

**SERVICE MANUAL**



**FISHER**

**RS-140**

**DIGITAL SYNTHESIZER RECEIVER**



*The first name in high fidelity*

## SPECIFICATIONS

### POWER AMPLIFIER SECTION

Minimum RMS sine wave power per channel within stated bandwidth at no more than stated distortion with an 8 ohm load	40 Watts
Power Bandwidth	10-30000 Hz
Total Harmonic Distortion	0.09 %
I.M. Distortion	0.05 %
Speaker Damping	40

### PREAMPLIFIER SECTION

Frequency Response	
Phono MM (RIAA)	±0.8 dB
Aux (20 Hz-20 kHz)	±1.0 dB
Input Sensitivity and Impedance	
Phono MM	2.5 mV/47 kΩ
Tape	150 mV/47 kΩ
Aux	150 mV/47 kΩ
Graphic Equalizer	
50 Hz	±10 dB
250 Hz	±10 dB
1 kHz	±10 dB
4.5 kHz	±10 dB
15 kHz	±10 dB
Low Filter (Below 60 Hz)	-6 dB/oct.
High Filter (Above 5 kHz)	-6 dB/oct.
Loudness Contour (100 Hz/10 kHz)	+7 dB/ +3 dB
Hum and Noise (IHF A Weighted, Inputs Shorted)	
Phono MM	75 dB
Tape	90 dB
Aux	90 dB

### FM TUNER SECTION

Usable Sensitivity	
Mono (26dB S/N 40 kHz DEV.)	1.8 μV/16.2 dBf
Stereo (46dB S/N 40 kHz DEV.)	30 μV (40.8dBf)

Signal-to-Noise Ratio	
Mono	65 dB
Stereo	60 dB
Capture Ratio	1.5 dB
Alt. Channel Selectivity (±300 kHz)	60 dB
Image Response Ratio	75 dB
Spurious Response Ratio	65 dB
IF Rejection	90 dB
AM Suppression	50 dB
T.H.D. at 65 dBf	
Mono	0.3 %
Stereo	0.4 %
Stereo Separation	
1 kHz	40 dB
Sub-Carrier Product Rejection	
19/38 kHz	60 dB
Audio Frequency Response	
(20 Hz-15 kHz)	±1 dB

### MW SECTION

Usable Sensitivity	400 μV/m
Signal-to-Noise Ratio	40 dB
Image Response Ratio	45 dB
IF Rejection	50 dB

### LW SECTION

Usable Sensitivity	1200 μV/m
Image Response Ratio	35 dB
IF Rejection	25dB

### GENERAL

Power Requirements	220V AC ± 10%
Maximum Power Consumption	185 Watts
Dimensions (WxHxD)	
Inches	15-3/4x4-3/4x11-13/16
mm	400x120x300
Weight	
lbs.	15-1/4
kg	6.9

\* Because its products are subject to continuous improvement, Fisher Corporation reserves the right to modify product designs and specifications without notice and without incurring any obligation.

## TO CHANGE THE VOLTAGE

This unit is capable of operation on 220V or 120V AC, 50 to 60Hz.

It has been preset at the factory for 220V AC operation by connecting a strip-wire into the position marked "~220V." See VOL. SEL. P.C.B. WIRING DIAGRAM.

To change for 120V AC operation, cut off the strip-wire on the "~220V" position, insert a strip-wire into the "~120V" position, and solder it. After changing, replace the mains voltage indication of the rating plate with the "120V" label supplied with the unit.

## ALIGNMENT PROCEDURES

AM ALIGNMENT INSTRUMENTS	AM IF Sweep Generator, AM RF Signal Generator, VTVM, and Oscilloscope.
NOTE	Place the controls and switches in the following positions unless otherwise instructed.
	FUNCTION—AN position
	BALANCE—0 (center)
	BASS—0 (center)
	MONO/FM mute, Loudness, High and Low Filters—OFF (outer) position
	Speakers—A position where a pair of test speakers are connected.
	Keep the input signal level as low as possible to avoid the AVC action.
	VOLUME—0 (minimum)
	Tape Monitor—OFF (SOURCE)
	TREBLE—0 (center)

### AM IF ALIGNMENT

Step	Generator Connection	Input Signal	Receiver, Dial setting	Test Equipment Connection	Adjustment
1	Sweep Generator to TP 10 Thru a 0.02 mfd ceramic capacitor	450 kHz	522 kHz	Oscilloscope to TP11	Tune L13,L14,L16 for highest and most symmetrical IF response. See Figure 1.

# ALIGNMENT PROCEDURES

## MW RF ALIGNMENT

Step	Generator Connection	Input Signal	Receiver Dial Setting	Test Equipment Connection	Adjustment
1	No Connection	No Signal	522 kHz	Connect VTVM across J402 and ground	Adjust L10 for more than 1.3V DC.
2		No Signal	1,611 kHz		Adjust CT5 for more than 8.0V DC.
3	Loop Ant.	603 kHz, 400 Hz, 30% mod. 300 $\mu$ V/m	603 kHz	Connect VTVM's in parallel with the test speakers. Adjust VOLUME Control for 2V reading on the VTVM's.	Tune L12 for max output.

## MW SIGNAL STRENGTH INDICATOR ADJUSTMENT

Step	Generator Connection	Input Signal	Receiver Dial Setting	Adjustment
1	Loop Ant.	999 kHz, 400 Hz, 30% mod. 10 $\mu$ V/m	999 kHz	Adjust SVR8 for 5 lighted LED's in the Signal Strength Indicator.

## MW SIGNAL SCAN LEVEL ADJUSTMENT

Step	Generator Connection	Input Signal	Receiver Dial Setting	Test Equipment Connection	Adjustment
1	Loop Ant.	999 kHz, 400 Hz, 30% mod. 398 $\mu$ V/m	999 kHz	Connect VTVM across Q16 Collector and ground.	Adjust SVR7 for 4.5V~5.5V DC.

## FM ALIGNMENT INSTRUMENT NOTE

FM IF Sweep Generator, Stereo Signal Generator, FM Generator, VTVM, and Oscilloscop. Place the FUNCTION switch in the FM position. Leave all other selectrors and switches in the positions as under NOTE of AM ALIGNMENT unless otherwise instructed.

## FM IF ALIGNMENT

Step	Generator Connection	Input Signal	Test Equipment Connection	Adjustment
1	Sweep Generator to CF1 thru a 0.02mfd ceramic capacitor.	10.7 MHz	Oscilloscope to TP7	Adujust T5,T6, for highest and mist symmetrical "S" curve. See Figure 2.

## LW RF ALIGNMENT

Step	Generator Connection	Input Signal	Receiver Dial Setting	Test Equipment Connection	Adjustment
1	No Connection	No Signal	153 kHz	Connect VTVM across J402 and ground	Adjust L9 for more than 9.3V DC.
2	Loop Ant.	15.5 kHz 400 Hz 30% mod. 1.2 $\mu$ V/m	155 kHz	Connect VTVM's in parallel with the test speakers Adjust VOLUME Control for 2V readings on the VTVM's	Tune L11, output. for maximum output.
3		350 kHz 400 Hz 30% mod. 1.2 $\mu$ V/m	350 kHz		Tune CT7 for maximum output.
4 Repeat above steps until no further change is noted in any of the MW RF adjustment.					

# ALIGNMENT PROCEDURES

## FM SIGNAL STRENGTH INDICATOR ADJUSTMENT

Step	Generator Connection	Input Signal	Receiver Dial Setting	Test Equipment Connection	Adjustment
1	Dummy Antenna See Figure 3.	98.1 MHz, 1000 Hz, 40 kHz mod. 1.7 $\mu$ V	98.1 MHz		Adjust SVR5 for 5 lighted LED in the Signal Strength Indicator

## FM MUTING LEVEL ADJUSTMENT

Step	Generator Connection	Input Signal	Receiver Dial Setting	Test Equipment Connection	Adjustment
1	Dummy Antenna See Figure 3.	98.1 MHz, 1000 Hz, 40kHz mod. 2.5 $\mu$ V	98.1 MHz	Connect VTVM across IC5 Pin NO.12 and ground	Adjust SVR6 for more than 4.5V DC.

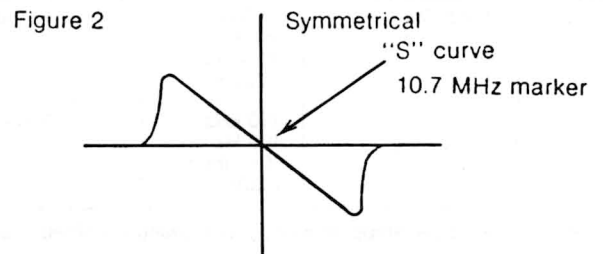
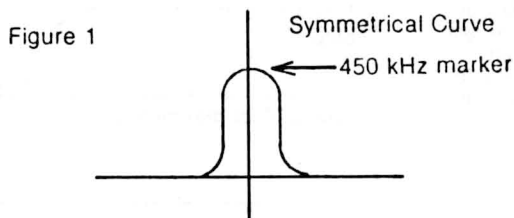
## FM MPX ADJUSTMENT (See Figure 4.)

NOTE The FM IF Alignment must be completed before attempting this FM MPX adjustment. Poor IF alignment. Poor IF alignment will result in poor FM MPX adjustment.  
Place the FUNCTION selector switch in FM position.

Step	Generator Connection	Input Signal	Stereo Signal Generator	Receiver Dial Setting	Test Equipment Connection	Adjustment
1	No Connection	No Signal	No Signal	Any setting where no external signal received. Place MUTE Switch On (outer) position if necessary.	Connect frequency Counter to TP-8 Disconnect flat cable from CS-11 on Function Board.	Adjust SVR10 for 19 kHz on the counter.
2	Thru dummy Ant. See Figure 3.	98.1MHz 1mV	19 kHz, 6 kHz mod. 1kHz 40 kHz mod. Right channel only	98.1 MHz	Connect VTVM's in parallel with the test speaker, or 8 ohm dummy loads.	Adjust VOLUME Control for 2V on the Right VTVM. Then adjust SVR 11 for minimum (less than 35mV) on the Left VTVM.
3			19 kHz, 6 kHz mod. 1 kHz 40 kHz mod. Left channel only			Adjust VOLUME Control for 2V on the Left VTVM. Then adjust SVR 11 for minimum (less than 35mV) on the Right VTVM.
4. Repeat the Steps 2 and 3 until the minimum readings on the both channels are balanced.						

## FM MUTING BAND WIDTH ADJUSTMENT

Step	Generator Connector	Input Signal	Receiver Dial Setting	Test Equipment Connection	Adjustment
1	Dummy Antenna See Fig.3	98.1 MHz 1 kHz 40 kHz mod. 1mV/m	98.1 MHz	Connect VTVM across IC5 pin No.12 and ground.	Adjust SVR 9 for more than 4.5V DC when SG Frequency change $\pm$ 35 kHz.









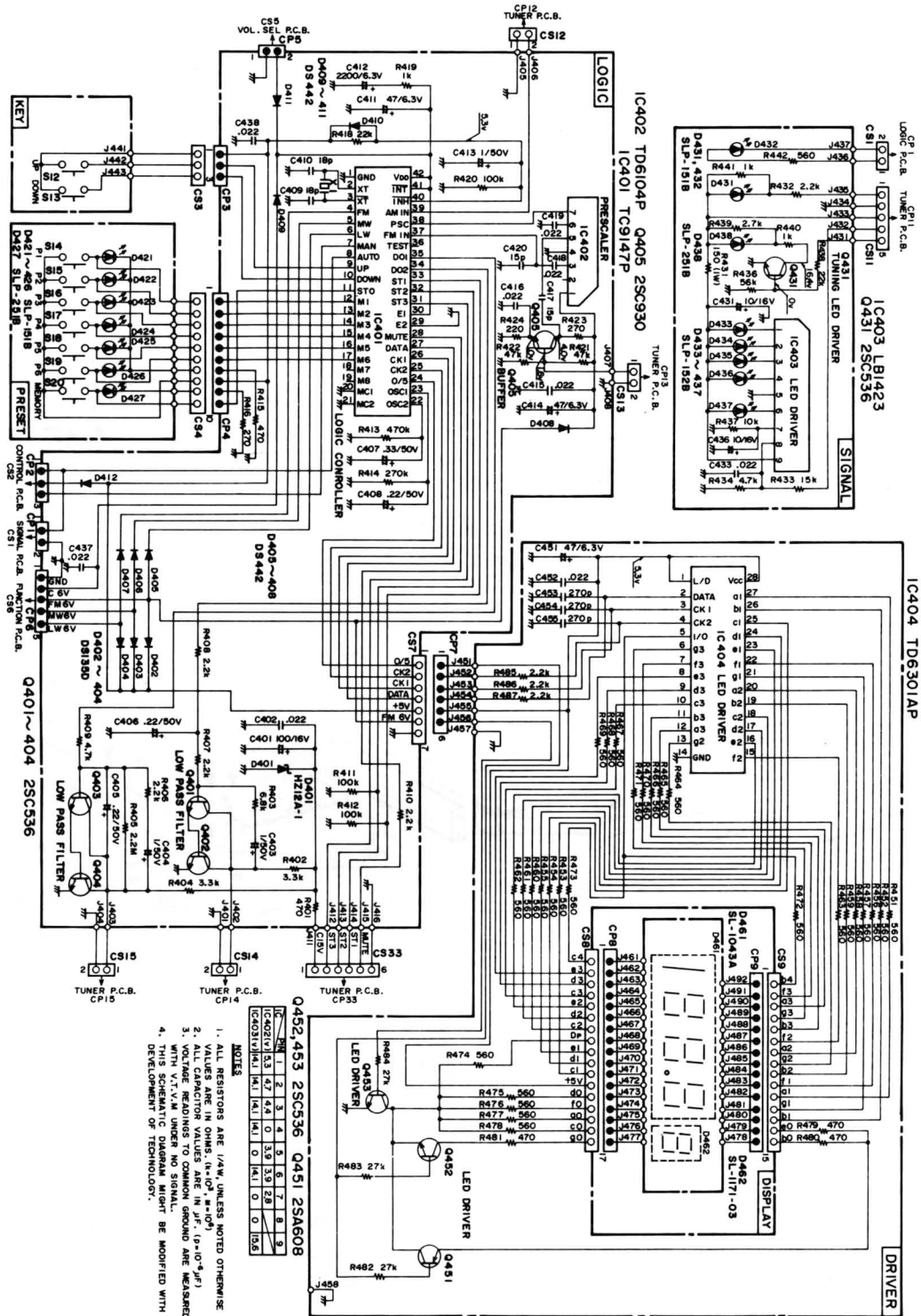




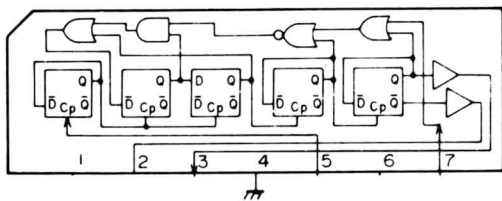




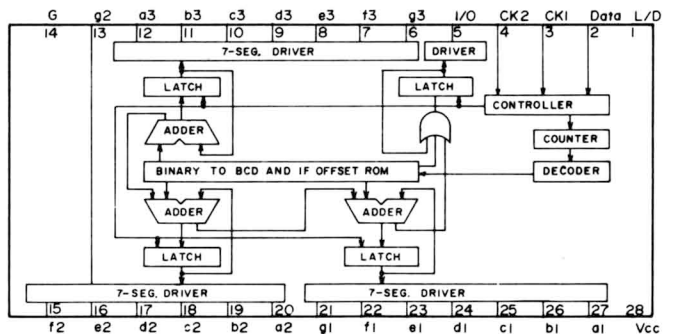
# SCHEMATIC DIAGRAM



**TD6104P, IC402**

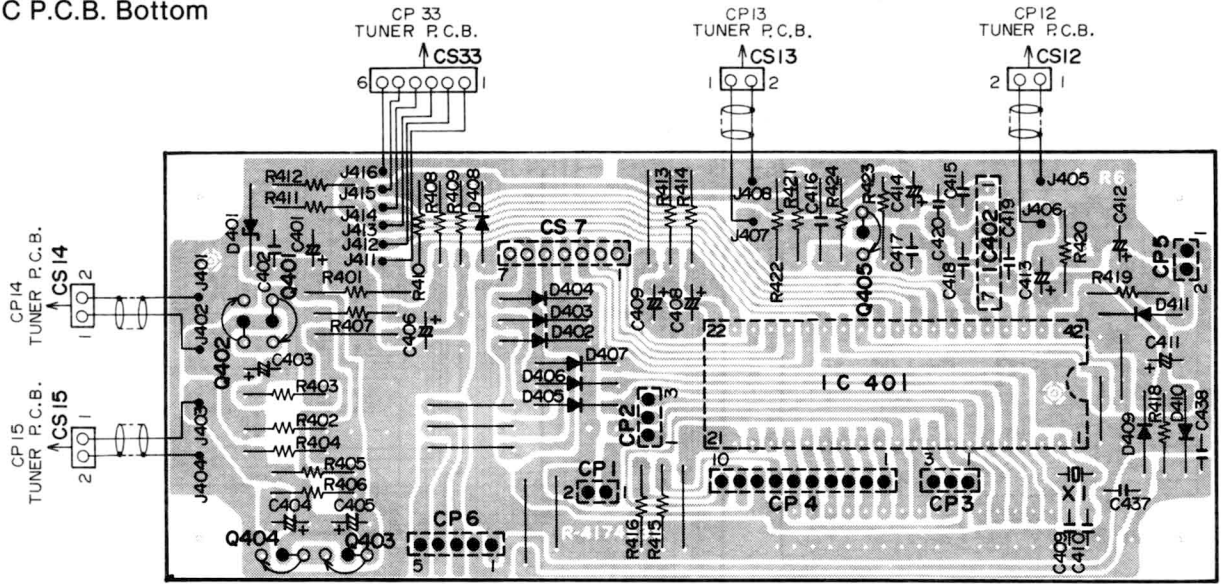


**TD6301AP, IC404**

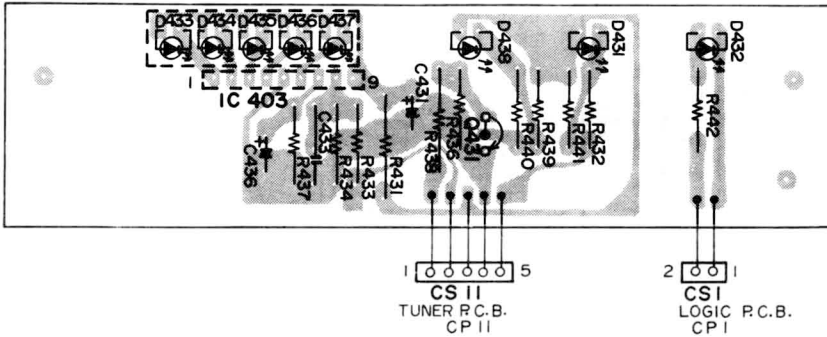


# WIRING DIAGRAM

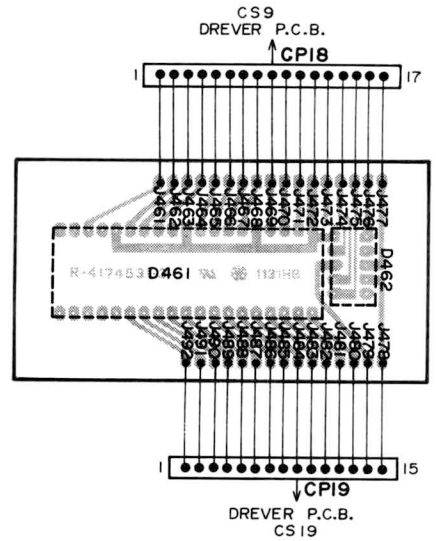
## LOGIC P.C.B. Bottom



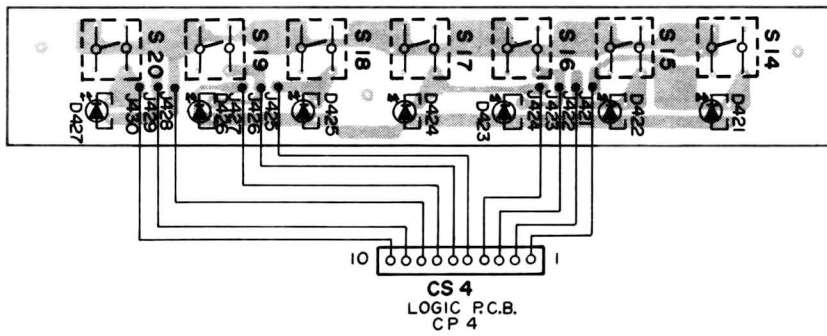
## SIGNAL P.C.B. Bottom



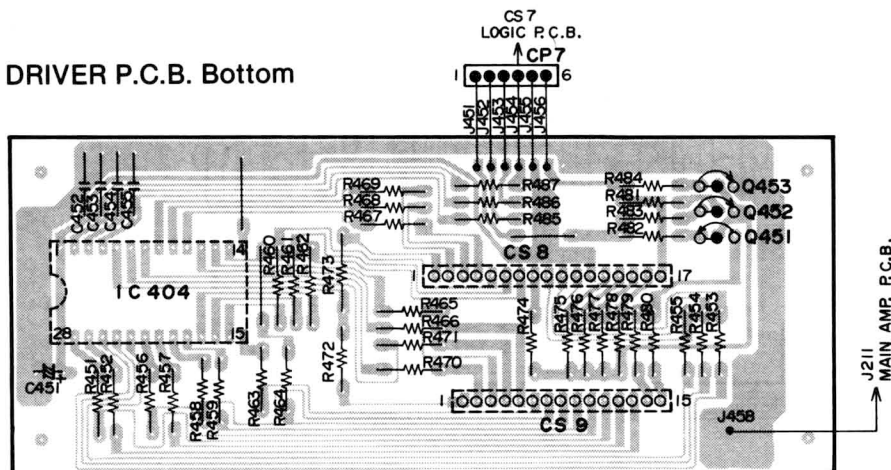
## DISPLAY P.C.B. Bottom



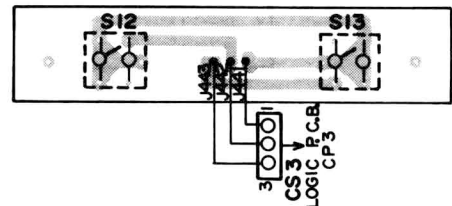
## PRESET P.C.B. Bottom



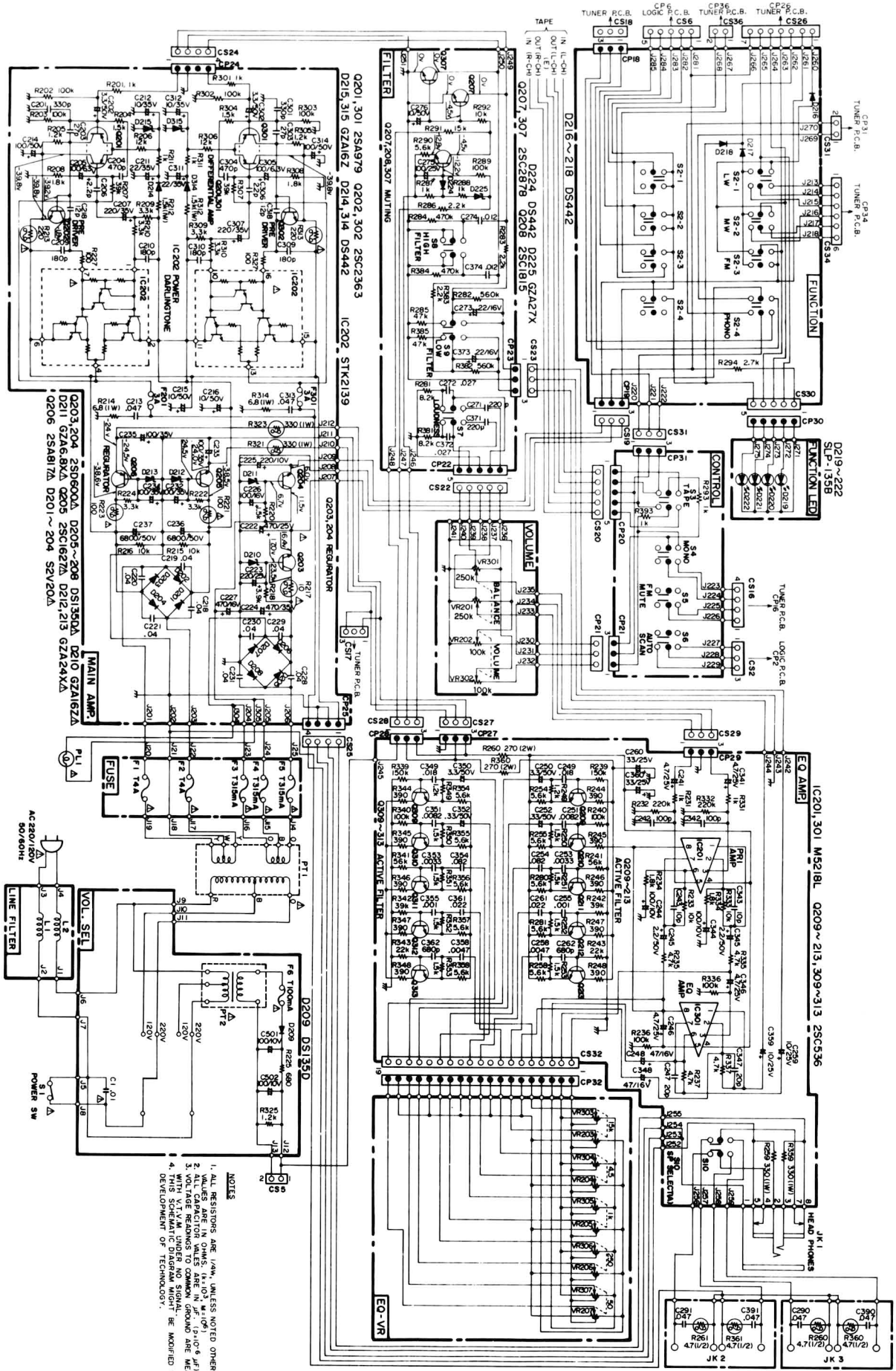
## DRIVER P.C.B. Bottom



## TUNING P.C.B. Bottom

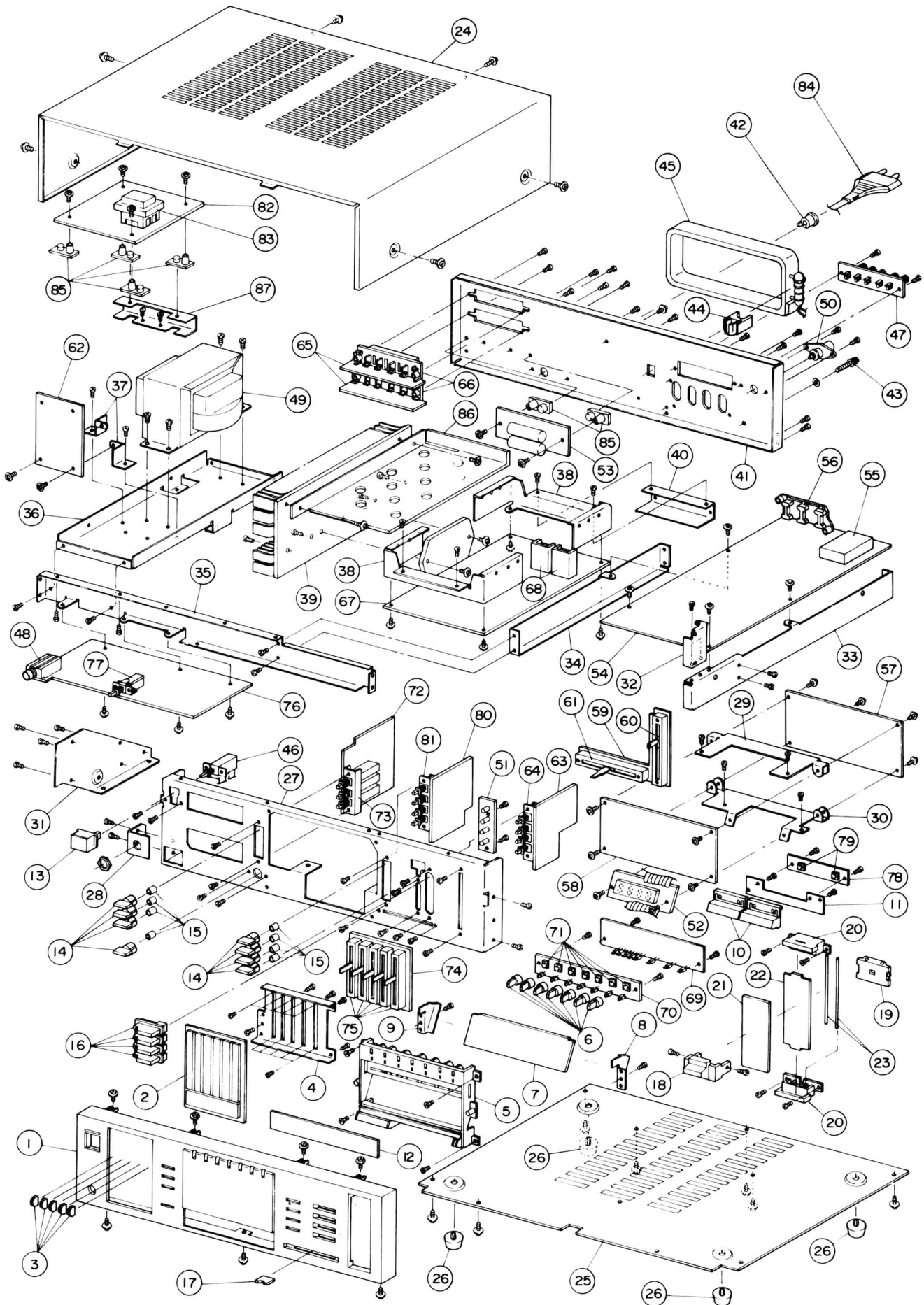


# SCHEMATIC DIAGRAM



- NOTES**
1. ALL RESISTORS ARE 1/4W, UNLESS NOTED OTHERWISE
  2. ALL CAPACITOR VALUES ARE IN μF. (1P=10<sup>-12</sup> F)
  3. WITH V.I.V.M UNDER NO SIGNAL AND ARE MEASURED
  4. THIS SCHEMATIC DIAGRAM MIGHT BE MODIFIED WITH DEVELOPMENT OF TECHNOLOGY.

# EXPLODED VIEW





# PARTS LIST

Key No.	Ref.No.	PART No.	DESCRIPTION	Q'ty
<b>PACKAGE PARTS</b>				
		R-4775652	Label, Date	3
		R-357556	Polyethylene bag, AC cord	1
		R-357694	Polyethylene bag, Set	1
		R-4776830	Instruction manual	1
		R-4773695	Guarantee card	1
		R-357562-1	Polyethylene bag, Instruction book	1
		R-4174399	Styro-foam cushion, Set front	1
		R-4174400A	Styro-foam cushion, Set rear	1
		R-4076399-1	Individual carton	1
		R-4776800	Caution label	1
		R-4776311-3	Caution sheet	1
<b>ACCESSORY</b>				
		R-S37219	FM antenna	1
<b>CABINET MECHANICAL PARTS</b>				
1		R-A78114-1	Front panel assembly	1
2		R-327646	Sign window, G'EQ	1
			Tap. Screw, Washer Hd., B-tight, 3x6	7
3		R-3975326	Knob, GRAPHIC EQUALIZER	5
4		R-1274198	Bracket, EQ VR	1
			Tap. Screw, Pan Hd., B-tight, 3x6	4
5		R-A78115	Bracket assembly	1
			Tap. Screw, Oval Hd., B-tight, 3x8	4
6		R-3975301	Knob, MEMO/P1~P6	7
7		R-3870478-1	Sign window, FREQ LED	1
8		R-1274199	Bracket, Sign window mtg.	1
9		R-1274200	Bracket, Sign window mtg.	1
			Tap. Screw, Pan Hd., B-tight, 3x8	2
10		R-3975279	Knob, TUN	2
11		R-1274201	Bracket, TUNING P.C.B.	1
			Tap. Screw, Pan Hd., B-tight, 3x6	2
12		R-3870477	Sign window, SIGNAL meter	1
13		R-3975314	Knob, POWER	1
14		R-3975293	Knob, LOUDNESS/HIGN FILTER/ LOW FILTER/SPEAKERS/ TAPE MONITOR/MONO/ FM MUTE/AUTO SCAN	8
15		R-4171489	Cushion, Knob	8
16		R-A78029	Knob assembly, FUNCTION	4
17		R-3975310	Knob, BALANCE	1
18		R-3975280	Knob, VOLUME	1
19		R-3975283	Slide, VOLUME	1
			Tap. Screw, Bind Hd., B-tight, 3x8	2
20		R-3975282	Bracket, Shaft	2
			Tap. Screw, Pan Hd., B-tight, 3x6	4
21		R-3870474-1	Sign window	1
22		R-1274202	Bracket, Sign window	1
23		R-1571712	Shaft, Slide	2
24		R-1274182-1	Top lid	1
			Tap. Screw, Washer Hd., S-tight, 4x6	4
			Tap. Screw, Washer Hd., B-tight, 3x6	2
25		R-1274191	Bottom lid	1
			Tap. Screw, Washer Hd., B-tight, 3x6	11
26		R-S872604	Base assembly	4
		R-4174627	Ventilation	1
<b>CHASSIS MECHANICAL PARTS</b>				
27		R-1274168	Front chassis	1
28		R-1274203	Bracket, H. PHONE	1
			Tap. Screw, Oval Hd., B-tight, 3x6	2
29		R-1274194	Bracket, LOGIC P.C.B. mtg.	1
30		R-1274195	Bracket, LOGIC P.C.B. mtg.	1
			Tap. Screw, Pan Hd., B-tight, 3x6	4
31		R-1274207	Bracket, Front chassis left	1
			Tap. Screw, Oval Hd., B-tight, 3x6	4
32		R-1274094	Bracket, Front chassis right	1
			Tap. Screw, Oval Hd., B-tight, 3x6	3
33		R-1274106	Bracket, Right chassis	1
			Tap. Screw, Oval Hd., B-tight, 3x6	1
			Tap. Screw, Pan Hd., B-tight, 3x6	4
34		R-1274104	Bracket, TUNER P.C.B. left	1
			Tap. Screw, Pan Hd., B-tight, 3x6	4
35		R-1274192A	Chassis	1

Key No.	Ref.No.	PART No.	DESCRIPTION	Q'ty
36		R-1274109B	Chassis, Trans	1
37		R-1274099	Tap. Screw, Pan Hd., B-tight, 3x6	4
			Bracket, Fuse P.C.B.	2
			Tap. Screw, Washer Hd., B-tight, 3x6	2
38		R-1274093A	Bracket, MAIN AMP. P.C.B.	2
			Tap. Screw, Washer Hd., B-tight, 3x6	4
39		R-277993-1	Heat sink, Power IC	1
			Tap. Screw, Pan Hd., B-tight, 3x8	4
40		R-1274098	Bracket, AMP. P.C.B.	1
			Tap. Screw, Pan Hd., B-tight, 3x6	2
41		R-1274396A	Rear chassis	1
42		R-377070	Bushing, AC cord	1
43		R-1570437	Earth terminal, GND	1
			Flat washer, Metal, $\varnothing 3x\varnothing 8x1t$ , GND	1
44		R-377150	Holder, Antenna coil	1
		R-3974571-L	Knob, Holder	1
85		R-3974830	Fix plastic board, Line filter P.C.B. mtg.	2
			Tap. Screw, Pan Hd., B-tight, 3x6	2
			Tap. Screw, Washer Hd., B-tight, 3x6	2
86		R-2673652	Heat sink	1
			Screw, Pan Hd., With flat washer, 3x8	2
			Tap. Screw, Washer Hd., B-tight, 3x6	1
87		R-1274402	Bracket, VOL select P.C.B. mtg.	1
			Tap. Screw, Pan Hd., B-tight, 3x6	2
85		R-3974830	Fix plastic board, VOL select P.C.B. mtg.	4
			Tap. Screw, Pan Hd., B-tight, 3x6	4
			Screw, Pan Hd., 2x3	10
			EQ VR mtg.	
			Tap. Screw, Pan Hd., B-tight, 3x8	2
			Signal P.C.B. mtg.	
			Tap. Screw, Pan Hd., B-tight, 3x8	3
			Preset P.C.B. mtg.	
			Tap. Screw, Washer Hd., B-tight, 3x6	6
			Tuner P.C.B. Mtg.	
			Screw, Oval Hd., 3x6	2
			Filter switch mtg.	
			Screw, Oval Hd., 3x6	2
			Push switch mtg.	
			Screw, Oval Hd., 3x6	2
			Push switch mtg.	
			Screw, Oval Hd., 3x6	2
			Function switch mtg.	
			Screw, Oval Hd., 3x6	2
			Balance VR mtg.	
			Screw, Pan Hd., 3x6	2
			Slide VR mtg.	
			Tap. Screw, Pan Hd., B-tight, 3x5	2
			Function LED P.C.B. mtg.	
			Tap. Screw, Washer Hd., B-tight, 3x6	8
			Logic P.C.B. mtg.	
			Tap. Screw, Washer Hd., B-tight, 3x6	2
			Display P.C.B. mtg.	
			Tap. Screw, Washer Hd., B-tight, 3x6	3
			Speaker P.C.B. mtg.	
			Tap. Screw, Pan Hd., B-tight, 3x6	2
			Fuse P.C.B. mtg.	
			Tap. Screw, Pan Hd., B-tight, 3x6	4
			Main amp. P.C.B. mtg.	
			Tap. Screw, Washer Hd., B-tight, 3x14	2
			IC-Heat sink	
			Tap. Screw, Pan Hd., B-tight, 3x8	8
			Terminal plate mtg.	
			Tap. Screw, Pan Hd., B-tight, 3x6	1
			Earth terminal mtg.	
			Tap. Screw, Washer Hd., B-tight, 3x6	4
			VOL select P.C.B. mtg.	
<b>CHASSIS ELECTRICAL PARTS</b>				
45	L17	R-W27182	Antenna coil	1
46	S1	▲ R-S47898A	Push switch, Power	1
			Screw, Oval Hd., 3x6	2
47	JK5	R-S17619	Terminal plate, AM/GND/LOOP	1
			Screw, Pan Hd., 3x8	2
			Nut, Hex Hd., 3	2
50	JK6	R-S27319	Socket, FM ANT	1
48	JK1	R-S27438-2	Jack, PHONES	1

NOTES : 1. Part orders must contain Model Number, Part Number and Description.  
2. Ordering quantity of screws and/or resistors must be multiple of 10 pcs.

**PARTS LIST**

Key No.	Ref.No.	PART No.	DESCRIPTION	Q'ty	
49	PT1	▲ R-W770253-2	Power transformer	1	
84		▲ R-S37089-1	Screw, Bind Hd., S-tight, 4x8	4	
		▲ R-367300	AC cord	1	
		▲ R-17432	Cover, AC cord	1	
	F1,2	R-S17432	Fuse, 4A	2	
	F3,4,5	R-S17261	Fuse, 315mA	3	
	F6	R-S17441	Fuse, 100mA	1	
	F201, 301	▲ R-S17286	Fuse, 3.15A	2	
		R-257277	Terminal	1	
		R-237113	Earth terminal	4	
			Tap. Screw, Pan Hd., B-tight, 3x6	1	
		R-S17243	Cord clip	6	
		R-S17399	Nylon band	13	
	PL1	▲ R-S17581	Pilot lamp, 14V 40mA	1	
	51		R-4174390-2	Printed circuit board, Function LED	1/2
	52		R-4174531-3	Printed circuit board, Display	1
	53		R-4174534	Printed circuit board, LINE FILTER	1
		L1,2	▲ R-W17004	Choke coil	2
		CS1,5,	R-S27298-2	Housing, 2P	8
		12~15,36,37			
		CS2,3,17,	R-S27298-3	Housing, 3P	11
	18,21,23,27,28,29,31,35				
	CS4	R-S27298-10	Housing, 10P	1	
	CS26	R-S27298-7	Housing, 7P	1	
	CS6,11,	R-S27298-5	Housing, 5P	4	
	20,22				
	CS16,24	R-S27298-4	Housing, 4P	2	
	CS33,34	R-S27298-6	Housing, 6P	2	
		R-247755	Terminal	123	
	CS9	R-S27440-15	Socket, 15P	1	
	CS8	R-S27440-17	Socket, 17P	1	
	CS7	R-S27440-6	Socket, 6P	1	
	CS30	R-S27440-5	Socket, 5P	1	
	CS25	R-377103-4	Housing, 4P	1	
		R-257265	Terminal	4	
	CP9	R-S37410-6	PC joiner	1	
	CP8	R-S37410-8	PC joiner	1	
	CP9	R-S37415-6	PC joiner	1	
	CP8	R-S37417-8	PC joiner	1	
	CP7	R-S37416-7	PC joiner	1	
	CP32	R-S37410-13	PC joiner	1	
		R-S37419-13	} or PC joiner	1	
	CP30	R-S37415-7	PC joiner	1	
	CS32	R-S27440-2	} or Socket	1	
		R-S27440-9		1	
<b>SEMICONDUCTORS</b>					
	IC202	▲	Integrated circuit, STK-2139	1	
	D461		LED, SL-1043A	1	
	D219,220,221,222		LED, SLP-135B	4	
	D421~426,431,432		LED, SLP-151B	8	
	D427,438		LED, SLP-251B	2	
	D437		LED, SLP-152B	1	
	D462		LED, SLP-1171-03	1	
<b>TUNER P.C.B. ASSEMBLY</b>					
54		R-A78639	Circuit board assembly, Tuner	1	
55		R-S872943	Tuner	1	
	T5	R-W5T7039	IF transformer	1	
	T6	R-W5T7040	IF transformer	1	
	L5,6	R-W17014-1	Filter coil	2	
	L7	R-M1722	Filter coil	1	
	L8	R-M1723	Filter coil	1	
	L9	R-W87058	OSC coil, LW	1	
	L10	R-W87059	OSC coil, MW	1	
	L11	R-W27212	Antenna coil, LW	1	
	L12	R-W27202	Antenna coil, MW	1	
	L13	R-W5T7008	IF transformer	1	
	L14	R-W5T7009	IF transformer	1	
	L15	R-W17048	Choke coil, 330μ	1	
	L16	R-W4722	Filter coil	1	
	CF1,2,3	R-S17483-1	Ceramic, filter	3	
	CF4	R-S17537	Ceramic filter	1	
	SVR5	R-R110705	Preset resistor, 50 k	1	
	SVR6,7,8,9	R-R110735	Preset resistor, 20 k	1	
	SVR10	R-R110724	Preset resistor, 10 k	1	
	SVR11	R-R110736	Preset resistor, 250 k	1	
	CT5,7	R-C0735	Trimmer	2	
	CP12,13,	R-S27207-2	Plug, 2P	6	
	14,15,36,37				

Key No.	Ref.No.	PART No.	DESCRIPTION	Q'ty	
56	CP17,35	R-S27207-3	Plug, 3P	2	
	CP16	R-S27207-4	Plug, 4P	1	
	CP11	R-S27207-5	Plug, 5P	1	
	CP33,34	R-S27207-6	Plug, 6P	2	
	CP26	R-S27207-7	Plug, 7P	1	
	JK7,8,9	R-S17523-1	Terminal plate, PHONO/TAPE	1	
	<b>SEMICONDUCTORS</b>				
		IC1		IC, M5219L	1
		IC5		IC, LA1235	1
		IC6		IC, LA1245	1
		IC7		IC, μPC1161C3	1
		Q5		Transistor, 2SC930	1
		Q6~18		Transistor, 2SC536	13
		Q19		Transistor, 2SA608	1
		Q20,21		Transistor, 2SD1012	2
		Q22		Transistor, 2SK315	1
	D5~19		Diode, DS442	1	
	D20,21		Diode, DS135D	2	
	D22		Zener diode, GZA3.6X	1	
	D23,24,30		Zener diode, GZA6.2X	3	
	D25		Zener diode, GZA8.2Y	1	
	D26		Diode, 1S188, AM	1	
	D27,28		Baractor diode, SVC321-C2	2	
* Do not use diode from different bags but a pair of diodes from a same bag.					
<b>RESISTORS</b>					
(Resistors are of carbon type, ±5% allowance and 1/4W unless otherwise noted.)					
	R10,22,62,98		330 ohm	4	
	R7,69,81		27 k ohm	3	
	R8,15,20,23,63,65,68,		10 k ohm	14	
	87,88,91,97,101,				
	102,110				
	R9		1.5 k ohm	1	
	R13,61,66,264,269,278,		100 k ohm	9	
	364,369,378				
	R14		39 k ohm	1	
	R16,26,266,366		56 k ohm	4	
	R17,67		68 k ohm	2	
	R19,111		3.3 k ohm	2	
	R21		2.7 k ohm	1	
	R24,82,105,268,276,		100 ohm	7	
	368,376				
	R25,92,93		82 k ohm	3	
	R27		5.6 k ohm	1	
	R28		22 k ohm	1	
	R29,71,76,77,90,270,370		1 k ohm	7	
	R11		33 ohm	1	
	R6		390 ohm	1	
	R64,86		120 ohm	2	
	R72,78,79		220 k ohm	3	
	R73,74		33 k ohm	2	
	R80,84,99,104		560 ohm	4	
	R83,273,274,373,374		1.8 k ohm	5	
	R85		150 ohm	1	
	R89,106		180 ohm	2	
	R94		12 k ohm	1	
	R95,277,377		2.2 k ohm	3	
	R96		270 ohm	1	
	R103		270 k ohm	1	
	R267,367		4.7 k ohm	2	
	R12,18		Metal oxide film, 150 ohm, ±5%, 1W	2	
	R100		Metal oxide film, 120 ohm, ±5%, 1W	1	
<b>CAPACITORS</b>					
	C7,10,11,12,13,16,18,22,		Ceramic, 0.022mfd, ±30%, 16V, X	29	
	23,24,30,61,62,64,67,				
	69,72,73,75,79,81,84,				
	88,89,90,92,96,98,102				
	C21,86		Ceramic, 0.022mfd, +80 -20%, 50V, Z	2	
	C28,66		Ceramic, 120pF, ±5%, 50V, SL	2	
	C31,34		Ceramic, 180pF, ±10%, 50V, B	2	
	C41		Ceramic, 560pF, ±10%, 50V, B	1	
	C65		Ceramic, 5.6pF, ±10%, 50V, SL	1	
	C63		Ceramic, 0.0015mfd, ±10%, 50V, B	1	
	C70		Ceramic, 8.2pF, ±10%, 50V, SL	1	
	C74,94		Ceramic, 0.001mfd, ±10%, 50V, B	2	
	C76		Ceramic, 330pF, ±10%, 50V, B	1	
	C77,78		Ceramic, 15pF, ±5%, 50V, SL	2	

NOTES : 1. Part orders must contain Model Number, Part Number and Description.  
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# PARTS LIST

Key No.	Ref.No.	PART No.	DESCRIPTION	Q'ty
	C80		Ceramic, 3.3pF, ±10%, 50V, SL	1
	C82,91		Ceramic, 0.01mfd, ±10%, 25V, X	2
	C83		Ceramic, 33pF, ±5%, 50V, SL	1
	C270,370		Ceramic, 470pF, ±5%, 50V, SL	2
	C268,269,368,369		Ceramic, 180pF, ±5%, 50V, SL	4
	C43		Styrol, 510pF, ±5%, 50V	1
	C68		Styrol, 75pF, ±5%, 50V	1
	C71		Styrol, 90pF, ±5%, 50V	1
	C37,38		Mylar, 0.0015mfd, ±10%, 50V	2
	C42		Mylar, 0.047mfd, ±10%, 50V	1
	C49,50		Mylar, 0.001mfd, ±10%, 50V	2
	C95		Mylar, 0.0022mfd, ±10%, 50V	1
	C264,364		Mylar, 0.016mfd, ±5%, 50V	2
	C263,363		Mylar, 0.056mfd, ±5%, 50V	2
	C8		Electrolytic, 33mfd/10V	1
	C5,14,32,35,36,48,101		Electrolytic, 10mfd/16V	7
	C15		Electrolytic, 0.47mfd/16V	1
	C17		Electrolytic, 220mfd/10V	1
	C9,19,97		Electrolytic, 47mfd/16V	3
	C25,55		Electrolytic, 2.2mfd/16V	2
	C26,27		Electrolytic, 22mfd/16V	2
	C29,93		Electrolytic, 0.1mfd/50V	2
	C33		Electrolytic, 330mfd/16V	1
	C39,40,85,87,90		Electrolytic, 4.7mfd/16V	5
	C47,100		Electrolytic, 1mfd/16V	2
	C44		Electrolytic, 1mfd/50V	1
	C45,261,266,361,366		Electrolytic, 3.3mfd/50V	5
	C46		Electrolytic, 0.22mfd/50V	1
	C56		Electrolytic, 33mfd/16V	1
	C103		Electrolytic, 220mfd/16V	1
	C265,365		Electrolytic, 220mfd/6.3V	2
	C267,367		Electrolytic, 10mfd/25V	2

## LOGIC P.C.B. ASSEMBLY

57		R-A78640	Circuit board assembly, Logic	1
X1		R-S17353-1	or Crystal	1
		R-S17353-2		
CP1,5		R-S27207-2	Plug, 2P	2
CP2,3		R-S27207-3	Plug, 3P	2
CP4		R-S27207-10	Plug, 10P	1
CP6		R-S27207-5	Plug, 5P	1
			<b>SEMICONDUCTORS</b>	
IC401			LSI, TC9147P	1
IC402			Integrated circuit, TD6104P	1
Q401,402,403,404			Transistor, 2SC536	4
Q405			Transistor, 2SC2999	1
D401			Zener diode, HZ12A1	1
D405~412			Diode, DS442-AT	8
D402~404			Diode, DS135D	3
			<b>RESISTORS</b>	
(Resistors are of carbon type, ±5% allowance and 1/4W unless otherwise noted.)				
R416,423			270 ohm	2
R403			6.8 k ohm	1
R424			220 ohm	1
R414			270 k ohm	1
R402,404			3.3 k ohm	2
R405			2.2 M ohm	1
R406,407,408,410			2.2 k ohm	4
R411,412,420			100 k ohm	3
R401,415			470 ohm	2
R413			470 k ohm	1
R418			22 k ohm	1
R419			1 k ohm	1
R421,422			47 k ohm	2
R409			4.7 k ohm	1
			<b>CAPACITORS</b>	
C416			Ceramic, 0.022mfd, ±30%, 16V, X	1
C402,415,418,419,437,438			Ceramic, 0.022mfd, +80 -20%, 50V, Z	6
C417,420			Ceramic, 15pF, ±5%, 50V, SL	2
C409,410			Ceramic, 18pF, ±5%, 50V, SL	2
C411,414			Electrolytic, 47mfd/6.3V	2
C401			Electrolytic, 100mfd/16V	1
C412			Electrolytic, 2200mfd/6.3V	1
C413			Electrolytic, 1mfd/50V	1
C403,404			Electrolytic, 1mfd/50V	2

Key No.	Ref.No.	PART No.	DESCRIPTION	Q'ty
	C405,406		Electrolytic, 0.22mfd/50V	2
	C407		Electrolytic, 0.33mfd/50V	1
	C408		Electrolytic, 0.22mfd/50V	1
<b>DRIVER P.C.B. ASSEMBLY</b>				
58		R-A78641	Circuit board assembly, Driver	1
			<b>SEMICONDUCTORS</b>	
	IC404		LSI, TD6301AP	1
	Q451		Transistor, 2SA608	1
	Q452,453		Transistor, 2SC536	2
			<b>RESISTORS</b>	
(Resistors are of carbon type, ±5% allowance and 1/4W unless otherwise noted.)				
	R451~478		560 ohm	23
	R485,486,487		2.2 k ohm	3
	R482,483,484		27 k ohm	3
	R479,480,481		470 ohm	3
			<b>CAPACITORS</b>	
	C452		Ceramic, 0.022mfd, ±30%, 16V, X	1
	C453,454,455		Ceramic, 270pF, ±10%, 50V, B	3
	C451		Electrolytic, 47mfd/6.3V	1
<b>VOLUME P.C.B. ASSEMBLY</b>				
59		R-A78119	Circuit board assembly, Volume	1
61	VR201, 301	R-R145736	Slide variable resistor, Balance	1
60	VR202, 302	R-R160719	Slide variable resistor, Volume	1
<b>FUSE P.C.B. ASSEMBLY</b>				
62		R-A78642	Circuit board assembly, Fuse	1
		R-S17024	Fuse holder	10
<b>FUNCTION P.C.B. ASSEMBLY</b>				
63		R-A78643	Circuit board assembly, Function	1
64	S2-1~4	R-S47918-1	Push switch, Function	1
	CP18	R-S27207-3	Plug, 3P	1
			<b>SEMICONDUCTORS</b>	
	D216,217,218		Diode, DS442	3
			or 1S1588	
			<b>RESISTORS</b>	
(Resistors are of carbon type, ±5% allowance and 1/4W unless otherwise noted.)				
	R150,151,152,153		2.7 k ohm	4
<b>SPEAKER P.C.B. ASSEMBLY</b>				
65		R-A78644	Circuit board assembly, Speaker	2
66		R-S17591	Terminal plate, SPEAKER	2
			<b>RESISTORS</b>	
(Resistors are of carbon type, ±5% allowance and 1/4W unless otherwise noted.)				
	R260,261,360,361		Metal film fusing, 4.7 ohm, ±5%, 1/2W	4
			<b>CAPACITORS</b>	
	C290,291,390,391		Mylar, 0.047mfd, ±10%, 50V	4
<b>MAIN AMP. P.C.B. ASSEMBLY</b>				
67		R-A78645	Circuit board assembly, MAIN AMP.	1
	CP24	R-S27207-4	Plug, 4P	1
	CP25	R-S27531-4	Plug, 4P	1
		R-S17024	Fuse holder	4
		R-2672904A	Heat sink, Transistor	2
			<b>SEMICONDUCTORS</b>	
	Q203,204		Transistor, 2SD600	2
			Screw, Washer, Hd., 3x8, B-tight	2
	Q201,301		Transistor, 2SA979	2
	Q202,302		Transistor, 2SC1627	2
	Q205		Transistor, 2SD600	1
	Q206		Transistor, 2SB631	1
	D201,202,203,204		Diode, S2V20	4
	D205,206,207,208		Diode, DS135D-KB1	4
	D214,314		Diode, 1S1588-T	2
			or DS442-AT	
	D211		Zener diode, GZA6.8X	1
	D210,215,315		Zener diode, GZA16Z	3
	D212,213		Zener diode, GZA24X	2
			<b>RESISTORS</b>	
(Resistors are of carbon type, ±5% allowance and 1/4W unless otherwise noted.)				

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# PARTS LIST

Key No.	Ref.No.	PART No.	DESCRIPTION	Q'ty
	R201,211,301,311		1 k ohm	4
	R202,203,302,303		100 k ohm	4
	R204,220,304		1.5 k ohm	3
	R205,305		1.2 k ohm	2
	R206,306		12 k hm	2
	R207,307		39 k ohm	2
	R208,308		1.8 k ohm	2
	R209,210,222,224,309,310		3.3 k ohm	6
	R215,216		10 k ohm	2
	R227,327		100 ohm	2
	R212,312		Metal oxide film, 1.5 k ohm, ±5%, 1W	2
	R214,314		Metal film fusing, 4.7 ohm, ±5%, 1/2W	2
	R221,223	⚠	Metal film fusing, 100 ohm, ±5%, 1/4W	2
	R213,313	⚠	Metal film fusing, 220 ohm, ±5%, 1/4W	2
	R217,226	⚠	Metal film fusing, 10 ohm, ±5%, 1/4W	2
	R321,323	⚠	Metal film fusing, 330 ohm, ±5%, 1W	2
	R218		3.9 k ohm	1
<b>CAPACITORS</b>				
	C209,210,309,310		Ceramic, 180pF, ±10%, 50V, B	4
	C201,301		Ceramic, 330pF, ±10%, 50V, B	2
	C204,304		Ceramic, 470pF, ±10%, 50V, B	2
	C203,303		Ceramic, 27pF, ±5%, 50V, SL	2
	C206,306		Ceramic, 2.2pF, ±5%, 50V, SL	2
	C208,308		Ceramic, 12pF, ±5%, 50V, SL	2
	C228,229,230,231		Ceramic, 0.04mfd, +80 -20%, 50V, FZ	4
	C213,313		Mylar, 0.047mfd, ±10%, 50V	2
	C218,219,220,221		Mylar, 0.01mfd, ±20%, 25V, 100V	4
	C205,305		Electrolytic, 100mfd/6.3V MVH	2
	C207,307		Electrolytic, 220mfd/35V MVH	2
	C212,312		Electrolytic, 10mfd/35V MVH	2
	C211,311		Electrolytic, 22mfd/35V MVH	2
	C215,216		Electrolytic, 10mfd/50V MVH	2
	C227		Electrolytic, 470mfd/16V MVH	1
	C224		Electrolytic, 1000mfd/35V MVH	1
	C223		Electrolytic, 220mfd/25V MVH	1
	C226		Electrolytic, 100mfd/16V MVH	1
	C225		Electrolytic, 220mfd/10V MVH	1
	C222		Electrolytic, 470mfd/25V MVH	1
	C232,233,234,235		Electrolytic, 100mfd/35V MVH	4
	C236,237		Electrolytic, 4700mfd/50V	2
	C202,302		Electrolytic, 3.3mfd/50V	2
	C214,314		Electrolytic, 100mfd/50V MVH	2
<b>SIGNAL P.C.B. ASSEMBLY</b>				
69		R-A78646	Circuit board assembly, Signal	1
	IC403		<b>SEMICONDUCTORS</b> Integrated circuit, LB1423	1
	Q431		Transistor, 2SC536	1
<b>RESISTORS</b>				
(Resistors are of carbon type, ±5% allowance and 1/4W unless otherwise noted.)				
	R432		2.2 k ohm	1
	R433		15 k ohm	1
	R434		4.7 k ohm	1
	R436		56 k ohm	1
	R437		10 k ohm	1
	R438		22 k ohm	1
	R439		2.7 k ohm	1
	R440,441		1 k ohm	2
	R442		560 ohm	1
	R431		Metal oxide film, 150 ohm, ±5%, 1W	1
<b>CAPACITORS</b>				
	C433		Ceramic, 0.022mfd, ±30%, 16V, X	1
	C431,436		Electrolytic, 10mfd/16V	2
<b>PRESET P.C.B. ASSEMBLY</b>				
70		R-A78647	Circuit board assembly, Preset	1
71	S14~20	R-S47901	Key switch	7

Key No.	Ref.No.	PART No.	DESCRIPTION	Q'ty
<b>FILTER P.C.B. ASSEMBLY</b>				
72		R-A78648	Circuit board assembly, Filter	1
73	S7,8,9	R-S47920	Push switch, LOUDNESS/HIGH/LOW	1
	CP22	R-S27207-5	Plug, 5P	1
	CP23	R-S27271-3	Plug, 3P	1
<b>SEMICONDUCTORS</b>				
	Q207,307		Transistor, 2SC2878	2
	Q208		Transistor, 2SC1815 or 2SC536	1
	D224		Diode, DS442 or 1S1588-5	1
	D225		Zener diode, GZA 18Y	1
<b>RESISTORS</b>				
(Resistors are of carbon type, ±5% allowance and 1/4W unless otherwise noted.)				
	R281,381		8.2 k ohm	2
	R282,382		560 k ohm	2
	R283,286,383		2.2 k ohm	3
	R284,384		470 k ohm	2
	R285,385		47 k ohm	2
	R287,288		1 k ohm	2
	R289		100 k ohm	1
	R290		5.6 k ohm	1
	R291		15 k ohm	1
	R292		10 k ohm	1
<b>CAPACITORS</b>				
	C271,371		Ceramic, 220pF, ±10%, 50V, B	2
	C272,372		Mylar, 0.027mfd, ±10%, 50V	2
	C274,374		Mylar, 0.012mfd, ±10%, 50V	2
	C273,373		Electrolytic, 0.22mfd/16V Aliscon	2
	C275		Electrolytic, 220mfd/10V	1
	C276		Electrolytic, 10mfd/50V	1
<b>EQ VOLUME P.C.B. ASSEMBLY</b>				
74		R-A78649	Circuit board assembly, EQ volume	1
75	VR203~207,303~307	R-R145734	Slide variable resistor	5
<b>EQ AMP. P.C.B. ASSEMBLY</b>				
76		R-A78650	Circuit board assembly, EQ amp.	1
77	S10	R-S47847-1	Push switch, SP	1
	CP27,28,29	R-S27207-3	Plug, 3P	3
<b>SEMICONDUCTORS</b>				
	IC201,301		Integrated circuit, M5218L	2
	Q209~213,309~313		Transistor, 2SC536	10
<b>RESISTORS</b>				
(Resistors are of carbon type, ±5% allowance and 1/4W unless otherwise noted.)				
	R231,331		1 k ohm	2
	R232,332		220 k ohm	2
	R233,333		10 k ohm	2
	R234,334		1.8 k ohm	2
	R235,237,335,337		4.7 k ohm	4
	R236,336		100 k ohm	2
	R249,349		Carbon, 1.2 k ohm, ±5%, 1/8W	2
	R244~248,344~348		Carbon, 390 ohm, ±5%, 1/8W	10
	R250~253,350~353		Carbon, 1.5 k ohm, ±5%, 1/8W	8
	R254~258,354~358		Carbon, 5.6 k ohm, ±5%, 1/6W	10
	R239,339		Carbon, 150 k ohm, ±5%, 1/8W	2
	R240,340		Carbon, 100 k ohm, ±5%, 1/8W	2
	R241,341		Carbon, 56 k ohm, ±5%, 1/8W	2
	R242,342		Carbon, 39 k ohm, ±5%, 1/8W	2
	R243,343		Carbon, 22 k ohm, ±5%, 1/8W	2
	R259,359		Metal oxide film, 330 ohm, ±5%, 1W	2
<b>CAPACITORS</b>				
	C242,342		Ceramic, 100pF, ±5%, 50V, SL	2
	C243,343		Ceramic, 10pF, ±5%, 50V, SL	2
	C247,347		Ceramic, 20pF, ±5%, 50V, SL	2
	C281,381		Ceramic, 680pF, ±5%, 50V, SL	2
	C254,354		Mylar, 0.082mfd, ±10%, 50V	2
	C249,249		SBL ceramic, 0.018mfd, ±10%, 25V	2
	C251,351		SBL ceramic, 0.0082mfd, ±10%, 25V	2
	C253,353		SBL ceramic, 0.0033mfd, ±10%, 25V	2
	C280,380		SBL ceramic, 0.022mfd, ±10%, 25V	2
	C255,355		SBL ceramic, 0.001mfd, ±10%, 25V	2
	C258,358		SBL ceramic, 0.0047mfd, ±10%, 25V	2

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# PARTS LIST

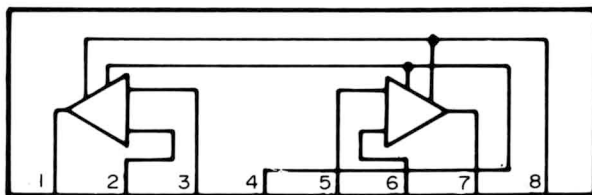
Key No.	Ref.No.	PART No.	DESCRIPTION	Q'ty
	C241,246,341,346		Electrolytic, 4.7mfd/25V	4
	C244,344		Electrolytic, 100mfd/10V	2
	C245,345		Electrolytic, 2.2mfd/50V	2
	C248,348		Electrolytic, 47mfd/16V	2
	C259,359		Electrolytic, 10mfd/25V	2
	C250,350		Electrolytic, 3.3mfd/50V	2
	C252,352		Electrolytic, 0.33mfd/50V	2
	C260,360		Electrolytic, 33mfd/25V	2
<b>TUNING P.C.B. ASSEMBLY</b>				
78		R-A78651	Circuit board assembly, Tuning	1
79	S12,13	R-S47901	Key switch, UP/DOWN	2
<b>CONTROL P.C.B. ASSEMBLY</b>				
80		R-A78652	Circuit board assembly, Control	1
81	S3,4,5,6	R-S47919	Push switch, TAPE/MONO/ FM MUTE/AUTO SCAN	1
	CP20	R-S27260-5	Plug, 5P	1
	CP21,31	R-S27260-3	Plug, 3P	2
<b>RESISTORS</b>				
Resistors are of carbon type, $\pm 5\%$ allowance and $\frac{1}{4}$ W unless otherwise noted.)				
	R293,393		1 k ohm	2
	R31,42		27 k ohm	2
	R32		15 k ohm	1
	R34,35		22 k ohm	2
	R36,37,47		12 k ohm	3
	R38,39		47 k ohm	2

Key No.	Ref.No.	PART No.	DESCRIPTION	Q'ty
	R40,41,44		3.3 k ohm	3
	R43		2.2 k ohm	1
	R45,50,51,56,57		10 k ohm	5
	R46		100 k ohm	1
	R48		1 k ohm	1
	R49		68 k ohm	1
	R52,53		2.7 k ohm	2
	R54,55		6.8 k ohm	2
	R58		560 ohm	1
	R33		Metal oxide film, 180 ohm, $\pm 5\%$ , 1W	1
<b>VOL SELECT P.C.B. ASSEMBLY</b>				
82		R-A78653	Circuit board assembly, VOL select	1
83	PT2	R-W770295	Power transformer	1
		R-S17024	Fuse holder	2
		R-237188	Eyelet lug	11
		R-367266	Cover	1
	C1	R-C97006	Capacitor, 0.01mfd, 250V	1
<b>SEMICONDUCTORS</b>				
	D209		Diode, DS135D	1
<b>RESISTORS</b>				
(Resistors are of carbon type, $\pm 5\%$ allowance and $\frac{1}{4}$ W unless otherwise noted.)				
	R225		680 ohm	1
	R325		1.2 k ohm	1
<b>CAPACITORS</b>				
	C501,502		Electrolytic, 100mfd/10V	2

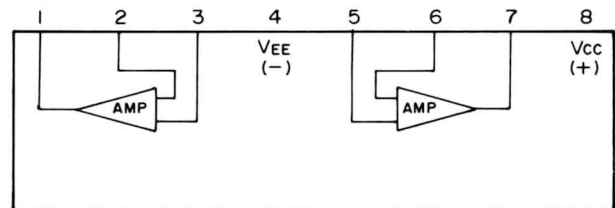
- NOTES : 1. Part orders must contain Model Number, Part Number and Description.  
2. Ordering quantity of screws and/or resistors must be multiple of 10 pcs.

## IC FUNCTIONS

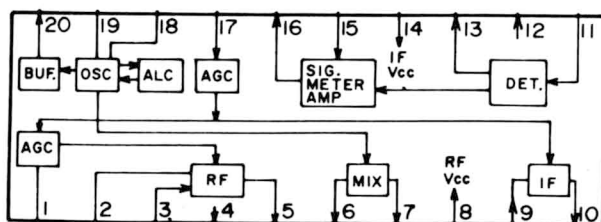
**M5219L, IC1**



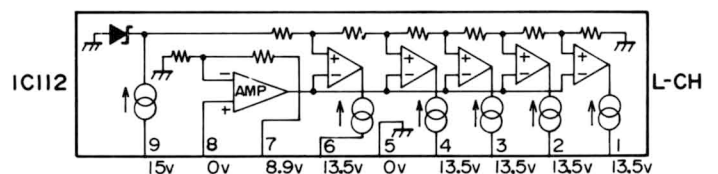
**M5218L, IC201, 301**



**LA1245, IC6**



**LB1423, IC403**





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