HYT

SERVICE MANUAL

TWO-WAY RADIO

TC-518

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Contents

Introduction

Manual Scope

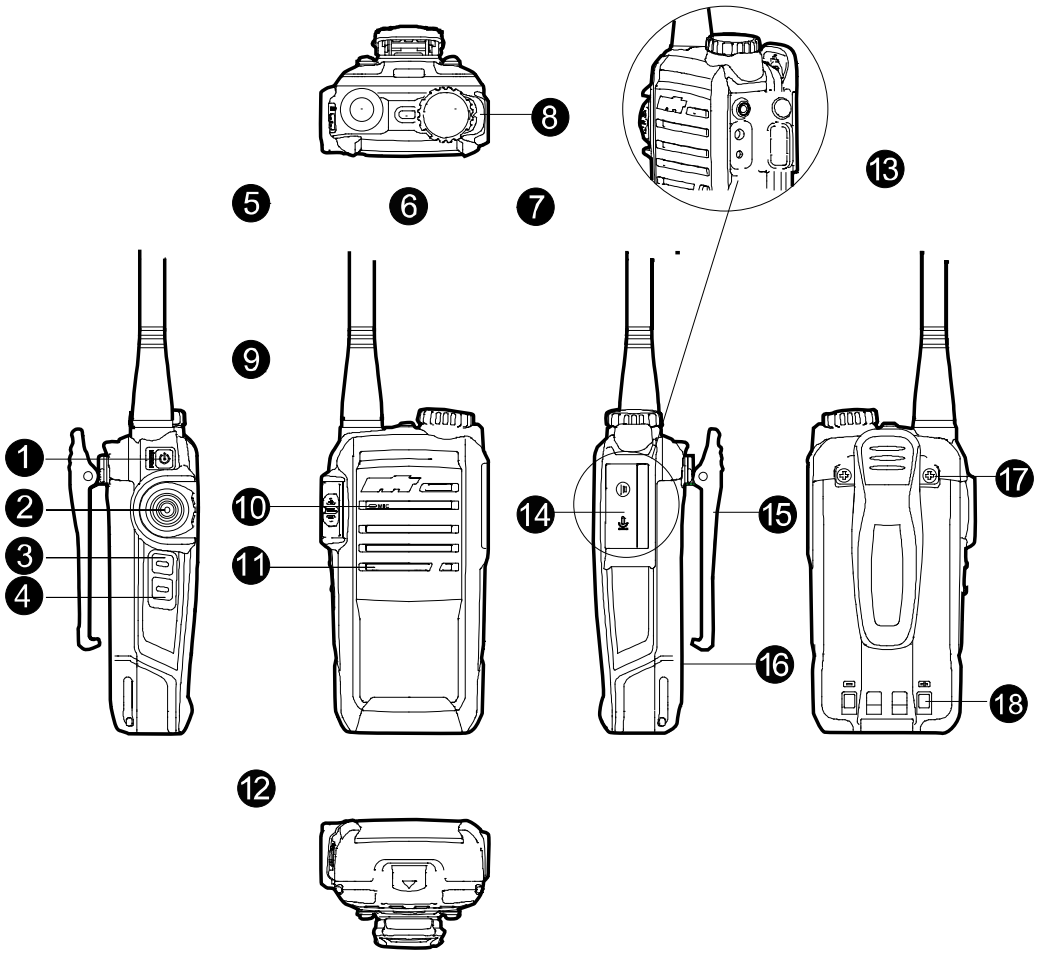
This manual is intended for use by experienced technicians familiar with similar types of communication equipment. It contains all service information required for the equipment and is current as of the publication date.

Safety Information

The following safety precautions shall always be observed during operation, service and repair of this equipment.

- ◇ This equipment shall be serviced by qualified technicians only.
- ◇ Use only HYT supplied or approved batteries and chargers.
- ◇ To avoid electromagnetic interference and/or compatibility conflicts, turn off your radio in any area where posted notices instruct you to do so. Turn off your radio before boarding an aircraft. Any use of a radio must be in accordance with airline regulations or crew instructions.
- ◇ For vehicles with an air bag, do not place a radio in the area over an air bag or in the air bag deployment area.
- ◇ **Turn off your radio prior to entering any area with explosive and flammable materials.**
- ◇ **Do not charge your battery in a location with explosive and flammable materials.**
- ◇ **Turn off your radio before entering a blasting area.**
- ◇ **Do not use any portable radio that has a damaged antenna. If a damaged antenna comes into contact with your skin, a minor burn can result.**
- ◇ Do not expose the radio to direct sunlight over a long time, nor place it close to heating source.
- ◇ When transmitting with a portable radio, hold the radio in a vertical position with the microphone 3 to 4 centimeters away from your lips. Keep antenna at least 2.5 centimeters away from your body when transmitting.

Radio Overview



(1) Power On/Off Key	(2) PTT (Push-to-Talk) Key	(3) SK1 (programmable key)	(4) SK2 (programmable key)
(5) Antenna	(6) LED Indicator	(7) Channel Selector Knob	(8) Channel Indicator
(9) Volume Control Knob	(10) Microphone	(11) Speaker	(12) Battery Latch
(13) Audio Accessory Jack and Programming Port	(14) Accessory Jack Cover	(15) Belt Clip	(16) Battery
(17) Belt Clip Screw	(18) Charging Piece		

⑤ **PTT (Push-to-Talk) Key**

Press and hold down the **PTT** key to transmit, and release it to receive.

⑤ **SK1**

SK1 is a programmable key that can be assigned with press function by your dealer.

⑤ **SK2**

SK2 is a programmable key that can be assigned with press function by your dealer.

⑤ **Channel Selector Knob**

Rotate the knob to select from channel 1 to channel 16.

⑤ **Volume Control Knob**

Turn the volume control knob up/down to increase/decrease the volume.

⑤ **LED Indicator** See table below for status of LED Indicator and alert tone：

<table>
<tr><th colspan="2">Function</th><th>Status of LED Indicator and Alert Tone</th></tr>
<tr><td rowspan="3">User Wired Clone</td><td rowspan="2">Enter the User Wired Clone Mode</td><td>Hold down the SK for 2 seconds to power on the source radio, and red LED flashes once.</td></tr>
<tr><td>Power on the target radio directly.</td></tr>
<tr><td>Status of the source radio (After the target radio is powered on and installation of clone cable is completed, press PTT to begin to clone.)</td><td>During cloning process, red LED glows.
Clone errors:
a. User Clone. Once clone begins, frequency band and Model ID will be checked.
LED glows orange for 2 seconds and then goes out to indicate a failed check. If the check is successfully carried out but error data clone occurs, LED will flash orange. In this situation, press any key other than the power switch to turn it off.
b. Factory clone. If error data clone occurs, LED will flash orange. In this situation, press any key other than the power switch to turn it off.
Once clone is completed, green LED solidly glows.
LED flashes red when it indicates low voltage, which will not be responded in the clone mode.</td></tr>
<tr><td>Status of the target radio</td><td>LED solidly glows green when cloning is in progress.
Green LED goes out when cloning is completed.</td></tr>
<tr><td colspan="2">Power On (enter User Mode)</td><td>When the radio is on, the alert tone sounds, and orange LED flashes once.
When the current channel is a blank channel, the radio sounds beep tone continuously.</td></tr>
<tr><td colspan="2">Low Battery Alert</td><td>LED flashes red, and a low-pitched tone sounds at intervals of 10 seconds.</td></tr>
<tr><td colspan="2">Transmit</td><td>Red LED solidly glows.
When TOT timer expires, the radio sounds beep tone continuously.
TOT pre-alert: a beep is heard.</td></tr>
<tr><td colspan="2">Receive</td><td>LED glows green when carrier is present.</td></tr>
<tr><td colspan="2">Scan</td><td>Green LED flashes at every 1 second, while scanning is in process.
Scan Start Alert Tone (programmable by your dealer): a beep is heard.
Scan Exit Alert Tone (programmable by your dealer): a beep is heard.</td></tr>
<tr><td colspan="2">Programming</td><td>Reading: red LED glows.
Writing: green LED glows.</td></tr>
<tr><td colspan="2">Power Adjustment</td><td>A low-pitched tone is heard when transmit power is switched from high power to low power.
A high-pitched tone is heard when transmit power is switched from low power to high power.</td></tr>
</table>

VOX	The alert tone sounds once when the VOX feature is activated. The alert tone sounds twice when the VOX feature is disabled.

Programmable Key Functions

The following auxiliary functions are programmable for **SK1** and **SK2** by your dealer.

- ③ None
- ③ Monitor
- ③ Monitor Momentary
- ③ Scan
- ③ Squelch Off
- ③ Squelch Off Momentary
- ③ Power Adjustment
- ③ Battery Strength Indicator
- ③ VOX (Voice-Operated Transmit)
- ③ Compandor
- ③ Scrambler
- ③ Channel Lock

Functions below are programmed by factory default:

Key	Operation	TC-518
SK1	Short press	VOX
	Long press	Squelch Off Momentary
SK2	Short press	Scan
	Long press	Battery Strength Indicator

Note: Short press: key-press time is no longer than 1 second;

Long press: key-press time is longer than 1 second.

Software Specifications

Feature Description

1. 1 - 16 channels available
2. Channel Spacing: 25KHz/12.5KHz
3. Channel Scan
4. Tx / Rx Status Indicator (Red & Green LED)
5. CTCSS/CDCSS Codec (38 groups of CTCSS, 83 groups of CDCSS, and CTCSS Tail Revert by 180 degree)
6. Low Battery Alert
7. Automatic Battery Save
8. Unlock Detection and Emergency Alarm
9. Nine selectable Squelch levels
10. Monitor
11. Time-out Timer (TOT)
12. Squelch Tail Elimination
13. PC Programming (manual / automatic adjustment)
14. High/Low Power Switch (2.0/4.0W)
15. Wide & Narrow Band Compatibility
16. Busy Channel Lockout (transmission prohibited in busy status)

17. Wired Clone
18. Battery Strength Indicator
19. Manual Tuning
20. VOX and five selectable sensitivity levels

Mode Description

User Mode

Conventional Communication Mode: the default mode after power-on.

PC Programming Mode

PC programming software will bring the radio into PC Programming Mode through communication based on specific communication protocol. In this mode, it works out to set radio functions and adjustment parameters by applying PC programming software (including User Version and Factory Version).

Wired Clone Mode

1. Description

Wired Clone Mode is an independent mode. To access other modes, you must restart the radio.

Wired Clone Mode covers user wired clone mode and factory wired clone mode.

1) User Wired Clone Mode:

   Connect two radios by using a cloning cable. Simultaneously hold down **SK1** and **Power On** key to power on the source radio so that the wired clone mode will be entered after 2 seconds, and then directly power on the target radio to enter the user mode. In this mode, parameter data stored in EEPROM of the source radio will be cloned to EEPROM of the target radio. The range of data transmitted only covers channel data and common parameters, excluding adjustment data, version and serial No. of the model.

2) Factory Wired Clone Mode:

   Connect two radios using a cloning cable. Simultaneously hold down **SK1** and **Power On** key to power on the source radio so that the wired clone mode will be entered after 2 seconds, and then press **SK1** to switch to factory wired clone mode (when the wired clone mode is entered, the user wired clone mode is defaulted); then directly power on the target radio to enter the user mode. The range of transmitted data covers all data (including flag of manual adjustment switch) stored in EEPROM, with exclusion of the serial No.

2. Process

Process of Wired Clone:

1) Red LED flashes once after the source radio enters wired clone mode. Press **PTT** to clone data to the target radio.
2) During communication, red LED of the source radio glows, and green LED of the target radio glows. When the communication ends, green LED of the source radio glows and the green LED of the target radio goes out, which indicates the preparation for another clone.
3) Stop the communication if any abnormality occurs during communication. Orange LED of the source radio glows, which indicates the preparation for another clone.
4) When the communication ends, the source radio goes back to standby status. Press **PTT** again to begin with clone.

Manual Adjust Mode

Hold down **PTT**, **SK1** and **Power On** key for 2 seconds to power on the radio and enter the Manual Adjust Mode. (Note: This operation is subject to the option Manual Adjust Disable in the programming software.)When manual adjustment function is disabled, the radio will be unable to enter the adjustment mode. It helps avoid parameter modification and performance decrease caused by user's misoperations.

Disable this function after the value is well-adjusted during production to avoid any unexpected value modification. The adjusted value can only be reset and changed in Factory Adjust Mode to meet different requirements.

Adjustment Instructions are as follows:

1) Access to Manual Adjust Mode:

Hold down **PTT**, **SK1** and **Power On** key to power on the radio for 2 seconds or longer. In case of a longer period (longer than 2 seconds), the orange LED (red LED plus green LED) glows, which indicates that the adjustment mode has been entered. When the key is released, the radio will enter Item N of Tx group (N depends on the position where the channel selector knob locates). Red LED glows in adjustment status of Tx group; green LED glows in adjustment status of Rx group.

2) Switch of adjustment items in Tx group and Rx group:

This operation is done through the channel selector knob.

Red LED solidly glows when you are adjusting items in Tx group.

Green LED solidly glows when you are adjusting items in Rx group.

3) Switch of adjustment items in Tx group/Rx group:

This action is carried out by applying channel selector knob as follows:

Tx group: CH1-CH9, respectively stands for Tx low power, Tx high power, CDCSS balance, CDCSS deviation, CTCSS deviation (low), CTCSS deviation (medium), CTCSS deviation (high), Tx low voltage threshold and Max. Tx audio deviation.

Red LED solidly glows when you are adjusting items CH1-CH9.

Rx group: CH10-CH12, respectively stands for normal carrier squelch open, normal carrier squelch close and Rx low voltage threshold.

Green LED solidly glows when you are adjusting items CH10-CH12.

With invalid CH13-CH16, no adjustment item can be found and LED goes out.

4) Wide/Narrow band switch for a certain adjustment item:

When adjusting a certain item, short press **SK1** (orange LED flashes indicating valid press) to switch between wide/narrow band. Then the first frequency of current bandwidth is the frequency to be adjusted by default.

5) Frequency switch under certain bandwidth and certain adjustment item

Short press (no longer than 1 second) **PTT** (green LED flashes indicating valid press) and automatically switch adjustment frequencies under certain bandwidth and certain adjustment item.

6) Add/Subtract the adjustment value under certain bandwidth and certain adjustment item:

Rotate the volume control knob upwards, and the adjustment value will increase by 1 under certain bandwidth and certain adjustment item; hold the knob up without release, and the adjustment value will keep increasing continuously in steps of 1. The adjustment value will keep unchanged once it reaches its maximum value.

Rotate the volume control knob upwards, and the adjustment value will decrease in steps of 1 under certain bandwidth and certain adjustment item; hold the knob up without release, and the adjustment value will keep decreasing continuously in steps of 1. The adjustment value will keep unchanged once it drops to its minimum value.

7) Measures on Special Items:

Tx group: Ch8 is the Tx low voltage threshold. These adjustment items are related to AD sampling. Rotate the volume control knob up or down to activate AD sampling (including calculation) for one time after entering the above mentioned adjustment options. Rotate the channel selector knob and save the current AD sampling value. If you do not rotate the volume control knob, neither the AD sampling will be activated, nor the original adjustment value will be updated.

Rx group: CH10-CH12, respectively stands for normal carrier squelch open, normal carrier squelch close and Rx low voltage threshold. These adjustment items are related to AD sampling. Rotate the volume control knob up or down to activate AD sampling (including calculation) for one time after entering the above mentioned adjustment options. Rotate the channel selector knob and save the current AD sampling value. If you do not rotate the volume control knob, neither the AD sampling will be activated, nor the original adjustment value will be updated.

8) Description of Key-press:

Short press: key-press time is no longer than 1 second.

Long press: key-press time is longer than 1 second.

Circuit Description

1.1 General Principle

Tx section: The modulated signal from MIC is directly sent to MCU chip (U604) for A-D conversion to digital signal, processing such as filtering, signal compression, encryption, pre-emphasis, Tx gain control and amplitude limiting, and restoration to modulated signal via D-A conversion. The modulated signal from MCU passes through RC low-pass filter circuit, and enters VCO together with CTCSS/CDCSS signal generated by MCU for direct frequency modulation (The PLL system is composed of U101, Q104 and Q105.). The modulated audio signal and CTCSS/CDCSS signaling are transferred to RF carrier signal. The modulated RF carrier signal is converted to RF signal by the buffer amplifier Q106 and Q109, and then enters the preamplifier Q402, where the signal power is amplified. The RF signal is further amplified by the pre-driver Q403 to drive the final power amplifier Q404 to get signals of the desired power. The amplified signal enters the low-pass filter circuit through the diode D402 and D404, and then it is transmitted from the antenna after high-order harmonics are removed. D402/D404 and D501/D502 compose the Rx-Tx switch circuit.

Rx section: Desired/Undesired RF signal is received via the antenna, and goes through the bandpass filter (composed of D503, D504 and D505) to filter the undesired out-of-band interference signal. Then the desired RF signal enters the high-frequency low-noise amplifier Q618, where the desired signal is amplified. The amplified signal goes through the bandpass filter (composed of D506 and D507) again to filter the undesired out-of-band interference signal. The desired RF signal is mixed with the first local oscillator signal (output from VCO) at Q502. The newly generated signal is processed by the crystal filter (XF503), which brings the first IF signal (desired). After amplified by Q505, this IF signal enters the IF demodulation IC (U301), and it is mixed with the second local oscillator signal to generate the second IF signal. Then the second IF signal is demodulated by U301 and outputs in the form of audio signal, which is sent to MCU for A-D conversion and filtering. Afterwards, the audio signal is divided into two flows for further processing: one flow is processed by CTCSS/CDCSS decoder; the other is restored to audio signal through filtering, de-emphasis, decoding and D-A conversion. Then the restored audio signal is processed by the audio power amplifier (U302) to drive the speaker directly.

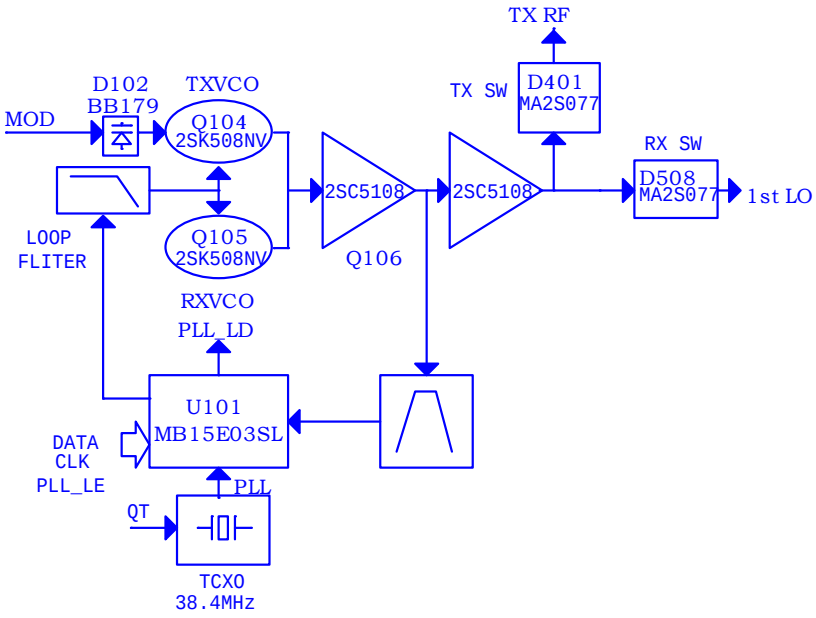
Power Supply Section: The 7.4V battery voltage goes through LDO IC U601, and generates 5V DC steady voltage, which is divided into two flows. One flow is converted to 4.5V voltage output (one flow supplies the Tx circuit with 4.5T and the other flow supplies VCO as V_SAVE under MCU control; V_SAVE flow is converted to 4.5R through Q604 and supplies the Rx circuit.) through double-channel LDO U602. The other flow is converted to 3.0V voltage output through double-channel LDO U603, and supplies MCU and PLL.

Signaling Code: CTCSS/CDCSS generated by MCU is divided into two flows. One flow. is output through MOD port, and sent to VCO together with audio signal for modulation through RC filter network. The other flow is output through D/A port, and goes through RC network to modulate the PLL reference frequency oscillator.

1.2. Realization Methods for Basic Functional Modules

1.2.1 HF Sections

(1) Block diagram of PLL circuit:



PLL circuit mainly generates RF carrier signal (for Tx) and 1st local oscillator signal (for Rx).

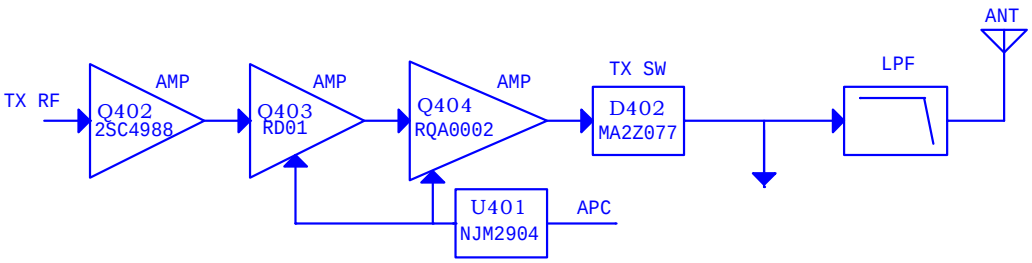
PLL: Step frequency of the PLL circuit is 5.0KHz or 6.25KHz. In U101, the 38.4MHz reference oscillator signal is divided into 5.0KHz or 6.25KHz reference frequencies via a fixed counter in PLL. The signal output from the VCO (TXVCO/RXVCO) is buffer amplified by Q106 and enters PLL where the signal is divided by the variable frequency-divider. In the phase detector (PD) of PLL, new signal generated in frequency division is compared with the reference frequency. After passing through a low-pass filter, the signal output from PD is sent to the varactor of VCO so as to control its output frequency.

VCO: Both Tx and Rx have a VCO section. Tx mode: PLL generates voltage to control the varactor by PD and low-pass filter (LOOP FILTER) so as to make TX VCO produce RF carrier signal which is consistent with MCU preset frequency. The modulated signal processed by MCU is transferred to RF carriers through D102, and buffer amplified. Then the signal is sent to RF power amplifier for further amplification.

Rx mode: RXPLL generates voltage to control the varactor by PD and low-pass filter (LOOP FILTER) so as to make RX VCO produce the first local oscillator signal which is consistent with MCU preset frequency, and then it is mixed with the received RF signal in mixing tube Q502 to generate the first IF signal.

Unlock Detector: In case any LD pin of U101 is at low level, it indicates an unlocked status. When the microprocessor detects such situations, Tx/Rx operation is prohibited, and the unlock alarm sounds.

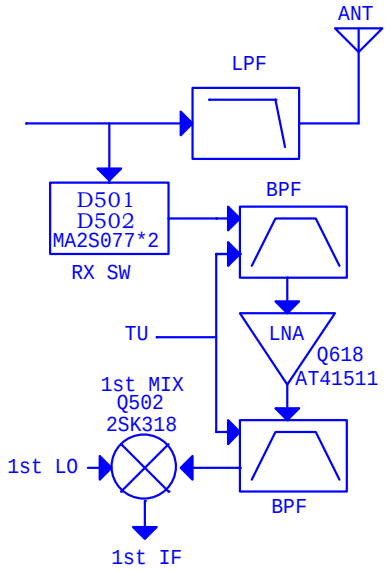
(2) Block diagram of RF power amplifier:



The modulated carrier signal from Q109 is preamplified at Q402, and then enters Q403 for amplification of driver stage to drive the final power amplifier Q404, which further amplifies the input RF signal. The last amplified RF signal enters LC low-pass filter circuit (LPF) through diode D402, and then it is transmitted from the antenna after the high-order harmonics are removed by LPF.

APC is composed of U401 and peripheral components. U401 controls Tx current by controlling the bias voltage at the gates of Q403 and Q404 so as to control the power.

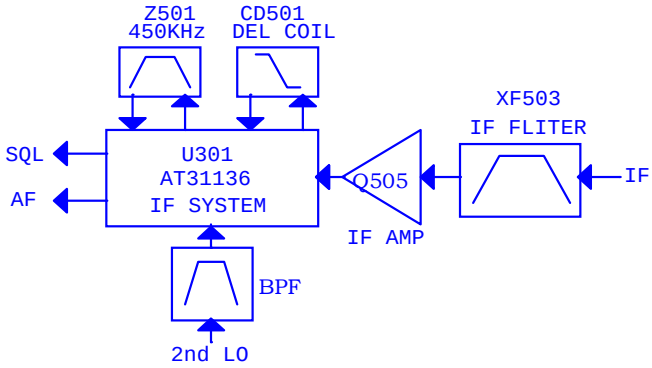
(3) Block Diagram of Rx LNA and the First Mixing circuit:



Desired/Undesired RF signal is received via the antenna, and goes through the bandpass filter to filter the undesired out-of-band interference signal. Then the desired RF signal enters the high-frequency low-noise amplifier Q618, where the desired signal is amplified. The amplified signal goes through the bandpass filter again to filter the undesired out-of-band interference signal. The desired RF signal is mixed with the first local oscillator signal output from VCO at Q502.

MCU controls the center frequency of tunable bandpass filter by output voltage from APC/TU pins.

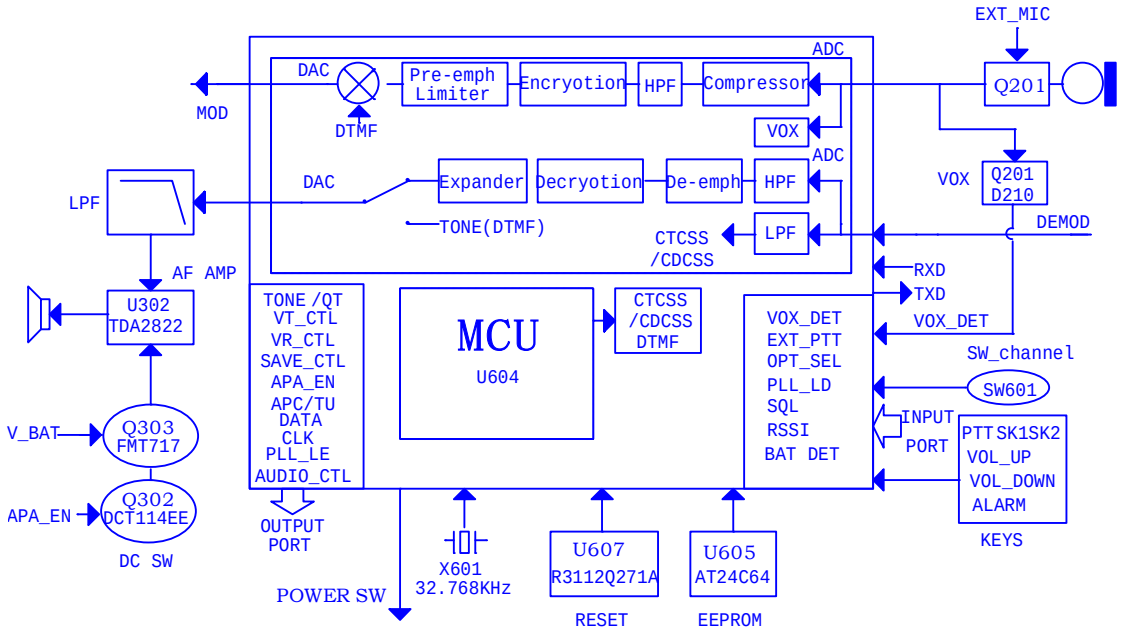
1.2.2 IF Processing and Audio Demodulation



The signal (mixed at Q502) is processed by crystal filter XF503, and the first IF signal (38.85MHz) is generated. After amplified at Q505, this IF signal enters the IF demodulation IC (U301), and it is mixed with the second local oscillator signal to generate the second IF signal (450KHz). Then the second IF signal is demodulated by U301 and outputs in the form of audio signal, which is sent to MCU for A-D conversion and filtering. Afterwards, the audio signal is divided into two flows for further processing: one flow is processed by CTCSS/CDCSS decoder; the other is restored to audio signal through filtering, de-emphasis, decoding, signal expansion and D-A conversion. Then the restored audio signal is processed by the audio power amplifier (U302) to drive the speaker directly.

1.2.3 MCU Control, Signal Processing and Audio Amplification

Circuit diagram of this section is shown as below:



(1) MCU Control Circuit

MCU control circuit is composed of MCU, EEPROM and keys, etc. This section features the following functions: to initialize data of the radio and save data in EEPROM; to detect and respond to signals from external keys, LD and VOX-DET, and battery voltage; to transmit the required data to PLL based on the channel encoding status; to switch and control Rx/Tx based on the input PTT signal; to control the squelch circuit (on/off) based on the input signaling decode signal and squelch level signal; to output control signal to control circuit of high/low power switch, audio power amplifier, VCO power supply, Rx power supply and Tx power supply; to communicate with PC by transmitting and receiving data between the RXD/TXD and PC based on RS232 protocol during programming by users.

(2) Signal Processing

a. Tx Baseband Processing

Audio signal from MIC is divided into two flows. One flow enters U604 directly, and it is converted to digital signal by analog-to-digital conversion (ADC). After filtered by the digital low-pass filter, the signal is sent for digital processing such as AGC, companding, high-pass filtering, encryption and pre-emphasis. Then this signal is superposed with CTCSS/CDCSS signal from MCU, converted to baseband signal by digital-to-analog converter (DAC), and put out. Afterwards, this signal is processed by the active low-pass filter, and sent to VCO for modulation. The other flow is converted to DC level at Q201 and D210, and sent to MCU as VOX energy detector.

b. Rx Baseband Processing

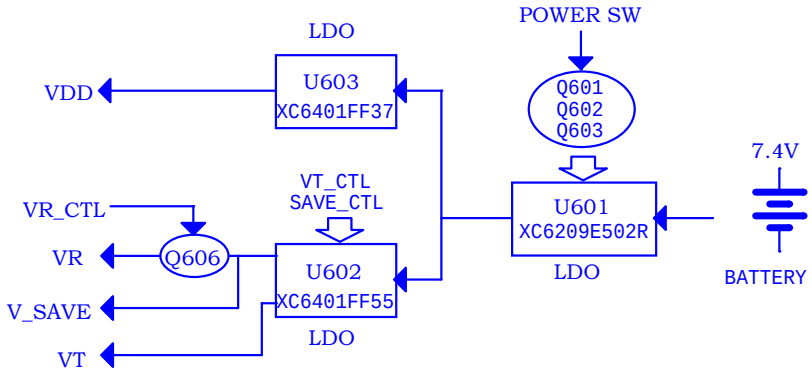
After the DEMOD signal demodulated at IF enters U604, a digital signal is generated as A-D conversion is completed. Then, the signal enters digital LPF for further filter.The signal is divided into 2 flows. One flow is processed by CTCSS/CDCSS signaling decoder; the other is processed through high-pass filtering, de-emphasis, decryption and signal expansion (volume control of audio digital signal), etc, and finally outputs audio signal via digital-to-analog conversion.

(3) Audio Power Amplifier

The digital audio signal demodulated at U604 is processed with volume control (digital gain control in MCU), and converted to analog signal via D/A conversion. Then it enters audio power amplifier IC (U302) for audio power amplification to drive the speaker directly.

1.2.4 Power Supply Processing

Block diagram of power supply is shown as below:



Power Supply Section: The 7.4V battery voltage is converted to 5V DC voltage through LDO IC U601. One flow is converted to 4.5V DC voltage by double-channel LDO U602 to supply the Tx/Rx/VCO circuit, and the other flow is converted to 3.3V DC voltage by U603 to supply the MCU/EEPROM/PLL.

CPU Pins

PIN NO.	PORT	Pin Name	I/O	Function
1	NC	/	/	/
2	NC	/	/	/
3	NC	/	/	/
4	NC	/	/	/
5	NC	/	/	/
6	TXD	TXD	O	UART TxD
7	RXD	RXD	I	UART RxD
8	P60	APA_EN	O	Speaker switch control, H: on; L: off.
9	P61	SAVE_CTL	O	Power save control. In non-power-save status, it is set at high level.
10	P62	MIC_EN	I	Check MIC connection (available for high level)
11	P63	EXT PTT	I	PTT key on the earpiece (available for high level)
12	P64	RLED	O	Red LED
13	P65	GLED	O	Greed LED
14	P66	Reserve	O	
15	P67	Reserve	O	
16	Vssd	GND	S	Power grounding of digital circuit
17	Vddd	VCC（3.3V）	S	Power supply of digital circuit
18	P50/INT0	VOL+	I	To increase the volume
19	P51/INT1	VOL-	I	To decrease the volume
20	P52/INT2	/	I	
21	P53/INT3	SK2	I	Programmable function key (SK2)
22	P54/INT4	SK1	I	Programmable function key (SK1)
23	P55/INT5	PTT	I	PTT key (available for low level)
24	P56/INT6	Reserve	O	
25	P57/INT7	Reserve	O	
26	Vdd_CLD	VCC（3.3V）	S	Power supply of digital power amplifier
27	CLD_OUTP	CLD_OUTP	O	LINEOUT output; positive output of digital power amplifier
28	VSS_CLD	GND	S	Power grounding of digital power amplifier
29	CLD_OUTM	Reserve		Negative output of digital power amplifier
30	Vdd_CLD	VCC（3.3V）	S	Power supply of digital power amplifier
31	P77	T/R_CTRL	O	Rx/Tx control, H: Rx; L: Tx (switch to VCO)
32	P76/DAC1	APC/TV	DA	Tx power control, Rx bandpass control/Tx power control
33	P75/VREF	VCC（3.3V）	I	Input of exterior reference voltage of ADC and DAC Pin
34	P74/DAC0	QT_OUT	DA	CTCSS/CDCSS Output
35	P73/AD3	Reserve	AD	
36	Vssa	GND	S	Power grounding of the analog circuit

37	Vdda	VCC（3.3V）	S	Power supply of analog circuit
38	P72/AD2	Reserve	AD	
39	P71/AD1	SQL	AD	Noise detect
40	P70/AD0	BAT_DET	AD	Battery strength detect
41	XTAL0	OSC0		32.678KHz Main crystal oscillator Pin
42	XTAL1	OSC1		
43	PLL_CAP	PLL_CAP		PLL external capacitor (10nF) connection
44	NC	/	/	/
45	NC	/	/	/
46	NC	/	/	/
47	NC	/	/	/
48	NC	/	/	/
49	P03/COM3	PWR_ON/OFF	O	Power output control
50	P02/COM2	PWR_DET	I	Power On/Off detect
51	P01/COM1	Reserve	O	
52	P00/COM0	Reserve	O	
53	P10/SEG0	Reserve	O	
54	P11/SEG1	Reserve	O	
55	P12/SEG2	Reserve	O	
56	P13/SEG3	Reserve	O	
57	P14/SEG4	Reserve	O	
58	P15/SEG5	PWR_LIGHT	O	Power LED control; blue LED.
59	P16/SEG6	Reserve	O	
60	P17/SEG7	Reserve	O	
61	P20/SEG8	CE0	I	Pin for detecting encode switch input
62	P21/SEG9	CE1	I	
63	P22/SEG10	CE2	I	
64	P23/SEG11	CE3	I	
65	P24/SEG12	Reserve	O	
66	P25SEG13	Reserve	O	
67	P26/SEG14	Reserve	O	
68	P27/SEG15	Reserve	O	
69	P30/SEG16	Reserve	O	
70	P31/SEG17	Reserve	O	
71	NC	/	/	/
72	NC	/	/	/
73	NC	/	/	/
74	NC	/	/	/
75	NC	/	/	/
76	P32/SEG18	Reserve	I/O	
77	P33/SEG19	Reserve	O	
78	P34/SEG20	Reserve	O	

79	P35/SEG21	Reserve	O	
80	P36/SEG22	Reserve	O	
81	P37/SEG23	Reserve	O	
82	P40/SEG24	Reserve	O	
83	P41/SEG25	SCL	O	EEPROM CLOCK
84	P42/SEG26	SDA	O	EEPROM DATA
85	P43/SEG27	LD	I	Unlock detection of PLL circuit (H: lock; L: unlock)
86	P44/SEG28	DATA	O	PLL DATA
87	P45/SEG29	CK	O	PLL CLOCK
88	P46/SEG30	STB	O	PLL ENABLE
89	Vssd	GND	S	Power grounding of digital circuit
90	Vddd	VCC（3.3V）	S	Power supply of digital circuit
91	SW_P0	Reserve	O	
92	SW_P1	TX_CTRL	O	Tx power control (high level Tx)
93	RESET	RESET	I	
94	Vssa	GND	S	Power grounding of the analog circuit
95	Vdda	VCC（3.3V）	S	Power supply of analog circuit
96	BG_REF		O	Output pin of reference voltage
97	MIC_IN	MIC_IN	I	Input pin of microphone
98	DEMODE	DEMODE	I	Input pin of base-band signals (audio and CTCSS/CDCSS)
99	MODOUT	MODOUT	O	Output pin of base-band signals (audio and CTCSS/CDCSS)
100	NC	/	/	/

TC-518 Parts List 1

TC-518 Parts List 1 (Main Board)					
No.	Material No.	Description	Qty.	Ref No.	Print No.
1	3001050000000	Chip resistor 0402 0 Ω J 1/16W	1	C622	B4I
2	3001050000000	Chip resistor 0402 0 Ω J 1/16W	1	R105	T4G
3	3001050000000	Chip resistor 0402 0 Ω J 1/16W	1	R111	T3G
4	3001050000000	Chip resistor 0402 0 Ω J 1/16W	1	R115	T4H
5	3001050000000	Chip resistor 0402 0 Ω J 1/16W	1	R309	B2E
6	3001050000000	Chip resistor 0402 0 Ω J 1/16W	1	R509	T2F
7	3001050000000	Chip resistor 0402 0 Ω J 1/16W	1	R515	T1F
8	3001051000020	Chip resistor 0402 10 Ω F 1/16W	1	R133	T3G
9	3001051000020	Chip resistor 0402 10 Ω F 1/16W	1	R303	T2I
10	3001051000020	Chip resistor 0402 10 Ω F 1/16W	1	R410	T4F
11	3001051000020	Chip resistor 0402 10 Ω F 1/16W	1	R413	T4F
12	3001051010040	Chip resistor 0402 100 Ω F 1/16W	1	R112	T3G
13	3001051010040	Chip resistor 0402 100 Ω F 1/16W	1	R535	T1H
14	3001051010040	Chip resistor 0402 100 Ω F 1/16W	1	R615	B2I
15	3001051010040	Chip resistor 0402 100 Ω F 1/16W	1	R622	B4I
16	3001051010040	Chip resistor 0402 100 Ω F 1/16W	1	R632	B4H
17	3001051010040	Chip resistor 0402 100 Ω F 1/16W	1	R637	B4H
18	3001051010040	Chip resistor 0402 100 Ω F 1/16W	1	R642	B4H
19	3001051020000	Chip resistor 0402 1K Ω F 1/16W	1	R110	T4G
20	3001051020000	Chip resistor 0402 1K Ω F 1/16W	1	R116	T4I
21	3001051020000	Chip resistor 0402 1K Ω F 1/16W	1	R215	B1H
22	3001051020000	Chip resistor 0402 1K Ω F 1/16W	1	R313	B2E
23	3001051020000	Chip resistor 0402 1K Ω F 1/16W	1	R516	T2F
24	3001051020000	Chip resistor 0402 1K Ω F 1/16W	1	R619	B1F
25	3001051020000	Chip resistor 0402 1K Ω F 1/16W	1	R625	B4I
26	3001051020000	Chip resistor 0402 1K Ω F 1/16W	1	R640	B2H
27	3001051020000	Chip resistor 0402 1K Ω F 1/16W	1	R641	B2H
28	3001051030000	Chip resistor 0402 10K Ω J 1/16W	1	R136	T2F
29	3001051030000	Chip resistor 0402 10K Ω J 1/16W	1	R401	T3F
30	3001051030000	Chip resistor 0402 10K Ω J 1/16W	1	R427	B4E
31	3001051030000	Chip resistor 0402 10K Ω J 1/16W	1	R605	T2E
32	3001051040000	Chip resistor 0402 100K Ω F 1/16W	1	R106	T3G
33	3001051040000	Chip resistor 0402 100K Ω F 1/16W	1	R108	T4H
34	3001051040000	Chip resistor 0402 100K Ω F 1/16W	1	R114	T4I
35	3001051040000	Chip resistor 0402 100K Ω F 1/16W	1	R205	B2H
36	3001051040000	Chip resistor 0402 100K Ω F 1/16W	1	R501	T3C
37	3001051040000	Chip resistor 0402 100K Ω F 1/16W	1	R502	T3C
38	3001051040000	Chip resistor 0402 100K Ω F 1/16W	1	R507	T3E
39	3001051040000	Chip resistor 0402 100K Ω F 1/16W	1	R508	T3E
40	3001051040000	Chip resistor 0402 100K Ω F 1/16W	1	R510	T2F
41	3001051040000	Chip resistor 0402 100K Ω F 1/16W	1	R512	T2F
42	3001051040000	Chip resistor 0402 100K Ω F 1/16W	1	R601	T2D
43	3001051040000	Chip resistor 0402 100K Ω F 1/16W	1	R602	T2E
44	3001051040000	Chip resistor 0402 100K Ω F 1/16W	1	R603	T2D
45	3001051040000	Chip resistor 0402 100K Ω F 1/16W	1	R604	B2D
46	3001051040000	Chip resistor 0402 100K Ω F 1/16W	1	R606	T4J
47	3001051040000	Chip resistor 0402 100K Ω F 1/16W	1	R609	T2E
48	3001051040000	Chip resistor 0402 100K Ω F 1/16W	1	R620	T1D
49	3001051050000	Chip resistor 0402 1M Ω F 1/16W	1	R426	B4F
50	3001051050000	Chip resistor 0402 1M Ω F 1/16W	1	R433	B4F
51	3001051050000	Chip resistor 0402 1M Ω F 1/16W	1	R435	T3E

52	3001051050000	Chip resistor 0402 1MΩ F 1/16W	1	R629	B1F
53	3001051220000	Chip resistor 0402 1.2KΩ J 1/16W	1	R117	T4I
54	3001051230000	Chip resistor 0402 12KΩ J 1/16W	1	R503	T3D
55	3001051240000	Chip resistor 0402 120KΩ J 1/16W	1	R123	T3I
56	3001051510010	Chip resistor 0402 150Ω F 1/16W	1	R131	T3G
57	3001051520010	Chip resistor 0402 1.5KΩ F 1/16W	1	R409	T3F
58	3001051520010	Chip resistor 0402 1.5KΩ F 1/16W	1	R532	T1H
59	3001051530000	Chip resistor 0402 15KΩ J 1/16W	1	C168	T3I
60	3001051530000	Chip resistor 0402 15KΩ J 1/16W	1	R124	T3J
61	3001051530000	Chip resistor 0402 15KΩ J 1/16W	1	R210	B1H
62	3001051530000	Chip resistor 0402 15KΩ J 1/16W	1	R421	T4E
63	3001051530000	Chip resistor 0402 15KΩ J 1/16W	1	R530	T2H
64	3001051540000	Chip resistor 0402 150KΩ F 1/16W	1	R126	T3J
65	3001051540000	Chip resistor 0402 150KΩ F 1/16W	1	R511	T2F
66	3001051540000	Chip resistor 0402 150KΩ F 1/16W	1	R513	T2F
67	3001051810010	Chip resistor 0402 180Ω J 1/16W	1	R118	T4I
68	3001051820000	Chip resistor 0402 1.8KΩ J 1/16W	1	R414	T4F
69	3001051840000	Chip resistor 0402 180KΩ J 1/16W	1	R113	T3G
70	3001051840000	Chip resistor 0402 180KΩ J 1/16W	1	R208	B4H
71	3001052210000	Chip resistor 0402 220Ω J 1/16W	1	R211	B1H
72	3001052220010	Chip resistor 0402 2.2KΩ F 1/16W	1	R302	T3I
73	3001052220010	Chip resistor 0402 2.2KΩ F 1/16W	1	R307	T1H
74	3001052220010	Chip resistor 0402 2.2KΩ F 1/16W	1	R610	B1F
75	3001052230010	Chip resistor 0402 22KΩ J 1/16W	1	R310	B1D
76	3001052240000	Chip resistor 0402 220KΩ J 1/16W	1	R137	T4H
77	3001052240000	Chip resistor 0402 220KΩ J 1/16W	1	R623	T1D
78	3001052740000	Chip resistor 0402 270KΩ J 1/16W	1	R301	T2I
79	3001053310010	Chip resistor 0402 330Ω J 1/16W	1	R411	T3F
80	3001053310010	Chip resistor 0402 330Ω J 1/16W	1	R506	T3E
81	3001053310010	Chip resistor 0402 330Ω J 1/16W	1	R514	T2F
82	3001053320000	Chip resistor 0402 3.3KΩ J 1/16W	1	R120	T3G
83	3001053320000	Chip resistor 0402 3.3KΩ J 1/16W	1	R130	T2G
84	3001053320000	Chip resistor 0402 3.3KΩ J 1/16W	1	R134	T3G
85	3001053320000	Chip resistor 0402 3.3KΩ J 1/16W	1	R135	T3F
86	3001053320000	Chip resistor 0402 3.3KΩ J 1/16W	1	R305	T2I
87	3001053330000	Chip resistor 0402 33KΩ F 1/16W	1	R422	T4E
88	3001053340000	Chip resistor 0402 330KΩ J 1/16W	1	R434	B4F
89	3001053920010	Chip resistor 0402 3.9KΩ J 1/16W	1	R212	B1H
90	3001053920010	Chip resistor 0402 3.9KΩ J 1/16W	1	R214	B1H
91	3001053920010	Chip resistor 0402 3.9KΩ J 1/16W	1	R311	B1D
92	3001053930000	Chip resistor 0402 39KΩ J 1/16W	1	R314	T3I
93	3001054320000	Chip resistor 0402 4.3KΩ J 1/16W	1	R505	T3E
94	3001054700000	Chip resistor 0402 47Ω J 1/16W	1	R415	T4E
95	3001054700000	Chip resistor 0402 47Ω J 1/16W	1	R420	T4D
96	3001054700000	Chip resistor 0402 47Ω J 1/16W	1	R612	B2I
97	3001054700000	Chip resistor 0402 47Ω J 1/16W	1	R614	B2I
98	3001054720000	Chip resistor 0402 4.7KΩ J 1/16W	1	R101	T4G
99	3001054720000	Chip resistor 0402 4.7KΩ J 1/16W	1	R203	B2H
100	3001054720000	Chip resistor 0402 4.7KΩ J 1/16W	1	R204	B2H
101	3001054720000	Chip resistor 0402 4.7KΩ J 1/16W	1	R416	T4E
102	3001054720000	Chip resistor 0402 4.7KΩ J 1/16W	1	R436	B4F
103	3001054720000	Chip resistor 0402 4.7KΩ J 1/16W	1	R437	B4F
104	3001054720000	Chip resistor 0402 4.7KΩ J 1/16W	1	R626	B4I
105	3001054720000	Chip resistor 0402 4.7KΩ J 1/16W	1	R627	B4I
106	3001054720000	Chip resistor 0402 4.7KΩ J 1/16W	1	R628	B1F
107	3001054790000	Chip resistor 0402 4.7Ω J 1/16W	1	R316	B1F

108	3001054790000	Chip resistor 0402 4.7Ω J 1/16W	1	R317	B1F
109	3001054730000	Chip resistor 0402 47KΩ J 1/16W	1	R109	T4H
110	3001054730000	Chip resistor 0402 47KΩ J 1/16W	1	R125	T3I
111	3001054730000	Chip resistor 0402 47KΩ J 1/16W	1	R127	T3J
112	3001054730000	Chip resistor 0402 47KΩ J 1/16W	1	R207	B4H
113	3001054730000	Chip resistor 0402 47KΩ J 1/16W	1	R306	T2I
114	3001054730000	Chip resistor 0402 47KΩ J 1/16W	1	R312	B2E
115	3001054730000	Chip resistor 0402 47KΩ J 1/16W	1	R611	B2I
116	3001054730000	Chip resistor 0402 47KΩ J 1/16W	1	R613	B2J
117	3001054730000	Chip resistor 0402 47KΩ J 1/16W	1	R616	B2I
118	3001054730000	Chip resistor 0402 47KΩ J 1/16W	1	R617	B1F
119	3001054730000	Chip resistor 0402 47KΩ J 1/16W	1	R621	B1F
120	3001054730000	Chip resistor 0402 47KΩ J 1/16W	1	R633	B3J
121	3001054730000	Chip resistor 0402 47KΩ J 1/16W	1	R634	B3J
122	3001054730000	Chip resistor 0402 47KΩ J 1/16W	1	R635	B3J
123	3001054730000	Chip resistor 0402 47KΩ J 1/16W	1	R636	B3J
124	3001054740000	Chip resistor 0402 470KΩ J 1/16W	1	R308	T2H
125	3001055600000	Chip resistor 0402 56Ω J 1/16W	1	R103	T4H
126	3001055600000	Chip resistor 0402 56Ω J 1/16W	1	R107	T4G
127	3001055610000	Chip resistor 0402 560Ω J 1/16W	1	R119	T4I
128	3001055610000	Chip resistor 0402 560Ω J 1/16W	1	R213	B1H
129	3001055610000	Chip resistor 0402 560Ω J 1/16W	1	R533	T2G
130	3001055610000	Chip resistor 0402 560Ω J 1/16W	1	R534	T2H
131	3001055620010	Chip resistor 0402 5.6KΩ F 1/16W	1	R132	T3G
132	3001055630000	Chip resistor 0402 56KΩ J 1/16W	1	R417	T4E
133	3001055630000	Chip resistor 0402 56KΩ J 1/16W	1	R531	T2H
134	3001055630000	Chip resistor 0402 56KΩ J 1/16W	1	R607	T2E
135	3001055630000	Chip resistor 0402 56KΩ J 1/16W	1	R608	T1E
136	3001055630000	Chip resistor 0402 56KΩ J 1/16W	1	R618	B1F
137	3001055630000	Chip resistor 0402 56KΩ J 1/16W	1	R638	B3J
138	3001056810000	Chip resistor 0402 680Ω J 1/16W	1	R408	T3F
139	3001056820000	Chip resistor 0402 6.8KΩ J 1/16W	1	R504	T3D
140	3001056830000	Chip resistor 0402 68KΩ J 1/16W	1	R209	B1H
141	3001058220000	Chip resistor 0402 8.2KΩ J 1/16W	1	R425	B4E
142	3001058230000	Chip resistor 0402 82KΩ J 1/16W	1	R304	T3I
143	3001059130000	Chip resistor 0402 91KΩ F 1/16W	1	R630	B1F
144	3001059130000	Chip resistor 0402 91KΩ F 1/16W	1	R631	B1F
145	3001060000000	Chip resistor 0603 0Ω J 1/10W	1	R412	T4D
146	3001061540000	Chip resistor 0603 150KΩ J 1/10W	1	R428	B4E
147	3001061540000	Chip resistor 0603 150KΩ J 1/10W	1	R429	B4E
148	3001061540000	Chip resistor 0603 150KΩ J 1/10W	1	R430	B4E
149	3001061540000	Chip resistor 0603 150KΩ J 1/10W	1	R431	B4E
150	3001061540000	Chip resistor 0603 150KΩ J 1/10W	1	R432	B4E
151	3001061540000	Chip resistor 0603 150KΩ J 1/10W	1	R441	B4E
152	3001062210000	Chip resistor 0603 220Ω J 1/10W	1	R423	B3B
153	3005051020010	Resistor array 0402 1K*4 J 1/16W	1	RN101	T3I
154	3005051020010	Resistor array 0402 1K*4 J 1/16W	1	RN601	B2J
155	3099080398000	Chip resistor 1206 0.39Ω J 1/4W	1	R438	B3D
156	3099080398000	Chip resistor 1206 0.39Ω J 1/4W	1	R439	B3D
157	3099080398000	Chip resistor 1206 0.39Ω J 1/4W	1	R440	B3D
158	3101050100030	Chip capacitor 0402 1PF B 50V	1	C502	T3B
159	3101050200010	Chip capacitor 0402 2PF B 50V	1	C553	T2G
160	3101050200010	Chip capacitor 0402 2PF B 50V	1	C555	T1H
161	3101050400010	Chip capacitor 0402 4PF B 50V	1	C501	T2B
162	3101050400010	Chip capacitor 0402 4PF B 50V	1	C530	T2F
163	3101050400010	Chip capacitor 0402 4PF B 50V	1	C532	T2F
164	3101050500010	Chip capacitor 0402 5PF B 50V	1	C117	T4H

165	3101050500010	Chip capacitor 0402 5PF B 50V	1	C503	T3C
166	3101050500010	Chip capacitor 0402 5PF B 50V	1	C508	T3D
167	3101050600010	Chip capacitor 0402 6PF B 50V	1	C153	T3G
168	3101050600010	Chip capacitor 0402 6PF B 50V	1	C170	T3G
169	3101050600010	Chip capacitor 0402 6PF B 50V	1	C174	T3G
170	3101050600010	Chip capacitor 0402 6PF B 50V	1	C407	T4F
171	3101050600010	Chip capacitor 0402 6PF B 50V	1	C507	T3D
172	3101050700010	Chip capacitor 0402 7PF B 50V	1	C517	T3E
173	3101050700010	Chip capacitor 0402 7PF B 50V	1	C529	T2F
174	3101050700010	Chip capacitor 0402 7PF B 50V	1	C533	T2F
175	3101057590000	Chip capacitor 0402 7.5PF(±0.1pF)(50V)	1	C525	T2F
176	3101050800000	Chip capacitor 0402 8PF B 50V	1	C131	T3H
177	3101050800000	Chip capacitor 0402 8PF B 50V	1	C504	T3B
178	3101050800000	Chip capacitor 0402 8PF B 50V	1	C523	T3F
179	3101050800000	Chip capacitor 0402 8PF B 50V	1	C541	T2F
180	3101050900000	Chip capacitor 0402 9PF B 50V	1	C528	T2F
181	3101051000020	Chip capacitor 0402 10PF J 50V	1	C164	T3I
182	3101051000020	Chip capacitor 0402 10PF J 50V	1	C165	T3I
183	3101051000020	Chip capacitor 0402 10PF J 50V	1	C310	T3I
184	3101051010030	Chip capacitor 0402 100PF J 50V	1	C140	T3I
185	3101051010030	Chip capacitor 0402 100PF J 50V	1	C141	T3I
186	3101051010030	Chip capacitor 0402 100PF J 50V	1	C142	T3I
187	3101051010030	Chip capacitor 0402 100PF J 50V	1	C143	T3I
188	3101051010030	Chip capacitor 0402 100PF J 50V	1	C510	T3D
189	3101051010030	Chip capacitor 0402 100PF J 50V	1	C513	T3E
190	3101051010030	Chip capacitor 0402 100PF J 50V	1	C514	T3E
191	3101051010030	Chip capacitor 0402 100PF J 50V	1	C526	T2F
192	3101051010030	Chip capacitor 0402 100PF J 50V	1	C655	B2H
193	3101051010030	Chip capacitor 0402 100PF J 50V	1	C656	B2H
194	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C105	T4G
195	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C107	T4G
196	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C108	T4G
197	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C119	T4H
198	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C120	T4H
199	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C123	T4H
200	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C133	T3H
201	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C137	T4I
202	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C138	T3I
203	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C163	T3I
204	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C177	T4I
205	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C204	B2I
206	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C215	B1H
207	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C318	T3I
208	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C320	B2D
209	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C328	B2E
210	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C410	T4E
211	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C418	T4E
212	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C462	B3F
213	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C505	T3C
214	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C522	T3E
215	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C557	T2H
216	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C559	T1H
217	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C601	T1D
218	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C621	B4I
219	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C626	B1G
220	3101051030020	Chip capacitor 0402 0.01UF K 25V	1	C314	T2H
221	3101051030020	Chip capacitor 0402 0.01UF K 25V	1	C322	B1E

222	3101051030020	Chip capacitor 0402 0.01UF K 25V	1	C538	T1F
223	3101051030020	Chip capacitor 0402 0.01UF K 25V	1	C539	T2F
224	3101051030020	Chip capacitor 0402 0.01UF K 25V	1	C543	T2G
225	3101051030020	Chip capacitor 0402 0.01UF K 25V	1	C556	T2H
226	3101051030020	Chip capacitor 0402 0.01UF K 25V	1	C558	T1H
227	3101051030020	Chip capacitor 0402 0.01UF K 25V	1	C615	B4I
228	3101051030020	Chip capacitor 0402 0.01UF K 25V	1	C618	B4I
229	3101051030020	Chip capacitor 0402 0.01UF K 25V	1	C633	B1F
230	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C103	T4G
231	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C110	T4G
232	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C125	T3G
233	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C145	T4I
234	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C160	T4I
235	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C162	T3J
236	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C172	T3G
237	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C304	T2I
238	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C311	T1H
239	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C316	T2H
240	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C324	B1F
241	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C325	B1F
242	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C327	B2E
243	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C413	T4E
244	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C419	B3C
245	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C453	B4F
246	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C458	B3C
247	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C463	B3F
248	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C464	B4F
249	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C520	T3E
250	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C535	T1F
251	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C603	T1E
252	3101051050000	Chip capacitor 0402 1UF K 6.3V	1	C207	B2H
253	3101051050000	Chip capacitor 0402 1UF K 6.3V	1	C319	T2I
254	3101051050000	Chip capacitor 0402 1UF K 6.3V	1	C212	B1H
255	3101051050000	Chip capacitor 0402 1UF K 6.3V	1	C307	T2I
256	3101051050000	Chip capacitor 0402 1UF K 6.3V	1	C321	B2D
257	3101051050000	Chip capacitor 0402 1UF K 6.3V	1	C330	B2E
258	3101051050000	Chip capacitor 0402 1UF K 6.3V	1	C609	T4J
259	3101051050000	Chip capacitor 0402 1UF K 6.3V	1	C611	T1E
260	3101051050000	Chip capacitor 0402 1UF K 6.3V	1	C614	T2E
261	3101051050000	Chip capacitor 0402 1UF K 6.3V	1	C625	B4I
262	3101051200020	Chip capacitor 0402 12PF J 50V	1	C554	T1G
263	3101051500020	Chip capacitor 0402 15PF J 50V	1	C616	B4J
264	3101051500020	Chip capacitor 0402 15PF J 50V	1	C617	B4I
265	3101051590000	Chip capacitor 0402 1.5PF B 50V	1	C155	T3H
266	3101051590000	Chip capacitor 0402 1.5PF B 50V	1	C506	T3C
267	3101051590000	Chip capacitor 0402 1.5PF B 50V	1	C524	T3F
268	3101051590000	Chip capacitor 0402 1.5PF B 50V	1	C531	T2F
269	3101052200010	Chip capacitor 0402 22PF J 50V	1	C132	T3H
270	3101052200010	Chip capacitor 0402 22PF J 50V	1	C148	T3G
271	3101052220010	Chip capacitor 0402 2200pF K 50V	1	C205	B2I
272	3101052220010	Chip capacitor 0402 2200pF K 50V	1	C206	B2H
273	3101052230000	Chip capacitor 0402 0.022UF K 16V	1	C619	B4I
274	3101052230000	Chip capacitor 0402 0.022UF K 16V	1	C620	B4I
275	3101052240010	Chip capacitor 0402 0.22UF Z 10V	1	C213	B1H
276	3101052240010	Chip capacitor 0402 0.22UF Z 10V	1	C638	B2I
277	3101051800010	Chip capacitor 0402 18PF J 50V	1	C118	T4H
278	3101052700000	Chip capacitor 0402 27PF J 50V	1	C308	T3I

279	3101052710000	Chip capacitor 0402 270PF J 50V	1	C417	T4E
280	3101054700010	Chip capacitor 0402 47PF J 50V	1	C312	T1H
281	3101054700010	Chip capacitor 0402 47PF J 50V	1	C415	T4E
282	3101054710010	Chip capacitor 0402 470PF K 50V	1	C101	T4G
283	3101054710010	Chip capacitor 0402 470PF K 50V	1	C111	T4G
284	3101054710010	Chip capacitor 0402 470PF K 50V	1	C126	T3G
285	3101054710010	Chip capacitor 0402 470PF K 50V	1	C150	T3G
286	3101054710010	Chip capacitor 0402 470PF K 50V	1	C158	T3H
287	3101054710010	Chip capacitor 0402 470PF K 50V	1	C161	T3J
288	3101054710010	Chip capacitor 0402 470PF K 50V	1	C171	T3G
289	3101054710010	Chip capacitor 0402 470PF K 50V	1	C173	T3G
290	3101054710010	Chip capacitor 0402 470PF K 50V	1	C301	T2I
291	3101054710010	Chip capacitor 0402 470PF K 50V	1	C303	T2I
292	3101054710010	Chip capacitor 0402 470PF K 50V	1	C305	T2I
293	3101054710010	Chip capacitor 0402 470PF K 50V	1	C306	T3I
294	3101054710010	Chip capacitor 0402 470PF K 50V	1	C309	T3I
295	3101054710010	Chip capacitor 0402 470PF K 50V	1	C317	T3I
296	3101054710010	Chip capacitor 0402 470PF K 50V	1	C401	T3F
297	3101054710010	Chip capacitor 0402 470PF K 50V	1	C405	T4F
298	3101054710010	Chip capacitor 0402 470PF K 50V	1	C406	T3F
299	3101054710010	Chip capacitor 0402 470PF K 50V	1	C411	T4E
300	3101054710010	Chip capacitor 0402 470PF K 50V	1	C414	T4E
301	3101054710010	Chip capacitor 0402 470PF K 50V	1	C421	B3C
302	3101054710010	Chip capacitor 0402 470PF K 50V	1	C436	B3B
303	3101054710010	Chip capacitor 0402 470PF K 50V	1	C450	B4E
304	3101054710010	Chip capacitor 0402 470PF K 50V	1	C452	B4F
305	3101054710010	Chip capacitor 0402 470PF K 50V	1	C454	B4F
306	3101054710010	Chip capacitor 0402 470PF K 50V	1	C455	B4E
307	3101054710010	Chip capacitor 0402 470PF K 50V	1	C457	B4F
308	3101054710010	Chip capacitor 0402 470PF K 50V	1	C460	B4F
309	3101054710010	Chip capacitor 0402 470PF K 50V	1	C512	T3E
310	3101054710010	Chip capacitor 0402 470PF K 50V	1	C521	T3E
311	3101054710010	Chip capacitor 0402 470PF K 50V	1	C536	T1E
312	3101054710010	Chip capacitor 0402 470PF K 50V	1	C537	T1F
313	3101054710010	Chip capacitor 0402 470PF K 50V	1	C540	T2F
314	3101054710010	Chip capacitor 0402 470PF K 50V	1	C610	B4A
315	3101054710010	Chip capacitor 0402 470PF K 50V	1	C613	B1I
316	3101054710010	Chip capacitor 0402 470PF K 50V	1	C623	B4I
317	3101054710010	Chip capacitor 0402 470PF K 50V	1	C624	T4J
318	3101054710010	Chip capacitor 0402 470PF K 50V	1	C627	T5E
319	3101054710010	Chip capacitor 0402 470PF K 50V	1	C628	T5F
320	3101054710010	Chip capacitor 0402 470PF K 50V	1	C629	B4C
321	3101054710010	Chip capacitor 0402 470PF K 50V	1	C630	B4I
322	3101054710010	Chip capacitor 0402 470PF K 50V	1	C631	B4H
323	3101054710010	Chip capacitor 0402 470PF K 50V	1	C632	B4H
324	3101054710010	Chip capacitor 0402 470PF K 50V	1	C634	B4J
325	3101054710010	Chip capacitor 0402 470PF K 50V	1	C637	B3H
326	3101054710010	Chip capacitor 0402 470PF K 50V	1	C639	B2I
327	3101054710010	Chip capacitor 0402 470PF K 50V	1	C641	B2I
328	3101054710010	Chip capacitor 0402 470PF K 50V	1	C642	B3J
329	3101054710010	Chip capacitor 0402 470PF K 50V	1	C643	B3J
330	3101054710010	Chip capacitor 0402 470PF K 50V	1	C644	B3J
331	3101054710010	Chip capacitor 0402 470PF K 50V	1	C645	B3J
332	3101054720000	Chip capacitor 0402 4700PF K 50V	1	C612	B2I
333	3101054740000	Chip capacitor 0402 0.47UF Z 6.3V	1	C203	B2I
334	3101054740000	Chip capacitor 0402 0.47UF Z 6.3V	1	C210	B1H
335	3101054740000	Chip capacitor 0402 0.47UF Z 6.3V	1	C211	B1H

336	3101054740000	Chip capacitor 0402 0.47UF Z 6.3V	1	C214	B1H
337	3101055600000	Chip capacitor 0402 56PF J 50V	1	C412	T4E
338	3101055610000	Chip capacitor 0402 560PF K 50V	1	C209	B4H
339	3101058200000	Chip capacitor 0402 82PF J 50V	1	C313	T2H
340	3101060100010	Chip capacitor 0603 1PF B 50V	1	C444	T4A
341	3101060200010	Chip capacitor 0603 2PF B 50V	1	C431	T4B
342	3101062490000	Chip capacitor 0603 2.4PF B 50V	1	C440	T2A
343	3101060300010	Chip capacitor 0603 3PF B 50V	1	C113	T4G
344	3101060300010	Chip capacitor 0603 3PF B 50V	1	C443	T3A
345	3101060400010	Chip capacitor 0603 4PF B 50V	1	C433	T4B
346	3101060390000	Chip capacitor 0603 0.3PF B 50V	1	C112	T4G
347	3101060590010	Chip capacitor 0603 0.5PF B 50V	1	C116	T4H
348	3101060590010	Chip capacitor 0603 0.5PF B 50V	1	C128	T4G
349	3101060500010	Chip capacitor 0603 5PF B 50V	1	C115	T4H
350	3101060500010	Chip capacitor 0603 5PF B 50V	1	C127	T3G
351	3101060500010	Chip capacitor 0603 5PF B 50V	1	C430	T4B
352	3101060700020	Chip capacitor 0603 7PF B 50V	1	C130	T3G
353	3101060700020	Chip capacitor 0603 7PF B 50V	1	C428	T4C
354	3101060800010	Chip capacitor 0603 8PF B 50V	1	C114	T4G
355	3101060900010	Chip capacitor 0603 9PF B 50V	1	C427	T4C
356	3101061000000	Chip capacitor 0603 10PF J 50V	1	C129	T4G
357	3101061020000	Chip capacitor 0603 1000PF K 50V	1	C438	T2B
358	3101061020000	Chip capacitor 0603 1000PF K 50V	1	C445	T4A
359	3101062700010	Chip capacitor 0603 27PF J 50V	1	C426	T4C
360	3101061590010	Chip capacitor 0603 1.5PF B 50V	1	C441	T3A
361	3101061590010	Chip capacitor 0603 1.5PF B 50V	1	C446	T4A
362	3101064790010	Chip capacitor 0603 4.7PF B 50V	1	C442	T3A
363	3101062210000	Chip capacitor 0603 220PF J 50V	1	C435	T3B
364	3101062250000	Chip capacitor 0603 2.2UF K 10V	1	C604	T2E
365	3101062250000	Chip capacitor 0603 2.2UF K 10V	1	C605	T2E
366	3101062250000	Chip capacitor 0603 2.2UF K 10V	1	C606	T2E
367	3101062250000	Chip capacitor 0603 2.2UF K 10V	1	C607	T3J
368	3101062250000	Chip capacitor 0603 2.2UF K 10V	1	C608	T4J
369	3101082260020	Chip capacitor 1206 22UF ±20% 10V	1	C329	B2F
370	3102992000040	Trimmer capacitor 3.2*2.5*1.25mm 10P 55V	1	TC101	T5G
371	3102992000040	Trimmer capacitor 3.2*2.5*1.25mm 10P 55V	1	TC102	T3H
372	3104071040010	Tantalum capacitor 0805 0.1UF M 20V	1	C134	T4I
373	3104071040010	Tantalum capacitor 0805 0.1UF M 20V	1	C136	T4I
374	3104071060070	Tantalum capacitor 0805 10UF M 10V	1	C302	T2I
375	3104072250060	Tantalum capacitor 0805 2.2UF M 10V	1	C144	T4I
376	3104072250060	Tantalum capacitor 0805 2.2UF M 10V	1	C159	T4I
377	3104072250060	Tantalum capacitor 0805 2.2UF M 10V	1	C167	T3J
378	3104074750070	Tantalum capacitor 0805 4.7UF M 10V	1	C208	B4H
379	3104074750070	Tantalum capacitor 0805 4.7UF M 10V	1	C451	B4E
380	3104081060120	Tantalum capacitor 1206 10UF M 16V	1	C323	B1E
381	3104081060120	Tantalum capacitor 1206 10UF M 16V	1	C459	B3D
382	3104082250040	Tantalum capacitor 1206 2.2UF K 16V	1	C135	T4I
383	3104081560050	Tantalum capacitor 1206 15UF M 10V	1	C106	T4G
384	3104082260060	Tantalum capacitor 1206 22UF M 10V	1	C602	T1E
385	3210106680000	Bobbin inductor 0603 68nH	1	L506	T3E
386	3210108230010	Bobbin inductor 1206 23nH	1	L104	T4H
387	3210108230010	Bobbin inductor 1206 23nH	1	L110	T3G
388	3210305220000	Multi-layer chip inductor 0402 22nH	1	C516	T3E
389	3210305220000	Multi-layer chip inductor 0402 22nH	1	L119	T3H
390	3210305220000	Multi-layer chip inductor 0402 22nH	1	L510	T2F
391	3210305330000	Multi-layer chip inductor 0402 33nH	1	L125	T3G
392	3210305390000	Multi-layer chip inductor 0402 39nH	1	L123	T3G

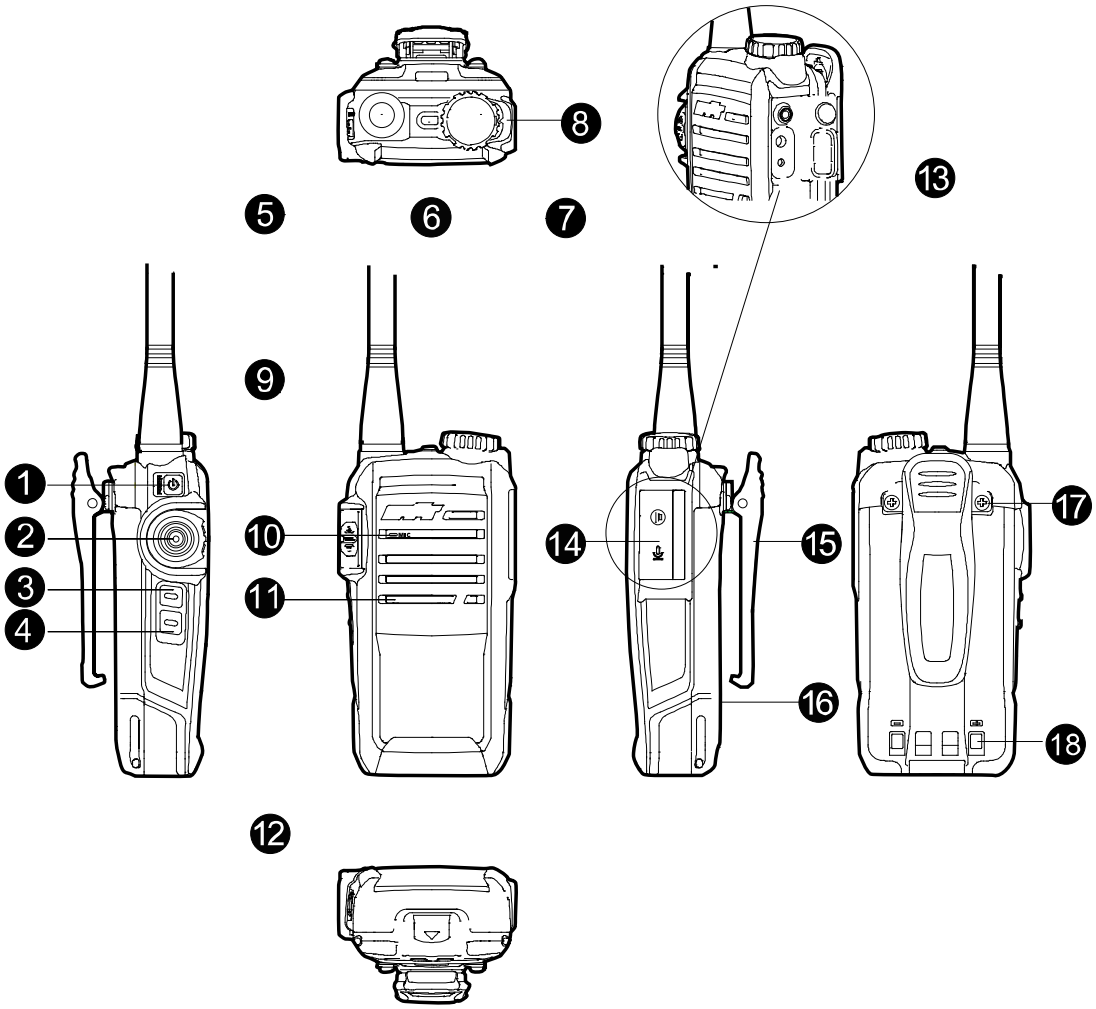
393	3210306220000	Multi-layer chip inductor 0603 22nH	1	L402	T3F
394	3215006100010	Multi-layer chip inductor 0603 10nH	1	L406	T4E
395	3213212102000	Multi-layer chip inductor 1008 1uH	1	L404	T4E
396	3213212102000	Multi-layer chip inductor 1008 1uH	1	L415	B4B
397	3213212102000	Multi-layer chip inductor 1008 1uH	1	L513	T1F
398	3213212821000	Multi-layer chip inductor 1008 0.82uH	1	L511	T2F
399	3210107221000	Bobbin inductor 0805 220nH	1	L410	B3B
400	3213306102000	Multi-layer chip inductor 0603 1uH	1	L115	T3J
401	3213306102000	Multi-layer chip inductor 0603 1uH	1	L116	T3I
402	3213306102000	Multi-layer chip inductor 0603 1uH	1	L201	B2I
403	3213306102000	Multi-layer chip inductor 0603 1uH	1	L203	B1H
404	3213306102000	Multi-layer chip inductor 0603 1uH	1	L301	T3I
405	3212106221000	Multi-layer chip inductor 0603 220nH	1	L102	T4G
406	3212106221000	Multi-layer chip inductor 0603 220nH	1	L108	T3G
407	3213306332000	Multi-layer chip inductor 0603 3.3uH	1	L103	T4G
408	3213306332000	Multi-layer chip inductor 0603 3.3uH	1	L105	T5H
409	3213306332000	Multi-layer chip inductor 0603 3.3uH	1	L106	T4H
410	3213306332000	Multi-layer chip inductor 0603 3.3uH	1	L109	T4G
411	3213306332000	Multi-layer chip inductor 0603 3.3uH	1	L111	T3H
412	3213306332000	Multi-layer chip inductor 0603 3.3uH	1	L112	T3H
413	3221506601000	Chip ferrite bead 0603 600Ω±25%	1	L101	T4G
414	3221506601000	Chip ferrite bead 0603 600Ω±25%	1	L107	T4H
415	3221506601000	Chip ferrite bead 0603 600Ω±25%	1	L118	T4I
416	3221506601000	Chip ferrite bead 0603 600Ω±25%	1	L202	B1H
417	3221506601000	Chip ferrite bead 0603 600Ω±25%	1	L403	T3F
418	3221506601000	Chip ferrite bead 0603 600Ω±25%	1	L514	T2E
419	3221506601000	Chip ferrite bead 0603 600Ω±25%	1	L602	T1E
420	3221506601000	Chip ferrite bead 0603 600Ω±25%	1	L603	T4J
421	3221506601000	Chip ferrite bead 0603 600Ω±25%	1	L604	T3J
422	3221506601000	Chip ferrite bead 0603 600Ω±25%	1	L605	B2J
423	3221506601000	Chip ferrite bead 0603 600Ω±25%	1	L606	B4J
424	3221507221000	Chip ferrite bead 0805 220Ω±25%	1	L405	T4E
425	3221507600000	Chip ferrite bead 0805 60Ω±25%	1	L408	B3C
426	3221507600000	Chip ferrite bead 0805 60Ω±25%	1	L601	T2D
427	3231351640000	Air-core inductor E2-0.35*1.6*4TL	1	L412	T3A
428	3231351640000	Air-core inductor E2-0.35*1.6*4TL	1	L413	T3A
429	3231351640000	Air-core inductor E2-0.35*1.6*4TL	1	L414	T3A
430	3231351640000	Air-core inductor E2-0.35*1.6*4TL	1	L501	T3B
431	3231301250000	Air-core inductor E2-0.30*1.2*5TL	1	L502	T3B
432	3231301250000	Air-core inductor E2-0.30*1.2*5TL	1	L503	T3D
433	3231301250000	Air-core inductor E2-0.30*1.2*5TL	1	L508	T3E
434	3231301250000	Air-core inductor E2-0.30*1.2*5TL	1	L509	T3F
435	3231351680000	Air-core inductor E2-0.35*1.6*8TR	1	L407	T4C
436	3303020100020	Switching diode MA2S11100L	1	D101	T4G
437	3303060300010	Switching diode HVC131TRF-E	1	D402	T3B
438	3303060300010	Switching diode HVC131TRF-E	1	D404	T3B
439	3303020100080	Switching diode MA2S07700L	1	D401	T3F
440	3303020100080	Switching diode MA2S07700L	1	D501	T3B
441	3303020100080	Switching diode MA2S07700L	1	D502	T3C
442	3303020100080	Switching diode MA2S07700L	1	D508	T3F
443	3304040200000	Varactor BB179 SOD523	1	D102	T4H
444	3304060300010	Varactor HVC376BTRF-E	1	D103	T4H
445	3304060300010	Varactor HVC376BTRF-E	1	D104	T5H
446	3304060300010	Varactor HVC376BTRF-E	1	D105	T5H
447	3304060300010	Varactor HVC376BTRF-E	1	D106	T3H
448	3304060300010	Varactor HVC376BTRF-E	1	D107	T3H
449	3304060300010	Varactor HVC376BTRF-E	1	D108	T5H
450	3304060300010	Varactor HVC376BTRF-E	1	D109	T3H

451	3304060300010	Varactor HVC376BTRF-E	1	D110	T3H
452	3304060300050	Varactor HVC350BTRF-E	1	D503	T3B
453	3304060300050	Varactor HVC350BTRF-E	1	D504	T3D
454	3304060300050	Varactor HVC350BTRF-E	1	D506	T3F
455	3304060300050	Varactor HVC350BTRF-E	1	D507	T3F
456	3399990000080	Zener diode EDZTE616.8B	1	D403	B4E
457	3399990000080	Zener diode EDZTE616.8B	1	D615	B2J
458	3399990000260	Diode HSM88ASTL-E	1	D505	T3D
459	3303010500290	Switching diode 1SS372(TE85L.F)	1	D210	B1H
460	3302030500020	Zener diode UDZSTE(1718B)18V	1	D616	B2D
461	3401001000490	Transistor 2SA1832-GR(TE85L.F)	1	Q620	B1F
462	3401002000990	Transistor 2SC5108-Y(TE85L.F)	1	Q106	T3G
463	3401002000990	Transistor 2SC5108-Y(TE85L.F)	1	Q109	T3G
464	3401002000990	Transistor 2SC5108-Y(TE85L.F)	1	Q505	T2H
465	3403007000020	Transistor DTA114YE(TL) PNP	1	Q405	B4E
466	3403008000010	Transistor DTC114EE(TL) NPN	1	Q302	B2E
467	3403008000010	Transistor DTC114EE(TL) NPN	1	Q406	B4F
468	3403008000010	Transistor DTC114EE(TL) NPN	1	Q602	T2D
469	3406001000090	Transistor 2SC4988FRTR-E NPN	1	Q402	T4F
470	3411001000000	Transistor 2SA1980E PNP	1	Q601	T2D
471	3411002000020	Transistor 2SC5343EG NPN	1	Q101	T4G
472	3411002000020	Transistor 2SC5343EG NPN	1	Q201	B1H
473	3418001000010	Transistor AT-41511-TR1G NPN	1	Q618	T3E
474	3499000000140	Transistor 2SK508-K52-T1B-A	1	Q104	T4G
475	3499000000140	Transistor 2SK508-K52-T1B-A	1	Q105	T3G
476	3499000000150	Transistor UMC4(NTR) NPN/PNP	1	Q103	T3G
477	3499000000180	Transistor UFMMT717 PNP	1	Q303	B2E
478	3501020000030	FET 3SK318YB-TL-E-Q N-channel	1	Q502	T2F
479	3503010000010	FET 2SJ243-T1-A P-channel	1	Q102	T4G
480	3503010000010	FET 2SJ243-T1-A P-channel	1	Q603	T4J
481	3503010000010	FET 2SJ243-T1-A P-channel	1	Q604	T2E
482	3503020000030	FET 2SK1824-T1-A N-channel	1	Q619	B1F
483	3504990000010	FET RD01MUS2-T113	1	Q403	T4E
484	3515990000000	FET RQA0002DNSTB-E	1	Q404	T4D
485	3603002005440	IF processor TA31136FNG(EL.HZ)	1	U301	T2I
486	3604007000000	PLL MB15E03SL-E1	1	U101	T4I
487	3605008005070	Operational amplifier NJM2904V	1	U401	B4F
488	3605017005540	Operational amplifier 1.7V TDA28	1	U302	B1E
489	3608015000040	Power management IC XC6401FF37MRN 3.0V&3.0V	1	U603	T4J
490	3608015000050	Power management IC XC6401FF55MRN 4.5V&4.5V	1	U602	T2E
491	3608015000060	Power management IC XC6209F502PR 5V	1	U601	T2D
492	3609006000000	Reset IC R3112Q271A-TR-F	1	U605	B2I
493	3610999000060	SCM SRT3210 100Pin	1	U604	B3I
494	3612031004440	Memory AT24C64AN-10SU-2.7	1	U606	B1I
495	3701038450000	Voltage-controlled Temperature-compensated crystal 38.4MHz TKL3060B(S)	1	X101	T3I
496	3701327610040	32.768khz clock crystal NX6914MA	1	X601	B4I
497	3801045030130	Ceramic filter 450KHz ±6.0KHz	1	CF301	T2J
498	3802388540010	Crystal filter 38.850MHz MFT38P	1	XF503	T2G
499	5205000001490	TC-518 Battery connector Black PA9T/Brass	1	G601	T2C
500	4318080000000	Momentary contact switch TC-518 EVQP4403M	1	S604	T5C
501	4399090000000	Push button switch 3000/3600 PT036-D1S	1	S601	B5A
502	4399090000000	Push button switch 3000/3600 PT036-D1S	1	S603	T5E
503	4399090000000	Push button switch 3000/3600 PT036-D1S	1	S605	T5F
504	5202020100040	Connector XF2M-2015-1A 20pin	1	J602	B2G
505	3002996830040	Trimmer resistor (2.7*2.0*0.9) 68KΩ (+30%)	1	VR101	T3J
506	3002996830040	Trimmer resistor (2.7*2.0*0.9) 68KΩ (+30%)	1	VR600	B4H
507	7000190000010	TC-518 Cooler sheet 1.5MM Thick Brass	1	J1	B4D
508	41005101001D0	TC-518U PCB	1		

TC-518 Parts List 1 (LED & Knob Board)					
No.	**Material No.**	**Description**	**Qty.**	**Ref No.**	**Print No.**
1	3001056810000	Chip resistor 0402 680Ω J 1/16W	1	R629	T4A
2	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C634	T3A
3	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C635	T3A
4	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C636	T3A
5	3101051050000	Chip capacitor 0402 1UF K 6.3V	1	C203	T3C
6	3001052720000	Chip resistor 0402 2.7KΩ J 1/16W	1	R631	T3A
7	3101054710010	Chip capacitor 0402 470PF K 50V	1	C201	T4C
8	3101054710010	Chip capacitor 0402 470PF K 50V	1	C630	T5C
9	3101054710010	Chip capacitor 0402 470PF K 50V	1	C631	T5C
10	3307990000460	LED LT8AB3-54-UBC3-TE-Z	1	D610	T3A
11	5202020100040	Connector XF2M-2015-1A 20pin	1	J202	B3B
12	3403008000010	Transistor DTC114EE(TL) NPN	1	Q606	T3A
13	3403008000010	Transistor DTC114EE(TL) NPN	1	Q607	T3A
14	3403008000010	Transistor DTC114EE(TL) NPN	1	Q608	T3A
15	3399990000080	Zener diode EDZTE616.8B	1	D202	B1D
16	3399990000080	Zener diode EDZTE616.8B	1	D204	T4C
17	3399990000080	Zener diode EDZTE616.8B	1	D301	B2C
18	3399990000080	Zener diode EDZTE616.8B	1	D302	B2C
19	3399990000080	Zener diode EDZTE616.8B	1	D303	B1C
20	3399990000080	Zener diode EDZTE616.8B	1	D606	B2B
21	3399990000080	Zener diode EDZTE616.8B	1	D607	T2B
22	3399990000080	Zener diode EDZTE616.8B	1	D608	B1B
23	3399990000080	Zener diode EDZTE616.8B	1	D609	T2B
24	3307110100070	LED KPT-1608SRC	1	D605	T3A
25	3307110100080	LED KPT-1608SGC	1	D604	T3A
26	3104074750070	Tantalum capacitor 0805 4.7UF M 10V	1	C202	T4C
27	3001051020000	Chip resistor 0402 1KΩ F 1/16W	1	R630	T3A
28	3001056820000	Chip resistor 0402 6.8KΩ J 1/16W	1	R202	T3C
29	3001053320000	Chip resistor 0402 3.3KΩ J 1/16W	1	R201	T3C
30	41005103001D0	TC-518 Channel selector knob board PCB	1		

Adjustment Description

Ⅰ. Function Key Overview



(1) Power On/Off Key	(2) PTT (Push-to-Talk) Key	(3) SK1 (programmable key)	(4) SK2 (programmable key)
(5) Antenna	(6) LED Indicator	(7) Channel Selector Knob	(8) Channel Indicator
(9) Volume Control Knob	(10) Microphone	(11) Speaker	(12) Battery Latch
(13) Audio Accessory Jack and Programming Port	(14) Accessory Jack Cover	(15) Belt Clip	(16) Battery
(17) Belt Clip Screw	(18) Charging Piece		

Ⅱ. Required Test Instruments

Radio communication test set	1 set
10V/3A regulated DC power supply	1 set
Digital voltmeter	1 set
Ammeter	1 set

Ⅲ. Preparation

Place the board to be tested on the test fixture (ensure good connection between each test point and the fixture), and connect the board to the power supply.

IV. Adjustment Procedures

1. Operating Steps before Adjustment

A. PCB Adjustment:

Before the PCB arrives each work station for specification inspection, programs must be recorded and EEPROM must be initialized by the configuration files (recording with test framework / initializing with programming software or by wired clone). If any adjustment is required, apply the programming cable to enter the Adjust mode, and perform PC adjustment or adjustment under manual mode.

B. Radio Adjustment:

1) Manual Adjust. Rotate to channel 1, and hold down **PTT**, **SK1** and **Power On** key simultaneously to power on the radio. If the keys are hold down for 2 seconds or longer, the orange LED (red LED plus green LED) glows, which indicates that the adjustment mode has been entered. When the key is released, the radio will directly enter the item corresponding to the adjustment mode. Red LED glows in adjustment status of Tx group; green LED glows in adjustment status of Rx group. All of the adjustment must be performed in accordance with the operating instructions.
2) Install the programming cable to the radio for real-time adjustment via PC mode. (Auto adjustment)

C. Instructions for Wired Clone:

1) Connect two radios with a cloning cable. Power on the source radio while holding down **SK1** on it. The radio will enter wired clone mode in 2 seconds. Then power on the target radio to enter normal mode.
2) In wired clone mode, press **SK1** on the source radio to switch between user clone mode and factory clone mode (check factory clone mode when programming, or you will fail to switch.).
3) Press **PTT** key to clone data to the target radio. Further clone the data to another target radio simply by connecting and pressing **PTT** key.

D. LED Instructions for Wired Clone:

1) During the cloning process, LED solidly glows red; once it is finished, LED solidly glows green.
2) Clone errors:

a. User clone. Once clone begins, frequency band and Model ID will be checked. LED glows orange for 2 seconds and then goes out to indicate a failed check. If the check is successfully carried out but error data clone occurs, LED will flash orange. In this situation, press any key (excluding the **Power On/Off** key) to turn it off.

b. Factory clone. If error data clone occurs, LED will flash orange. In this situation, press any key (excluding the **Power On/Off** key) to turn it off. Re-clone by pressing **PTT** again.

3) Target radio status: LED solidly glows green during the cloning process and goes out once it finishes.

E. Difference between Factory Clone Mode and User Clone Mode:

1) User Clone Mode: Only clone corresponding data (such as frequency) in user mode. Test parameters like adjustment frequency, adjustment items and base band parameter will not be cloned.
2) Factory Clone Mode: Clone all the data excluding serial No.

F. Attentions:

1) Wrongly press **SK1** and switch into user clone mode (LED flashes red once), which may cause error adjustment data of factory clone mode.
2) After the radio enters clone mode and before cloning begins, red flashing LED indicates low battery of the source radio and low battery alert will sound. During cloning process, the radio will not give low battery alert.

2. Description of Adjustment Item

TC-518 Adjustment Items											
Channel	Adjustable Frequency	Wide Band					Narrow Band				
		Freq.1	Freq.2	Freq.3	Freq.4	Freq.5	Freq.1	Freq.2	Freq.3	Freq.4	Freq.5
Tx Section											
1	Tx Low Power	Y	Y	Y	Y	Y					
2	Tx High Power	Y	Y	Y	Y	Y					
3	CDCSS Balance	When programming, set this item (in adjustment mode) as 0.									
4	CDCSS Deviation	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
5	CTCSS (67Hz) Deviation	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
6	CTCSS (151.4Hz) Deviation	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
7	CTCSS (254.1Hz) Deviation	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8	DTMF Deviation	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
9	TX Low Voltage Threshold			Y							
10	Max. Tx Audio Deviation	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Rx Section											
11	SQL level 5 ON	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
12	SQL level 5 OFF	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
13	RX Low Voltage Threshold			Y							
14	Bandpass Filter	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Remarks: Y indicates valid frequencies for adjustment, and the rest are blank channels without adjustment items.										
	Note: As for squelch level 1 and level 9, the VOX level only can be set during programming process with adjustment unavailable. Make sure that programming comes before adjustment!										

1) Wide/Narrow band switch for a certain adjustment item:

When the adjustment mode is entered, the wide band low frequency is defaulted. Short press SK1 (orange LED flashes indicating valid press) to switch between wide/narrow band circularly. Then the first frequency of current bandwidth is the frequency to be adjusted by default.

2) Frequency switch under certain bandwidth and certain adjustment item:

Short press (no longer than 1 second) **PTT** (green LED flashes indicating valid press) and automatically switch

adjustment frequencies under certain bandwidth and certain adjustment item.

3) Add/Subtract the tuning value under certain bandwidth and certain adjustment item:

Rotate the volume control knob upwards, and the adjustment value will increase by 1 under certain bandwidth and certain adjustment item; hold the knob up without release, and the adjustment value will keep increasing continuously in steps of 1. The adjustment value will keep unchanged once it reaches its maximum value.

Rotate the volume control knob downwards, and the adjustment value will decrease in steps of 1 under certain bandwidth and certain adjustment item; hold the knob up without release, and the adjustment value will keep decreasing continuously in steps of 1. The adjustment value will keep unchanged once it drops to its minimum value.

4) Measures on Special Items:

SQL level 5 ON, SQL level 5 OFF and Rx low voltage threshold - these adjustment items are related to AD sampling. Rotate the volume control knob upwards/downwards to activate AD sampling (including calculation) for one time after entering the above mentioned adjustment options. Rotate the channel selector knob and save the current AD sampling value. If you do not rotate the volume control knob, neither the AD sampling will be activated, nor the original adjustment value will be updated.

5) Description of Key-press:

Short press: key-press time is no longer than 1 second.

Long press: key-press time is longer than 1 second.

6) Adjustment Items are:

Tx Group:

Tx frequency tolerance, VCO lock voltage and CDCSS waveform are adjusted outside the adjustment mode via hardware; Tx low power, Tx high power, CDCSS deviation, CTCSS deviation (low), CTCSS deviation (medium), CTCSS deviation (high), DTMF deviation, Tx low voltage threshold and Max. Tx audio deviation are adjusted inside the adjustment mode.

Rx Group:

VCO lock voltage is adjusted outside the adjustment mode; squelch, Rx bandpass filter and Rx low voltage threshold are adjusted inside the adjustment mode.

3. Specific Operations and Requirements

1) Conventional Adjustment Items (outside the adjustment mode): Tx frequency tolerance, VCO voltage adjustment and CDCSS waveform.

(Note: CH1, CH2 and CH3 are preset as wide band with low, medium and high frequencies respectively, and CH4, CH5 and CH6 as narrow band with low, medium and high frequencies respectively. Make sure the antenna or load is connected before adjustment.)

Item	Condition		Test		Adjustment		Specifications / Remarks
			Test Instrument	Test point	Part	Method	
Tx Frequency Tolerance	Rotate the Channel Selector knob to CH1 and press **PTT** to transmit.		Communication Test Set	Antenna	VR101	Adjust VR101 with ceramic tuning tool to control the center frequency within the error range.	≤150Hz
VCO Tx Lock Voltage	Rotate the Channel Selector knob to CH3 and press **PTT** to transmit.		Digital Voltmeter	CV	TC101	Adjust TC101 with ceramic tuning tool until the lock voltage meets the requirements.	UHF: 4.1±0.2V VHF: 3.0±0.2V
	Rotate the Channel Selector knob to CH1 and press **PTT** to transmit.					Check	UHF/VHF: ≥0.5V
VCO Rx Lock Voltage	Rotate the Channel Selector knob to CH3.				TC102	Adjust TC102 with ceramic tuning tool until the lock voltage meets the requirements.	UHF: 4.1±0.2V VHF: 4.0±0.2V
	Rotate the Channel Selector knob to CH1.					Check	UHF/VHF:≥0.5V
Sensitivity Modulation	Wide Band	Rotate the Channel Selector Knob to CH1, CH2 and CH3 respectively, and press **PTT** to transmit.	Communication Test Set BPF: 0.3-3KHz AF: 1KHz	Antenna Earpiece Port		Adjust the audio output signal of communication test set to ensure that the deviation value reaches 3.0KHz.	9±5mV
	Narrow Band	Rotate the Channel Selector Knob to CH4, CH5 and CH6 respectively, and press **PTT** to transmit.				Adjust the audio output signal of communication test set to ensure that the deviation value reaches 1.5KHz.	9±5mV

2) Adjustment in the adjustment mode (Note: Make sure the antenna or load is connected before adjustment.)

Item		Condition	Test		Adjustment		Specifications / Remarks
			Test Instrument	Test point	Part	Method	
Tx Power	High Power	Rotate the Channel Selector Knob to CH2, and this function is activated by default with low frequency. Short press **PTT** to switch between different frequencies circularly (refer to adjustment list).	Communication Test Set Ammeter	Antenna Connector	Volume Adjustment Knob	Rotate the Volume Control Knob upwards/downwards to adjust the output power, and rotate the Channel Selector knob to save it.	3.9-4.1W I≤1.4A
	Low Power	Rotate the Channel Selector Knob to CH1, and this function is activated by default with low frequency. Short press **PTT** to switch between different frequencies circularly (refer to adjustment list).				Rotate the Volume Control Knob upwards/downwards to adjust the output power, and rotate the Channel Selector knob to save it.	1.7-1.9W I≤1.1A
CDCSS Waveform		Rotate the Channel Selector Knob to CH4, and this function is activated by default with low frequency. Short press **PTT** to switch between frequencies (the lowest, low, medium, high and the highest).	Communication Test Set BPF: 20Hz~300Hz	Antenna	VR600	Adjust VR600 with ceramic tuning tool to ensure similarity between the CDCSS waveform (with 5 adjustment points) and square waveform.	

CDCSS Deviation	Wide Band	Rotate the Channel Selector Knob to CH4, and this function is activated by default with low frequency.	Communication Test Set BPF: 20Hz~300Hz	Antenna	VOL+ VOL-	When the mode is entered, rotate the volume control key to make slight adjustments until the CDCSS deviation meets the requirements. Check the CDCSS waveform.	650-700Hz
		Press **PTT** key to switch between different frequencies (the lowest, low, medium, high and the highest).					
	Narrow Band	Short press (≤1 second) **SK1** to enter the “narrow band” and select low frequency.				When the mode is entered, rotate the volume control knob to make slight adjustments until the CDCSS deviation meets the requirements. Check the CDCSS waveform.	400-450Hz
		Press **PTT** key to switch between different frequencies (the lowest, low, medium, high and the highest).					
CTCSS Deviation	Wide Band	Rotate the Channel Selector Knob to CH5, CH6 and CH7 respectively indicates low, medium and high frequencies of CTCSS. Wide band is defaulted. Short press **PTT** key to switch between different frequencies on each channel.	Communication Test Set BPF: 20Hz-300Hz	Antenna	VOL+ VOL-	When the mode is entered, rotate the volume control knob to make slight adjustments until the CTCSS deviation meets the requirements.	650-700Hz
	Narrow Band	On CH5, CH6 and CH7, short press (≤1 second) **SK1** to enter “narrow band”, and short press **PTT** to switch between different frequencies.				When the mode is entered, rotate the volume control knob to make slight adjustments until the CDCSS deviation meets the requirements.	400-450Hz

DTMF Deviation	Wide Band	Rotate the Channel Selector Knob to CH8 (wide band low frequency by default). Press **PTT** to switch between frequencies.	Communication Test Set BPF: 20Hz-15KHz AF Genl Lvl: off	Antenna	VOL+ VOL-	When the mode is entered, rotate the volume control knob to make slight adjustments until the DTMF deviation meets the requirements.	3.5±0.1kHz
	Narrow Band	Rotate the Channel Selector Knob to CH8, and press **SK1** to switch to narrow band.					1.8±0.1kHz
Audio-related Frequency Deviation	Wide Band	Rotate the Channel Selector Knob to CH10 (wide band low frequency by default). Short press **PTT** to switch between frequencies.	Communication Test Set BPF: 20Hz~15KHz AF Genl Lvl: 1KHz	Antenna	VOL+ VOL-	When the mode is entered, adjust the value of AF Gen1 Lv1, find out the value (100-150mv) at Max. frequency deviation and make it a fixed value. Rotate the Channel Control Knob upwards and downwards slightly to ensure the audio-related frequency deviation meets the requirements.	3.8±0.1kHz
	Narrow Band	Rotate the Channel Selector Knob to CH10, and short press **SK1** to switch to narrow band.					1.9±0.1kHz
TX Low Voltage Threshold		Rotate the Channel Selector knob to CH9.	Digital Voltmeter	Power Supply Port	Power supply	Adjust the output voltage of the power supply and check the alarm level.	When the voltage is equal to or less than 6.5V, the alarm sounds and transmission is prohibited.
Rx Sensitivity (Bandpass)		Rotate the Channel Selector Knob to CH14 with low frequency.	Communication Test Set SSG:-119dBm MOD: 1KHz DEV: 3.0KHz Filter: 0.3~3KHz	Antenna Earpiece Port	VOL+ VOL-	Check the bandpass waveform, and adjust the volume knob. Rotate the channel switch to save these data after five-point test finishes.	Turn to appropriate volume before adjustment to limit the output SINAD: ≥12dB
		Short press **PTT** to switch to other frequencies.					

Squelch On	Wide Band	Rotate the Channel Selector knob to CH11 and SQL level 5 ON is set. Wide band and low frequency are selected. Rotate the Channel Control Knob upwards and downwards to activate this function. Short press **PTT** to switch between frequencies.	Communication Test Set SSG:-121dB MOD:1KHz DEV:3KHz Filter: 0.3-3KHz	Antenna Earpiece Port	VOL+ VOL-	Adjust the output signals of SSG to the squelch level. Rotate the Channel Selector knob to save the value after five-point adjustment.	Squelch level (Level 5) -121dB
		As for Level 1 to Level 9, directly clone to the target radio after the source radio is properly adjusted. Tests are not required if it is inside the mode; while outside the mode, tests are required.					Squelch level: Level 1: -123dB Level 9: -117dB
	Narrow Band	Rotate the Channel Selector knob to CH11 and SQL level 5 ON is set. Short press **SK1**, and the wide band as well as low frequency are selected. Rotate the Channel Control Knob upwards and downwards to activate this function. Short press **PTT** to switch between frequencies.	Communication Test Set SSG:-120dB MOD: 1KHz DEV: 1.5KHz Filter: 0.3-3KHz	Same as above	Same as above	Same as above	Squelch level (Level 5) -121dB
		As for Level 1 to Level 9, directly clone to the target radio after the source radio is properly adjusted. Tests are not required if it is inside the mode; while outside the mode, tests are required.					Squelch level: Level 1: -122dB Level 9: -116dB

Squelch Off	Wide Band	Rotate the Channel Selector knob to CH12 and SQL level 5 OFF is set. Wide band and low frequency are selected. Rotate the Channel Control Knob upwards and downwards to activate this function. Short press **PTT** to switch between frequencies.	Communication Test Set SSG: -123dBm MOD: 1KHz DEV: 3KHz Filter: 0.3-3KHz	Antenna Earpiece Port	VOL+, VOL-	Adjust the output signals of SSG to the squelch level. Rotate the Channel Selector knob to save the value after five-point adjustment.	Squelch level (Level 5) -123dB
		As for Level 1 to Level 9, directly clone data to the target radio after the source radio is properly adjusted. Tests are not required if it is inside the mode; while outside the mode, tests are required.					Squelch level: Level 1: -125dB Level 9: -119dB
	Narrow Band	Rotate the Channel Selector knob to CH12 and SQL level 5 OFF is set. Short press **SK1**, and the wide band as well as low frequency are selected Rotate the Channel Control Knob upwards and downwards to activate this function. Short press **PTT** to switch between frequencies.	Communication Test Set SSG: -122dBm MOD: 1KHz DEV:1.5KHz Filter: 0.3-3KHz	Antenna Earpiece Port	VOL+, VOL-	Same as above	Squelch level (5 Levels): -122dB
		As for Level 1 to Level 9, directly clone data to the target radio after the source radio is properly adjusted. Tests are not required if it is inside the mode; while outside the mode, tests are required.					Squelch level Level 1: -124dB Level 9: -118dB

RX Low Voltage Threshold	Rotate the Channel Selector knob to CH13.	Digital Voltmeter	Power supply Port	Power supply	Adjust the output voltage, and check the alarm level (red LED flashes and alarm tone sounds).	Red LED flashes with alarms when output voltage is less than 7.0V; neither LED flashes nor alarm sounds when output voltage exceeds 7.2V.

Appendix 1: Reference Values for TC-518 Source Radio

Test Items	Wide Band					Narrow Band				
	Freq.1	Freq. 2	Freq. 3	Freq. 4	Freq. 5	Freq. 1	Freq. 2	Freq. 3	Freq. 4	Freq. 5
Tx Low Power	51	49	49	43	45					
Tx High Power	84	90	84	80	91					
CDCSS Balance (CH3)	0	0	0	0	0	0	0	0	0	0
CDCSS Deviation	57	61	59	55	52	40	40	39	38	38
CTCSS (67Hz) Deviation	114	110	105	100	87	64	64	62	62	55
CTCSS (151.8Hz) Deviation	107	108	108	102	125	65	70	67	64	78
CTCSS (254.1Hz) Deviation	109	125	122	125	136	72	81	85	82	90
DTMF	110	85	85	95	135	29	22	23	26	36
TX Low Voltage Threshold			164							
Max. TX Audio Deviation	134	119	116	129	165	33	29	28	30	40
SQL level 5 ON	48	44	48	77	56	26	19	27	54	36
SQL level 5 OFF	73	67	62	85	83	48	38	43	75	55
RX Low Voltage Threshold			170							
Bandpass Filter	34	75	120	160	188					

Appendix 2: Reference Values for TC-518 Battery Strength

Battery Capacity: 1100mAh

During transmitting procedure, the voltage level is subject to Tx threshold; while during receiving or stand-by procedure, it depends on Rx threshold.

1) Battery voltage check is required under Tx status: (time depends on the 1.5A Tx current.)

Green LED 70%~100% >7.46V Time: 13.95min

Orange LED 50%~70% >7.17V Time: 13.95min

Red LED 30%~50% >6.70V Time: 13.95min

Red LED flashes >5.97V

(Tx is allowed.)

Red LED flashes ≤5.97V

+ Low Voltage Tx-prohibited Alert Tone

(Tx is prohibited.)

2) Under Stand-by & Receiving Status: (time depends on 5-5-90 principle)

Green LED 70%~100% >7.85V Time: 134.55min

Orange LED 50%~70% >7.53V Time: 134.55min

Red LED 30%~50% >7.10V Time: 134.55min

Red LED flashes >6.56V Time: more than 30min

+The alarm sounds every n seconds.

（Tx is allowed. You may set the time of alarming by programming software.）

Red LED flashes ≤6.56V Time: more than 10min

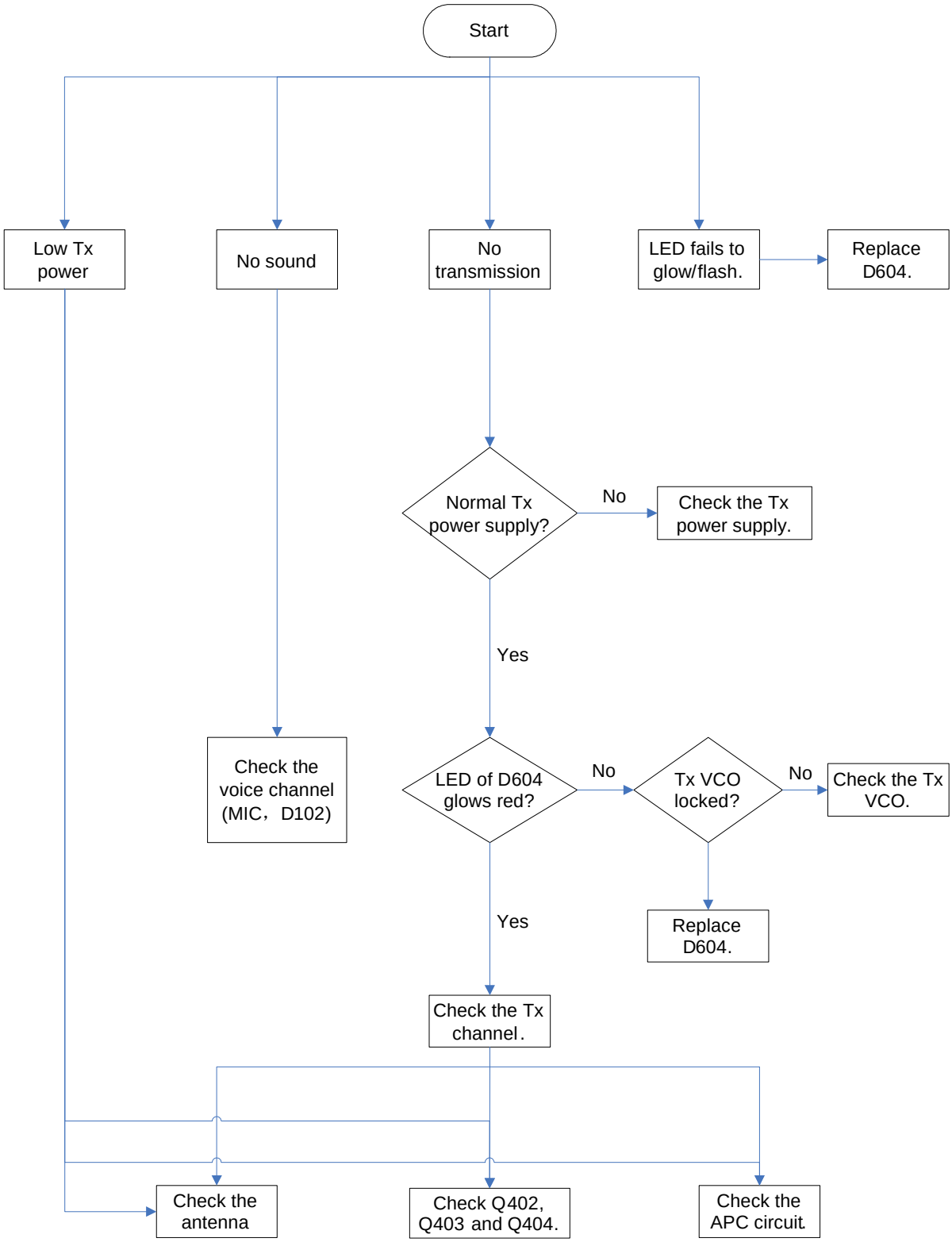
+The alarm sounds every n seconds.

（Tx is prohibited. You may set the time of alarming by programming software.）

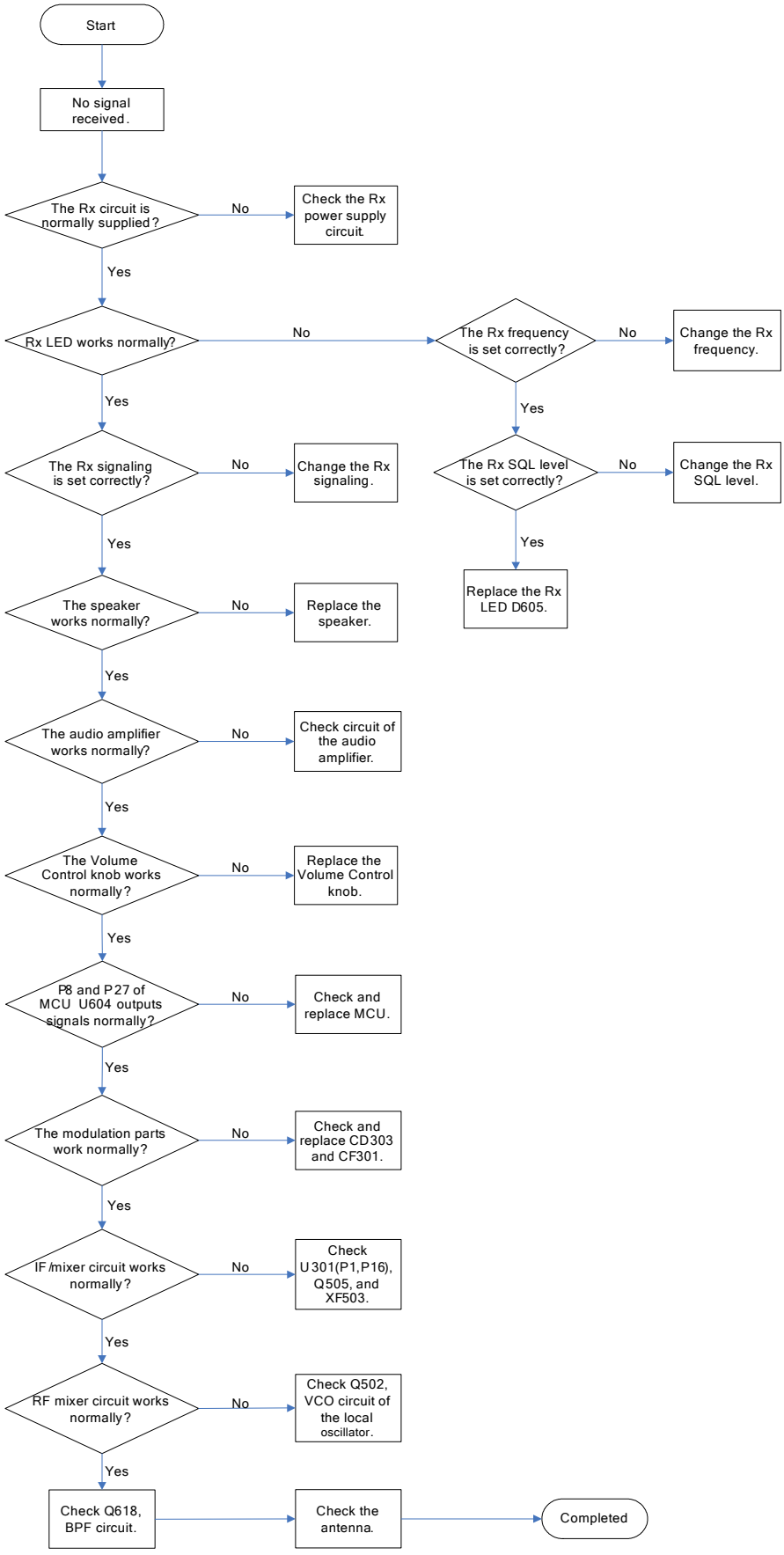
Power off <5.80V

Troubleshooting Flow Chart

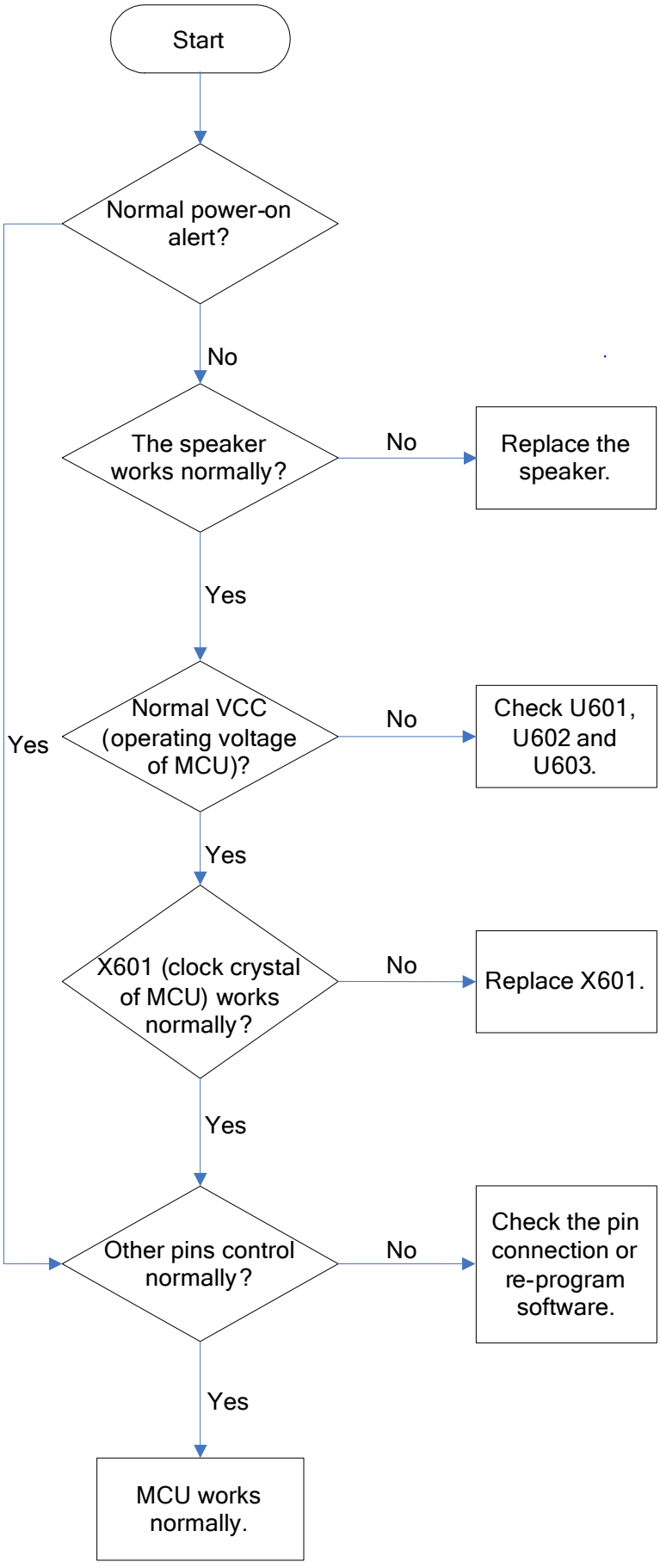
Tx Section



Rx Section


Start
No signal received.
The Rx circuit is normally supplied?
No
Check the Rx power supply circuit.
Yes
Rx LED works normally?
No
The Rx frequency is set correctly?
No
Change the Rx frequency.
Yes
Yes
The Rx signaling is set correctly?
No
Change the Rx signaling.
The Rx SQL level is set correctly?
No
Change the Rx SQL level.
Yes
Yes
Replace the Rx LED D605.
The speaker works normally?
No
Replace the speaker.
Yes
The audio amplifier works normally?
No
Check circuit of the audio amplifier.
Yes
The Volume Control knob works normally?
No
Replace the Volume Control knob.
Yes
P8 and P27 of MCU U604 outputs signals normally?
No
Check and replace MCU.
Yes
The modulation parts work normally?
No
Check and replace CD303 and CF301.
Yes
IF /mixer circuit works normally?
No
Check U301(P1,P16), Q505, and XF503.
Yes
RF mixer circuit works normally?
No
Check Q502, VCO circuit of the local oscillator.
Yes
Check Q618, BPF circuit.
Check the antenna.
Completed

MCU


Start
Normal power-on alert?
No
The speaker works normally?
No
Replace the speaker.
Yes
Normal VCC (operating voltage of MCU)?
No
Check U601, U602 and U603.
Yes
Yes
X601 (clock crystal of MCU) works normally?
No
Replace X601.
Yes
Other pins control normally?
No
Check the pin connection or re-program software.
Yes
MCU works normally.

Disassembly and Assembly for Repair

Attaching/Removing the Battery

Removing the Battery

① Turn off the radio. Hold the top part of the radio's body, and press the belt clip to make its bottom up. Lift the battery latch in the direction of the arrow by the notch at its bottom, as shown in Figure 1.

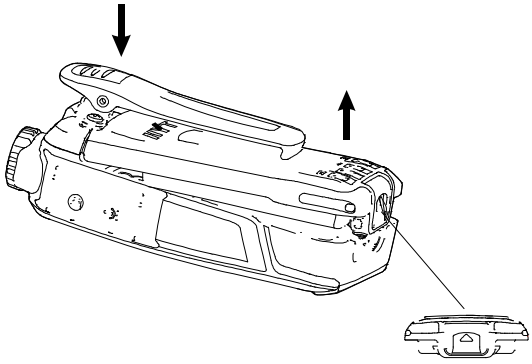


Figure 1

② When the battery tilts with its bottom up, release the battery latch and lift the battery from the radio's body, as shown in Figure 2.

(Note: When the battery tilts with its bottom up, degree of the angle formed with the radio should not be too large, to avoid severe damage on the jut at the battery's top part and slot at the radio's top part.)

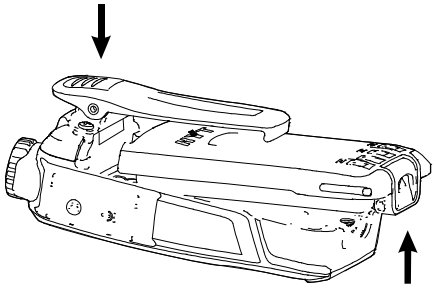


Figure 2

Attaching the Battery

① Press the battery closer to the top part of the aluminum chassis under the belt clip, as shown in Figure 3.

(Note: Insert the jut at the battery's top part into the slot at the radio's top part.)

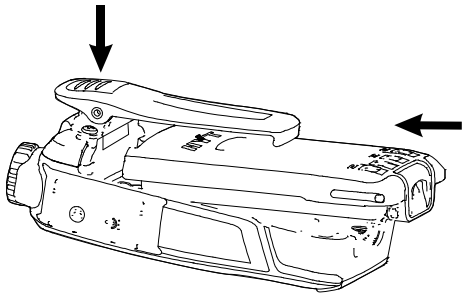


Figure 3

② Slightly press the bottom of the battery towards the radio until a click is heard, and then the battery is securely attached to the radio.

(Note: If the battery is not well locked, please remove the battery and attach it again.)

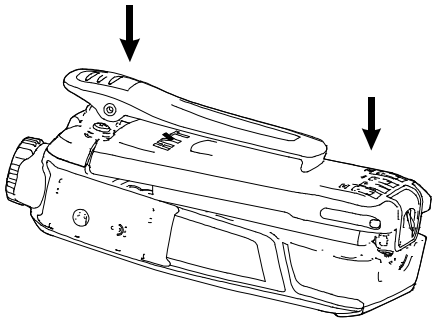


Figure 4

Removing the Aluminum Chassis

① Remove the 2 screws at the bottom of the radio.

② Rotate and remove the antenna at the top of the radio. As shown in Figure 5.

③ Remove the fixed nuts by professional instructions.

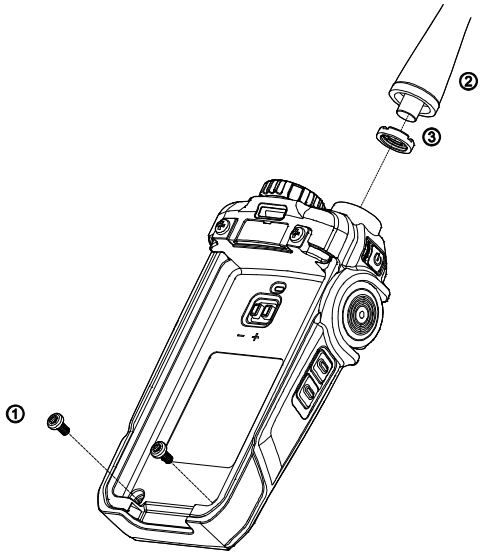


Figure 5

④ Lift the bottom of the aluminum chassis by certain tools, as shown in Figure 6.

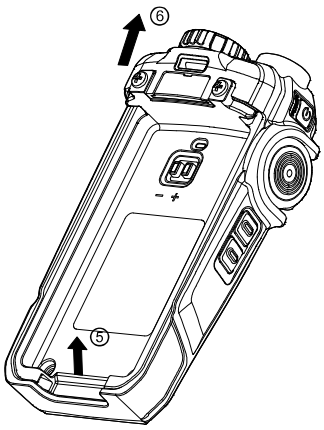


Figure 6

⑤ After removing the antenna pedestal from the front case, pull out the aluminum chassis along the antenna pedestal direction gently. To avoid unexpected FPC failure, remember not to pull the chassis backwards with much strength. See Figure 7.

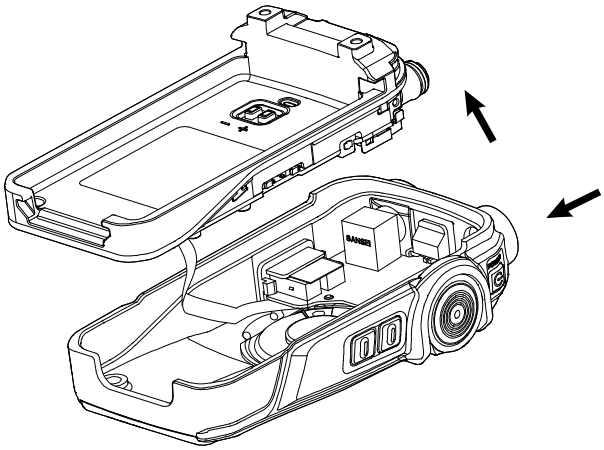


Figure 7

⑥ Unfasten the FPC connector on the main board, and uninstall the FPC.

Attaching/Removing the Antenna

Removing the Antenna

⑦Turn the antenna counter-clockwise until you can remove it. See Figure 8.

Attaching the Antenna

① Align the threaded end of the antenna with the radio's large-size threaded hole.

② Turn the antenna clockwise to fasten it. See Figure 9.

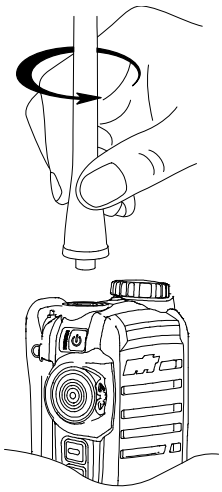


Figure 8

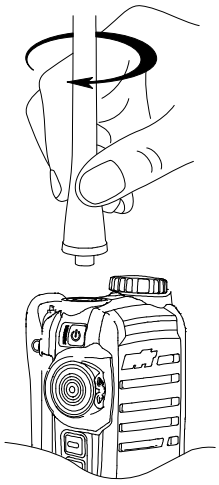


Figure 9

Attaching/Removing the Belt Clip

Attaching the Belt Clip

Loosen the screw on the belt clip first. Then fix the belt clip to the radio, and align the belt clip screw with the threaded hole on the radio, and then turn the screw clockwise to fasten it, as shown in Figure 10.

Removing the Belt Clip

Loosen the screw to remove the belt clip. Please refer to the operations for attaching the belt clip.

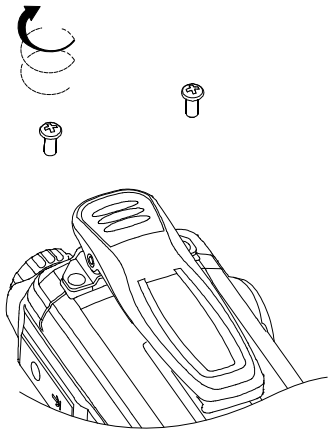


Figure 10

Attaching/Removing the Earpiece/Microphone

Attaching the Earpiece/Microphone

① Open (not remove) the accessory jack cover.

② Plug the earpiece or microphone into the accessory jack, and screw down the screws, as shown in Figure 11.

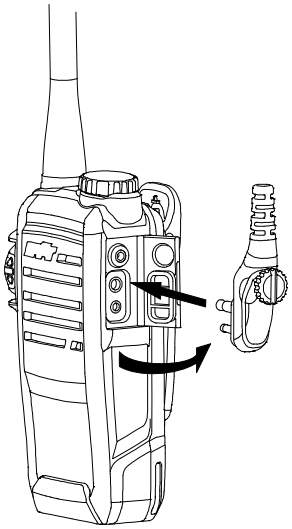


Figure 11

Removing the Earpiece/Microphone

Loosen and remove the screws.

Note: Using the radio with audio accessory may affect the waterproof performance of the radio.

Attaching/Removing the Encoder Knob Cap

Unclench cover of the encoder knob by a flathead screwdriver at the dent of the encoder knob (as shown below).

Turn the screw in the middle to remove the encoder knob, and turn the fixed nuts of the encoder switch.

As for the attaching method, it's on the contrary.

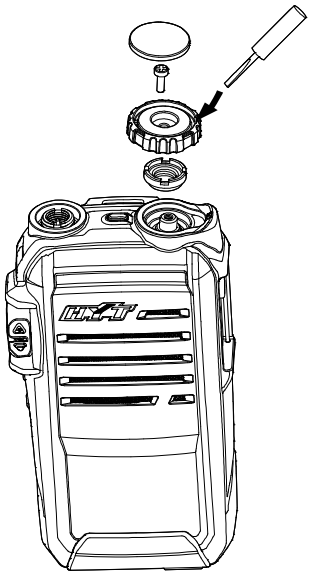
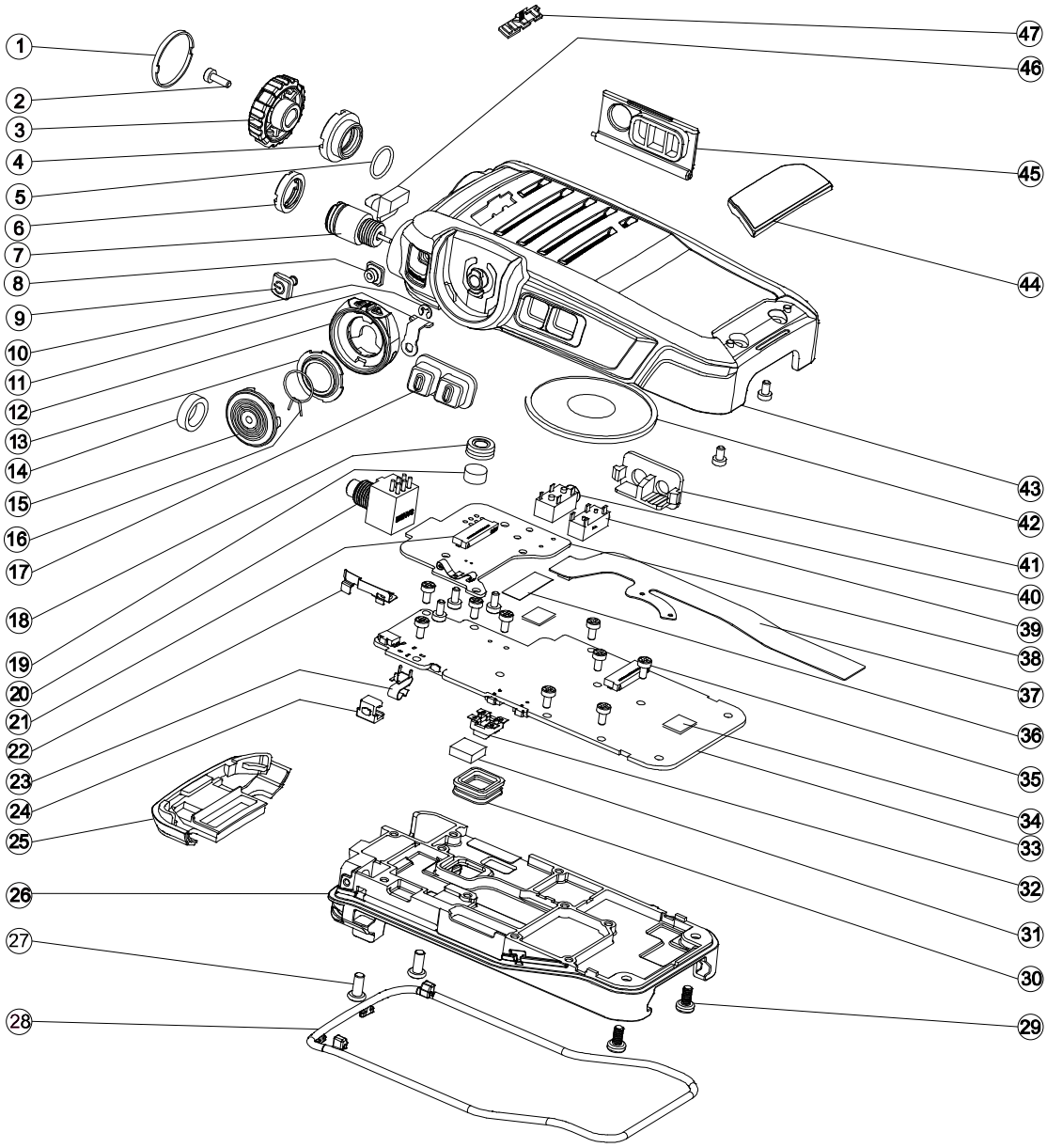


Figure 12

Exploded View



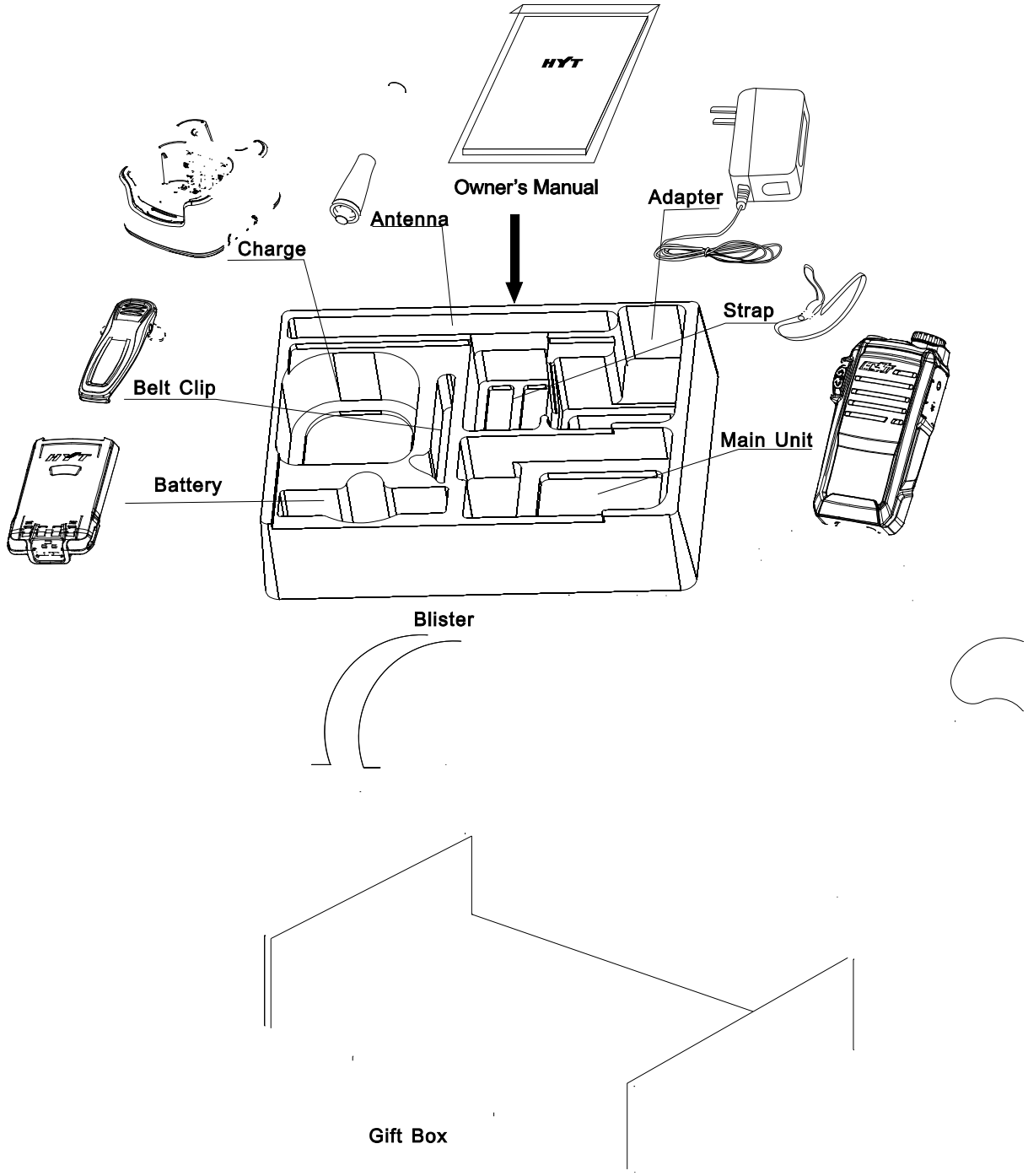
TC-518 Parts List 2

No.	Material No.	Description	Qty. (PCS)
1	6201658000010	Encoder knob cover	1
2	7102006000000	Machine screw	1
3	6000718000000	Encoder knob	1
4	7206007400000	Encoder switch nut	1
5	6100335000000	Antenna O-ring	2
6	7209002500000	Antenna nut	1
7	4400000029000	Antenna pedestal	1
8	6100361000000	Silicone rubber power on/off key	1
9	6000728000000	Plastic power on/off key	1
10	7000181000000	Fender washer (open)	1
11	6201692000000	Volume control slide piece	1
12	6000723000000	Volume control knob	1
13	6100378000000	Silicone rubber PTT rebound pad	1
14	7209802800000	Support ring, encoder switch	1
15	6000724000000	Plastic PTT key	1
16	7000180000000	Volume control spring	1
17	6100359000000	Silicone rubber programmable side key	1
18	6100111000010	Silicone rubber mic bushing	1
19	5002230000010	Microphone	1
20	4304030000030	Gray code rotary switch	1
21	5202020100040	Connector	2
22	6201636000000	Connection shrapnel, power on/off key	1
23	6201765000000	Antenna shrapnel	1
24	6100298000000	Silicone rubber PTT key	1
25	6000720100000	Rear cover	1
26	6300046000000	Aluminum chassis	1
27	7103006001000	Machine screw	2
28	6100360000000	Waterproof ring	1
29	7102506002100	Machine screw	2
30	6100314000000	Waterproof ring, battery connector	1
31	7500116000020	Heatsinking pad	1
32	5205000001490	Battery connector	1
33	NC	PCB	1
34	7500271000000	FPCB sponge support pad	2
35	7101904020200	Self-tapping screw (2.0 V)	13
36	7400023010010	PC piece	1
37	41005101003B0	TC-518 FPC 0.15T/2L/1P B	1
38	NC	Channel selector knob board	1
39	5205000000190	Earpiece jack	1
40	5205000000280	Speaker jack	1

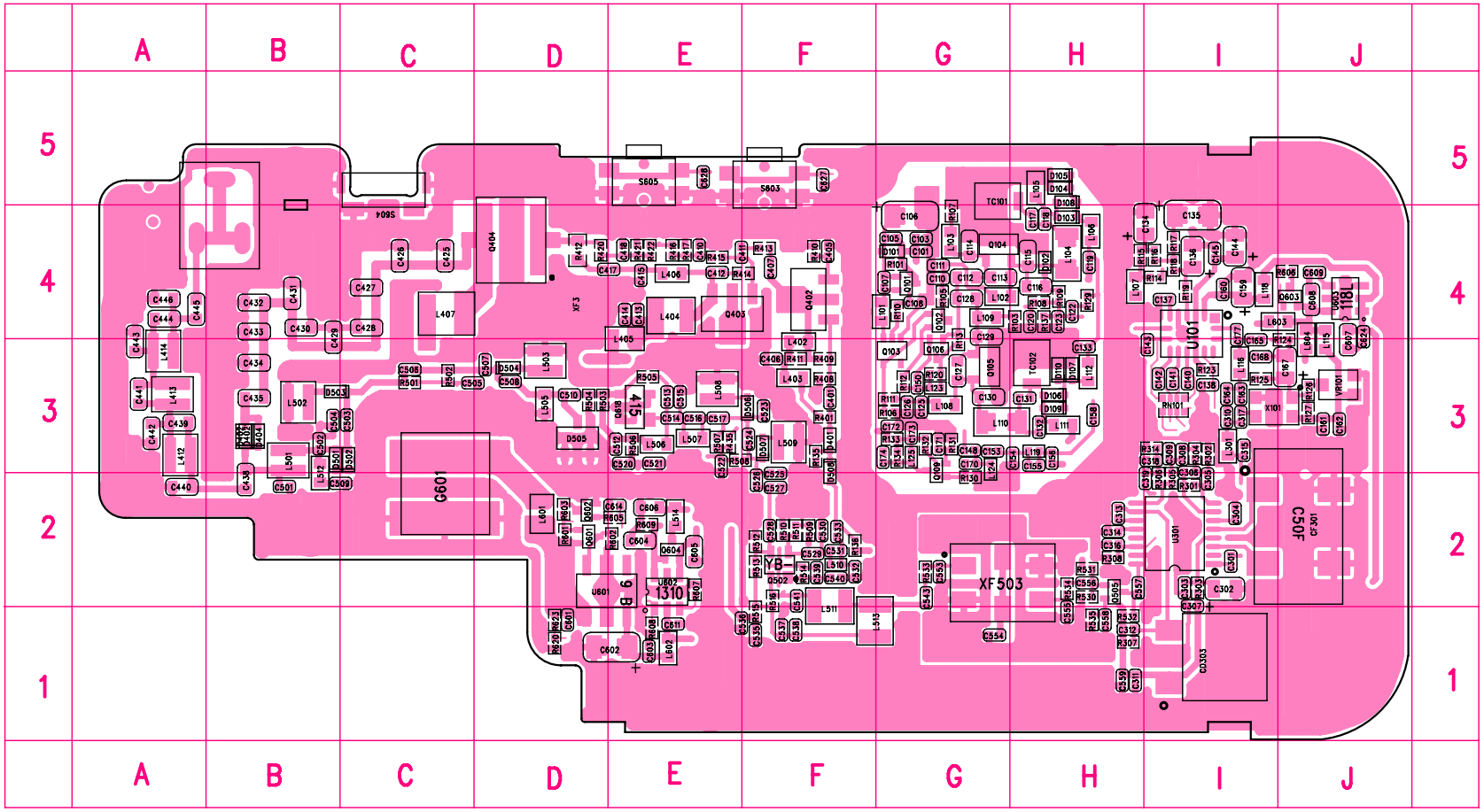
41	6100323000000	Earpiece jack bracket	1
42	5001210000340	Speaker	1
43	1510051000000	TC-518 Front case kit	1
44	6300060000000	Decorative sheet, zinc alloy	1
45	6000749000000	Accessory jack cover	1
46	6000727000000	LED shade	1
47	8600510600100	TC-518 HYT PC label	1

Remarks: Parts that are not marked with material number may vary with radio frequency band.

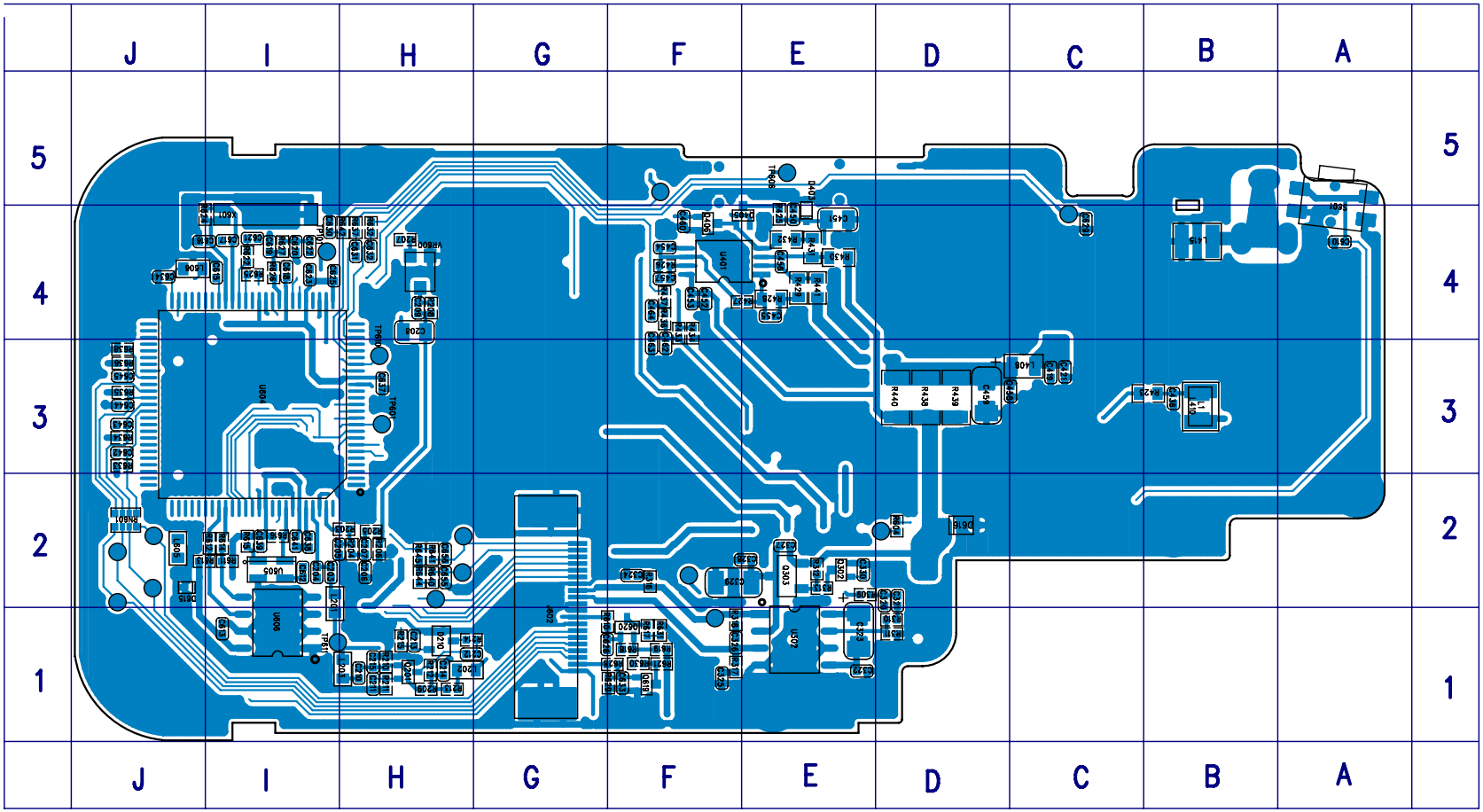
Packing


Owner's Manual
Adapter
Antenna
Charge
Strap
Belt Clip
Main Unit
Battery
Blister
Gift Box

TC-518 PCB View
Top Layer

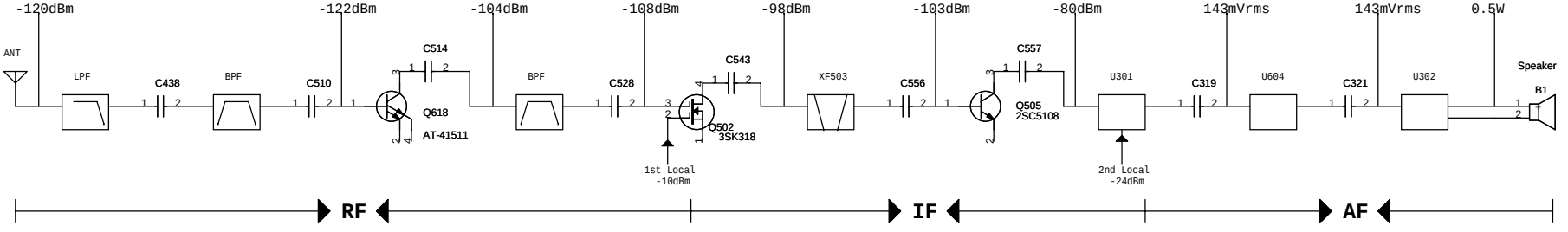


TC-518 PCB View
Bottom Layer



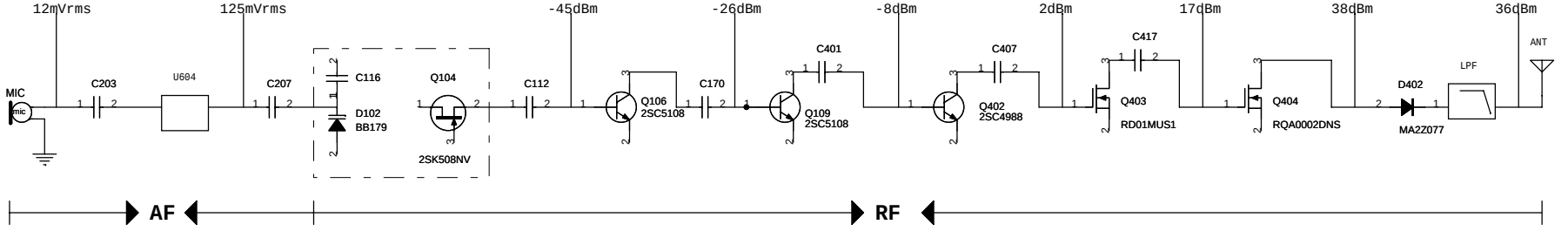
TC-518 Level Diagram

Rx Section



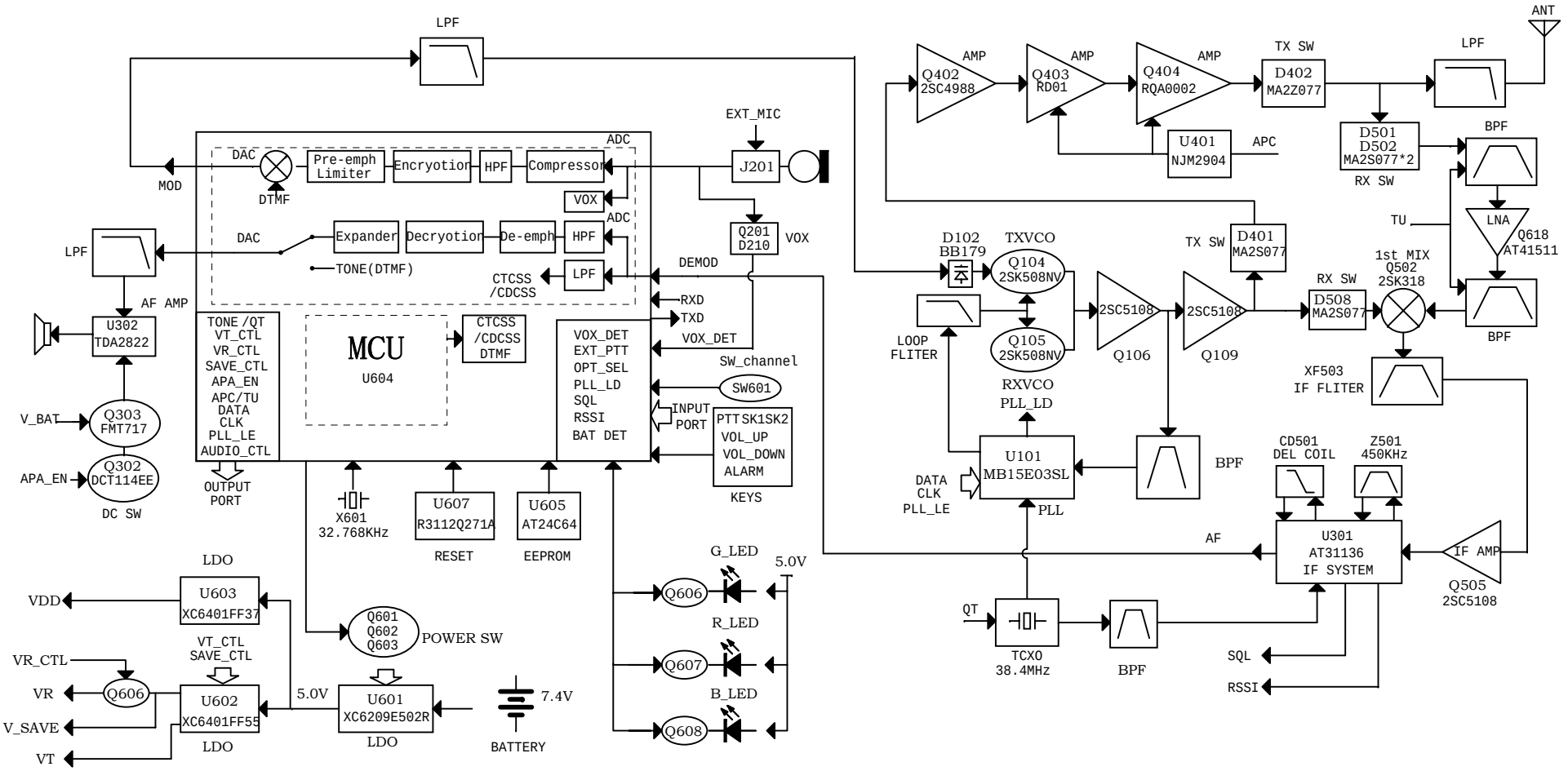
Each of the levels plotted from RF to the first IF is the level that can provide a 12dB SINAD for an SSG signal through a 470pFb coupling capacitor.When AF ouput is adjusted to 0.5W, adjust the frequency deviation of 1KHz AF level to 3KHz (Wide), 1.5KHz (Narrow).

Tx Section

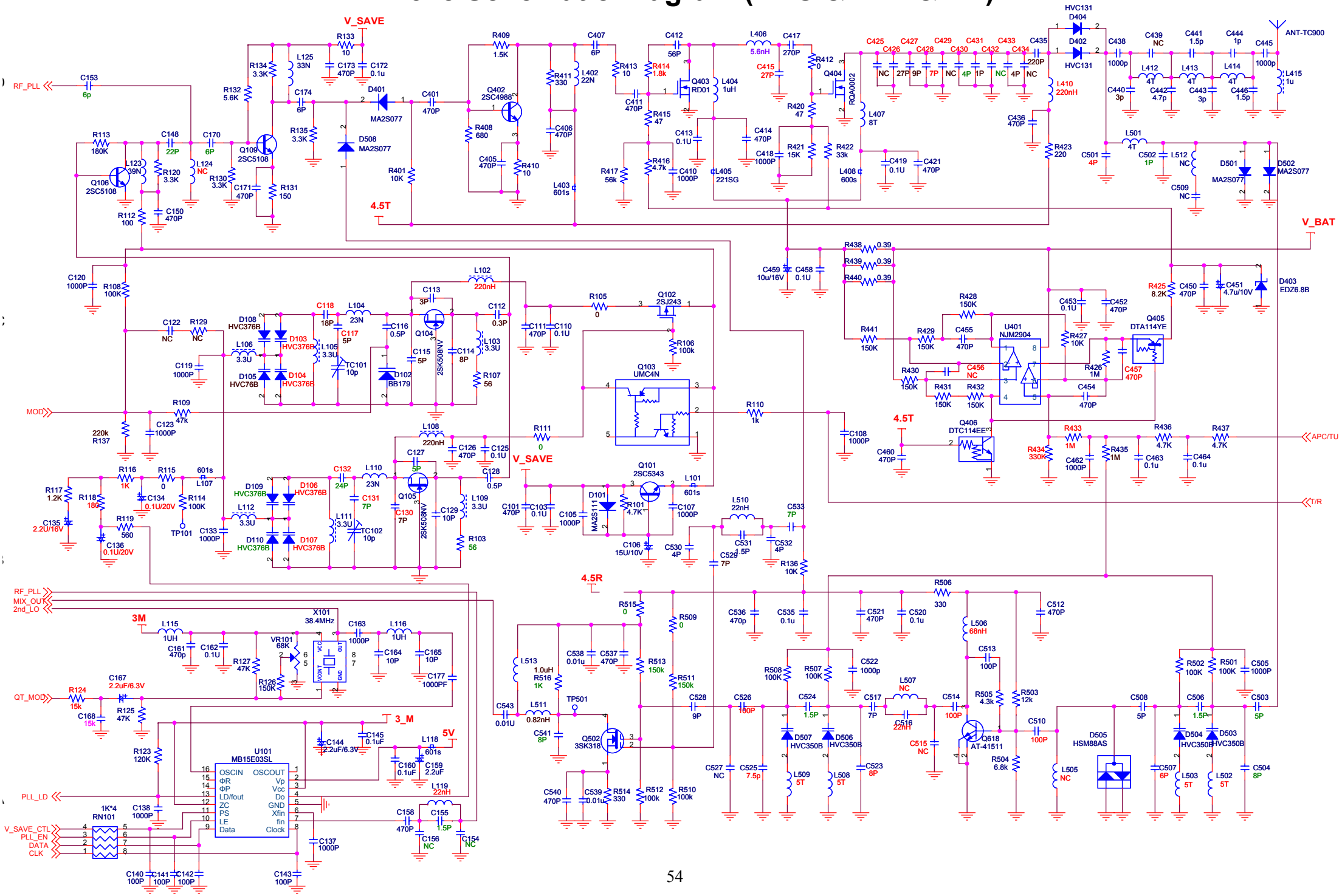


AF and RF levels are measured at high impedance.

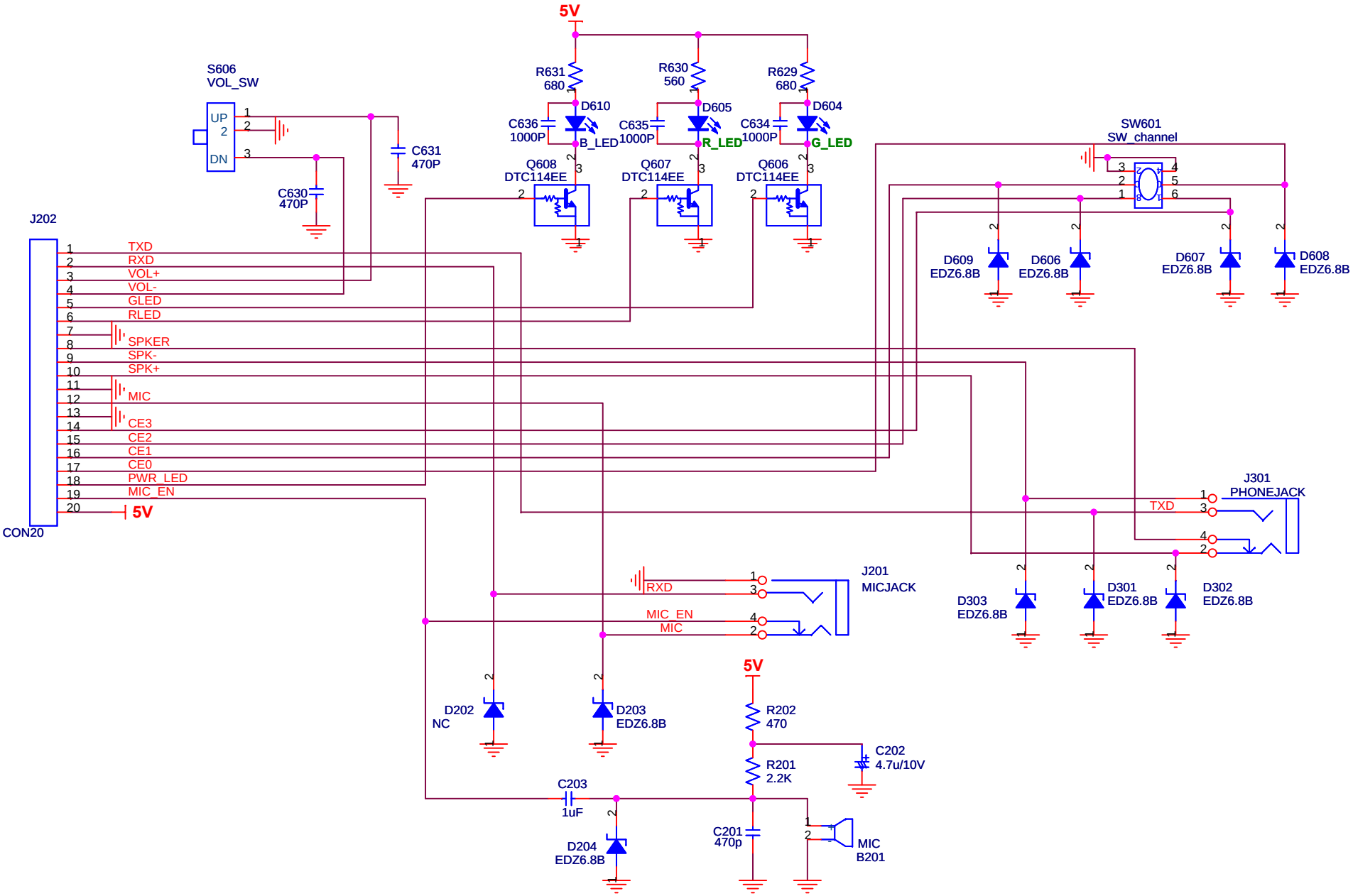
TC-518 Block Diagram



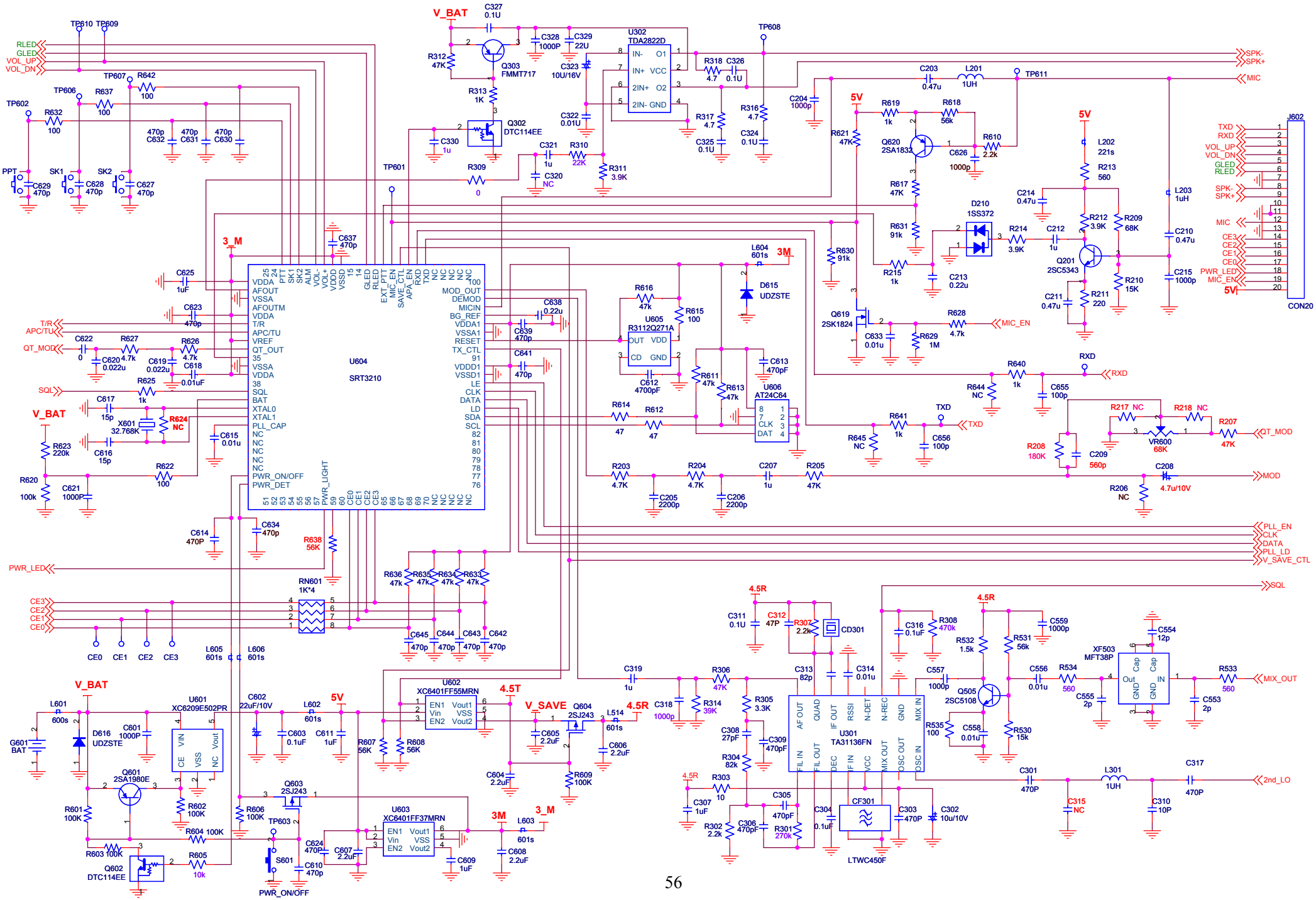
TC-518 Schematic Diagram (VCO & PLL & RF)



TC-518 Schematic Diagram
(LED & Knob Board)



TC-518 Schematic Diagram (MCU & Power & AF)



Specifications

General	
Frequency Range	VHF: 136-174MHz UHF: 400-470MHz 450-510MHz 350-390MHz
Channel Capacity	16
Channel Spacing	25/12.5 KHz
Operating Voltage	7.4V DC
Battery	1100mAh Li-Ion battery
Battery Life (5-5-90 duty cycle)	9 hours above
Operating Temperature	-30℃～+60℃
Dimensions (H×W×D) (with battery, without antenna)	111mm*60mm*32mm
Weight (with antenna & battery)	222g
Frequency Stability	±2.5ppm
Receiver	
Sensitivity	0.25μV/0.28uV
Selectivity	≥70dB(W)/55dB(N)
Intermodulation	≥60dB
Spurious Response Rejection	≥70dB
Rated Audio Power Output	500mW
Rated Audio Distortion	≤5%（500mW）
Transmitter	
RF Power Output	VHF: 4.5-5.0W(H)/2.0±0.3W(L) UHF:4.0±0.3W(H)/2.0±0.3W(L)
Spurious and Harmonics	≤ -36dBm（Frequency <1GHz） ≤ -30dBm（Frequency >1GHz）
Modulation Limiting	≤5KHz/2.5KHz
FM Noise	40dB(W)/35dB(N)
Modulation Distortion	≤5%

All Specifications are tested according to TIA/EIA-603, and subject to change without prior notice due to continuous development.

HYT endeavors to achieve the accuracy and completeness of this manual, but no warranty of accuracy or reliability is given. All the specifications and design are subject to change without prior notice due to continuous technology development. Changes which may occur after publication are highlighted by Revision History contained in Service Manual.

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