

# *Service Manual*

## **PR-D4**

### **FM/MW PLLSYNTHESIZED RECEIVER**

#### **CONTENTS**

Specification .....	2-5
Block Diagram .....	6
Alignment Instructions.....	7-11
Test Points diagram.....	12
Main PCB Top View.....	13
Main PCB Bottom View.....	14
Power PCB Top View.....	15
Wiring Diagram.....	16
Troubleshooting Flow Chart.....	17-18
Electrical Parts List.....	19-21
Mechanical Parts List.....	22
Exploded Views.....	23
IC Circuit Block Diagram.....	24-26
Voltage List.....	27-29
Semiconductor Lead Identifications.....	30
Schematic Diagram.....	31

# Specification

## FM. ELECTRICAL PERFORMANCE

Model: PR-D4/L	Brand:	Temp: °C	R.H.: %	Date: 2005/1/11					
Test Item	Condition			Value		Test no.		Unit	
	Input	Output	freq	Nom.	Lim	1.	2.		
Tuning Range		S/N=6dB	Min	87.5				MHz	
			Max	108					
Intermediate freq.		S/N=6dB		10.7	±0.05			MHz	
Max. Sensitivity		S/N=6dB	90MHz	12	18			dBu	
			98MHz	12	18				
			106MHz	12	18				
Usable Sensitivity		S/N=30dB	90MHz	18	24			dBu	
			98MHz	18	24				
			106MHz	18	24				
Image Rejection		S/N=6dB	106MHz	24	18			dB	
I.F. Rejection		S/N=6dB	90MHz		60			dB	
3db Limiting	80dBu		98MHz	18	24			dBu	
Min. output				1.5	3			mV	
Auto Scan	60dBu			22	28			dBu	
S/N (1mV)				46	40			dB	
Current Consumption		R. O.		140	160			mA	
Am. Suppression (1mV)				32	26			dB	
Audio fidelity 75kHz/or 50kHz (-3dB W/pre emphasis)				100	200			Hz	
				10K	8K			Hz	
Output Power(75KHz dev.)		10%T.H.D.		800	600			mW	
T. H. D. (75KHz dev.)				1	3			%	
Over load capacity		10%T. H.D.		100	90			dBu	
Calibration				S/N=6dBu	90MHz				
	98MHz								
	106MHz								
Lowest Batt. Volt.	60dBu		98MHz	3.6	4.0			V	
Supply Voltage: DC 6 V	R.O.: 50mW	Load: 4 Ohm	Modulation: 1KHz Mod./22.5KHz Dev.						
Remark:			Approved by		Released/Tested by				
<input type="checkbox"/> 首件產品 <input type="checkbox"/> 客戶抽測: <input type="checkbox"/> 成品 <input type="checkbox"/> 例行抽測 <input type="checkbox"/> 業務樣品: <input type="checkbox"/> 半成品 <input type="checkbox"/> 新機種 <input type="checkbox"/> 工程變更:									

**MW. ELECTRICAL PERFORMANCE**

Model: PR-D4		Brand:		Temp: ° C	R.H.: %	Date: 2005/1/11			
Test Item	Condition			Value		Test no.		Unit	
	Input	Output	freq	Nom.	Lim	1.	2.		
Tuning Range			Min	522				KHz	
			Max	1629					
Intermediate freq.		S/N=6dB	Min	450	±2			KHz	
Max. Sensitivity		S/N=6dB	603KHz	46	56			dBu/m	
			999KHz	42	54				
			1404KHz	42	54				
Usable Sensitivity		S/N=20dB	603KHz	56	62			dBu/m	
			999KHz	54	60				
			1404KHz	54	60				
Image Rejection		S/N=6dB	1404KHz	36	30			dB	
I.F. Rejection		S/N=6dB	603KHz	50	40			dB	
Selectivity(±10KHz)		S/N=6dB	999KHz	32	26			dB	
Bandwidth(-6dB)		S/N=6dB			6-11			KHz	
T. H. D.	74dBu/m			2	4			%	
Lowest Batt. Volt.	74dBu/m			3.6				V	
Hum Modulation	100dBu/m							dB	
Auto. Scan. Stop. Sens.				56	62			dBu/m	
Current Consumption	74dBu/m							mA	
Tone Action (3KHz)	74dBu/m							dB	
Freq. Response (-6dB)	74dBu/m				100	200			Hz
					2500	1800			Hz
Output Power 80% Mod.		10%T.H.D.			800	600			mW
Over load capacity	80%mod.	10%T. H.D.			100	90			dBu/m
A. G. C. F. O. M.	100dBu/m				46	40			dB
S/N Ration	74dBu/m			40	34			dB	
Whistle Modulation	74dBu/m		2IF/3IF		15			%	
Supply Voltage: DC 6 V	R.O.: 50mW	Load: 4 Ohm	Modulation: 1KHz/30% Mod						
Remark:			Approved by		Released/Tested by				
<input type="checkbox"/> 首件產品 <input type="checkbox"/> 客戶抽測: <input type="checkbox"/> 成品 <input type="checkbox"/> 例行抽測 <input type="checkbox"/> 業務樣品: <input type="checkbox"/> 半成品 <input type="checkbox"/> 新機種 <input type="checkbox"/> 工程變更:									

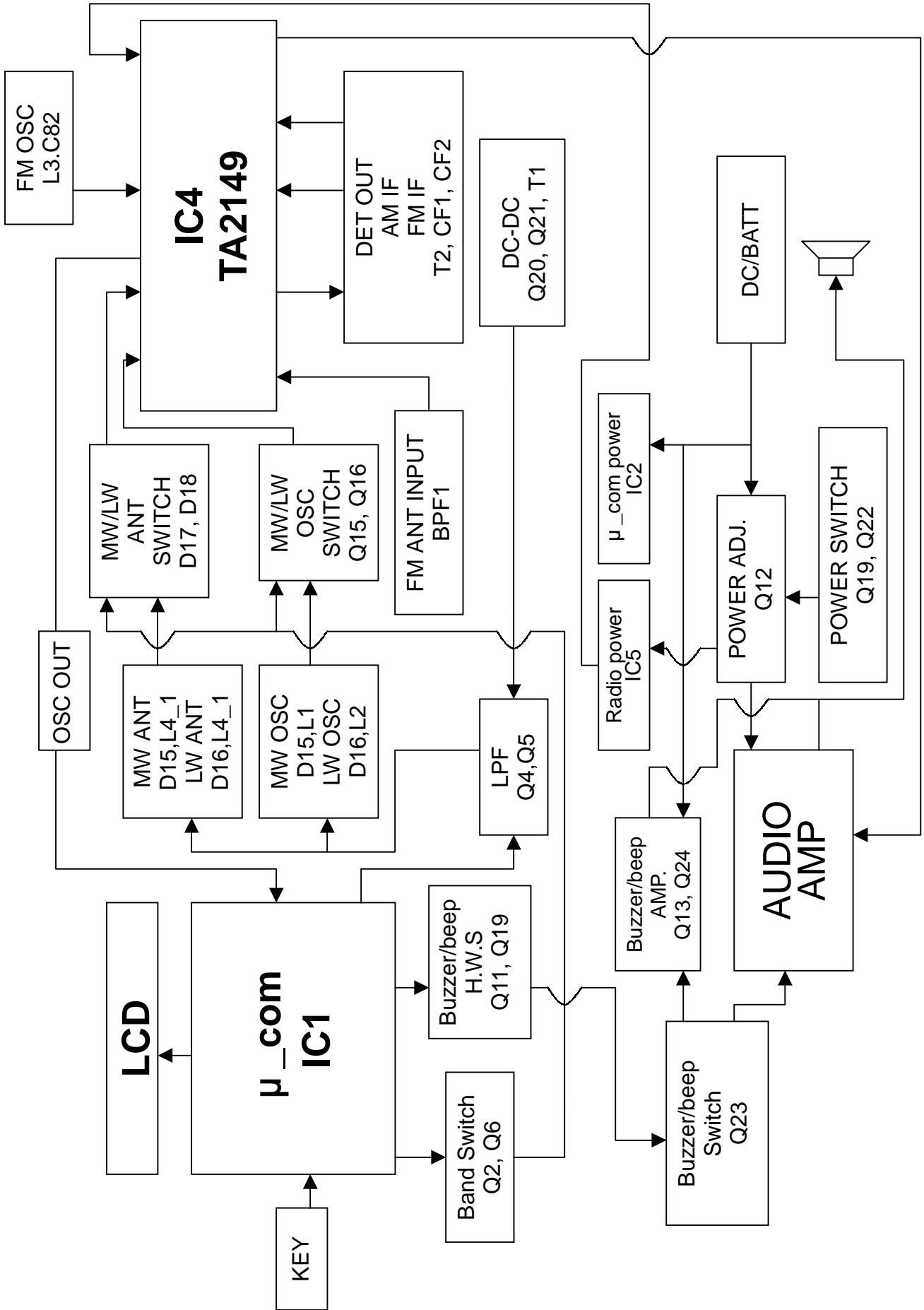
**MW. ELECTRICAL PERFORMANCE**

<b>Model:</b> PR-D4L	<b>Brand:</b>	<b>Temp:</b> ° C	<b>R.H.:</b> %	<b>Date:</b> 2005/1/11					
Test Item	Condition			Value		Test no.		Unit	
	Input	Output	freq	Nom.	Lim	1.	2.		
Tuning Range			Min	522				KHz	
			Max	1629					
Intermediate freq.		S/N=6dB	Min	450	±2			KHz	
Max. Sensitivity		S/N=6dB	600KHz	48	58			dBu/m	
			1000KHz	44	56				
			1400KHz	44	56				
Usable Sensitivity		S/N=20dB	600KHz	60	66			dBu/m	
			1000KHz	56	62				
			1400KHz	56	62				
Image Rejection		S/N=6dB	1400KHz	36	30			dB	
I.F. Rejection		S/N=6dB	600KHz	50	40			dB	
Selectivity(±10KHz)		S/N=6dB	1000KHz	32	26			dB	
Bandwidth(-6dB)		S/N=6dB			6-11			KHz	
T. H. D.	74dBu/m				2	4			%
Lowest Batt. Volt.	74dBu/m				3.6				V
Hum Modulation	100dBu/m								dB
Auto. Scan. Stop. Sens.					56	62			dBu/m
Current Consumption	74dBu/m								mA
Tone Action (3KHz)	74dBu/m								dB
Freq. Response (-6dB)	74dBu/m				100	200			Hz
					2500	1800			Hz
Output Power 80% Mod.		10%T.H.D.			800	600			mW
Over load capacity	80%mod.	10%T. H.D.			100	90			dBu/m
A. G. C. F. O. M.	100dBu/m				46	40			dB
S/N Ration	74dBu/m				38	32			dB
Whistle Modulation	74dBu/m			2IF/3IF		15			%
Supply Voltage: DC 6 V	R.O.: 50mW	Load: 4 Ohm	Modulation: 1KHz/30% Mod						
Remark:			Approved by		Released/Tested by				
<input type="checkbox"/> 首件產品 <input type="checkbox"/> 客戶抽測: <input type="checkbox"/> 成品 <input type="checkbox"/> 例行抽測 <input type="checkbox"/> 業務樣品: <input type="checkbox"/> 半成品 <input type="checkbox"/> 新機種 <input type="checkbox"/> 工程變更:									

**LW. ELECTRICAL PERFORMANCE**

<b>Model: PR-D4L</b>	<b>Brand:</b>	<b>Temp: ° C</b>	<b>R.H.: %</b>	<b>Date: 2005/1/11</b>					
Test Item	Condition			Value		Test no.		Unit	
	Input	Output	freq	Nom.	Lim	1.	2.		
Tuning Range			Min	153	±5			KHz	
			Max	279	±5				
Intermediate freq.		S/N=6dB		450	±1			KHz	
Max. Sensitivity		S/N=6dB	162KHz 225KHz 270KHz		68 66 66			dBu/m	
Usable Sensitivity		S/N=20dB	162KHz 225KHz 270KHz	68 66 66	74 72 72			dBu/m	
I.F. Rejection		S/N=6dB	270KHz	60	50			dB	
Selectivity(±10KHz)		S/N=6dB	225KHz	32	26			dB	
Image Rejection		S/N=6dB		36	30			dB	
T. H. D.				3	5			%	
Lowest Batt. Volt.	74dBu/m			3.6	4.0			V	
Auto. Scan. Stop. Sens.				68	74			dBu/m	
S/N Ration(5mV)	74dBu/m			28	22			dB	
Current Consumption	74dBu/m							mA	
Output Power	80%mod. 74dBu/m	DC			800	600			mW
Over load capacity	80%mod.	10%T. H.D.			106	100			dB
Supply Voltage: DC 6 V	R.O.: 50mW	Load: 4 Ohm		Modulation:	1KHz/30% Mod				
Remark:			Approved by		Released/Tested by				
<input type="checkbox"/> 首件產品 <input type="checkbox"/> 客戶抽測: <input type="checkbox"/> 成品 <input type="checkbox"/> 例行抽測 <input type="checkbox"/> 業務樣品: <input type="checkbox"/> 半成品 <input type="checkbox"/> 新機種 <input type="checkbox"/> 工程變更:									

# BLOCK DIAGRAM



# ALIGNMENT INSTRUCTIONS

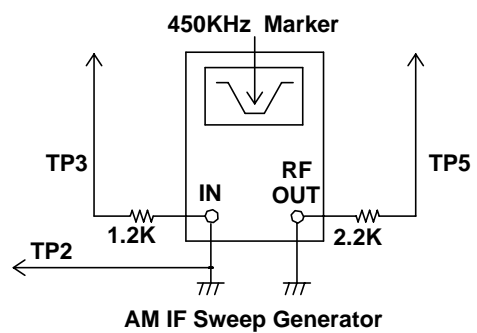
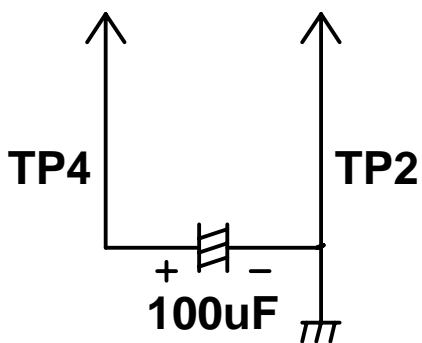
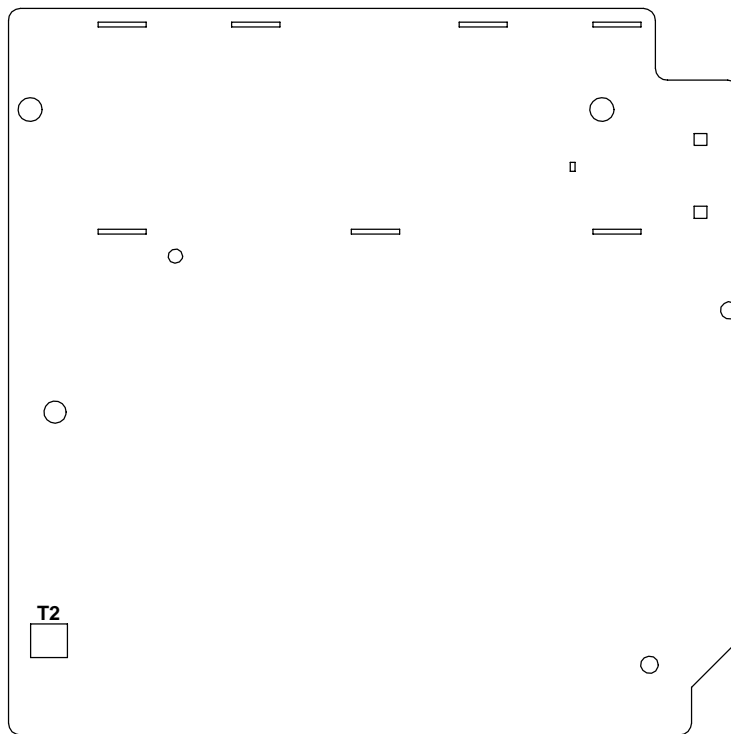
## 1. ALIGNMENT FOR AM/LW IF

a. Required Instruments:  
AM IF Sweep Generator with scope

b. Alignment Procedure

Mode	Adjustment	Procedure
AM	T2	(1) Press the power button to turn on the radio. (2) Connect the input terminal of AM IF sweep generator in series with a resistor of 1.2K $\Omega$ to the TP2 and TP3. (3) Connect the RF output terminal of AM IF sweep generator to another test point TP5. (4) Connect a 100 $\mu$ F electrolytic capacitor to test point TP2 .TP4. (5) Adjust T2 to have a max. output with a marker frequency of 450 kHz on the sweep scope.

c. Instrument Connection



## 2. ALIGNMENT FOR AM/LW TUNING VOLTAGE RANGE

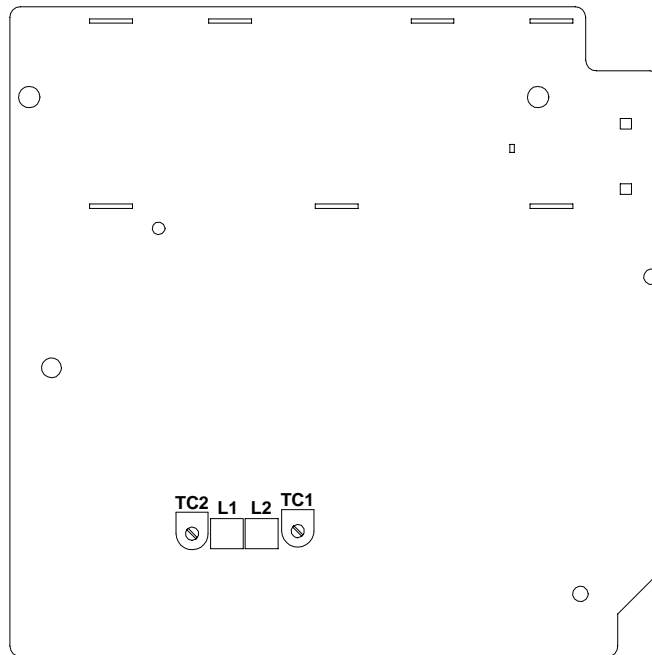
a. Required Instruments:  
DVM

b. Alignment Procedure

Mode	Adjustment	Procedure
AM	L1 TC2	(1) Turn on the radio. (2) Connect the probe of DVM to the test point TP1 and TP2. (3) Tune the AM frequency to 522 kHz. (4) Adjust L1 to have a reading of $1.2 \pm 0.04V$ . (5) Tune the AM frequency to 1629 kHz. (6) Adjust TC2 to have a reading of $7.6 \pm 0.3V$ .

Mode	Adjustment	Procedure
LW	L2 TC1	(1) Turn on the radio. (2) Connect the probe of DVM to the test point TP1 and TP2. (3) Tune the LW frequency to 153 kHz. (4) Adjust L2 to have a reading of $1V \pm 0.04V$ . (5) Tune the LW frequency to 279 kHz. (6) Adjust TC1 to have a reading of $4.8V \pm 0.2V$ .

c. Instrument Connection





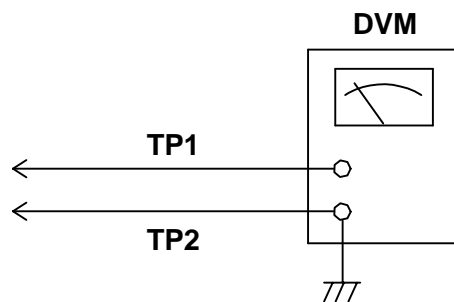
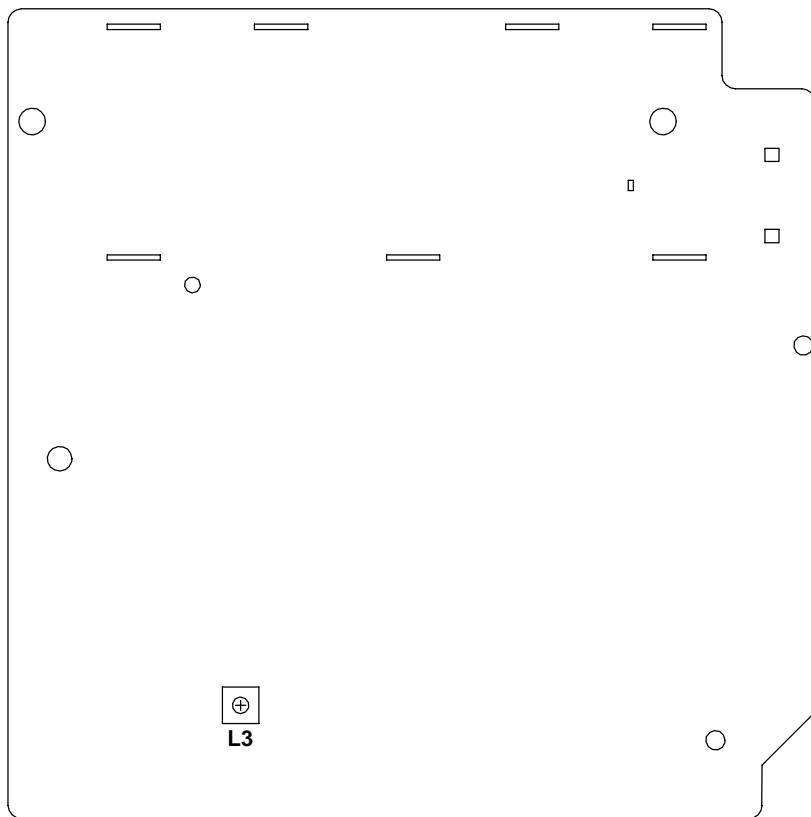
### 3. ALIGNMENT FOR FM TUNING VOLTAGE

a. Required Instruments  
DVM

b. Alignment Procedure

Mode	Adjustment	Procedure
FM	L3	(1) Turn on the radio. (2) Connect the probe of DVM to the TP1 and TP2 (3) Tune the FM frequency to 108MHz. (4) Adjust L3 to have a reading of $8.2V \pm 0.3V$ .

c. Instrument Connection



#### 4. ALIGNMENT FOR AM/LW SENSITIVITY

a. Required Instruments

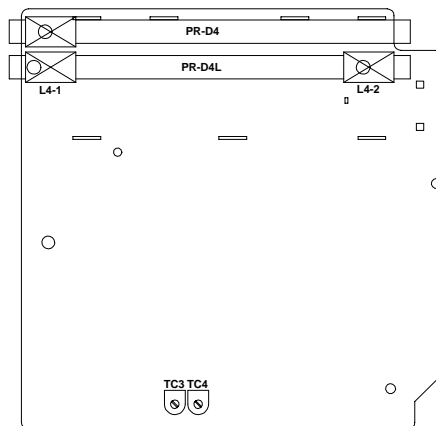
- AM Signal Generator
- SSVM

b. Alignment Procedure

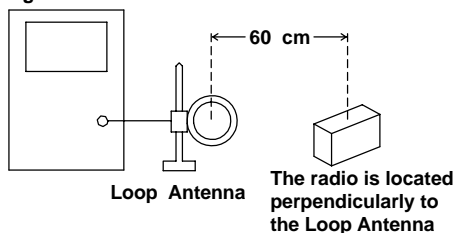
Mode	Adjustment	Procedure
AM	TC3 L4-1	<ol style="list-style-type: none"> <li>(1) Turn on the radio.</li> <li>(2) Connect a SSVM to the speaker TP7 and TP8 terminals.</li> <li>(3) Connect an AM signal generator together with standard loop dummy antenna and feed 30% modulated signal to the AM ferrite bar antenna L4.</li> <li>(4) Tune the generator frequency to 1404 kHz.</li> <li>(5) Tune the AM frequency to 1404 kHz and adjust TC3 to have a max reading on SSVM.</li> <li>(6) Return the generator frequency to 603 kHz.</li> <li>(7) Tune the AM frequency to 603 kHz and adjust L4-1 to have a max reading on SSVM.</li> <li>(8) Repeat (4) to (7) as necessary to minimize tracking error.</li> </ol>

Mode	Adjustment	Procedure
LW	TC4 L4-2	<ol style="list-style-type: none"> <li>(1) Turn on the radio.</li> <li>(2) Connect a SSVM to the speaker TP7 and TP8 terminals.</li> <li>(3) Connect an AM signal generator together with standard loop dummy antenna and feed 30% modulated signal to the AM ferrite bar antenna L4.</li> <li>(4) Tune the generator frequency to 270 kHz.</li> <li>(5) Tune the AM frequency to 270 kHz and adjust TC4 to have a max reading on SSVM.</li> <li>(6) Return the generator frequency to 162 kHz.</li> <li>(7) Tune the AM frequency to 162 kHz and adjust L4-2 to have a max reading on SSVM.</li> <li>(8) Repeat (4) to (7) as necessary to minimize tracking error.</li> </ol>

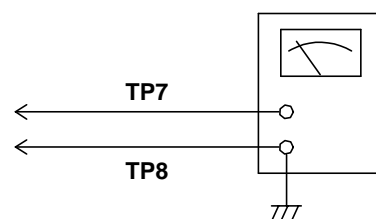
c. Instrument Connection



AM Signal Generator



DVM



## 5. ALIGNMENT FOR FM TUNING SENSITIVITY

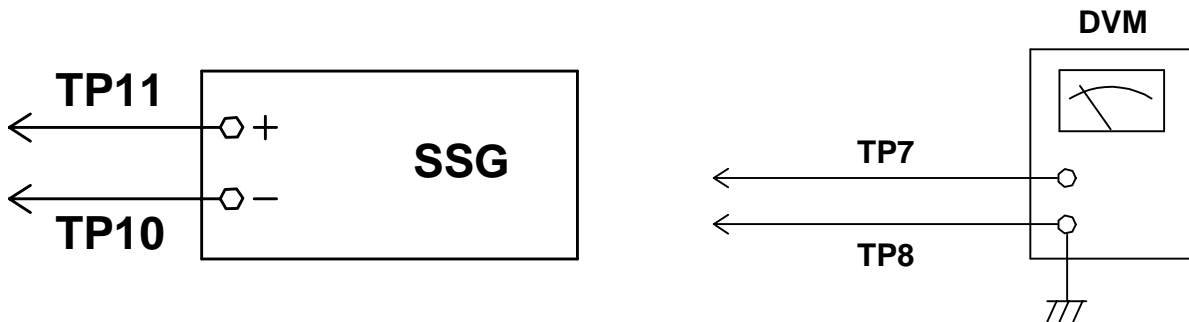
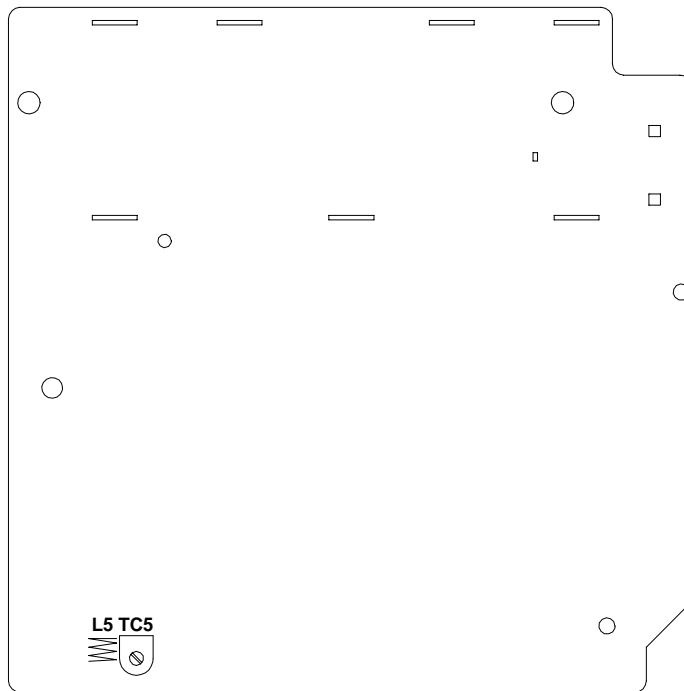
### a. Required Instruments

FM Signal Generator (frequency range up to 220 MHz)  
SSVM

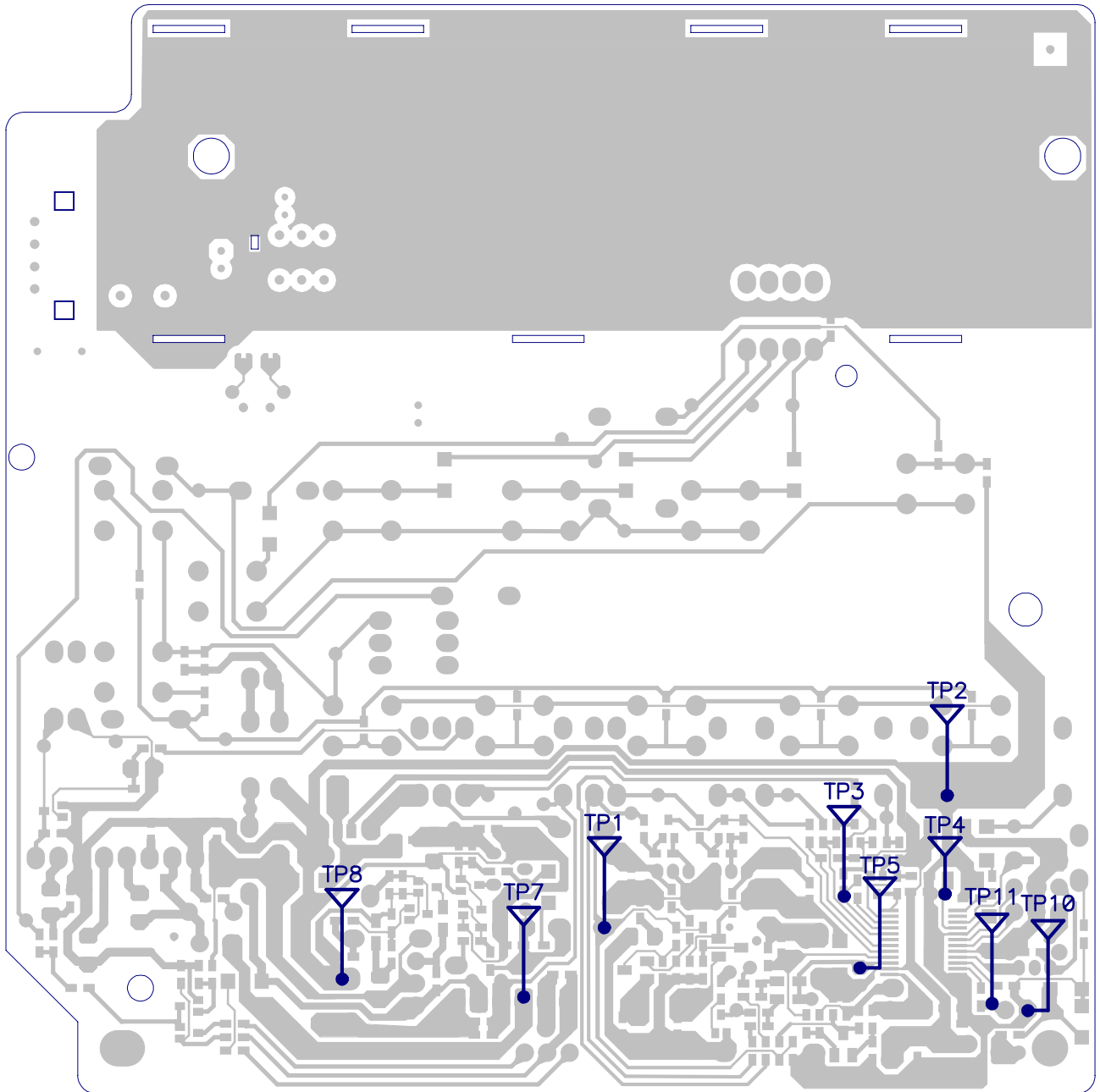
### b. Alignment Procedure

Mode	Adjustment	Procedure
FM	TC5 L5	(1) Turn on radio. (2) Connect a SSVM to speaker TP7 and TP8. (3) Connect a FM signal generator to TP10 and TP11. (4) Set the signal generator to 22.5 kHz deviation with 1 kHz modulation. (5) Always tune the generator frequency to exactly same as the radio band frequency before adjustment. (6) Tune the FM frequency to 106MHz and adjust TC5 to have a max audio output. (7) Tune the FM frequency to 90MHz and adjust L5 to have a max audio output. (8) Repeat (6) to (7) as necessary to minimize tracking error.

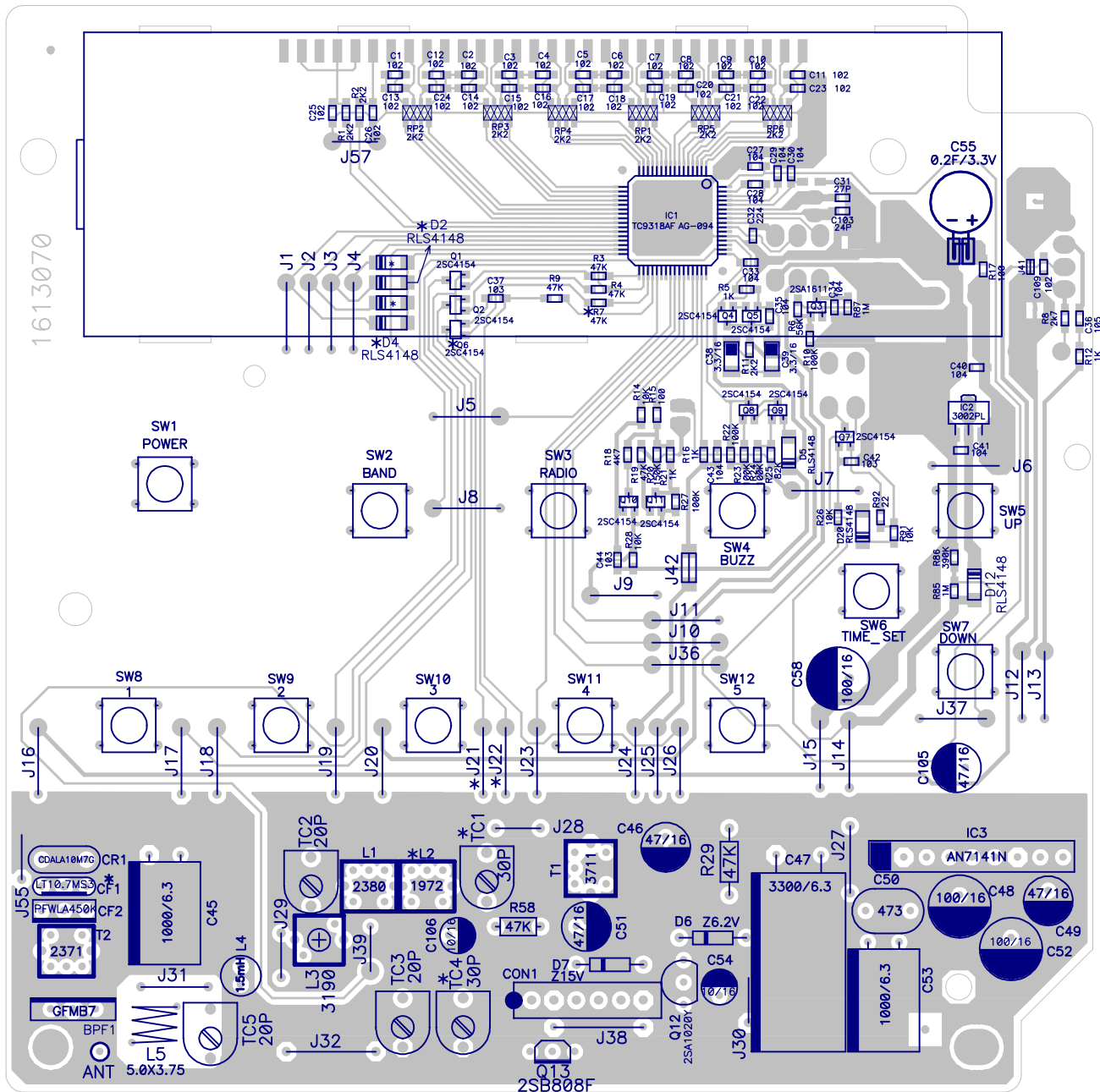
### c. Instrument Connection



# TEST POINTS DIAGRAM



# MAIN PCB TOP VIEW



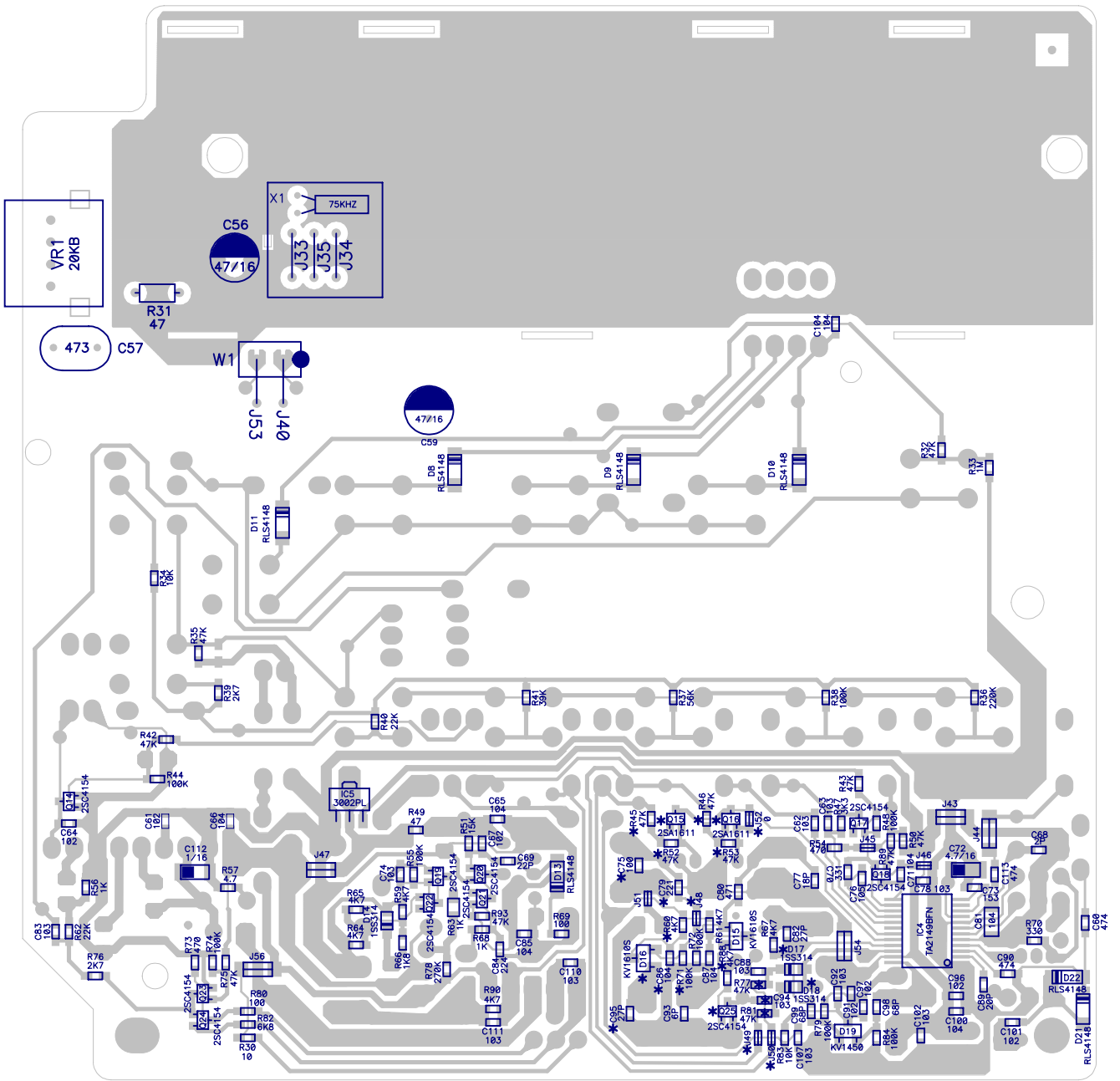
\*

	L2, TC1, TC4, D4, Q6, J21, J22, R7	D2
PR-D4	No	No
PR-D4L	Yes	No
ARGENTINA	No	Yes

\*

	CF1
Taiwan	1664081 SFELA10.7MJ
Other	1664121 LT10.7MS2

# MAIN PCB BOTTOM VIEW



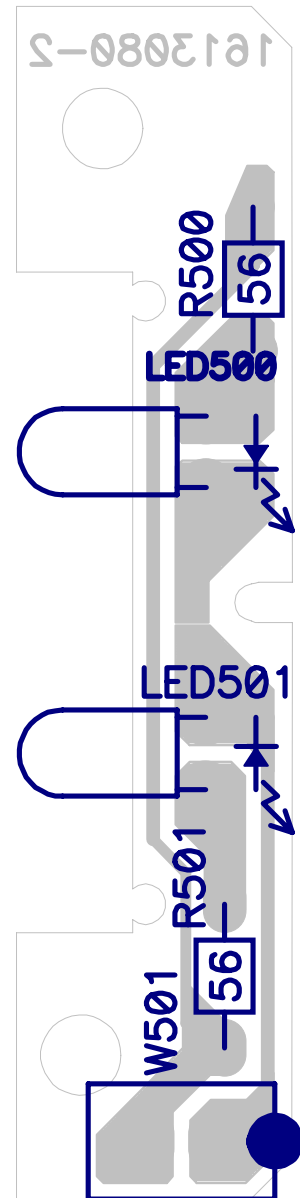
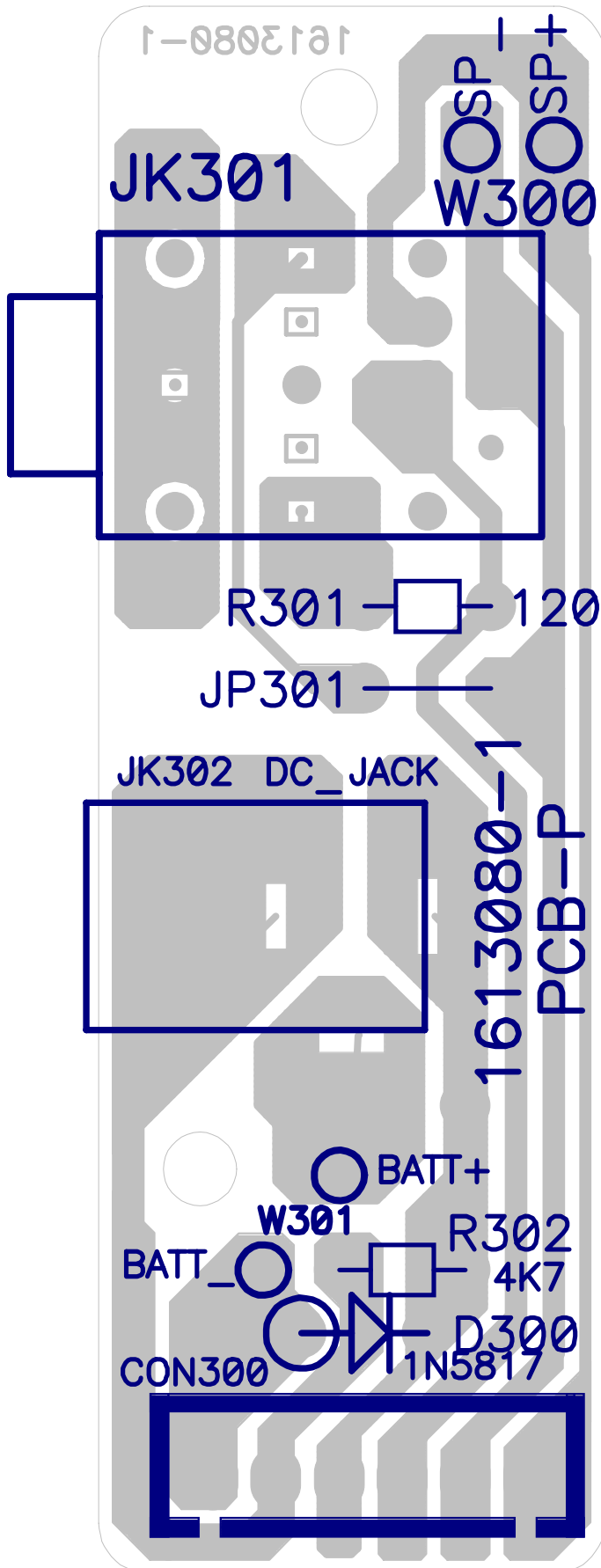
\*

	C75,C79,C86,C94,C95,D16,D18,J48,J49,J50,J52 Q15,Q16,Q25,R45,R46,R52,R53,R60,R71,R77 R81,R88	D17
PR-D4	No	JUMP
PR-D4L	Yes	1SS314

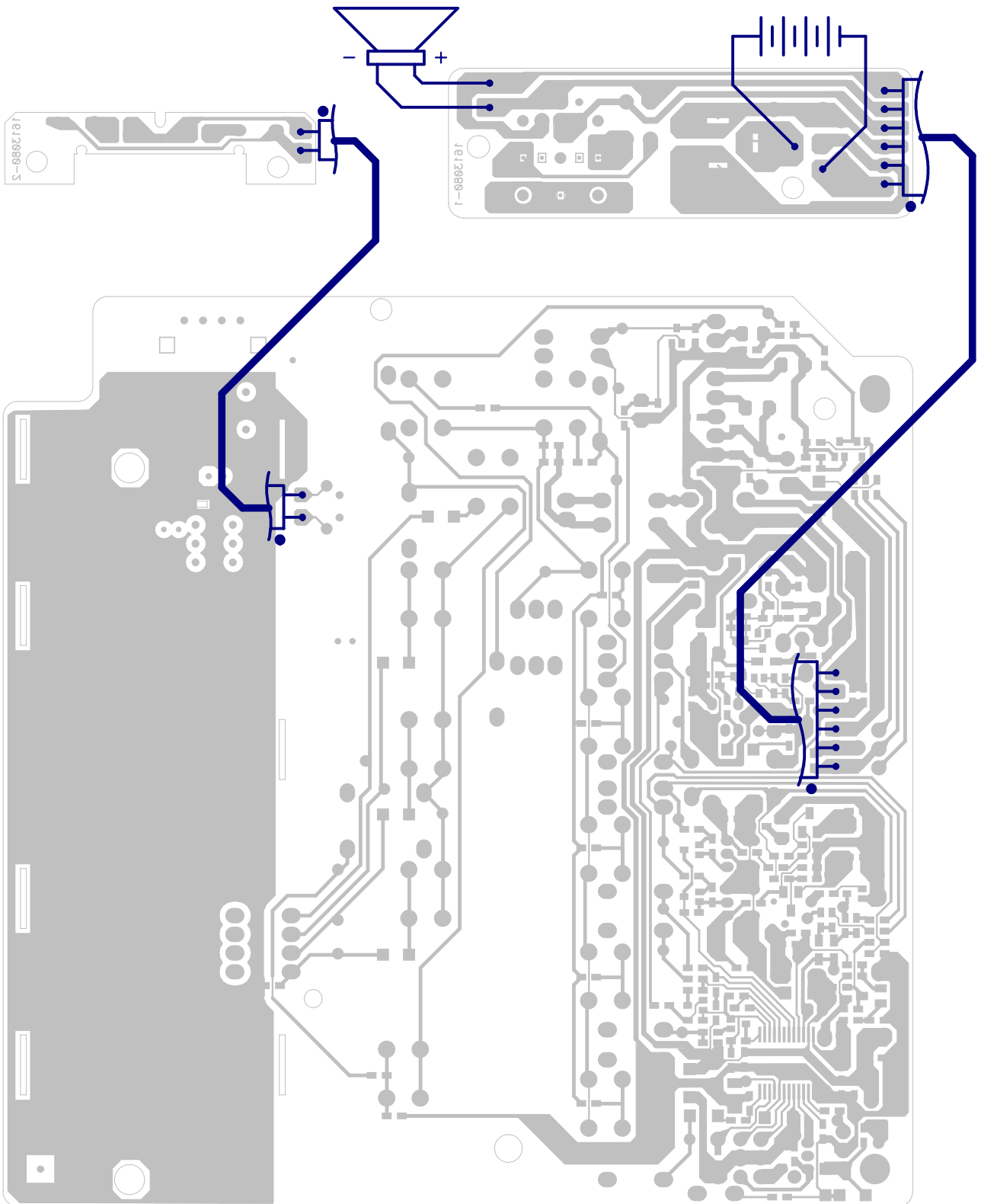
\*

	J52	BAR ANT
PR-D4	Yes	1111260
PR-D4L	No	1111270

# POWER PCB TOP VIEW



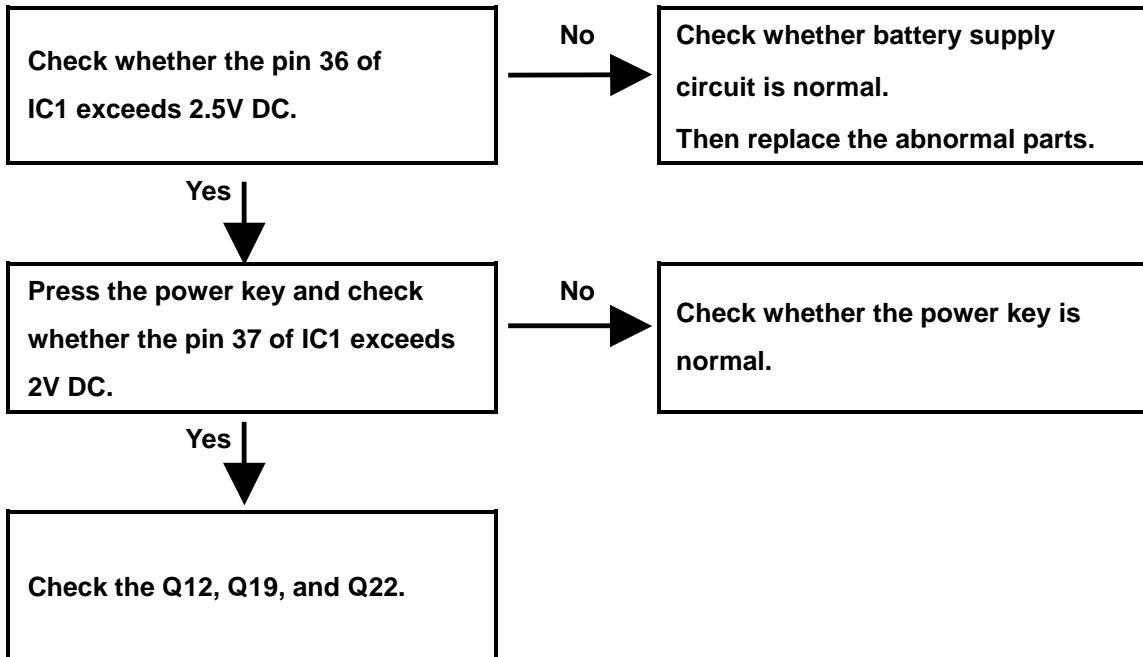
# WIRING DIAGRAM



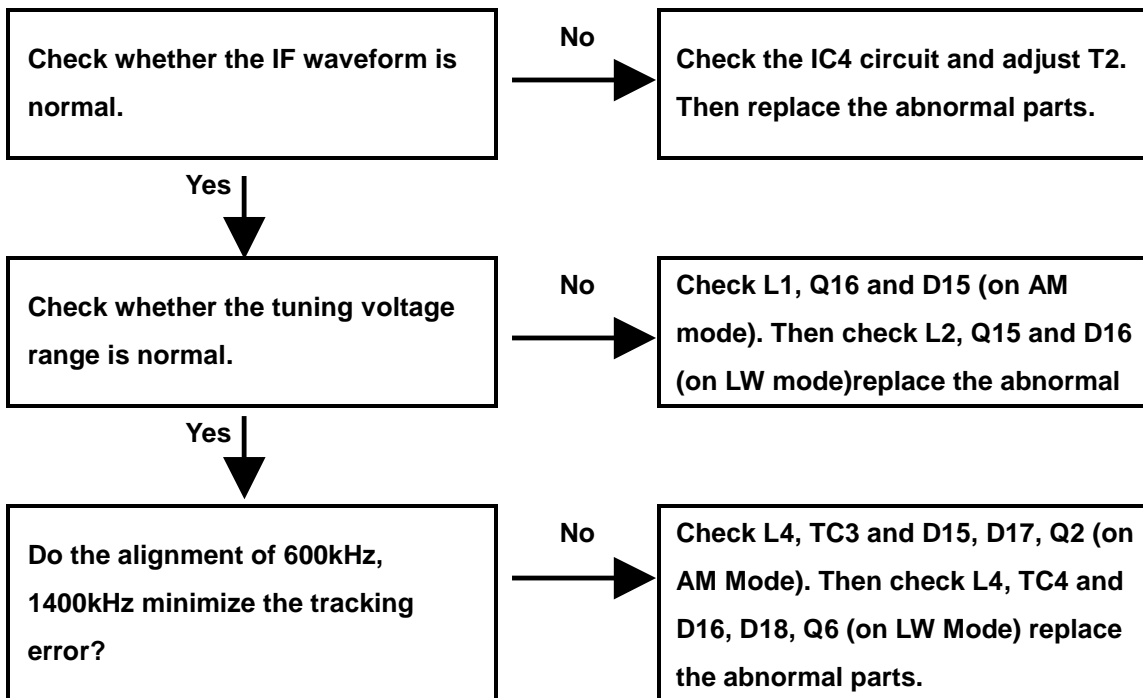


# TROUBLESHOOTING FLOW CHART

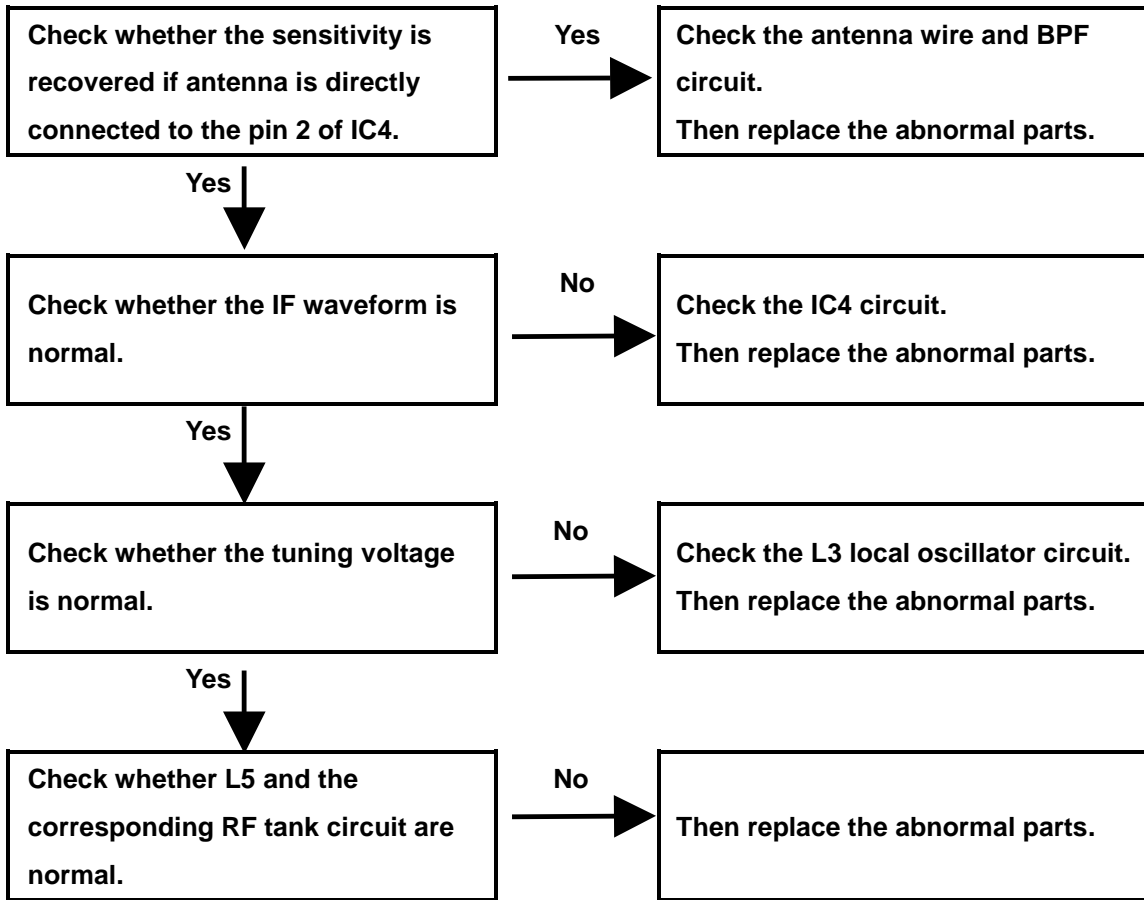
## ( 1 ) Power can not be turned on



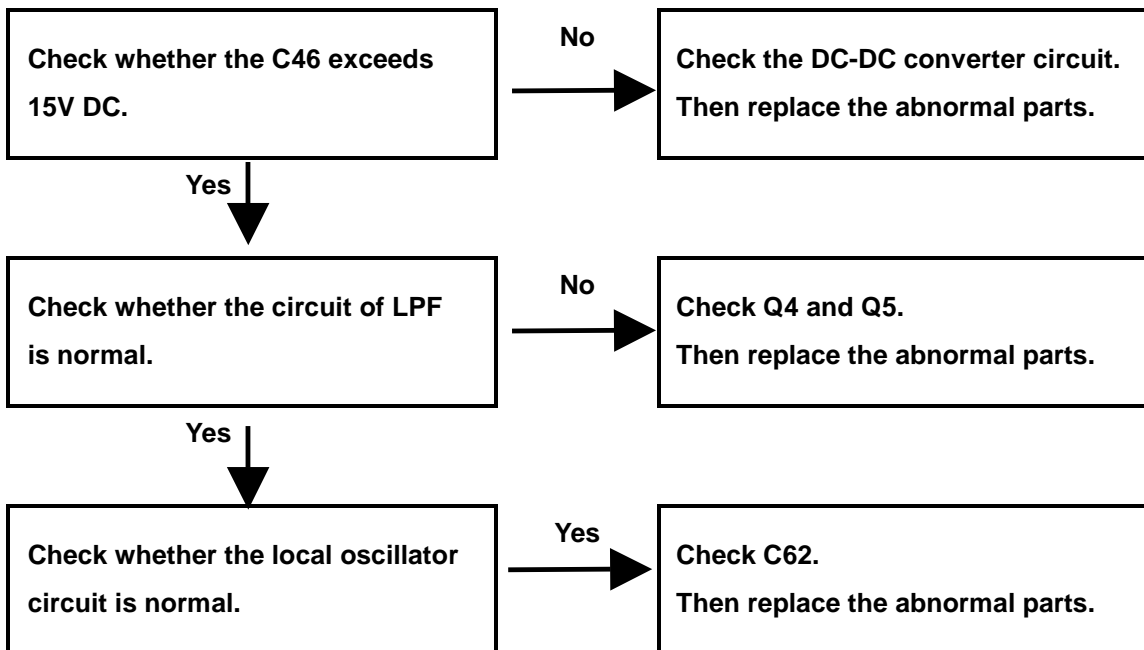
## ( 2 ) Weak sensitivity in AM/LW band



**( 3 ) Power can not be turned on**



**( 4 ) PLL does not work**



# ELECTRICAL PARTS LIST

PRD-4

PART NO	DESCRIPTION	Q'TY	REMARK
1000750	IC TC9318 AFAG-094	1	IC 1,
1011350	IC AN7141N	1	IC 3,
1011362-P	CH IC XC62FP3002PRN PbF	2	IC 2,5,
1013260	CH IC TA2149BFN	1	IC 4,
1020040	TR 2SB808F	1	Q 13,
1020250	TR 2SA1020Y	1	Q 12,
1020410	CH TR 2SA1611 M6	1	Q 3,
1022272	CH TR 2SC4154-G	18	Q 1,2,4-5,7-11,14,17-24,
1041190T	DIODE 1N5817-T	1	D 300,
1043150	CH VARACTOR KV1450	1	D 19,
1043161	CH VARACTOR KV1610S-1	1	D 15,
1045020	CH DIODE 1SS314	1	D 14,
1045092T	ZENER HZ15-3-T	1	D 7,
1045120T	ZENER RD6.2EB-T	1	D 6,
1046010	CH DIODE RLS4148	10	D 5,8-13,20-22,
1059060	LED ORG 3mm 45E4YL28TS-B	2	LED500,501,
1111310-P	BAR ANT & COIL 1310 PbF	1	BAR ANT
1122371	ADJ. COIL 2371	1	T 2,
1122380	ADJ. COIL 2380	1	L 1,
1123190-P	ADJ. COIL 3190 PbF	1	L 3,
1123711	ADJ. COIL 3711	1	T 1,
1135100S	FIXED COIL 1.5mH-S	1	L 4,
1145160	SP COIL 5x3.5Tx0.7	1	L 5,
1210360	TC 20P RED	3	TC 2,3,5,
1316224	R-VR 20KB L12.5H10	1	VR 1,
1600670	LCD PR-D4 20661TF	1	LCD1,
1613070	PCB-A PR-D4	1	
1613080	PCB-P PR-D4	1	
1620950	SPK 3" 4Ω 3W	1	SP
1630680	TOUCH SW (A)	12	SW 1-12,
1640060	JACK HP(F)	1	JK 301,
1647100	JACK DC-470AG PBT 2.0L	1	JK 302,
1650135	X'TAL 75KHz ±20PPM 2x6	1	X 1,
1660341	PFWLA450KS2A-A0	1	CF 2,
1664121	FILTER LT10.7MS2A10-A	1	CF 1,
1664222	FILTER GFMB7	1	BPF1,
1664480	FILTER CDALA10M7GA100ABO	1	CR 1,
1701086	CNT BASE 2.5x6P	1	CON300,
1704830	W/ASS'Y 220(2.5+6P)	1	CON1,
1900360	W/SPK 200(6+2P)	1	W 300,
441063NT0	EL 106M 16V 4x7	2	C 54,106,
444763JT0	EL 476M 16V 5x7	6	C 46,49,51,56,59,105,
441073JT0	EL 107M 16V 6.3x7	3	C 48,52,58,
441081KT0	EL 108M 6.3V 8x11.5	2	C 45,53,
443381KT0	EL 338M 6.3V 10x20	1	C 47,
4647360	MY 473J 50V	1	C 57,
4647360S	MY 473J 50V-S	1	C 50,
4920400	CH SUPERCAP EECENOF204RT	1	C 55,
4B10535	CH TA 105M 16V 3.2x1.6	1	C 112,
4B33532	CH TA 335M 16V 3.2x1.6	2	C 38,39,
4B47533	CH TA 475M 16V 3.2x1.6	1	C 72,
5002001	CH CC 020C 50V NPO-C	1	C 68,
5006001	CH CC 060C 50V NPO-C	1	C 93,
5010261	CH CC 102K 50V X7R-C	35	C 1-26,60,61,64,67,91,96,97,101,109,

# ELECTRICAL PARTS LIST

PRD-4

PART NO	DESCRIPTION	Q'TY	REMARK
5010361	CH CC 103K 50V X7R-C	14	C 37,42,44,62,63,74,78 ,83,88,92,102,107, 110,111,
5010471	CH CC 104Z 25V Y5V-C	17	C 27-30,33-35,40,41, 43,65,66,71,85,87, 100,104,
5010557	CH CC 105Z 10V F-C	2	C 36,76,
5015361	CH CC 153K 50V X7R-C	1	C 73,
5018001	CH CC 180J 50V NPO-C	1	C 77,
5020001	CH CC 200J 50V NPO-C	1	C 89,
5022001	CH CC 220J 50V NPO-C	1	C 69,
5022472	CH CC 224Z 16V Y5V-C	2	C 32,84,
5024001	CH CC 240J 50V NPO-C	1	C 103,
5027001	CH CC 270J 50V NPO-C	2	C 31,82,
5033101	CH CC 331J 50V NPO-C	1	C 70,
5047101	CH CC 471J 50V NPO-C	1	C 80,
5047472	CH CC 474Z 16V Y5V-C	2	C 90,113,
5068001	CH CC 680J 50V NPO-C	2	C 98,99,
5210471	CH CC 104Z 25V Y5V-B	1	C 81,
6010720T	RD 1/8W 47J-T	1	R 31,
6010721T	RD 1/8W 56J-T	2	R 500,501,
6010725T	RD 1/8W 120J-T	1	R 301,
6010744T	RD 1/8W 4.7KJ-T	1	R 302,
6010756T	RD 1/8W 47KJ-T	2	R 29,58,
6100108	CH RD 1/16W 4.7J-C	1	R 57,
6100112	CH RD 1/16W 10J-C	1	R 30,
6100116	CH RD 1/16W 22J-C	1	R 92,
6100120	CH RD 1/16W 47J-C	1	R 49,
6100124	CH RD 1/16W 100J-C	4	R 15,17,69,80,
6100130	CH RD 1/16W 330J-C	1	R 70,
6100132	CH RD 1/16W 470J-C	2	R 54,73,
6100136	CH RD 1/16W 1KJ-C	6	R 5,12,16,21,56,68,
6100139	CH RD 1/16W 1.8KJ-C	1	R 66,
6100140	CH RD 1/16W 2.2KJ-C	3	R 1,2,11,
6100141	CH RD 1/16W 2.7KJ-C	3	R 8,39,76,
6100142	CH RD 1/16W 3.3KJ-C	1	R 47,
6100144	CH RD 1/16W 4.7KJ-C	7	R 18,59,61,64,65,67,90
6100146	CH RD 1/16W 6.8KJ-C	1	R 82,
6100148	CH RD 1/16W 10KJ-C	6	R 14,26,28,34,83,91,
6100150	CH RD 1/16W 15KJ-C	1	R 51,
6100152	CH RD 1/16W 22KJ-C	2	R 40,62,
6100155	CH RD 1/16W 39KJ-C	1	R 41,
6100156	CH RD 1/16W 47KJ-C	12	R 3,4,9,19,32,35,42,43 ,50,75,89,93,
6100157	CH RD 1/16W 56KJ-C	2	R 6,37,
6100159	CH RD 1/16W 82KJ-C	1	R 25,
6100160	CH RD 1/16W 100KJ-C	13	R 10,22-24,27,38,44,48 ,55,72,74,79,84,
6100162	CH RD 1/16W 150KJ-C	1	R 20,
6100164	CH RD 1/16W 220KJ-C	1	R 36,
6100165	CH RD 1/16W 270KJ-C	1	R 78,
6100167	CH RD 1/16W 390KJ-C	1	R 86,
6100172	CH RD 1/16W 1MJ-C	3	R 33,85,87,
6100194	CH RD 1/16W OJ-C	5	J 41,45,46,51,52,
6110194	CH JUMP OJ-B	6	J 42-44,47,54,56,
6160136	CH RD 1/10W 1KJ-A	1	R 63,
6160194	CH RD 1/10W OJ-A	1	D 17,

# ELECTRICAL PARTS LIST

PRD-4

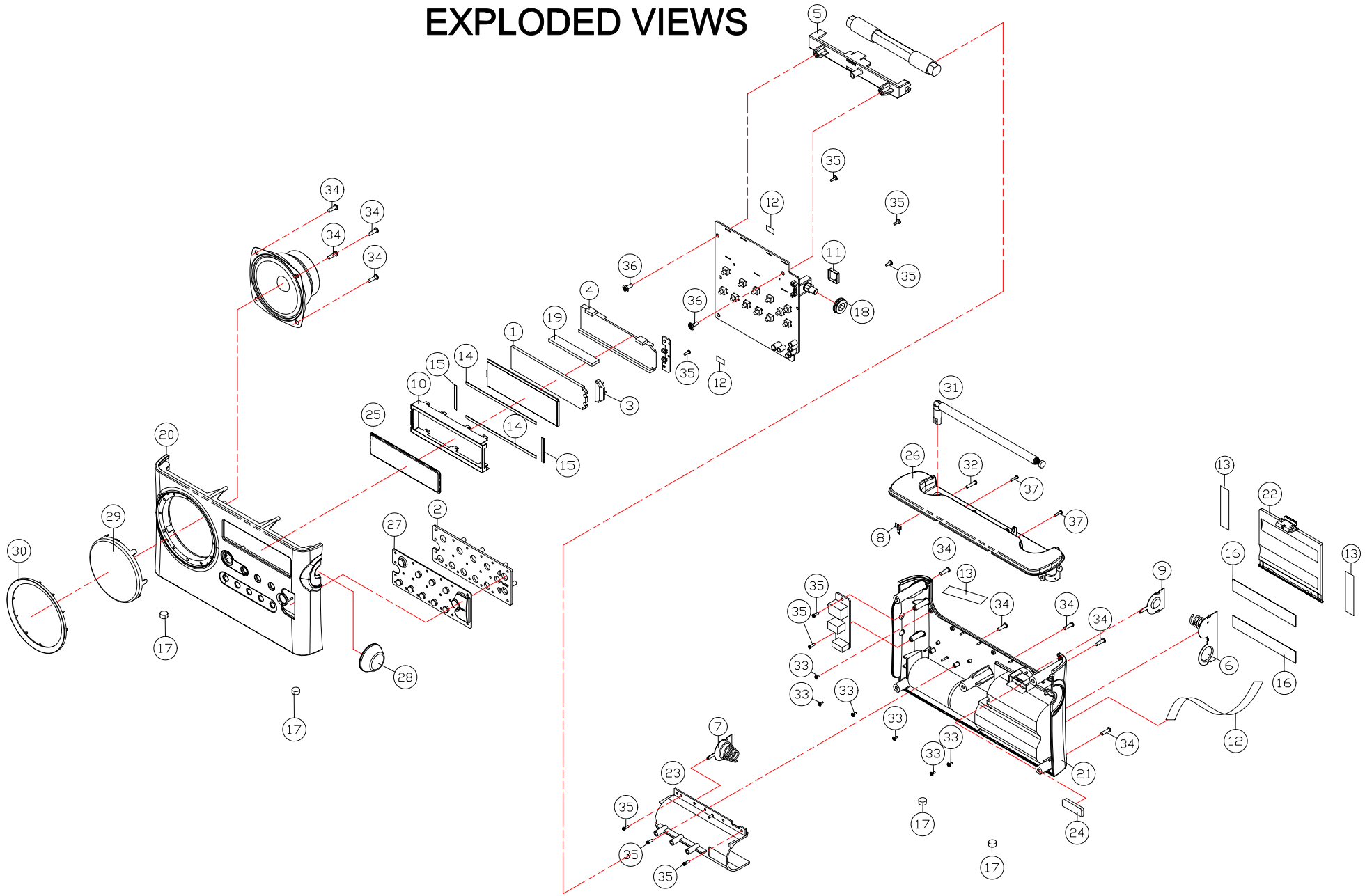
PART NO	DESCRIPTION	Q'TY	REMARK
6500440	CH RP 2.2KJx4-C	6	RP 1-6,
8000010	W/JUMP 5(10)0.6mm	12	J 28-30,33-35,39,40,53 ,55,57,301,
8000030	W/JUMP 7.5(10)0.6mm	28	J 1-20,23-27,31,36,37,
8000040	W/JUMP 10(10)0.6mm	2	J 32,38,
8173649	W/PVC 200(6+6)WHT	1	ANT
8592300	W/UL1007#30 55(2.5x2)RW	1	W 1,
8592750	W/2 270(6+6) R/B	1	W 301,

## MECHANICAL PARTS LIST

PRD-4

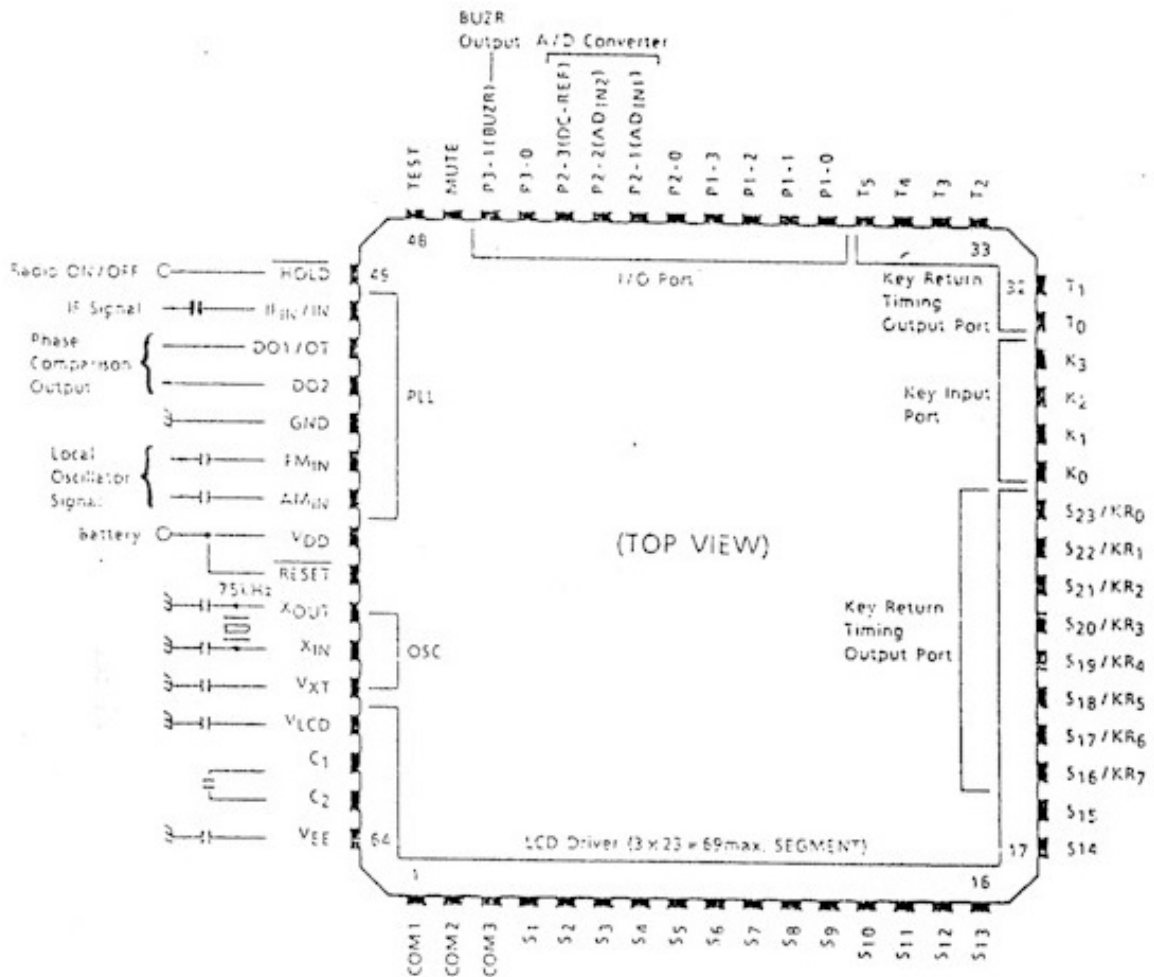
Ref no	PART NO.	DESCRIPTION	Q'TY	DWG NO.	REMARK
1	20K4001	LCD LIGHT LENS	1	A4-RD2-04A	
2	20M3000	RUBBER KEY HOLDER	1	A2-RD15-08	
3	20M3010	LED COVER	1	A4-RD15-19	
4	20N2000	CONDUCT RUBBER HOLDER	1	A4-PRD4-02	
5	20N2010	BAR ANT HOLDER	1	A4-PRD4-03	
6	21K9000	BATTERY CONTACT (+)(-)	1	A3-TONE-35A	
7	21K9120	BATTERY CONTACT ASS'Y	1	A4-TONE-51A	
8	21M3010A	ROD ANT LUG	1	A4-RD15-22	
9	21M3040	BATTERY CONTACT (+)	1	A4-RD15-28	
10	21N2000	LCD HOLDER	1	A4-PRD4-01	
11	21N2010	A-PCB-SHIELD	1	A4-PRD4-05	
12	2256000	P.C.B. HEMELON	2		
13	22G2020	HEMELON SPACER	3	A4-PC3-23	
14	22M3010	RIBBON	1	A4-RD15-30	
15	23K8030	LCD HOLDER NEP	2	A4-DDR3-25	
16	23K8110	NEP SPACER(E)	2	A4-DDR3-26	
17	23M3000	BATTERY COVER SPONGE	2	A4-RD15-29	
18	23N2000	LCD LIGHT MYLAR	1	A4-PRD4-06	
19	24M3000	PAD	4	A4-RD15-13	
20	24M3010	VR-KNOB SPACER	1	A4-RD15-27	
21	24N2000	CONDUCT RUBBER	1	A4-PRD4-04	
22	301N201	FRONT CABINET	1	A1-RD15-01	
23	303N201	BACK COVER	1	A1-RD15-02	
24	304M301	BATTERY COVER	1	A2-RD15-09	
25	304M301-1	BATT CASE	1	A3-RD15-10	
26	304M301-2	BATTERY CASE COVER	1	A4-RD15-11	
27	305N201	DIAL WINDOW	1	A3-RD15-07	
28	307N201	TOP COVER	1	A1-RD15-03	
29	313N201	PUSH RUBBER KEY	1	A2-RD15-05	
30	320N201	VR-KNOB	1	A4-RD15-18	
31	343M301	SPEAKER GRILL	1	A3-RD15-04	
32	344N201	SPK.FRAME	1	A2-RD15-06	
33	360M301A	ROD ANT	1	A1-RD15-12	
34	9062122	SCREW JMB 2.6x12(NI)	1		ROD ANT
35	9090019	SCREW M1.4x4(NI)	6		TOP COVER/BACK COVER x6
36	9103082	SCREW PTP 3x8(NI)	11		SPEAKERx4前/後CAB.x5 BAR ANT HOLDERx2
37	9151062	SCREW PTPW 2x6(NI)	9		BATT-CASE/BACK COVER x3 JACK-PCBx2/LCD ASS'Y/FRONT CAB.x1 A PCB/FRONT CAB.x3
38	9161082	SCREW PTB M2x8(NI)	2		FRONT/TOP CAB.x2

# EXPLODED VIEWS



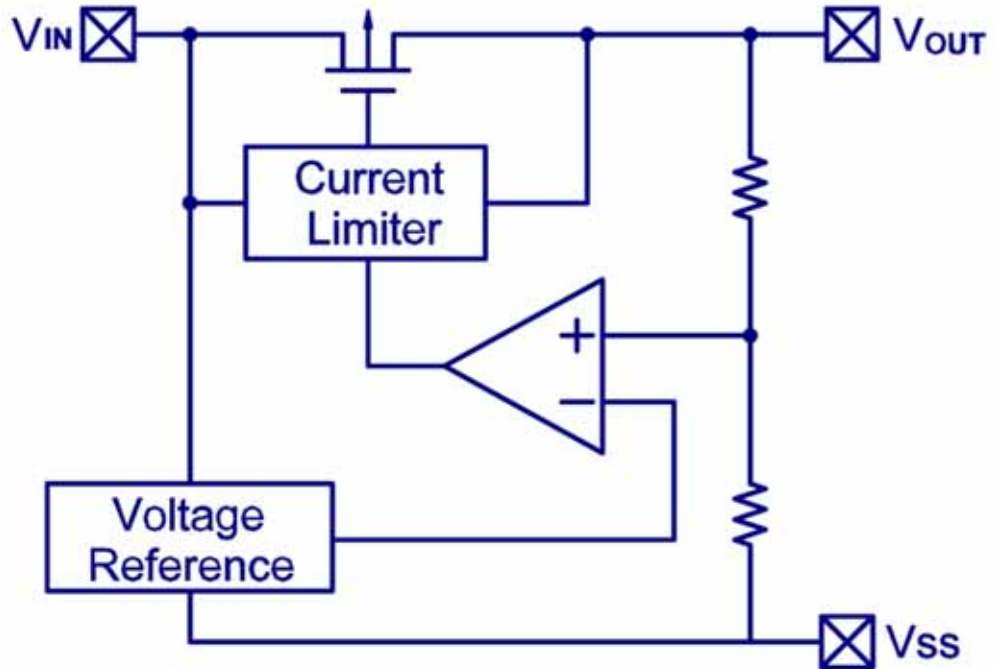
# IC CIRCUIT BLOCK DIAGRAM

## 1. IC1 – TC9318BF

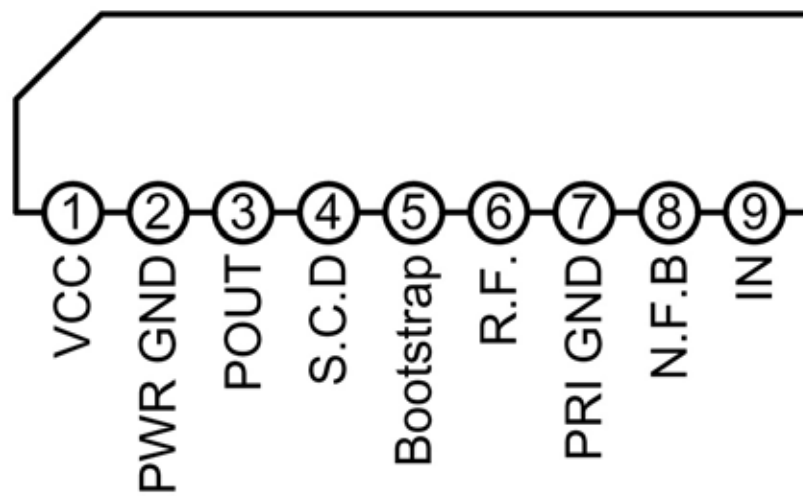




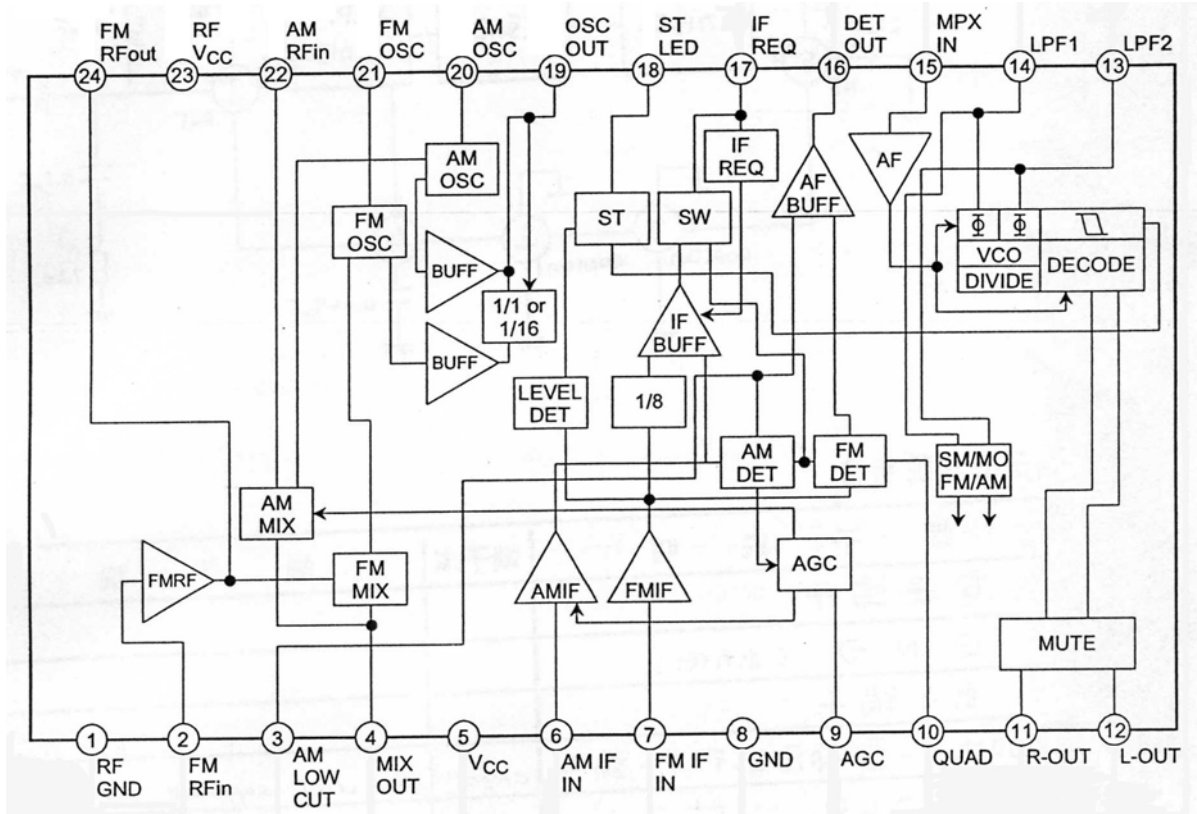
2. IC2 & IC5 – 3002PL



3. IC3 – AN7141



#### 4. IC4 – TA2149BFN



# VOLTAGE LIST

## IC1 – TC9318BF

PIN	OFF	FM	MW	LW
1	1.48	1.49	1.49	1.49
2	1.50	1.50	1.50	1.50
3	1.48	1.50	1.50	1.49
4	1.48	1.48	1.48	1.48
5	1.47	1.48	1.48	1.50
6	1.47	1.48	1.48	1.47
7	1.47	1.48	1.48	1.48
8	1.47	1.48	1.48	1.47
9	1.49	1.49	1.49	1.47
10	1.47	1.48	1.48	1.47
11	1.47	1.48	1.48	1.47
12	1.47	1.48	1.48	1.47
13	1.47	1.48	1.48	1.49
14	1.47	1.48	1.48	1.48
15	1.47	1.48	1.48	1.49
16	1.47	1.48	1.48	1.50
17	1.47	1.48	1.48	1.48
18	1.48	1.48	1.49	1.47
19	1.48	1.48	1.48	1.47
20	1.47	1.48	1.48	1.47
21	1.47	1.48	1.49	1.47
22	1.47	1.48	1.48	1.47
23	1.48	1.48	1.48	1.40
24	1.47	1.48	1.49	1.47
25	1.47	1.48	1.49	1.47
26	1.47	1.48	1.48	1.48
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0
30	0	0	0	0
31	3.02	2.99	2.98	2.99
32	0	0	0	0

PIN	OFF	FM	MW	LW
33	0	2.85	0	0
34	0	0	2.95	0
35	0	0	0	2.95
36	0	2.85	2.98	2.98
37	0	0	0	0
38	0	0	0	0
39	0	0	0	0
40	-0.08	-0.25	-0.24	-0.24
41	0	0	0	0
42	1.43	1.37	1.39	1.37
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	3	3	3	3
50	0	1.41	1.46	1.46
51	0	0.19	0.15	0.10
52	0	0.96	0.96	0.96
53	0	0	0	0
54	0	0	0	0
55	0	0.8	0.8	0.8
56	3	2.86	2.99	2.99
57	3.01	2.85	2.98	2.98
58	0.31	0.33	0.31	0.33
59	0.34	0.34	0.35	0.34
60	1.40	1.40	1.40	1.40
61	2.97	2.97	2.97	2.97
62	0.74	0.73	0.73	0.74
63	2.23	2.23	2.23	2.23
64	1.50	1.50	1.50	1.50

**IC2 – XC62AP3002PL**

PIN	FM
1	3.02
2	5.02
3	0

**IC3 – AN7141N**

PIN	FM
1	5.67
2	0
3	2.98
4	0.63
5	5.34
6	5.61
7	0
8	1.38
9	0.02

**IC5 – XC62AP3002PL**

PIN	FM
1	3.03
2	5.66
3	0

**IC4 – TA2149BFN**

PIN	FM	AM
1	0	0
2	0.8	0
3	0.44	1.03
4	2.80	2.99
5	3.03	3.03
6	2.50	2.35
7	3.02	3.03
8	0	0
9	0	0.20
10	2.26	2.46
11	1.17	1.17
12	0.97	0.98
13	2.16	0.01
14	0	0
15	0.7	0.7
16	1.26	1.02
17	0.94	0.93
18	0	0
19	2.19	2.32
20	3.01	2.39
21	3.03	3.03
22	3.03	3.03
23	3.03	3.03
24	3.03	3.03

### Transistor

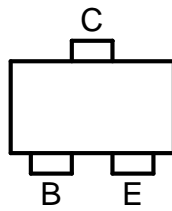
		FM	AM	LW			FM	AM	LW			FM	AM	LW
Q1	E	0	0	/	Q9	E	0.42	/	/	Q17	E	0	/	/
	B	0.58	0	/		B	0.96	/	/		B	0	/	/
	C	0.01	1.79	/		C	0.44	/	/		C	0.94	/	/
Q2	E	0	0	0	Q10 *2	E	0	0	0	Q18	E	0	0	/
	B	0	0.58	0		B	0	0	0		B	0.01	0.56	/
	C	3	0.10	3		C	0	0	0		C	2.16	0.01	/
Q3	E	2.86	/	/	Q11 *2	E	0	0	0	Q19	E	0	/	/
	B	2.31	/	/		B	0	0	0		B	0.64	/	/
	C	2.85	/	/		C	0	0	0		C	0.13	/	/
Q4	E	0	0	0	Q12	E	5.69	/	/	Q20	E	0.51	/	/
	B	0.56	0.56	0.56		B	4.98	/	/		B	0	/	/
	C	4.46	4.75	3.83		C	5.66	/	/		C	5.12	/	/
Q5	E	0.56	0.56	0.56	Q13 *2	E	5.72	5.72	5.72	Q21	E	0.56	/	/
	B	0.96	0.95	0.96		B	5.17	5.17	5.17		B	0	/	/
	C	4.46	4.75	3.83		C	0	0	0		C	0.51	/	/
Q6	E	0	0	0	Q14	E	0	/	/	Q22	E	0.11	/	/
	B	0	0	0.58		B	0	/	/		B	0	/	/
	C	3	3	0.01		C	0.02	/	/		C	0.64	/	/
Q7 *1	E	0	0	0	Q15	E	3.03	3.03	3.03	Q23	E	0.59	/	/
	B	0	0	0		B	3.01	3.01	2.44		B	0	/	/
	C	1.64	1.64	1.64		C	2.39	3.01	3.01		C	0	/	/
Q8	E	0.43	/	/	Q16	E	3.03	3.03	3.03	Q24 *2	E	0	0	0
	B	0.44	/	/		B	3.01	2.44	3.01		B	0	0	0
	C	3	/	/		C	2.39	3.01	3.01		C	5.35	5.35	5.35
										Q25	E	0	0	0
											B	0	0.57	0
											C	0	0	0

\*1 Light OFF

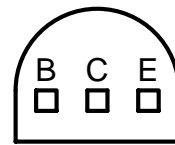
\*2 BZ OFF

# SEMICONDUCTOR LEAD IDENTIFICATIONS

## Transistors



2SC4154  
2SA1611



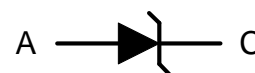
2SA1020Y  
2SB808F

(E:Emitter C:Collector B:Base)

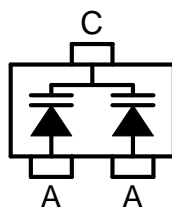
## Diodes



RLS4148  
1SS314



ZENER RD15  
ZENER RD6.2



KV1610S  
KV1450

(A:Anode C:Cathode)

# SCHEMATIC DIAGRAM

