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# Specifications

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## Frequency Response

DSP Out Mode ..... 300 to 3000 Hz

## NR Mode

Wide Position Bandwidth ..... 200 to 2950 Hz

Med Position Bandwidth..... 200 to 2500 Hz

Narrow position Bandwidth..... 200 to 2000 Hz

## CW Mode

Wide Position Bandwidth ..... 269 to 1231 Hz

Med Position Bandwidth..... 469 to 1031 Hz

Narrow Position Bandwidth ..... 597 to 903 Hz

## SSB Mode

Wide Position Bandwidth ..... 300 to 3000 Hz

Med Position Bandwidth..... 500 to 2600 Hz

Narrow Position Bandwidth ..... 800 to 2000 Hz

Total Harmonic Distortion ..... 1.0% (Typical)

Signal to Noise Ratio ..... 55 dB (Typical)

Audio Input Level ..... 3.0 Volt Peak - Peak (Max.)

DC 12V Input ..... 11 - 15 VDC, 1.0 A (Max.)

EXT SP (External Speaker Output) ..... 8 Ohms, 8 Watts

Audio Output Power (to EXT SP)..... 6.0 Watts (Typical, 10% THD)

Heterodyne Rejection (SSB/NR Mode) ..... 40 dB (Max.)

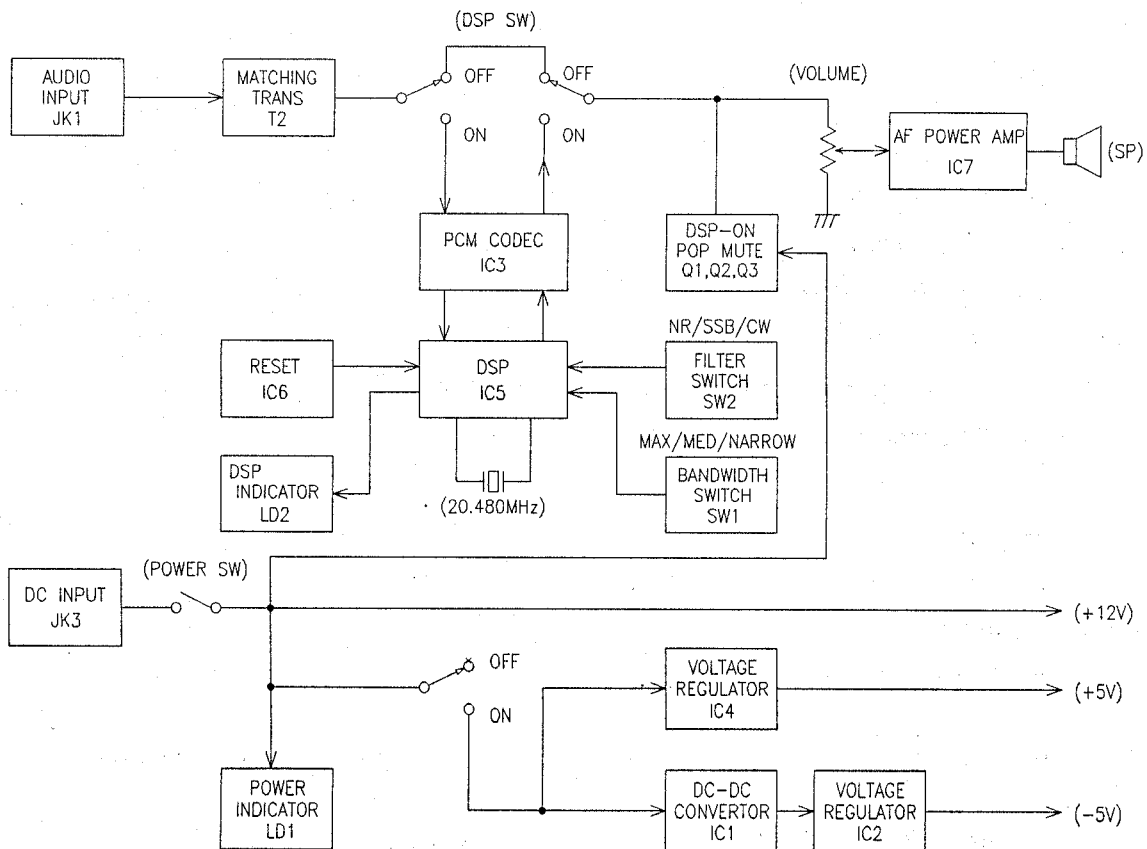
Noise Reduction (NR Mode) ..... 20 dB (Typical)

Dimensions..... 1 15/16 x 4 9/16 x 7 1/16 Inches

Weight ..... 1 lb, 4 ounces

# Block Diagrams

BLOCK DIAGRAM



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# Theory of Operation

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## General

The 21-543 is a DSP noise reduction system with audio power amplifier.

Power is supplied by a 12 volts DC, negative ground power source. Refer to the Block Diagram and the Schematic Diagram as you read the following circuit descriptions.

## Audio Power Amp

Audio input signal is fed to pin 5 of audio power amp. IC (IC7) through matching transformer (T2) and volume control (VR1). The output drives speaker (SP501).

Q1, Q2, and Q3 are to mute pop sound, when DSP switch is turned on.

## DSP Noise Reduction

When DSP switch SW3 is set to the on position, the audio signal is fed to pin 14 of PCM CODEC IC (IC3) through T2 and the output signal is fed to pin 33 of DSP IC (IC5).

The output of IC5 is fed to pin 6 of IC3, then the output is fed to pin 5 of IC7 through VR1.

IC1 and IC2 provide -5 Volts to IC3.

IC4 provides +5 Volts to IC3 and IC5.

IC6 provides power-on reset signal for IC5.

Bandwidth switch (SW1) is the bandwidth selector for WIDE, MED. and NARROW.

Filter switch (SW2) is the filter selector for NR, SSB, and CW.

## Indicators

### Power Indicator (Red)

The Indicator LED (LD1) will light when power switch is turned to the on position.

### DSP Indicator (Green)

The Indicator LED (LD2) will blink when the audio signal level to the audio input jack (JK1) is at a suitable level.

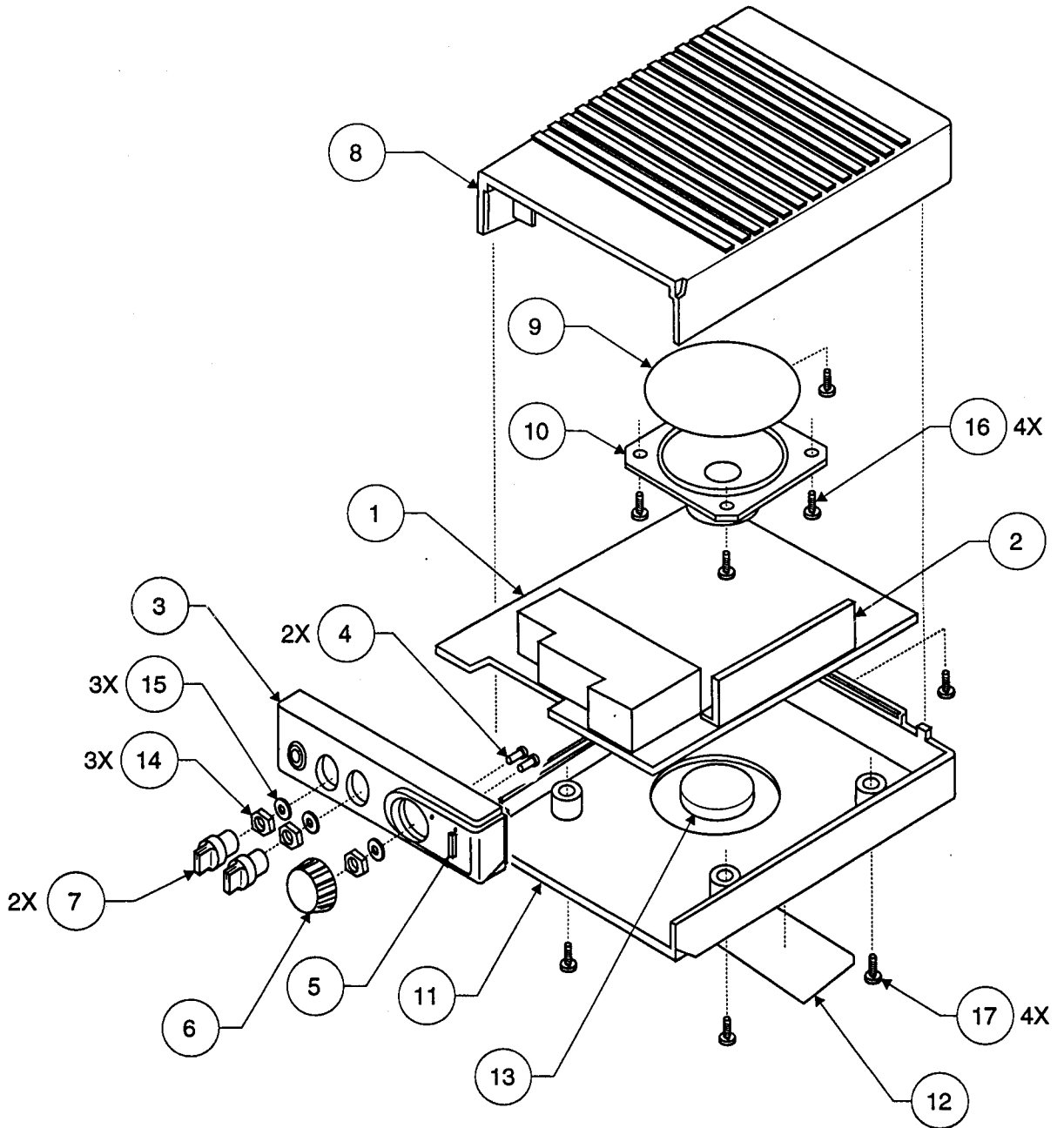
The LED (LD2) will stay lit when the audio input signal level is too high, and will not light when the audio input signal level is too low.

**Note:** This Indicator does not function on the following conditions:

When DSP switch (SW3) is set to the " off " position.

When DSP switch (SW3) is set to the "on" position and filter switch (SW2) is set to the "CW" position.

# Exploded Views



A761001A

## Exploded View Part List

Ref. No.	Description	RS Part No.	MFR Part No.
1	PCB Assy, Main		U-25832-
2	Heat Sink, A1100P, DEGR		471011120A
Not Shown	Screw, Taptite, 3x8BT-B, Heat Sink		HCBB3008SY
Not Shown	Screw, 3x10B, For Heat Sink		HMB03010SY
Not Shown	Nut, Flange, 3FN, For Heat Sink		HANF300-SY
Not Shown	Case, Shield, SPTE, DEGR		473010810B
Not Shown	Plate, Shield, SPTE, DEGR		473211610A
Not Shown	Sheet, Insulation, Fiber		483013560A
Not Shown	PCB Assy, LED		U-25833-
	Panel Assy, Front		MT00412
3	Panel, Front, ABS 94HB		701610110A
4	Lens, PMMA, 94HB		715110540A
5	Knob, 25, ABS, 94HB, For Push		655210110A
6	Knob, 25, ABS, 94HB, For Vol		652511110A
7	Knob, 25, ABS, 94HB, Function		652511120A
	Cabinet Assy, Top		MT00413
8	Cabinet, Top, ABS 94HB		601212820A
9	Net, Nylon Screen		851311010A
10	Speaker, D87, 8ohm, 8W		271011110A or 271011111A
	Cabinet Assy, Bottom		MT00414
11	Cabinet, Bottom, ABS 94HB		601312410A
12	Label, Rating, PE-Sheet		738014200A
13	Cushion, NEOP Sponge, t=3.5		851020790A
Not Shown	Cord, Patch, With 2 Plugs, L=120		313510260A
Not Shown	Holder Assy, Fuse		MT00415
Not Shown	Holder, Fuse, With Lead Wire		197210160A
Not Shown	Fuse, 125V, 2A		251010310A or 251010311A
Not Shown	Label, Warning, Sticker		733311480B
Not Shown	Holder, SPCC, Paint		411117350A
Not Shown	Ass'y Spare Parts		MT00416
Not Shown	Bolt, 5x16H		HBH05016SY
14	Nut, 5N-1		HANN501-SY
15	Washer, 5W		HAWP50SSSY
Not Shown	Washer, Spring, 5SW		HAWS50SSSY
Not Shown	Screw, Tapping, 5x20, PT-2		HTP55020SY
Not Shown	EXT/INT Hardware Kit		HWK0210543
16	Screw, Taptite, 3x6BT-B, For SP		HCBB3006SY
17	Screw, Taptite, 3x12BT-B, Top/Bottom		HCBB3012SY
Not Shown	Screw, Taptite, 3x8BT-B, Heat Sink		HCBB3008SY
Not Shown	Screw, 3x10B, For Heat Sink		HMB03010SY
Not Shown	Nut, Flange, 3FN, For Heat Sink		HANF300-SY

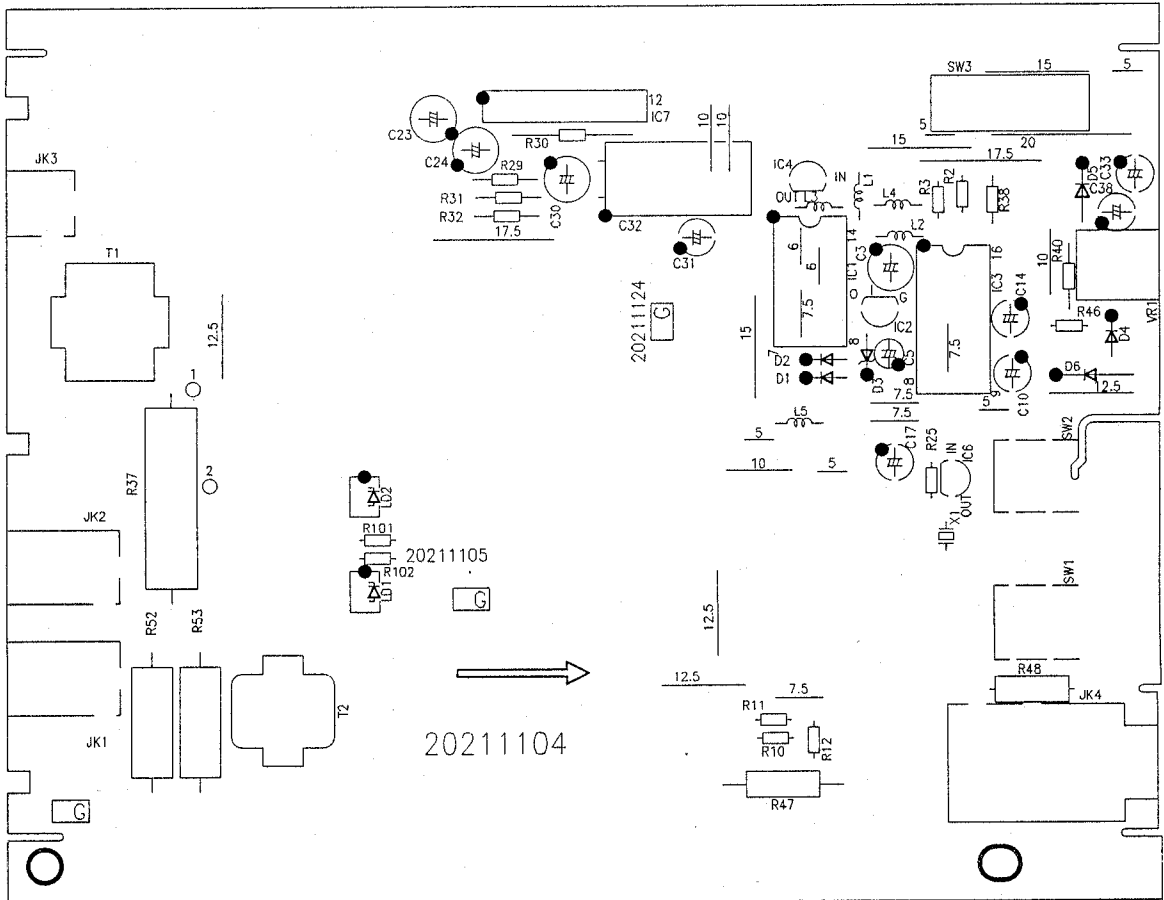
# Parts List

<u>Reference #</u>	<u>Description</u>	<u>RS Part #</u>	<u>MFR Part #</u>
C1, 37	Cap, Cer, 220pF, 50V, 5%		CBVAK221J*
C2, 4, 6, 9, 11, 12, 16, 18	Cap, Cer, 0.1uF, 25V, 10%		CJVEI104K*
C3	Cap, Elec, 47uF, 16V, 20%		CEB1G476M*
C5	Cap, Elec, 1uF, 50V, 20%		CEB1K105M*
C10	Cap, Elec, 4.7uF, 35V, 20%		CEB1J475M*
C13, 34, 35	Cap, Cer, 0.01uF, 25V, 10%		CJVEI103K*
C14	Cap, Elec, 47uF, 6.3V, 20%		CEB1D476M*
C17	Cap, Elec, 100uF, 6.3V, 20%		CEB1D107M*
C20, 27, 39, 40	Cap, Cer, 1000pF, 50V, 10%		CJVEK102K*
C21, 22	Cap, Cer, 51pF, 50V, 5%		CBVAK510J*
C23, 24, 30	Cap, Elec, 100uF, 10V, 20%		CEA1E107M*
C25, 29	Cap, Cer, 0.15pF, 16V, 10%		CJVRG154K*
C26, 28, 36	Cap, Cer, 0.047uF, 25V, 10%		CJVEI473K*
C31	Cap, Elec, 1uF, 50V, 20%		CEA1K105M*
C32	Cap, Elec, 1000uF, 16V, 20%		CECCG108M*
C33, 38	Cap, Elec, 2.2uF, 50V, 20%		CEB1K225M*
D1, 2, 4, 6	Diode, Silicon, 1N4148, Regulator		SDSIT0006- or SDSIT0146- or SDSIT6049- SZRD12E-B1
D3	Diode, Zener, RD12E, RANK:B1		SDSIT0065- or SDSIT0145- or SDSIT6032- SDSI56002- or SDSI56003- or SDSI56005-
D5	Diode, Silicon, 1N4002, Protector		142011510A or 142060330A
D7, 8	Diode, Silicon, LL4148		142011510A or 142060330A
L1, 2, 3, 4	Coil, Ind, 100uHKLAL03TB		STK12712-G or STK13875-G
L5	Coil, Ind, 100uHKSPT0305		RG0TV103J*
Q1, 2, 3	Xsistor, KTC2712(GROSCAMP)		RC0XT103J*
R1, 7, 8, 13, 14, 15, 16, 17, 18	Xsistor, KTC3875(GR,		RC0XT102J*
R19, 20, 21, 22, 23, 24, 45	Res, MG, 10K, 1/10W, 5%		RG0TV152J*
R2, 10, 11, 12, 25	Res, CF, 10K, 1/6W, 5%		RG0TV362J*
R3	Res, CF, 1K, 1/6W, 5%		RG0TV102J*
R5	Res, MG, 1.5K, 1/10W, 5%		RG0TV105J*
R6	Res, MG, 3.6K, 1/10W, 5%		RG0TV101J*
R9, 35, 36	Res, MG, 1K, 1/10W, 5%		RG0TV562J*
R26	Res, MG, 1M, 1/10W, 5%		RC0XT562J*
R27, 54, 55, 56	Res, MG, 100, 1/10W, 5%		RC0XT560J*
R57			
R28	Res, MG, 5.6K, 1/10W, 5%		
R29	Res, CF, 5.6K, 1/6W, 5%		
R30	Res, CF, 56, 1/6W, 5%		

<u>Reference #</u>	<u>Description</u>	<u>RS Part #</u>	<u>MFR Part #</u>
R31	Res, CF, 33K, 1/6W, 5%		RC0XT333J*
R32	Res, CF, 22K, 1/6W, 5%		RC0XT223J*
R34	Res, MG, 200K, 1/10W, 5%		RG0TV204J*
R37	Res, MF, 1.8, 3W, 5%		RM03P1R8J*
R38	Res, CF, 1.5K, 1/6W, 5%		RC0XT152J*
R39	Res, MG, 47K, 1/10W, 5%		RG0TV473J*
R40	Res, CF, 100K, 1/6W, 5%		RC0XT104J*
R41, 44	Res, MG, 22K, 1/10W, 5%		RG0TV223J*
R42	Res, MG, 100K, 1/10W, 5%		RG0TV104J*
R43	Res, MG, 180K, 1/10W, 5%		RG0TV184J*
R46	Res, CF, 47, 1/6W, 5%		RC0XT470J*
R47	Res, MF, 56, 1W, 5%		RM01P560J*
R48	Res, MF, 390, 1W, 5%		RM01P391J*
R49, 50	Res, MG, 5.6, 1/10W, 5%		RG0TV5R6J*
R52, 53	Res, MO, 47, 2W, 5%		RN02M470J*
R101	Res, CF, 470, 1/6W, 5%		RC0XT471J*
R102	Res, CF, 1.8K, 1/6W, 5%		RC0XT182J*
T1	Coil, Choke, EI19HKP93284		144010201A or
	Coil, Choke, EI19		144010202A
T2	Xformer, Matching, AT-14E-1		10252250MA or
	Xformer, Matching, EI14HF/B2534P		102700953A
X1	Cry, 20.480MHz, HC-49/U		391013060A or
			391060700A
IC1	IC, MC14584BCP, Trigger		SIMD4584B-
IC2	IC, S-80250AG, Regulator		SISS80250A
IC3	IC, TCM129C16N, Frequency Processor		SICT129C16
IC4	IC, KIA78S05P, Regulator		SIKA78S05P or
	IC, NJM78L05		SINM78L05A
IC5	IC, TCR1007, D16041FN, Microprocessor		SICR1007--
IC6	IC, KIA7039P, Regulator		SIKA7039P-
IC7	IC, KIA6227H, Frequency Processor		SIKA6227H- or
	IC, KIA7227CP		SIKA7227CP
JK1, 2	Jack, 3.5mm, HSJ0615-01-010		191201330A
JK3	Jack, DC Power, HEC0470-01-230		196204200A or
	Jack, DC Power, DJ-0702-020		196204202A or
	Jack, DC Power, DC-470		196204203A
JK4	Jack, 6.3mm, HTJ-064-07E		191010340A
SW1, 2	Switch, Rotary, SRBM13NL15		181110420A
SW3	Switch, Push, SPUY19-4N		182111280A or
	Switch, Push, SPUY19C602		182111281A
VR1	Pot, Rotary, 10KAL15W/SW		172910400A or
			172910401A
LD1	LED, LN217RP		SL-R101370 or
	LED, HLR8-215RL		SL-R60053-
LD2	LED, LN317GP		SL-G101390 or
	LED, HLR8-213L		SL-G60013-

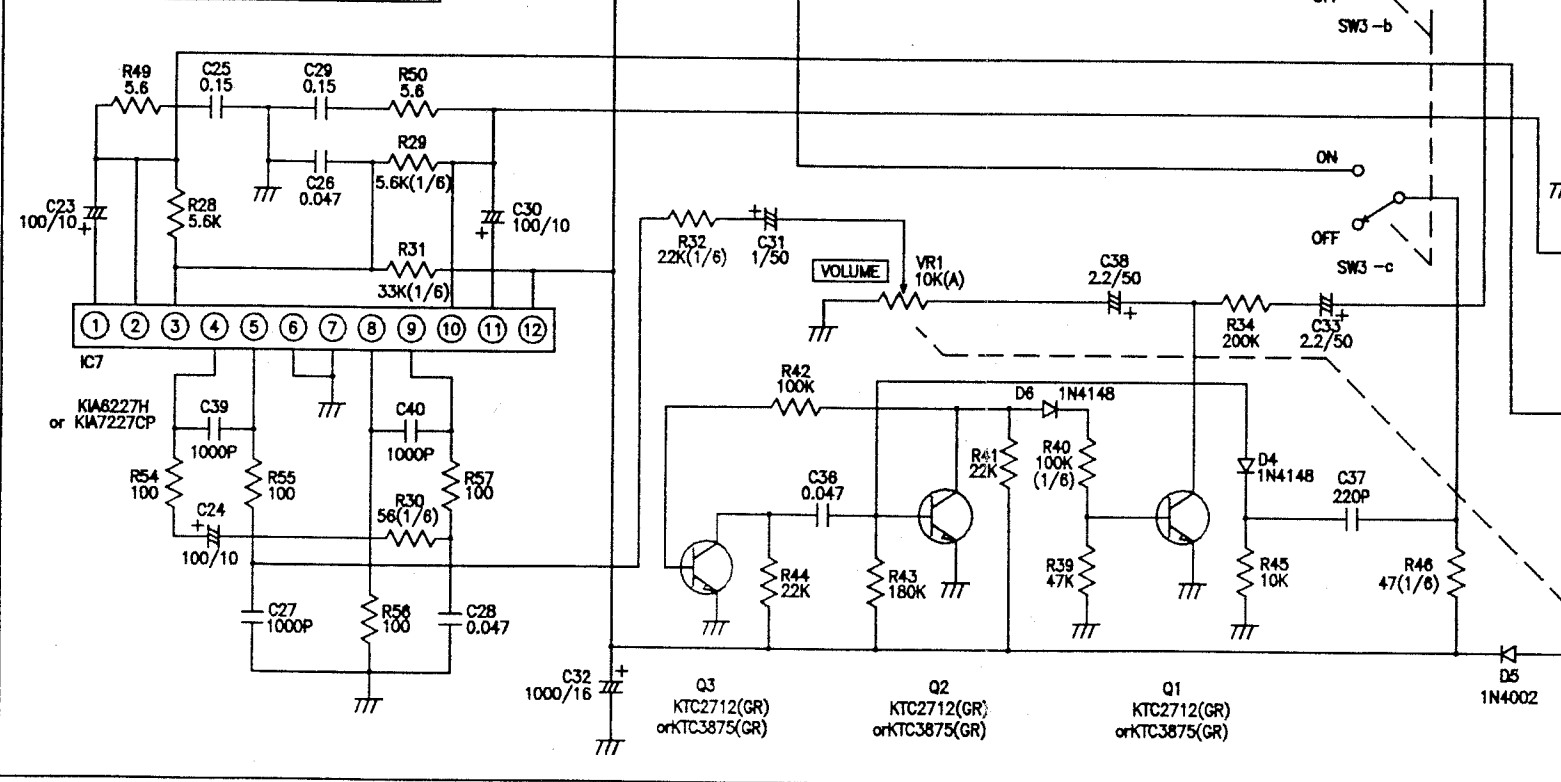
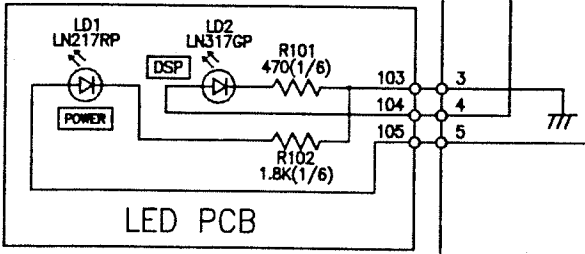
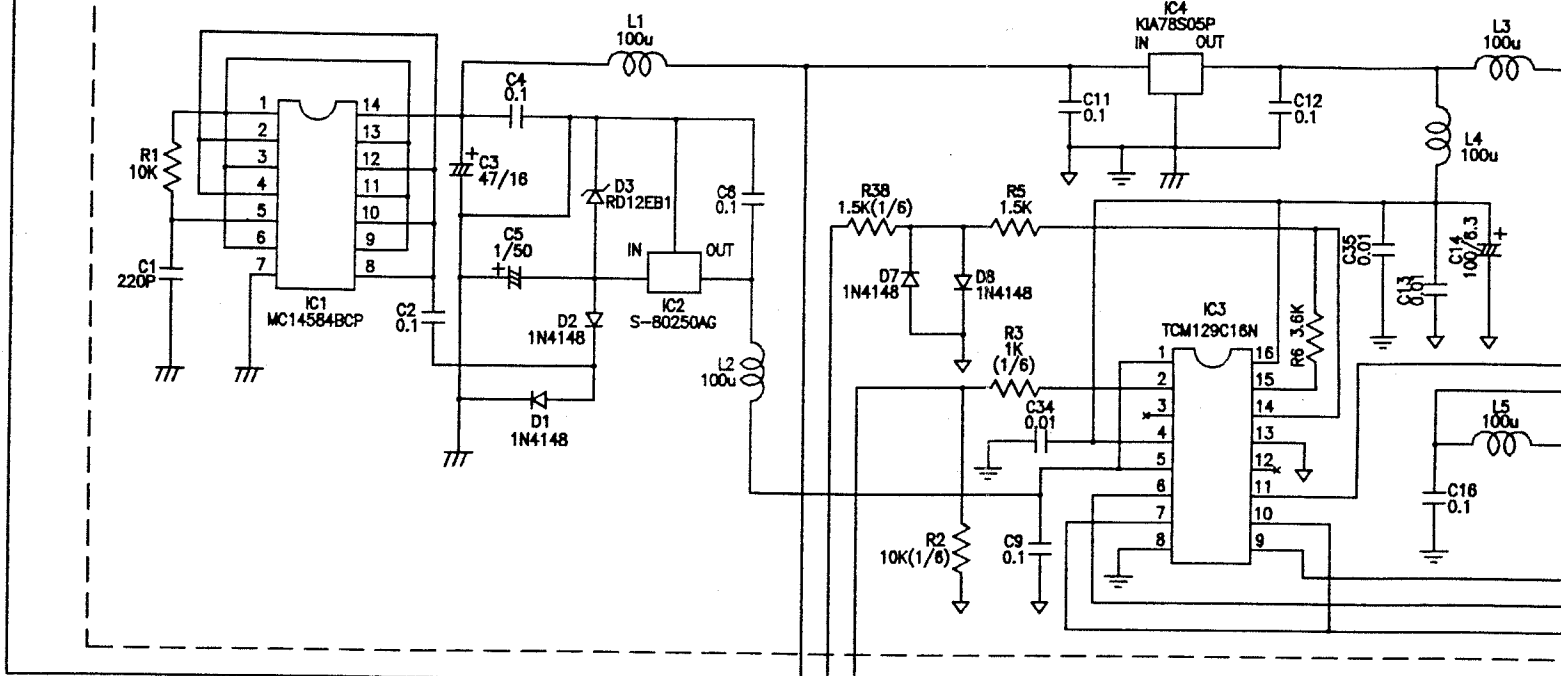
# PCB Layout and Schematics

## Main PCB





# MAIN PCB



NOTES: (1) ALL RESISTANCE VALUES ARE INDICATED IN " OHM " ( K=10<sup>3</sup> OHM, M=10<sup>6</sup> OHM ).  
 (2) ALL CAPACITANCE VALUE ARE INDICATED IN " uF " ( P=10<sup>-6</sup> uF ).

