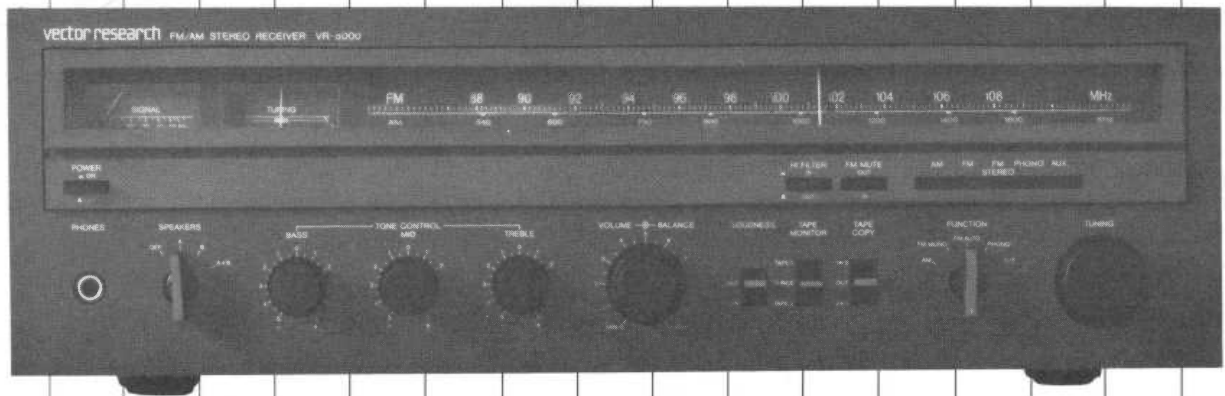


55

# AM-FM STEREO RECEIVER

# VR-5000

## Service Manual



# vector research

# 1 SPECIFICATIONS

## AUDIO SECTION

RMS Power, both channels driven, with no more than 0.08% total harmonic distortion

- 45 W per channel from 20 Hz to 20,000 Hz (8 ohms)\*
- 49 W per channel at 1,000 Hz (8 ohms)\*
- 55 W per channel at 1,000 Hz (4 ohms)\*

IM Distortion (at 8 ohms)

(60 Hz:7 kHz = 4:1 SMPTE method) 0.1%

Damping factor

(1,000 Hz, 8 ohms) 50

Phono overload level

180 mV at 1,000 Hz

Frequency response

(at 1 watt) 10 Hz~50,000 Hz  $\begin{matrix} +0.5 \\ -1 \end{matrix}$  dB

RIAA curve deviation

20 Hz~20,000 Hz  $\pm 0.5$  dB

S/N (IHF, A weighted, rated power)

Phono 82 dB

Aux 93 dB

Playback 93 dB

Input sensitivity and impedance

Phono 2.5 mV/47 k ohms

Aux 150 mV/47 k ohms

Tape 1, 2 150 mV/47 k ohms

Output voltage and load impedance

Rec out 130 mV/47 k ohms

Tone Controls

Bass 100 Hz  $\pm 10$  dB

Mid 1 kHz  $\pm 6$  dB

Treble 10 kHz  $\pm 10$  dB

Loudness control

(Volume at -40 dB) 50 Hz + 10 dB,

10 kHz + 3 dB

High Filter

10 kHz - 10 dB

## FM TUNER SECTION

Tuning range 87.5 MHz~108.5 MHz

Sensitivity (IHF) 10.8 dBf (1.9  $\mu$ V)

50 dB quieting sensitivity

Mono 19 dBf

Stereo 40 dBf

S/N ratio at 65 dBf

Mono 78 dB

Stereo 71 dB

Frequency response

Mono 30 Hz~15,000 Hz  $\pm 1.5$  dB

Stereo 30 Hz~15,000 Hz  $\pm 1.5$  dB

Distortion at 65 dBf

Mono 1,000 Hz 0.15%

Stereo 1,000 Hz 0.25%

Capture ratio 1.2 dB

Alternate channel selectivity 55 dB

Spurious rejection 65 dB

Image rejection 50 dB

IF rejection 80 dB

AM Suppression 53 dB

Stereo Separation (1,000 Hz) 40 dB

Carrier Suppression 50 dB

Antenna terminals 300 ohms balanced

75 ohms unbalanced

## AM TUNER SECTION

Tuning range 515 kHz~1,650 kHz

Sensitivity (bar antenna) 300  $\mu$ V/m

Selectivity ( $\pm 10$  kHz) 26 dB

Image rejection 40 dB

IF rejection 30 dB

S/N ratio

(5 mV/m Input) 40 dB

## GENERAL

Power requirements and consumption 120 V, 60 Hz, 270 W

Dimensions

mm (inch) 440(W) x 376(D) x 142(H)

(17-5/16" x 14-3/4"

x 5-9/16")

Weight 11 kgs (24 lbs)

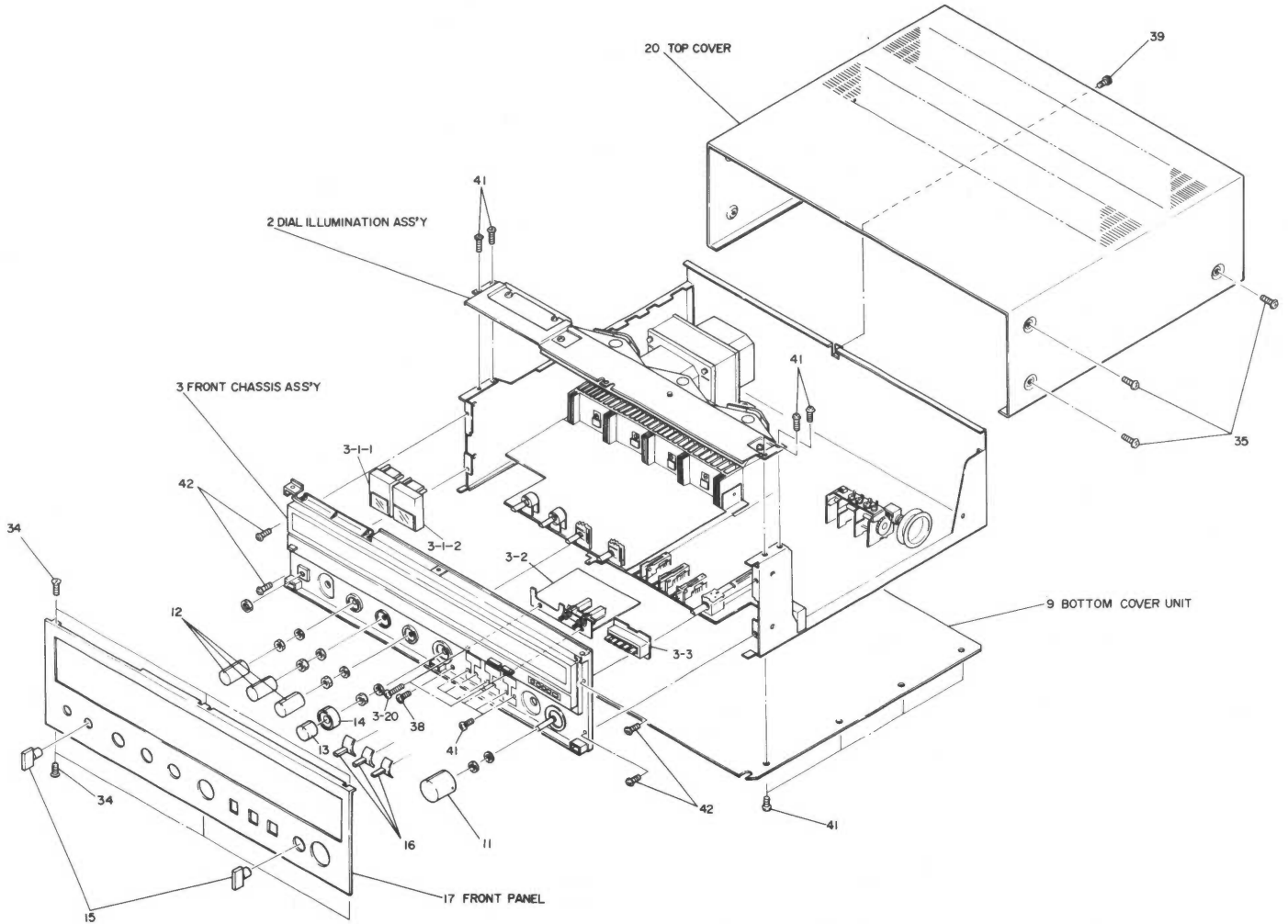
\* Power specification measured pursuant to U.S. federal trade commission trade regulation on power output claims for amplifiers.

Features and specifications subject to change without notice.

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## 2 EXPLODED VIEW



Ref. No.	Description	Ref. No.	Description	Ref. No.	Description
3 - 1 - 1	Signal Meter	3 - 3	LED PCB-1 Ass'y (Function Indicator)	13	Volume Knob (Volume)
3 - 1 - 2	Tuning Meter	11	Tuning Knob	14	Volume Knob (Balance)
3 - 2	Switch PCB Ass'y (HI Filter, FM Mute)	12	Volume Knob (Tone Control)	15	Selector Knob
				16	Lever Knob

## 3 DISASSEMBLY

### 3-1 Removal of Top Cover

Undo the 3 screws on both the left and right hand sides, and the single screw in the rear (a total of 7 screws).

(2) Remove the Speaker selector and Function select-or knobs.

(3) Undo a total of 6 screws, 3 in the top and 3 in the bottom.

### 3-2 Removal of Bottom Cover

Undo the 17 screws in the bottom cover.

### 3-4 Removal of Dial Illumination Ass'y

(1) Remove the top cover (see 3-1 above).

(2) Undo the 2 screws at the left edge and the 2 screws at the right edge (total of 4 screws).

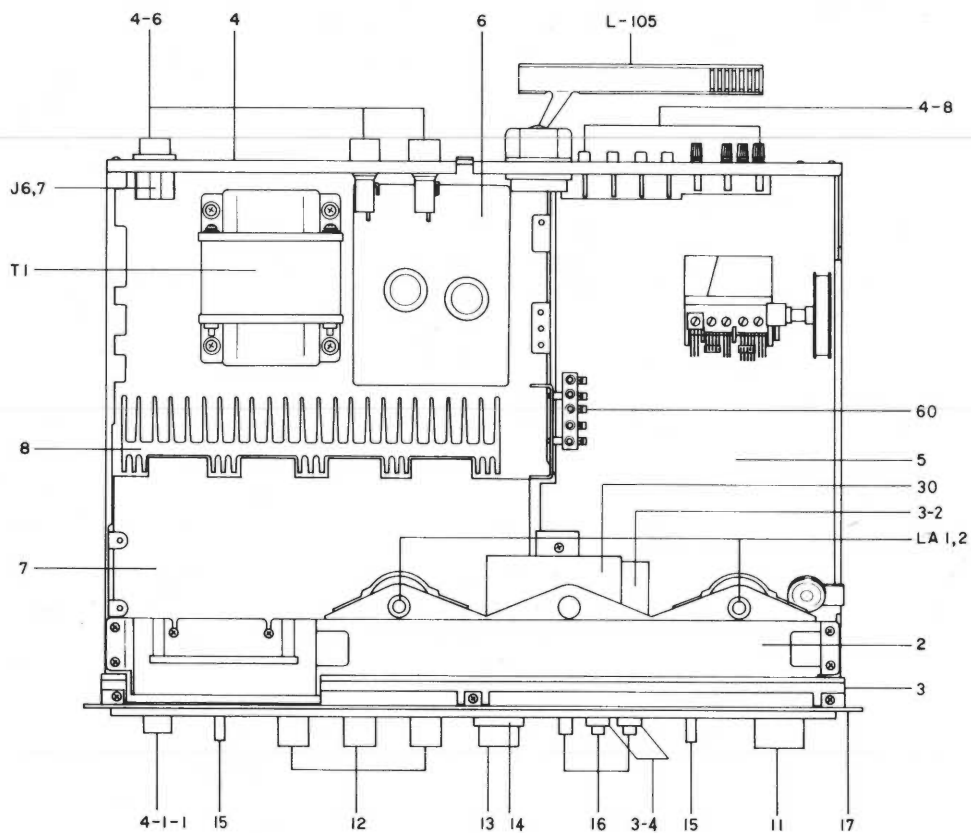
### 3-3 Removal of Front Panel

(1) Remove the top cover (see 3-1 above).

### 3-5 Removal of Front Chassis Ass'y

- (1) Remove the top cover (see 3-1 above).
- (2) Remove the bottom cover (see 3-2 above).
- (3) Remove the front panel (see 3-3 above).
- (4) Remove the dial illumination ass'y (see 3-4 above).
- (5) Remove the Signal and Tuning meters.
- (6) Remove the dial string.
- (7) Remove the LED PCB Ass'y (Function Indicator)
- (8) Undo the single screw and remove the shield Plate-3.
- (9) Undo the 2 screws and remove Switch PCB Ass'y (HI FILTER and FM MUTE).
- (10) Remove the Tuning, Volume control, Balance control, and Tone control knobs.
- (11) Remove the Loudness, Tape Monitor, and Tape Copy levers, and also the 6 screws.
- (12) Remove the nuts securing the Phones jack, Speaker selector, Tone controls, Volume/Balance control, and Function selector.
- (13) Remove the 2 screws at the left edge and the 2 screws at the right edge of the front chassis ass'y, and also the single screw at the bottom (a total of 5 screws).

## 4 COMPONENT LOCATION



Ref. No.	Description	Ref. No.	Description	Ref. No.	Description
2	Dial Illumination Ass'y	5	Tuner PCB Ass'y	16	Lever Knob
3	Front Chassis Ass'y	6	Power Supply PCB Ass'y	17	Front Panel
3-2	Switch PCB Ass'y (HI Filter, FM Mute)	7	Amplifier PCB Ass'y	30	Shield Plate-3
3-4	Push Knob-1	8	Heat Sink Ass'y	60	Lug
4	Back Chassis Ass'y	11	Tuning Knob	J6, 7	AC Socket
4-1-1	Power Button	12	Volume Knob	L105	Bar Antenna
4-6	Fuse Holder	13	Volume Knob	LA1, 2	Lamp
4-8	Terminal	14	Volume Knob	T1	Power Transformer
		15	Selector Knob		

## 5 DIAL CORD STRINGING

### 5-1 Stringing Diagram (Fig. 5-1-1 and 5-1-2)

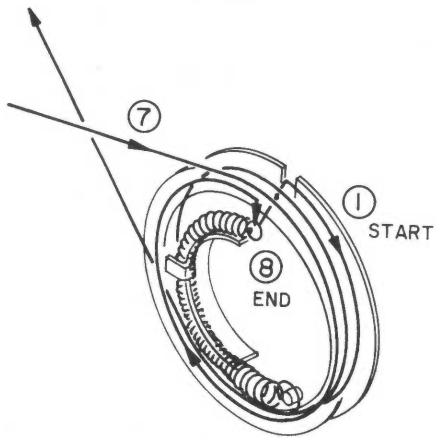


Fig. 5-1-2

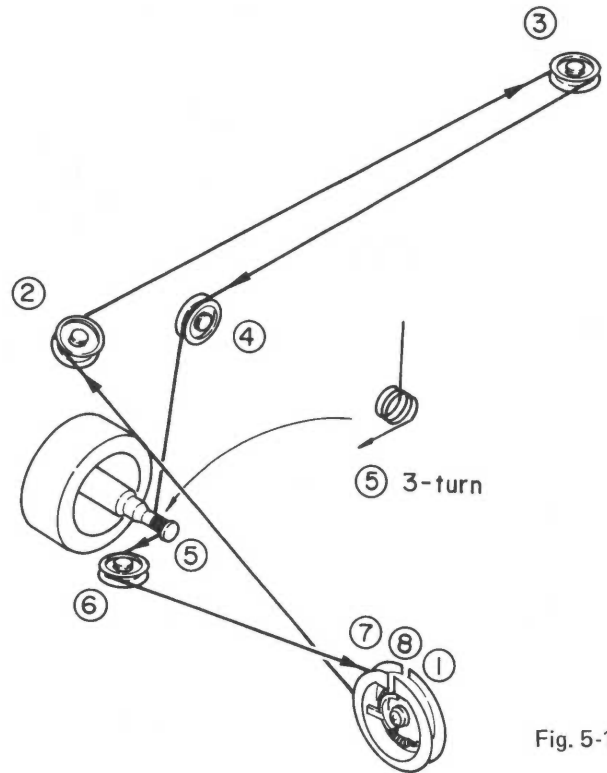


Fig. 5-1-1

### 5-2 Connecting up the Dial String

- (1) Pass the dial string (2) through the dial pulley (1). Then place both ends of the dial string together and pass them through the dial spring (3) and eyelet (4). Finally tie the two ends together, noting that the spring should be directed as shown in Fig. 5-2-1.

- (2) When tying both ends of the dial string together, the final length must comply with the dimensions shown in Fig. 5-2-2.
- (3) After securely tying the ends of the string, close the eyelet and seal the end with a sealing adhesive.
- (4) Load the dial spring inside the dial pulley as shown in Fig. 5-2-3.

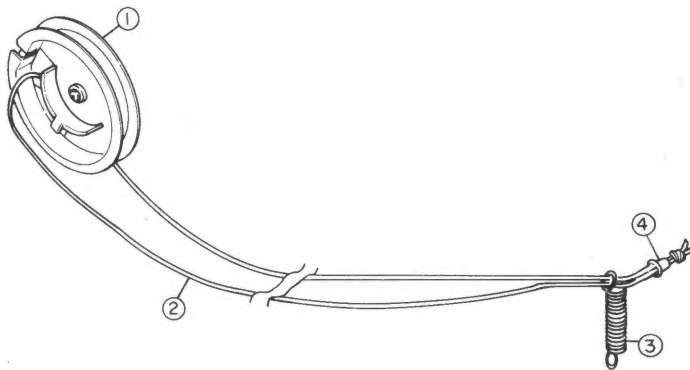


Fig. 5-2-1

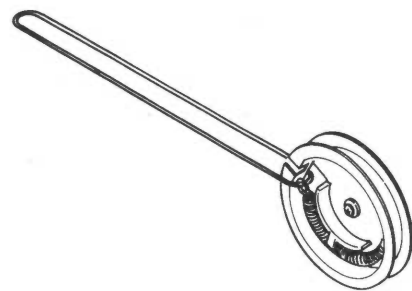


Fig. 5-2-3.

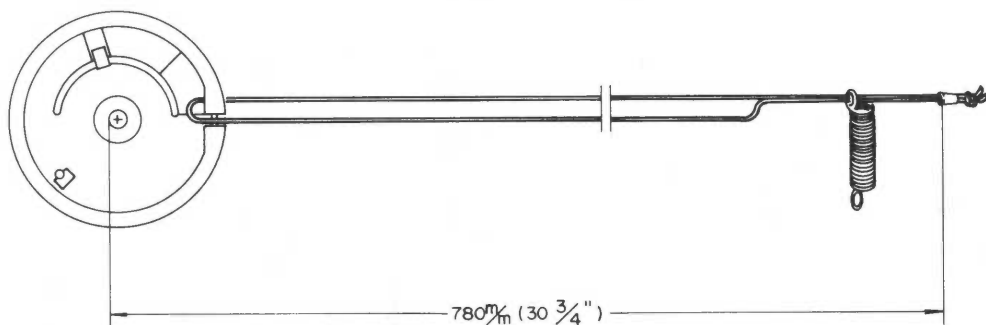
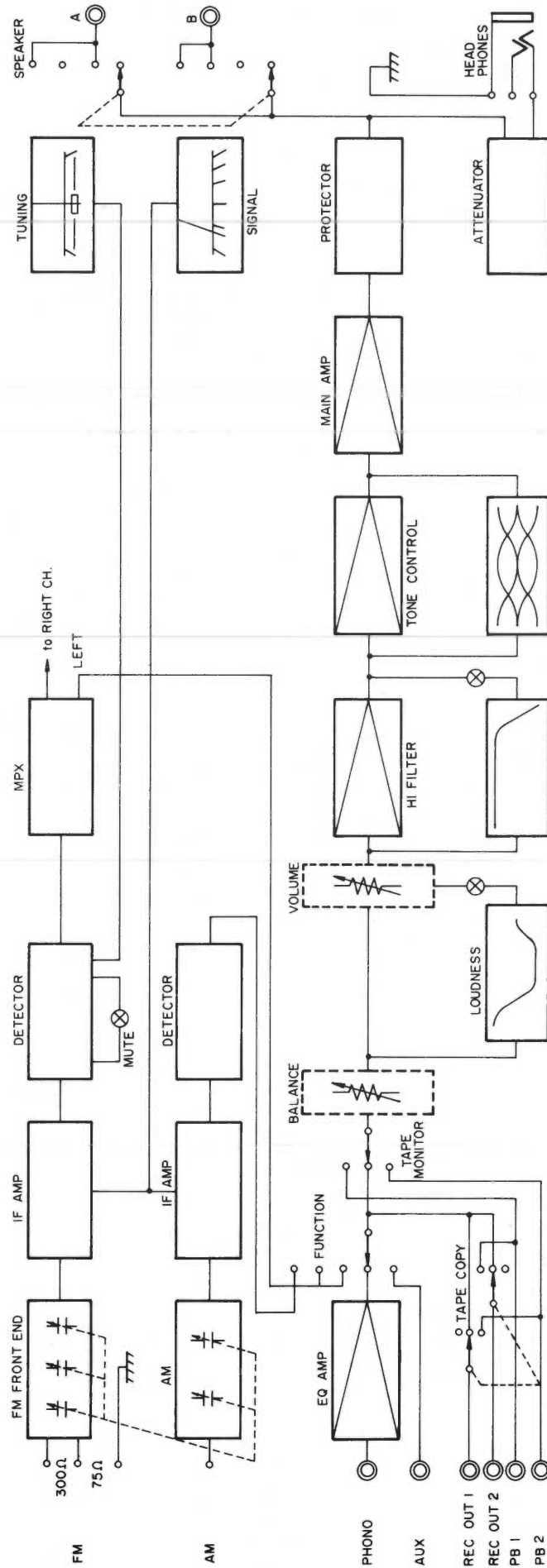


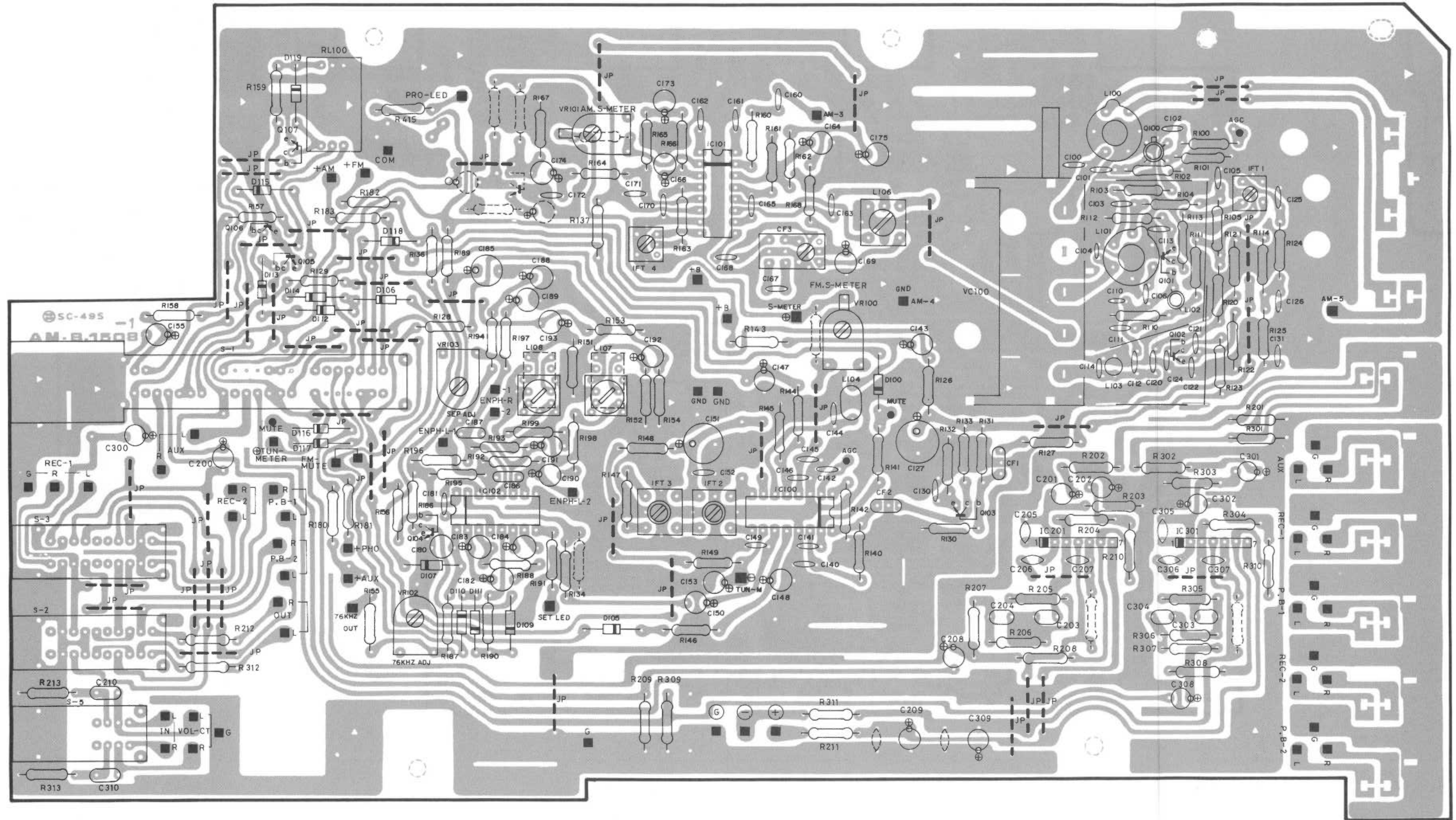
Fig. 5-2-2

# 6 BLOCK DIAGRAM



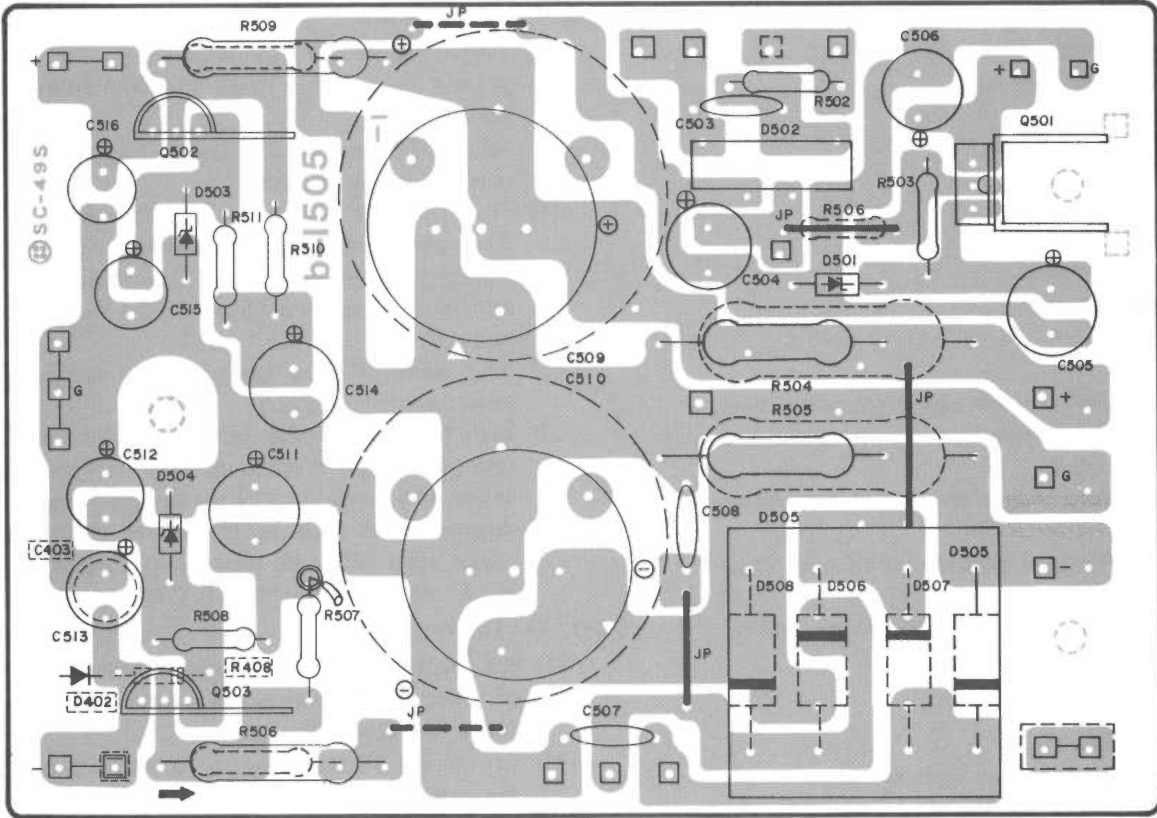
7 PC BOARD VIEWS FROM BOTTOM SIDE

7-1 AM/FM Tuner PC Board

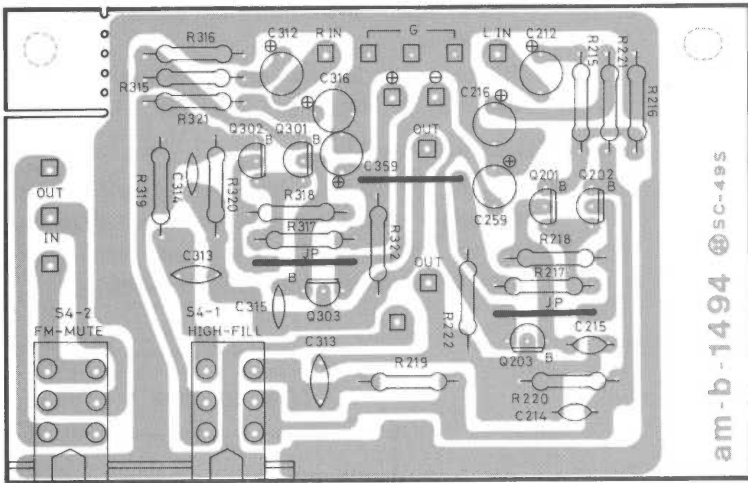




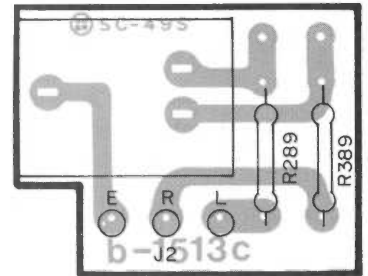
7-4 Power Supply PC Board



7-5 Switch PC Board



7-6 Headphone Jack PC Board



## 8 AM/FM TUNER ADJUSTMENTS

### 8-1 Instruments Required

- (1) FM signal generator
- (2) MPX stereo signal generator
- (3) AM signal generator
- (4) AC VTVM
- (5) Distortion meter
- (6) Oscilloscope
- (7) Frequency counter
- (8) AM IF sweepgenerator
- (9) FM dummy antenna
- (10) Loop antenna

#### NOTE

- (1) After the FM and AM signal generators have been warmed up, recalibrate the frequencies at least twice a day.
- (2) Set the FM signal generator to FM modulation 1 kHz, 75 kHz deviation.
- (3) Set the MPX signal generator to 9% pilot signal and 91% main signal.
- (4) Set the AM signal generator to 30% modulation 1 kHz.

### 8-2 FM Alignment Procedures

Connect the relevant measuring instruments up to the receiver as shown in Fig. 8-2. Refer to Fig. 8-5 for the layout of parts to be adjusted.

#### 8-2-1 FM Frequency Alignment

- (1) When the Tuning meter shows considerable offset when there is no input signal, adjust IFT2 to bring the indicator needle into a central position.
- (2) Set the FM SG output to 1 K $\mu$ V and frequency of 87.5 MHz. Turn the Tuning knob of the receiver full around in the counter clockwise direction (where the dial indicator will stop at a position below 88 MHz), and adjust the L103 oscillator coil for reception of 87.5 MHz.
- (3) Then set the FM SG frequency to 108.5 MHz, turn the receiver Tuning knob full around in the clockwise direction (where the dial indicator will stop at a position above 108 MHz), and adjust the oscillator circuit trimmer capacitor (FM OSC TC) for reception of 108.5 MHz.
- (4) Repeat the above adjustment steps (2) and (3) until the minimum and maximum reception frequencies correspond exactly with 87.5 MHz and 108.5 MHz respectively.

#### 8-2-2 FM IF Alignment

- (1) Set the FM SG to 1 K $\mu$ V, 98 MHz.
- (2) Set the dial indicator to 99 MHz with no input signal.
- (3) Adjust IFT2 so that the Tuning meter needle moves to center position.
- (4) Then tune the receiver to 98 MHz (where the Tuning meter will give center reading).
- (5) Adjust IFT3 to the position which results in minimum distortion as shown in the distortion meter.
- (6) Next adjust IFT1 to again obtain a minimum distortion meter reading.
- (7) With the Tuning meter indicating center position when there is no input signal, and the receiver then tuned (so that the Tuning meter indicator moves back to the center position), repeat steps (2) to (6) above until a distortion meter reading of less than 0.15% is obtained.

#### 8-2-3 FM Tracking Alignment

- (1) Set the FM SG output so that a small amount of noise can be seen in the output waveform (distortion about 3%).
- (2) Set the FM SG frequency to 90 MHz and tune the receiver to this frequency. Then adjust the antenna coils L100 and L101 to positions of minimum noise (minimum distortion).
- (3) Next set the FM SG frequency to 106 MHz, and again tune the receiver to the new frequency. Adjust the antenna trimmer capacitor (FM ANT TC) and RF trimmer capacitor (FM RF TC) to again obtain minimum noise (minimum distortion).
- (4) Repeat steps (2) and (3) above until noise is reduced to minimums at both frequencies.

#### 8-2-4 FM Signal Meter Alignment

- (1) Set the FM SG to 98 MHz and 10 K $\mu$ V output, and then tune the receiver to this frequency.
- (2) Adjust VR100 so that the Signal meter coincides with the maximum scale marking.

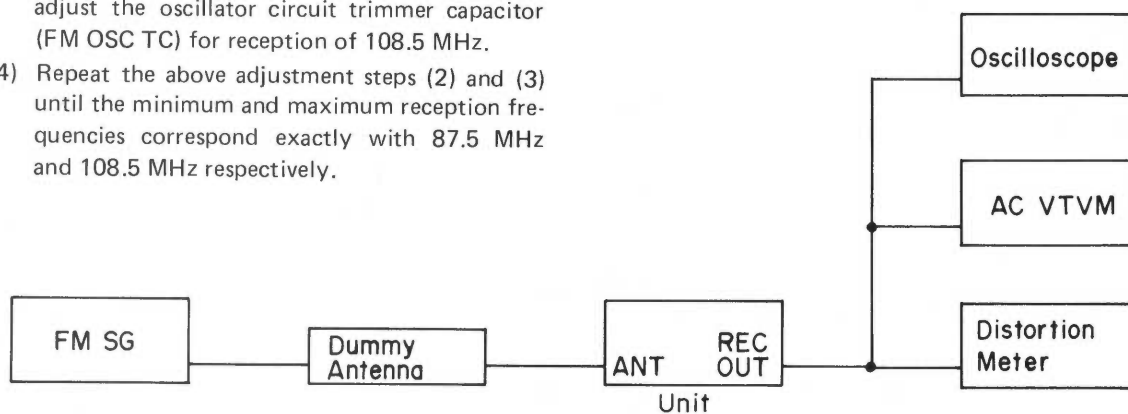


Fig. 8-2

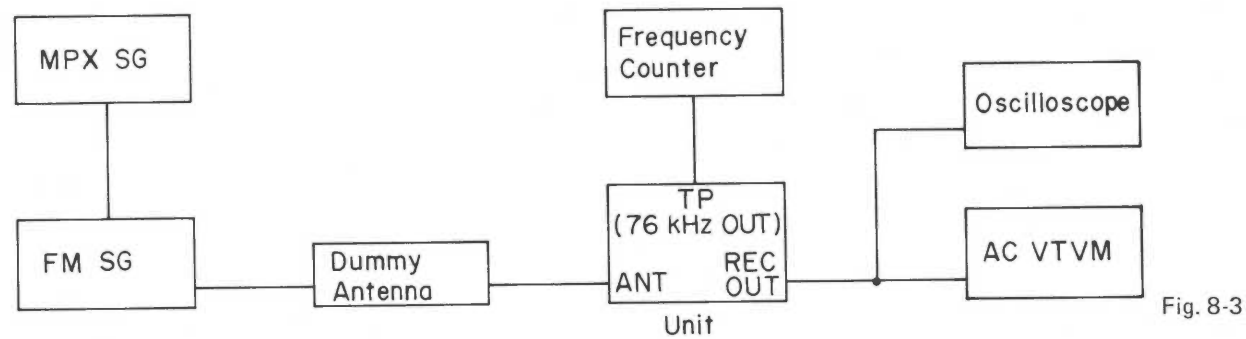


Fig. 8-3

### 8-3 FM MPX Alignment Procedures

Connect the measuring instruments up to the receiver as shown in Fig. 8-3. Refer to Fig. 8-5 for the layout of the parts to be adjusted.

#### 8-3-1 FM MPX Subcarrier Oscillator Frequency Alignment

- (1) Set the FM SG to 98 MHz and 1 K $\mu$ V output.
- (2) Tune the receiver to 98 MHz, and then switch the FM SG modulation off (including 19 kHz pilot).
- (3) Connect the frequency counter to TP (76 kHz OUT), and adjust VR102 until the frequency counter reads 76.00 kHz.

#### 8-3-2 FM MPX Separation Adjustment

- (1) Set the FM SG to 98 MHz and 1 K $\mu$ V output. Connect up the MPX SG using an external modulator, and set to 75 kHz deviation for main signal + pilot signal.
- (2) Tune the receiver to 98 MHz.
- (3) Set the MPX SG mode to L ch, and reduce the receiver R ch output level to a minimum by means of VR103.
- (4) Then switch the MPX SG mode to R ch, and check that the receiver L ch output level is much the same as the R ch output level obtained in step (3) above. If there is a considerable difference, adjust VR103 again until the L to R and R to L crosstalk difference is less than 2 to 3 dB.

- (2) Adjust IFT, CF 3 equipped with the ceramic filter and IFT 4 for maximum output and symmetrical response of waveform, at around 455 kHz.

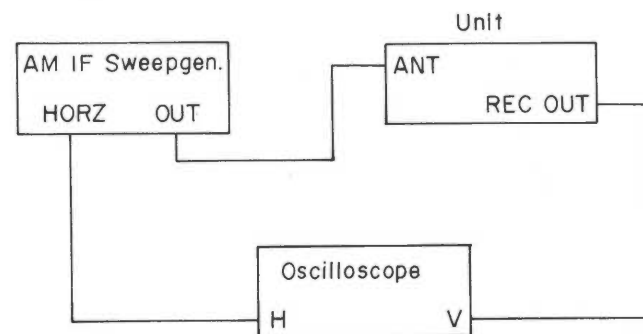


Fig. 8-4-1

### 8-4-2 AM Frequency Range Alignment

- (1) Connect the receiver and the measuring instrument as shown in Fig. 8-4-2; refer to Fig. 8-5 for the layout of parts to be adjusted.
- (2) Set the AM SG to 515 kHz with a small amount of noise present in the tuner output waveform.
- (3) Turn the receiver Tuning knob full around counter clockwise (thereby shifting the dial indicator below the 540 kHz position), and adjust the oscillator coil L106 for reception of 515 kHz.
- (4) Set the AM SG to 1,650 kHz, and turn the receiver Tuning knob full around clockwise (until the dial indicator stops at a position above 1,600 kHz). Then adjust the oscillator trimmer capacitor (AM OSC TC) for reception of 1,650 kHz.
- (5) Repeat steps (2) to (4) above.

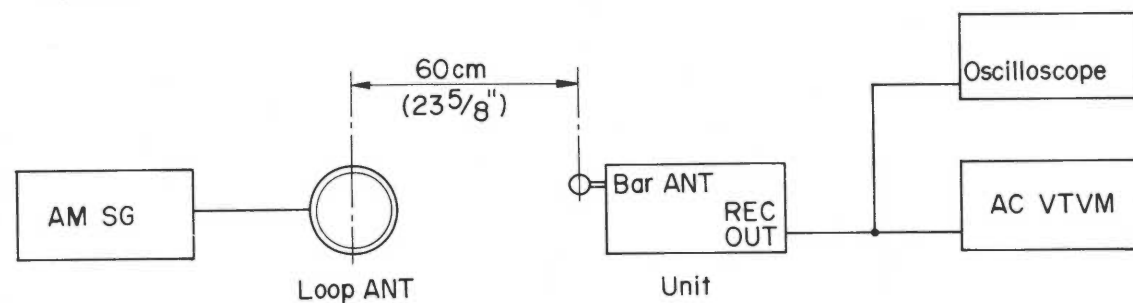


Fig. 8-4-2

### 8-4-3 AM Tracking Alignment

- (1) Measuring instrument connections to the receiver are the same as for section 8-4-2 above.
- (2) Set the AM SG to 600 kHz and the output to a level which produces a slight amount of noise in the tuner output.
- (3) Tune the receiver to 600 kHz, and rotate the core of the bar antenna coil in order to obtain maximum output level.
- (4) Next set the AM SG to 1,400 kHz, and tune the receiver to this frequency. Rotate the antenna trimmer capacitor (AM ANT TC) until maximum output level is obtained.
- (5) Repeat steps (2) to (4) above.

### 8-4-4 AM Signal Meter Alignment

- (1) The measuring instruments are again to be connected up to the receiver in the same way as in section 8-4-2.
- (2) Set the AM SG to 1,000 kHz and 120 dB output (or 1 V to generator loop).
- (3) Adjust VR101 so that Signal meter coincides with the maximum scale marking.

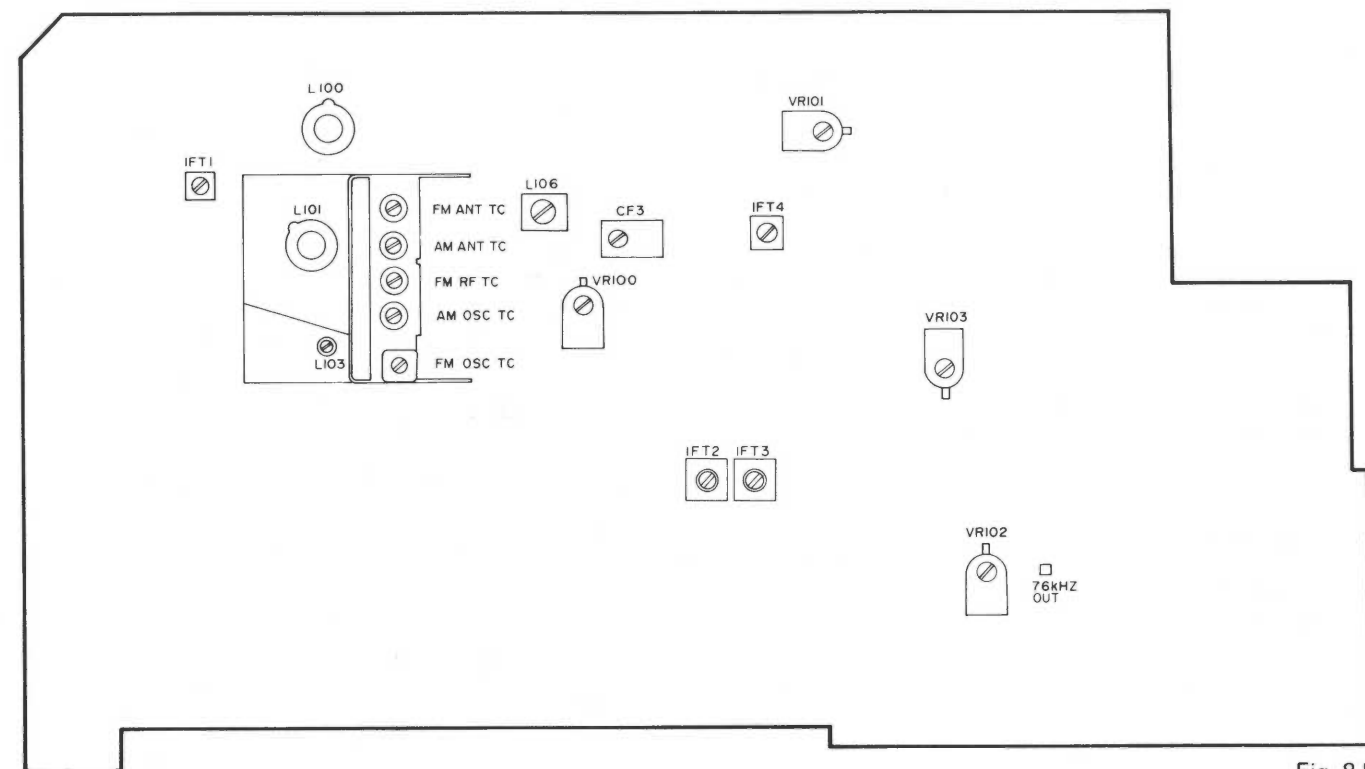


Fig. 8-5

### 8-4 AM Alignment Procedures

#### 8-4-1 AM IF Alignment

- (1) Connect the measuring instruments up to the receiver as shown in Fig. 8-4-1. Refer to Fig. 8-5 for the layout of the parts to be adjusted.

## 9 AMPLIFIER ADJUSTMENTS

### 9-1 Instrument Required

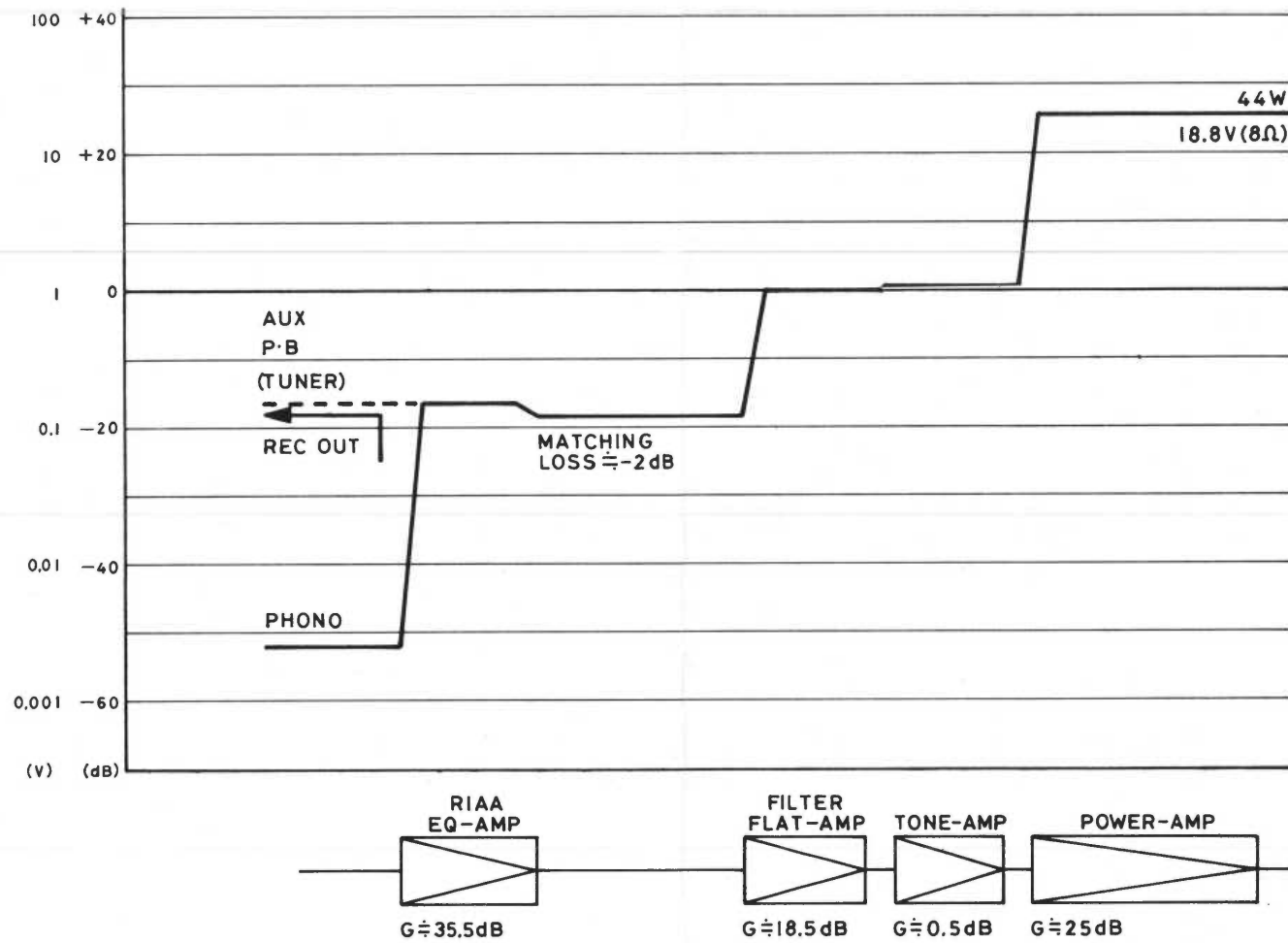
DC VTVM

### 9-2 Idling Current Adjustment

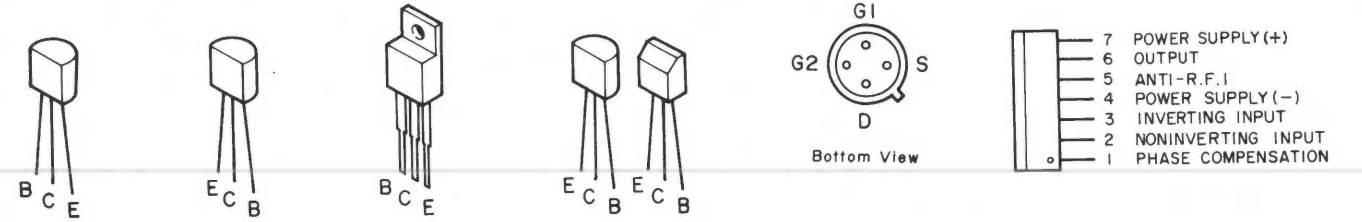
- Adjust idling current at rated voltage (120 V) and load conditions.
- Connect a DC voltmeter between the 2 TPs (test points) on the amplifier PC board (near R285 and Q312).

- First depress power switch and allow transistors and heat sink to stabilize heatwise for ten (10) minutes or more without signal. Then adjust VR-206 and VR-306 until voltage between TPs is 14 mV (at which time the idling current will be 30 mA).

### 9-3 Level Diagram



## 10 TRANSISTORS and ICs



2SA850D  
2SA1100LF  
2SC711G  
2SC1312G  
2SC1375D  
2SC2575LF

2SB646  
2SB647C  
2SC460C  
2SC535CM  
2SC1342CM  
2SD666  
2SD667C

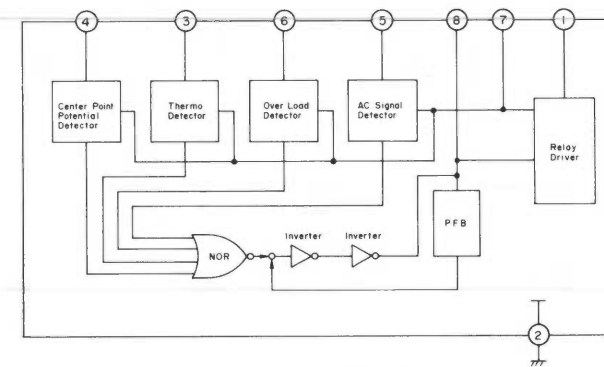
2SD357D

2SA844E

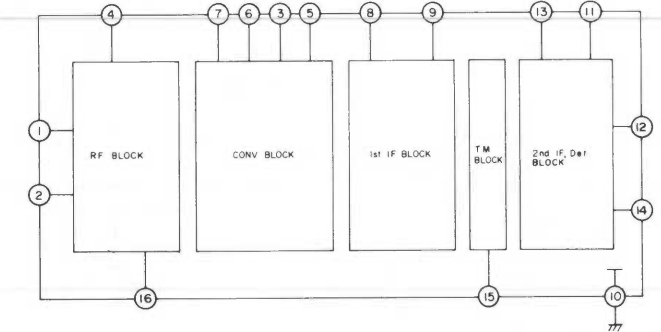
3SK51

M5213L (Linear IC)

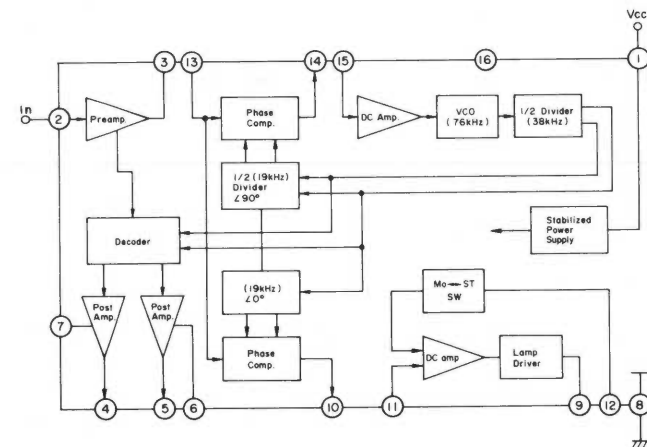
HA12002 (Relay control IC)



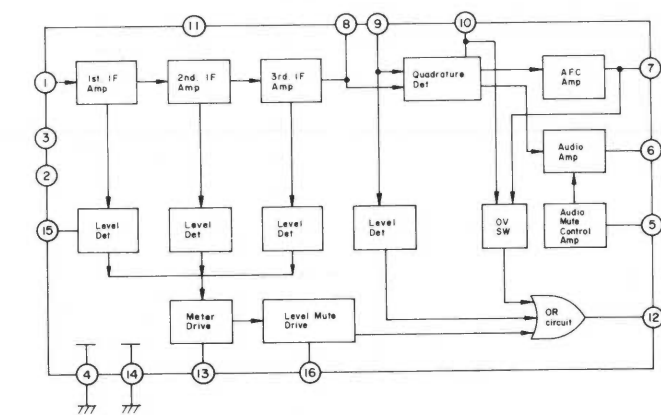
HA1197 (AM IC)



HA1196 (Multiplex IC)



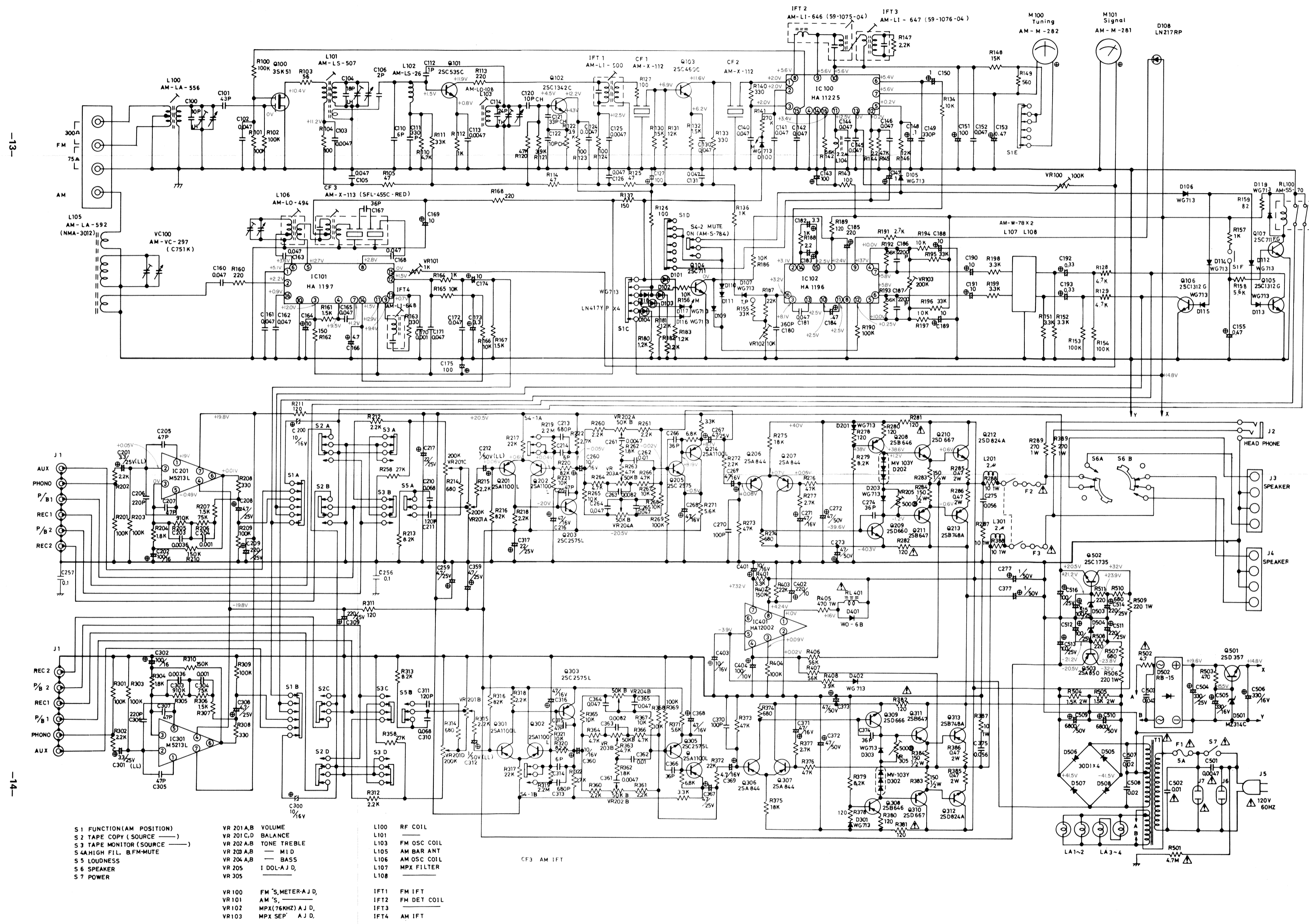
HA11225 (FM IF & Det. IC)



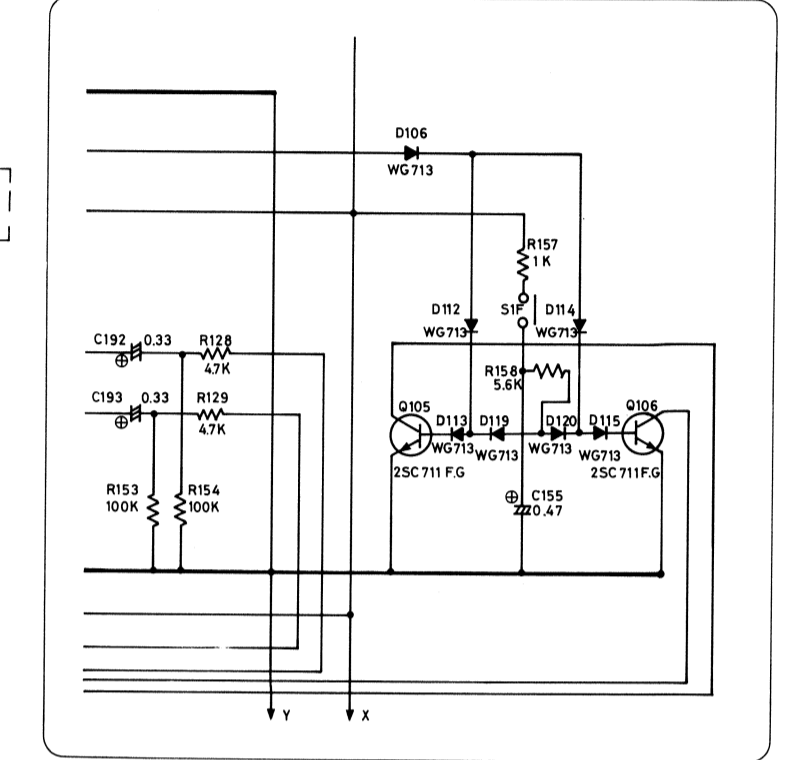
10 SCHEMATIC DIAGRAM

NOTE: 1. In the FM Muting Circuit there are some differences between the units with serial Nos. 500001-5001415 and the ones which follow. Please refer to the right hand side of schematic.  
 2. This circuit is subject to change without notice.

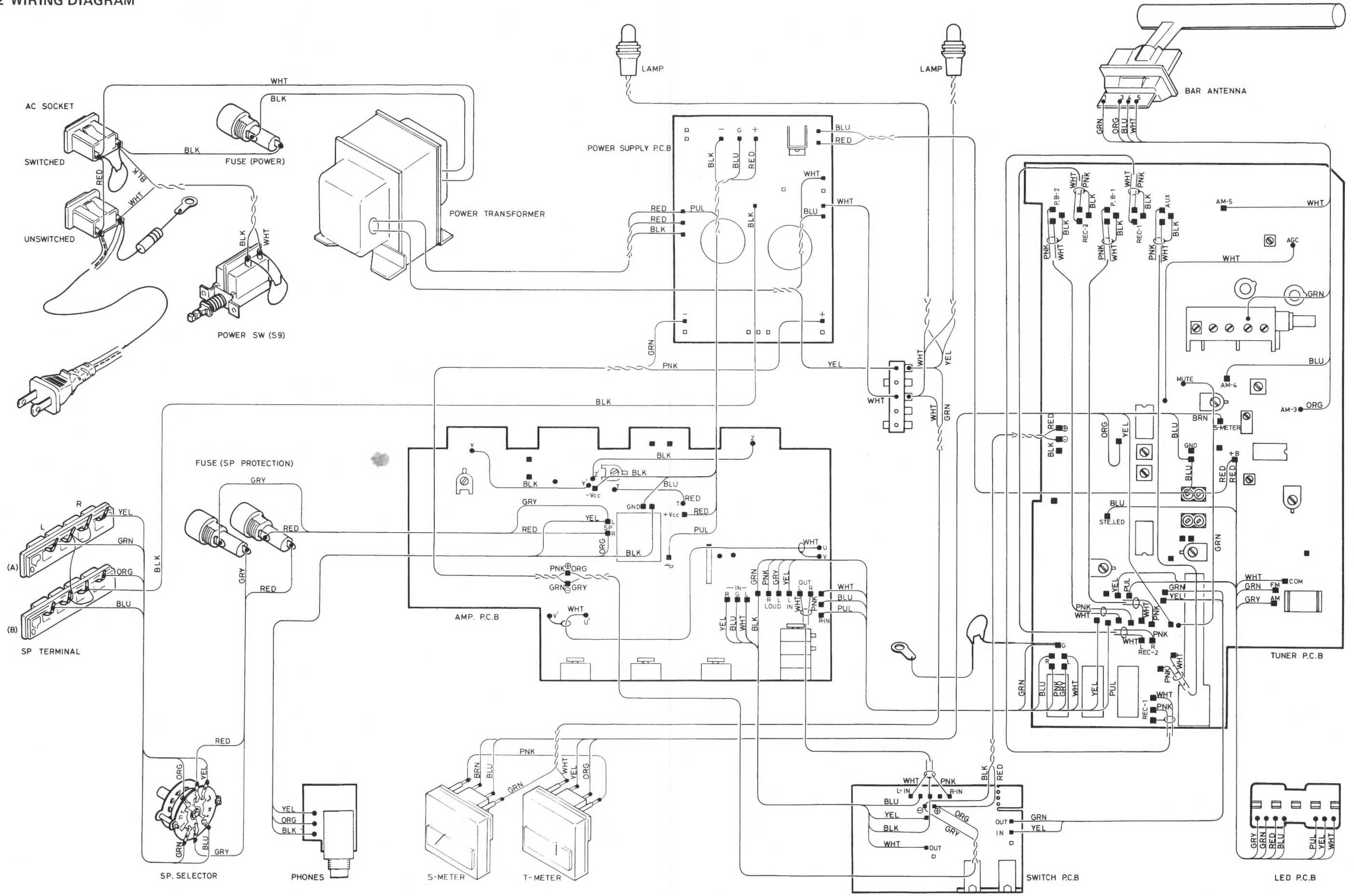
-13-



The FM Muting Circuit for the units with serial Nos. 500001-5001415.



12 WIRING DIAGRAM



13 PARTS LIST

NOTE: Parts with "\*" in the stock No. can not be supplied.

Main Component Parts

Ref. No.	Stock No.	Description	Q'ty	Remarks
1	*	Dial Pulley Ass'y	1	
2	*	Dial Illumination Ass'y	1	
3	*	Front Chassis Ass'y	1	
4	*	Back Panel Ass'y	1	
5	*	Tuner PCB Ass'y	1	
6	*	Power Supply PCB Ass'y	1	
7	*	Amplifier PCB Ass'y	1	
8	*	Heat Sink Ass'y	1	
9	*	Bottom Cover Unit	1	
10	*	Carton Box Ass'y	1	
11	1215053	Tuning Knob R79017-006 (I)	1	
12	1225140	Volume Knob R79018-014 (I)	3	
13	1225141	Volume Knob R79018-015 (I)	1	
14	1225142	Volume Knob R79018-016	1	
15	1245323	Selector Knob R79018-018 (I)	2	
16	1275027	Lever Knob R79018-006 (I)	3	
17	1325242	Front Panel R79016-006	1	
18	1445159	Serial Number Plate R79018-050	1	
19	1475496	Inspection Label R79018-055	1	
20	1715561	Top Cover R79016-005A	1	
21	2125196	Side Chassis-1 R79018-029	1	
22	2125203	Chassis-1 R79017-023	1	
23	2125216	Chassis-2 R79018-028A	1	
24	2125218	Power Transformer Chassis R79017-041	1	
25	2171013	Egg Lug B-4 3 mm 0.35 t	2	
26	2295530	Pulley Retainer-1 R79017-012	1	
27	2295532	Pulley Retainer-3 R79017-014	1	
28	2295535	Meter Retainer R79017-018	1	
29	2295540	Metal-1 R79018-048	1	
30	2335312	Shield Plate-3 R79017-040A	1	
31	2345616	Earth Plate R79017-028A	1	
32	2675096	Packing-1 R79022-062	2	
33	2675100	Packing-2 R79022-070	2	
34	3120004	Flat Countersunk Head Screw 3 x 8 S/BZ	6	
35	3180406	Binding Head Screw 4 x 6 S/BZ	6	
36	3510023	Hexagon Nut 3 mm S/Z	3	
37	3510024	Hexagon Nut 4 mm S/CM	4	
38	3610038	DT Binding Head Screw 3 x 16 S/Z	1	
39	3610042	DT Binding Head Screw 3 x 6 S/BZ	12	
40	3615066	DT Pan Head Screw 2.6 x 6 S/Z	1	
41	3615068	DT Pan Head Screw 3 x 6 S/Z	57	
42	3615069	DT Pan Head Screw 3 x 8 S/Z	8	
43	3615077	DT Screw 3 x 8 S/Z	1	
44	3615080	DT Pan Head Screw 3 x 6 S/Z	9	
45	3618003	PW Tapping Screw A3 x 8 S/Z	2	
46	3618044	PW Screw 4 x 10 S/Z	4	
47	3711064	Flat Washer 4 mm S/Z	4	
48	3714024	Toothed Lock Washer 3 S/ZB	1	
49	3750034	Nylon Rivet NRP-335 (B)	2	
50	4213057	Operation Manual H-22A	1	
51	4221151	Warranty Card A-91	1	
52	4230061	Serial Number Label R79016-007A	1	
53	4341004	Free Up Belt C-type	1	
54	4491110	Polyethylene Bag A-10	1	
55	4491205	Polyethylene Bag-B	1	
56	4491503	Polyethylene Bag-E	1	
	7140187	Ceramic Capacitor AM-CS-187	1	C502
57	7220147	FM Antenna AM-K-147	1	
	7450114	HV Solid Resistor 4.7 MΩ ½W AM-RS-114	1	R501
	7530806	Power Transformer AM-TS-806	1	T1
58	7710186	Binder AM-Z-186	8	
59	7710287	Short Pin Plug AM-Z-287	2	
60	7710289	Lug AM-Z-289	1	

(1) Dial Pulley Ass'y

Ref. No.	Stock No.	Description	Q'ty	Remarks
1 - 1	2485125	Dial Pulley R79017-003	1	
1 - 2	3790002	Eyelet 2 x 3 B/NI	1	
1 - 3	3825922	Dial Spring R79017-031	1	
1 - 4	5110168	Dial String 0.4 mm x 1600 mm	1	

(2) Dial Illumination Ass'y

Ref. No.	Stock No.	Description	Q'ty	Remarks
2 - 1	1715547	Cover R79017-032	2	
2 - 2	2125217	Chassis-3 R79017-024A	1	
2 - 3	2315170	Illumination Plate R79017-005 (I)	1	
2 - 4	2455166	Collar-1 R79017-033	2	
2 - 5	3100253	Washer Faced Head Screw 3 x 8 S/Z	1	
2 - 6	3615083	DT Pan Head Screw 3 x 10 S/Z	2	
	7440365	Lamp EQL-Z-065	2	LA1, 2

(3) Front Chassis Ass'y

Ref. No.	Stock No.	Description	Q'ty	Remarks
3 - 1	*	Meter Ass'y	1	
3 - 2	*	Switch PCB Ass'y	1	(HI Filter, FM Mute)
3 - 3	*	LED PCB-1 Ass'y	1	(Function Indicator)
3 - 4	1245324	Push Knob-1 R79018-004 (I)	2	
3 - 5	1325247	Panel-2 R79017-011A	1	
3 - 6	1325257	Panel-1 R79016-003A	1	
3 - 7	1485354	Dial Scale R79017-027 (I)	1	
3 - 8	1715563	Dial Cover R79017-004 (A)	1	
3 - 9	2125206	Front Chassis R79016-001 (I)	1	
3 - 10	2295531	Pulley Retainer-2 R79017-013	1	
3 - 11	2295533	Supporter-1 R79017-016	1	
3 - 12	2295534	Supporter-2 R79017-017	1	
3 - 13	2295536	Knob Retainer R79017-020	1	
3 - 14	2315169	Dial Pointer R79017-009 (I)	1	
3 - 15	2325185	Slide Plate R79017-026	1	
3 - 16	2415131	Dial Shaft R79017-007	1	
3 - 17	2435059	Shaft Retainer R79017-008	1	
3 - 18	2475052	Flywheel R79017-029	1	
3 - 19	3111306	Pan Head Screw 3 x 6 S/Z	1	
3 - 20	3111325	Pan Head Screw 3 x 25 S/Z	2	
3 - 21	3120006	Flat Countersunk Head Screw 2 x 4 S/BZ	9	
3 - 22	3121103	Flat Countersunk Head Screw 2 x 3 S/Z	4	
3 - 23	3615074	DT Pan Head Screw 3 x 16 S/Z	3	
3 - 24	3618003	PW Tapping Screw A3 x 8 S/Z	8	
3 - 25	3630056	PS Washer 6 x 0.5	2	
3 - 26	3721007	E Ring 5 SUS	1	
	7210139	Headphone Jack AM-J-139	1	J2
	7460830	Rotary Switch AM-S-830	1	S6

(3 - 1) Meter Ass'y

Ref. No.	Stock No.	Description	Q'ty	Remarks
3 - 1 - 1	7310281	Signal Meter AM-M-281	1	M101
3 - 1 - 2	7310282	Tuning Meter AM-M-282	1	M100
3 - 1 - 3	7710186	Binder AM-Z-186	1	

(3 - 2) Switch PCB Ass'y (HI FILTER, FM MUTE)

Ref. No.	Stock No.	Description	Q'ty	Remarks
3 - 2 - 1	2255092	Switch Retainer R79017-021	1	
3 - 2 - 2	3615068	DT Pan Head Screw 3 x 6 S/Z	2	
3 - 2 - 3	7121494	PCB AM-B-1494	1	
	7460787	Push Switch AM-S-787	1	S4
3 - 2 - 4	7710203	Jumper Wire AM-Z-203	3	
3 - 2 - 5	7740206	Print Tip AM-ZE-206	10	
	8111290	Transistor 2SA1100LF	4	Q201, 202, 301, 302
	8113407	Transistor 2SC2575LF	2	Q203, 303
		<b>CAPACITORS</b>		
	5512060	Ceramic 6pF 50V D	2	C214, 314
	5514470	Ceramic 47pF 50V J	2	C215, 315
	5545681	Ceramic 680pF 50V K	2	C213, 313
	5713470	Electrolytic 47μF 16V M	2	C216, 316
	5714479	Electrolytic 4.7μF 25V M	2	C259, 359
	7140179	Electrolytic 1μF 50V MSR AM-CS-179	2	C212, 312
		<b>RESISTORS</b>		
	5922103	Carbon 10KΩ ¼W J CF	2	R221, 321
	5922222	Carbon 2.2KΩ ¼W J CF	4	R215, 315, 218, 318
	5922223	Carbon 22KΩ ¼W J CF	2	R217, 317
	5922225	Carbon 2.2MΩ ¼W J CF	2	R219, 319
	5922272	Carbon 2.7KΩ ¼W J CF	2	R222, 322
	5922823	Carbon 82KΩ ¼W J CF	4	R216, 316, 220, 320

(3 - 3) LED PCB-1 Ass'y (Function Indicator)

Ref. No.	Stock No.	Description	Q'ty	Remarks
3 - 3 - 1	2675107	Packing-1 R79017-035	1	
3 - 3 - 2	7121508	PCB AM-B-1508	1	
	8120261	LED LN217RPC	1	D108
	8120277	LED LN417YP	4	D101, 102, 103, 104
3 - 3 - 3	7710186	Binder SKB-1M	1	

(4) Back Panel Ass'y

Ref. No.	Stock No.	Description	Q'ty	Remarks
4 - 1	*	Power Switch Ass'y	1	
4 - 2	2125207	Back Panel R79016-002 (I)	1	
4 - 3	2171013	Egg Lug 3 mm 0.3 t	1	
4 - 4	2665381	Bushing	1	
4 - 5	3385103	Binding Head Tapping Screw A3 x 8 S/BZ	4	
4 - 6	7150135	Fuse Holder AM-D-135	3	
	7150139	Fuse 125V 4A AM-D-139	2	F2, 3 (Speaker Protection)
	7150140	Fuse 125V 5A AM-D-140	1	F1 (Power)
	7210138	AC Socket AM-J-138	2	J6, 7
4 - 7	7660286	Power Cord AM-YS-286	1	
4 - 8	7710093	Terminal AM-Z-93	1	
4 - 9	7710186	Binder AM-Z-186	1	
4 - 10	7710272	Speaker Terminal AM-Z-272	2	

## (4 - 1) Power Switch Ass'y

Ref. No.	Stock No.	Description	Q'ty	Remarks
4 - 1 - 1	1265093	Power Button R79022-010 (I)	1	
4 - 1 - 2	1715543	Power Switch Cover R79018-009 (I)	1	
4 - 1 - 3	2365489	Power Switch Retainer R79018-038	1	
4 - 1 - 4	3615060	DT Pan Head Screw 3 x 5 S/Z	2	
4 - 1 - 5	3615074	DT Pan Head Screw 3 x 16 S/Z	2	
	7140180	Ceramic Capacitor AM-CS-180	1	C501
	7460785	Push Switch AM-S-785	1	S9

## (5) Tuner PCB Ass'y

Ref. No.	Stock No.	Description	Q'ty	Remarks
5 - 1	2335289	Shield Plate R79017-030	1	
5 - 2	2335302	Shield Plate-2 R79017-034	1	
5 - 3	7121508	PCB AM-B-1508	1	
	7230556	Antenna Coil AM-LA-556	1	L100
	7230592	Bar Antenna AM-LA-592	1	L105
	7250500	IFT AM-LI-500	1	IFT1
	7250646	IFT AM-LI-646	1	IFT2
	7250647	IFT AM-LI-647	1	IFT3
	7250648	IFT AM-LI-648	1	IFT4
	7270108	OSC Coil AM-LO-108	1	L103
	7270494	OSC Coil AM-LO-494	1	L106
	7290026	Choke Coil AM-LS-26	1	L102
	7290293	Choke Coil AM-LS-293	1	L104
	7290507	Tuning Coil AM-LS-507	1	L101
	7460783	Slide Rotary Switch AM-S-783	1	S1
	7460784	Lever Switch AM-S-784	1	S5 (Loudness)
	7460829	Lever Switch AM-S-829	2	S2, 3 (Tape Mon., Copy)
	7560297	Variable Capacitor AM-VC-297	1	VC100
	7470070	Reed Relay AM-SS-70	1	RL100
	7610078	MPX Filter AM-W-78	2	L107, 108
	7640112	Ceramic Filter AM-X-112	2	CF1, 2
	7640113	Ceramic Filter AM-X-113	1	CF3
5 - 4	7710186	Binder AM-Z-186	1	
5 - 5	7710203	Jumper Wire AM-Z-203	50	
	7710271	Jack Plate Unit AM-Z-271	1	J1
5 - 6	7740206	Print Tip AM-ZE-206	60	
	8110058	FET 3SK51	1	Q100
	8110072	IC M5213L	2	IC201, 301
	8110075	IC HA11225	1	IC100
	8110076	IC HA1197	1	IC101
	8110077	IC HA1196	1	IC102
	8113054	Transistor 2SC460C	1	Q103
	8113067	Transistor 2SC535CM	1	Q101
	8113241	Transistor 2SC1342CM	1	Q102
	8113323	Transistor 2SC1312G	2	Q105, 106
	8113328	Transistor 2SC711G	2	Q104, 107
	8130036	Varistor WG-713	15	D100, 105, 106, 107, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119
	8917102	Semi-fixed Resistor 1K $\Omega$ -B	1	VR101
	8917103	Semi-fixed Resistor 10K $\Omega$ -B	1	VR102
	8917104	Semi-fixed Resistor 100K $\Omega$ -B	1	VR100
	8917204	Semi-fixed Resistor 200K $\Omega$ -B	1	VR103

Continued on the following page.

Ref. No.	Stock No.	Description				Q'ty	Remarks	
		<b>CAPACITORS</b>						
	5511010	Ceramic	1pF	50V	C	1	C112	
	5511020	Ceramic	2pF	50V	C	1	C106	
	5512060	Ceramic	6pF	50V	D	1	C110	
	5514221	Ceramic	220pF	50V	J	2	C206, 306	
	5514470	Ceramic	47pF	50V	J	4	C205, 207, 305, 307	
	5515331	Ceramic	330pF	50V	K	2	C111, 149	
	5515360	Ceramic	36pF	50V	K	1	C167	
	5515430	Ceramic	43pF	50V	K	1	C101	
	5527473	Ceramic	0.047 $\mu$ F	50V	Z	21	C102, 105, 126, 130, 131, 140, 141, 142, 144, 145, 146, 152, 160, 161, 162, 163, 165, 168, 171, 172, 181	
	5545102	Ceramic	0.001 $\mu$ F	50V	K	1	C170	
	5545472	Ceramic	0.0047 $\mu$ F	50V	K	4	C103, 113, 124, 125	
	5564100	Ceramic	10pF	50V	J	2	C120, 122	
	5564330	Ceramic	33pF	50V	J	1	C121	
	5572100	Ceramic	10pF	50V	D	1	C100	
	5574180	Ceramic	18pF	50V	J	1	C104	
	8793243	Ceramic	24pF	50V	J	1	C114	
	8797105	Ceramic	0.1 $\mu$ F	50V	Z	2	C256, 257	
	5713010	Electrolytic	1 $\mu$ F	16V	M	2	C147, 150	
	5713100	Electrolytic	10 $\mu$ F	16V	M	7	C164, 169, 174, 188, 189, 190, 191	
	5713101	Electrolytic	100 $\mu$ F	16V	M	6	C127, 143, 151, 175, 202, 302	
	5713108	Electrolytic	0.1 $\mu$ F	16V	M	1	C148	
	5713229	Electrolytic	2.2 $\mu$ F	16V	M	1	C183	
	5713338	Electrolytic	0.33 $\mu$ F	16V	M	2	C192, 193	
	5713339	Electrolytic	3.3 $\mu$ F	16V	M	2	C173, 182	
	5713478	Electrolytic	0.47 $\mu$ F	16V	M	3	C153, 155, 184	
	5713479	Electrolytic	4.7 $\mu$ F	16V	M	1	C166	
	5714479	Electrolytic	4.7 $\mu$ F	25V	M	2	C208, 308	
	7140189	Electrolytic	3.3 $\mu$ F	25V	MSR	2	C201, 301	
	8441222	Electrolytic	220 $\mu$ F	16V	M	1	C185	
	8451222	Electrolytic	220 $\mu$ F	25V	M	2	C209, 309	
	8663023	Styrol	360pF	50V	J	1	C180	
	8873102	Un-inductive Mylar	0.001 $\mu$ F	50V	J	2	C204, 304	
	8873222	Un-inductive Mylar	0.0022 $\mu$ F	50V	J	2	C186, 187	
	8873362	Un-inductive Mylar	0.0036 $\mu$ F	50V	J	2	C203, 303	
	8874683	Un-inductive Mylar	0.068 $\mu$ F	50V	K	2	C210, 310	
		<b>RESISTORS</b>						
	5922101	Carbon	100 $\Omega$	$\frac{1}{4}$ W	J	6	R104, 123, 124, 126, 127, 143	
	5922102	Carbon	1K $\Omega$	$\frac{1}{4}$ W	J	5	R112, 136, 157, 164, 188	
	5922103	Carbon	10K $\Omega$	$\frac{1}{4}$ W	J	7	R134, 156, 165, 166, 186, 194, 197	
	5922104	Carbon	100K $\Omega$	$\frac{1}{4}$ W	J	12	R100, 101, 102, 153, 154, 190, 201, 203, 209, 301, 303, 309	
	5922121	Carbon	120 $\Omega$	$\frac{1}{4}$ W	J	3	R189, 211, 311	
	5922122	Carbon	1.2K $\Omega$	$\frac{1}{4}$ W	J	4	R180, 181, 182, 183	
	5922123	Carbon	12K $\Omega$	$\frac{1}{4}$ W	J	2	R131, 146	
	5922151	Carbon	150 $\Omega$	$\frac{1}{4}$ W	J	2	R137, 162	
	5922152	Carbon	1.5K $\Omega$	$\frac{1}{4}$ W	J	5	R132, 161, 167, 207, 307	
	5922153	Carbon	15K $\Omega$	$\frac{1}{4}$ W	J	2	R130, 148	
	5922154	Carbon	150K $\Omega$	$\frac{1}{4}$ W	J	2	R210, 310	
	5922182	Carbon	1.8K $\Omega$	$\frac{1}{4}$ W	J	2	R204, 304	
	5922221	Carbon	220 $\Omega$	$\frac{1}{4}$ W	J	3	R113, 160, 168	
	5922222	Carbon	2.2K $\Omega$	$\frac{1}{4}$ W	J	6	R144, 147, 202, 212, 302, 312	
	5922223	Carbon	22K $\Omega$	$\frac{1}{4}$ W	J	1	R187	
	5922272	Carbon	2.7K $\Omega$	$\frac{1}{4}$ W	J	1	R191	
	5922274	Carbon	270K $\Omega$	$\frac{1}{4}$ W	J	1	R141	
	5922331	Carbon	330 $\Omega$	$\frac{1}{4}$ W	J	5	R133, 140, 163, 208, 308	
	5922332	Carbon	3.3K $\Omega$	$\frac{1}{4}$ W	J	4	R151, 152, 198, 199	
	5922333	Carbon	33K $\Omega$	$\frac{1}{4}$ W	J	4	R111, 155, 195, 196	

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Ref. No.	Stock No.	Description	Q'ty	Remarks
	5922392	Carbon 3.9K $\Omega$ 1/4W J CF	1	R122
	5922393	Carbon 39K $\Omega$ 1/4W J CF	1	R121
	5922470	Carbon 47 $\Omega$ 1/4W J CF	3	R105, 114, 125
	5922472	Carbon 4.7K $\Omega$ 1/4W J CF	3	R110, 128, 129
	5922473	Carbon 47K $\Omega$ 1/4W J CF	2	R120, 145
	5922560	Carbon 56 $\Omega$ 1/4W J CF	1	R103
	5922561	Carbon 560 $\Omega$ 1/4W J CF	1	R149
	5922562	Carbon 5.6K $\Omega$ 1/4W J CF	2	R158, 142
	5922753	Carbon 75K $\Omega$ 1/4W J CF	2	R206, 306
	5922820	Carbon 82 $\Omega$ 1/4W J CF	1	R159
	5922822	Carbon 8.2K $\Omega$ 1/4W J CF	2	R213, 313
	5922914	Carbon 910K $\Omega$ 1/4W J CF	2	R205, 305
	5922563	Carbon 56K $\Omega$ 1/4W J CF	2	R192, 193

(6) Power Supply PCB Ass'y

Ref. No.	Stock No.	Description	Q'ty	Remarks
6 - 1	2335290	Heat Sink-1	1	
6 - 2	3311108	Pan Head Tapping Screw 3 x 6 S/Z-2M	1	
6 - 3	7121505	PCB AM-B-1505	1	
6 - 4	7710203	Jumper Wire AM-Z-203	3	
6 - 5	7710205	Jumper Wire AM-Z-205	1	
6 - 6	7740206	Print Tip AM-ZE-206	14	
	7910364	Diode RB-151 CF	1	D502
	8120236	Diode 30D1-KE	4	D505, 506, 507, 508
	8120283	Zener Diode MZ-320B	2	D503, 504
	8120285	Zener Diode MZ-314C	1	D501
	8111289	Transistor 2SA850D F-1	1	Q503
	8113410	Transistor 2SC1735D F-1	1	Q502
	8114083	Transistor 2SD357D	1	Q501
		<b>CAPACITORS</b>		
	5527473	Ceramic 0.047 $\mu$ F 50V Z	1	C503
	7140137	Ceramic 0.022 $\mu$ F 500V AM-CS-137		C507, 508
	5714101	Electrolytic 100 $\mu$ F 25V M	4	C512, 513, 515, 516
	7140182	Electrolytic 6800 $\mu$ F 50V AM-CS-182	2	C509, 510
	8441332	Electrolytic 330 $\mu$ F 16V M	2	C505, 506
	8451222	Electrolytic 220 $\mu$ F 25V M	2	C511, 514
	8451332	Electrolytic 330 $\mu$ F 25V M	1	C504
		<b>RESISTORS</b>		
	5922221	Carbon 220 $\Omega$ 1/4W J CF	2	R508, 511
	5922471	Carbon 470 $\Omega$ 1/4W J CF	1	R503
	5922681	Carbon 680 $\Omega$ 1/4W J CF	2	R507, 510
	7450151	Fuse 4.7 $\Omega$ 1/4W J UR AM-RS-151	1	R502
	7450224	Fuse 220 $\Omega$ 1W J SR AM-RS-224	2	R506, 509
	7450182	Metal Film 1.5K $\Omega$ 2W J CF AM-RS-182	2	R504, 505

(7) Amplifier PCB Ass'y

Ref. No.	Stock No.	Description	Q'ty	Remarks
7 - 1	7121513	PCB AM-B-1513	1	
	7290535	Choke Coil 2 mH AM-LS-535	2	L201, 301
	7470071	Relay AM-SS-71	1	RL401
	7580919	Volume 200K $\Omega$ AM-VR-919	1	VR201
	7580920	Volume 50K $\Omega$ -B AM-VR-920	3	VR202, 203, 204
7 - 2	7710203	Jumper Wire AM-Z-203	14	
7 - 3	7710233	Jumper Lead AM-Z-233	1	

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Ref. No.	Stock No.	Description	Q'ty	Remarks
7 - 4	7740206	Print Tip AM-ZE-206	25	
	8110073	IC HA12002	1	IC401
	8111268	Transistor 2SA844E	4	Q206, 207, 306, 307
	8111290	Transistor 2SA1100LF	2	Q214, 314
	8112229	Transistor 2SB646	2	Q208, 308
	8112230	Transistor 2SB647C	2	Q211, 311
	8113407	Transistor 2SC2575LF	2	Q205, 305
	8114085	Transistor 2SD666	2	Q209, 309
	8114086	Transistor 2SD667C	2	Q210, 310
	8120067	Diode W06B	1	D401
	8130036	Varistor WG-713	5	D201, 203, 301, 303, 402
	8130050	Varistor MV-103YS	2	D202, 302
	8917501	Semi-fixed Resistor 500Ω-B	2	VR205, 305
		<b>CAPACITORS</b>		
	5514101	Ceramic 100pF 50V J	2	C270, 370
	5514121	Ceramic 120pF 50V J	2	C211, 311
	5514360	Ceramic 36pF 50V J	4	C266, 366, 274, 374
	5712101	Electrolytic 100μF 10V M	1	C404
	5712221	Electrolytic 220μF 10V M	1	C402
	5713100	Electrolytic 10μF 16V M	8	C200, 300, 260, 360, 267, 367, 401, 403
	5713470	Electrolytic 47μF 16V M	4	C268, 368, 271, 371
	5713479	Electrolytic 4.7μF 16V M	2	C269, 369
	5714220	Electrolytic 22μF 25V M	2	C217, 317
	5716470	Electrolytic 47μF 50V M	4	C272, 372, 273, 373
	8461100	Electrolytic 1μF 50V M	2	C277, 377
	8874103	Un-inductive Mylar 0.01μF 50V K	2	C262, 362
	8874472	Un-inductive Mylar 0.0047μF 50V K	2	C261, 361
	8874473	Un-inductive Mylar 0.047μF 50V K	4	C264, 364, 265, 365
	8874563	Un-inductive Mylar 0.056μF 50V K	2	C275, 375
	8874822	Un-inductive Mylar 0.0082μF 50V K	2	C263, 363
		<b>RESISTORS</b>		
	5922103	Carbon 10KΩ ¼W J CF	6	R265, 268, 365, 368, 267, 367
	5922104	Carbon 100KΩ ¼W J CF	3	R269, 369, 404
	5922121	Carbon 120Ω ¼W J CF	4	R278, 378, 280, 380
	5922154	Carbon 150KΩ ¼W J CF	1	R402
	5922182	Carbon 1.8KΩ ¼W J CF	2	R262, 362
	5922183	Carbon 18KΩ ¼W J CF	2	R275, 375
	5922222	Carbon 2.2KΩ ¼W J CF	6	R260, 261, 360, 361, 272, 372
	5922223	Carbon 22KΩ ¼W J CF	1	R403
	5922272	Carbon 2.7KΩ ¼W J CF	2	R277, 377
	5922273	Carbon 27KΩ ¼W J CF	2	R258, 358
	5922332	Carbon 3.3KΩ ¼W J CF	2	R270, 370
	5922392	Carbon 3.9KΩ ¼W J CF	1	R408
	5922472	Carbon 4.7KΩ ¼W J CF	6	R263, 363, 264, 364, 266, 366
	5922473	Carbon 47KΩ ¼W J CF	4	R273, 373, 276, 376
	5922562	Carbon 5.6KΩ ¼W J CF	2	R271, 371
	5922681	Carbon 680Ω ¼W J CF	4	R274, 374, 214, 314
	5922822	Carbon 8.2KΩ ¼W J CF	2	R279, 379
	8300136	Carbon 6.8KΩ ¼W J UR	2	R294, 394
	8300150	Carbon 56KΩ ¼W J UR	2	R406, 407
	7450180	Metal Film 10Ω 1W J CF AM-RS-180	4	R287, 288, 387, 388
	7450184	Metal Film 470Ω 1W J CF AM-RS-184	1	R405
	7450207	Metal Film 270Ω 1W J CF AM-RS-207	1	R289, 389
	7450183	Cement 0.47Ω 2W AM-RS-183	4	R285, 385, 286, 386
	7450201	Fuse 120Ω ¼W J SR AM-RS-201	4	R281, 381, 282, 382
	7450221	Fuse 150Ω ½W J SR AM-RS-221	4	R283, 383, 284, 384
	8233333	Solid 3.3KΩ ½W J RC	1	R401

**(8) Heat Sink Ass'y**

Ref. No.	Stock No.	Description	Q'ty	Remarks
8 - 1	2295529	Heat Sink Retainer R79018-039	2	
8 - 2	2335293	Heat Sink R79016-004	1	
8 - 3	3615068	DT Pan Head Screw 3 x 6 S/Z	2	
8 - 4	3615069	DT Pan Head Screw 3 x 8 S/Z	11	
	8112231	Transistor 2SB748AC	2	Q213, 313
	8114087	Transistor 2SD824AC	2	Q212, 312

**(9) Bottom Cover Unit**

Ref. No.	Stock No.	Description	Q'ty	Remarks
9 - 1	1615343	Bottom Cover R79017-03901	1	
9 - 2	1735016	Cabinet Foot S-type	5	
9 - 3	3111410	Pan Head Screw 4 x 10 S/Z	5	
9 - 4	3711017	Flat Washer 5 SPC/Z	5	

**(10) Carton Box Ass'y**

Ref. No.	Stock No.	Description	Q'ty	Remarks
10 - 1	4416296	Carton Box ZPK-A6296	1	
10 - 2	4426146	Cushion-1 ZPK-B6146	1	
10 - 3	4426147	Cushion-2 ZPK-B6147	1	
10 - 4	4426148	Cushion-3 ZPK-B6148	1	





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