	Mylar
C308	0.018 μ	50	± 5	Mylar
C309	33 μ	10	+50/-10	Electrolytic
C310	33 μ	10	+50/-10	Electrolytic
C311	0.47 μ (Low Noise)	50	+10/-10	Electrolytic
C312	0.47 μ (Low Noise)	50	+10/-10	Electrolytic
C313	47 μ	16	+50/-10	Electrolytic
C314	47 μ	16	+50/-10	Electrolytic
C401	270 p	50	± 5	Polystyrene
C402	270 p	50	± 5	Polystyrene
C403	0.082	50	± 10	Mylar
C404	0.082	50	± 10	Mylar
C405	1 μ	50	+75/-10	Electrolytic
C406	1 μ	50	+75/-10	Electrolytic
C407	0.47 μ	50	+75/-10	Electrolytic
C408	0.47 μ	50	+75/-10	Electrolytic
C409	150 p	50	± 5	Polystyrene
C410	150 p	50	± 5	Polystyrene
C411	0.0056 μ	50	± 10	Mylar
C412	0.0056 μ	50	± 10	Mylar
C413	0.022 μ	50	± 10	Mylar
C414	0.022 μ	50	± 10	Mylar
C415	0.027 μ	50	± 10	Mylar
C416	0.027 μ	50	± 10	Mylar
C417	0.1 μ	50	± 10	Mylar
C418	0.1 μ	50	± 10	Mylar
C419	0.27 μ	50	± 10	Mylar
C420	0.27 μ	50	± 10	Mylar
C421	2.2 μ (Low Noise)	50	+20/-20	Electrolytic
C422	2.2 μ (Low Noise)	50	+20/-20	Electrolytic
C423	10 μ	25	+50/-10	Electrolytic
C424	10 μ	25	+50/-10	Electrolytic
C501	2.2 μ	50	+75/-10	Electrolytic
C502	2.2 μ	50	+75/-10	Electrolytic
C503	560 p	50	± 5	Polystyrene
C504	560 p	50	± 5	Polystyrene
C505	33 μ	16	+50/-10	Electrolytic
C506	(Not Used)			
C507	33 p	50	± 5	Ceramic
C508	33 p	50	± 5	Ceramic
C509	0.1 μ	50	± 10	Mylar
C510	0.1 μ	50	± 10	Mylar
C511	0.1 μ	50	± 10	Mylar
C512	0.1 μ	50	± 10	Mylar
C513	0.01 μ	50	± 10	Mylar
C514	0.01 μ	50	± 10	Mylar

Ref. No.	Value (F)	Voltage (V)	Tolerance (%)	Material
C515	0.082 μ	50	± 10	Mylar
C516	0.082 μ	50	± 10	Mylar
C517	33 μ	16	+50/-10	Electrolytic
C518	33 μ	16	+50/-10	Electrolytic
C519	220 μ	16	+50/-10	Electrolytic
C520	220 μ	16	+50/-10	Electrolytic
C521	33 μ	25	+50/-10	Electrolytic
C522	47 μ	25	+50/-10	Electrolytic
C523	47 p	50	± 5	Ceramic
C524	47 p	50	± 5	Ceramic
C601	0.047 μ	50	+80/-20	Ceramic
C602	0.047 μ	50	+80/-20	Ceramic
C603	0.047 μ	50	+80/-20	Ceramic
C604	0.047 μ	50	+80/-20	Ceramic
C605	4700 μ	25	+50/-10	Electrolytic
C606	4700 μ	25	+50/-10	Electrolytic
C607	10 μ	25	+50/-10	Electrolytic
C608	10 μ	25	+50/-10	Electrolytic
C609	100 μ	25	+50/-10	Electrolytic
C610	100 μ	25	+50/-10	Electrolytic
C611	0.047 μ	50	+80/-20	Ceramic
C612	470 μ	35	+50/-10	Electrolytic
C613	220 μ	35	+50/-10	Electrolytic
C614	220 μ	35	+50/-10	Electrolytic
C615	100 μ	35	+50/-10	Electrolytic
C616	100 μ	16	+50/-10	Electrolytic
C617	10 μ	25	+50/-10	Electrolytic
C618	1000 μ	10	+50/-10	Electrolytic
C619	10 μ	25	+50/-10	Electrolytic
C701	0.022 μ	50	+80/-20	Ceramic
C901	0.0047 μ	50	± 10	Mylar
C902	0.0047 μ	50	± 10	Mylar

CERAMIC FILTERS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
CF201-202	FM Ceramic (SFE10.7 MA-8)	CA-7536	392300300A

COILS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
L101	FM Antenna	CA-5610	143301180A or 143301420A
L102	Trap	CA-5819	141100031A
L103	RF	CA-3371	141200330A
L104	Trap	CA-5819	141100031A
L105	VHF Osc.	CA-5028	131300860A or 121301140A
L106	Balun	CA-5107	145001070B or 145010020A or 145000121A
L201	AM Bar Antenna		111110030A
L202	Inductor (2.2 μ H)		142000340A

Ref. No.	Description	R/S Part No.	Mfr's Part No.
L203	Inductor (2.2 μ H)		142000340A
L204	MW Osc.	CA-5890	121110030A
L205	Inductor (22 μ H)	CA-7872 CA-5444	142000940A or 142010040A
L206	Inductor (2.2 μ H)	CA-5894	142000210A or 142000960A
L501-502	Air	CB-2415	141100310A
L701	Inductor (18 μ H)	CA-5613	142000710A

DIODES

Ref. No.	Description	R/S Part No.	Manufacturer
D101	ITT73N Silicon	DX-1774	ITT
D102	WZ110 or Zener	DX-1606	JRC
	RD11E-B Zener	DX-0862	NEC
D103	ITT410 Vari Cap	DX-0307	ITT
D201-202	ITT73N Silicon	DX-1774	ITT
D203	VD1121 Varistor		NEC
D204-209	ITT73N Silicon	DX-1774	ITT
D501	ITT73N Silicon		ITT
D601-606	SR1K-2 Silicon	DX-0475	UNIZON
D607	WZ-056 or Zener	DX-0547	JRC
	RD5.6E-B Zener	DX-0735	NEC
D608	ITT73N Silicon	DX-1774	ITT

FUSES

Ref. No.	Description	R/S Part No.	Mfr's Part No.
F1	Fuse 2.5 A/250 V (U.S.A., Canada)	HF-0021	251000080A
F1	Fuse 1.25 A/250 V (Europe, Australia)		251200900A
F2	Fuse 1 A/250 V	HF-1136	251000130A
F3	Fuse 1.5 A/250 V	HF-0004	251000070A

INTEGRATED CIRCUITS (IC's)

Ref. No.	Description	R/S Part No.	Manufacturer
IC201	μ PC1167C2	MX-5209	NEC
IC202	μ PC1161C3	MX-4812	NEC
IC203	LB1405	MX-3836	SANYO
IC204	μ PC1178C	MX-5198	NEC

Ref. No.	Description	R/S Part No.	Manufacturer
IC301	NJM4558DX or LA6458DX or TL4558PB	MX-4325 MX-4824	JRC SANYO TI
IC401	NJM4558DX or LA6458DX or TL4558PB	MX-4325 MX-4824	JRC SANYO TI
IC501-502	μ PC1188H	MX-5210	NEC

LAMPS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
PL1-PL2	Tubular 0.3A/8V	L-1428	24311010A

LIGHT EMITTING DIODES (LED's)

Ref. No.	Description	R/S Part No.	Manufacturer
D701-707	SLP (RED)	L-1185	SANYO
D708	SLP (GREEN)	L-1268	SANYO

LOW PASS FILTERS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
L207-208	Low Pass (19 kHz, 38 kHz)	C-1228	524010030A

RESISTORS

Ref. No.	Value (Ω)	Wattage (W)	Tolerance (%)	Material
R101	100 k	1/4	± 5	Carbon
R102	330	1/4	± 5	Carbon
R103	5.6 k	1/4	± 5	Carbon
R104	33 k	1/4	± 5	Carbon
R105	1.5 k	1/4	± 5	Carbon
R106	100	1/4	± 5	Carbon
R107	330	1/4	± 5	Carbon
R108	150	1/4	± 5	Carbon
R109	22 k	1/4	± 5	Carbon
R110	10 k	1/4	± 5	Carbon
R111	3.3 k	1/4	± 5	Carbon
R112	220 k	1/4	± 5	Carbon
R113	240 k	1/4	± 5	Carbon
R114	10 k	1/4	± 5	Carbon
R115	(Not Used)			
R116	270 k	1/4	± 5	Carbon
R117	390 k	1/4	± 5	Carbon
R201	470	1/4	± 5	Carbon

Ref. No.	Value (Ω)	Wattage (W)	Tolerance (%)	Material	Ref. No.	Value (Ω)	Wattage (W)	Tolerance (%)	Material
R202	3.9 k	1/4	± 5	Carbon	R256	10 k	1/4	± 5	Carbon
R203	180	1/4	± 5	Carbon	R257	(Not Used)			
R204	330	1/4	± 5	Carbon	R258	18 k	1/4	± 5	Carbon
R205	100	1/4	± 5	Carbon	R259	47	1/4	± 5	Carbon
R206	(Not Used)				R260	4.7 k	1/4	± 5	Carbon
R207	330	1/4	± 5	Carbon	R261	2.2 k	1/4	± 5	Carbon
R208	68 k	1/4	± 5	Carbon	R262	220 k	1/4	± 5	Carbon
R209	33 k	1/4	± 5	Carbon	R301	100 k	1/4	± 5	Carbon
R210	68 k	1/4	± 5	Carbon	R302	100 k	1/4	± 5	Carbon
R211	180 k	1/4	± 5	Carbon	R303	120 k	1/4	± 5	Carbon
R212	(Not Used)				R304	120 k	1/4	± 5	Carbon
R213	5.6 k	1/4	± 5	Carbon	R305	2.2 k	1/4	± 5	Carbon
R214	1.5 k	1/4	± 5	Carbon	R306	2.2 k	1/4	± 5	Carbon
R215	47 k	1/4	± 5	Carbon	R307	15 k	1/4	± 5	Carbon
R216	6.8 k	1/4	± 5	Carbon	R308	15 k	1/4	± 5	Carbon
R217	330	1/4	± 5	Carbon	R309	220 k	1/4	± 5	Carbon
R218	2.2 k	1/4	± 5	Carbon	R310	220 k	1/4	± 5	Carbon
R219	(Not Used)				R311	270	1/4	± 5	Carbon
R220	27 k	1/4	± 5	Carbon	R312	270	1/4	± 5	Carbon
R221	100 k	1/4	± 5	Carbon	R313	100 k	1/4	± 5	Carbon
R222	100	1/4	± 5	Carbon	R314	100 k	1/4	± 5	Carbon
R223	43 k	1/4	± 5	Carbon	R315	100	1/4	± 5	Carbon
R224	10 k	1/4	± 5	Carbon	R316	100	1/4	± 5	Carbon
R225	10 k	1/4	± 5	Carbon	R401	4.7 k	1/4	± 5	Carbon
R226	22 k	1/4	± 5	Carbon	R402	4.7 k	1/4	± 5	Carbon
R227	22 k	1/4	± 5	Carbon	R403	4.7 k	1/4	± 5	Carbon
R228	39 k	1/4	± 5	Carbon	R404	4.7 k	1/4	± 5	Carbon
R229	39 k	1/4	± 5	Carbon	R405	10 k	1/4	± 5	Carbon
R230	3.3 k	1/4	± 5	Carbon	R406	10 k	1/4	± 5	Carbon
R231	3.3 k	1/4	± 5	Carbon	R407	1 k	1/4	± 5	Carbon
R232	3.3 k	1/4	± 5	Carbon	R408	1 k	1/4	± 5	Carbon
R233	3.3 k	1/4	± 5	Carbon	R409	220 k	1/4	± 5	Carbon
R234	1.8 k	1/4	± 5	Carbon	R410	220 k	1/4	± 5	Carbon
R235	100 k	1/4	± 5	Carbon	R411	1 M	1/4	± 5	Carbon
R236	1 k	1/4	± 5	Carbon	R412	1 M	1/4	± 5	Carbon
R237	15 k	1/4	± 5	Carbon	R413	470	1/4	± 5	Carbon
R238	12 k	1/4	± 5	Carbon	R414	470	1/4	± 5	Carbon
R239	22	1/4	± 5	Carbon	R415	3.3 k	1/4	± 5	Carbon
R240	68 k	1/4	± 5	Carbon	R416	3.3 k	1/4	± 5	Carbon
R241	13 k	1/4	± 5	Carbon	R417	100 k	1/4	± 5	Carbon
R242	1.8 k	1/4	± 5	Carbon	R418	100 k	1/4	± 5	Carbon
R243	18 k	1/4	± 5	Carbon	R419	12 k	1/4	± 5	Carbon
R244	(Not Used)				R420	12 k	1/4	± 5	Carbon
R245	(Not Used)				R421	330	1/4	± 5	Carbon
R246	1.5 k	1/4	± 5	Carbon	R422	330	1/4	± 5	Carbon
R247	47 k	1/4	± 5	Carbon	R423	560	1/4	± 5	Carbon
R248	100 k	1/4	± 5	Carbon	R424	560	1/4	± 5	Carbon
R249	18 k	1/4	± 5	Carbon	R425	3.6 k	1/4	± 5	Carbon
R250	56 k	1/4	± 5	Carbon	R426	3.6 k	1/4	± 5	Carbon
R251	33 k	1/4	± 5	Carbon	R427	6.8 k	1/4	± 5	Carbon
R252	(Not Used)				R428	6.8 k	1/4	± 5	Carbon
R253	3.3 k	1/4	± 5	Carbon	R429	180 k	1/4	± 5	Carbon
R254	3.3 k	1/4	± 5	Carbon					
R255	10 k	1/4	± 5	Carbon					

(Europe, Australia)

Ref. No.	Value (Ω)	Wattage (W)	Tolerance (%)	Material
R430	180 k (Europe, Australia)	1/4	± 5	Carbon
R501	2.2 k	1/4	± 5	Carbon
R502	2.2 k	1/4	± 5	Carbon
R503	56 k	1/4	± 5	Carbon
R504	56 k	1/4	± 5	Carbon
R505	100 k	1/4	± 5	Carbon
R506	100 k	1/4	± 5	Carbon
R507	33 k	1/4	± 5	Carbon
R508	33 k	1/4	± 5	Carbon
R509	10	1	± 5	Metal Oxide
R510	10	1	± 5	Metal Oxide
R511	10	1/2	± 5	Carbon
R512	10	1/2	± 5	Carbon
R513	6.8 k	1/4	± 5	Carbon
R514	6.8 k	1/4	± 5	Carbon
R515	220	1/4	± 5	Carbon
R516	220	1/4	± 5	Carbon
R517	4.7	1/4	± 5	Carbon
R518	4.7	1/4	± 5	Carbon
R519	1.5 k	1/4	± 5	Carbon
R520	1.5 k	1/4	± 5	Carbon
R521	15	1/4	± 5	Carbon
R522	15	1/4	± 5	Carbon
R523	33 k	1/4	± 5	Carbon
R524	100 k	1/4	± 5	Carbon
R525	0.22	1	± 5	Metal Oxide
R526	0.22	1	± 5	Metal Oxide
R527	0.22	1	± 5	Metal Oxide
R528	0.22	1	± 5	Metal Oxide
R529	(Not Used)			
R530	(Not Used)			
R531	4.7 k	1/4	± 5	Carbon
R532	(Not Used)			
R533	330 k	1/4	± 5	Carbon
R534	6.8 k	1/4	± 5	Carbon
R601	100	1	± 5	Metal Oxide
R602	100	1	± 5	Metal Oxide
R603	4.7 k	1/4	± 5	Carbon
R604	4.7 k	1/4	± 5	Carbon
R605	22 k	1/4	± 5	Carbon
R606	22 k	1/4	± 5	Carbon
R607	12 k	1/4	± 5	Carbon
R608	15 k	1/4	± 5	Carbon
R609	15 k	1/4	± 5	Carbon
R610	100 k	1/4	± 5	Carbon
R611	100	1/4	± 5	Carbon
R612	100	1/4	± 5	Carbon
R613	5.6 k	1/4	± 5	Carbon
R614	150	2	± 5	Metal Oxide
R615	4.7 k	1/4	± 5	Carbon
R616	1 k	1/4	± 5	Carbon

Ref. No.	Value (Ω)	Wattage (W)	Tolerance (%)	Material
R617	10	1/4	± 5	Carbon
R618	2.7 k	1/4	± 5	Carbon
R619	56 k	1/4	± 5	Carbon
R620	39 k	1/4	± 5	Carbon
R621	220 k	1/4	± 5	Carbon
R622	3.3 k	1/4	± 5	Carbon
R701	4.7 k	1/4	± 5	Carbon
R702	1.8 k	1/4	± 5	Carbon
R703	680 k	1/4	± 5	Carbon
R801	220	1	± 5	Metal Oxide
R802	220	1	± 5	Metal Oxide
R901	2.2 M (U.S.A., Canada)	1/2	± 5	Carbon

SWITCHES

Ref. No.	Description	R/S Part No.	Mfr's Part No.
	Rotary Slide Function Selector	S-1621	181210030A
	Push Push Power (U.S.A., Canada)	S-7577	182710010A 182110100A or 182105790A
	Push Power (Europe, Australia)		182105800A

TRANSFORMERS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
T101	IFT 7F-070 or 7F-060	CA-8206	133000700A 133000600A
*T201	IFT (TOKO) (MITSUMI)		133010020A or 133010010A
*T202	IFT (TOKO) (MITSUMI)		133010040A or 133010030A
T203	IFT	CA-8204	131000640A
T204	IFT	CA-8205	131000650A
T205	IFT Power (U.S.A., Canada) 120 V AC 60 Hz Power (Europe, Australia) 220/240 V AC 50 Hz	CA-8255	131010090A 10101049TA 10101050TA

*Reference No. with asterisk should be replaced in pair per each Manufacturer. See SPECIAL PAIRED PARTS on next page.

TRANSISTORS

Ref. No.	Description	R/S Part No.	Manufacturer
TR101	2SK41F		SANYO
TR102-103	2SC1674 (L) or 2SC1674 (K) or 2SC2786 (L)		NEC NEC NEC
TR201	2SC1674 (L) or 2SC1674 (K) or 2SC2786 (L)		NEC NEC NEC
TR202	2SC536 (G) or 2SC536 (H) or 2SC1840 (E) or 2SC1840 (F)		SANYO SANYO NEC NEC
TR501	2SC536 (G) or 2SC536 (H) or 2SC1840 (E) or 2SC1840 (F)		SANYO SANYO NEC NEC
TR601	2SD571 (L) or 2SD571 (K) or 2SD438 (F) or 2SC438 (G) or 2SC2235 (Y)		NEC NEC SANYO SANYO TOSHIBA
TR602	2SC1844 (E) or 2SC1175 (F) or 2SC1815 (GR)		NEC SANYO TOSHIBA
TR603	2SA991 (E) or 2SA659 (F) or 2SA1015 (GR)		NEC SANYO TOSHIBA
TR604	2SB605 (L) or 2SB605 (K) or 2SB560 (F) or 2SB560 (G) or 2SB965 (Y)		NEC NEC SANYO SANYO TOSHIBA
TR605	2SD571 (L) or 2SD571 (K) or 2SD438 (F) or 2SD438 (G) or 2SC2235 (Y)		NEC NEC SANYO SANYO TOSHIBA
TR606	2SC536 (G) or 2SC536 (H) or 2SC1840 (E) or 2SC1840 (F)		SANYO SANYO NEC NEC

VARIABLE CAPACITORS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
VC101-103	Tuning Gang FM: 3 Gang AM: 2 Gang	C-4567	151000190B
VC104-105	Tuning Gang FM: 3 Gang AM: 2 Gang	C-4567	151000190B
TC103	Trimmer IT-MP6	C-1213	154000200A

VARIABLE RESISTORS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
VR201	Semi Fixed 50 kΩB	P-6671	175205150A or 175206210A
VR202	Semi Fixed 100 kΩB	P-6685	175205160A or 175206220A
VR203	Semi Fixed 500 kΩB	P-6687	175205180A or 175206240A
VR204	Semi Fixed 5 kΩB	P-6688	175205120A or 175206180A
VR205	(Not Used)		
VR206	Semi Fixed 50 kΩB		175205150A or 175206210A
VR401	Rotary VOLUME 200 kΩB	P-7304	171610240A
VR402	Rotary BALANCE 250 kΩ	P-3140	171210170A
VR403	Rotary BASS 100 kΩ	P-4038	171610160A
VR404	Rotary TREBLE 100 kΩ	P-5024	171610170A

SPECIAL PAIRED PARTS

Ref. No.	Description	R/S Part No.	Mfr's Part No.
T201	IFT (TOKO)		133010020A
T202	IFT (TOKO)		133010040A
T201	IFT (MITSUMI)		133010010A
T202	IFT (MITSUMI)		133010030A

17. EXPLODED VIEW PARTS LIST

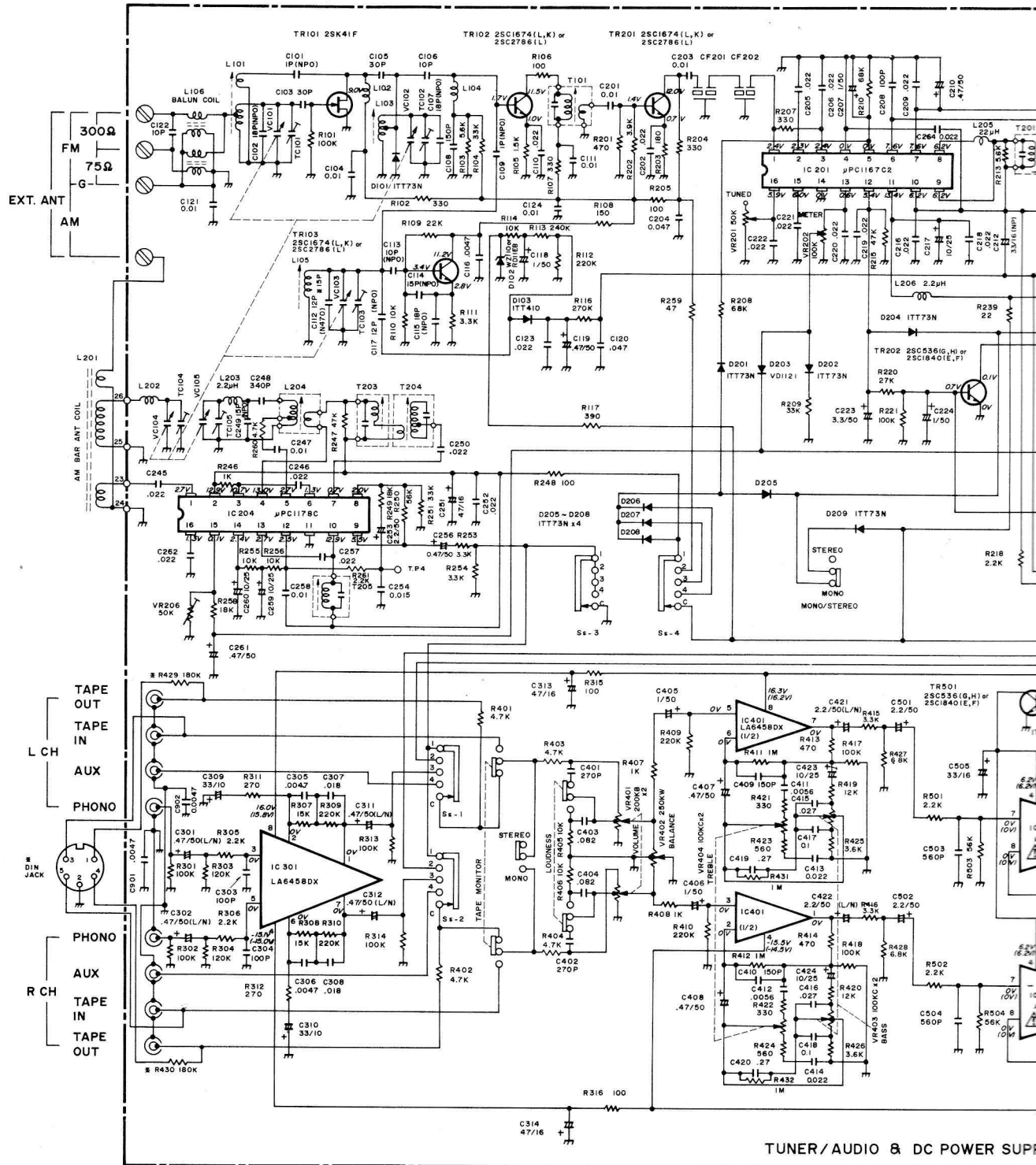
Ref. No.	Description	R/S Part No.	Mfr.'s Part No.	Ref. No.	Description	R/S Part No.	Mfr.'s Part No.
1	P.C.B. Tuner Audio Unit		U-22053	31	Antenna, AM BAR	CA-0722	111110030A
2	P.C.B. LED Indicator Unit	X-9262	U-23224	32	Nip Terminal		192310060A
3	P.C.B. Lamp Unit	X-9264	U-23225	33	Nip Terminal		192310070A
4	Headphone Unit	X-9261	U-23226	34	Fuse Holder	F-1210	197100161A
5	Chassis, Front		402010110B		(U.S.A., Canada)		
6	Holder		411100740A		Fuse Holder		197110010A
7	Holder		411100730B		(Europe, Australia)		
8	Dial Side (L)	D-5515	713410020A	35	Fuse 250 V/2.5 A	HF-0021	251000080A
9	Dial Side (R)	D-5519	713410030A		(U.S.A., Canada)		
10	Scale, Dial (U.S.A., Canada)	D-5516	717010090A		Fuse 250 V/1.25 A		251200900A
	Scale, Dial		717010100A		(Europe, Australia)		
11	Back Board, Dial	D-5517	416510050A	36	Power Switch	S-7578	182110100A
12	Chassis, Side (L)		403210060A		(U.S.A., Canada)		
13	Chassis, Side (R)		403210060A		Power Switch		182105800A
14	Pulley, Dial	D-0492	433006040A		(Europe, Australia)		
15	Spring Bar, Dial Pulley Tension	RB-7584	434510110A	37	Holder for AVC		411101150A
16	Eyelet, Dial String (2 × 3)		HAE32030BQ	38	Shield Plate		473207050B
17	String	D-0000	857010010A	39	Bar Spring		434510090A
18	Guide Pulley	D-0489	433100420A	40	Antenna, Screw Terminal		192203910A
19	POINTER DIAL ASS'Y	D-1417	435010020A	41	Jack RCA	J-1259	192004140A
	consisting of Pointer			42	Fuse Clip	F-1172	197303080A
	Pointer Base			43	Heat Sink		471010070A
	Pointer Sheet			44	Holder for Frontside		411100750A
20	Shaft, Tuning Ass'y	C-4770	431010030A	45	Sheet, Insulation		483000400A
21	Panel, Back (U.S.A.)	Z-6715	707010140A	46	Holder		411025270A
	Panel, Back (Canada)		707010150A	47	Sheet, Insulation		483004000A
	Panel, Back (Australia)		707010160A		FRONT PANEL ASS'Y	Z-6716	M-00223
	Panel, Back (Europe)		707010220A		Consisting of following parts:		
22	Shcrew, GRD		HMW0A002SN	[48	Front Panel (U.S.A., Canada, Australia)		701010050A]
23	Holder		411012970A	[48	Front Panel (Europe)		701010060A]
	(U.S.A., Canada, Europe)			[49	Window Dial	G-0504	652510130A]
	Holder (Australia)		411013690A	50	Knob 25, Tuning	K-5087	652510130A
24	Sheet, Insulation	HB-6963	483002140A	51	Knob 25, Volume	K-5090	652510120A
	Sheet, Insulation	HB-6963	483002260A	52	Knob 25, Selector, Bass, Treble, Balance	K-5088	652510160A
25	Joint Shaft	RT-4354	432008680A	53	Knob 50	K-5089	655010050A
26	Jack 6.3	J-1292	191010060A		TOP CABINET ASS'Y	Z-6717	M-00224
27	Blind		851210460A		Consisting of following parts:		
28	AC Outlet (U.S.A.)	J-6399	196001570A or 196000980A or 196010020A	[54	Cabinet, Top Cover		601210220A]
	AC Outlet (Canada)		196010010A	[55	Net		851301720A]
	AC Outlet (Australia)		196001570A or 196000980A		BOTTOM CABINET ASS'Y	Z-6718	M-00225
			481000100A		Consisting of following parts:		
29	Bushing, AC Cord	HB-0705	481000100A	[56	Cabinet, Bottom		601310160A]
	(U.S.A., Europe)			[57	Sheet, Shield		473310160A]
	Bushing, AC Cord (Canada)		481000800A	[58	Sheet, Shield		473310160A]
	Bushing, AC Cord		481001650A	59	Foot		608010060A
	(Australia)			60	Number Plate	HB-6879	712001840A
30	Cord AC (U.S.A.)	W-1000	311001150A	61	Transformer, Power	TA-0992	10101049TA
	Cord AC (Canada)		311001360A		(U.S.A., Canada)		
	Cord AC (Europe)		311001610A		Transformer, Power		10101050TA
	Cord AC (Australia)		311000410A		(Europe, Australia)		
				62	Holder		411101480A

18. MISCELLANEOUS PARTS LIST

HARD WARE			
Ref. No.	Description	R/S Part No.	Mfr.'s Part No.
S1	Screw, Tapping	3 × 6BT-2	
S2	Screw, Tapping	3 × 8BT-2	
S3	Screw, F-Lock	3 × 6FL	
S4	Screw, NL Tapping	3 × 8TNL-2 (Black)	
S5	Screw, Tap Tite	3 × 8BT-B (Black)	
S6	Screw, Tap Tite	3 × 8BT-B	
S7	Screw, Del Tite	4 × 6BT-3	
S8	Screw, Del Tite	3 × 6BT-3	
S9	Screw, Del Tite	4 × 10BT-3	
S10	Screw, F-Lock	3 × 8FL	
S11	Screw	3 × 3P	
S12	Screw, Triple	3 × 10TR	
S13	Screw, Tapping	3 × 10BT-2	
S14	Screw, Triple Tap	3 × 8PT-2	
S15	Screw, Del Tite	4 × 6BT-3 (Black)	
S16	Screw, Tapping	3 × 8BT-2 (Black)	
S17	Screw, Triple	3 × 8TR	
S18	Screw, Tap Tite	3 × 12BT-B	
N1	Nut, Flange	4FN	
N2	Nut	3N (U.S.A., Canada)	
11	Rivet, Blind	2.4 × 5.7 (Black)	
W1	Washer, Toothed	3TW-A	
W2	Washer	3W	
W3	Washer	4W	

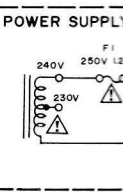
Description	R/S Part No.	Mfr.'s Part No.
Terminal, Block		197602510A
[This part is for Australian Models only with Screw, Del Tite 3 × 18BT-3 and Nut 3N]		
Lug, Earth 2PL Type		199101520A
[Australian Models only with Screw, Del Tite 3 × 8BT-3 and Nut, Flange 3FN]		
Cap, Insulation		482410020A
Label, Caution		733210190A
Label, Caution (U.S.A.)		733210160A
Label, Caution (Canada)		733210200A
Label, Caution (Canada)		733210260A
Label, Caution (Europe)		733210250A
Jack, DIN (Europe, Australia)	J-9067	193404220A
Connector, Wire		193903400A
Connector, Wire		193903410A
Terminal, PIN		194403140A
Gift Box (U.S.A., UK, Australia)		801010880A
Gift Box (Canada)		801010890A
Gift Box (BG)		801011070A
Master Carton		801510530A
Snow Box		802010280B
Pad		802510200A
Pad		802510210A
Curly Stopper		806203650A
Bag		803110020A
Poly Bag		803004180A
Label, Caution (U.S.A.)		733210090A
Label, Caution (Canada)		733210170A
Label, Caution (Europe, Australia)		733200090A
121 Label (U.S.A.)		731001210A
CSA Label (Canada)		731100240A
FTZ Label (Europe)		731710050A
Pass Label		735101830A
QC Label		735000190A
No. Label		736000440A
(Canada, Europe, Australia)		
Safety Manual (U.S.A.)		811200461A
Warranty Card (Europe)		813004640A
Owner's Manual	MU-3101760	811010720A
(U.S.A., UK, Australia)		
Owner's Manual (Canada)		810010730A
Owner's Manual (BG)		811010880
Label Cord (Europe)		734106969A
Outlet Label AC (Australia)		733204630A
Blind		851210460A
Hardware kit	HW-3101969	
Manual, Service	MS-3101969	
Spacer		852010350A

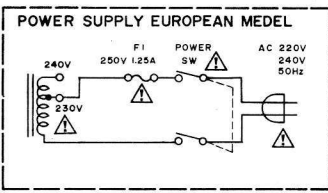
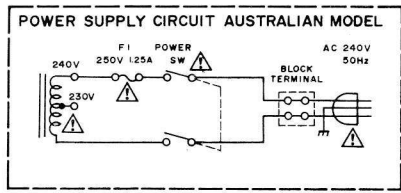
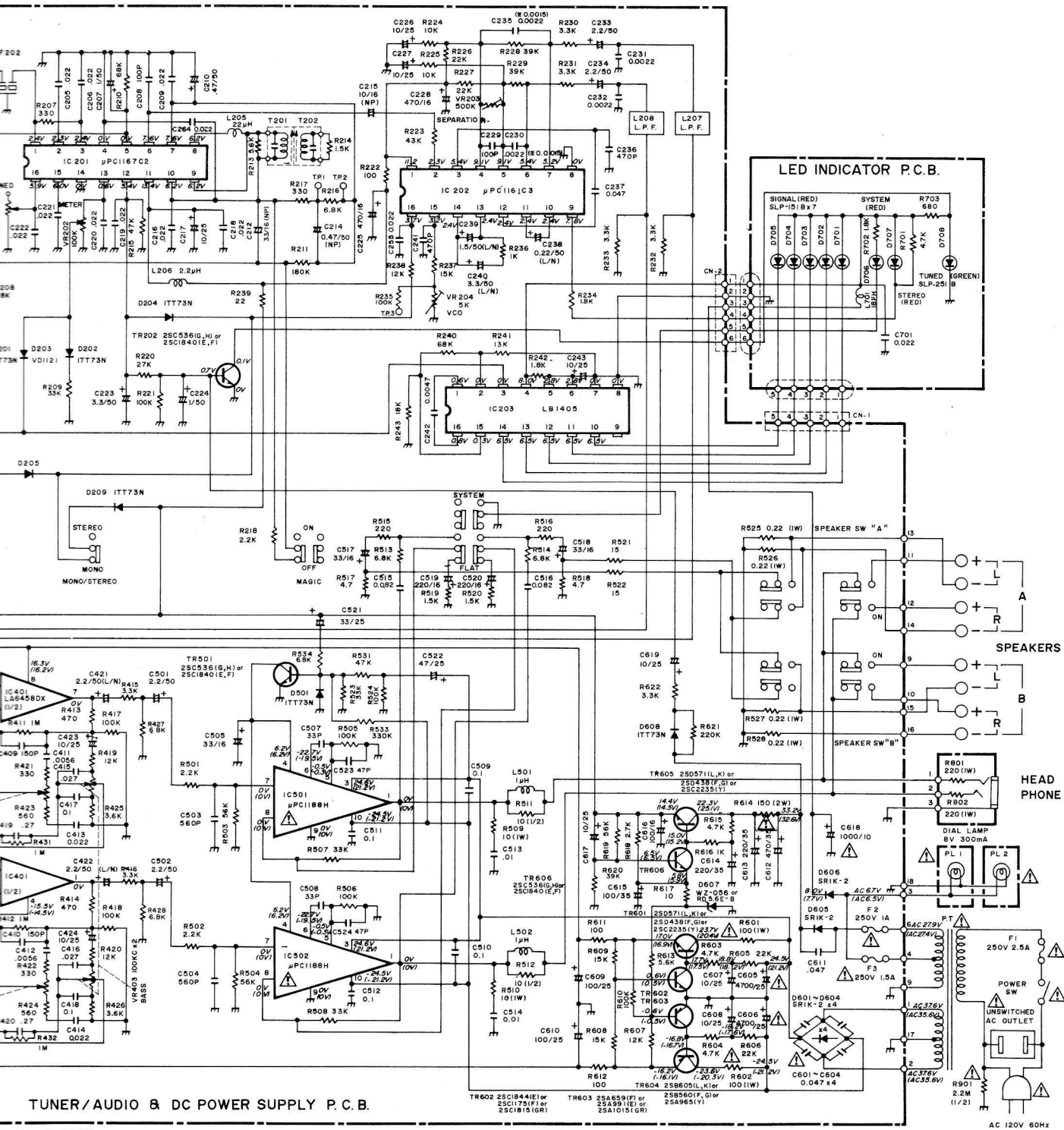
19. SCHEMATIC DIAGRAM



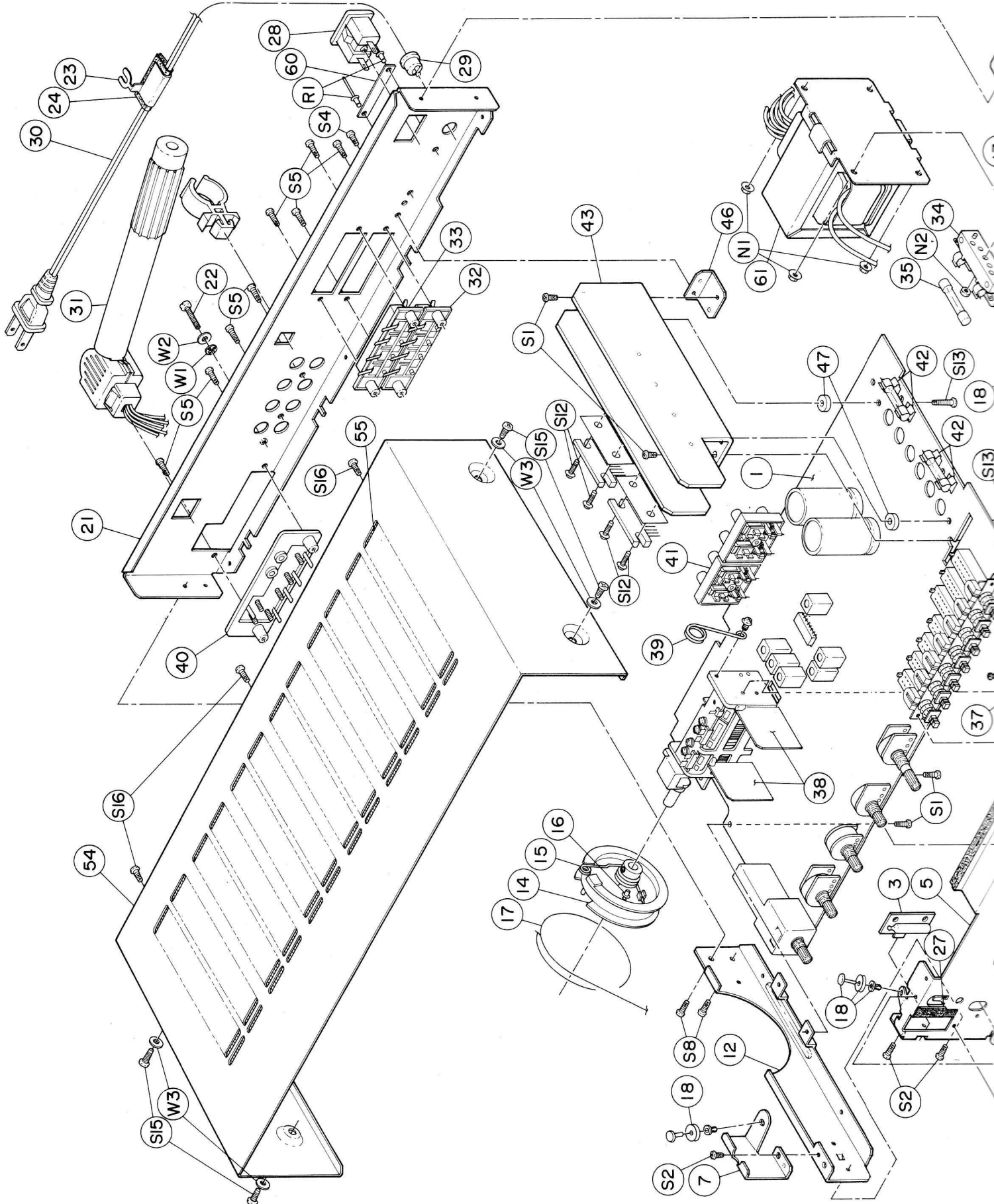
- NOTE: 1. Ss-1~Ss-4 FUNCTION SELECTOR SWITCH POSITION: 1 AM, 2 FM, 3 PHONO, 4 AUX.
 2. ALL RESISTANCE VALUES ARE INDICATED IN "OHM" (K=10³, M=10⁶ OHM).
 3. ALL CAPACITANCE VALUES ARE INDICATED IN "μF" (P=10⁻⁶ μF).
 4. VOLTAGE ARE INDICATED UNDER TWO CONDITIONS: WITH NO INPUT AND 12 WATTS (1KHz) OUTPUT POWER (INSIDE PARENTHESIS).
 5. IC301, IC401 LA6458DX or NJM4558DX or TL4558DX.
 6. *MARK PARTS AND VALUES ARE AVAILABLE ON EUROPEAN AND AUSTRALIAN MODELS ONLY.

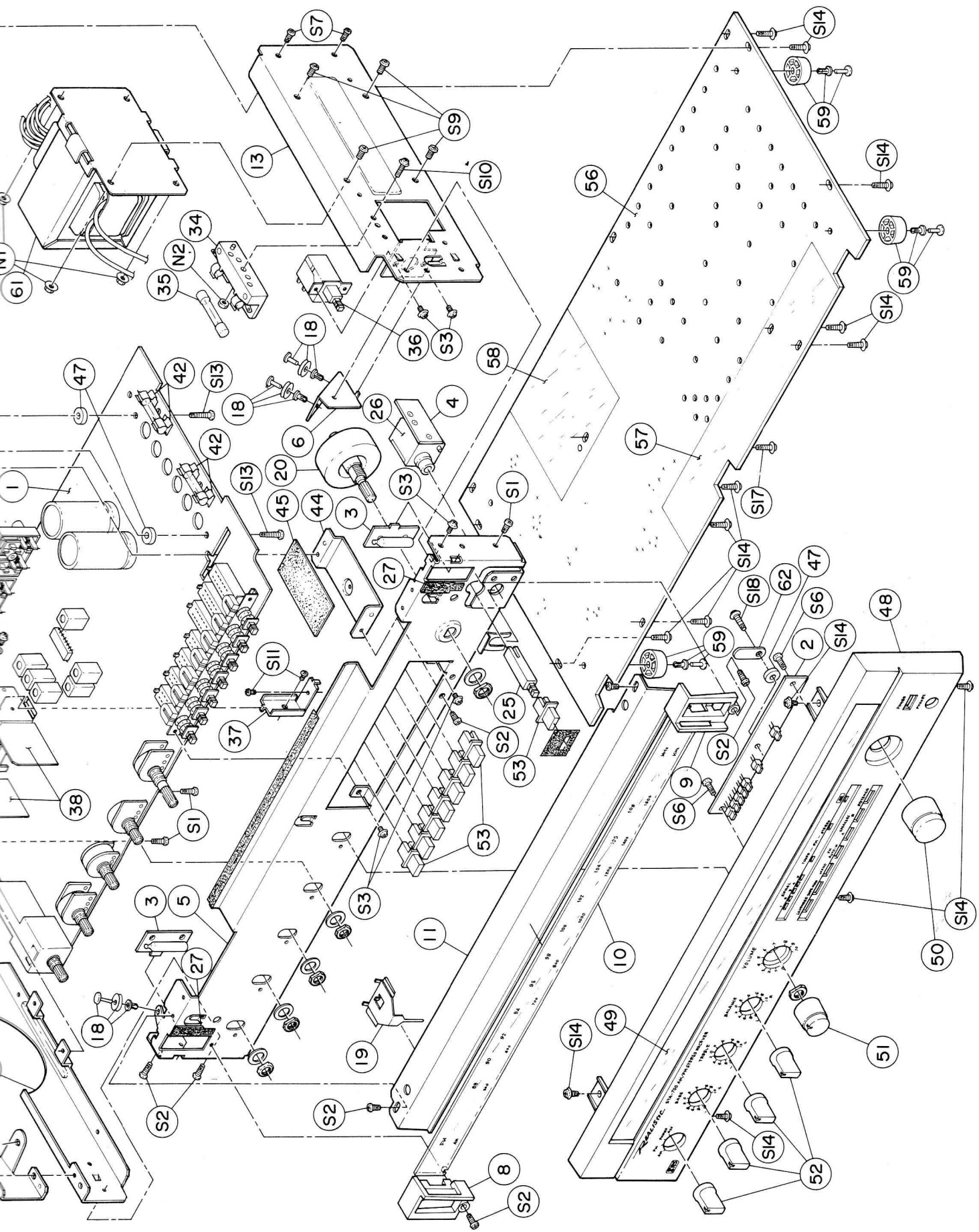
CAUTION: SINCE THE COMPONENTS MARKED BY \triangle ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED ON PARTS LIST ONLY.





20. EXPLODED VIEW





RADIO SHACK, A DIVISION OF TANDY CORPORATION

**U.S.A.: FORT WORTH, TEXAS 76102
CANADA: BARRIE, ONTARIO L4M 4W5**

TANDY CORPORATION

AUSTRALIA

**280-316 VICTORIA ROAD
RYDALMERE, N S W 2116**

BELGIUM

**PARC INDUSTRIEL DE NANINNE
5140 NANINNE**

U K

**BILSTON ROAD, WEDNESBURY
WEST MIDLANDS WS10 7JN**