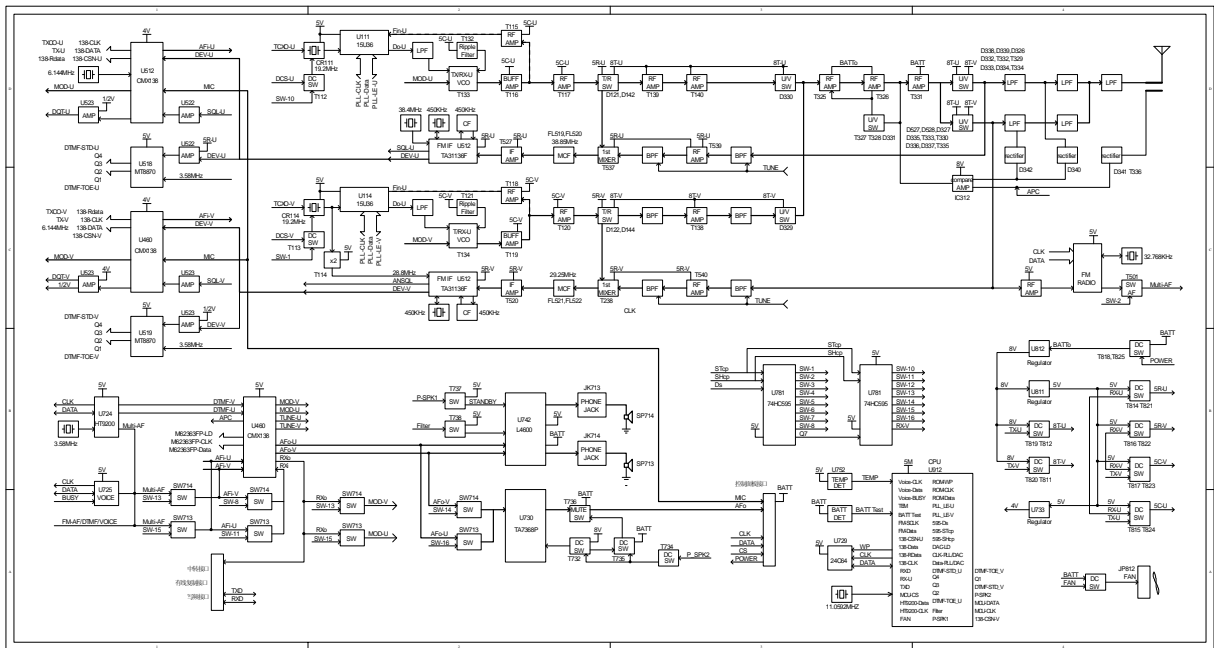


Twin Band Mobile Radio Service Manual



I Structure of Frequency

This model uses twice frequency conversion. For UHF band, the 1st IF is 38.85MHz, and the 2nd IF is 455KHz; For VHF band, the 1st IF is 29.95MHz, and the 2nd IF is 450KHz. The 1st local oscillations are provided by PLL circuit. PLL circuit is also produced the necessary transmitting frequencies (see Chart I). A, B, C, D frequency points of Chart I are as follows:

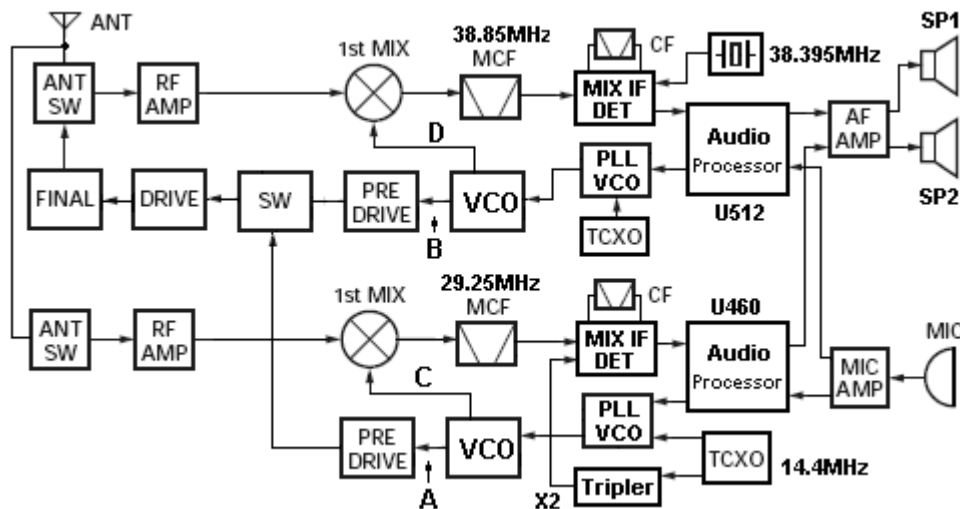


Chart I

Structure of Frequency	A	C	B	D
(1)	136~174.995MHz	165.250~204.245MHz	400~470.995MHz	429.25~500.245MHz
(2)	136~174.995MHz	165.250~204.245MHz	450~520.995MHz	479.25~550.245MHz
(3)	136~174.995MHz	165.250~204.245MHz	245~245.995MHz	274.25~275.245MHz

II Receiving

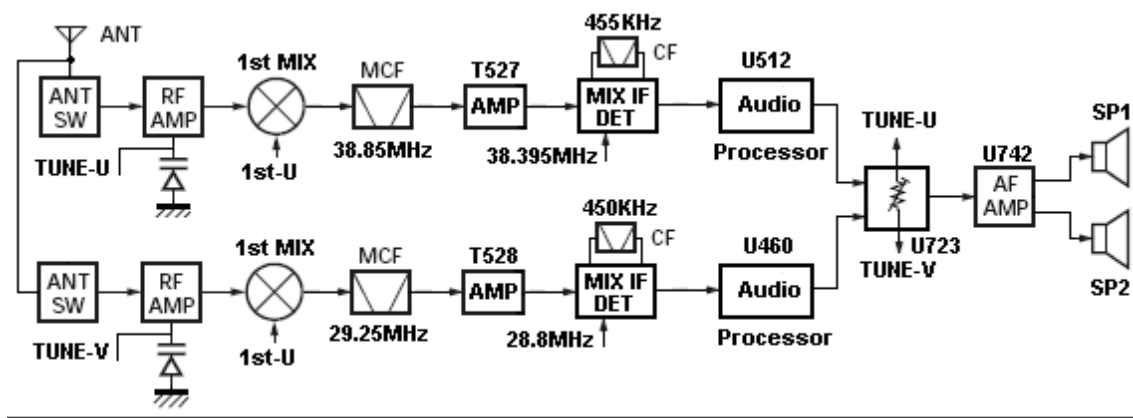


Chart II

(1) The front end of U Band (RF Amplifier)

The signal which is received from the antenna enters the transmission/receive change-over switch diode circuit (D332, D333, D338 and D339), then goes through BPF(L1560, L561 and L562), and is enlarged by RF amplifier (T539). The signal goes through the BPF (L544 and L545), and then enters the mixing. These BPF is adjusted by the variable condenser(D531, D532, D533, D534). Input voltage through the the variodencer is adjust to output voltage by the D/A switch (U723).(See Chart II)

(2)The front end of V Band(RF Amplifier)

The signal which is received from the antenna enters the transmission/receive change-over switch diode circuit (D335, D336, D527 and D528), then goes through BPF(L568, L543 and L546), and is enlarged by RF amplifier (T540).The signal goes through the BPF(L566), and then enters the mixing. These BPF (D541, D542, D535 and D536)adjusted by the variable condenser. The input voltage by variable condenser is adjusted by the outputting voltage by D/A switch (U723).(See Chart 2)

(3) The 1st Mixer

The signals from the front end of U Band and the Rx LO prouduced by PLL electro circuit creat the 1st intermediate frequency signal of 38.850MHz on T537 Mixing. The 1st intermediate frequency signal enters the crystal filter FL519 and FL50 (UM5-3P 38.85M) to eliminate the signals from the adjacent channels.

The signals from the front end of V Band and the Rx LO prouduced by PLL electro circuit creat the 1st intermediate frequency signal of 29.250MHz on T323 Mixing. The 1st intermediate frequency signal enters the crystal filter FL521 and FL522 (UM5-3P 29.25M) to eliminate the signals from the adjacent channels.(See Chart II)

(4)Intermediate Frequency Enlarging Circuit

For U band, the 1st intermediate frequency signal via filter enters the 1st intermediate frequency amplifier T527(2SC4215) to amplify and enter the intermediate frequency system IC U524. The intermediate frequency system chip provides 2nd mixer, 2nd local oscillations' signals, limiting amplifier, orthogonal intersection detector and RSSI(Receiving Signal Strength Indicator). The 2nd mixer mixes the 1st intermediate frequency signal and the 2nd local oscillations' signals output, and then creates the 2nd intermediate frequency signal 450KHz. The 2nd intermediate frequency signal continuously eliminate the signals from the adjacent channels via ceramic filter(FL515). The 2nd intermediate signal through filter is enlarged by limiting amplifier and demodulated by orthogonal detector with chinaware discriminator (CR514). The demodulated signal enters the tone circuit.

For V band, the 1st intermediate frequency signal via filter enters the 1st intermediate frequency amplifier T528 (2SC4215) to amplify and enter the intermediate frequency system IC U525. The intermediate frequency system chip provides 2nd mixer, 2nd local oscillations' signals, limiting amplifier, orthogonal intersection detector and RSSI(Receiving Signal Strength Indicator). The 2nd mixer mixes the 1st intermediate frequency signal and the 2nd local oscillations' signals output, and then creates the 2nd intermediate frequency signal 450KHz. The 2nd intermediate frequency signal continuously eliminate the signals from the adjacent channels via ceramic filter(FL5156). The 2nd intermediate signal through filter is enlarged by limiting amplifier and demodulated by orthogonal detector with chinaware discriminator (CR515). The demodulated signal enters the tone circuit.(See Chart II)

(5) Tone Amplifier Circuit

For U band, after transmitting to the tone processor U512 to process the circuit, the demodulated signal outputs to U723 volume control IC from the 23rd foot tube, and outputs to speaker after being enlarged by tone power amplifier (U742).

For V band, after transmitting to the tone processor U460 to process the circuit, the demodulated signal outputs to U723 volume control IC from the 23rd foot tube, and outputs to speaker after being enlarged by tone power amplifier (U742). (See Chart II)

(6) Squelch

For U band, FM IC (U524) and V band, a part of AF signal outputted by FM IC(U460) enters IC again. Noise components are amplified and amended via filter and amplifier, and creates the appropriate DC voltage with the noise PWL.

DC signal is sent to the 18th foot analogue port of tone processor IC (U512) via FM IC. U912 determines if outputs the voice via speaker by checking the inputted data by the tone processor IC (U512). When the speaker outputs voice, the 14th foot of microprocessor (U912) transmits the high level signals to P-SPK1 line, and opens AF AMP (U742) via T737. See Chart III

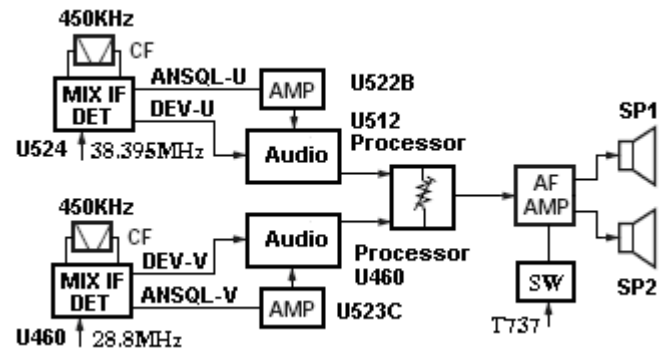


Chart III

III Synthesis of PLL Frequency

PLL circuit creates the local oscillator signals for receiving and RF signals for transmitting.

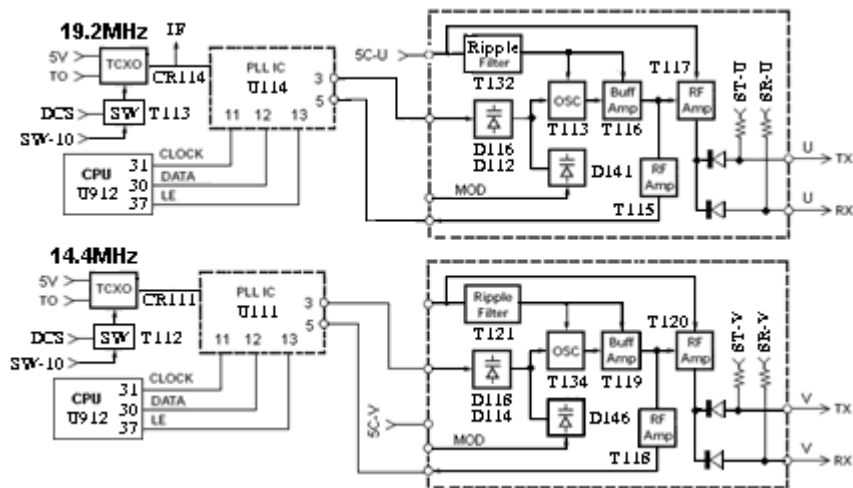


Chart IV

(1) PLL

The step frequency for PLL circuit is 5KHz or 6.25KHz.

Reference oscillation signals of 14.4MHz and 19.2MHz are split frequencies by a fixed counter on U111 and U114. The outputted signals from VCO of V/U band oscillator are respectively buffered and amplified by T116 and T115, and then are split frequencies by a programmable two-module counter on U111 and U114. The signals of splitting frequencies are separately compared in the phase comparator of U111 and U114. The two created signals go through different low pass to filter, and then separately transmits to U/V VCO to control the oscillation frequencies.(See Chart IV)

(2) VCO

①VCO for U Band

For U band, the used frequency points are created by T113 for transmitting and receiving.

Transmit the VCO controlling voltage that is obtained from the phase comparator to variable diode (D116, D112) to control oscillation frequency. The signals from the oscillated frequency are amplified

by T116 and T117, and then are transmitted to RF amplifier and receiver separately via D142 and D135. (See Chart IV)

② VCO for V Band

For V band, the used frequency points are generated by T134 for transmitting and receiving.

Transmit the VCO controlling voltage that is obtained from the phase comparator to variable diode (D116, D114) to control oscillation frequency. The signals from the oscillated frequency are amplified by T116 and T117, and then are transmitted to RF amplifier and receiver separately via D144 and D122. (See Chart IV)

IV Transmitting Segment System

(1) Speaker Amplifier

The signals from the speaker via U611 are adjusted maximum frequency deviation by U band tone processor (U512) and V band tone processor (U460), and then are sent to VCO of U or V band to modulate and input. (See Chart V)

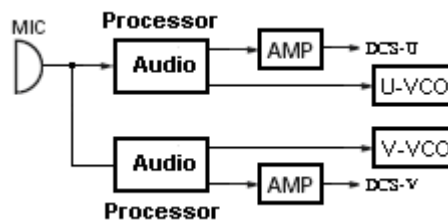


Chart V

(2) Driver and Terminal Amplifier

① The signals from U band T/R switch (D142 ON) are amplified by pre-driver amplifier (T139, T2140). The signals from V band T/R switch (D144 ON) are amplified by pre-driver amplifier (T138). The amplified U/V signals are separately transmitted to the driver amplifier (T325, T326) to 5W.

The output of the driver amplifier is amplified to 50W (when on low power level, it is 25W) by RF power amplifier (T331). For U band, the output of RF power amplifier passes harmonic filter(LPF) and antenna switch(D332, D333), and then is sent to antenna terminal. For V band, the output of RF power amplifier passes harmonic filter (LPF) and antenna switch (D335, D335), and then is sent to antenna terminal.(See Chart VI)

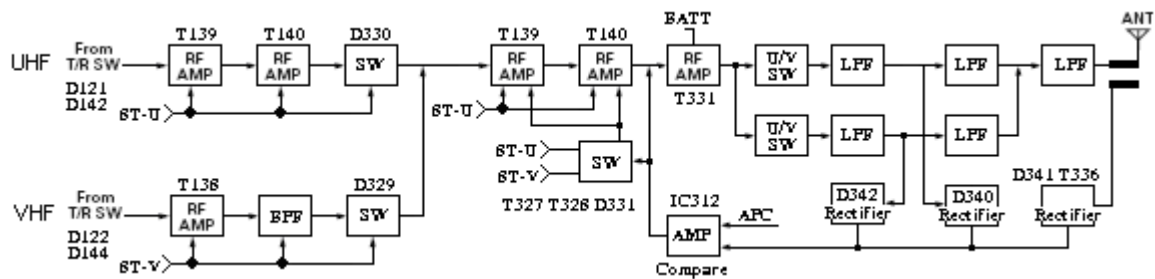


Chart VI

(3) Auto Power Control (APC) Circuit

For U band, a part of the output from RF power amplifier is commuted to DC voltage by D340, D341 and T336, and then is sent to APC IC312. APC IC312 produces a controlled voltage by comparing DC voltage and the 3rd output reference voltage from U723 D/A converter. And the controlled voltage is provided by auto power controlled tube T327, T328, pre-driver amplifier T325, driver amplifier T326 and power amplifier T331. So that it still can continuously output stable power under the changing antenna loading condition.

For V band, a part of the output from RF power amplifier is commuted to DC voltage by D341, D342 and T336, and then is sent to APC IC312. APC IC312 produces a controlled voltage by comparing DC voltage and the 3rd output reference voltage from U723 D/A converter. And the controlled voltage is provided by auto power controlled tube T327, T328, pre-driver amplifier T325, driver amplifier T326 and power amplifier T331. So that it still can continuously output stable power under the changing antenna loading condition. (See Chart VI)

(4) Encoding Signaling

QT/DQT

For U band, DQT/QT data is outputted by the 13th tube foot of tone processor IC U512. A part of signals are sent to TCXO CR111 via IC U523B. Another part of signals are mixed with tone signals, and then separately is inputted to VCO of U band.

For V band, DQT/QT data is outputted by the 13th tube foot of tone processor IC U460. A part of signals are sent to TCXO CR111 via IC U523A. Another part of signals are mixed with tone signals, and then separately is inputted to VCO of V band.

V Power Supply

The radio can control the power supply via the POWER key on the panel.

There are most-used power supplies 8V and 5V.

5C-V is the public 5V for V band, which keeps outputting in the un-saving mode.

5R-V is the public 5V, which keeps outputting during receiving. 5R-U is 5V for receiving on U band, and keeping outputting during receiving.

8T-V is the 5V for transmitting on V band, which keeps outputting during transmitting. 8T-V is also 5V for transmitting on U band, and keeps outputting during transmitting.

There are another two general supplies, BATT+ and BATT. BATT+ is the inputted power supply, BATT is the power supply that is controlled by the power supply switch.

VI Control Circuit

The control circuit is consist of the micro processor(U912) and the outside circuit. It controls TX-RX unit. The main functions for the U912 are as followings:

Switch the TX-RX state according to the signal input from PTT.

Read out the data of the systems, groups, frequencies and programming from the memory circuit.

Transmit the data of the frequencies to PLL.

Control the ON&OFF of the squelch according to the DC voltage ouput from the squelch circuit.

Control the tone mute according to the data of the decoder.

1) Memory Circuit

The memory circuit is consist of the CPU(U912) and EEPROM(U729).

The capacity is 256K bits, including the control program used on the CUP of the hand-held sets and the datas of the channels and operating functions.(See PIC7)

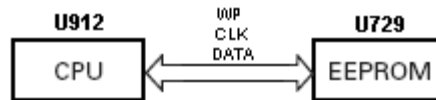


Chart VII

2) Prompt of Low Voltage

Monitor the battery voltage through the micro processor. When the battery voltage is in low state, there is prompt transmit for warning.(See Chart VII)

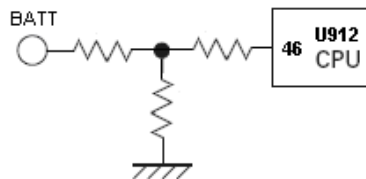


Chart VIII

VII. Keyboard and Display Circuit

1) Detecting for the keyboard entry

K1,K2,K3 and K4 are the output ends for the keyboard, while D1,D2,D3 and D4 are the input ends. They conduct after being detected by the micro processor(IC811). (See PIC9)

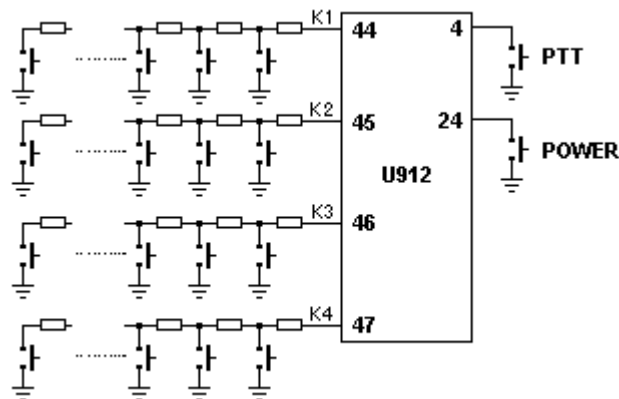


Chart IX

2) Display Circuit

LCD displays the information, which is controlled the unicircuit of the display driver for the screen by the micro processor (IC811), to ensure that the LCD displays the corresponding information. (See

Chart X)

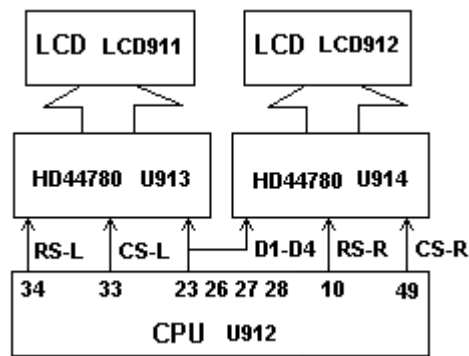


Chart X

2) Backlight Circuit

The LCD screen for this radio is using three color of the backlight, while the keyboard is using the solid color. The backlight is controlled by the micro processor(U912). (See PIC11)

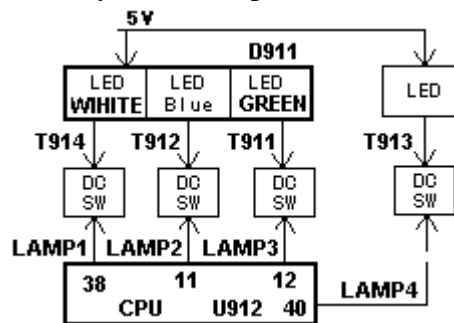


Chart XI

VIII Adjustment

Public Segment

ITEM	CONDITION	Measurement		Adjustment		SPEC/ MARK
		Test Facility	Terminal	Components	Method	
1.Setting	1)BATT Terminal Voltage: 13.8V 2)SSG Standard Modulation [WIDE]MOD:1KHz,DEV:3KHz [NARROW]MOD:1KHz,DEV:1.5KHz					
2.VCO Latch Voltage RX	1) CH: High	Power Meter DVM	ANT CV		3.0V	+/-0.1V
	2) CH: Low				Inspection	0.6V or above
3.VCO Latch Voltage TX	3) CH: High PTT:ON				3.0V	+/-0.1V
	4) CH: Low PTT:ON				Inspection	0.6V or above

Transmission Segment

ITEM	CONDITON	Measurement		Adjustment		SPEC/ MARK
		Test Facility	Terminal	Components	Method	
1.Frequecn Adjustment	1) CH: High 2)PTT:ON	Frequency Meter	ANT			High Freque ncy +/-50Hz
2.High Power Adjustment	Test CH: Low Center High BATT Terminal Voltage:13.8V PTT:ON	Power Meter Current Meter				4.0W +/-0.1V 1.9A or below
3. Low power adjustment	Test CH: Low Center High BATT Terminal Voltage:13.8V PTT:ON					1.0W +/-0.1V 0.9A or below
4. Maximum Frequency Offset Adjustment[Wide]	Test CH: Low Center High AG:1KHz/150Mv Frequency offset analyzer filter LPF:15KHz HPF:OFF PTT:ON	Power Meter Frequency Offset Analyzer oscillograph AG AF VTVM	ANT SP/MIC Connector		4.2KHz (According to Maximum)	+/-50Hz
[NARROW]	Test CH: Center PTT:ON				2.2KHz (According to Maximum)	+/-50Hz

Receiving Segment

ITEM	Condition	Measurement		Adjustment		SPEC/ MARK
		Test Facility	Terminal	Components	Method	
1.Sensitivity Inspection [WIDE]	Test CH: Low Center High SSG Output:-117dBm(0.3 uV) SSGMOD:3KHz	SSG DVM oscillograph AF VTVM	ANT		Inspection	12dB SINAD or above
[Narrow]	Test CH: Center SSG Output:-115dBm(0.4					

	uV) SSGMOD:1.5 KHz					
3. SQL(Squelch Threshold Value) Write-into [Wide]	Test CH: Low Center High SSG Output:-123dBm(0.16uV) SSGMOD:3.0 KHz			Programming Software	Write-into	Squelch Open
[NARROW]	Test CH: Center SSG Output:-122dBm(0.16uV) SSGMOD:3.0 KHz					
4. SQL(Deep squelch threshold value) Write-into [Wide]	Test CH: Center Low High SSG Output:-117dBm(0.3 uV) SSGMOD:3.0 KHz					
[Narrow]	Test CH: Center SSG Output:-116dBm(0.3 5uV) SSGMOD:1.5 KHz					

IX Component List

Front Component List on PCB

SPEC	USE/Function	encapsulation	Item	QTY
0.5P	Chip capacitor	C0603	C396 C397	9
100P	Chip capacitor	C0402	C883 C884 C859 C851 C856 C855 C736 C735 C115 C501 C485 C480 C478 C473 C472 C468 C766 C767 C865 C867 C869 C870 C873 C875 C885 C886 C890 C891 C892 C894 C895 C896	32
100P	Chip capacitor	C0603	C317	1
102P	Chip capacitor	C0402	C729 C825 C315 C119 C514 C461 C121 C123 C839 C840 C518 C493 C732 C697 C698 C882 C872 C458	6
102P	Chip capacitor	C0603	C108 C104 C322 C324 C325 C309 C739 C218 C133 C313 C316 C319 C320 C323 C326 C327 C328 C329 C330 C334 C336 C340 C341 C342 C343 C344 C346 C348 C411	17
102P.Q	Chip capacitor	C0805	C423	1
103P	Chip capacitor	C0603	C364	6
103P	Chip capacitor	C0402	C600 C601 C818 C154 C454 C511 C512 C462 C460 C832 C833 C158 C731 C486 C753 C455	2
104P	Chip capacitor	C0603	C844 C308 C321 C232 C318 C354 C355 C356 C357 C358 C359 C360 C826 C502	8
104P	Chip capacitor	C0402	C843 C842 C582 C583 C584 C585 C586 C817 C750 C143 C607 C939 C234 C235 C751 C474 C781 C814 C820 C829 C830 C524 C536 C150 C492 C494 C487 C477 C471 C467 C466 C465 C782 C747 C754 C555 C559	2
105P	Chip capacitor	C0805	C774 C771	6
105P	Chip capacitor	C0603	C413	2
105P	Chip capacitor	C0402	C587 C602 C813 C941 C510 C528 C481 C464 C457 C821 C517 C542	1
10P	Chip capacitor	C0603	C380 C404 C405 C352 C416 C238 C210	2
10P.Q	Chip capacitor	C1210	C394	1
10uF/16V	Chip capacitor	C0805	E518 E736 E735	3
10uF/16V	Chip capacitor	3216	E517 E814 E815 E816 E516 E915	1
120P.Q	Chip capacitor	C0805	C424	1
12P	Chip capacitor	C0603	C391 C392	1

12P	Chip capacitor	C0402	C658	1
12P.Q	Chip capacitor	C1210	C412	2
150P	Chip capacitor	C0402	C456 C538	1
15P	Chip capacitor	C0402	C688	8
15P	Chip capacitor	C0603	C229	4
15P.Q	Chip capacitor	C0805	C419	3
15P.Q	Chip capacitor	C1210	C350 C403	
180P	Chip capacitor	C0402	C176	
18P	Chip capacitor	C0603	C141 C201	
18P.Q	Chip capacitor	C0805	C369 C410	
18P.Q	Chip capacitor	C1210	C400 C383	
1P.Q	Chip capacitor	C1210	C431	
2.2Uf/16V	Chip capacitor	3216	E742	
220P	Chip capacitor	C0402	C679	
20P.Q	Chip capacitor	C1210	C429	
220P	Chip capacitor	C0603	C742	
220P	Chip capacitor	C0402	C743 C532 C455	
220P.Q	Chip capacitor	C0805	C430	
223P	Chip capacitor	C0402	C684 C686 C687 C765	
225P	Chip capacitor	C0603	C444 C442	
22P	Chip capacitor	C0603	C406 C379	
22P.Q	Chip capacitor	C0805	C370 C407	
24P	Chip capacitor	C0603	C311	
27P.Q	Chip capacitor	C1210	C426 C428 C427	
2P	Chip capacitor	C0603	C106	
2P.Q	Chip capacitor	C1210	C395	
2P.Q	Chip capacitor	C1206	C415	
30P	Chip capacitor	C0603	C417	
33P	Chip capacitor	C0603	C382	
33P.Q	Chip capacitor	C1210	C365	
39P	Chip capacitor	C0603	C107 C418	
39P.Q	Chip capacitor	C1210	C414	
3P	Chip capacitor	C0603	C402	
4.7uF/16V	Chip capacitor	C0805	C463 CC459 C519 C523 C491 C690 C541 C513	
470P	Chip capacitor	C0402	C816 C733	
473P	Chip capacitor	C0402	C533 C482	
47P	Chip capacitor	C0603	C422	
47P.Q	Chip capacitor	C1210	C420 C421	
4P	Chip capacitor	C0603	C105	
5P	Chip capacitor	C0603	C134	
5P.Q	Chip capacitor	C1210	C389	
680P	Chip capacitor	C0402	C728	
6P	Chip capacitor	C0603	C103	
6P.Q	Chip capacitor	C0805	C409	
6P.Q	Chip capacitor	C1210	C351 C390 C393	
7P	Chip capacitor	C0603	C187	

7P.Q	Chip capacitor	C1210	C388 C425	
82P	Chip capacitor	C0402	C153	
82P.Q	Chip capacitor	C1210	C366	
9P	Chip capacitor	C0603	C142	
9P.Q	Chip capacitor	C1210	C433	
0R	Resistor chip	R0402	R541 R750 R481 R477 R466 R465 R474 R882 R872 R581 R178	
0R	Resistor chip	R0603	R382	
1.2K	Resistor chip	R0402	R586 R585	
100K	Resistor chip	R0805	R326	
100K	Resistor chip	R0603	C824	
100K	Resistor chip	R0402	R715	
100K.1W	Resistor chip	R1812	R327	
100KF	Resistor chip	R0402	R749 R322	
100KF	Resistor chip	R0603	R324	
100R	Resistor chip	R0402	R180 R758 R757 R183 R830 R831 R191	
10K	Resistor chip	R0603	R166 R132 R388 R389 R391 R139	
10K	Resistor chip	R0402	R714 R245 R246 R244 R111 R776 R761 R762 R771 R862 R863 R759 R777 R656 R657 R658 R783 R655 R654 R652 R651 R543 R544 R756 R755 R483 R482 R458 R571 R129 R128 R668 R667 R666 R665 R664 R663 R662 R16 R711 R712 R770 R768 R769 R569	
10KF	Resistor chip	R0402	R384	
10R	Resistor chip	R0402	R526 R513 R511	
120K	Resistor chip	R0402	R539 R459	
15K	Resistor chip	R0603	R401 R400	
15KF	Resistor chip	R0603	R385	
15R	Resistor chip	R0603	R152	
1K	Resistor chip	R0603	R318 R321 R377 R378	

1K	Resistor chip	R0402	R319 R587 R467 R452 R451 R248 R502 R501 R829 R531 R532 R533 R534 R743 R741 R485 R480 R478 R468 R472 R473 C881 C871	
2.2K	Resistor chip	R0402	R169 R168 R767 R861 R818 R820 R832	
2.2K	Resistor chip	R0603	R237 R383	
200K	Resistor chip	R0402	R456 R555	
20KF	Resistor chip	R0402	R747	
220K	Resistor chip	R0402	R597 R779 R780	
220R	Resistor chip	R0402	R409	
22K	Resistor chip	R0402	R719 R718 R540 R460	
22K	Resistor chip	R0603	R329	
22R	Resistor chip	R0603	R404	
27K	Resistor chip	R0402	R746 R765 R457 R556	
330K	Resistor chip	R0402	R228	
330R	Resistor chip	R0603	R410	
330R	Resistor chip	R0402	R787	
33R	Resistor chip	R0603	L548 R163	
33R.1W	Resistor chip	R2512	R312 R313	
39K	Resistor chip	R0402	R535 R464 R764 R739	
39KF	Resistor chip	R0603	R323	
4.7K	Resistor chip	R0603	R104 R102 R133 R402 R403 R136 R824	
47K	Resistor chip	R0402	R856 R859 R812 R814 R828	
47R	Resistor chip	R0603	R167 R122 R399 R405 R406	
5.6K	Resistor chip	R0402	R463 R561	
51K	Resistor chip	R0402	R462 R560 R563 R593	
CH100nH	Chip inductor	L0603	L540 L516 L911 L533 L482	
CH12nH	Chip inductor	L0603	L345	
CH15nH	Chip inductor	L0603	L163 L344 L343	
CH180nH	Chip inductor	L0603	L555	
CH2.2nH	Chip inductor	L0603	L354	
CH22nH	Chip inductor	L0603	L355	
CH27nH	Chip inductor	L0603	L356	
CH39nH	Chip inductor	L0603	L341	
CH47nH	Chip inductor	L0603	L170	
CH56nH	Chip inductor	L0603	L342	
CH68nH	Chip inductor	L0603	L348	
CI100nH	Chip inductor	L0603	L519 L512 L463 L460	
CI1uH	Chip inductor	L0603	L114	
CI3.3uH	Chip inductor	L0603	L346 L347	
CI470nH	Chip inductor	L0603	C683	
CI560nH	Chip inductor	L0603	L112	
RED	LED	D0603	D815	1
GREEN	LED	D0603	D814	1
RLS4148	Diode	D-ESC	D811 D518 D326 D169 D517	5

LED	LED	LED	D926	1
RLS4148	Diode	USC	D611 D610	2
1SS372	Diode	USM	D812 D612	2
32.768KHz	Crystal	MC-146	CR811	1
2.5 mm	Earphone socket	ST-104	JK513	1
3.5 mm	Speaker socket	ST-301	JK611	1
JP20	20 chip console	JP-20-2L	JP811	1
CH100nH	Fixed conductor	L0603	L811 L611 L520 L517	4
CH68nH	Fixed conductor	L0603	L519 L518	2
4.7K	Resistor chip	R0402	R221 R854 R840 R839 R630 R625 R624 R623 R618 R359 R216 R144 R133 R219 R927 C629	16
1K	Resistor chip	R0402	R222 R132 R824 R669 R668 R663 R815 R814	8
0R	Resistor chip	R0402	R152 R675 R859 R838 R641 R632 R856	7
10K	Resistor chip	R0402	R674 R673 R672 R671 R813 R811 R633 R627 R651 R163	10
22K	Resistor chip	R0402	R384 R852 R848 R637 R620 R576 R862 R134	8
180K	Resistor chip	R0402	R131 R646	2
560K	Resistor chip	R0402	R861	1
220K	Resistor chip	R0402	R860 R858 R828 R819 R578 R218 R112	7
100R	Resistor chip	R0402	R855 R664 R662 R617 R572	5
68K	Resistor chip	R0402	R853 R644	2
100K	Resistor chip	R0402	R851 R843 R818 R642	4
47K	Resistor chip	R0402	R850 R817 R622 R596 R135 R118 R116 R115 R113 R648 R389 R379 R667	13
91K	Resistor chip	R0402	R846	1
5.6K	Resistor chip	R0402	R845 R844 R634	3
33K	Resistor chip	R0402	R842 R841 R629 R628 R626 R621 R613 R137	8
120K	Resistor chip	R0402	R830	1
330R	Resistor chip	R0402	R829 R665	2
150R	Resistor chip	R0402	R822 R821	2
2.2K	Resistor chip	R0402	R820 R666 R639 R573 R119 R114 R390 R378	8
47R	Resistor chip	R0402	R816	1
18K	Resistor chip	R0402	R640	1
680K	Resistor chip	R0402	R638	1
1.5K	Resistor chip	R0402	R636	1
39K	Resistor chip	R0402	R635 R139	2
10R	Resistor chip	R0402	R619	1
1.8M	Resistor chip	R0402	R612 R611	2
15K	Resistor chip	R0402	R217 R140	2

NC	Resistor chip	R0402	R145 R110	2
27K	Resistor chip	R0402	R138	1
150K	Resistor chip	R0402	R655 R654	2
1M	Resistor chip	R0402	R650 R647 R645	3
5.6R	Resistor chip	R0402	R926	1
560R	Resistor chip	R0402	R117 R312	2
220R	Resistor chip	R0603	R358 R356	2
15K	Resistor chip	R0603	R360	1
150K	Resistor chip	R0603	R658 R657 R656 R614	4
20K	Resistor chip	R0603	R361	1
0.33R	Resistor chip	R1206	R660 R615 R616	3
NC	Resistor chip	R1206	R659	1
47K	Exclusion	1206-4	RP812 RP811	2
50K	Trimming resistor	RV1008	RES611	1
50K	Trimming resistor	RV1208	RV112	1
PF1	Switch	TD-26EA	SW615	1
MONI KEY	Switch	TD-26EA	SW614	1
PTT KEY	Switch	TD-30EA	SW613	1
2SK3476	FET	2-5N1A	T322 T142	2
2SC4617	Transistor	ESM	T615 T614	2
DTA114EE	Transistor	ESM	T661	1
DTC114EE	Transistor	ESM	T222 T152 T674 T673 T672 T671 T815 T814 T611 T146 T613 T219 T862 T326	14
FT717	Transistor	TSM	T138 T137 T136 T318 T317 T812	6
2SC2712	Transistor	TSM	T926	1
2SC4116	Transistor	USM	T811	1
2SC4226	Transistor	USM	T521	1
1SS4181	Transistor	USM	T616	1
RDA5807P	IC	QFN24	U514	1
EM78P568	IC	QFP44	IC811	1
24C64	IC	SOP8	U811	1
LM4558	IC	SOP	U611	1
LM358	IC	SOP8	U612	1
VOICE	Voltage Regulator Tube	VOICE	U812	1

Obverse Component List on PCB

SPEC	Use/Function	encapsulatin	Item	QTY
ANT-2	Antenna	ANT-KX01	ANT112	1
BATTERY	Battery contract	BATTERY3	BATT611	1
102P	Chip capacitor	C0402	C666 C819 C317 C137 C363 C264 C247 C546 C539 C281 C555 C532 C531 C426 C412 C405 C401 C400 C391 C375 C351 C339 C228 C212 C266 C183 C172 C170 C619 C122 C354 C348 C347 C124 C114 C113 C231 C385 C331 C852	40
104P	Chip capacitor	C0402	C667 C665 C316 C561 C525 C683 C573 C251 C234 C543 C319 C562 C529 C403 C374 C286 C283 C621 C538 C387 C329 C205	22
NC	Chip capacitor	C0402	C818 C559 C557 C682 C572 C540 C558 C530 C425 C378 C384 C376 C372 C244 C235 C224 C222 C210 C112 C284 C432 C430	22
103P	Chip capacitor	C0402	C622 C353 C365 C139 C684 C574 C345 C550 C542 C536 C221 C219 C650 C648 C620 C358 C428 C424 C402 C133 C130 C123 C230 C383 C218 C217 C203 C377	28
470P	Chip capacitor	C0402	C416 C423 C361 C135 C240 C239 C595 C144 C556 C433 C443 C429 C413 C408 C407 C392 C357 C355 C350 C332 C326 C147 C258 C254 C252 C248 C236 C220 C261 C257 C185 C184 C174 C173 C171 C129 C125 C120 C115 C649 C618 C366 C343 C285 C127 C117 C422 C414 C181 C176 C323 C321	52
18P	Chip capacitor	C0402	C313 C180 C177	3
5P	Chip capacitor	C0402	C312 C311 C398 C232 C263 C262 C260 C226 C225	9
473P	Chip capacitor	C0402	C549	1
100P	Chip capacitor	C0402	C547 C560 C449 C215 C213 C208 C204 C202 C192	9
224P	Chip capacitor	C0402	C563	1
272P	Chip capacitor	C0402	C554	1
180P	Chip capacitor	C0402	C528 C527 C282	3
10P	Chip capacitor	C0402	C526 C452 C381 C328 C209 R341 R335	7
56P	Chip capacitor	C0402	C447	1
2P	Chip capacitor	C0402	C445	1
27P	Chip capacitor	C0402	C442	1

3P	Chip capacitor	C0402	C440 C439 C419 C418 C191 C188 C187 C111	8
22P	Chip capacitor	C0402	C437	1
7P	Chip capacitor	C0402	C410 C246 C245 C265 C119	5
24P	Chip capacitor	C0402	C406 C280	2
12P	Chip capacitor	C0402	C404 C395 C346 C337 C333 C253	6
15P	Chip capacitor	C0402	C399 C342	2
0.5P	Chip capacitor	C0402	C330 C250 C242	3
1P	Chip capacitor	C0402	C322	1
6P	Chip capacitor	C0402	C318 C182	2
8P	Chip capacitor	C0402	C255 C259 C175 C533	4
82P	Chip capacitor	C0402	C227	1
51P	Chip capacitor	C0402	C211	1
11P	Chip capacitor	C0402	C189 C186 C152	3
4P	Chip capacitor	C0402	C179 C178 C229	3
3P	Chip capacitor	C0603	C453 C154 C153 C150	4
7P	Chip capacitor	C0603	C451	1
NC	Chip capacitor	C0603	C450 C446 C427 C409 C371 C132 C118 C267	8
8P	Chip capacitor	C0603	C444 C436 C142 C141	4
4P	Chip capacitor	C0603	C438	1
22P	Fixed inductance	C0603	L341 L340	2
30P	Chip capacitor	C0603	C435	1
33P	Chip capacitor	C0603	C420 C349	2
2P	Chip capacitor	C0603	C368 C151	2
102P	Chip capacitor	C0603	C367	1
220P	Chip capacitor	C0603	C356	1
470P	Chip capacitor	C0603	C352 C128 C121	3
100P	Chip capacitor	C0603	C320	1
56P	Chip capacitor	C0603	C238	1
1P	Chip capacitor	C0603	C155	1
5P	Chip capacitor	C0603	C149	1
104P	Chip capacitor	C0603	C146	1
10P	Chip capacitor	C0603	C145 C116	2
13P	Fixed inductance	C0603	L319	1
0.5P	Chip capacitor	C0603	C143	1
27P	Chip capacitor	C0603	C140 C126	2
10uF	Chip capacitor	C0805	E665 E667 E519 E684 E574 E520	6
22uF	Chip capacitor	C0805	C256	1
470P	Chip capacitor	C0805	C338	1
1uF	Chip capacitor	C0805	C571 E521	2
4.7uF	Chip capacitor	C0805	E118 C454	2
1SV376	Variable diode	ESC	D328 D327 D325 D324 D140 D139 D132 D131	8
RLS4148	Diode	ESC	D682 D681 D542 D541 D661	5

HSC277	Diode	ESC	D133 D323 D316 D315 D314 D312 D148 D138 D137 D136	12
			D135 D311	
1SV305	Variable diode	ESC	D321 D320 D145 D144 D143 D142 D319 D318 D141	9
HSM88A	Diode	TSM	D443 D147	2
BA592	Diode	USC	D322 D146	2
1SV278	Variable diode	USC	D317	1
0.1uF	Chip tantalum electrolytic condenser	EIA3216	E314 E313 E121	3
4.7uF	Chip tantalum electrolytic condenser	EIA3216	E312 E119 E120 E311	4
0.22uF	Chip tantalum electrolytic condenser	EIA3216	E122	1
10uF	Chip tantalum electrolytic condenser	EIA3216	E616 E613	2
100uF	Chip tantalum electrolytic condenser	EIA6032	E522	1
450K	Filter	PBFC455R	FL514	1
29.250MHz	Filter	UM-5-3S	FL516 FL515	2
14.4MHz	Crystal	19.2MHZ	CR112	1
C24	Crystal	6060	CR512	1
CH68nH	Fixed inductance	L0402	L339 L325	2
CH47nH	Fixed inductance	L0402	L314	1
CH27nH	Fixed inductance	L0402	L186	1
CH15nH	Fixed inductance	L0402	L171	1
CH12nH	Fixed inductance	L0402	L159	1
CH18nH	Fixed inductance	L0603	L313 L170 L169 R351	4
CI3.3uH	Fixed inductance	L0603	L166 L322 L167 L321	4
HW120nH	Fixed inductance	L0603	L346 C336	2
HW18nH	Fixed inductance	L0603	L345 L164	2
HW68nH	Fixed inductance	L0603	L344 R346	2

HW82nH	Fixed inductance	L0603	L343 L320 C415	3
HW560nH	Fixed inductance	L0603	L326	1
CH220nH	Fixed inductance	L0603	L324 L323	2
HW47nH	Fixed inductance	L0603	L318	1
CH100nH	Fixed inductance	L0603	L317 L153	2
CH120nH	Fixed inductance	L0603	L316 L312 L311	3
CI6.8uH	Fixed inductance	L0603	L315 L152	2
CH270nH	Fixed inductance	L0603	L168 L162 L161 L160	4
HW6.8nH	Fixed inductance	L0603	L163 L192	2
CI560nH	Fixed inductance	L0603	L157	1
CI1uH	Fixed inductance	L0603	L156	1
HW4.7nH	Fixed inductance	L0603	L191	1
HW12nH	Fixed inductance	L0603	L190	1
HW56nH	Fixed inductance	L0603	L189	1
HW27nH	Fixed inductance	L0603	L188 L187	2
CH2.2nH	Fixed inductance	L0603	L177	1
HW220nH	Fixed inductance	L0603	L173	1
HW1uH	Fixed inductance	L0603	L172	1
HW150nH	Fixed inductance	L0603	L165	1
CH15nH	Fixed inductance	L0603	L155	1
CH22nH	Fixed inductance	L0603	L154	1
CH12nH	Fixed inductance	L0603	L158	1
CH100nH	Fixed inductance	L0805	L333 L179	2
HW560nH	Fixed	L0805	L327	1

	inductance			
CI560nH	Fixed inductance	L0805	L174	1
CI100nH	Fixed inductance	L0805	L328	1
HW220nH	Fixed inductance	L0805	L176 L330 L175	3
HW1uH	Fixed inductance	L0805	L329	1
0.31*1.5*7T	Air core coil	LC03155T	L338 L335	2
0.31*1.5*8T	Air core coil	LC03155T	L336	1
0.31*1.5*5T	Air core coil	LC03155T	L185 L182 L181	3
0.31*1.5*7T	Air core coil	LC03157T	L183	1
0.35*1.5*8T	Air core coil	LC035158T	L332 L178	2
0.4*1.0*3T	Air core coil	LC04103T	L334	1
1K	Resistor chip	R0402	R835 R834 R320 R538 R154 R149 R146 R158 C537	9
47K	Resistor chip	R0402	R833 R832 R683 R543 R542 R522 R363 R348 R162 R207 R375	11
4.7K	Resistor chip	R0402	R831 R823 R534 R681 R541 R161 R518 R533 R332 R331 R661 R392 R388 R382 R184 R183 R182 R181 R179 R322 R383	21
150K	Resistor chip	R0402	R321 R515 R325 R171 R148 R200 R199 R159	8
1.5K	Resistor chip	R0402	R537	1
3K	Resistor chip	R0402	R535	1
100R	Resistor chip	R0402	R511 R444 R380 R372 R329 R326 R178 R173 R121	9
2.2K	Resistor chip	R0402	R682 R523 R532 R531 R338 R155 R191 R376	8
56K	Resistor chip	R0402	R529 R352	2
33K	Resistor chip	R0402	R528 R353	2
470K	Resistor chip	R0402	R527	1
0R	Resistor chip	R0402	R526 R313 R157 R153 R151 R214 C448 C223 C421 C417	10
150R	Resistor chip	R0402	R525	1
10R	Resistor chip	R0402	R524 R438 R324 R147	4
3.9K	Resistor chip	R0402	R520 R598 R536 R439	4
180K	Resistor chip	R0402	R599 R512 R122	3
NC	Resistor chip	R0402	R539 R215 R196 R127 R143 R142 R141	7
820R	Resistor chip	R0402	R516 R395 R120	3
2K	Resistor chip	R0402	R514	1
100K	Resistor chip	R0402	R513 R446 R362 R160 R198 R128	6
120K	Resistor chip	R0402	R463 R460 R458 R210 R209	5
200K	Resistor chip	R0402	R459	1
330R	Resistor chip	R0402	R456 R126	2

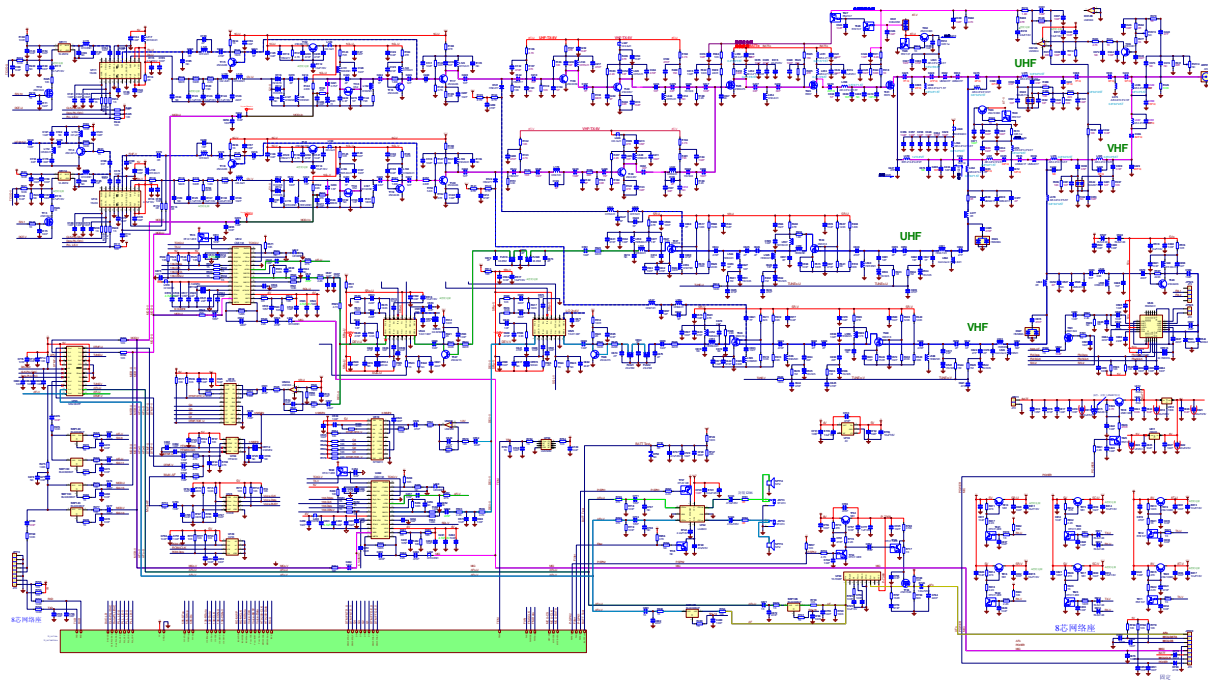
2.7K	Resistor chip	R0402	R455	1
82K	Resistor chip	R0402	R448 R447 R445 R201	4
47R	Resistor chip	R0402	R418 R176 R172 R166 R192 R334 R205 R187 R452	9
680R	Resistor chip	R0402	R417 R330 R317 R194 R190	5
10K	Resistor chip	R0402	R394 R349 R333 R186 R185 R364	6
3.3K	Resistor chip	R0402	R387 R328 R175 R180 R517	5
5.6K	Resistor chip	R0402	R377 R174	2
22R	Resistor chip	R0402	R354 R350 R339 R208 R202 R193	6
220R	Resistor chip	R0402	R327	1
180R	Resistor chip	R0402	R319 R136	2
1.8K	Resistor chip	R0402	R316 R206	2
560R	Resistor chip	R0402	R315 R177 R188	3
91R	Resistor chip	R0402	R168	1
68K	Resistor chip	R0402	R204	1
5.6R	Resistor chip	R0402	R195	1
220K	Resistor chip	R0402	R123	1
1M	Resistor chip	R0402	R465 R464 R130 R129 R125 R124 R451 R450	8
220R	Resistor chip	R0603	R213 R212	2
0R	Resistor chip	R0603	R203 L342 L331	3
10R	Resistor chip	R0603	R197	1
0R	Resistor chip	R0805	R355	1
ED08741O	Channel switch	ED08741O	SW811	1
R08710NS	Power//Volume Switch	R08710NS	SW612	1
2SC4617	Transistor	ESM	T132 T313	2
DTA114EE	Transistor	ESM	T526	1
DTC114EE	Transistor	ESM	T681 T541 T523 T524 T383	5
2SC3357	Transistor	SOT89	T320 T140	2
2SK1588	FET	SOT89	T525	1
2SK3475	FET	SOT89	T321 T141	2
FT717	Transistor	TSM	T684 T574 T522 T316	4
2SC3356	Transistor	TSM	T319 T139	2
2SK508NV	FET	TSM	T325 T134	2
3SK318	FET	US4	T324 T323 T144 T143	4
2SC4215	Transistor	USM	T520	1
2SC4226	Transistor	USM	T129	1
2SC4226	Transistor	USM	T311 T312 T131 T130	4
2SC5488	Transistor	USM	T315 T135	2
TA7368	IC	SSOP10	U515	1
TA31136F	IC	SSOP16	U516	1
LMX2336	IC	SSOP20	U112	1
5V	Voltage Regulator Tube	5V	U616 U613	2

LCD Controlled Board Component List

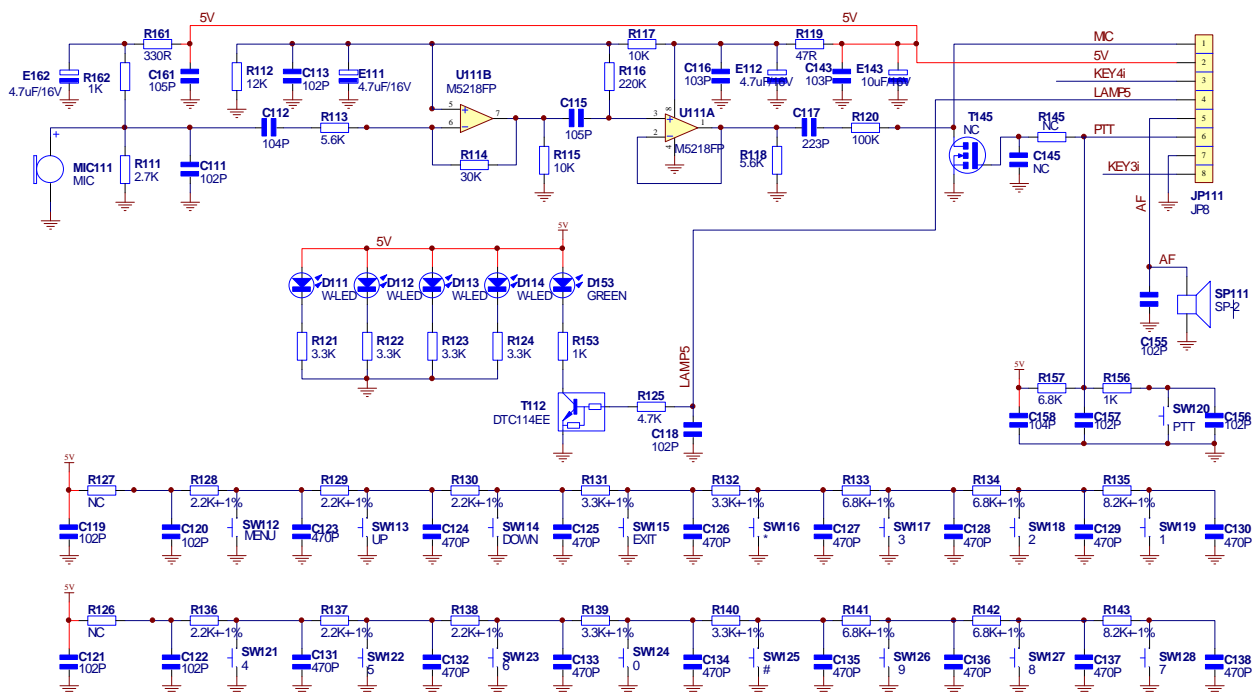
Front Component List on PCB				
SPEC	Use/Function	encapsulation	ITEM	QTY
LED	Light-emitting diode	D0603	D616 D615 D612 D611	4
LED	Backlight film	LED	D812	1
MIC	Speaker	MIC60	MIC611	1
Obverse Component List on PCB				
SPEC	Use/Function	encapsulation	ITEM	QTY
103P	Chip capacitor	C0402	C624 C620	2
102P	Chip capacitor	C0402	C619 C812	2
100P	Chip capacitor	C0402	C618 C617 C616 C615 C614 C613 C612 C611	8
10uF	Tantalum electrolytic condense	EIA3216	E611	1
JP20	20 chip socket	JP20	JP612	1
100nH	Fixed inductance	L0603	L611	1
100R	Resistor chip	R0402	R623	1
1.8K	Resistor chip	R0402	R621	1
2.2K	Resistor chip	R0402	R618 R617 R614 R613	4
1.2K	Resistor chip	R0402	R612	1
91K	Resistor chip	R0402	R611	1
510R	Resistor chip	R0402	R616 R615	2
1K	Resistor chip	R0402	R814 R619	2
510R	Resistor chip	R0603	R813 R812	2
4.7K	Exclusion	1206-4	R622	1

X Elementary Diagram and PCB Diagram

Motherboard Diagram



MIC/Speaker Diagram



Panel Diagram

