Service Manual

Model: KG-689
Frequency: 400-470MHz
Version: KG-689-0801-V1

QUANZHOU WOUXUN ELECTRONICS CO., LTD

# KG-689 transceiver service manual

Contents

Introduction

Scope of this manual

This manual is intended for use by experienced technicians familiar with similar types of commercial grade communications equipment. It contains all required service information the equipment and is current as of the publication date. This manual almost correct and complete, if there is something oversight, WOUXUN company keeps the right of explanation. And we also keep the right of change the design and the specification.

Personal Safety:

◼   Do not transmit, if you don't check all transmitting pins or one of the opening pins hasn't connect

to the correspond port.

◼   Switch off power when you are on flammability gas condition.

◼   Do not take it apart, or have it repaired by a nonprofessional.

◼   Turn off the radio before of detonator and blasting area.

◼   In order to avoid the problem arising by Electromagnetic interference and/or Electromagnetic

Compatibility, please turn off the radio where there has a mark: Turn off radio, such as hospital or other health care place and enplane.

Disassembly for repair
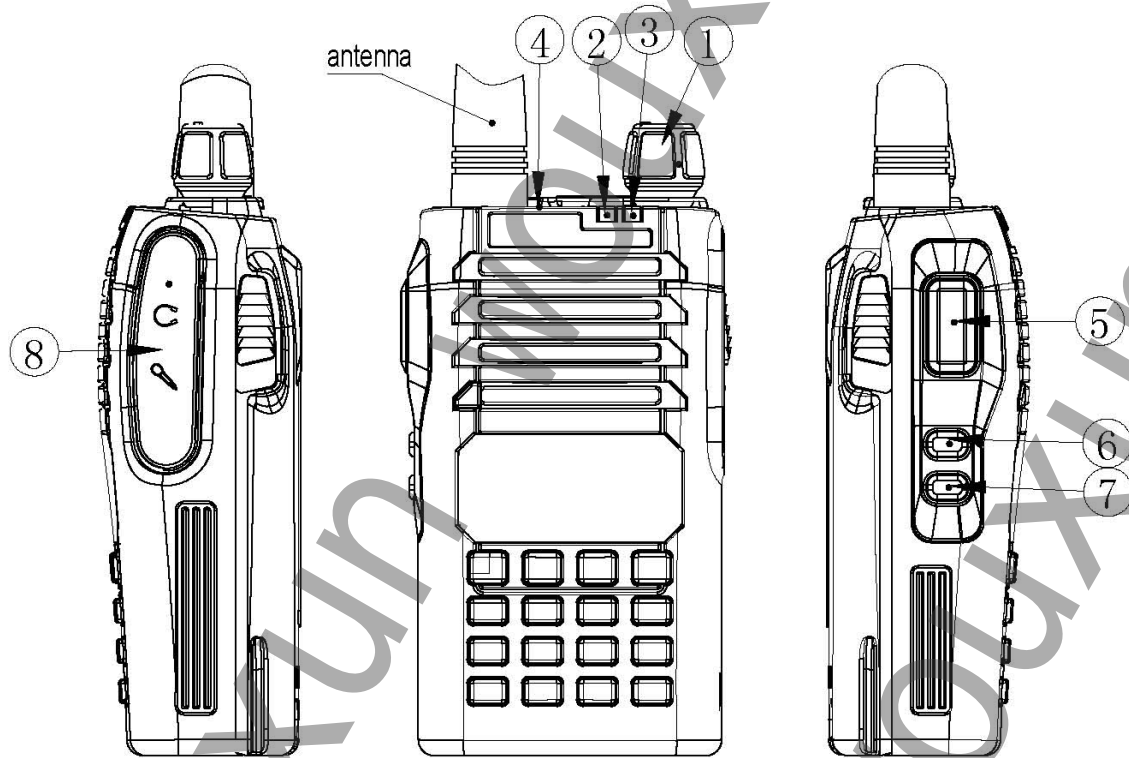
① Power / Voice Switch

Turning by clockwise to switch on radio; Turning to bottom by counter-clockwise to switch off radio; Turning by clockwise to turn up voice; Counter-clockwise to turn down .

② LED indicator light (A light)

A light is corresponding to the A frequency range. Red light means radio transmitting signal, green light means radio receiving signal, then red light and green light flicker alternate means someone transmits urgency alarm.

③ LED indicator light (B light)

B light is corresponding to the B frequency range. Red light means radio transmitting signal, green light means radio receiving signal, then red light and green light flicker alternate means someone transmits urgency alarm.

④ Top-key (PF2)

Programming function key-press, press this key to turn on accessorial function.

⑤ PTT switch

Press this switch, then you can transmit through speaker.

⑥ Side-key 1 (PF1)

Programming function key-press, press this key-press to turn on accessorial function.

⑦ MONI key

On this mode the speaker will be opened in force, using to receive the signal on frequency. If there is not any signal on frequency, then you will hear a background noise, or you wil l receive audio frequency.

⑧ Speaker/Mic.faucet

On this position you can connect with speaker/Mic.

Disassembly for repair

1.Pull down the button of the battery ①
   both side at the same time, then take off battery.
2.Take off the knob ② and antenna ③.
3.Take the earphone plug ④ from earphone seat.
4.Open the Aluminum shell⑤,then get board.
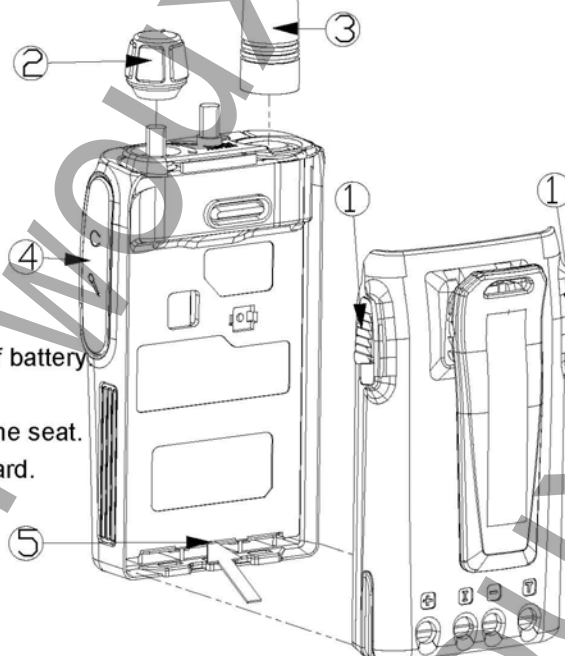
1.Use an electric iron to weld the welding ① which connect the speaker with board,
   then get the speaker. Becareful don't break the line which connects with speaker.
2.Take off the two waterproof circles ② and two round screws③.
3.Take off the four screw sets ④ which on the keyboard.
4.Take off the bottom seat ⑤ carefully which connect
   the keyboard with baord, then take off keyboard.
5.Take off the twelve screw sets ⑥, then take off the board.
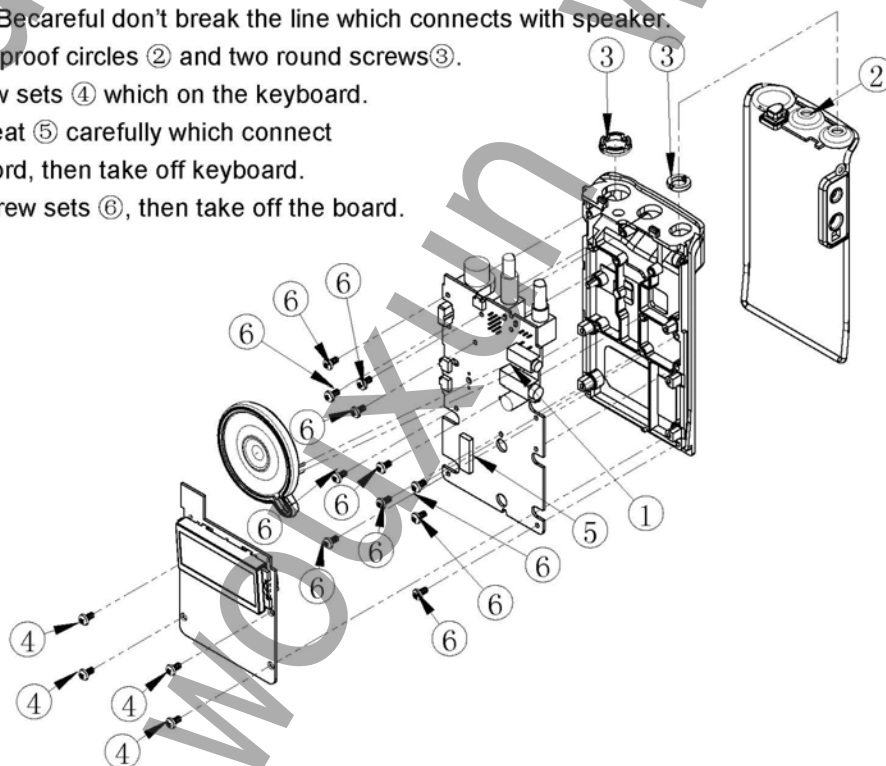
Circuit Description

1. Frequency association

Frequency association is shown in Chart 1.
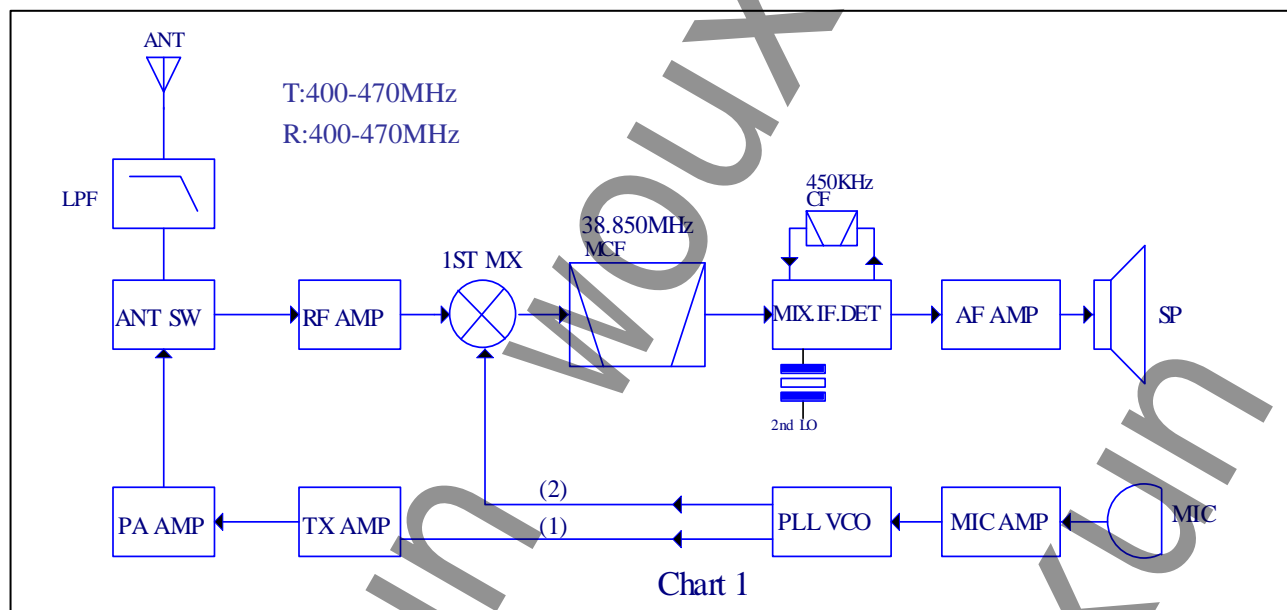
Chart 1

2. Receive system

(1). RF amplifier is shown in Chart 2.

The radio wave enter by antenna, through a low-pass and a transmit/receive switch circuit(D215,D216), then input to RF amplifier, blow up by T220, the disturb signal will be unchained by band-pass filter.

Chart 2
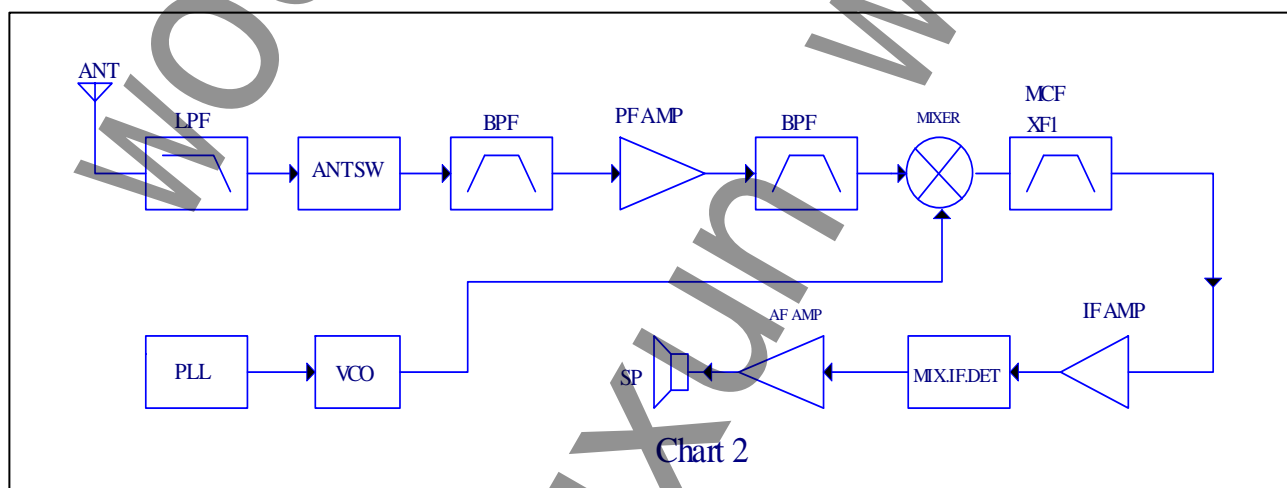
(2). The first mixer

The receive signal and the first PLL unit output root flap signal will mix on the first mixer T233, then give birth to the first intermediate frequency(IF) signal, except that all disturb signals will be unchained by crystal filter..

Circuit Description

(3). Intermediate amplifier

As Chart 3 shows, the first intermediate frequency blow up by T253, then enter U261 (FM signal frequency modulation integrate circuit). At time signal will mix with second root flap, switch to second IF signal. Through 450K filter, except that all disturb signals will be unchained, then be blew up and inspected.

Audio frequency amplifier

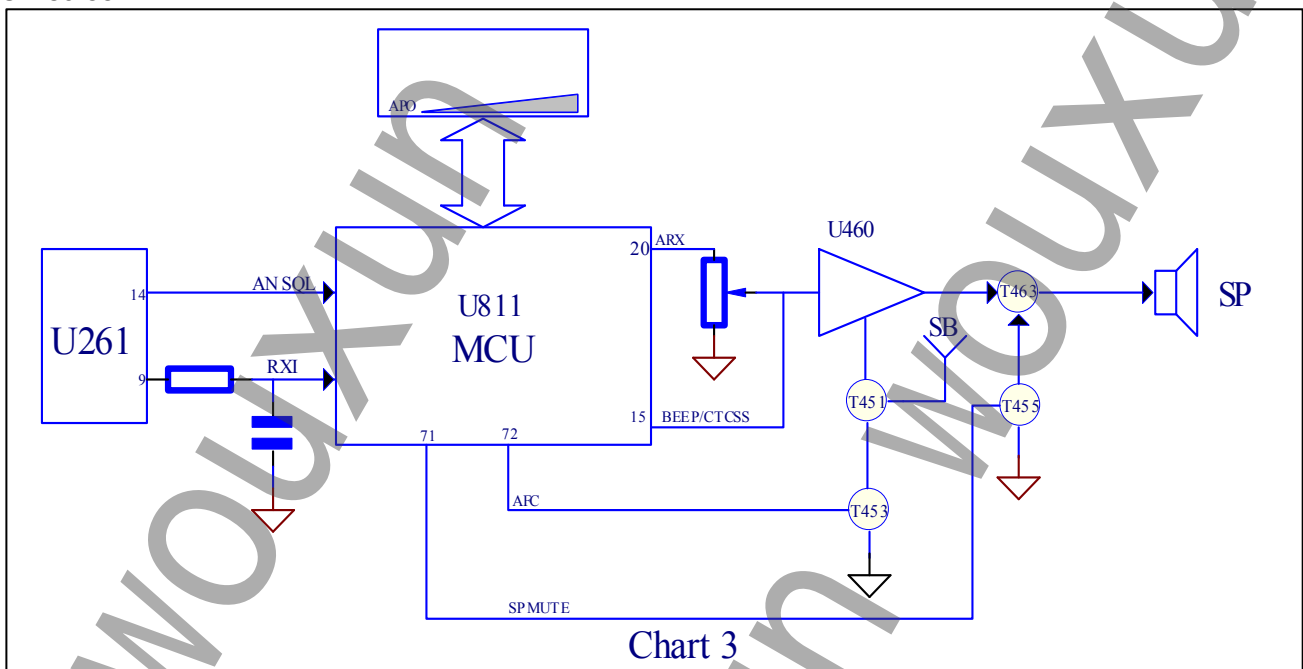The audio frequency signal comes from inspected filter and be aggravated, then input to MCU(U811), then through adjust potentiometer, blow up by U460, get the audio frequency power, contact with MIC via T463.

Squelch circuit and signal intensity list

Check by U261: Output yawp signal, then put it into CPU (U811) and deal with it by the 25 feet interior. According to the electricity level signal which MCU get, one side, it can control SP MUTE, APX and AFC, to complete to control audio frequency output circuit (The level of CPU inside control system is from 1 to 9 grades, it can program by software or by keyboard). On the other side, it can control the signal strong list of LCD screen.

Chart 3

3. Transmit system

(1). Speaker amplifier

As show in Chart 4, audio frequency signal comes from MIC will be aggravated, then limited blow up by U411-A, all distortion audio frequency signals will be unchained by adjacent filter which makes up with U411-B caused by limited blow up.

Modulate circuit

The signal comes from speaker amplifier modulated by adjust potentiometer VR382, then modulating changeable reactance by varactors tube D348.

Circuit Description

5C

1
2
3   MIC
4
5

PTT/RX232

U411A   U411B   T430   T433

T471   W/N

MODE

T414   5T   5T   5T

MIC

T443   D442   VOX

SAVE

T438   5V

Chart 4
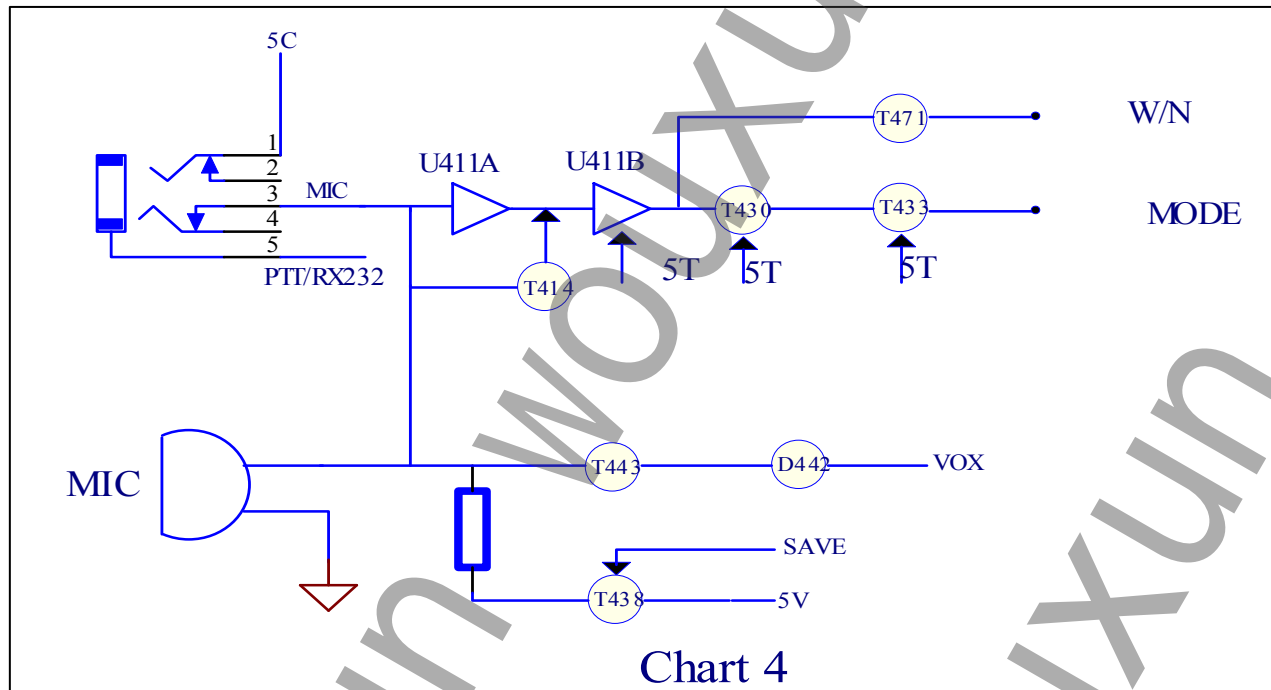
(2). VOX circuit

Blow up audio frequency signal comes from the speaker's by T443, change the AC audio frequency to DC electricity level signal by D442, then put it into the CPU (U811) the 21 feet   to manage.

Blow up drive and end level

The goal signal produce by VCO and cushion blow up by T113, then send it to a two grade FEI amplifier after invigorative blow up T117, and blow up the power about 4W.

Circuit Description

4. Select transmit and receive circuit

As shown in Chart 5. Output transmit signal will pass transmit and/or receive switch circuit and low-pass, then send to antenna. Transmit and/or receive circuit has made up of D146 D145 D216. Start during transmitting and stop during receiving, switch transmitting system and receiving system.

Auto power control circuit APC, use for get a reliable transmit power and transmit control output. This circuit check out power discreteness end terminal current exhaust and control transmit output. Two reference voltage from U170, one is give birth to the voltage which use for adjust the power output(AD1 give birth to), the other one is get the R171-R173 two terminal and end terminal exhaust current be direct ratio check out voltage. On the output terminal of U181 can get a reference voltage and check out voltage dispersion be direct ratio voltage signal. This signal by reverse then as APC voltage. This voltage be use control power discreteness' power control feet and make transmit output level off.

As show in Chart 5
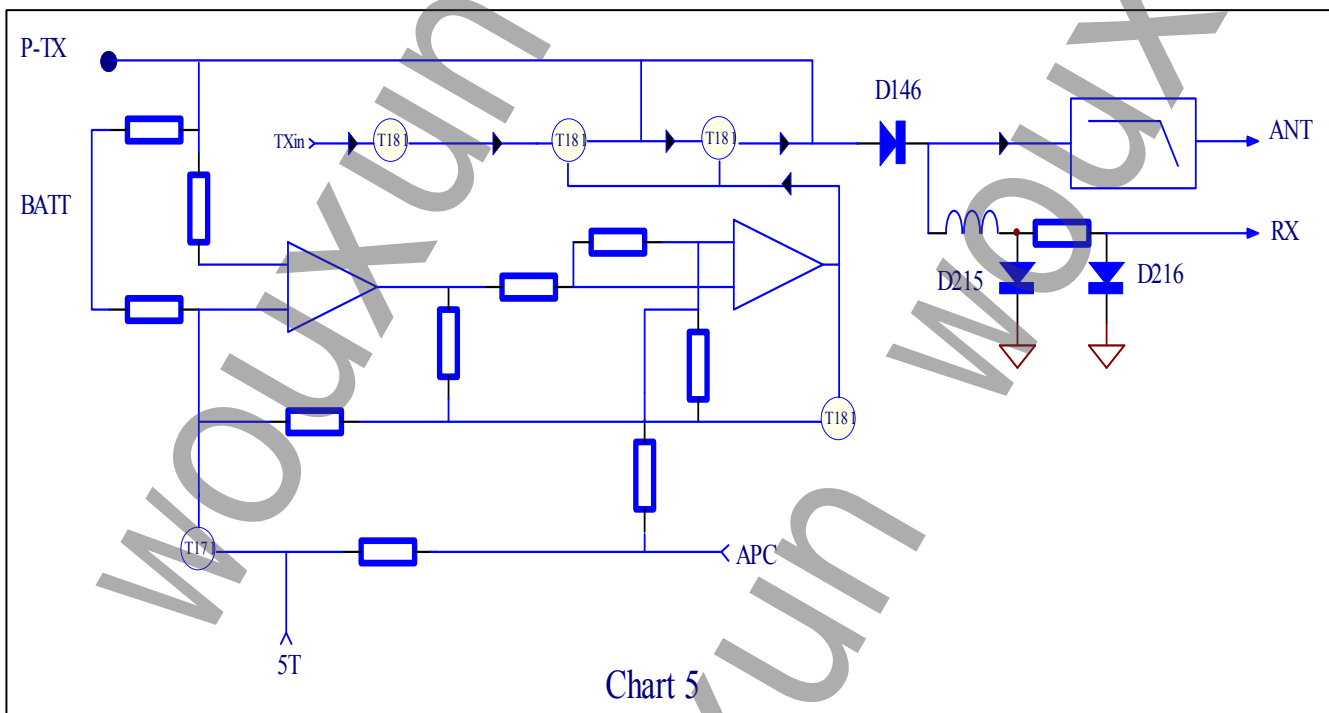
Chart 5

Circuit Description

5. PLL Circuit

(1) PLL

19.25MHz reference oscillator output through PLL IC(U311) reference frequency then bring 5KHz and 6.5 KHz reference frequency.

VCO output signal blew up by T337, then bring compare frequency by U311 dispart frequency. Use different dispart frequency ratio by CR311, and get different inspect posture consult frequency. According referenced frequency and comparable frequency value, then bring 5, 6.25, 10, 12.5 and 25KHz for step frequency value of PLL synthesizer. According referenced frequency and comparable frequency discrepancy value, the output correspond pulse voltage from the fifth feet of U311, change it to direct current signal direct current signal by filter after through Charge Pump, then bring lock voltage.

(2) VCO

Goal frequency is make up of FETT355 and T350 directly produced by Rapids oscillator. Lock controllable voltage and then modify oscillator frequency by D353, D352, D346 and D345.

(3) Lose lock detection circuit

When PLL is on lose lock, one pulse will be plastic by R312 D312 C312 and R313, then add to LD side of PLL (tenth LD side), and the voltage of LD side will be rose, CPU will control transmitting and receiving by detecting the voltage of LD side.

(4) Digital control circuit

Conformation of Keyboard circuit: Directly input the signal come From the keyboard to CPU (U811).

Chart 6
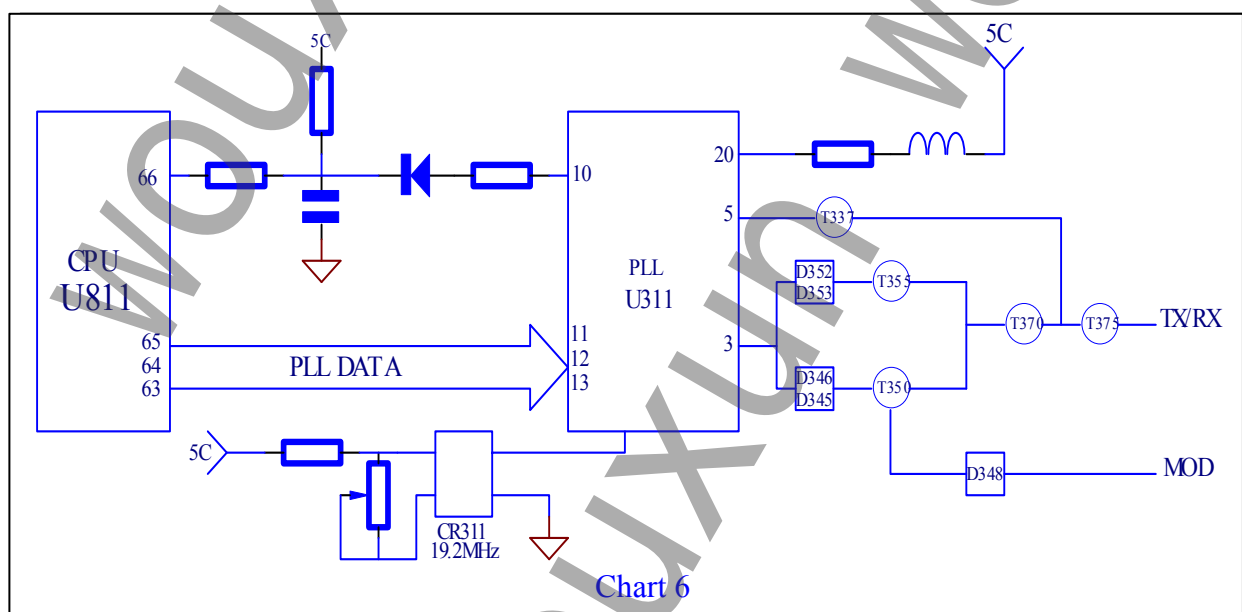
Circuit Description

6. Reset and reserve circuit

When connect with power, one reset circuit made up of T823 R823 R825 C825 output a positive impulse, this impulse signal add to the 37th feet reset side of U81. When turn off the power, the 37th feet side of U811 turn low, and CPU send all data to U835 to store, then go into reserve.

Detect battery voltage circuit

Input SB to the 23rd side A/D switch port of CUP(U811) after be disparted, and after disposal by CUP, drive LCD battery level indicator.

Floodlight and LCD circuit

Floodlight and LCD directly be controlled on of off by CPU port circuit

Chart 7
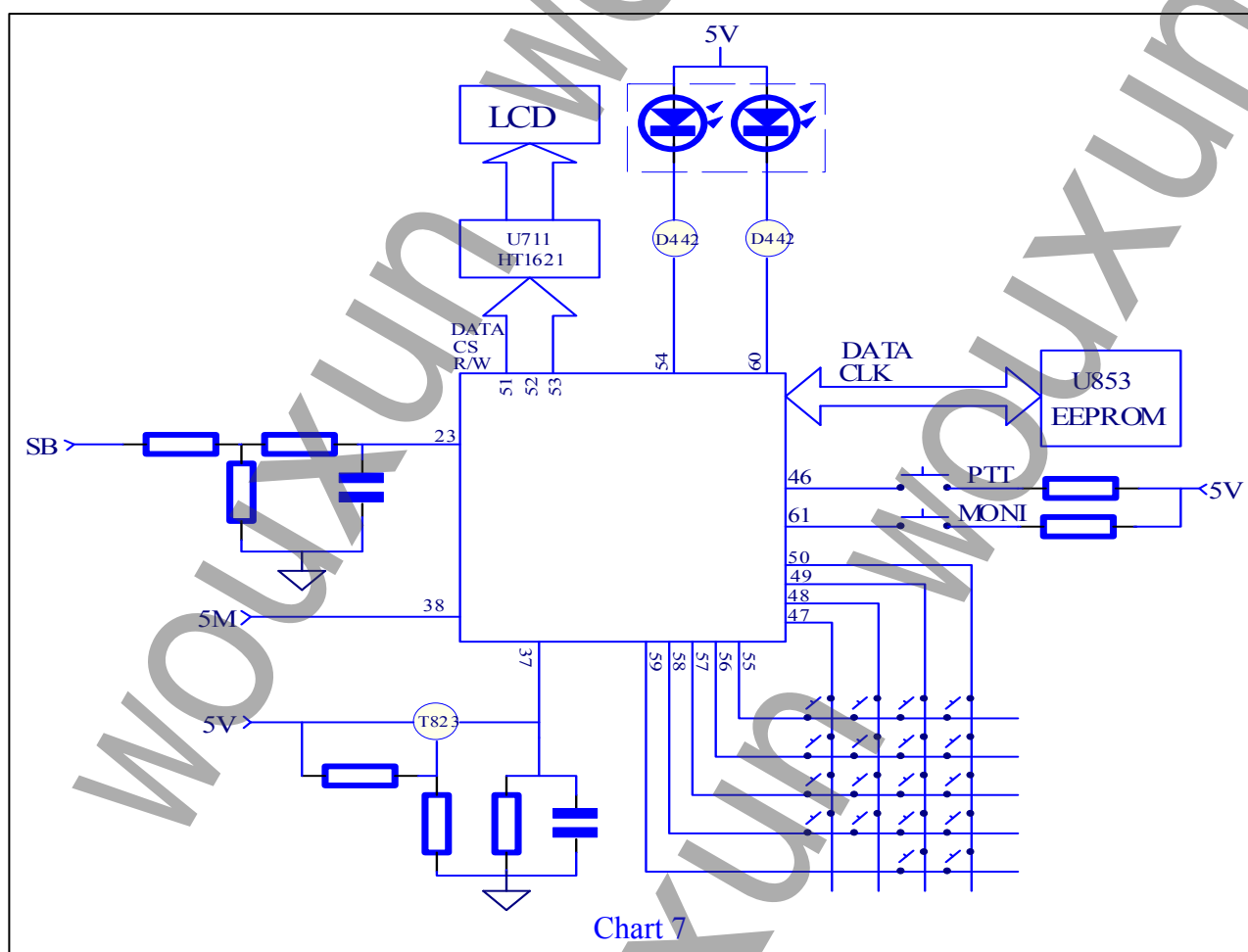
Circuit Description

7. Battery save circuit

One receive state the squelch turn off, if not press any key within 5 second, the power circuit will enter save state mode, This control circuit through CPU directly control.
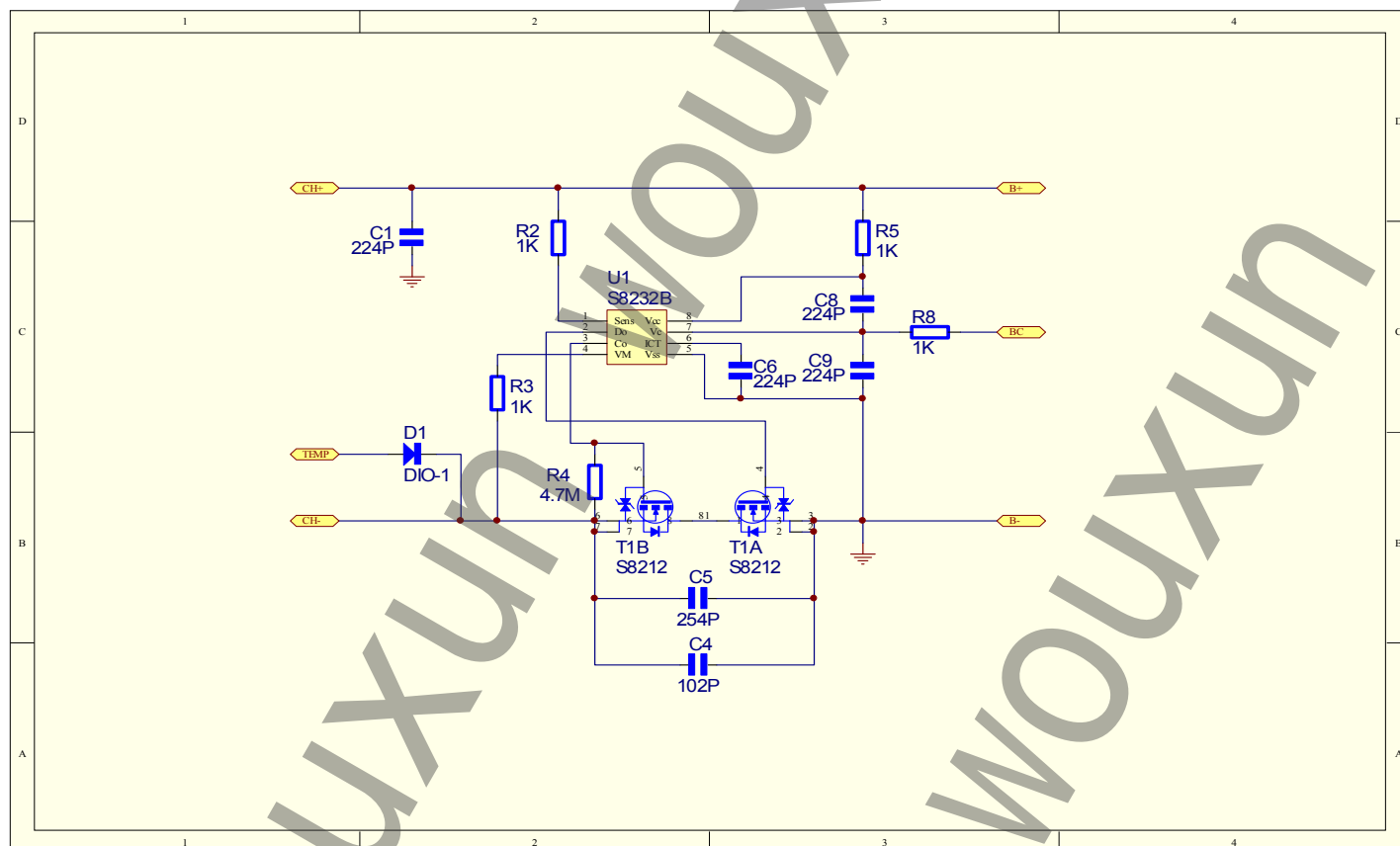
Circuit Description

8. Select power circuit

Power offset circuit as following:

POWER		TX POWER		Power voltage of power amplifier
	→	5V	→	Output 5V by U906 regulator circuit, used for reset circuit power VDD of U511 U853 D711 and U8111.
	→	5M	→	Output 5M by U911 regulator circuit, used for CPU power VDD.
	→	5C	→	T301 be controlled by the 40th side of CPU (811), output 5C by 5V, used for PLL circuit, VCO circuit and CR311 power circuit VDD.
	→	5R	→	T202 be controlled by the 27th side of CPU (811), output 5R by 5V, used for U261, T233, T253, T220 power VDD.
	→	5T	→	T103 be controlled by the 26th of CPU (811), output 5T by 5V, used for T113 T117 T430 T433 T171 U411 U170 and D146 D216 switch (transmit and/or receive transform switch voltage).
	→	P-7368	→	T451 and T453 be controlled by the 72th side of CPU, output P-7368 power by BATT, used for U460 power.

Chart 8
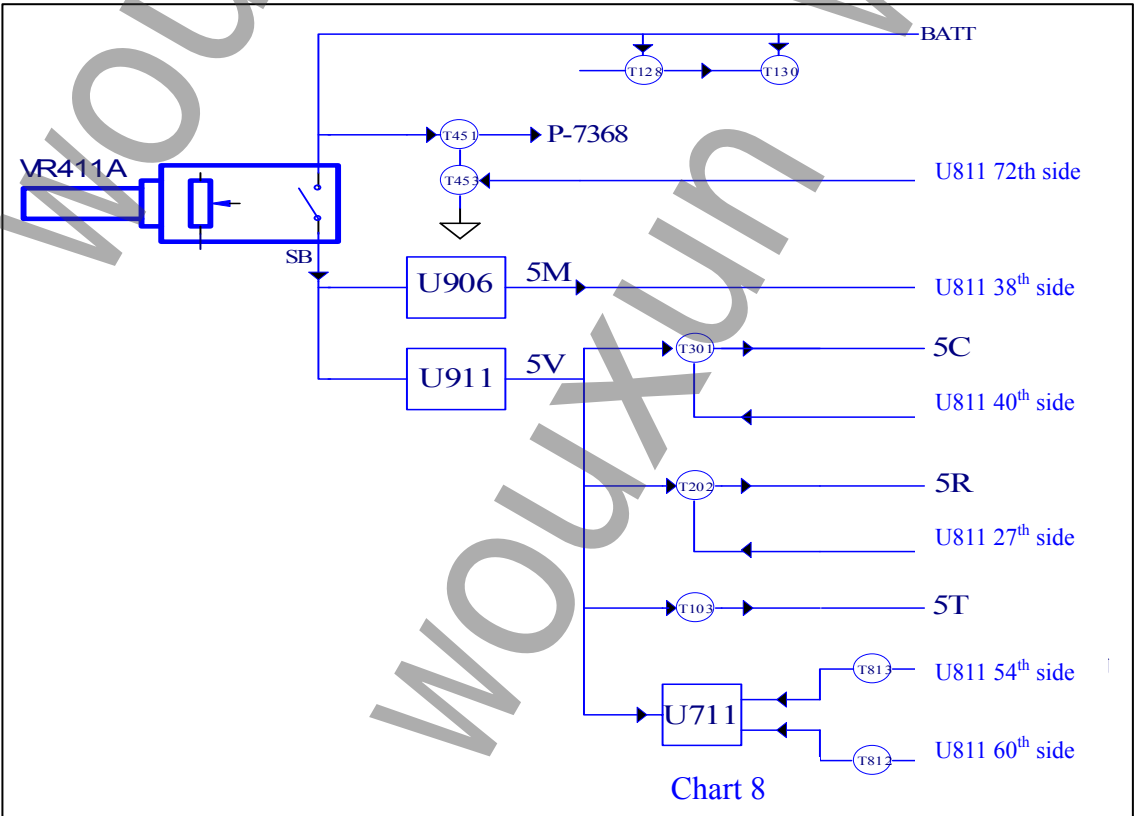
Circuit Description

9. CTCSS / DCS circuit

DCS signal output CTCSS audio frequency signal from the 15th feet of CPU (U811), and output DCS signal from the 29th. When transmit CTCSS, the DCS output from CPU be modulated by low-pass; When receive, directly disposed by CUP after through detection frequency.

PARTS LIST

Designators	Name and specifications			Footprint
C211	Capacitance	0.3P	B	0402
C246 C226	Capacitance	0.5P	B	0402
C348	Capacitance	0.75P	B	0402
C351 C358 368 C228 C230	Capacitance	1P	B	0402
C251 C213 C253	Capacitance	2P	B	0402
C117 C337 C338 C216	Capacitance	3P	B	0402
C231 C267	Capacitance	4P	B	0402
C219	Capacitance	4.3P	B	0402
C334 C356 C217 C229	Capacitance	5P	B	0402
C357 C371 C372 C377 C227	Capacitance	6P	C	0402
C232 C116	Capacitance	7P	C	0402
C252 C350	Capacitance	8P	C	0402
C236 C321 C332 C811	Capacitance	10P	C	0402
C349	Capacitance	12P	J	0402
C827 C826	Capacitance	20P	J	0402
C289	Capacitance	33P	J	0402
C312	Capacitance	51P	J	0402
C1147	Capacitance	56P	J	0402
C1086 C288	Capacitance	82P	J	0402
C102 C224 C271 C287 C303 C329 C335 C336 C461 C841	Capacitance	100P	J	0402
C1138 C238 C138 C212 C902 C1051 C1084 C1083 C127 C125 C115 C121 C319 C328 C333 C342 C376 C410 C439 C322 C296 C220 C1155 C222 C1143 C283 C183 C176 C173 C872 C871 C837 C421 C419 C256 C1101	Capacitance	102P	J	0402
C1102 C1144 C1128 C233 C331 C901 C361 C364 C374 C451 C454 C1156 C440 C1154 C181 C174 C907 C903-C905 C852 C820 C802 C512 C402 C274 C255 C1103	Capacitance	103P	J	0402
C1103 C133 C1054 C1130 C137 C221 C1127 C1023 C1056 C101 C455 C318 C330 C339 C366 C291 C182 C846 C843 C825 C514 C513 C417 C412 C403 C401 C272 C270 C263 C301 C1094 C1039 C373 C438 C442-C445 C1552 C103 C281 C294 C297 C298 C279	Capacitance	104P	J	0402
C1045 C821	Capacitance	105P	J	0402

PARTS LIST

Designators	Name and specifications		Footprint
C1081 C284	Capacitance	180P J	0402
C278	Capacitance	200P J	0402
C870 C424 C265 C264 C465	Capacitance	220P J	0402
C295	Capacitance	222P J	0402
C324 C460 C422 C420	Capacitance	223P J	0402
C1124 C273	Capacitance	224P J	0402
C521 C213	Capacitance	273P J	0402
C290	Capacitance	330P J	0402
C286 C285 C432 C430	Capacitance	332P J	0402
C1047 C282	Capacitance	333P J	0402
C325-C327	Capacitance	390P J	0402
C1100 C1131 C126 C1129 C135 C136 C234 C235 C145 C128 C111 C112 C118 C120 C362 C1142 C292 C180 C175 C906 C860-C863 C413 C411 C268 C363 C365 C367 C370 C375 C452 C453 C223 C225	Capacitance	470P K	0402
C1046 C293 C431 C840 C426 C418 C446	Capacitance	473P K	0402
C462	Capacitance	474P K	0402
C433 C429	Capacitance	680P K	0402
C1099 C1145 C1551 C1009 C1021 C352 C1018 C1040 C1146 C1014 C237 C572 C569 C1012 C1015 C1013 C847 C845 C269 C261 C260 C1020 C113 C353 C355	Capacitance	NC	0402
C152 C142	Capacitance	0.5P B	0603
C154 C156 C158	Capacitance	1.5P B	0603
C1038 C1037	Capacitance	2P B	0603
C153	Capacitance	3P B	0603
C157	Capacitance	4P B	0603
C1150 C155	Capacitance	6P C	0603
C150	Capacitance	7P C	0603
C1029 C143	Capacitance	8P C	0603
C215	Capacitance	9P C	0603
C122	Capacitance	10P C	0603
C1168	Capacitance	22P J	0603
C141	Capacitance	24P J	0603
C139	Capacitance	27P J	0603

PARTS LIST

Designators	Name and specifications		Footprint
C144	Capacitance	33P J	0603
C132 C129	Capacitance	102P J	0603
C276 C275	Capacitance	104P J	0603
C835	Capacitance	105P J	0603
C124 C151	Capacitance	470P J	0603
C1010 C131 C140 C1148	Capacitance	NC	0603
C1163	Capacitance	5P B	0805
C1050 C147	Capacitance	104P J	0805
E341	Laminated capacitance	0.1UF	0805
E340	Laminated capacitance	2.2UF/16V/±10%	0805
E146 E454	Laminated capacitance	1UF/16V/±10%	0805
E332 E423	Laminated capacitance	4.7UF/16V/±10%	0805
E280 E180 E801 E274 E330	Laminated capacitance	10UF/16V/±10%	0805
E1140 E912 E910 E1035	Laminated capacitance	22UF/6.3V±20%	0805
E1134 E1141	Laminated capacitance	NC	0805
E908	Laminated capacitance	22UF	1206
R1550 R341 R1025 R1082 R454 R460 R437 R467 R1106 R822 R436 R415 R262	Resistance	0R J	0402
R118	Resistance	5.6R J	0402
R462 R366 R367 R373 R469	Resistance	10R J	0402
R121	Resistance	22R J	0402
R124 R116 R332	Resistance	47R J	0402
R234 R1085 R357 R364 R371 R376 R221 R224 R283 R282 R274 R256 R417	Resistance	100R J	0402
R350 R461 R511	Resistance	150R J	0402
R317	Resistance	180R J	0402
R233 R444	Resistance	330R J	0402
R1553	Resistance	470R J	0402
R237 R1070 R338 R253 R814 R813	Resistance	560R J	0402

PARTS LIST

Designators	Name and specifications			Footprint
R114 R117 R119 R375	Resistance	680R	J	0402
R1053 R1122 R203 R848 R323 R303 R336 R453 R280 R875 R272 R870 R843 R416 R473	Resistance	1K	J	0402
R270 R340 R422	Resistance	1.2K	J	0402
R349 R446 R845 R422	Resistance	1.5K	J	0402
R255 R187	Resistance	2K	J	0402
R836 R452 R120	Resistance	2.2K	J	0402
R325 R326 R377 R381 R293 R268 R434	Resistance	3.3K	J	0402
R380 R87 R852 R844 R1159 R815 R818 R817 R236 R1152 R212 R111 R112 R361 102	Resistance	4.7K	J	0402
R281 R426 R414 R440	Resistance	5.6K	J	0402
R846 R322	Resistance	6.8K	J	0402
R425	Resistance	8.2K	J	0402
R1137 R571 R1121 R342 R439 R442 R284 R266 R842 R520 R515 R433 R430 R1160 R184 R177	Resistance	10K	J	0402
R1049 R823	Resistance	15K	J	0402
R418	Resistance	18K	J	0402
R324 R291 R512 R421	Resistance	22K	J	0402
R441 R133 R518 R853	Resistance	27K	J	0402
R423	Resistance	30K	J	0402
R1022 R465 R432 R429 R427 R424 R431 R472	Resistance	33K	J	0402
R321	Resistance	39K	J	0402
R857 R450 R126 R115 R374 R101 R320 R220 R222 R522 R510 R186 R872 R829 R828 R435 R411 R864-R868 R182 R876-R878	Resistance	47K	J	0402
R1052 R1055	Resistance	51K	J	0402
R464 R294	Resistance	56K	J	0402
R125 R185	Resistance	68K	J	0402
R824	Resistance	82K	J	0402
R1024 R337 R345 R370 R825 R513 R413	Resistance	100K	J	0402
R323	Resistance	120K	J	0402
R313 R292 R874	Resistance	150K	J	0402

PARTS LIST

Designators	Name and specifications		Footprint
R265 R264 R181	Resistance	180K J	0402
R524 R254 R841 R519 R514	Resistance	220K J	0402
R443	Resistance	270K J	0402
R1126 R182	Resistance	330K J	0402
R1158	Resistance	470K J	0402
R420	Resistance	680K J	0402
R517	Resistance	750K J	0402
R404 R428	Resistance	1.8M J	0402
R1017 R572 R572 R1016 R1019 R1098 R113 R372 R468 R273 R521 R516 R180 R176 R275	Resistance	NC	0402
R1153	Resistance	10R J	0603
R131	Resistance	47R J	0603
R145 R146	Resistance	270R J	0603
R132	Resistance	47K J	0603
R834	Resistance	56K J	0603
R170-R175	Resistance	150K J	0603
R1011 R123	Resistance	NC	0603
R1157 R810 R141	Resistance	0R J	0805
R1151	Resistance	10K J	0805
R1044	Resistance	100K J	0805
R1091-R1093	Resistance	0.33R J	1206
R901	Resistance	0R	1206
R1125	Resistance	10R	1206
PR311 PR858	Resistance	1K×4	RP-1206
PR856	Resistance	4.7K×4	RP-1206
VR318 VR413	Adjustable Resistance	50K	RV1208
E1090 E435 E417	Ta Capacitance	2.2UF/A/16V/±10%	EIA3216
E907 E844 E905	Ta Capacitance	10UF/A/16V/±10%	EIA3126
E461 E362	Ta Capacitance	10UF/A/10V	EIA3126
E463	Ta Capacitance	100UF/C/10/±10%	EIA7343
L130	High frequency fold Inductance	2.2NH	0603
L232 L117 L1139 L337 L374 L820	High frequency fold Inductance	18NH	0603
L113 L370	High frequency fold Inductance	22NH	0603
L282 L283	High frequency fold Inductance	68NH	0603

PARTS LIST

Designators	Name and specifications		Footprint
L354 L357 L366 L412	High frequency fold Inductance	100NH	0603
L331 L345 L352	High frequency fold Inductance	120NH	0603
L1167 L364	High frequency fold Inductance	220NH	0603
L121 L871 L870 L451	Low frequency fold Inductance	100NH	0603
L380	Low frequency fold Inductance	270NH	0603
L314	Low frequency fold Inductance	560NH	0603
L311	Low frequency fold Inductance	1uH	0603
L350	Low frequency fold Inductance	2.2uH	0603
L310 L363	Low frequency fold Inductance	3.3uH	0603
L341	Low frequency fold Inductance	6.8uH	0603
L371		NC	0603
L127 L135	Low frequency fold Inductance	100NH	0805
L1149	Line Inductance	19NH±2%	0603
L230 L217 L223 L229	Line Inductance	15NH±2%	0805
L1161	Line Inductance	22NH±2%	0805
L145	Line Inductance	220NH±5%	0805
L237	Line Inductance	560NH±5%	0805
L128 L236	Line Inductance	1uH	0805
L158	Module Inductance	1uH±2%	1206
L281 L216	High temperature without high loop	0.31*1.4*7T	LC042125
L152		0.35*1.2*4T	LC032319
L154 L156 L215		0.35*1.4*4T	LC032121
L132		0.35*1.5*8T	LC032334
L131		NC	LC032319
D1 D813	Green light	GREEN	0603
D2 D814	Red light	RED	0603
D345 D346	Diode	A	D-ESC
D352 D353	Diode	B9	D-ESC

PARTS LIST

Designators	Name and specifications		Footprint
D211 D215 D111 D216	Diode	HSC277	D-ESC
D326	Diode	LL4148	D-ESC
D362	Diode	MA2S11	D-ESC
D133 D146	Diode	BA592	D-USC
D283 D282	Diode	BB910	D-USC
D572 D571	Diode	NC	D-ESC
D416	Dynatron	DAN222	D-ESM
D417 T442	Dynatron	ISS372	D-USM
T361 T291 T433 T430	Dynatron	2SC4617	T-ESM
T363	Dynatron	2SJ243	T-ESM
T842	Dynatron	2SK1824	T-ESM
T471 T438	Dynatron	DTA114EE	T-ESM
T202 T301	Dynatron	DTA114YE	T-ESM
T1041-T1043 T1123 T813 T181 T171 T841 T453 T455	Dynatron	DTC114EE	T-ESM
T451 T103 T823	Dynatron	5B1	T-TSM
T113	Dynatron	R25	T-TSM
T280-T282 T366	Dynatron	UMC4	T-USV
T414 T443	Dynatron	ISS4181	T-USM
T253 T313	Dynatron	2SC4215	T-USM
T337 T370 T375	Dynatron	2SC4226	T-USM
T117	Dynatron	2SC3357	T-SOT89
T463	Dynatron	2SK1588	T-SOT89
T271 T525	Dynatron	NC	
IC70	Integrate Circuit	8870	SSOP-20
U281	Integrate Circuit	7088	U-SOP16
U411	Integrate Circuit	RC4558	U-SOP8
U853	Integrate Circuit	24C64	U-SOP8
U460	Integrate Circuit	TA7368	U-SSOP10
U261	Integrate Circuit	TA31136F	U-SSOP16
U311	Integrate Circuit	LMX2332	U-SSOP20
U170	Integrate Circuit	NJM2904V	U-SSOP8
IC264	Integrate Circuit	NC	264
T220 T233	Double Tube	U72	T-TSQ
T350 T355	Single Tube	K52	T-TSM
T130	Power Tube	RD07	T-PD54008
T128	Impel Tube	RD01	T-SOT89
U906 U1	5V Steady Press	POOU	U-TSV

PARTS LIST

Designators	Name and specifications		Footprint
U511	Sound Chip	VOICE	U-KX0602
U811	CMOS chip	AP88P868	U-QFP80
CR270	Chinaware	50C24	FX-6060
FL261	Filter	450K	FL-PBF
FL251 FL252	Partnership Crystal	38.850MHz	FL-UM
CR311	Crystal	19.2MHz	FX-DS0507
CR826	Crystal	32.768MHz	FX-DS7325
FL1036	Patch Chinaware Crystal	3.58MHz	ZTA/ZTTCC
FL1030	Patch Chinaware Crystal	NC	ZTA/ZTTCC
VR411	Potentiometers	RD91	S-RD810S
ANT111	Antenna seat	ANTENNA	ANT-KX01
JK451	Earphone Seat Ø2.5	ST104	JK-ST-104
JK411	Earphone Seat Ø3.5	ST-301	JK-ST-301
JP811	Line Seat	JP20	JP-20-2
SW870 SW872 SW873	Touch switch	TD-26EA	S-TD-26
SW87	Touch switch	TC-3121	S-TC-3121
SP611	Speaker	SP	R1206
MIC411	MIC.	MIC	MIC60

KG-689 LCD PARTS LIST

Comment	Footprint	Quantity	Designators				
102P	C0603	2	C722	C723			
103P	C0603	1	C725				
104P	C0603	1	C721				
1.8K	R0402	1	R730				
2.2K	R0402	4	R726	R727	R728	R731	
100R	R0603	1	R725				
510R	R0603	4	R736	R732	R733	R737	
820R	R0603	2	R740	R729			
1K	R0603	4	R734	R735	R738	R739	
4.7K	R0603	4	R723	R724	R721	R722	
91K	R0603	1	R719				
10uF	C0805	1	E721				
White	D0603	5	D704	D701	D702	D703	D705
RLS4148	D-ESC	2	D721	D722			
CI100NH	L0603	1	L721				
DTC114EE	T-ESM	3	T703	T722	T723		
HT44780	HT44780	1	U701				
20PIN	JP-20	1	JP701				

Exploded View

Packing

antenna

hand strap

charger

adapter

belt clip

inside box

radio body

ourside box

manual

inside plastic foam box
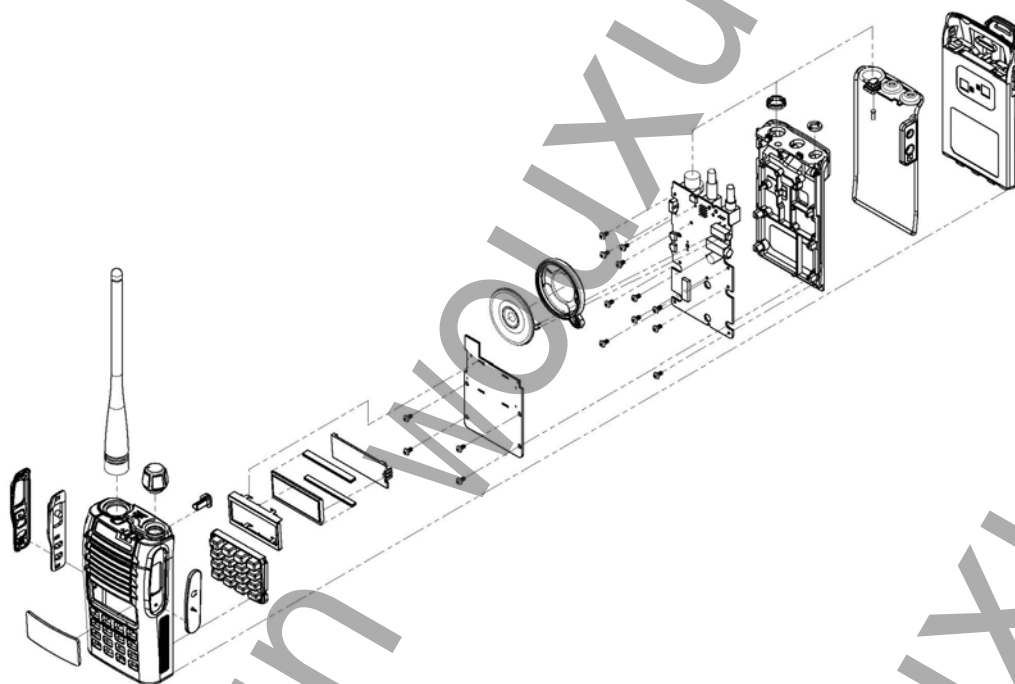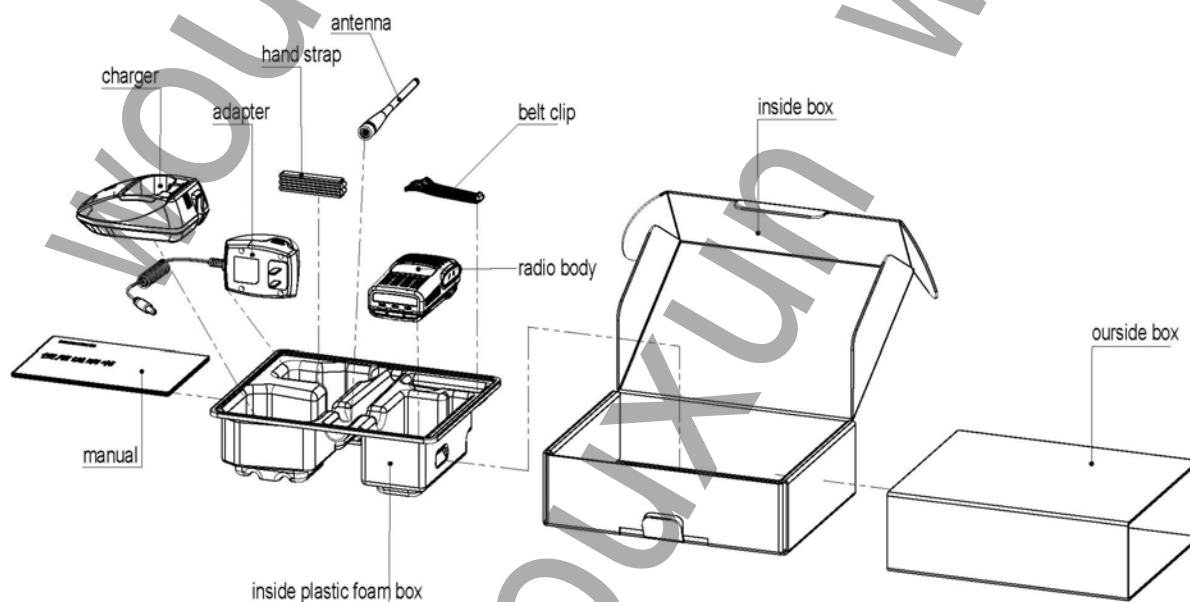
Adjustment Description

The radio can be adjusted by PC programming software or by keypad adjustment.

Adjustment procedure as follows,

Instrument:

Radio Communication Test Set	1 set
Scanner	1 set
3A/12V Power Supply	1 set
Digital Voltmeter	1 set

Adjustment:

The PC programming software can download from WOUXUN website or ask for your WOUXUN dealer. Install in your PC

Connect the radio with PC by programming cable; Select the right correspond port by edit software; Turn the radio on.

Reading the administer code into the frequencymode

Switch the transceiver to the frequencymode

1.VOC

Item	Condition	Test frequency band	Test Instrument	Terminal	VCO	Specification /Remarks
Receiver	Power supply voltage DC7.4V	400-470MHz	Digital Voltmeter	CV	DC1.1-3.3V	
Transmitter	Power supply voltage DC7.4V	400-470MHz	Digital Voltmeter	CV	DC1.1-3.6V	

2. **Receiver**

Item	Condition	Operation of Test Instrument	Test frequency band	Terminal	Test data	Specification /Remarks
Sensitivity	Power supply voltage DC7.4V	Setting Level: -118dbm MOD FREQ: 1KHz LEVEL: 3KH	400-470MHz	Connect Headset with Radio Communication Test Set AF GENOUTUT by SPK	SINAD: ≥22dbm	

Adjustment Description

Item	Adjustment		Factory set	Specification /Remarks
	Method	Part		
Squelch Sensitivity	Entering MENU 2	1-9 level 0 is ON	On 5 level	
VOX Level	Entering MENU 7	0-10 level 0 is OFF	OFF	
Receive CTCSS	Entering MENU 10	50 groups	OFF	
Receive DCS	Entering MENU 11	105 groups	OFF	

3.Transmitter

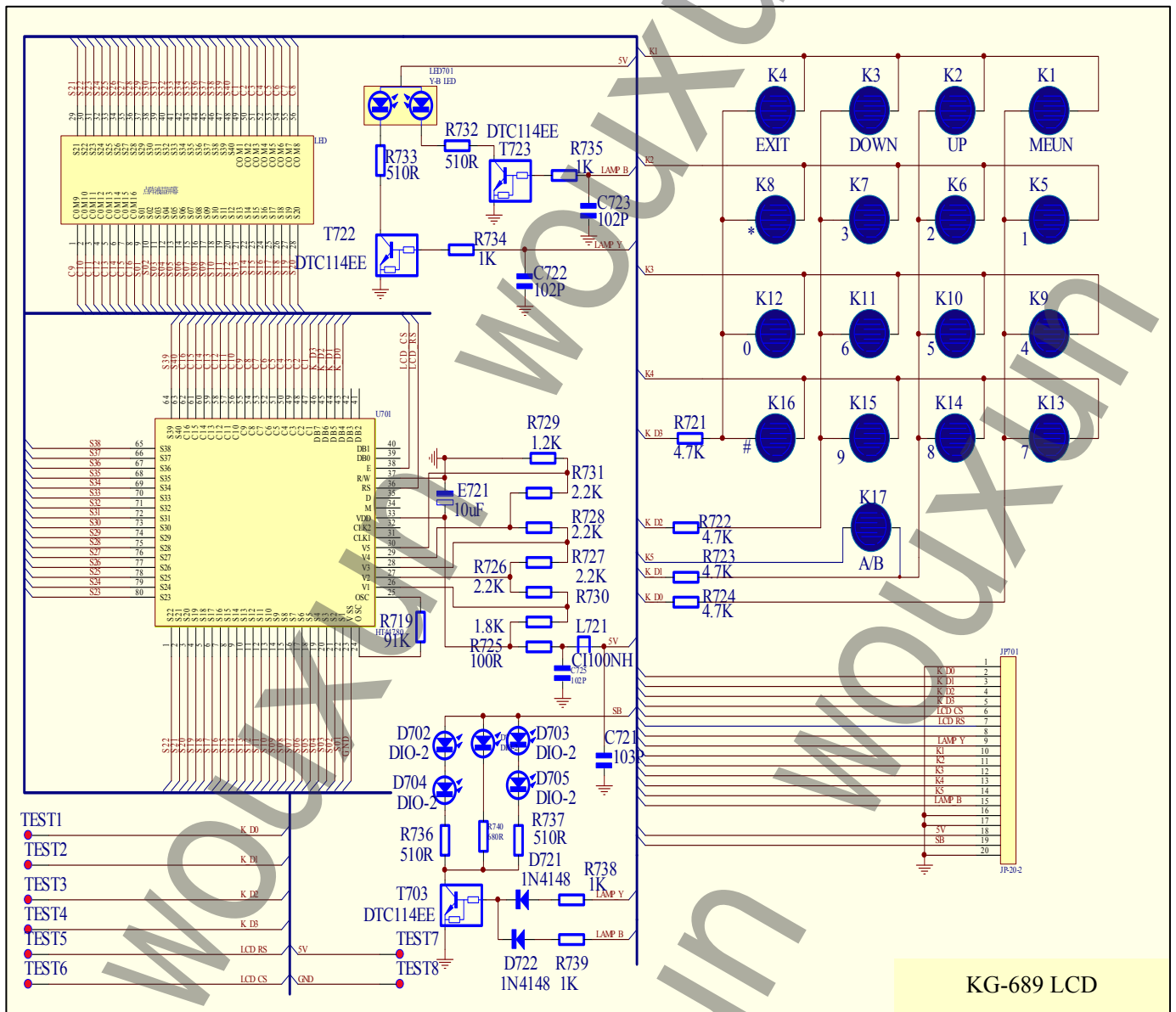| Item	Adjustment		Factory set	Specification /Remarks
	Method	Part		
Transmit Power	Entering MENU 4	10 levels	On 10 level	
Overtime prompt	Entering MENU 6	Has 15-600 seconds each level 15s difference	On 90 seconds	
Transmit W&N	Entering MENU 8		WIDE	WIDE Modulate 5KHz NARROW Modulate 2.5KHz
Transmit CTCSS	Entering MENU 10	50 groups	Full modulate band :0.5-0.75KHz	Same to W&N
Transmit DCS	Entering MENU 11	105groups	Full modulate band :0.5-0.75KHz	Same to W&N
Speaker/MIC	WIDE Modulate 5KHz NARROW Modulate 2.5KHz	MOD FREQ: 1KHz LEVEL：3KH		WIDE Modulate 5KHz NARROW Modulate 2.5KHz
DTMF		1-3KHz	WIDE Modulate 2.5-3.5KHz NARROW Modulate 1.5-2KHz	

Adjustment Description

4.Setting programmed software functions and parameter

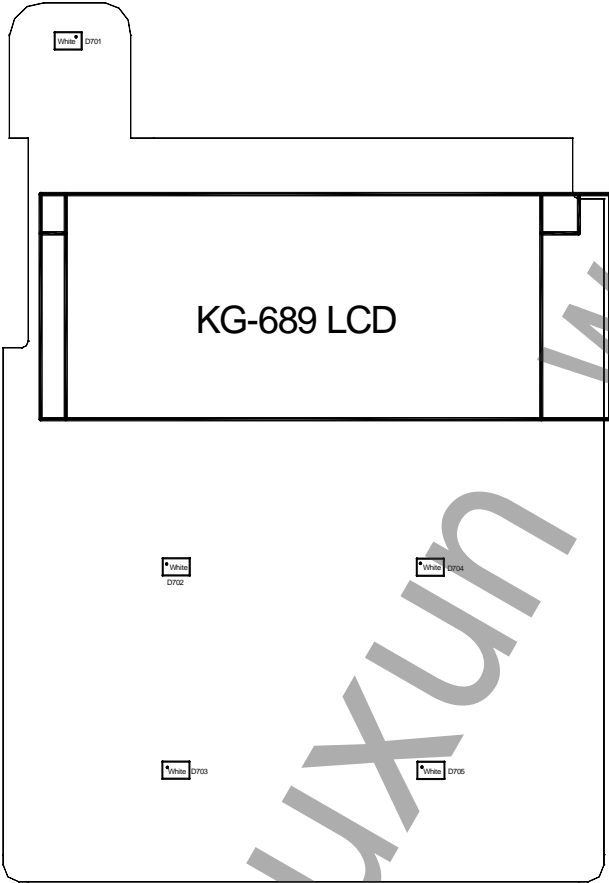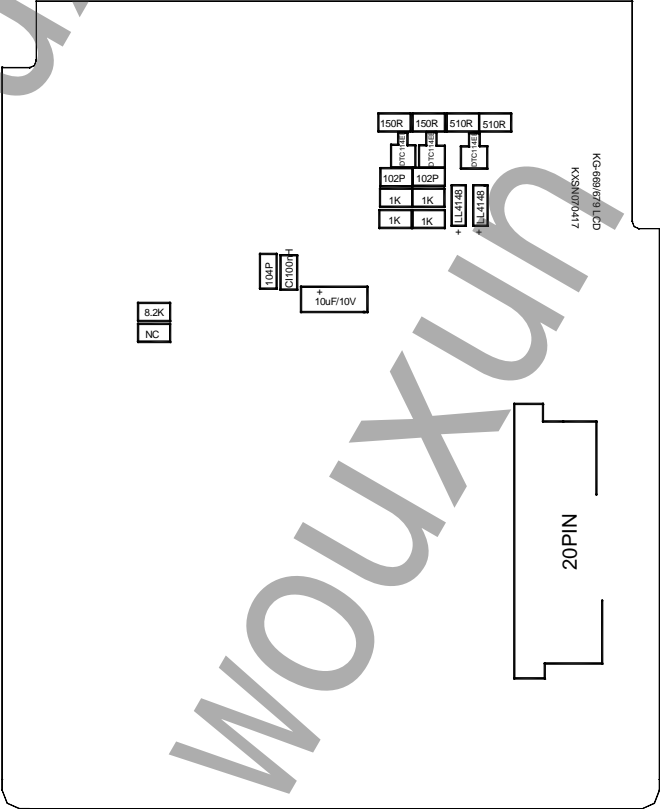| Item	Edit Method	Adjustment band		Specification /Remarks
ANI	Entering the page of programmed software which has available ANI	ANI can be programmed 3-5 bits info codes		See the user's manual
DTMF	Entering the DTMF set page which has available signal			See the user's manual

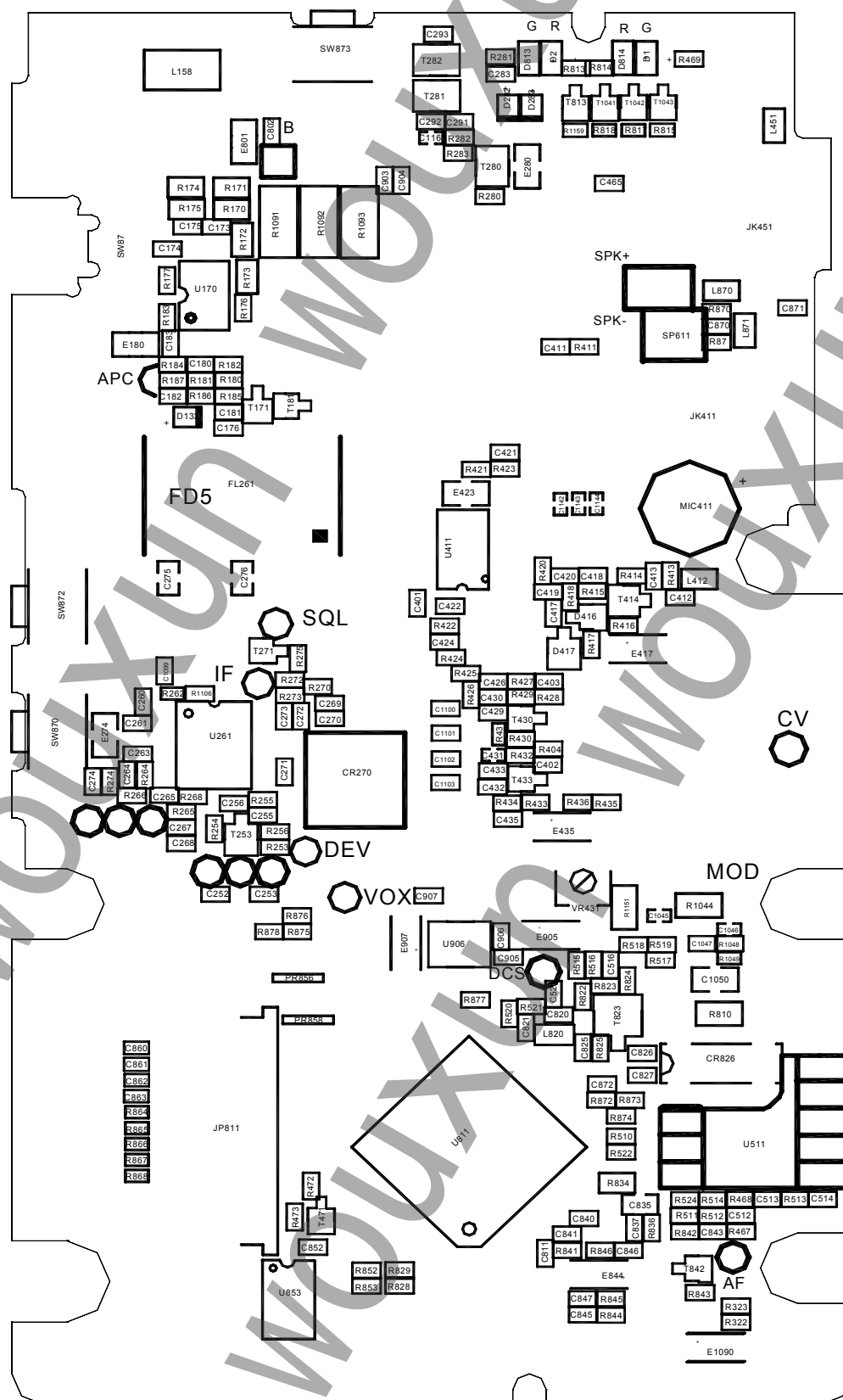# Schematic
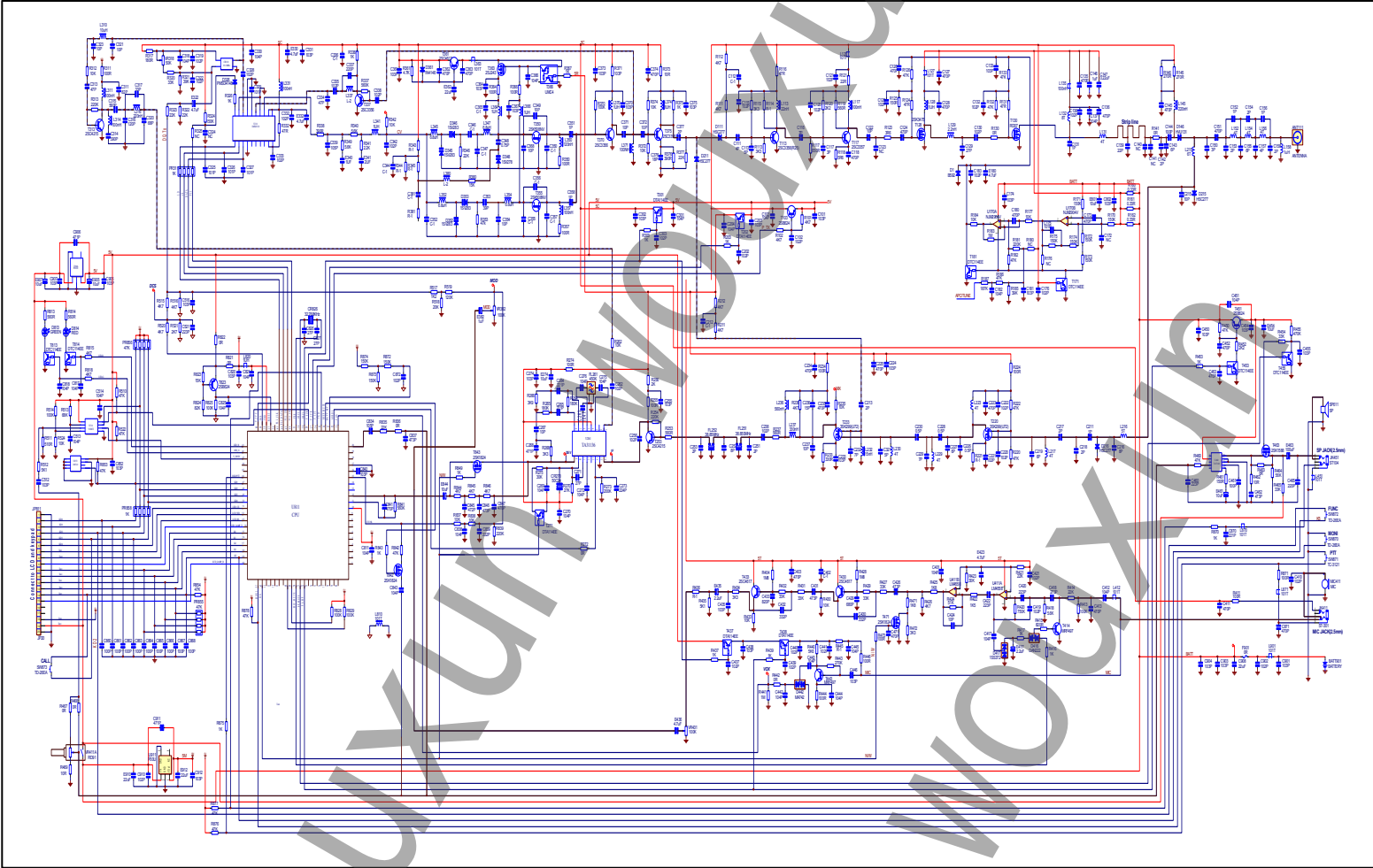
LCD Schematic

KG-689 LCD

LCD Board

KG-689 LCD TOP   **KG-689 LCD BOTTOM**

White D701

KG-689 LCD

White
D702

White D704

White D703

White D705

150R 150R 510R 510R

102P 102P

LL4148 LL4148

1K 1K

1K 1K

104P CI100

10uF/10V

8.2K

NC

KG-689/679 LCD
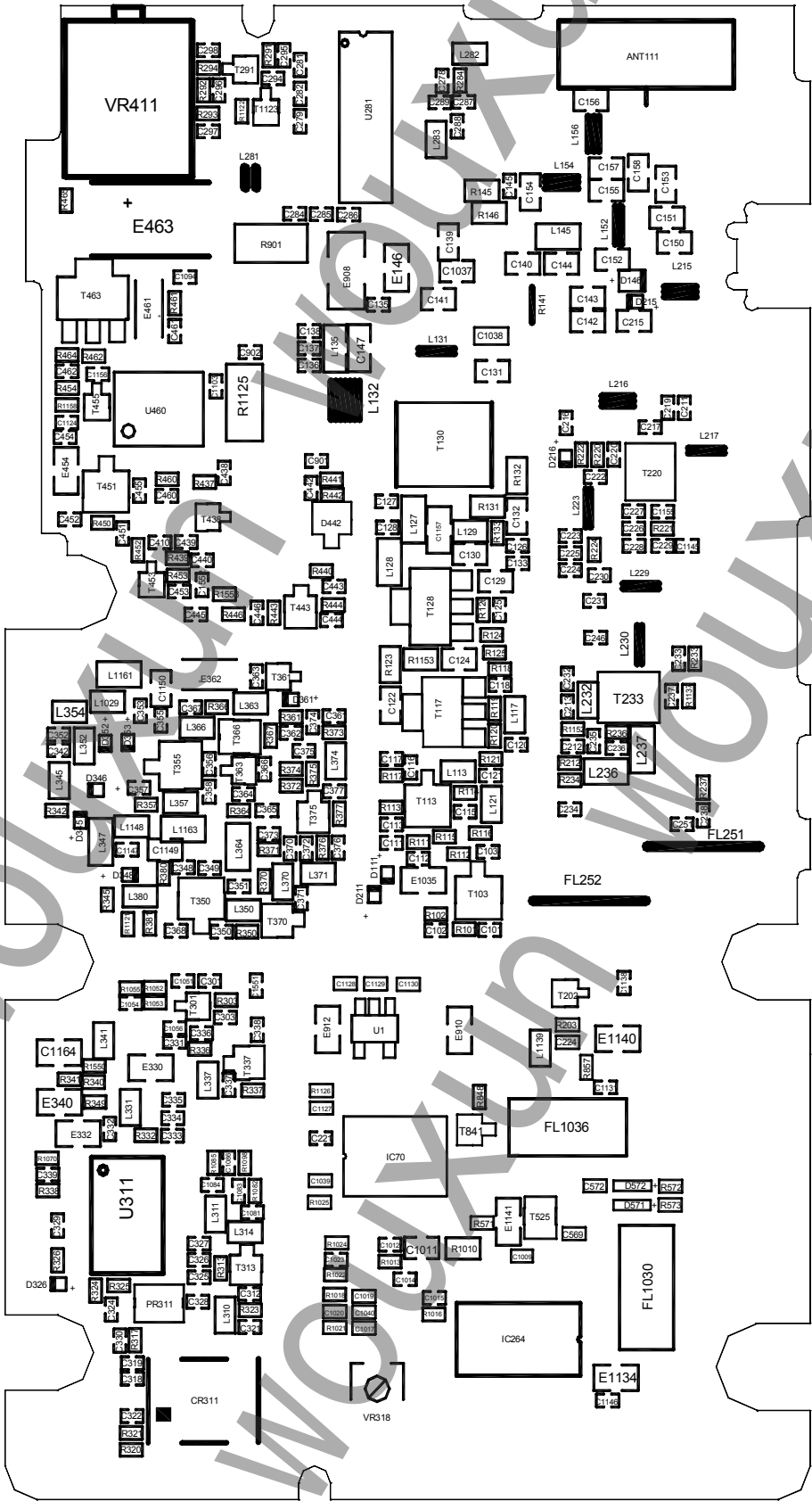KXSN070417

20PIN

Layout Board

Layout Board View------Top

Layout Board

Layout Board View--------Bottom

PCB Board

PCB Board View----Top

CH1UH TD-26EA TC-321 FD5 450K APC BA592 SQL IF TA31136F 50C24 DEV VOX JP20 AP88P868 24C64 DCS MOD VOICE AF CV MIC RC4558 ST-301 ST104 SPK+ SPK- SP P00U

BB910 UMC4 GREEN RED DTC114EE ISS4181 DAN222 1SS372 2SC4617 2SK1824 NJM2904V

32.768KHz
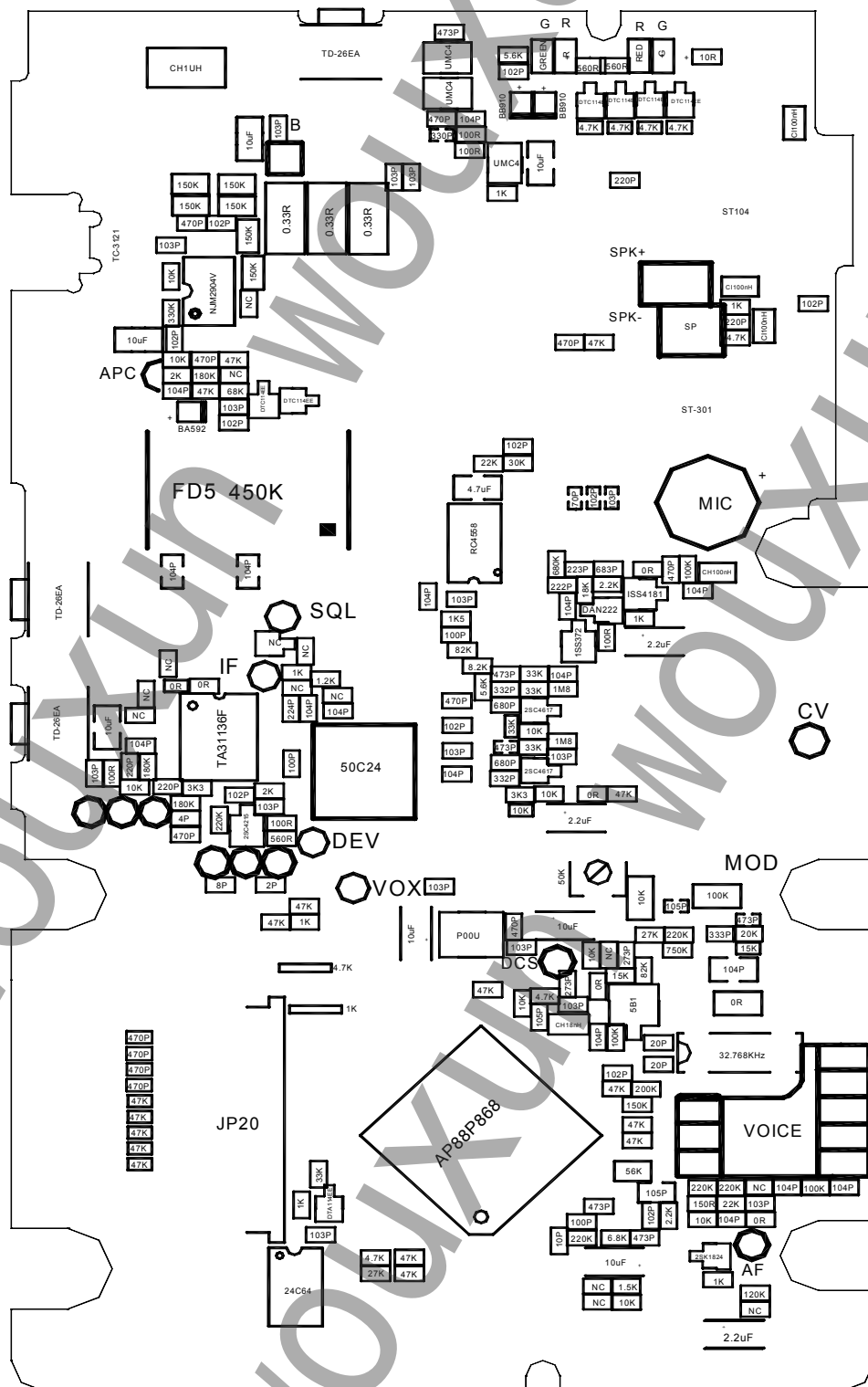
PCB Board

PCB Board View----Bottom
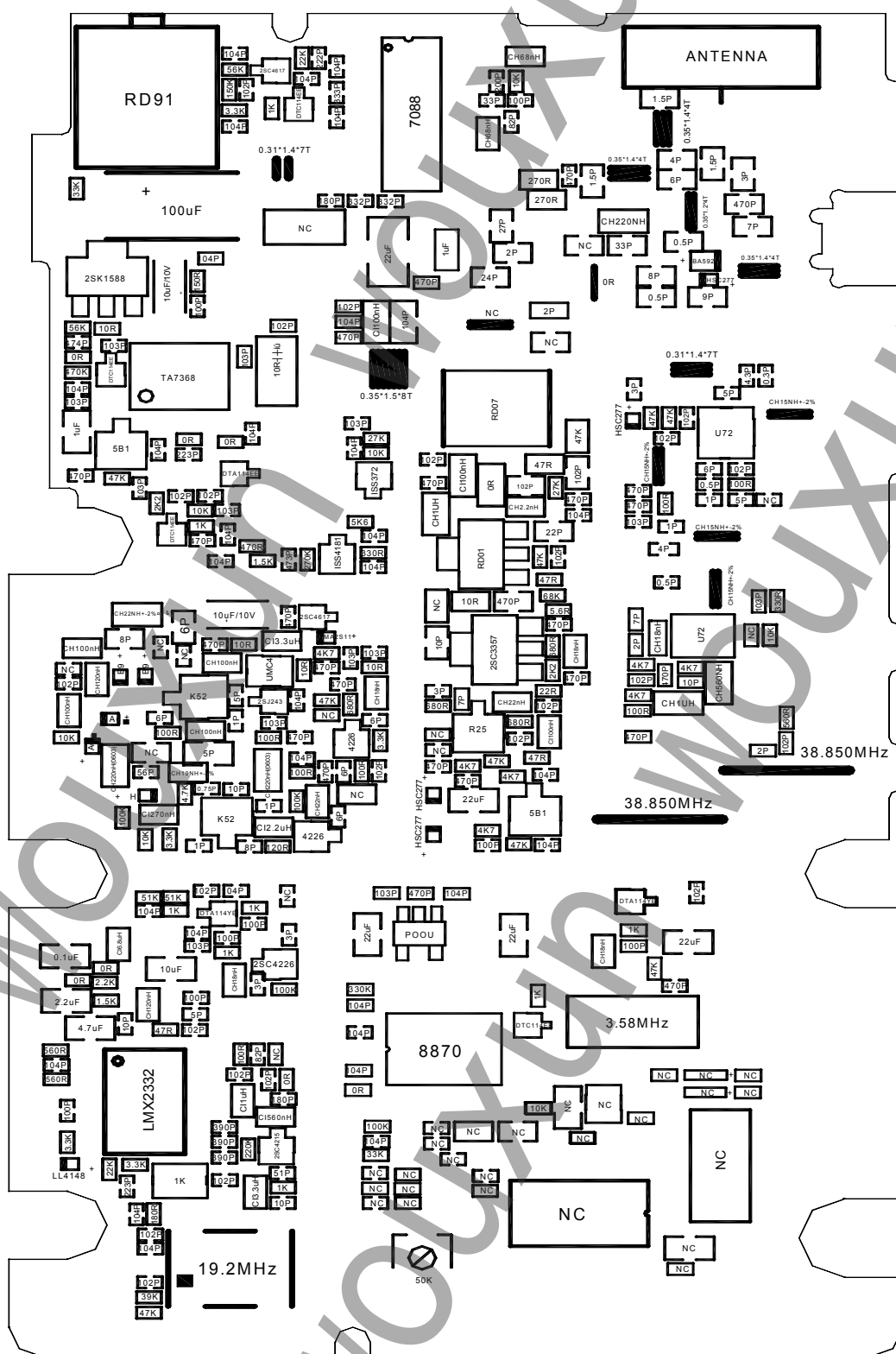
Block Diagram
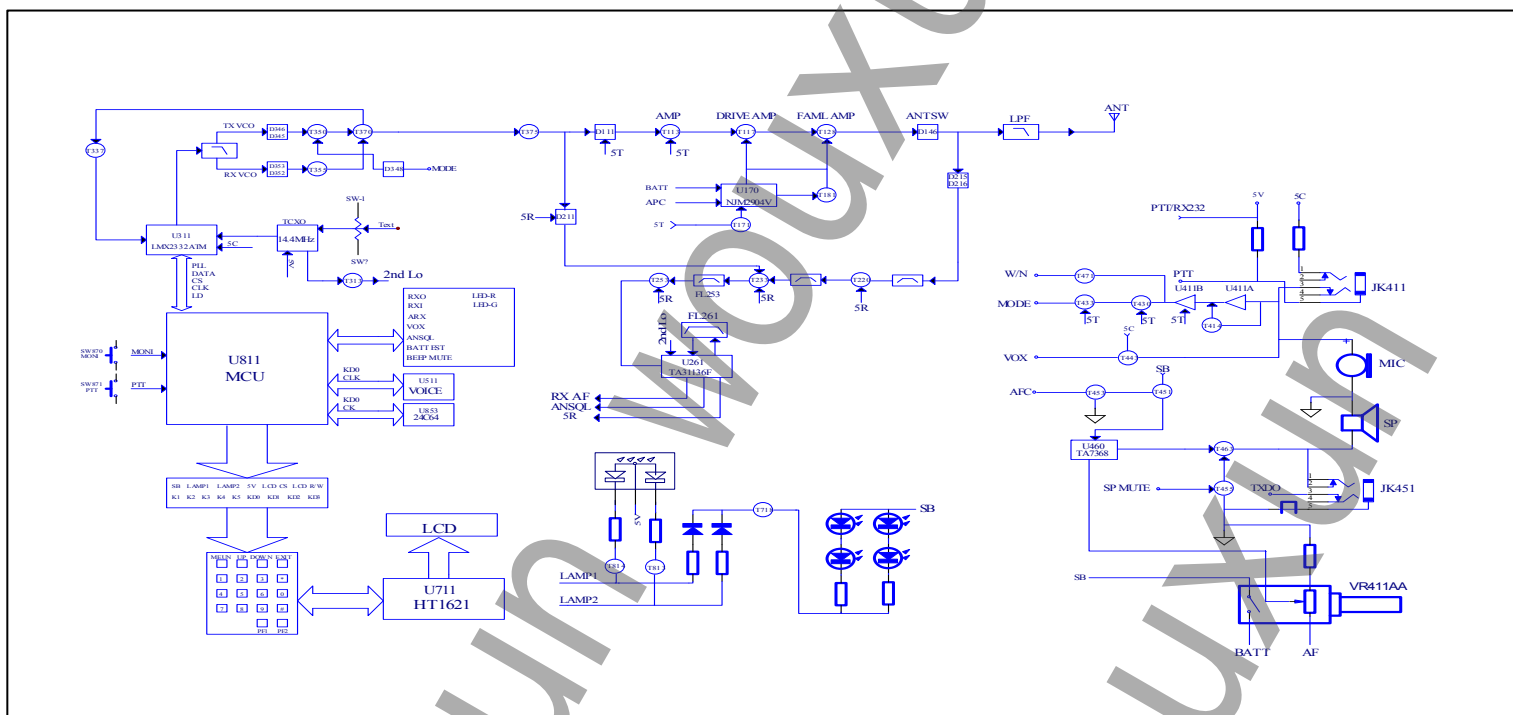
Technology Specication

Frequencyrange	UHF:400-470MHz
Memory Channels	128 channel + 1 group urgency alarm
Voltage	7.4V
Battery Life(90-5-5)	8 hours
Working Temperature	-30℃ to +60℃
Antenna Impedance	50 ohms
Frequency Stability	±2.5ppm(-30℃ to +60℃)

Transmit part

Max. Output Power	5W
Modulation Type	FM（F3E）
Frequency Error	≤2.5ppm
Mixed radio heft	≤7μW
Adjacent power	≥65dB
Modulation Fidelity	+3dB of 6db per octave pre-emphasis characteristics
Max Modulation	≤5KHz
Modulate Sensitivity	12mV+3mV

Receive part

Sensitivity (12dB SINAD)	≤0.2μV
Squelch Sensitivity	≤0.2μV
Rated audio output frequency	≥500mW
Audio Distortion	≤5%
Signal to remaining output power rate	≥40dB
Channel Inhibition	≥-8dB
Adjacent Channel Selectivity	≥65dB
Spurious Immunity	≥55dB
InterModulation	≥55dB
Blocking	≥55dB
Receiver limited characteristics	≤3dB(between 6dBμV and100dBμV)
Modulate Audio Distortion	≤10%