

# **XT-600PLUS(4)**

**Transceiver**

**User manual**

# **Wisetone science & technology Co., Ltd**

## **General**

This manual is intended for use by experienced technicians familiar with similar types of commercial grade communications equipment. It contains main required service information and data for the equipment.

The following precautions are recommended for personal safety:

- 1、DO NOT transmit until all RF connectors are verified secure and any open connectors are properly terminated.
- 2、SHUT OFF and DO NOT operate this equipment near electrical blasting caps or in an explosive atmosphere.
- 3、This equipment should be maintained by qualified technicians only.

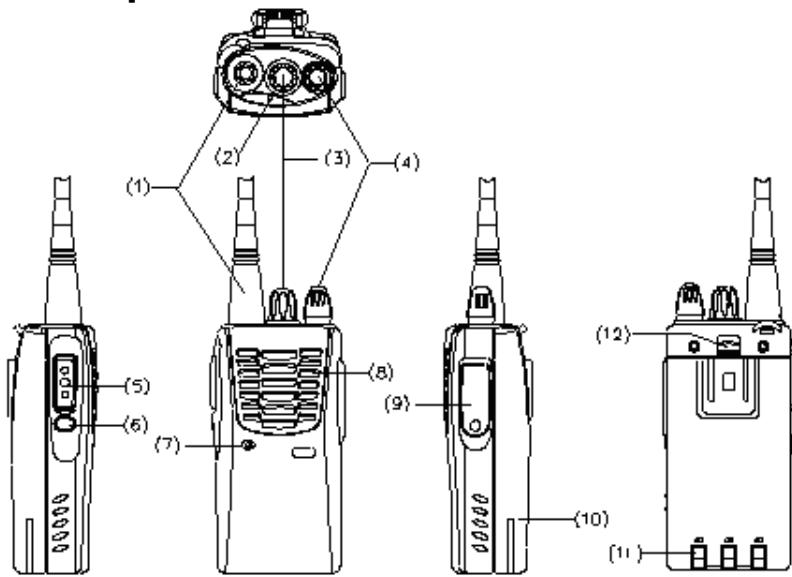
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Transceiver model and specification

MODEL	FREQUENCY(MHz)	POWER	BATTERY	CHARGER
XT-600PLUS(4)	430~470MHz	4W	XBP-1250	DC-791 fast charger

## Parts Description



### 1. Antenna

The helical antenna is threaded plugs for the reception and transmission signal.

### 2. LED light

Lights red while transmitting, green while receiving a signal. Flashes red when the battery voltage is low while transmitting.

### 3. Channel selector knob

4. Power switch/Volume control Turn the knob clockwise to switch the transceiver ON, anti-clockwise to turn off the power till there is a "click" sound , rotate to adjust the volume level.

### 5. PTT switch(push to talk)

Press the button while transmitting, and release it while receiving.

### 6. Monitor key

Press it to shut off squelch, noise could be heard, release to connect squelch.

### 7. Microphone

Put in voice.

### 8. Speaker

Put out voice.

### 9. Speaker jack

Put down the cover, when you program you can put in the program line in it.

### 10. Battery

### 11. Charger plate

Put the battery into the charger, it will operate when the charger plates touch the metal plates.

### 12. Battery deduction

It use to close the battery, pull it up you can take out the battery.

## Specification of the software function

1. Turn the volume button can choice 15+1(scan) channels.
2. Moni function.
3. CTCSS/CDCSS program
4. CTCSS: 50 groups
5. CDCSS: 210 groups
6. 25KHz channel spacing
7. Scan function, set scan channel.
8. Power save.
9. Time- out timer.
10. Voice number notice, program by Chinese/English.
11. VOX function and 9 levels can be choice.
12. 9 levels squelch control.
13. Battery low-volt alarm.
14. Set ANI ID code number by program.
15. Remove the squelch tail function.
16. PC model.
17. Manual adjustment model.
18. Clone function

### Model description

#### 1. User mode

Standard model (look for the XT-600PLUS(4) instruction manual)

#### 2. PC mode

Set and adjust the follow function numbers with PC software or programmer.

- (1) Channel RX and TX power.
- (2) Channel RX and TX tone.
- (3) BCL (busy channel lock)
- (4) TOT (TX time-out-timer)
- (5) Squelch level choice.
- (6) Power save function choice.
- (7) Voice alarm function choice.
- (8) Moni model choice.
- (9) Scan channel choice.
- (10) VOX level set.
- (11) Chinese/English number notice choice.
- (12) ANI ID number set.

#### 3. manual adjustment mode

High or low power by manual adjustment

- (1) make sure the channel and then close the transceiver.
- (2) press the PTT+MONI button to open the transceiver, it will be TX power adjustment model, the transceiver turn to the TX model.
- (3) loose the PTT+MONI button.
- (4) press the PTT button one time, the power will increase, press the MONI button one time, the power will reduce.
- (5) After you finish the adjustment please close the transceiver immediately, then if you open the transceiver again it will operate with the power which you have adjusted.

## 4 Clone function

- (1) Use the clone line connect clone radio with be-cloned radio.
- (2) Turn on the power of the be-cloned radio.
- (3) Choose the 16 channel.
- (4) Push the MONI button after turn off the power of clone radio, then turn on the power; it will come into clone model.
- (5) If the clone is successful the Green LED will light, or the Orange LED will light.

## Circuit Description

### 一、 Frequency configuration

The receiver utilizes double conversion. The first IF is 38.85MHz and the second IF is 450KHz. The first local oscillator signal is supplied from the PLL circuit. The PLL circuit in the transmitter generates the necessary frequencies. Fig.1 shows the frequencies.

XT-600PLUS(4) Frequency range: 430 MHz—470MHz

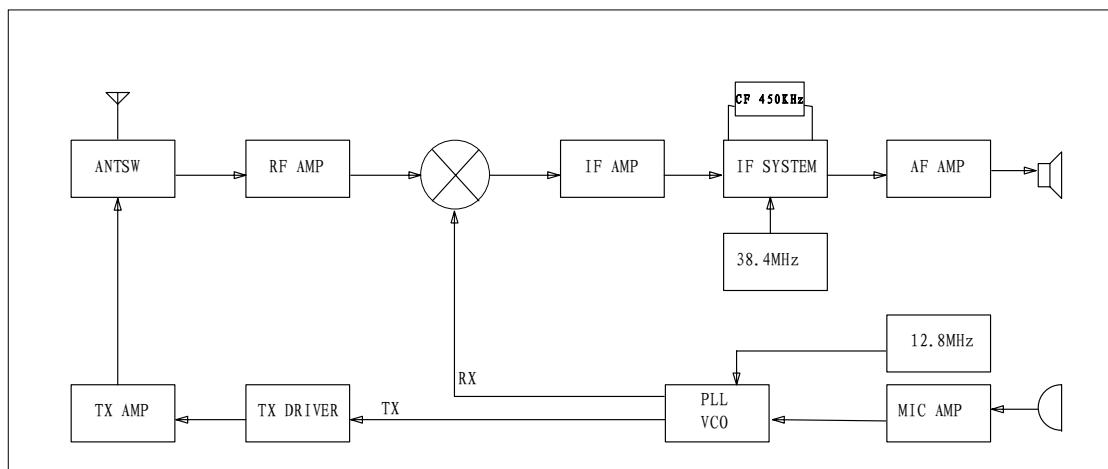


Fig.1 Frequency configuration

### 二、 Receiver

The receiver utilizes double conversion.

#### 1. Front-end RF amplifier

An incoming signal from the antenna is applied to an RF amplifier after passing through a transmit/receive switch circuit and a band pass filter. After the signal is amplified, the signal is filtered through a band pass filter to eliminate unwanted signals before it is passed to the first mixer.

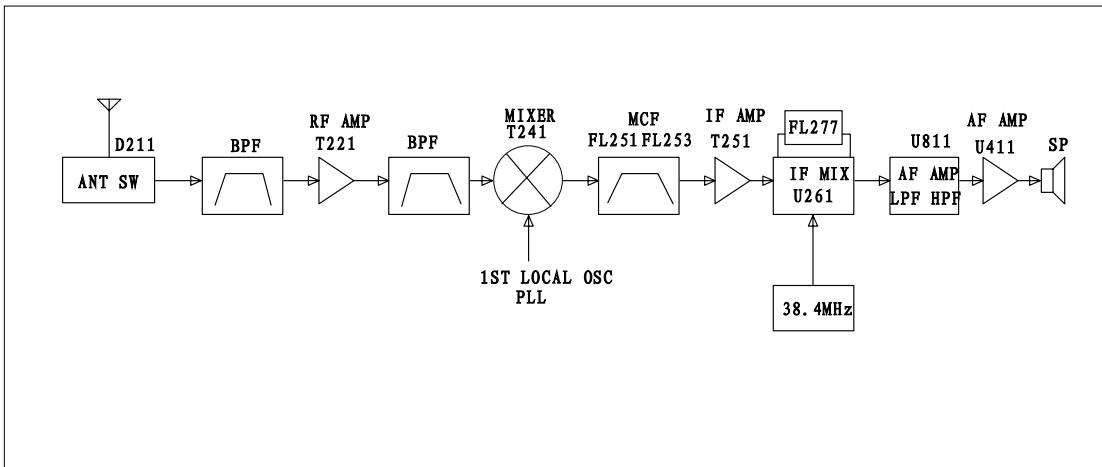


Fig. 2 Receiver section configuration

## 2. First Mixer

The signal from the RF amplifier is heterodyned with the first local oscillator signal from the PLL frequency synthesizer circuit at the first mixer (T241) to create a 38.85 MHz first intermediate frequency (1st IF) signal. The first IF signal is then fed through two monolithic crystal filters (FL251,FL253) to further remove spurious signals.

## 3. IF amplifier

The first IF signal is amplified by T251, and then enters U261 (FM processing IC). The signal is heterodyned again with a second local oscillator signal within U261 to create a 450kHz second IF signal. The second IF signal is then fed through a 450kHz ceramic filter (FL277) to further eliminate unwanted signals before it is amplified and FM detected in U261.

## 4. AF amplifier

The recovered AF signal obtained from U261, and de-emphasized by R264 and C264. The AF signal is then passed through U811 is amplified and low-pass filter and high-pass filter. The processed AF signal passes through an AF volume control and is amplified to a sufficient level to drive a loud speaker by an AF power amplifier (U411).

## 5. Squelch

Part of the AF signal from the U261 is go into the U261 again, and the noise component is amplified and rectified by a filter and an amplifier to produce a DC voltage corresponding to the noise level.

The DC signal from the U261 goes to the analog port of the microprocessor (U811).

U811 determines whether to output sounds from the speaker, U811 sends a high signal to the MUTE and AFCO lines and turns U411 on through T490. (See Fig.3)

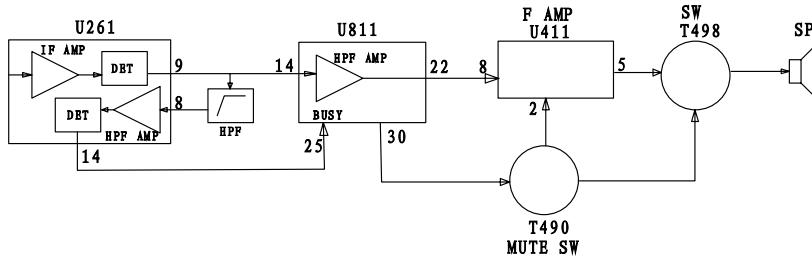


Fig.3. AF Amplifier and squelch

## 6. Receiving signaling CTCSS/CDCSS

300 Hz and audio frequencies of the output signal from IF IC are cut by a low-pass filter. The resulting signal enters the microprocessor (U811). U811 determines whether the CTCSS or CDCSS matches the preset value, and controls the MUTE SW and the speaker output sounds according to the squelch results.

### 三、PLL frequency synthesizer

The PLL circuit generates the first local oscillator signal for reception and the RF signal for transmission.

#### 1. PLL

The frequency step of the PLL circuit is 5 or 6.25KHz. A 12.8MHz reference oscillator signal is divided at U311 by a fixed counter to produce the 5 or 6.25KHz reference frequency. The voltage controlled oscillator (VCO) output signal is buffer amplified by T311, then divided in U311 by a dual-module programmable counter. The divided signal is compared in phase with the 5 or 6.25KHz reference signal in the phase comparator in U311. The output signal from the phase comparator is filtered through a low-pass filter and passed to the VCO to control the oscillator frequency. (See Fig. 4)

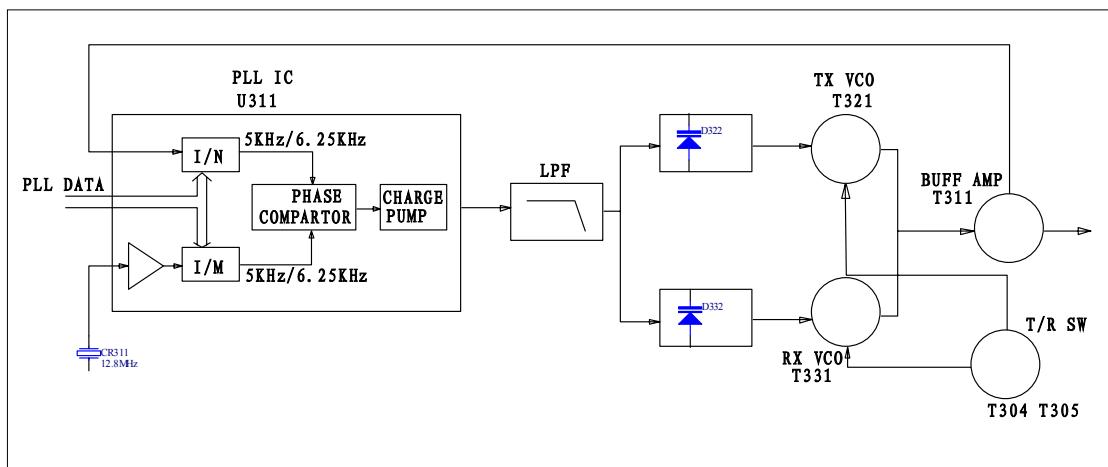


Fig. 4 PLL

#### 2. VCO

The operating frequency is generated by T321 in transmit mode and T331 in receive mode. The oscillator frequency is controlled by applying the VCO control voltage, obtained from the phase comparator, to the varactor diodes (D322 in transmit mode and D332 in receive mode). The T/R pin is set high in receive mode causing T304 and T305 to turn T321 off, and turn T331 on. The T/R pin is set low in transmit mode. The outputs from T321 and T331 are amplified by T311, then sent to the PLL circuit U311 and receiver or transmitter.

#### 四、Transmitter

##### 3. Transmit audio

The modulation signal from the microphone is amplified by U421, passes through a preemphasis circuit, and the signal then passes through a low-pass filter (splatter filter) (T430 and T433) and cuts up 3kHz and higher frequencies. The resulting signal goes to the VCO for direct FM modulation. (See Fig. 5)

##### 4. CTCSS/CDCSS encoder

A necessary signal for CTCSS/CDCSS encoding is generated by U811 and FM-modulated to the PLL reference signal. Since the reference OSC does not modulate the loop characteristic frequency or higher, modulation is performed at the VCO side by adjusting the balance. (See Fig. 5)

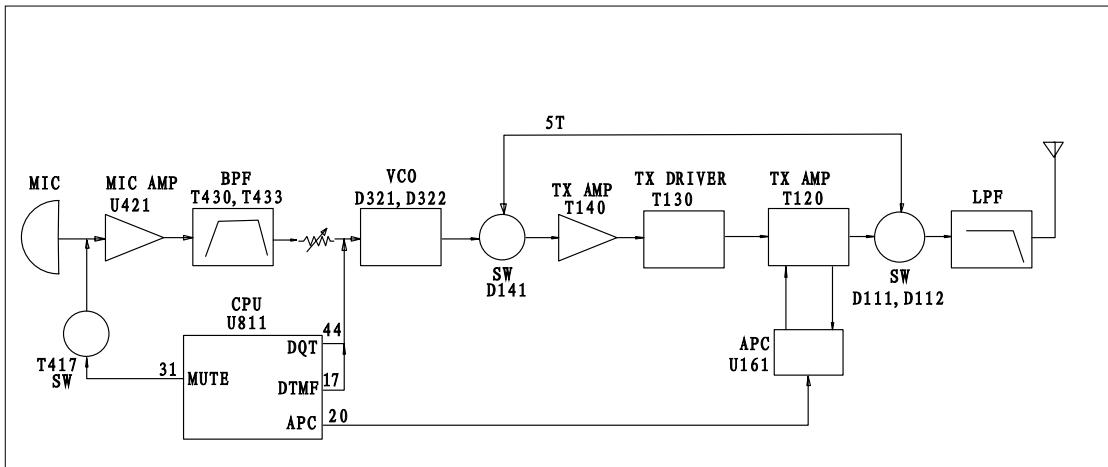


Fig. 5. Transmit audio CTCSS

## 5. RF amplifier

The transmit signal obtained from the VCO buffer amplifier T311, is amplified by T140. This amplified signal is passed to the power amplifier T130 and T120, which consists of a 2 stage FET amplifier and is capable of producing up to 4W of RF power

## 6. ANT switch and LPF

The RF amplifier output signal is passed through a low-pass filter network and a transmit/receive switching circuit before it is passed to the antenna terminal. The transmit/receive switching circuit is comprised of D111 and D112. D111 and D112 turned on (conductive) in transmit mode and off (isolated) in receive mode.

## 五、Power supply

A 5V reference power supply for the control circuit is derived from an internal battery. This power is used to provide a 5V supply in transmit mode [5T], a 5V supply in receive mode [5R] , and a 5V, supply common in both modes based on the control signal sent from the microprocessor.

## 六、Control system

The IC U811CPU operates at 32.768kHz.

## CPU pins Description

PIN No.	PIN NAME	I/O	DESCRIPTION
1	PC0	I/O	RS-232C output
2	PC1	I/O	Input encode
3	PC2	I/O	Input encode
4	PC3	I/O	Input encode
5	PC4	I/O	Input encode
6	PC5	O	Red light control
7	PC6	O	Green light control
8	PC7	O	TX Power control
9	PB3	O	VCO Power control
10	PB4	O	RX Power control
11	PB5	I	MONI Button
12	AVdd	I	CPU input power 5V
13	RXO	O	Input QT/DQT signal
14	RXI	I	AF amplifier
15	TXI		NC
16	TXO		NC
17	TONE	O	DTMF output
18	LC		Capacitance input
19	AVSS		Grounding
20	D/A	O	APC/AFC
21	ATX	O	RS-232C output
22	ARX	O	Audio output
23	AD1	I	Detect battery voltage
24	AD2	I	VOX check
25	AD3	I	Input busy signal
26	OSCI	I	Oscillator
27	OSCO	O	Oscillator
28	Vss		Connect VSS
29	PD1	O	Audio IC control
30	PD2	O	Squelch control
31	PD3	O	MIC mute control
32	RESET	I	Reset
33	Vdd	I	CPU input power 5V
34	PA0	I/O	EEPROM data cable
35	PA1	I/O	EEPROM clock cable
36	PA2	I/O	EEPROM enable
37	PA3	I/O	PLL data output
38	PA4	I/O	PLL clock output
39	PA5	I/O	PLL LE
40	PA6	I/O	Lock circuit detector
41	PA7	I/O	RS-232C input
42	PB0	I	PTT Button
43	PB1	O	Wide or narrow control
44	PB2	O	Output QT/DQT

# XT-600PLUS(4) Parts list

Material code	Size	Description	Precision	QUA	A Ref.No	B Ref.No
R5-F0R1-00	2512	0. 1R/1W	F	1	R121	
R2-J000-00	0402	0R	J	14	R886. R835. R456. R410. R436 R264. R566	R376, R370, R101, R103, R135 R267, R364
R2-J2R2-00	0402	2. 2R	J	1		R473
R2-J100-00	0402	10R	J	1	R440	
R2-J220-00	0402	22R	J	1		R142
R2-J330-00	0402	33R	J	1		R313
R2-J470-00	0402	47R	J	4		R361, R305, R132, R131
R2-J680-00	0402	68R	J	1		R245
R2-J101-00	0402	100R	J	11	R564. R554. R439. R804	R584, R311, R304, R257, R136 R244, R221
R2-J151-00	0402	150R	J	3	R822. R821	R360
R2-J181-00	0402	180R	J	5		R380, R331, R321, R314, R312
R2-J221-00	0402	220R	J	3		R256, R246, R113
R2-J561-00	0402	560R	J	1		R365
R2-J681-00	0402	680R	J	3	R515	R253, R273
R2-J102-00	0402	1K	J	10	R838. R824. R823. R455. R458	R482, R478, R373, R366, R362
R2-J102-00	0402	1. 2K	J	1	R414	
R2-J182-00	0402	1. 8K	J	3	. R437. R425	R581
R2-J222-00	0402	2. 2K	J	1		R368
R2-J272-00	0402	2. 7K	J	4		R316, R146, R133, R262
R2-J332-00	0402	3. 3K	J	6	R438. R434	R255, R272, R263, R582
R2-J392-00	0402	3. 9K	J	0		
R2-J472-00	0402	4. 7K	J	14	R516. R873. R872. R426. R871 R371, R595, R594, R593, R591	R363, R243, R242, R367
R2-J512-00	0402	5. 1K	J	1	R417	
	0402	5. 6K	J	1	R562	
R2-J682-00	0402	6. 8K	J	1		R147
R2-J822-00	0402	8. 2K	J	2	R556,	R143
R2-J103-00	0402	10K	J	17	R452, R151, R153, R430, R433 R511	R296, R481, R335, R333, R322 R315, R307, R306, R148. R249 R291
R2-J153-00	0402	15K	J	2	R885	R241
R2-J183-00	0402	18K	J	3	R552. R412. R159	
R2-J203-00	0402	20K	J	3	R563. R553. R442	
R2-J223-00	0402	22K	J	6	R833. R494. R419. R857	R385, R383
R2-J333-00	0402	33K	J	8	R441. R432. R431. R429, R427 R158.	R379, R378
R2-J393-00	0402	39K	J	2	R862. R157	
R2-J473-00	0402	47K	J	9	R808. R806. R803. R802. R801 R372. R154, R592	R110
R2-J513-00	0402	51K	J	0		
R2-J563-00	0402	56K	J	2	R852	R218
R2-F683-00	0402	68K	F	1	R855	
R2-J823-00	0402	82K	J	2	R884. R854	
R2-F104-00	0402	100K	F	13	R883. R493. R444. R231. R411	R325, R323, R215, R227, R224 R216, R392, R391
R2-J124-00	0402	120K	J	2	R567. R551	
R2-J154-00	0402	150K	J	10	R832. R831. R167. R166. R165 R164. R163. R161	R369, R254

R2-J224-00	0402	220K	J	2	R561. R155	
R2-J274-00	0402	270K	J	1		R268
R2-J334-00	0402	330K	J	2	R512. R445	
R2-J474-00	0402	470K	J	4	R491. R413. R421	R271
R2-J105-00	0402	1M	J	1	R152	
R2-J185-00	0402	1M8	J	2	R428. R404	
R2-J475-00	0402	4. 7M	J	2	R492	R475
RP-0473-00	RP-1206-4	47K		2	PR804. PR801	
RP-0472-00	RP-1206-4	4. 7K		1	PR805	
RP-0102-00	RP-1206-4	1K		1		PR802
RT-0103-00	RV1208	10K		1	RV422	
RT-0503-00	RV1208	50K		2	RV266. RV361	
C2-B0R5-00	0402	0. 5P	B	2		C326, C325
C2-B010-00	0402	1P	B	0		
C2-B1R5-00	0402	1. 5P	B	1		C252
C2-B020-00	0402	2P	B	3		C363, C311, C116
C2-B030-00	0402	3P	B	5		C134, C249, C247, C323, C226
C3-B090-00	0603	3P	B	1		C126
C2-B040-00	0402	4P	B	0		
C2-B050-00	0402	5P	B	1		C322
C2-B060-00	0402	6P	B	7		C332, C333, C315, C243, C236 C214, C117
C3-B070-00	0603	7P	B	2		C125, C713
C2-B070-00	0402	7P	B	4	C253	C143, C228, C383
C2-B080-00	0402	8P	B	1		C312
C2-B090-00	0402	9P	B	4		C146, C115, C225, C223
C3-B070-00	0603	9P	B	1		C128
C2-B100-00	0402	10P	B	2		C321, C112
C2-B120-00	0402	12P	C	4		C224, C215, C324, C136
C2-B130-00	0402	13P	C	1		C216
C2-B150-00	0402	15P	C	4		C227, C331, C328, C334
C2-B180-00	0402	18P	C	1		C218
C2-B220-00	0402	22P	C	2		C211. 245
C3-B220-00	0603	22P	C	1		C111
C2-B240-00	0402	24P	C	1		C212
C3-B240-00	0603	24P	C	0		
C2-B270-00	0402	27P	C	5	C882. C811. C596. C597	C213
C2-B330-00	0402	33P	C	5		C144, C251, C237, C235, C291
C2-B390-00	0402	39P	C	0		
C2-B470-00	0402	47P	C	2	C492	C133
C2-B560-00	0402	56P	C	1		C292
C2-B820-01	0402	82P	C	2		C262, C135
C2-J101-00	0402	100P	J	5	C161	C362, C368, C367, C366
	0402	120P	J	1		C387
C2-J221-00	0402	220P	J	6	C838. C471. C454. C852. C458	C472
C2-J331-00	0402	330P	J	2		C271, C268
C2-J471-00	0402	470P	J	20	C823. C661. C554. C447. C436 C403. C152. C164	C583, C364, C360, C335, C307 C306, C304, C142, C113, C451 C392, C906
C3-J471-00	0603	470P	J	1		C122
C2-J681-00	0402	680P	J	1	C429	
C2-J681-00	0402	820P	J	1	C433	
C2-k102-00	0402	102P	K	13	C151, C162, C430, C432, C365	C377, C372, C370, C361, C118 C371, C293, C132
C2-k222-00	0402	222P	K	2		C266, C265

C2-k392-00	0402	392P	K	1	C856	
C2-J472-00	0402	472P	J	5	C264, C595, C591, C412, C871	
C2-k103-00	0402	103P	K	29	C513. C885. C854. C435. C388 C163. C153. C105. C402	C202, C201, C102, C101, C301 C141, C148, C256, C255, C254 C246, C241, C231, C234, C233 C232, C221, C277, C907, C905
C2-k223-00	0402	223P	K	3	C389. C426, C431	
C2-k273-00	0402	273P	K	2	C414. C413	
C2-k333-00	0402	333P	K	1	C855	
C2-J473-00	0402	473P	J	1	C872	
C2-k563-00	0402	563P	K	1	C411	
C2-k104-00	0402	104P	K	33	C516. C514. C512. . C886 C883. C864. C857. C851. C837 C836. C833. C822. C555. C494 C493. C491. C445. C441. C440 C410, C155. C457. C455	C296, C376, C375, C309, C103 C282, C281, C278, C382, C473
C2-k224-00	0402	224P	K	3	C417	C263, C261
C2-Z105-00	0402	105P	Z	3	C446, C452	C477
C5-Z475-00	0805	4. 7uF	Z	11	E151. C415	E371, C475, C474, E422, C257 C121, C123, C276, C124
C5-J104-00	0805	0. 1uF	J	2		E363, E361
C5-k105-00	0805	1uF	Z	2	C106	E362
CA-T225-16	A	2. 2uF/16V	M	2	E417. E435	
CA-T106-10	A	10uF/10V	M	5	E871. E854	E365, E907, E905
CA-T105-16	A	1uF/16V	M	1	E491	
CA-T475-16	A	4. 7uF/16V	M	2		E373, C305
CB-T226-16	B	22uF/16V	M	2		E481, E261
CC-T107-06	C	100uF/6V3	Z	1		E473
CT-0060-00		6PF		2		CV331, CV321
L9-0301-00	0603	301T		1	L886	
L9-0101-00	0603	101T		4	L851. L101	L376, L391
L3-0682-01	0603	6.8nH		2		L142, L134
L3-0273-01	0603	27nH		2		L311, L237
L3-0475-00	0603	4.7uH		1	L454	
L3-0104-00	0603	100nH		2		L221, L362
L3-0105-00	0603	1uH		1		L291
L3-0224-00	0603	220nH		6		L333, L331, L323, L321, L135 L113
L3-0333-00	0603	33nH		2		L141, L131
L3-0824-00	0603	820nH		1		L243
L3-0223-00	0603	22nH		1		L247
L3-0183-00	0603	18nH		1		L361
L9-2811-06	0.28X1.1X6TL	6T		4		L216. L224. L227. L215
L9-3516-07	0.35X1.6X7TL	7T		1		L121
L9-0514-04	0.5X1.4X4TL	4T		3		L211. L111. L112
L9-0311-03	0.3X1.1X3TL	3T		1		L322
L9-0315-03	0.3X1.15X3TL	3T		1		L332
D0-302T-00	SLS-YGUR302TM	LED3225		1	D821	
D0-0372-00	ISS372	USM		1	D417	
D0-0122-00	KDS122	USM		1	D491	
D0-0154-00	KDV154	USC		5		D321, D215, D227, D224, D216

D0-0376-00	MA2S376			2		D332, D322
D0-0131-00	HVC131	ESC		4		D211, D112, D111, D361
D0-0114-00	KDS114	USC		2		D141, D249
Q0-4008-00	PD54008L	2-5N1A		1		T120
Q0-3078-00	2SK3078	SOT89		1		T130
Q0-1824-00	2SK1824	ESM		4	T571. T561. T551	T581
Q0-305S-00	KRA305	USM		7	T455. 452	T296, T481, T202, T101, T301
Q0-404S-00	KRC404	USM		11	T822. T821. T162. T151. T456	T483, T477, T305, T304, T273 T263
Q0-2014-00	KTA2014	USM		1	T881	
Q0-4075-00	KTC4075	USM		3	T417. T433. T430	
Q0-4080-00	KTC4080Y	USM		1		T251
Q0-4226-00	2SC4226	USM		7		T361, T331, T321, T311, T140 T241, T221
U0-UDIO-00	TMP87P805B U	QFP44		1	U811	
U0-UDIO-00	AUDIO	SOP8		1	U511	
U0-LC08-00	24LC08	SOP8		1	U835	
U0-7233-00	TDA7233	SOP8		1		U411
U0-5002-00	XC62FP5002 PR (5A)	SOT89-5A		1		U906
U0-324V-00	NJM324	SSOP16-225		1	U421	
U0-1136-00	TA31136F	SSOP16-225		1		U261
U0-2332-01	LMX2332	SSOP20-225		1		U311
U0-2904-00	NJM2904V	SSOP8		1	U161	
U0-7385-00	LC7385M	U-SOP18-245		1	U591	
L0-4500-02	6060-2S	JTB450CM		1		CR262
Y0-1280-05	DS0305	12. 8MHz		1		CR311
Y0-3276-00	DS7325-MC2 06	32. 768KHz		1	CR881	
Y0-3580-01	FX-CS20	3. 58MHz		1	CR596	

## Adjust Description and specifications

Use programmer or PC software to program XT-600PLUS(4) , or by manual program , eg . To program XT-600PLUS(4) by manual as follows:

### 一、Instrument::

Synthesized test instrument	1 set
Scanner	1 set
3A/10V power	1 set
Digital Voltmeter	1 set
3A DC Ammeter	1 set

### 二、Adjust:

- Initialization: It is necessary to initialize the transceiver because there is useless data in EEPROM. So make initialization before adjust. After set the Initialization data on PC, connect the radio by program line, then turn on the radio power, you can write in Initialization data.
- Adjustment: The adjustment of XT-600PLUS(4), some are conducted in PC communication mode; some are in manual program mode. Turn on the power and enter the manual program mode.

### VCO SECTION:

ITEM	CONDITION	measurement		Adjustment		Specifications/Remark	
		Test equip	terminal	part	Method		
1、Setting	1、power 7.5V						
2 、 Transmit VCO1.CH: lock voltage	1、TX high frequency, enter the manual program mode and press the PTT		CV	CV321	4.0V±0.1V		
	2、TX low frequency, enter the manual program mode and press the PTT				>0.7V		
	1、RX high frequency, enter the manual program mode and press the MONI	Digital Voltmeter		CV331	3.8V±0.1V		
	2、RX low frequency, enter the manual program mode and press the MONI				>0.7V		

### Adjust the Transmitter section:

Item	Condition	Measurement		Adjustment		Specifications /Remarks
		Test equip	Terminal	parts	Method	
7、Transmit frequency	1、TX center Turn to manual mode and press the PTT	Synthetical test	ANT	RV361	Adjust to the center frequency	the error≤±250Hz
8、MAX DEV 最大频偏	1、TX center frequency Turn to manual mode and press the PTT	Synthetical test LPF: 15kHz ±5kHz	ANT	RV422	Adjust the frequency error to:4.2kHz±100Hz	

		AF:1kHz 120mV				
9、FM Sensitivity	1、TX center Turn to manual mode and press the PTT	Synthetical test FILTER: 0.3-3.4kHz AF:1kHz 15mV	ANT		Check frequency error :2.2kHz-3.6kHz	
10、CTCSS balance	1、TX center and with 67.0Hz CTCSS, turn to manual mode  2、TX center and with 250.3Hz CTCSS, turn to manual mode and press the PTT	Synthetical test LPF: 300Hz	ANT		Adjust VR3, the test value of on condition 1 & condition 2 is consistent, the difference value<=200Hz	67.0Hz CTCSS  250.3Hz CTCSS
11、CTCSS frequency error	1、TX center frequency CTCSS:67.0Hz turn to manual mode	Synthetical test	ANT		Adjust the frequency error to:0.65kHz±100Hz	
12、CDCSS frequency error	1、TX center frequency CDCSS:023 turn to manual mode	LPF:300Hz	ANT		Adjust the frequency error to:0.65kHz±100Hz	
13、.Low Battery alarm level	Turn to manual mode, Adjust the battery to 5.7V	Digital voltmeter			Adjust so that the LED flashes	

#### Adjust the receiver section: (enter manual mode first)

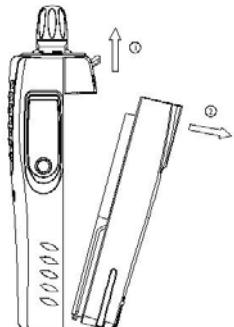
Item	Condition	Measurement		Adjustment		Specifications /Remarks
		Test equip	Terminal	parts	Method	
4、.Band-pass filter	1、RX center turn to channel 4 in manual mode	Spectrum analyz	ANT .		Adjust the undee to the top, the bandwidth is about 20MHz, the sign of central frequency is in the middle of the undee	
5、Sensitivity	1、RX center Turn to manual mode	Synthetical test SSG output:	ANT		check	SINAD: 12dB or higher

6、Squelch	2、RX low Turn to manual mode	-118dBm MOD:1KHz DEV: $\pm$ 3kHz FILTER: 0.3-3.4kHz	ANT	RV266		
	3、RX high Turn to manual mode				Level 9 Adjust to close the squelch.	Adjust the Level 9 squelch.
	1、RX center Turn to manual mode	Synthetical test SSG output: -117dBm			Level 3 Adjust to close the squelch.	Adjust the Level 3 squelch.
	2、RX center Turn to manual mode	Synthetical test SSG output: -125dBm				

## Disassembly for Repair

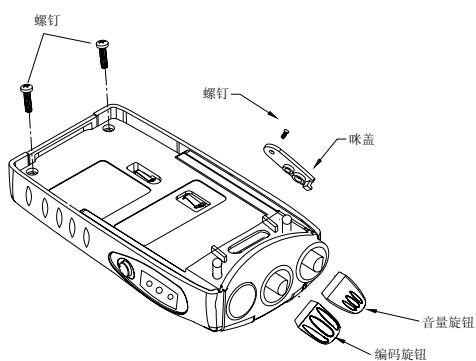
### Put out the battery

Make sure close the transceiver, then press down battery locking tap, and then pull down the battery pack.

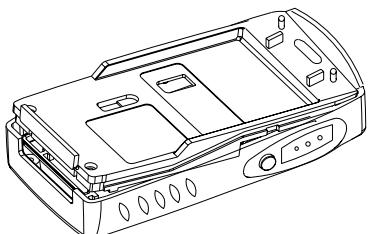


### Put out the cassette(aluminum hull and PCB board)

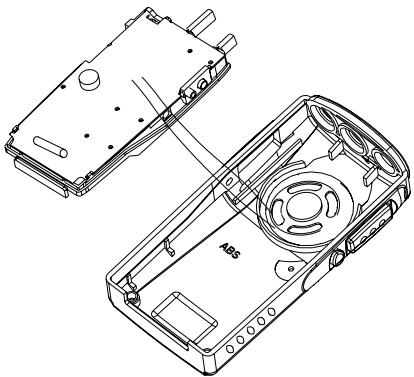
1. Put down the 2 crews which in the transceiver bottom.
2. Pull out the volume knob and channel knob button
3. Turn the antenna
4. Pull down the mic-cover bolt and mic-cover.



Put up the aluminum hull bottom, then pull out the base.

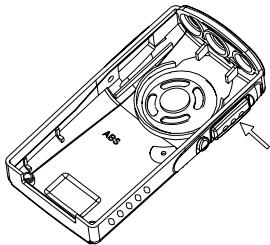


Pull down as follow



### Put down the PTT button

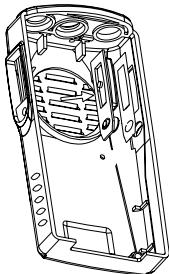
Pull out the PTT button from the front cover.



### Put on the PTT button

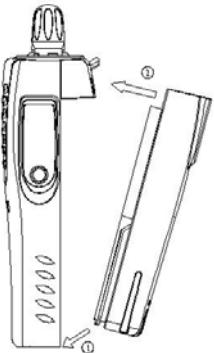
Put the double glue on the front cover.

Then push the PTT button into the hole which in the front cover.

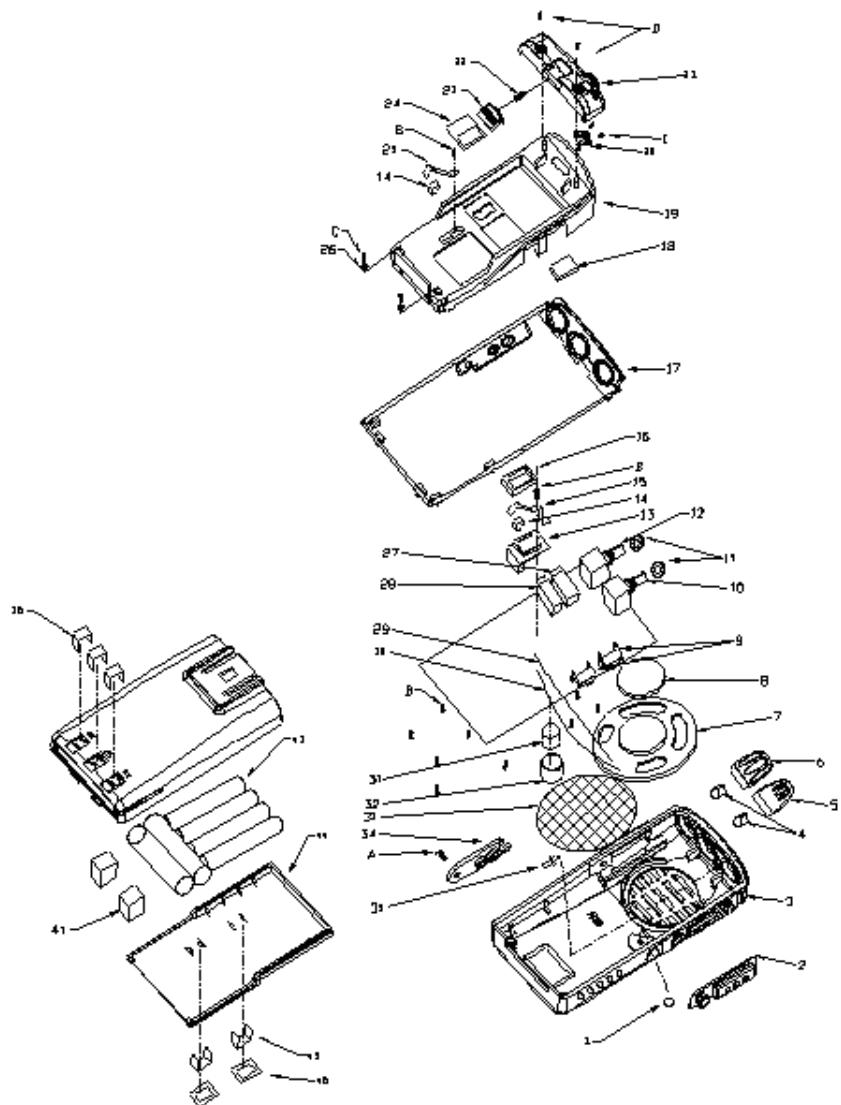


### Put on the battery

Put the base of the battery to the radio aluminum hull rabbet and push, then press the top of the battery to the radio until you heart a "click" sound, it will be OK.



## Component plans



## **FCC Compliance**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 90 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Modifications not authorized by the manufacturer may void users authority to operate this device.

## **FCC Licensing Requirements**

Your radio must be properly licensed Federal Communications Commission prior to use. Your dealer can assist you in meeting these requirements. Your dealer will program each radio with your authorized frequencies, signaling codes, etc., and will be there to meet your communications needs as your system expands.

## **Safety:**

It is important that the operator is aware of and understands hazards common to the operation of any radio.

READ THIS IMPORTANT INFORMATION ON SAFE AND EFFICIENT OPERATION.

The EUT is Face-held only, not allow to body-worn configuration, the safety distance should be at least 2.5 cm.