CONTENTS

General

Manual Scope

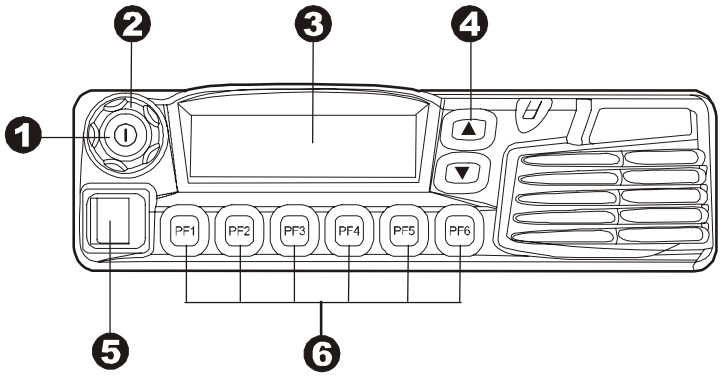
This manual is intended for use by experienced technicians familiar with similar types of communication equipment. It contains all service information required for the equipment and is current as of the publication date.

Precautions

- **Safety Standards**
  - DO NOT operate your radio when someone is either touching or standing within 2 or 3 feet of the antenna, to avoid the possibility of radio frequency burns or related physical injury.
  - DO NOT operate the radio near electrical blasting caps or in an explosive atmosphere.
  - Switch OFF the radio while refueling or parking at gas station.
  - Turn off your radio in any place where posted notices instruct you to do so.
  - DO NOT modify the radio for any reason.
  - DO NOT expose the radio to direct sunlight over a long time, nor place it close to heating source.
  - DO NOT place the radio in excessively dusty, humid areas, nor on unstable surfaces.
  - Refer the service to qualified technicians only.
- **Operation Safety Guidelines**
  - For vehicles equipped with electronic anti-skid braking systems, electronic ignition systems or electronic fuel injection systems, interferences may occur during the radio transmission. If the foregoing electronic equipments are installed on your vehicle, please contact your dealer for further assistance to make sure that the radio transmission will not interfere with these equipments.
  - For radio installation in vehicles fueled by LP gas with LP gas container within interior of the vehicles, the following precautions are recommended for personal safety.
    (1) Any space containing radio equipment shall be isolated by a seal from the space in which the LP gas container and its fittings are located.
    (2) Remote (outside) fitting connections shall be used.
    (3) Good ventilation is required for the container space.
- **Installation Safety Guidelines**
  - Do not mount the mobile radio overhead or on a sidewall unless you take special precautions.
  - If someone were to remove the radio and fail to replace it properly, road shock could bump the radio loose, and the falling radio could, in some circumstances, cause serious injury to the driver or a passenger. In a crash, even when properly installed, the radio could break loose and become a dangerous projectile.

Radio Overview

Front Panel View



① Power

Press the power button to switch the radio on/off.

② Selector Knob

Volume Up/Down, Channel Up/Down, Zone Up/Down features can be programmed to this knob (Set by your dealer).

Turn the knob clockwise to adjust upwards and counter-clockwise to adjust downwards.

③ LCD Display

Please refer to “LCD Display” section.

④ Up/Down Key

Volume Up/Down, Channel Up/Down, Zone Up/Down features can be programmed to the keys (Set by your dealer).

⑤ Microphone Jack

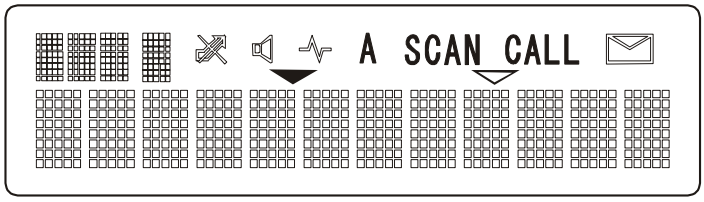
Insert a 6-pin connector into the jack.

⑥ Programmable Function Key (PF1-PF6)

Your dealer can program these keys as shortcuts to various radio features.

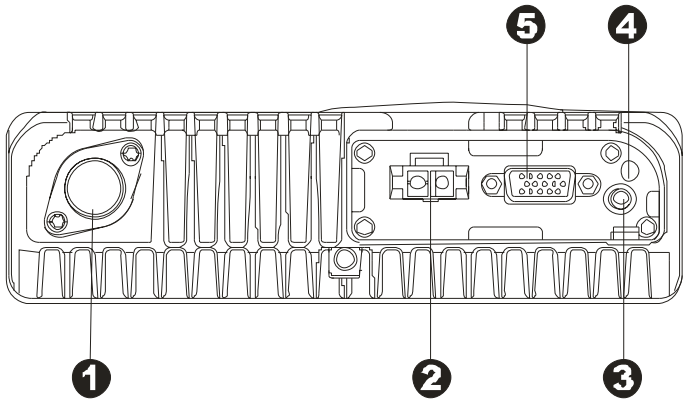
Microphone

LCD Display



Indicator	Description
	1. Display zone / channel number. 2. Display zone / channel label (set by your dealer, up to 12 alphanumeric characters). 3. Display channel Frequency 4. Display the preprogrammed function
	1. Display zone / channel number. 2. Display transmit power level (H, M or L). 3. Display the preprogrammed function.
	Appears when the selected channel is busy.
	Appears when [MONI] key is pressed to disable CTCSS, CDCSS, DTMF or 2-Tone/5-Tone.
	Appears when [MONI] key is pressed to switch the speaker on.
A	1. Indicate second development feature. 2. Appears when the auxiliary port is open.
SCAN	Appears while scanning.
CALL	Appears when transmitting selective call.
	Appears when a new message is received.
	Appears when the selected zone is in the scan list.
	Appears when the selected channel is in the scan list.

Rear Panel View



① Antenna Connector
Used to connect external antenna.

② Power input Connector
Adopt HYT-authorized DC power cable and 13.6 V input AC power.

③ Speaker Jack
Used to connect external speaker and only available for the plug of 3.5 mm.

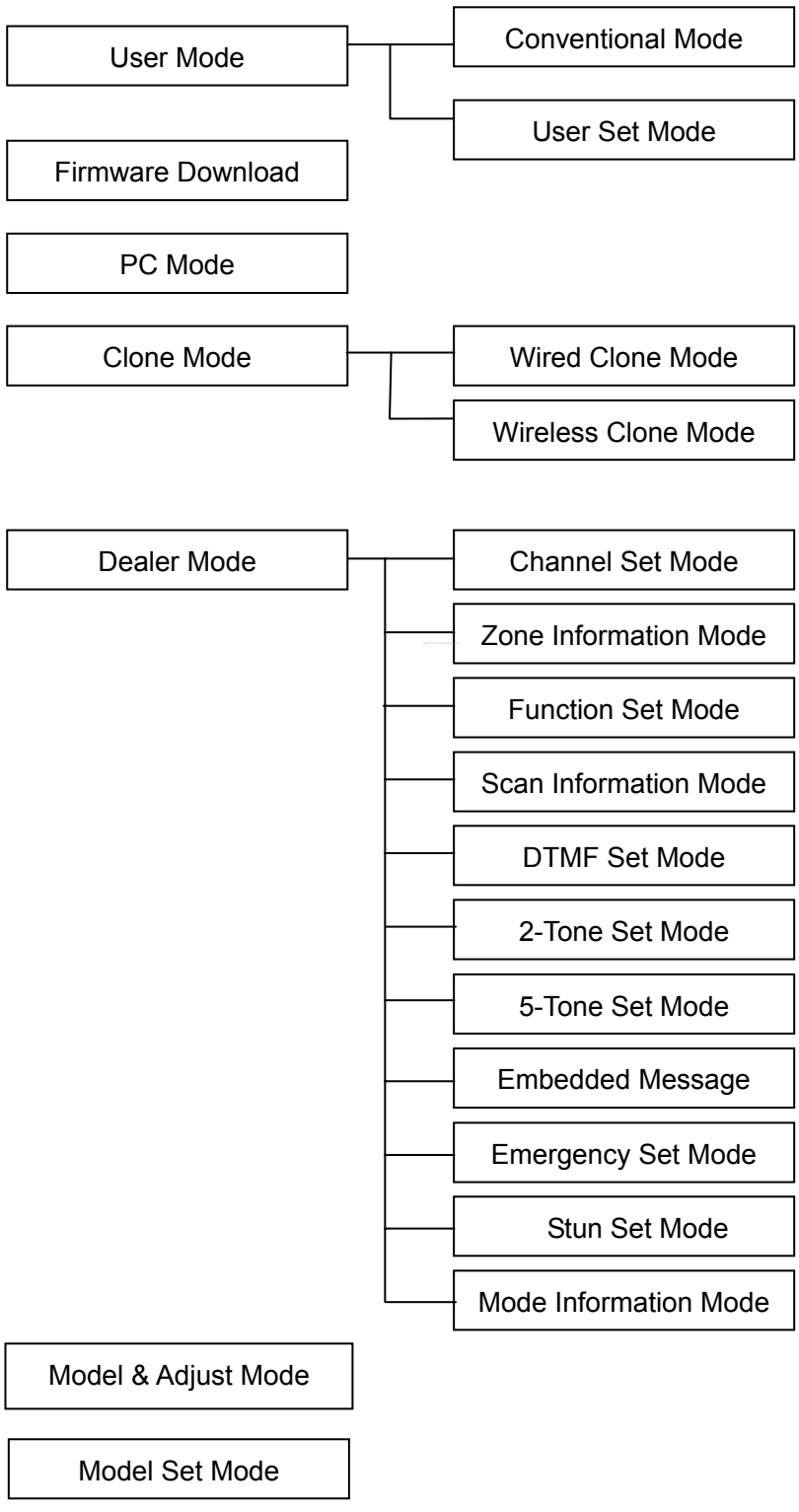
④ GPS Antenna Jack

⑤ 15 Pin Connector (for accessories)

Software Specification

Radio Modes

1. Frame of Radio Modes



2. Keypad Entry for Mode Startup

MODE	Main Menu	Display/Sub Menu	Operation	Remarks
USER MODE	Conventional Mode	----------	Turn on the power to enter Conventional Mode	
	User Set Mode	Function Set	While holding down [PF1] key, turn on the power	
		PowerOn Text		Refer to Appendix 1 “Character Input”
		PWR Password		Power on password set
		Ust Code		
		Key Assign		Programmable Function Key
DEALER MODE	Channel Set Mode	Channel Set	Turn on the power while holding down [PF6] key to enter Dealer Mode, select one of Menu items.	New zone & ch, edit ch
	Zone Information Mode	Zone Inform		Only existing Zone can be edited
	Function Set	Function 1		
		Function 2		
		Tone Volume		
		Alert Tone		
		Aux Inform		
		Data Password		
	Scan Information	Scan Set		
		Zone Scan List		
	DTMF Set Mode	DTMF Encode		
		DTMF Decode		
		Auto Dial List		
		PTT ID		
	2 Tone Set Mode	2Tone Encode		
		2Tone Decode		
		2Tone Option		
	5 Tone Set Mode	Parameter		
		Encode Teleg		
		Encode Frame		
		Encode Option		
		Decode Teleg		
		Decode Option		
	Embedded Message	Embedded Msg1		32 bytes
		Embedded Msg2		32 bytes
		Embedded Msg3		32 bytes
		Embedded Msg4		32 bytes
		Msg Password		Protect Msg
	Emergency set	Emergency Set		
	Stun Set	Stun Inform		
		Stun Password		Password Authentication
	Mode Information	Mode Select		Password Authentication
		Mode Password		

TEST & ADJUST MODE	Test Mode	----------	While holding down [PF2] key, turn on the power	
	ADJUST MODE	----------		
	Model Set Mode	----------		
Firmware Version Display Mode		----------	While holding down [PF3] key, turn on the power	
Firmware Down Load Mode		----------	While holding down [PF4] key, turn on the power	
Wire Clone Mode		----------	While holding down [PF5] key, turn on the power	
PC Mode		----------	Receive commands from PC	

Note:

When power-on password is enabled, you can enter User Mode only after inputting correct password. And if data password is enabled, you can enter Dealer Mode only after inputting correct data password.

You can input password through the keypad and press [#] to clear.

3. User Set Mode

(1) Turn the power on while holding down [PF1], the radio enters User Set Mode after inputting correct power-on password (if Power-On Password is set). The submenus are shown as follows:

Sub Menu	Menu Item
1	Function Set
2	PowerOnText
3	PWR Password
4	UST Code
5	Key Assign

(2) Press [PF6] to enter the selected submenu.

(3) Adjust settings through the Selector Knob.

(4) Press [PF6] to save the change and enter the next item.

(5) Press [Up]/ [Down] to select your desired menu item.

(6) Press [PF1] to return to User Set Mode.

■ Function Set

Select submenu “Function Set”, then press [PF6] to enter Function Set Mode.

No.	Function Name	Settings	Display	Remarks
1	Home Channel	Home Off	Home Off	
		Home 1 On	Home 1 On	
		Home 2 On	Home 2 On	
		Home Both On	Home Both On	
		Zone Home Channel	Home Zone	
2	Home Channel 1	Zone	1	Selector Knob: change a zone/ch
		Channel	Home1 1	[PF5]: toggle between zone and ch
3	Home Channel 2	Zone	1	Selector Knob: change a zone/ch
		Channel	Home2 1	[PF5]: toggle between zone and ch

■ Power On Text

Select submenu “Power OnText”, press [PF6], the power-on text is displayed. Press [PF1] to edit the power-on text.

No.	Function Name	Settings	Display	Remarks
1	Power On Text	None	----------	Refer to Appendix 1 “Character Input” Max.12 characters
		Power on text	HYT MOBILE	

■ Power On Password

Select submenu “PWR Password”, press [PF6], the power-on password is displayed. Press [PF1] to edit the power-on password.

No.	Function Name	Settings	Display	Remarks
1	Power On Password	None	----------	Refer to Appendix 1 “Character Input” Max. 8 digits
		Power on password	88888888	

■ UST Code

Select submenu “UST Code”, press [PF6] to enter UST Code Mode.

No.	Function Name	Settings	Display	Remarks
1	UST Code No.	1-32	UST 1	
			UST 32	
2	UST Code Name	ASCII CODE	Name	
			--------	No input
3	RX Signalling	OFF	R Off	[PF5]: OFF/CTCSS/CDCSS [PF4]: standard/step mode [PF3]: CDCSS/ reverse CDCSS
		CTCSS (EIA standard) 67.0-254.1Hz	R CTCSS 67.0	
			R CTCSS 254.1	
		CTCSS (0.1Hz step) 67.0-254.1Hz	R CTCSS 67.0*	
			R CTCSS 254.1*	
		CDCSS (standard) 023-754	R CDCSS 023N	
			R CDCSS 754N	
		CDCSS (1 step) 000-777	R CDCSS 000N*	
			R CDCSS 777N*	
		CDCSS (standard) 023-754 reverse	R CDCSS 023I	
			R CDCSS 754I	
		CDCSS (1step) 000-777 reverse	R CDCSS 000I*	
			R CDCSS 777I*	

4	TX Signalling	OFF	T Off	[PF5]: Off/CTCSS/CDCSS [PF4]: standard/step mode [PF3]: CDCSS/ reverse CDCSS
		CTCSS (EIA standard) 67.0-254.1Hz	T CTCSS 67.0	
			R CTCSS 254.1	
		CTCSS (0.1Hz step) 67.0-254.1Hz	T CTCSS 67.0*	
			T CTCSS 254.1*	
		CDCSS (standard) 023-754	T CDCSS 023N	
			T CDCSS 754N	
		CDCSS (1step) 000-777	T CDCSS 000N*	
			T CDCSS 777N*	
		CDCSS (standard) 023-754 reverse	T CDCSS 023I	
			T CDCSS 754I	
		CDCSS (1step) 000-777 reverse	T CDCSS 000I*	
			T CDCSS 777I*	
5	END	END	END	Display “END” indicating the end of menu options

■ Key Assignment

Select submenu “Key Assign”, press [PF6] to program the programmable function key PF1-PF6.

No.	Key	Settings	Display	Remarks
1	[PF1]	Off	1 PF1 Off	None
		VOL Up	2 PF1 VOL Up	Volume up
		VOL Down	3 PF1 VOL Down	Volume down
		CH Up	4 PF1 CH Up	Channel up
		CH Down	5 PF1 CH Down	Channel down
		Zone Up	6 PF1 Zone Up	Zone up
		Zone Down	7 PF1 Zone Down	Zone down
		MONI A	8 PF1 MoniA	MONI A: Monitor Unmute-Momentary
		MONI B	9 PF1 MoniB	MONI B: Monitor Unmute-Toggle
		MONI C [Default]	10 PF1 MoniC	MONI C: Carrier Squelch-Momentary
		MONI D	11 PF1 MoniD	MONI D: Carrier Squelch-Toggle
		Display Label	12 PF1 DLabel	Display channel label
		Display Frequency	13 PF1 DFreq	Display frequency
		Display Mode	14 PF1 DMode	Ch No./ch label/zone No./zone label/RX Freq.
		User Selectable Tone	15 PF1 UserTone	Tone 01-32(CTCSS/CDCSS)
		Sel 2Tone	16 PF1 Sel2Tone	Select 2-Tone encode
		Sel 5Tone	17 PF1 Sel5Tone	Select 5-Tone encode
		Tx Power	18 PF1 TxPower	Switch TX power

1	[PF1]	Scan	19 PF1 Scan	Scan
		Add/Del	20 PF1 Add/Del	Add/Del in non-scan mode
				Nuisance channel temp.Del
				Priority ch temp. del
		Reverse	21 PF1 Reverse	Reverse frequency
		Talk Around	22 PF1 TA	Talkaround
		SEL SQL	23 PF1 SelSQL	Select SQL
		Home CH	24 PF1 HomeCH	Home channel
		Public Address	25 PF1 PA	Public address
		Horn Alert	26 PF1 Horn Alert	Horn alert
		LCD BackLight	27 PF1 LCD Light	LCD backlight
		Scrambler	28 PF1 Scramble	Scrambler
		Compander	29 PF1 Compande	Compander
		AUX A	30 PF1 AUX A	AUXA port output control
		AUX B	31 PF1 AUX B	AUXB port output control
		Send GPS	32 PF1 Send GPS	Send GPS
		Emergency Call	33 PF1 Emergency	Emergency call
		Message	34 PF1 Message	Message

2	[PF2]	Off	1 PF2 Off	None
		VOL Up	2 PF2 VOL Up	Volume up
		VOL Down	3 PF2 VOL Down	Volume down
		CH Up	4 PF2 CH Up	Channel up
		CH Down	5 PF2 CH Down	Channel down
		Zone Up	6 PF2 Zone Up	Zone up
		Zone Down	7 PF2 Zone Down	Zone down
		Moni A	8 PF2 MoniA	MONI A
		Moni B	9 PF2 MoniB	MONI B
		Moni C	10 PF2 MoniC	MONI C
		Moni D	11 PF2 MoniD	MONI D
		DisplayLabel	12 PF2 DLabel	Display channel label
		Display Frequency	13 PF2 DFreq	Display frequency
		DisplayMode [Default]	14 PF2 DMode	Ch No./ch label/zone No./zone label/RX Freq.
		User Selectable Tone	15 PF2 UserTone	Tone 01-32(CTCSS/CDCSS)
		Sel 2Tone	16 PF2 Sel2Tone	Select 2-Tone encode
		Sel 5Tone	17 PF2 Sel5Tone	Select 5-Tone encode
		Tx Power	18 PF2 TxPower	Switch TX power
		Scan	19 PF2 Scan	Scan
		Add/Del	20 PF2 Add/Del	Add/Del as not in scan status
				Nuisance channel temp.Del
				Priority ch temp. del

2	[PF2]	Reverse	21 PF2 Reverse	Reverse frequency
		Talk Around	22 PF2 TA	Talkaround
		Sel SQL	23 PF2 SelSQL	Select SQL
		Home CH	24 PF2 HomeCH	Home channel
		Public Address	25 PF2 PA	Public address
		Horn Alert	26 PF2 Horn Alert	Horn alert
		LCD BackLight	27 PF2 LCD Light	LCD backlight
		Scramble	28 PF2 Scramble	Scrambler
		Compander	29 PF2 Compande	Compander
		AUX A	30 PF2 AUX A	AUXA port output control
		AUX B	31 PF2 AUX B	AUXB port output control
		Send GPS	32 PF2 Send GPS	Send GPS
		Emergency Call	33 PF2 Emergency	Emergency call
		Message	34 PF2 Message	Message
3	[PF3]	Off	1 PF3 Off	None
		VOL Up	2 PF3 VOL Up	Volume up
		VOL Down	3 PF3 VOL Down	Volume down
		CH Up	4 PF3 CH Up	Channel up
		CH Down	5 PF3 CH Down	Channel down
		Zone Up	6 PF3 Zone Up	Zone up
		Zone Down	7 PF3 Zone Down	Zone down

3	[PF3]	Moni A	8 PF3 MoniA	MONI A: Monitor Unmute-Momentary
		Moni B	9 PF3 MoniB	MONI B: Monitor Unmute-Toggle
		Moni C	10 PF3 MoniC	MONI C: Carrier Squelch-Momentary
		Moni D	11 PF3 MoniD	MONI D: Carrier Squelch-Toggle
		Display Label	12 PF3 DLabel	Display channel label
		Display Frequency	13 PF3 DFreq	Display frequency
		Display Mode	14 PF3 DMode	Ch No./ch label/zone No./zone label/RX Freq.
		User Selectable Tone	15 PF3 UserTone	Tone 01-32(CTCSS/CDCSS)
		Sel 2Tone	16 PF3 Sel2Tone	Select 2-Tone encode
		Sel 5Tone	17 PF3 Sel5Tone	Select 5-Tone encode
		Tx Power [Default]	18 PF3 TxPower	Switch TX power
		Scan	19 PF3 Scan	Scan
		Add/Del	20 PF3 Add/Del	Add/Del as not in scan status Nuisance channel temp.Del Priority ch temp. del
		Reverse	21 PF3 Reverse	Reverse frequency
		Talk Around	22 PF3 TA	Talkaround
		Sel SQL	23 PF3 SelSQL	Select SQL
		Home CH	24 PF3 HomeCH	Home channel
		Public Address	25 PF3 PA	Public address
		Horn Alert	26 PF3 Horn Alert	Horn alert
		LCD BackLight	27 PF3 LCD Light	LCD backlight

3	[PF3]	Scramble	28 PF3 Scramble	Scrambler
		Compander	29 PF3 Compande	Compander
		AUX A	30 PF3 AUX A	AUXA port output control
		AUX B	31 PF3 AUX B	AUXB port output control
		Send GPS	32 PF3 Send GPS	Send GPS
		Emergency Call	33 PF3 Emergency	Emergency call
		Message	34 PF3 Message	Message
4	[PF4]	Off	1 PF4 Off	None
		VOL Up	2 PF4 VOL Up	Volume up
		VOL Down	3 PF4 VOL Down	Volume down
		CH Up	4 PF4 CH Up	Channel up
		CH Down	5 PF4 CH Down	Channel down
		Zone Up	6 PF4 Zone Up	Zone up
		Zone Down	7 PF4 Zone Down	Zone down
		Moni A	8 PF4 MoniA	MONI A: Monitor Unmute-Momentary
		Moni B	9 PF4 MoniB	MONI B: Monitor Unmute-Toggle
		Moni C	10 PF4 MoniC	MONI C: Carrier Squelch-Momentary
		Moni D	11 PF4 MoniD	MONI D: Carrier Squelch-Toggle
		DispayLabel	12 PF4 DLabel	Display channel label
		Display Frequency	13 PF4 DFreq	Display frequency

4	[PF4]	Display Mode	14 PF4 DMode	Ch No./ch label/zone No./zone label/RX Freq.
		User Selectable Tone	15 PF4 UserTone	Tone 01-32(CTCSS/CDCSS)
		Sel 2Tone	16 PF4 Sel2Tone	Select 2-Tone encode
		Sel 5Tone	17 PF4 Sel5Tone	Select 5-Tone encode
		Tx Power	18 PF4 TxPower	Switch TX power
		Scan [Default]	19 PF4 Scan	Scan
		Add/Del	20 PF4 Add/Del	Add/Del as not in scan status
				Nuisance channel temp.Del
				Priority ch temp. del
		Reverse	21 PF4 Reverse	Reverse frequency
		Talk Around	22 PF4 TA	Talkaround
		Sel SQL	23 PF4 SelSQL	Select SQL
		Home CH	24 PF4 HomeCH	Home channel
		Public Address	25 PF4 PA	Public address
		Horn Alert	26 PF4 Horn Alert	Horn alert
		LCD BackLight	27 PF4 LCD Light	LCD backlight
		Scramble	28 PF4 Scramble	Scrambler
		Compander	29 PF4 Compande	Compander
		AUX A	30 PF4 AUX A	AUXA port output control
		AUX B	31 PF4 AUX B	AUXB port output control
		Send GPS	32 PF4 Send GPS	Send GPS
		Emergency Call	33 PF4 Emergency	Emergency call
		Message	34 PF4 Message	Message

5	[PF5]	Off	1 PF5 Off	None
		VOL Up	2 PF5 VOL Up	Volume up
		VOL Down	3 PF5 VOL Down	Volume down
		CH Up	4 PF5 CH Up	Channel up
		CH Down	5 PF5 CH Down	Channel down
		Zone Up	6 PF5 Zone Up	Zone up
		Zone Down [Default]	7 PF5 Zone Down	Zone down
		Moni A	8 PF5 MoniA	MONI A: Monitor Unmute-Momentary
		Moni B	9 PF5 MoniB	MONI B: Monitor Unmute-Toggle
		Moni C	10 PF5 MoniC	MONI C: Carrier Squelch-Momentary
		Moni D	11 PF5 MoniD	MONI D: Carrier Squelch-Toggle
		Display Label	12 PF5 DLabel	Display channel label
		Display Frequency	13 PF5 DFreq	Display frequency
		Display Mode	14 PF5 DMode	Ch No./ch label/zone No./zone label/RX Freq.
		User Selectable Tone	15 PF5 UserTone	Tone 01-32(CTCSS/CDCSS)
		Sel 2Tone	16 PF5 Sel2Tone	Select 2-Tone encode
		Sel 5Tone	17 PF5 Sel5Tone	Select 5-Tone encode
		Tx Power	18 PF5 TxPower	Switch TX power
		Scan	19 PF5 Scan	Scan
		Add/Del	20 PF5 Add/Del	Add/Del as not in scan status
				Nuisance channel temp.Del
				Priority ch temp. del

5	[PF5]	Reverse	21 PF5 Reverse	Reverse frequency
		Talk Around	22 PF5 TA	Talkaround
		Sel SQL	23 PF5 SelSQL	Select SQL
		Home CH	24 PF5 HomeCH	Home channel
		Public Address	25 PF5 PA	Public address
		Horn Alert	26 PF5 Horn Alert	Horn alert
		LCD BackLight	27 PF5 LCD Light	LCD backlight
		Scramble	28 PF5 Scramble	Scrambler
		Compander	29 PF5 Compande	Compander
		AUX A	30 PF5 AUX A	AUXA port output control
		AUX B	31 PF5 AUX B	AUXB port output control
		Send GPS	32 PF5 Send GPS	Send GPS
		Emergency Call	33 PF5 Emergency	Emergency call
		Message	34 PF5 Message	Message
6	[PF6]	Off	1 PF6 Off	None
		VOL Up	2 PF6 VOL Up	Volume up
		VOL Down	3 PF6 VOL Down	Volume down
		CH Up	4 PF6 CH Up	Channel up
		CH Down	5 PF6 CH Down	Channel down
		Zone Up [Default]	6 PF6 Zone Up	Zone up
		Zone Down	7 PF6 Zone Down	Zone down

6	[PF6]	Moni A	8 PF6 MoniA	MONI A: Monitor Unmute-Momentary
		Moni B	9 PF6 MoniB	MONI B: Monitor Unmute-Toggle
		Moni C	10 PF6 MoniC	MONI C: Carrier Squelch-Momentary
		Moni D	11 PF6 MoniD	MONI D: Carrier Squelch-Toggle
		Display Label	12 PF6 DLabel	Display channel label
		Display Frequency	13 PF6 DFreq	Display frequency
		Display Mode	14 PF6 DMode	Ch No./ch label/zone No./zone label/RX Freq.
		User Selectable Tone	15 PF6 UserTone	Tone 01-32 (CTCSS/CDCSS)
		Sel 2Tone	16 PF6 Sel2Tone	Select 2-Tone encode
		Sel 5Tone	17 PF6 Sel5Tone	Select 5-Tone encode
		Tx Power	18 PF6 TxPower	Switch TX power
		Scan	19 PF6 Scan	Scan
		Add/Del	20 PF6 Add/Del	Add/Del as not in scan status
				Nuisance channel temp.Del
				Priority ch temp. del
		Reverse	21 PF6 Reverse	Reverse frequency
		Talk Around	22 PF6 TA	Talkaround
		Sel SQL	23 PF6 SelSQL	Select SQL
		Home CH	24 PF6 HomeCH	Home channel
		Public Address	25 PF6 PA	Public address
		Horn Alert	26 PF6 Horn Alert	Horn alert
		LCD BackLight	27 PF6 LCD Light	LCD backlight

6	[PF6]	Scramble	28 PF6 Scramble	Scrambler
		Compander	29 PF6 Compande	Compander
		AUX A	30 PF6 AUX A	AUXA port output control
		AUX B	31 PF6 AUX B	AUXB port output control
		Send GPS	32 PF6 Send GPS	Send GPS
		Emergency Call	33 PF6 Emergency	Emergency call
		Message	34 PF6 Message	Message
7	[SELECTOR KNOB]	Volume Knob [Default]	Volume Knob	Volume knob
		Channel Knob	Channel Knob	Channel selector knob
		Zone Knob	Zone Knob	Zone selector knob
8	[Up/Down]	Volume Up/Down	Volume UpDn	Volume knob
		Channel Up/Down [Default]	Channel UpDn	Channel selector knob
		Zone Up/Down	Zone UpDn	Zone selector knob
9	END	END	END	Display “END” indicating the end of menu option

Note: In User Set Mode, turn the power off and back on to enter the Conventional Mode.

4. Firmware Download Mode

The built-in FLASHROM enables user to add new functions simply by upgrading.

(1) Turn on the power while holding down [PF4] simultaneously to enter Firmware Download Mode, “PC Program” appears on the LCD.

(2) Run the programming software.

(3) Connect the radio with a PC by programming cable.

(4) Select the corresponding COM port, then click “Download”.

(5) When data is successfully written into the radio, click “OK” to exit.

(6) Repeat step 1-5 to program another radio.

Note: The radio can’t enter the Firmware Download Mode if it is prohibited by your dealer.

It can be set ON only after being programmed through the programming software or by your dealer.

5. Firmware Version Display Mode

Turn the power on while holding down [PF3] to enter Firmware Version Display Mode.
Firmware version and Firmware checksum will be displayed on the LCD.
Release [PF3] to enter User Mode.

6. PC Mode

Connect the radio with a PC by programming cable. If data is written to the radio from PC, it can be programmed into the FLASH. Data programming is accessible by programming software.

(1) When data is written to the radio from PC, “PROGRAMMING” appears on the LCD. LED glows green when data is written to the radio and red when data is read from the radio. Radio will restart automatically when programming is completed.

(2) The following parameters can be set through the programming software.

- Frequency stability
- High power
- Middle power
- Low power
- Maximum frequency deviation
- CDCSS balance
- CTCSS deviation
- CDCSS deviation
- DTMF deviation
- MSK deviation
- Single Tone deviation
- RX sensitivity
- Squelch Level 9
- Squelch Level 3

7. Clone Mode

Data can be transferred from radio to radio either by wired cloning or wireless cloning.

■ Wired Clone Mode

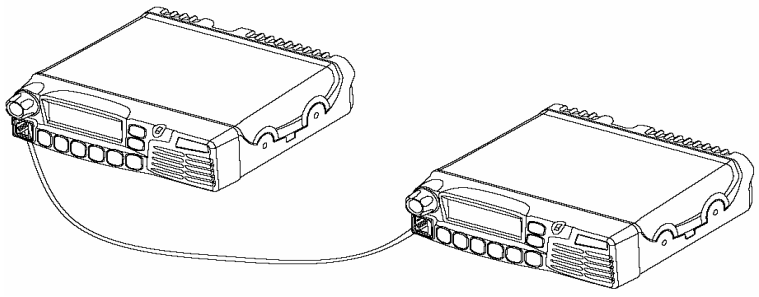
(1) Turn on the source radio while holding down [PF5] simultaneously, the radio enters Clone Mode with “CLONE” on the LCD, or enters User Mode if Clone Mode is set OFF by your dealer.

(2) Press [PF2] to toggle between Dealer Clone and Factory Clone Mode. “Dealer Clone” or “Factory Clone” appears on the display when the corresponding mode is selected. The radio returns to original display mode in 5 seconds.
Unlike Factory Clone Mode, adjustment settings and embedded messages are not covered in Dealer Clone Mode.
Dealer Clone Mode is the default mode.

(3) Connect the two radios by clone cable, then turn on the target radio.

(4) Press [PF6] to start cloning, the LED of source radio glows red and that of target radio glows green during cloning. “PROGRAMMING” is also displayed on the target radio. “END” appears on the source radio when cloning is completed and appears on the target radio when all data is received.

(5) Press [PF6] to return to Clone Mode. “CLONE” appears on the source radio. Repeat the above steps to continue wired cloning.



Note: Only the same models can be cloned together.

Wireless Clone Mode

(1) Turn on the source radio while holding down [PF5] simultaneously, the radio enters Clone Mode with “CLONE” on the LCD, or enters User Mode if Clone Mode is set OFF by your dealer.

(2) Press [PF1], the radio enters Wireless Clone Mode with “WIRELESS” on the LCD. The initial frequency that matches the destination is displayed in 2 seconds. Turn the Selector Knob to choose desired frequency. Press [PF1] again to return to Clone Mode.

(3) Press [PF2] to toggle between Dealer Clone and Factory Clone Mode. “Dealer Clone” or “Factory Clone” appears on the display when the corresponding mode is selected. The radio returns to original display mode in 5 seconds.
Unlike Factory Clone Mode, adjustment settings and embedded messages are not covered in Dealer Clone Mode.
Dealer Clone Mode is the default mode.

(4) Repeat step1-2 to operate the target radio, the frequency is set the same as that of source radio.

(5) Press [PF6] to start wireless cloning. The LED of source radio glows red and that of target radio glows green during cloning. “CLONE 00%” is displayed on both source and target radios. “BUSY” mark also appears on the target radio. The leftmost 2 digits (00) on the LCD show the data transfer rate and count upwards in increments of 1 as data transmission/reception proceeds.

(6) When data transmission is completed, “END” appears on the source radio and red LED goes out. Press [PF1], the source radio displays the frequency, repeat the above steps to continue wireless cloning. When all data is received, “END” is displayed on the target radio.

Note: Clone Mode can be enabled/disabled by your dealer. Wired cloning is accessible only when Clone Mode is enabled. Refer to “Clone Mode” in “Mode Information” of “Dealer Mode”.

8. Dealer Mode

(1) Turn the power on while holding down [PF6], the radio enters Dealer Mode after inputting correct data password (if Data Password is set). The first mode option that is activated is displayed.
When all mode options are prohibited, the radio enters Mode Information Mode after a correct mode-info password (if mode-info Password is set) is entered.
Turn the Selector Knob to select one of the following mode options:

No.	Dealer Mode Option	LCD Display
1	Channel Set Mode	Channel Set
2	Zone Information Mode	Zone Inform
3	Function Set Mode	Function Set
4	Scan Information Mode	Scan Inform
5	DTMF Set Mode	DTMF Set
6	2-Tone Set Mode	2-Tone Set
7	5-Tone Set Mode	5-Tone Set
8	Embedded Message	EmbeddedMsg
9	Emergency Set Mode	EmergencySet
10	Stun Set Mode	Stun Inform
11	Mode Information	Mode Inform

(2) Press [PF6] to enter the selected dealer mode option, and then operate as follows:
- Turn the Selector Knob to adjust the setting.
- Press [PF6] to save the selected settings and goes to the next mode option.
- Press [Up]/[Down] to select upwards/downwards. The current setting displayed on the LCD will not be saved.
- Press [PF1] to return to the first mode option or Dealer Mode.

Dealer Mode 1: Channel Set

Select menu “Channel Set”, then press [PF6] to enter Channel Set Mode.

No.	Function Name	Settings	Display	Remarks
1	Zone Channel	Channel 1-256 Step 1	1 CH 1	Selector Knob: change a channel or zone (default: ch) [PF5]: toggle between channel and zone
			1 CH 256	
		Zone 1-256 Step 1	1 CH 1	
			256	
			CH 1	
2	RX Frequency	2.5K/5.0K/6.25K/1M 100.0000-550.0000MHz	250 0 R 100.00000	Selector Knob: change at step frequency [PF4]: 2.5K/5.0K/6.25K/1M step Step 2.5K: only for TM800 VHF(<200MHz)
			500 0 R 400.00000	
			625 0 R 400.00000 1M R 550.00000	
		Blank	----------	[PF5]: On/Blank
3	RX Signalling	OFF	R Off	[PF5]: Off/CTCSS/CDCSS [PF4]: standard/step mode [PF3]: CDCSS /reverse CDCSS
		CTCSS (EIA standard) 67.0-254.1Hz	R CTCSS 67.0	
			R CTCSS 254.1	
		CTCSS (0.1Hz step) 67.0-254.1Hz	R CTCSS 67.0*	
			R CTCSS 254.1*	
		CDCSS (standard) 023-754	R CDCSS 023N	
			R CDCSS 754N	
		CDCSS (1 step) 000-777	R CDCSS 000N*	
			R CDCSS 777N*	

3	RX Signalling	CDCSS (standard) 023-754 reverse	R CDCSS 023I	
			R CDCSS 754I	
		CDCSS (1 step) 000-777 reverse	R CDCSS 000I*	
			R CDCSS 777I*	
4	TX Frequency	2.5K/5.0K/6.25K/1M 100.0000-550.0000MHz	250 0 T 100.00000	Selector Knob: change at step frequency [PF4]: 2.5K/5.0K/6.25K/1M step Step 2.5K: only for TM800 VHF(<200MHz)
			500 0 T 400.00000	
			625 0 T 400.00000	
			1M T 550.00000	
		Blank	----------	[PF5]: On/Blank
5	TX Signalling	OFF	T Off	[PF5]: Off/CTCSS/CDCSS [PF4]: standard/step mode [PF3]: CDCSS / reverse CDCSS
		CTCSS (EIA standard) 67.0-254.1Hz	T CTCSS 67.0	
			T CTCSS 254.1	
		CTCSS (0.1Hz step) 67.0-254.1Hz	T CTCSS 67.0*	
			T CTCSS 254.1*	
		CDCSS (standard) 023-754	T CDCSS 023N	
			T CDCSS 754N	
		CDCSS (1 step) 000-777	T CDCSS 000N*	
			T CDCSS 777N*	
		CDCSS (standard) 023-754 reverse	T CDCSS 023I	
			T CDCSS 754I	
		CDCSS (1 step) 000-777 reverse	T CDCSS 000I*	
			T CDCSS 777I*	

6	Optional Signalling	Off	Option Off	Default
		DTMF	DTMF	
		2-Tone	2 Tone	
		5-Tone	5 Tone	
		HDC2400™	HDC2400	
		HDC1200	HDC1200	
7	BCL (Busy Channel Lockout)	Off	BCL	Default
			Off	
		CTCSS/CDCSS	BCL	
			CTCSS/CDCSS	
		Opt Signalling	BCL	
			Opt Signal	
		Carrier Only	BCL	
			Carrier Only	
8	Clock Shift	Off	Shift Off	Default
		On	Shift On	
9	TX Power	High	TXPower HI	
		Middle	TXPower MI	
		Low	TXPower LO	Default
10	Wideband / Narrowband	Wide	Wide Band	Default
		Narrow	Narrow Band	
11	Scan ADD/DEL	Delete	Scan Del	
		Add	Scan Add	Default
12	Compander	Off	Compand Off	
		On	Compand On	
13	Scrambler	Off	Scramble Off	Default
		On	Scramble On	
14	PTT ID	Off	PTTID Off	
		PTT ID 1	PTT ID 1	
		PTT ID 2	PTT ID 2	
		PTT ID 3	PTT ID 3	
		PTT ID 4	PTT ID 4	
		5-Tone	5Tone	

15	Channel Name	PHILLPOTTS	Name PHILLPOTTS	12 characters maximum Current input position is indicated by cursor Refer to Appendix 1 “Character Input”
		----------	Name ----------	
16	2-Tone Decode	None	2T Decode None	Appears when 2-Tone is selected Default: None
		2-ToneDecode 1-8	2T Decode 1	
			2T Decode 8	
	5-Tone Rx Address	5-Tone Rx Address	5TRx Address 12345	Appears when 5-Tone is selected User-defined
	HDC2400™	None	None	Default: None Appears when HDC2400™ is selected
		HDC2400™ Call 1-8	List 1 List 8	
17	5-Tone Tx Address	5-Tone Tx Address	5TTx Address23456	Appears when 5-Tone is selected User-defined
	HDC2400™ Call 2	None	None	Default: None Appears when HDC2400™ is selected
		HDC2400™ Call 1-8	List 1 List 8	
18	5-Tone Parameter	5-Tone Parameter 1-16	5T Parameter 1	Appears when 5-Tone is selected Default: Parameter 1
			5T Parameter 16	
19	END	END	END	

Dealer Mode 2: Zone Information

Select menu “Zone Inform”, then press [PF6] to enter Zone Set Mode.

No.	Function	Setting	Display	Remarks
1	Zone Select	100	Zone 100	Selector Knob: select a zone Only existing zone can be set.
2	Zone Name		Name	
			PHILLPOTTS	12 characters maximum
			Name	Current input position is indicated by cursor
			----------	Refer to Appendix 1 ‘Character Input”
3	Data Transmission (Zone-CH)	Channel 1-256 Step 1	1 CH 1	Selector Knob: change a channel or zone (default ch)
			1 CH 256	
		Zone 1-256 Step 1	1 CH 1	[PF5]: toggle between channel and zone
			256 CH 1	
4	Multi-Scan Scan Add/Del	ADD	MultiLst Add	Add/del to multi-scan list Only for multi-scan
		DEL	MultiLst Del	
5	TOT	Off 15~1200s	TOT Off	
			TOT 15	15s/1Step
			TOT 180	Default
			TOT 1200	
6	TOT PreAlert Time	Off 1-10s	TOT PreAlert Off	Default
			TOT PreAlert 1	1s/1Step
			TOT PreAlert 10	
7	TOT Rekey Time	Off 1-60s	TOT Rekey Off	Default
			TOT ReKey 1	1s/1Step
			TOT ReKey 60	

8	TOT Reset Time	Off 1-15s	TOT Reset Off	Default
			TOT Reset 1	1s/1Step
			TOT Reset 15	
9	Signalling Control	Or	Signal OR	Default
		And	Signal AND	
10	ClearToTranspond	On	CLR Transpond On	
				Default
		Off	CLR TranspondOff	
11	Zone Home Channel	1-256	Home Channel 1	Default
			Home Channel 256	
12	END	END	END	Display “END” indicating the end of menu option

Dealer Mode 3: Function Set

Select menu “Function Set”, then press [PF6] to enter Function Set Mode. The menu options are shown as follows:

Sub Menu	Menu Item
3.1	Function 1
3.2	Function 2
3.3	Tone Volume
3.4	Alert Tone
3.5	Aux Inform
3.6	DataPassword

1. Select submenu “Function 1”, then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	Squelch Level	0-9	SQL 0	Step: 1
			SQL 5	Default
			SQL 9	
2	Off Hook Decode	Not decode	Off HookNoDecode	Not decode ctcss/cdtcc during off hook status, it works as carrier squelch
		Decode	Off Hook Decode	Decode ctcss/cdtcc during off hook status
3	Off Hook Horn Alert	Off	Off Hook No HA	Horn alert is not available when off hook
		On	Off Hook HA	Horn alert is available when off hook
4	PTT Release Tone	Off	PTT RL Tone Off	
		On	PTT RL Tone On	
5	Busy LED	Off	BusyLED Off	
		On	BusyLED On	
6	UST BackUp	Off	USTBackUpOff	UST RX/TX signalling setting
		On	USTBackUp On	
7	Scrambler BackUp	Off	ScramBak Off	Scrambler setting BackUp to current channel
		On	ScramBak On	
8	Compand BackUp	Off	CompdBak Off	Compand setting backUp to current channel
		On	CompdBak On	
9	Horn Alert BackUp	Off	HABackUp Off	The Horn Alert on status is memorized. The Horn Alert on status is cleared when the radio is turned off.
		On	HABackUp On	
10	BCL Override	Off	BCL Override Off	To transmit in Busy Channel Lockout mode, press [PTT] again within approx. 500ms after [PTT] is released
		On	BCL Override On	

11	Roll Over	Off	RollOver Off	Display rolls over as over 12 characters
		On	RollOver On	
12	END	END	END	Display “END” indicating the end of menu options

2. Select submenu “Function 2”, then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	Sub LCD Display	Off CH Number Zone Number	SUB LCD ZoneNum	
			SUB LCD Off	
			SUB LCD ChNum	
2	Main LCD Display	CH Number	SUB LCD ChNum	
		CH Name	Main Ch Name	
		Zone Number	Main Zone Number	
		Zone Name	Main Zone Name	
		CH Frequency	Main Frequency	RX frequency is displayed in receive mode and TX frequency in transmit mode
3	Icon Display	None	Icon None	No Display
		Tx Power	Icon Tx Power	Display Tx power: H, M, L
		Aux	Icon AuxFunction	Aux function: D(data),G(GPS) A(Aux Out A=High), B(Aux Out B=High)
4	Horn Alert Logic	Until Reset	HA Until Reset	Continuous low (logic level) output until Option Signalling is reset.
		Pulse	HA Pulse	The Horn Alert port is activated 1s, inactivated 500ms, activated 1s in sequence.
		1-30s step 1s	HA 1 second	Continuous low (logic level) output until the selected time has expired.
			HA 30 seconds	

5	Ignition Sense	Off	Ignition Off	
		On	Ignition On	
6	Ignition Sense Power off Timer	00-59Min Step 1Min	IGN 00Hour 00Min	Adjust timer: 0Hour, 0Min-24Hour, 00Min PF5: 1MIN/1HOUR step change
			IGN 00Hour 59Min	
		00-24Hour Step 1Hour	IGN 00Hour 00Min	
			IGN 24Hour 00Min	
7	END	END	END	Display “END” indicating the end of menu option

3. Select submenu “Tone Volume”, then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	Power-Up Tone Volume	Off	Tone PowerUp Off	
		User Current	Tone PowerUp User	Use Current volume setting
		1-127	Tone PowerUp 1	Default: 1
2	Control Tone Volume	Off	Tone Control Off	
		User Current	Tone Control User	Use Current volume setting
		1-127	Tone Control 2	Default: 2
3	Alert Tone Volume	Off	Tone AlertOff	
		User Current	Tone Alert User	Use Current volume setting
		1-127	Tone Alert 3	Default: 3
4	Warning Tone Volume	Off	Tone Warning Off	
		User Current	Tone Warning User	Use Current volume setting
		1-127	Tone Warning 4	Default: 4

5	Volume Min	Off	VolumeMinOff	
		1-64 Step 1	VolumeMin 1	
			VolumeMin 64	
6	Volume Max	64-127 Step 1	VolumeMin 64	
			VolumeMin 127	
7	END	END	END	Display “END” indicating the end of menu option

4. Select submenu “Alert Tone”, then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	Alert Tone No.	Alert Tone 1-8	Alert Tone 1	
			Alert Tone 8	
2	Cycle	Continuous	Continuous	
		Cycle 0-255S Step 1	Cycle 0S	
			Cycle 255S	
3	Interval	0-255ms	Interv 1ms	
		Step 1ms	Interv 255ms	
4	Tone Frequency No. 1-14 Step 1	Off	Freq No.1 ----	
		400-2550Hz Step 10Hz	Freq No.1 400Hz	
			Freq No.1 2550Hz	
		Off	Freq No.14 ----	
		400-2550Hz Step 10Hz	Freq No.14 400Hz	
			Freq No.14 2550Hz	

5	Tone Duration No. 1-14 Step 1	0-2550ms Step 10ms	Dura No.1 0ms	
			Dura No.1 2550ms	
		0-2550ms Step 10ms	Dura No.14 0ms	
			Dura No.14 2550ms	
6	END	END	END	Display “END” indicating the end of menu option

5. Select submenu “AUX Inform”, then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	UART0	None	UART 0 None	
		Data	UART 0 Data	
2	UART1	None Data	UART 1 None	
			UART 1 Data	
		GPS SmarTrunk	UART 1 GPS	
			UART 1 SmarTrunk	

No.	Function	Setting	Display	Remarks
3	AUX1	None	AUX 1 None	
		External PTT	AUX 1 External PTT	Input
		Data PTT	AUX 1 Data PTT	Input
		Speaker Mute	AUX 1 Speaker Mute	Input
		External Monitor	AUX 1 External Moni	Input
		Up Key	AUX 1 Up Key	Input
		Down Key	AUX 1 Down Key	Input
		External Hook	AUX 1 External Hook	Input
		Emergency	AUX 1 Emergency	Input
		Mic Mute	AUX 1 Mic Mute	Input
		RxCarrier	AUX 1 RxCarrier	Output, L: Carrier; H : No carrier
		RxTone	AUX 1 RxTone	Output, L: CTCSS/CDCSS match
		AUX A	AUX 1 AUX A	Output controlled by [AUX A] key
		AUX B	AUX 1 AUX B	Output controlled by [AUX B] key

No.	Function	Setting	Display	Remarks
4	AUX2	None	AUX 2 None	
		External PTT	AUX 2 External PTT	Input
		Data PTT	AUX 1 Data PTT	Input
		Speaker Mute	AUX 2 Speaker Mute	Input
		External Monitor	AUX 2 External Moni	Input
		Up Key	AUX 2 Up Key	Input
		Down Key	AUX 2 Down Key	Input
		External Hook	AUX 2 External Hook	Input
		Emergency	AUX 2 Emergency	Input
		Mic Mute	AUX 2 Mic Mute	Input
		RxCarrier	AUX 2 RxCarrier	Output, L: Carrier; H : No carrier
		RxTone	AUX 2 RxTone	Output, L: CTCSS/CDCSS match
		AUX A	AUX 2 AUX A	Output controlled by [AUX A] key
		AUX B	AUX 2 AUX B	Output controlled by [AUX B] key

No.	Function	Setting	Display	Remarks
5	AUX3	None	AUX 3 None	
		External PTT	AUX 3 External PTT	Input
		Data PTT	AUX 1 Data PTT	Input
		Speaker Mute	AUX 3 Speaker Mute	Input
		External Monitor	AUX 3 External Moni	Input
		Up Key	AUX 3 Up Key	Input
		Down Key	AUX 3 Down Key	Input
		External Hook	AUX 3 External Hook	Input
		Emergency	AUX 3 Emergency	Input
		Mic Mute	AUX 3 Mic Mute	Input
		RxCarrier	AUX 3 RxCarrier	Output, L: Carrier; H : No carrier
		RxTone	AUX 3 RxTone	Output, L: CTCSS/CDCSS match
		AUX A	AUX 3 AUX A	Output controlled by [AUX A] key
		AUX B	AUX 3 AUX B	Output controlled by [AUX B] key

No.	Function	Setting	Display	Remarks
6	AUX4	None	AUX 4 None	
		External PTT	AUX 4 External PTT	Input
		Data PTT	AUX 1 Data PTT	Input
		Speaker Mute	AUX 4 Speaker Mute	Input
		External Monitor	AUX 4 External Moni	Input
		Up Key	AUX 4 Up Key	Input
		Down Key	AUX 4 Down Key	Input
		External Hook	AUX 4 External Hook	Input
		Emergency	AUX 4 Emergency	Input
		Mic Mute	AUX 4 Mic Mute	Input
		RxCarrier	AUX 4 RxCarrier	Output, L: Carrier; H : No carrier
		RxTone	AUX 4 RxTone	Output, L: CTCSS/CDCSS match
		AUX A	AUX 4 AUX A	Output controlled by [AUX A] key
		AUX B	AUX 4 AUX B	Output controlled by [AUX B] key

No.	Function	Setting	Display	Remarks
7	AUX5	None	AUX 5 None	
		External PTT	AUX 5 External PTT	Input
		Data PTT	AUX 5 Data PTT	Input
		Speaker Mute	AUX 5 Speaker Mute	Input
		External Monitor	AUX 5 External Moni	Input
		Up Key	AUX 5 Up Key	Input
		Down Key	AUX 5 Down Key	Input
		External Hook	AUX 5 External Hook	Input
		Emergency	AUX 5 Emergency	Input
		Mic Mute	AUX 5 Mic Mute	Input
		RxCarrier	AUX 5 RxCarrier	Output, L: Carrier; H : No carrier
		RxTone	AUX 5 RxTone	Output, L: CTCSS/CDCSS match
		AUX A	AUX 5 AUX A	Output controlled by [AUX A] key
		AUX B	AUX 5 AUX B	Output controlled by [AUX B] key

No.	Function	Setting	Display	Remarks
8	AUX6	None	AUX 6 None	
		External PTT	AUX 6 External PTT	Input
		Data PTT	AUX 1 Data PTT	Input
		Speaker Mute	AUX 6 Speaker Mute	Input
		External Monitor	AUX 6 External Moni	Input
		Up Key	AUX 6 Up Key	Input
		Down Key	AUX 6 Down Key	Input
		External Hook	AUX 6 External Hook	Input
		Emergency	AUX 6 Emergency	Input
		Mic Mute	AUX 6 Mic Mute	Input
		RxCarrier	AUX 6 RxCarrier	Output, L: Carrier; H : No carrier
		RxTone	AUX 6 RxTone	Output, L: CTCSS/CDCSS match
		AUX A	AUX 6 AUX A	Output controlled by [AUX A] key
		AUX B	AUX 6 AUX B	Output controlled by [AUX B] key

No.	Function	Setting	Display	Remarks
9	AUX7	None	AUX 7 None	
		External PTT	AUX 7 External PTT	Input
		Data PTT	AUX 1 Data PTT	Input
		Speaker Mute	AUX 7 Speaker Mute	Input
		External Monitor	AUX 7 External Moni	Input
		Up Key	AUX 7 Up Key	Input
		Down Key	AUX 7 Down Key	Input
		External Hook	AUX 7 External Hook	Input
		Emergency	AUX 7 Emergency	Input
		Mic Mute	AUX 7 Mic Mute	Input
		RxCarrier	AUX 7 RxCarrier	Output, L: Carrier; H : No carrier
		RxTone	AUX 7 RxTone	Output, L: CTCSS/CDCSS match
		AUX A	AUX 7 AUX A	Output controlled by [AUX A] key
		AUX B	AUX 7 AUX B	Output controlled by [AUX B] key
10	END	END	END	Display “END” to indicate the end of menu option

6. Select submenu “DataPassword”, then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	Data Password	88888888	88888888	Default data, max. 8 Digital
		12345678	12345678	Refer to Appendix 1 ‘Character Input”
		Blank	----------	

Dealer Mode 4: Scan Information

Select menu “Scan Inform”, then press [PF6] to enter Scan Information Mode. The menu options are shown as follows:

Sub Menu	Menu Item
4.1	Scan Set
4.2	ZoneScanList

1. Select submenu “Scan Set”, then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	Scan Type	Single Zone Scan	Scan Single Zone	Scan the added channel of the current zone
		Multi-Zone Scan	Scan Multi Zone	Scan the added channel of zones in multi-scan list
		List Zone Scan	Scan List Zone	Scan the added channel of zones in current zone scan list
2	Scan Restart	Time Operated	Scan Time OP	
		Carrier Operated	Scan Carrier OP	
3	Priority Scan1	Off	PRI 1 Off	Default
		Fixed	PRI 1 Fixed	Dealer mode set
		Selected	PRI 1 Selected	Always Set current CH as priority CH
		Operator Select	PRI 1 Operator Sel	Set current CH as priority CH by key operation (hold [scan], press [MONI] 3 times
4	Priority Scan 2	Off	PRI 2 Off	Default
		Fixed	PRI 2 Fixed	Dealer mode set
		Selected	PRI 2 Selected	Always Set current CH as priority CH
		Operator Select	PRI 2 Operator Sel	Set current CH as priority CH by key operation (hold [scan], press [MONI] 3 times

5	Priority Channel1	Off	PRICH1 Off	Ch: Off, 1-256
		Zone	1	Selector Knob: change a channel or zone (default CH)
		Channel	PRICH1 1	[PF5]: channel/zone [PF4]: Priority CH On/Off
6	Priority Channel 2	Off	PRICH2 Off	Ch: Off,1-256
		Zone	1	Selector Knob: change a channel or zone (default CH)
		Channel	PRICH2 1	[PF5]: channel/zone [PF4]: Priority CH On/Off
7	Priority Ch Temporary Add/Del	Both Off	PrioBoth Off	
		Priority 1 On	Priority 1 On	
		Priority 2 On	Priority 2 On	
		Both On	Prio Both On	
8	Priority Ch detect	CTC/DCS Off	Prio CTC/DCS Off	Detect carrier only at priority channel
	CTCSS/CDCSS	CTC/DCS On	Prio CTC/DCS On	Carrier and Signal at priority channel
9	Look Back A	2.0s	Scan LBTimeA 2.0S	The time period that radio returns to a priority channel from a normal channel when no carrier is being received on the priority channel.
		0.5-5s	Scan LBTimeA 0.5S	
		0.1s/1Step	Scan LBTimeA 5.0S	
10	Look Back B	2.0s	Scan LBTimeB 2.0S	The time period that radio returns to a priority channel from a normal channel when signal is present on priority channel but not matching its signalling.
		0.5-5s	Scan LBTimeB 0.5S	
		0.1s/1Step	Scan LBTimeB 5.0S	

11	Revert Channel	Last used (RX)	Scan Revert Call	Default
		Last used (TX)	Scan Revert Used	
		Selected	Scan Revert SEL	
		Selected + TalkBack	Scan SEL TalkBack	
		Priority 1	Scan Revert PRIO1	
		Priority 1 +TalkBack	Scan P1 TalkBack	
		Priority 2	Scan Revert PRIO2	
		Priority 2 +TalkBack	Scan P2 TalkBack	
12	Revert Channel Display	On	Revt Display On	
		Off	Revt Display Off	
13	Dropout Delay Time	3s	Scan DropOutT 3	Default
		1-300s	Scan DropOutT 1	
		1s/1Step	Scan DropOutT 300	
14	Scan Dwell Time	3s	Scan DwellT 3	Default
		1-300s	Scan DwellT 1	
		1s/1Step	Scan DwellT 300	
15	Off Hook Scan	Scan	Off Hook Scan	Scanning is not controlled by hook status
		No Scan	Off Hook No Scan	To scan, microphone must be on hook
16	END	END	END	Display “END” indicating the end of menu option

2. Select submenu “ZoneScan List”, then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	Select a Zone	100	Zone 100	Selector Knob：select zone 1-256 Only existing zone can be set. [PF6]: enter the second item
2	Zone Scan List Enable/Disable		List Enable	Only enabled list for zone list scan,
			List Disable	
3	Add/Del	Add	Zone 1 Add	Selector Knob: change channel 1－256 Only existing zone can be added/ deleted. [PF5]: ADD/DEL (save directly) [PF6]: enter the first item
		Del	Zone 1 Del	
4	END	END	END	Display “END” to indicate the end of menu option

Dealer Mode 5: DTMF Set

Select menu “DTMF Set”, then press [PF6] to enter DTMF Set Mode. The menu options are shown as follows:

Sub Menu	Menu Item
5.1	DTMF Encode
5.2	DTMF Decode
5.3	AutoDialList
5.4	PTT ID

1. Select submenu “DTMF Encode”, then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	DTMF Speed (Digital/Sec)	6	DTMF Speed 6	
		8	DTMF Speed 8	
		10	DTMF Speed 10	
		15	DTMF Speed 15	

2	First Digit Time	0ms	1st DT 0ms	First digit = first digit time + digit time
		100ms	1st DT 100ms	Default
		500ms	1st DT 500ms	
		1000ms	1st DT 1000ms	10ms/1Step
3	Digit Time (＊and＃)	0ms	* # DT 0ms	First: Max (first digit time,*and# time) + digit time Not first: * and # time + digit time
		100ms	* # DT 100ms	Default
		500ms	* # DT 500ms	
		1000ms	* # DT 1000ms	10ms/1Step
4	DTMF Transmit Delay Time	200ms	Tx RDT 200ms	
		100-1000ms	Tx RDT 100ms	Default
			Tx RDT 1000ms	50ms/1Step
5	Dial ID	OFF	DTMF Dial ID Off	Keypad dial BOT&EOT ID
		PTT ID 1	DTMF Dial ID 1	
		PTT ID 2	DTMF Dial ID 2	
		PTT ID 3	DTMF Dial ID 3	
		PTT ID 4	DTMF Dial ID 4	
6	DTMF Hold Time	OFF	DTMF HoldTime Off	
		0.5-2.0S Step 0.5s	Hold Time 0.5s	
			Hold Time 2.0s	Default
7	Store & Send	OFF	DTMF Sto&Send Off	
		ON	DTMF Sto&Send On	

8	D Key Assignment	D Code	DTMF DKey D-Code	
		Pause1-16s	DTMF DKeyPause 1	
			DTMF DkeyPause 16	
9	DTMF Side Tone	Side Tone Off	DTM F SideTone Off	
		Side Tone On	DTM F SideTone On	
10	Auto Dial	Auto Dial Off	AutoDial Off	
		Auto Dial On	AutoDial On	
11	Auto Dial Programming	AutoDialP Off	AutoDP Off	
		AutoDialP On	AutoDP On	
12	Manual Dial	Manual Dial Off	ManuDial Off	Hold [PTT], then dial
		Manual Dial On	ManuDial On	
13	Keypad Auto Tx	Auto Tx Off	KeyAutoTxOff	Not sent DTMF when only DTMF keys are pressed.
		Auto Tx On	KeyAutoTx On	Sent DTMF by pressing a DTMF Keypad key
14	END	END	END	Display “END” indicating the end of menu option

Notes:

1) If a transmission starts with the "*" or "#" tone, the radio compares the tone duration with the set "First Digit Time", and adapts the longer time of the two to the first "*" or "#" tone.
2) DTMF Transmit Delay Time sets the delay time from from the starting of transmission to the sending of the first DTMF digit. Making this value longer has a similar effect as setting the First Digit Time longer. When using DTMF and CTCSS/CDCSS it is recommended to set this parameter to 100 ms or more.
3) If automatic DTMF encode function (PTT ID, Auto Dial, Store & Send and Dial ID) is used for DTMF Call, DTMF Speed must be set 6, 8 or 10 digits per second.

2. Select submenu "DTMF Decode", then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	Primary Code	12345678	12345678	
		ABCDEF12	ABCDEF12	
2	Secondary Code	12345678	12345678	
		ABCDEF12	ABCDEF12	
3	Auto Reset Time	Off	Auto RstTime Off	
		1-300s	Auto RstTime 1S	
			Auto RstTime 300S	
4	Primary Decode Response	Off	PDR None	
		Ring	PDR Ring	
		Alert	PDR Alert	
		Transpond	PDR Transpond	
		Alert & Tran	PDR Alert & Tran	
5	Primary Decode Alert Tone	Alert 1-8	PDR Alert Tone 1	Ref. Alert Tone in Function Set Mode
			PDR Alert Tone 8	
6	Secondary Decode Response	Off	SDR None	
		Ring	SDR Ring	
		Alert	SDR Alert	
		Transpond	SDR Transpond	
		Alert & Tran	SDR Alert & Tran	
7	Secondary Decode Alert Tone	Alert 1-8	SDR Alert Tone 1	Ref. Alert Tone in Function Set Mode
			SDR Alert Tone 8	
8	END	END	END	Display “END” indicating the end of menu options

3. Select submenu "AutoDialList", then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	Auto Dial No.	1-32 Step 1	AutoDial 1	
			AutoDial 32	
2	Auto Dial Name	ASCII CODE	Name AutoDial N	
			Name ----------	No input
3	Auto Dial Code	ABCD123456789012	Code ABCD12345678	It will be scrolled as >=12
			Code ----------	No input
4	END	END	END	Display "END" indicating the end of menu options

4. Select submenu "PTT ID", then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	PTT ID No.	1-4 Step 1	PTT ID 1	
			PTT ID 4	
2	PTT ID Type	BOT	PTT ID BOT	
		EOT	PTT ID EOT	
		BOTH	PTT ID BOTH	
3	BOT of PTT ID	ABCD12345678	BOT ABCD12345678	It will be scrolled as >=12
			BOT ----------	No input
4	EOT of PTT ID	ABCD12345678	EOT ABCD12345678	It will be scrolled as >=12
			EOT ----------	No input
5	END	END	END	Display "END" indicating the end of menu options

Dealer Mode 6: 2-Tone Set

Select menu “2-Tone Set”, then press [PF6] to enter 2-Tone Set Mode. The menu options are shown as follows:

Sub Menu	Menu Item
6.1	2-Tone Encode
6.2	2-Tone Decode
6.3	2-Tone Option

1. Select submenu “2-Tone Encode”, then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	2-Tone Code No.	1-32 Step 1	2-Tone 1	
			2-Tone 32	
2	2-Tone Code Name	ASCII Code	Name 2-Tone 1	
		--------	Name --------	No input
3	Tone A Frequency	288.5-3100Hz	Step A: 288.5Hz	Press [PF4] to switch between 0.1Hz/1Hz/10Hz/100Hz step
			Step A: 3100.0Hz	
4	Tone B Frequency	288.5-3100Hz	Step B: 288.5Hz	Press [PF4] to switch between 0.1Hz/1Hz/10Hz/100Hz step
			Step B: 3100.0Hz	
5	Tone A Duration	0.5-10.0s Step 0.1s	Dur. A: 0.5S	
			Dur. A: 10.0S	
6	Tone B Duration	0.5-10.0s Step 0.1s	Dur. B: 0.5S	
			Dur. B: 10.0S	
7	Gap Duration	0.0-2.0s Step 0.1s	Dur. Gap: 0.0S	
			Dur. Gap: 2.0S	

8	Long A Duration	Off	Dur. Long: Off	
		0.5-10.0s	Dur. Long: 0.5S	
			Dur. Long: 10.0S	
9	END	END	END	Display “END” indicating the end of menu options

2. Select submenu “2-Tone Decode”, then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	2-Tone Code No.	1-8 Step 1	2-Tone 1	
			2-Tone 8	
2	Decode 1 Format	A-B	Decode1: A-B	
		A-C	Decode1: A-C	
		A-D	Decode1: A-D	
		B-A	Decode1: B-A	
		B-C	Decode1: B-C	
		B-D	Decode1: B-D	
		C-A	Decode1: C-A	
		C-B	Decode1: C-B	
		C-D	Decode1: C-D	
		D-A	Decode1: D-A	
		D-B	Decode1: D-B	
		D-C	Decode1: D-C	
		Long A	Decode1: A	
		Long B	Decode1: B	
		Long C	Decode1: C	

3	Decode 2 Format	None	Decode2: None	
		A-B	Decode2: A-B	
		A-C	Decode2: A-C	
		A-D	Decode2: A-D	
		B-A	Decode2: B-A	
		B-C	Decode2: B-C	
		B-D	Decode2: B-D	
		C-A	Decode2: C-A	
		C-B	Decode2: C-B	
		C-D	Decode2: C-D	
		D-A	Decode2: D-A	
		D-B	Decode2: D-B	
		D-C	Decode2: D-C	
		Long A	Decode2: A	
		Long B	Decode2: B	
		Long C	Decode2: C	
4	Decode 3 Format	None	Decode3: None	
		A-B	Decode3: A-B	
		A-C	Decode3: A-C	
		A-D	Decode3: A-D	
		B-A	Decode3: B-A	
		B-C	Decode3: B-C	
		B-D	Decode3: B-D	
		C-A	Decode3: C-A	
		C-B	Decode3: C-B	
		C-D	Decode3: C-D	
		D-A	Decode3: D-A	
		D-B	Decode3: D-B	
		D-C	Decode3: D-C	
		Long A	Decode3: A	
		Long B	Decode3: B	
		Long C	Decode3: C	

5	Decode 4 Format	None	Decode4: None	
		A-B	Decode4: A-B	
		A-C	Decode4: A-C	
		A-D	Decode4: A-D	
		B-A	Decode4: B-A	
		B-C	Decode4: B-C	
		B-D	Decode4: B-D	
		C-A	Decode4: C-A	
		C-B	Decode4: C-B	
		C-D	Decode4: C-D	
		D-A	Decode4: D-A	
		D-B	Decode4: D-B	
		D-C	Decode4: D-C	
		Long A	Decode4: A	
		Long B	Decode4: B	
		Long C	Decode4: C	
6	Tone A Frequency	288.5-3100Hz	Step A: 288.5Hz	Press [PF4] to switch between 0.1Hz/1Hz/10Hz/100Hz step
			Step A: 3100.0Hz	
7	Tone B Frequency	288.5-3100Hz	Step B: 288.5Hz	Press [PF4] to switch between 0.1Hz/1Hz/10Hz/100Hz step
			Step B: 3100.0Hz	
8	Tone C Frequency	288.5-3100Hz	Step C: 288.5Hz	Press [PF4] to switch between 0.1Hz/1Hz/10Hz/100Hz step
			Step C: 3100.0Hz	
9	Tone D Frequency	288.5-3100Hz	Step D: 288.5Hz	Press [PF4] to switch between 0.1Hz/1Hz/10Hz/100Hz step
			Step D: 3100.0Hz	

10	Call Response 1	None	D1 None	
		Alert	D1 Alert	
		Transpond	D1 Transpond	
		Alert & Tran	D1 Alert & Tran	
11	Call Response 2	None	D2 None	
		Alert	D2 Alert	
		Transpond	D2 Transpond	
		Alert & Tran	D2 Alert & Tran	
12	Call Response 3	None	D3 None	
		Alert	D3 Alert	
		Transpond	D3 Transpond	
		Alert & Tran	D3 Alert & Tran	
13	Call Response 4	None	D4 None	
		Alert	D4 Alert	
		Transpond	D4 Transpond	
		Alert & Tran	D4 Alert & Tran	
14	Decode 1 Alert Tone	Tone A	D1 Tone A	
		Decode Code	D1 Decode Code	
		Alert 1-8	D1 Alert Tone 1	Ref. “Alert Tone” in Function Set Mode
			D1 Alert Tone 8	

15	Decode 2 Alert Tone	Tone A	D2 Tone A	
		Decode Code	D2 Decode Code	
		Alert 1-8	D2 Alert Tone 1	Ref. “Alert Tone” in Function Set Mode
			D2 Alert Tone 8	
16	Decode 3 Alert Tone	Tone A	D3 Tone A	
		Decode Code	D3 Decode Code	
		Alert 1-8	D3 Alert Tone 1	Ref. “Alert Tone” in Function Set Mode
			D3 Alert Tone 8	
17	Decode 4 Alert Tone	Tone A	D4 Tone A	
		Decode Code	D4 Decode Code	
		Alert 1-8	D4 Alert Tone 1	Ref. “Alert Tone” in Function Set Mode
			D4 Alert Tone 8	
18	Tone A Duration	0.5-10.0s Step 0.1s	Dur. A: 0.5S	
			Dur. A: 10.0S	
19	Tone B Duration	0.5-10.0s Step 0.1s	Dur. B: 0.5S	
			Dur. B: 10.0S	
20	Gap Duration	0.0-2.0s Step 0.1s	Dur. Gap: 0.0S	
			Dur. Gap: 2.0S	
21	Long A Duration	Off	Dur. Long: Off	
		0.5-10.0s	Dur. Long: 0.5S	
			Dur. Long: 10.0S	
22	END	END	END	Display “END” indicating the end of menu options

3. Select submenu “2-Tone Option”, then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	2-Tone Tx Rise Time	200ms	Rise Time 200ms	Default
		100-1000ms	Rise Time 100ms	
			Rise Time 1000ms	50ms/1Step
2	2-Tone Tx Tone	Off	Tone Off	
		SideTone	SideTone	
		Short Beep	Short Beep	
3	Auto Rese Time	Off	RstTime OFF	
		1-300s	Auto	
			RstTime 1S	
4	END	END	END	Display “END” indicating the end of menu options

Dealer Mode 7: 5-Tone Set

Select menu “5-Tone Set”, then press [PF6] to enter 5-Tone Set Mode. The menu options are shown as follows:

Sub Menu	Menu Item
7.1	Parameter
7.2	Encode Teleg
7.3	Encode Frame
7.4	EncodeOption
7.5	Decode Teleg
7.6	DecodeOption

1. Select submenu "Parameter", then press [PF6] to enter. Select Parameter 1-16 to set 5-Tone parameters.

No.	Function	Setting	Display	Remarks
1	5-Tone Parameter	Parameter1-16 Step 1	Parameter 1 Parameter 16	Default: Parameter 1
2	SingleTone	SigleTone 0-F	SingleTone 0 SingleTone F	Default: SingleTone F
3	Connect ID	Off	CNCT Off	Default: Off
		TxCode 1-32	CNCT ID TxCode 1 CNCT ID TxCode 32	
4	Disconnect ID	Off	DCNT Off	Default: Off
		TxCode 1-32	DCNT ID TxCode 1 DCNT ID TxCode 32	
5	TX/RX Address Standard	ZVEL1	TxRx ZVEL1	Default
		ZVEL2	TxRx ZVEL2	
		ZVEL3	TxRx ZVEL3	
		PZVEI	TxRx PZVEI	
		DZVEI	TxRx DZVEI	
		PDZVEI	TxRx PDZVEI	
		CCIR1	TxRx CCIR1	
		CCIR2	TxRx CCIR2	
		PCCIR	TxRx PCCIR	

5	TX/RX Address Standard	EEA	TxRx EEA	
		Eurosignal	TxRx Eurosignal	
		Natel	TxRx NATEL	
		EIA	TxRx EIA	
		MODAT	TxRx MODAT	
		CCITT	TxRx CCITT	
		USER DEFINED	TxRx USER DEFINED	
6	Decode Code 1	None	DC1 None	
		Decode Telegram 1-10	DC1 Telegram 1	
			DC1 Telegram 10	
7	Decode Code 2	None	DC2 None	
		Decode Telegram 1-10	DC2 Telegram 1 DC2 Telegram 10	
8	Decode Code 3	None	DC3 None	
		Decode Telegram 1-10	DC3 Telegram 1 DC3 Telegram 10	
9	Decode Code 4	None	DC4 None	
		Decode Telegram 1-10	DC4 Telegram 1 DC4 Telegram 10	
10	END	END	END	Display “END” indicating the end of menu options

4. Select submenu “Encode Teleg”, then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	5-Tone EncodeTelegram	Encode Telegram 1-32 Step 1	EncodeTel 1	Default: EncodeTelegram 1
			EncodeTel 32	
2	First Frame	Disable	1stF Disable	Default: Disable
		RxAdress	1stF RxAdress	
		TxAdress	1stF TxAdress	
		Frame 1-32	1st Frame 1	
			1st Frame 32	
3	Second Frame	Disable	2ndF Disable	Default: Disable
		RxAdress	2ndF RxAdress	
		TxAdress	2ndF TxAdress	
		Frame 1-32	2nd Frame 1	
			2nd Frame 32	
4	Third Frame	Disable	3rdF Disable	Default: Disable
		RxAdress	3rd F RxAdress	
		TxAdress	3rd F TxAdress	
		Frame 1-32	3rd t Frame 1	
			3rd Frame 32	

5	Transpond Decode	Disable	Disable	Default: Disable
		DecodeTel 1-10	Decode Tel 1	
			Decode Tel 10	
6	TelegramName		Name 12345	Refer to Appendix 1 “Character Input”
			Name ----------	
7	END	END	END	Display “END” indicating the end of menu options

3. Select submenu “EncodeFrame”, then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	Frame	Frame 1-32	Frame 1	Default: Frame 1
			Frame 32	
2	5-Tone Standard	ZVEL1	ZVEL1	Default: ZVEL1
		ZVEL2	ZVEL2	
		ZVEL3	ZVEL3	
		PZVEI	PZVEI	
		DZVEI	DZVEI	
		PDZVEI	PDZVEI	
		CCIR1	CCIR1	
		CCIR2	CCIR2	
		PCCIR	PCCIR	
		EEA	EEA	
		Eurosignal	Eurosignal	
		Natel	NATEL	
		EIA	EIA	
		MODAT	MODAT	
		CCITT	CCITT	
		USER DEFINED	USER DEFINED	
3	Frame Code	12345	Fcode 12345	Default:FFFFF
4	END	END	END	Display “END” indicating the end of menu options

4. Select submenu “EncodeOption”, then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	5-Tone Delay 1	0-7000ms Step 10ms	1st Delay 0ms 1st Delay 7000ms	Default: 100ms
2	5-Tone Delay 2	0-7000ms Step 10ms	2nd Delay 0ms 2nd Delay 7000ms	Default: 300ms
3	5-Tone Delay 3	0-7000ms Step 10ms	3rd Delay 0ms 3rd Delay 7000ms	Default: 300ms
4	5-Tone End Delay	0-7000ms Step 10ms	End Delay 0ms End Delay 7000ms	Default: 100ms
5	5-Tone Transpond Delay	0-7000ms Step 10ms	Tspd Delay 0ms Tspd Delay 7000ms	Default: 1000ms
6	5-Tone First Tone Length	0-7000ms Step 10ms	1st ToneL 0ms 1st ToneL 7000ms	Default: 1000ms
7	5-Tone Delay 2Tone	Off 0-9,A-F Step 1	D2ToneOff Delay2Tone 0 Delay2Tone F	Default: Off
8	5-Tone Delay 3Tone	Off 0-9,A-F Step 1	D3ToneOff Delay3Tone 0 Delay3Tone F	Default: Off
9	5-Tone Side Tone	Side Tone On Side Tone Off	Side Tone On Side Tone Off	Default: Off
10	5-Tone Monitor	Monitor On Monitor Off	Monitor On Monitor Off	Default: On

11	END	END	END	Display “END” indicating the end of menu options

5. Select submenu “Decode Telegr”, then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	5Tone Decode Telegram	Decode Telegram 1-10	DecodeTel 1	
			Decode Tel 10	
2	5Tone Standard	ZVEL1	ZVEL1	Default: ZVEL1
		ZVEL2	ZVEL2	
		ZVEL3	ZVEL3	
		PZVEI	PZVEI	
		DZVEI	DZVEI	
		PDZVEI	PDZVEI	
		CCIR1	CCIR1	
		CCIR2	CCIR2	
		PCCIR	PCCIR	
		EEA	EEA	
		Eurosignal	Eurosignal	
		Natel	NATEL	
		EIA	EIA	
		MODAT	MODAT	
		CCITT	CCITT	
		USER DEFINED	USER DEFINED	
3	Frame 1	None	F1 None	Default: None
		Normal	F1 Normal	
		Rx Address	F1 Rx Address	
		Single	F1 Single Tone	
4	Frame 2	None	F2 None	Default: None
		Normal	F2 Normal	
		Rx Address	F2 Rx Address	
		Single	F2 Single Tone	

5	Frame 3	None	F3 None	Default: None
		Normal	F3 Normal	
		Rx Address	F3 Rx Address	
		Single	F3 Single Tone	
6	Monitor	Disable	Moni Disable	Default: Open
		Close	Moni Close	
		Open	Moni Open	
7	Stun	Disable	Stun Disable	Default: Disable
		Stun	Stun Enable	
		Revive	Stun Revive	
		Kill	Stun Kill	
8	Scan	Disable	Scan Disable	Default: Disable
		Start	Scan Start	
		Stop	Scan Stop	
9	Transpond	None	None	Default: None
		Encode Telegram1-32	EncodeTel 1	
			EncodeTel 32	
10	Individual Alert Tone		IndAlert Off	
		Alert 1-8	IndivdAlert1	
			IndivdAlert8	
11	Group Alert Tone	Off	GrpAlert Off	
		Alert 1-8	GroupAlert 1	
			GroupAlert 8	
12	END	END	END	Display “END” indicating the end of menu options

6. Select submenu “Decode Option”, then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	5 Tone Auto Reset Time	Off	Auto Reset Time Off	
		1-180s Step 1s	Auto ResetTime1	Default: Off
			Auto ResetTime180	
2	Next Decode Delay Time	0-2550ms Step 10ms	NDDT 0ms	Default: 1600ms
			NDDT 2550ms	
3	Alert	Alert On Alert Off	Alert On Alert Off	Default: On
4	LED	Enable	LED Enable LED Disable	Default: Enable
5	END	END	END	Display “END” indicating the end of menu options

Dealer Mode 8: Embedded Message

Select menu “Embedded Msg”, and then press [PF6] to enter if no password is set or a correct password is entered. The menu options are shown as follows:

Sub Menu	Menu Item
8.1	EmbeddedMsg1
8.2	EmbeddedMsg2
8.3	EmbeddedMsg3
8.4	EmbeddedMsg4
8.5	Msg Password

Press [PF6] to enter any of the above menu options, the selected embedded message or message password would be displayed. Then press [PF1] to edit the embedded message or message password. Please refer to Appendix 1 “Character Input”.

Dealer Mode 9: Emergency Set

Select menu “Emergency Set”, then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	Emergency Zone Emergency CH	1-256	1	Selector Knob: change a channel or zone (default ch) [PF5]: channel/zone
		1-256	CH 100.	
2	Emergency Cycle	Continuous	Cycle Contin	
		1-200	Cycle 1	
		Step 1	Cycle 200	
3	Emergency Key Delay Time	Off	Key Deley Off	
		0.1-5.0s	Key Deley 0.1S	
		Step 0.1s	Key Deley 5.0S	
4	Tx Duration	20s	Tx Dur. 20S	Default data
		1-60s Step 1s	Tx Dur. 1S	
			Tx Dur. 60S	
5	Rx Duration	20s	Tx Dur. 20S	Default data
		1-180s	Tx Dur. 1S	
		Step 1s	Tx Dur. 180S	
6	Emergency Type	Off	Type Off	
		DTMF	Type DTMF	
		MSK	Type MSK	
7	Emergency ID	----------	ID ----------	No input
		0000000000000000 9999999999999999	ID 0000000000000000	
			ID 9999999999999999	
8	Emergency Led	Off	LED Off	
		On	LED On	

9	Emergency Display Text	----------	Tex t ----------	No Text to be Displayed
		Emergency	Tex t Emergency	Max 12
10	Emergency Mode	Silent	Mod e Silent	
		Audible	Mod e Audible	
11	Tone 1 Duration	0-255s Step 1s	Ton e 1 Dur. 0S	
			Ton e 1 Dur. 255S	
12	Tone 2 Duration	0-255s Step 1s	Ton e 2 Dur. 0S	
			Ton e 2 Dur. 255S	
13	END	END	END	Display “END” indicating the end of menu options

Dealer Mode 10: STUN Inform

Select menu “Stun Inform”. Press [PF6], the radio enters Stun Information Mode if no password is set or a correct password is entered.

Sub Menu	Menu Item
10.1	Stun Set
10.2	Stun Password

1. Select submenu 'Stun Set", then press［PF6］to enter.

No.	Function	Setting	Display	Remarks
1	Stun Encode	----------	Stun Disable	No encode, disable Stun
		0000000	Stun 0000000	
		~FFFFFFF	Stun FFFFFFF	
2	Stun Response	TX Inhibit	Stun TX Inhibit	Default
		TX/RX Inhibit	Stun TXRX Inhibit	
		Kill	Stun Kill	
3	END	END	END	Display "END" to indicate the end of menu options

2. Select submenu "Stun Password", then press［PF6］to view the password. Then press［PF1］to edit the password. Please refer to Appendix 1 "Character Input".
The password is numeric digit only, 8 digits maximum.

Dealer Mode 11: Mode Information

Select menu "Mode Inform", then press [PF6], the radio enters Mode Information Mode if no password is set or a correct password is entered. The menu options are shown as follows:

Sub Menu	Menu Item
11.1	Mode Select
11.2	Mode Password

1. Select submenu "Mode Select", then press [PF6] to enter.

No.	Function	Setting	Display	Remarks
1	User Set Mode	OFF	Mode UserSet Off	
		ON	Mode UserSet On	Default
2	Channel Set Mode	OFF	Mode CHSet Off	
		ON	Mode CHSet On	Default

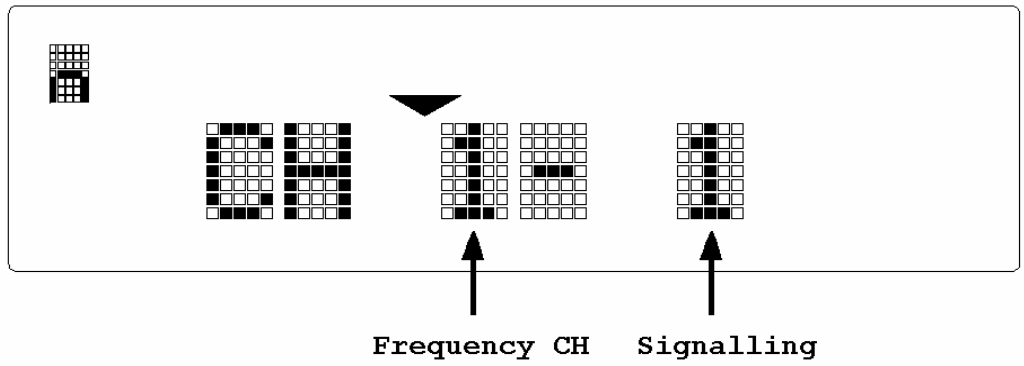
3	Zone Information Mode	OFF	Mode ZoneSet Off	
		ON	Mode ZoneSet On	Default
4	Function Set Mode	OFF	Mode FuncSet Off	
		ON	Mode FuncSet On	Default
5	Scan Information Mode	OFF	Mode ScanSet Off	
		ON	Mode ScanSet On	Default
6	DTMF Set Mode	OFF	Mode DTMFSet Off	
		ON	Mode DTMFSet On	Default
7	2-Tone Set Mode	OFF	Mode 2ToneSet Off	
		ON	Mode 2ToneSet On	Default
8	5-Tone Set Mode	OFF	Mode 5ToneSet Off	
		ON	Mode 5ToneSet On	Default
9	Embedded Message Mode	OFF	Mode EmbedMsg Off	
		ON	Mode EmbedMsg On	Default
10	Emergency Set Mode	OFF	Mode Emergency Off	
		ON	Mode Emergency On	Default
11	Stun Set Mode	OFF	Mode Stun Set Off	
		ON	Mode Stun Set On	Default
12	Test Mode	OFF	Mode LocalTestOff	
		ON	Mode LocalTest On	Default

13	Clone Mode	OFF	Mode WireCloneOff	
		ON	Mode WireClone On	Default
14	Model Set Mode	OFF	Mode ModelSel Off	
		ON	Mode ModelSel On	Default
15	Firmware Download Mode	OFF	Prog FirmWare Off	
		ON	Prog FirmWare On	Default
16	Firmware Version Display	OFF	Ver Version Off	
		ON	Ver Version On	Default
17	END	END	END	Display “END” indicating the end of menu options

2. Select submenu “DBD Password”, then press [PF6] to view the password. Then press [PF1] to edit the password. Please refer to Appendix 1 “Character Input”.
The password is numeric digit only, 8 digits maximum.

Test Mode

1. Turn power on while holding down [PF2], the radio enters Test Mode. Frequency test channel and signalling test channel are displayed.



In this mode, the channel frequency (center, low, high) can be modified through the programming software.

Model	RX/TX	CH1 (C)	CH 2 (L)	CH 3 (H)	CH 4	CH 5	CH 6	CH 7	CH 8
0 (V)	RX(MHz)	155.15	136.15	173.85	145.55	164.55	155.00	155.20	155.40
	TX(MHz)	155.00	136.00	174.00	145.50	164.50	155.00	155.20	155.40
1 (U1)	RX(MHz)	481.15	450.15	511.85	465.55	496.55	481.00	481.20	481.40
	TX(MHz)	481.00	450.00	512.00	465.50	496.50	481.00	481.20	481.40
2 (U2)	RX(MHz)	375.15	350.15	399.85	362.55	387.55	375.00	375.20	375.40
	TX(MHz)	375.00	350.00	400.00	362.50	387.50	375.00	375.20	375.40
3 (U3)	RX(MHz)	435.15	400.15	469.85	417.55	452.55	435.00	435.20	435.40
	TX(MHz)	435.00	400.00	470.00	417.50	452.50	435.00	435.20	435.40
4 (U4)	RX(MHz)	465.15	440.15	489.85	452.55	477.55	465.00	465.20	465.40
	TX(MHz)	465.00	440.00	490.00	452.50	477.50	465.00	465.20	465.40
5 (U5)	RX(MHz)	503.15	480.15	525.85	491.75	515.25	503.00	503.20	503.40
	TX(MHz)	503.00	480.00	526.00	491.70	515.20	503.00	503.20	503.40
6 (U6)	RX(MHz)	425.15	400.15	449.85	412.55	437.55	425.00	425.20	425.40
	TX(MHz)	425.00	400.00	450.00	412.50	437.50	425.00	425.20	425.40

Signallings are shown as follows:

No.	RX	TX	Description
1	None	None	
2	None	100Hz square wave	
3	CTCSS 67.0Hz	CTCSS 67.1Hz	
4	CTCSS 151.4Hz	CTCSS 151.4Hz	
5	CTCSS 210.7Hz	CTCSS 210.7Hz	
6	CTCSS 250.3Hz	CTCSS 250.3Hz	
7	CDCSS 023N	CDCSS 023N	
8	CDCSS 754I	CDCSS 754I	
9	DTMF (159D)	DTMF (159D)	
10	None	DTMF 9	
11	2-tone 321.7/928.1	None	Tone duration: 1s/1s
12	Single tone 1200Hz	Single tone 1200Hz	Tone duration: 4s
13	None	Single tone 1000Hz	
14	MSK	MSK	

2. In Test Mode, the following functions can be accomplished by key pressing.

Key	Function	Description
Up	Volume Up	
Down	Volume down	
PF1	Wide band/Narrow band	
PF2	Squelch Open/Close	"  " icon appears when squelch is opened.
PF3	Test Mode/ Adjustment Mode	
PF4	Activate compander function	PF1: compander on/off PF2: clock shift on/off PF3: 1200/2400bps MSK
PF5	Signalling Up	
PF6	Signalling Down	
Selector Knob	Channel Up/Down	

In Test Mode, press [PF4], then press the following key to enable the corresponding functions.

PF1	Compander On/Off	"▼" icon appears when compander is turned On
PF2	Clock shift On/Off	"A" icon appears when clock shift is turned On
PF3	1200/2400bps MSK	"  " icon appears when 2400bps is selected
PF4	Return to Test Mode	
PF5	None	
PF6	None	

3. In Test Mode, press [PF3] to enter Adjustment Mode. Turn the Selector Knob to choose your desired setting items.

No.	Dealer Mode	LCD Display
1	Frequency stability	Frequency
2	TX power	Tx Power
3	Max. deviation	Max.Deviate
4	CDCSS balance	CDCSSBalance
5	CTCSS deviation	CTCSSDeviate
6	CDCSS deviation	CDCSSDeviate
7	DTMF deviation	CDCSSDeviate
8	MSK deviation	MSK Deviate
9	Single tone deviation	Tone Deviate
10	RX sensitivity	Rx Sensitivi
12	SQL close	Close SQL

In Test Mode, user can press the following key to switch models.

① Press [PF3] to toggle between Test Mode and Adjustment Mode.
Press [PF4] to toggle between Adjustment Mode and Model Set Mode ([PF4] is invalid if Model Set Mode is inhibited by your dealer. Refer to “Model Set Mode” for details).

② Press [PF6] to enter the selected mode.

4. In Adjustment Mode, the following functions can be accomplished by key pressing.

Key	Function	Description
Up	Volume Up	
Down	Volume down	
PF1	Return to Adjustment Item menu	
PF2	Squelch Open/Close	“  ” icon appears when squelch is opened.
PF4	Enter the previous item (Down)	
PF5	Enter the next item (Up)	
PF6	Save the settings, enter the next item	
Selector Knob	Adjust upwards/downwards	

5. Setting Items （＊＊＊：1-256）

Setting Item	Wideband/ Narrowband	Frequency	Main LCD	Sub LCD	Description
CDCSS Balance	Wide	Center	CDCSS BAL ***	__C	100Hz square wave
		Low	CDCSS BAL ***	__L	100Hz square wave
		High	CDCSS BAL ***	__H	100Hz square wave
	Narrow	Center	CDCSS BAL ***	n_C	100Hz square wave
CTCSS Deviation	Wide	Center	67.0 DEV ***	__C	CTCSS: 67.0Hz
		Low	67.0 DEV ***	__L	CTCSS: 67.0Hz
		High	67.0 DEV ***	__H	CTCSS: 67.0Hz
	Narrow	Center	67.0 DEV ***	n_C	CTCSS: 67.0Hz
	Wide	Center	151.4 DEV ***	__C	CTCSS: 151.4Hz
		Low	151.4 DEV ***	__L	CTCSS: 151.4Hz
		High	151.4 DEV ***	__H	CTCSS: 151.4Hz
	Narrow	Center	151.4 DEV ***	n_C	CTCSS: 151.4Hz
	Wide	Center	254.1 DEV ***	__C	CTCSS: 254.1Hz
		Low	254.1 DEV ***	__L	CTCSS: 254.1Hz
		High	254.1 DEV ***	__H	CTCSS: 254.1Hz
	Narrow	Center	254.1 DEV ***	n_C	CTCSS: 254.1Hz
CDCSS Deviation	Wide	Center	CDCSS DEV ***	__C	CDCSS: 023N
		Low	CDCSS DEV ***	__L	CDCSS: 023N
		High	CDCSS DEV ***	__H	CDCSS: 023N
	Narrow	Center	CDCSS DEV ***	n_C	CDCSS: 023N
DTMF Deviation	Wide	Center	DTMF DEV ***		DTMF: 9
	Narrow	Center	DTMF DEV ***	n__	DTMF: 9
MSK Deviation	Wide	Center	MSK DEV ***		0XAAA…
	Narrow	Center	MSK DEV ***	n__	0XAAA…
Single Tone Deviation	Wide	Center	Tone DEV ***		1KHz
	Narrow	Center	Tone DEV ***	n__	1KHz
RX Sensitivity	-	Low	Sensiti ***	__L	No signalling，SQ off
	-	Center/Low	Sensiti ***	_CL	No signalling，SQ off
	-	Center	Sensiti ***	__C	No signalling，SQ off
	-	High/Center	Sensiti ***	_HC	No signalling，SQ off
	-	High	Sensiti ***	__H	No signalling，SQ off

SQL Open	SQL 9 Wideband	Center	OpenSQL9 ***	__C	No signalling
		Low	OpenSQL9 ***	__L	No signalling
		High	OpenSQL9 ***	__H	No signalling
	SQL 9 Narrowband	Center	OpenSQL9 ***	n_C	No signalling
	SQL3 Wideband	Center	OpenSQL3 ***	__C	No signalling
		Low	OpenSQL3 ***	__L	No signalling
		High	OpenSQL3 ***	__H	No signalling
	SQL3 Narrowband	Center	OpenSQL3 ***	n_C	No signalling
SQL Close	SQL 9 Wideband	Center	CloseSQL9 ***	__C	No signalling
		Low	CloseSQL9 ***	__L	No signalling
		High	CloseSQL9 ***	__H	No signalling
	SQL 9 Narrowband	Center	CloseSQL9 ***	n_C	No signalling
	SQL3 Wideband	Center	CloseSQL3 ***	__C	No signalling
		Low	CloseSQL3 ***	__L	No signalling
		High	CloseSQL3 ***	__H	No signalling
	SQL3 Narrowband	Center	CloseSQL3 ***	n_C	No signalling

Model Set Mode

1. Turn power on while holding down [PF2], the radio enters Test Mode. The frequency test channel and signalling test channel are displayed.
2. In Test Mode, press [PF3] to enter Adjustment Mode.
3. In Adjustment Mode, press [PF4] to enter Model Set Mode. “DESTINATION” and the model No. are displayed.
4. Turn the Selector Knob to choose model 1-6.
5. Press [PF6] to confirm.
6. Press [PF3] to return to Test Mode.

Notes:

1. Once the new model is set, previous channel settings (frequency, CTCSS/CDCSS, channel function settings) will be deleted, and part of functions are also changed. Therefore, do not make this operation unless it’s very necessary, such as changing the EEPROM or FLASHROM, etc.
2. Initial Data Table

Model	RX/TX	CH 1 (Center)	CH 2 (Low)	CH 3 (High)	CH 4	CH 5	CH 6	CH 7	CH 8
0 (V)	RX(MHz)	155.15	136.15	173.85	145.55	164.55	155.00	155.20	155.40
	TX(MHz)	155.00	136.00	174.00	145.50	164.50	155.00	155.20	155.40
1 (U1)	RX(MHz)	481.15	450.15	511.85	465.55	496.55	481.00	481.20	481.40
	TX(MHz)	481.00	450.00	512.00	465.50	496.50	481.00	481.20	481.40
2 (U2)	RX(MHz)	375.15	350.15	399.85	362.55	387.55	375.00	375.20	375.40
	TX(MHz)	375.00	350.00	400.00	362.50	387.50	375.00	375.20	375.40
3 (U3)	RX(MHz)	435.15	400.15	469.85	417.55	452.55	435.00	435.20	435.40
	TX(MHz)	435.00	400.00	470.00	417.50	452.50	435.00	435.20	435.40
4 (U4)	RX(MHz)	465.15	440.15	489.85	452.55	477.55	465.00	465.20	465.40
	TX(MHz)	465.00	440.00	490.00	452.50	477.50	465.00	465.20	465.40
5 (U5)	RX(MHz)	503.15	480.15	525.85	491.75	515.25	503.00	503.20	503.40
	TX(MHz)	503.00	480.00	526.00	491.70	515.20	503.00	503.20	503.40
6 (U3)	RX(MHz)	425.15	400.15	449.85	412.55	437.55	425.00	425.20	425.40
	TX(MHz)	425.00	400.00	450.00	412.50	437.50	425.00	425.20	425.40

Circuit Description

1. Frequency Configuration

The receiver utilizes double conversion superheterodyne. The first IF is 49.95MHz and the second is 450KHz. The first local oscillator signal is supplied by PLL circuit. The second local oscillator signal (50.4MHz) is generated from the frequency tripling of TCXO (16.8MHz).
The PLL circuit also generates the frequencies needed in the transmitter (See Fig.2).
Frequency Range: 136 MHz—174MHz

2. Receiver Circuit

The receiver section configuration is shown as Fig. 1.

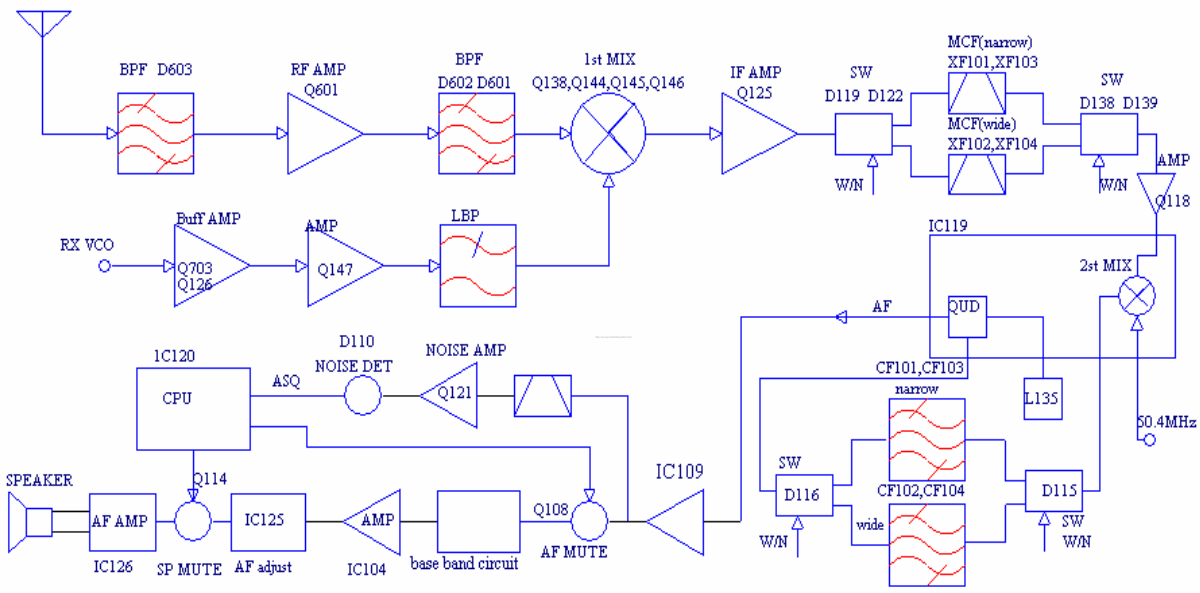


Figure 1 Receiver Section Configuration

2.1 RF AMP BPF

It consists of BPF (D603, D602, D601) and RF amplifier (Q601). The range of bandpass frequency is from 136MHz to 174MHz. The signal is filtered by the RF Amp BPF to eliminate unwanted signals before going to the first mixer.

2.2 The First Mixer

The signal from RF AMP BPF is mixed with the first local oscillator signal from PLL circuit in the double-balance mixer (Q138, Q144, Q145, Q146) to generate a 49.95MHz first IF signal. The first IF signal is then fed through two crystal filters (N: XF101, XF103; W: XF102, XF104) to further remove spurious signals.

2.3 IF Amplifier

The first IF signal is amplified by Q125, Q118 and then enters IC119 (TA31136FN). The signal is mixed with the second local oscillator signal (50.4MHz) to create a 450KHz second IF signal. The second IF signal is then fed to a ceramic filter (N: CF101, CF103; W: CF102, CF104) to eliminate unwanted signals. The resulting signal is detected by IC119 and output from Pin9 as an AF signal.

2.4 AF Amplifier

The AF signal from IC119 is amplified by IC109 before being filtered. The resulting AF signal passes through Q108 (AF MUTE) and IC121 (electronic switch), then is amplified by IC106 (the received signalling is inputted into CPU for decoding) and IC104. The amplified signal is fed to IC125 (volume control) and Q114 (SP MUTE) before entering AF AMP (IC126). The outputted AF signal is then delivered to the speaker through control panel.

2.5 Squelch

The AF signal from IC119 is amplified by IC109 again, then filtered to remove noise signals. The noise signal is amplified by Q121 and rectified by D110 to produce an ASQ level. The ASQ level is then compared in CPU (IC120) to generate a level which controls AF MUTE and SP MUTE. IC120 determines whether to output sounds from the speaker by controlling Q108, Q114.

3. Transmitter Circuit

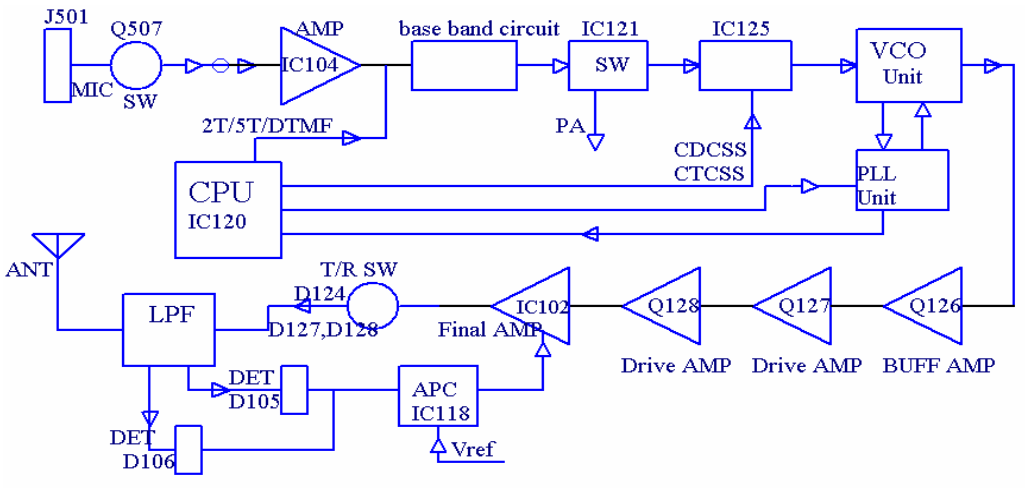


Figure 2 Transmitter Section Configuration

3.1 MIC Circuit and Modulation Circuit

The AF signal from MIC is amplified by IC104 after passing through the MIC control switch (Q507). The resulting signal is then amplified by IC106 and pre-emphasized, encoded. It is passed to IC121 (electronic switch) before reaching IC125. The signalling is inputted into IC125 and enters VCO for modulation.

3.2 Driver and Final Power Amplifier Circuit

TX-RF signal is outputted from Q703 in VCO circuit and amplified by Q126, Q127 and Q128. The amplified signal is then fed to IC102 (Power Module) and passes through LPF before reaching the antenna terminal.

3.3 APC

The APC is used to keep the power output at a constant preset value. D105 and D106 transform the signal from detector into DC voltage which is then compared with the reference voltage from CPU in IC118 and outputted as DC control voltage. The DC control voltage controls the output power by controlling the grid of IC102.

4. PLL Circuit

PLL circuit generates the first local oscillator signal for reception and the RF signal for transmission. PLL circuit consists of TX frequency oscillator (Q701), RX frequency oscillator (Q702), buffer amplifier (Q703), RF amplifier (Q124), PLL IC (IC801), LPF (Q804, Q805) and TX/RX VCO control switch (Q704, Q706).

In transmit mode, IC120 transmits the frequency data to PLL IC. Q704 is turned on to activate TX VCO. The outputted signal is amplified by Q703, Q124, and then divided by PLL IC into 2.5KHz, 5KHz or 6.25KHz signal. The divided signal is compared with 2.5KHz, 5KHz or 6.25KHz reference signal from 16.8MHz crystal oscillator (2.5 PPM frequency stability) in the phase comparator. The frequency control voltage outputted from the phase comparator is sent to TX VCO after passing through LPF (Q804, Q805). In the meantime, modulation signal (TX) is passed to TX VCO for frequency modulation.

The working principle in receive mode is similar to that in transmit mode.

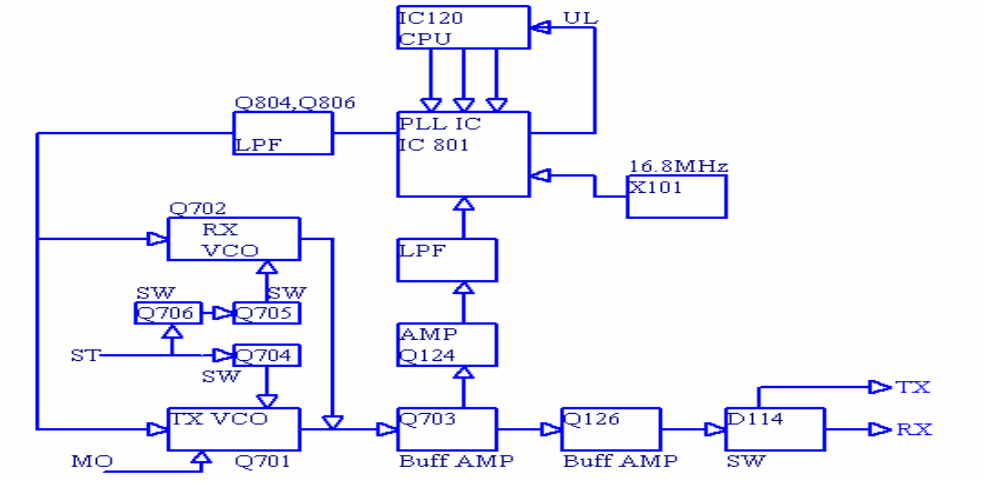


Figure 3 PLL Circuit

5. Control Circuit

Circuit in this section is comprised of CPU, reset IC, power supply controller and flash ROM.

5.1 CPU

IC120 (CPU) operates at 9.8304MHz. It controls the data transmission between receive circuit, transmit circuit, control circuit, display circuit and peripheral circuit.

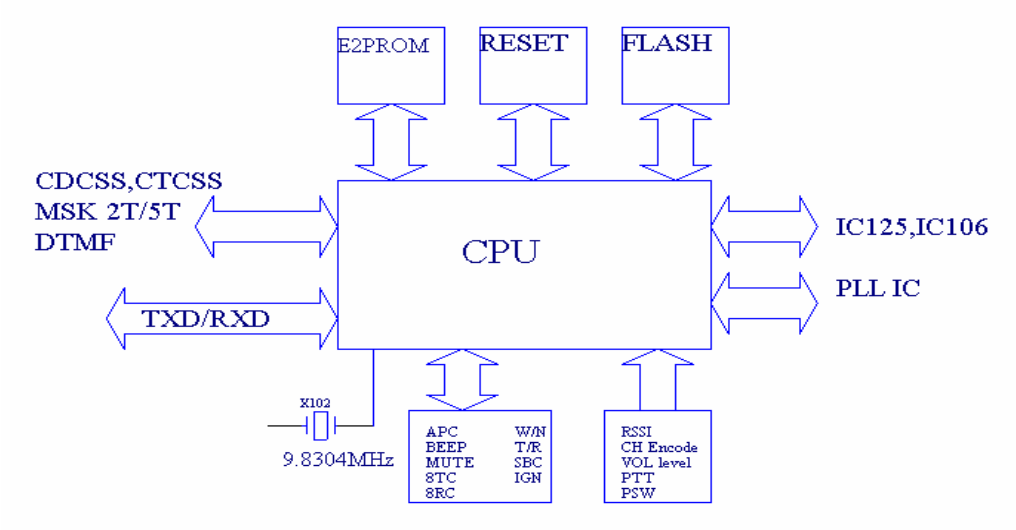


Figure 4 Control Circuit

5.2 Power Supply

Power supply of the radio is derived from the battery which supplies battery B+. D135 and D137 are over-voltage protection diodes. Power-on/off can be controlled by software.

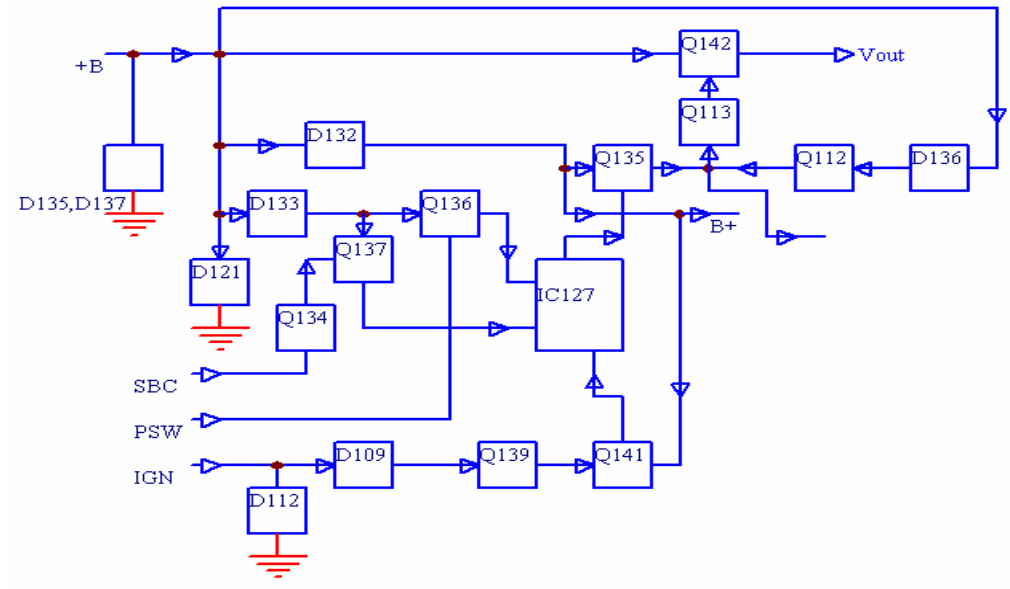


Figure 5 Power Switch Circuit

Vout provides power supply to IC115, IC114, IC113, and IC111, which produces 8V, 9V, 5V, and 3.3V voltage to the circuit.

6. Display Circuit

Display circuit is comprised of CPU (IC503), LCD module, LED and other components. Radio features are programmable by PF1-PF6. Data is displayed on the 12-digit and 4-digit dot matrix LCD in alphanumeric form.

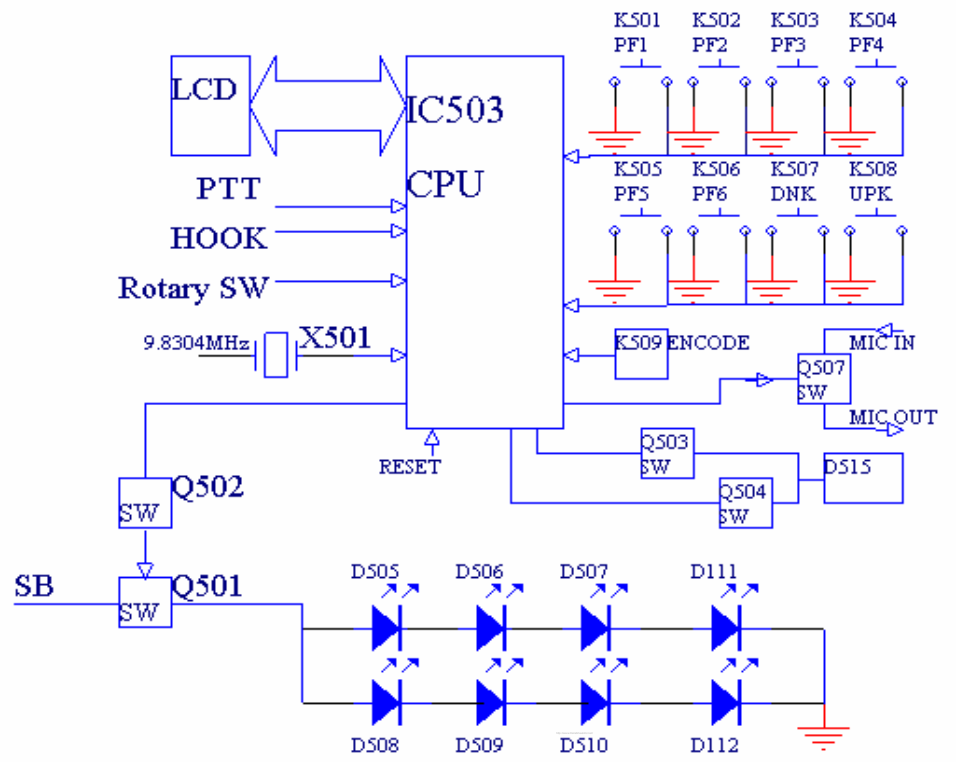


Figure 6 Display Circuit

Semiconductor Data

1. Voltage Supply: TA7805F (Display Unit IC501): Providing supply voltage.
2. Voltage Detector: R3111H421C(Display Unit IC502)

2-1.Pin Function

Pin No.	Name	I/O	Function
1	Vout	O	Reset.
2	GND		GND.
3	Vin	I	Supply voltage.

3. Display CPU: UPD780112(Display Unit IC503)

3-1.Pin Function

Pin No.	Name	I/O	Function
1	AVref		+5V.
2	AVss		GND.
3	IC(vpp)		Internal connected.
4	VDD		+5V.
5	Vss		GND.
6	X1		Connection to crystal.
7	X2		
8	RESET	I	CPU reset.
9	XT1		+5V.
10	XT2		Not used.
11	SHIFT		Beat Shift.
12	Mute		MIC Mute.
13	RSW3		Not used.
14	RSW2		Not used.
15	RSW0(DN)	I	Rotary SW0 (down).
16	RSW1(UP)	I	Rotary SW1 (up).
17	LCDBL	O	LCD backlight.
18	LCDCS	O	LCD control signal output.
19	LCDSOD	O	LCD data read.
20	LCDDAT	O	LCD data write.
21	LCDCLK	O	Clock output for LCD driver.
22	EVss		GND.
23	EVdd		+5V.
24	MICDAT	O	Serial data output for keypad MIC.
25	OUT1		Not used.
26	RXD1	I	Serial data input.
27	TXD1	O	Serial data output.

28	HMBL		MIC backlight control signal output.
29	HOOK/RXD0		Hook signal input/ Serial data input.
30	TXD0	O	PC commands (TXD)/connects to PTT.
31	RLED	O	Red LED output.
32	GLED	O	Green LED output.
33	PTT	O	PTT/connect to TXD0.
34	DNKEY	I	Up key.
35	UPKEY	I	Down key.
36	KEYBL	I	Key backlight.
37	IN1		Not used.
38	IN2		Not used.
39	PF6	I	PF6 Key Input.
40	PF5	I	PF5 Key Input.
41	PF4	I	PF4 Key Input.
42	PF3	I	PF3 Key Input.
43	PF2	I	PF2 Key Input.
44	PF1	I	PF1 Key Input.

4. Flash ROM: AT29C020-90T1(TX-RX Unit IC103)

4-1 Pin Function

Pin No.	Name	I/O	Function
1～6, 9～20, 31	A18～A0	I	Flash ROM address bus.
7	WR	I	Flash ROM write enable.
8	VCC		+5V.
21～23, 25～29	D0～D7	I/O	Flash ROM data bus.
24	VSS		GND.
30	CE	I	Flash ROM chip enable.
32	OE	I	Flash ROM output enable.

5. EEPROM: AT2408N12.5S(TX-RX Unit IC105)

5-1 Pin Function

Pin No.	Name	I/O	Function
1～3	A0～A2	I	Address inputs.
4	GND		GND.
5	SDA	I/O	Serial Data.
6	SCL		Serial clock input.
7	TEST		Test.
8	VCC		+5V.

6. Audio processor: AK2346 (TX-RX Unit IC106)

6-1 Pin Function

Pin No.	Name	I/O	Function
1	AGNDIN	I	Analog ground input pin.
2	AGND	O	Analog ground output pin.
3	TXIN	I	Transmit audio signal input pin.
4	TXINO	O	TXA1 feedback output pin.
5	LIMLV	I	Limit level adjuster pin.
6	EXTLIMIN	I	External signal input pin pre-limiter circuit.
7	MOD	O	The modulated transmit signal output pin.
8	VSS		GND.
9	TCLK	O	Clock output pin for MSK transmission data.
10	TDATA	I	MSK transmission data input pin. Data are latched synchronizing with the TCLK rising edge.
11	DI/O	I/O	Serial data input and output pin. Input for register setting data and output for MSK receive data.
12	RDF/FC	O	MSK signal received flag and frame detection signal output pin.
13	SCLK	I	Clock input pin for serial data I/O.
14	DIR	I	Serial data I/O control pin.
15	XOUT	I	Crystal oscillator connecting input pin.
16	XIN	I/O	Crystal oscillator connecting input and output pin.
17	VDD		Positive power supply pin.
18	EXPOUT	O	Expander and VR4 output pin.
19	RXAFIN	I	Receive audio signal input pin.
20	RXAF	O	Receive audio signal output pin.
21	RXLPFO	O	Receive LPF output pin.
22	RXINO	O	RXA1 feedback output pin.
23	RXIN	I	Demodulated audio signal input pin.
24	TEST	I	Test register control input pin.

7. DTMF Receiver: LC73872M (TX-RX Unit IC122)

7-1 Pin Function

Pin No.	Name	I/O	Description
1	INPUT	I	Signal input.
2	NC		No connection.
3	PD	I	The IC goes to lower power mode when this pin is pulled high.
4	OSCO	O	Oscillator output.
5	OSCI	I	Oscillator input.
6	NC		No connection.
7	V_{SS}		GND.
8	LOAD	I	Inputting a clock to this pin allows the serial data to be output two or more times.
9	SD	O	The decoded DTMF signal is output.
10	ACK	I	Shifting out data from SD pin.
11	STD	O	A high level indicates the presence of a DTMF signal.
12	EST	O	A high level indicates the presence of a DTMF signal.
13	NC		No connection.
14	V_{DD}		+5V.

8. D/A converter with buffer amplifier: M62364FP (TX-RX Unit IC125)

8-1 Pin Function

Pin No.	Name	I/O	Description
1,4,9,12,13,16,21,24	V_{IN1}～V_{IN8}	I	D/A converter input.
2,3,10,11,14,15,22,23	V_{OUT1}～V_{OUT8}	O	D/A converter output with 8-bit resolution.
5	V_{DD}		+5V.
6	LD	I	A low state enables data loading to shift register.
7	CLK	I	Shift clock input.
8	DI	I	Serial data input.
17	DO	O	Serial data output.
18	V_{DAref}	I	D/A Converter reference voltage input.
19	RESET	I	Reset 8-bit latches.
20	GND		GND.

9. Power amplifier: TDA8561Q (TX-RX Unit IC126)

9-1 Pin Function

Pin No.	Name	I/O	Description
1	-INV1	I	Non-inverting input 1.
2	GND(S)		Signal ground.
3	INV2	I	Inverting input 2.
4	RR		Supply voltage ripple rejection.
5	VP1		Supply voltage.
6	OUT1	O	Output 1.
7	GND1		Power ground 1.
8	OUT2	O	Output 2.
9	NC		No connection.
10	OUT3	O	Output 3.
11	GND2		Power ground 2.
12	OUT4	O	Output 4.
13	VP2		Supply voltage.
14	MODE	I	Mode select switch input.
15	INV3	I	Inverting input 3.
16	VDIAG	O	Diagnostic output.
17	-INV4	I	Non-inverting input 4.

10. Positive voltage regulator : XC62FP3302P (TX-RX Unit IC111)、TA7805F (TX-RX Unit IC113)、TA78L09 (TX-RX Unit IC114)、TA7808S (TX-RX Unit IC115).
11. Amplifier: NJM2904V(TX-RX Unit IC104、TX-RX Unit IC110)、TA75W558FU(TX-RX Unit IC107)、TC75W51FU(TX-RX Unit IC108)、NJM4558M(TX-RX Unit IC109)、TA75S01F(TX-RX Unit IC116、TX-RX Unit IC117)、TA75W01FU(TX-RX Unit IC118).
12. IF detector: TA31136FN (TX-RX Unit IC119).
13. Dual D-type Flip-flop: TC4013BF (TX-RX Unit IC127).
14. RF PLL Frequency Synthesizers: ADF4111 (TX-RX Unit IC801).

15. CPU: M16C (Tx-Rx Unit IC120)

15-1 Pin Funcion

PIN No.	PORT	PIN NAME	I/O	DESCRIPTION
1	P94/DA1	2TN/5TN	I	2-tone/5-tone decode pulse input
2	P93/DA0	DTMF	O	DTMF/2Tone/5Tone/BEEP output
3	P92	SBC	O	SB power switch control. H: off L: on
4	P91	AFDIO	I/O	AK2346 DATA I/O (SDAT)
5	P90	AFSCLK	O	AK2346 serial clock (SCLK)
6	BYTE	BYTE	I	+5V(5C)
7	CNVSS	CNVSS	I	GND
8	P87	PA	O	MIC PA switch control PA: H
9	P86	DACSTB	O	DA conversion strobe output
10	RESET	RESET	I	Reset
11	XOUT	XOUT	O	Clock output
12	VSS	VSS	I	GND
13	XIN	XIN	I	Clock input
14	VCC	VCC	I	+5V
15	P85/NMI	NMI	I	NMI, usually not use
16	P84/INT2	AFRDF	I	Bandpass MSK receive detect (RDF/FD)
17	P83/INT1	DTMFSTD	I	DTMF decode detect Detect: H
18	P82/INT0	AUX2	I/O	PCB AUX 2 (input)
19	P81/TA4in	AUX3	I/O	AUX3 port (input)
20	P80/TA4out	AUX4	I/O	AUX4 port (input) (output)
21	P77/TA3in	SPMUTE	O	SP Mute Mute: H
22	P76/TA3out	TO	O	CTCSS/CDCSS modulation output
23	P75/TA2in	EMICC	O	External MIC control External MIC: H
24	P74/TA2out	AFTDATA	O	Bandpass chip MSK serial data(TDATA)
25	P73/TA1in	AFTCLK	I	Bandpass chip MSK serial clock(TCLK)
26	P72/TA1out	AFDIR	O	Bandpass chip I/O control (DIR)
27	P71/RXD2	RXD2	I	Serial data input
28	P70/TXD2	TXD2	I	Serial data output
29	P67/TXD1	TXD1	O	Acc comm2 (serial data output)
30	P66/RXD1	RXD1	I	Acc comm2 (serial data input)
31	P65	AUX5	I/O	AUX5 port (output)
32	P64	AUX6	I/O	AUX6 port (output)
33	P63	TXD0	O	Acc comm1(serial data output)
34	P62	RXD0	I	Acc comm1(serial data input)
35	P61	AUX7	I/O	AUX7 port (output)
36	P60	AUX1	I/O	AUX1 port (input)
37	P57	RDY	I	Pull Up

38	P56	NC	O	NC (left floating)
39	P55	HOLD	O	NC (left floating)
40	P54	NC	O	NC (left floating)
41	P53	NC	O	NC (left floating)
42	P52	RD	O	Read (for expansion)
43	P51	NC	O	NC (left floating)
44	P50	WR	O	Write (for expansion)
45	P47	HNC	O	Horn alert control On: H
46	P46	SHIFT	O	Clock frequency shift On: H
47	P45	W/N	O	W/N switch W: L
48	P44	CS0	O	Signal select (expansion chip)
49	A19	A19	O	NC
50~59	A18~A9	A18~A9	O	FLASHROM address bus
60	VCC	VCC	I	+5V
61	A8	A8	O	FLASHROM address bus
62	VSS	VSS	I	GND
63~70	A7~A0	A7~A0	O	FLASHROM address bus
71	P17	8RC	O	8R power supply control RX: H
72	P16	8TC	O	8T power supply control TX: H
73	P15	RX	O	TX/RX VCO switch RX: L
74	P14	EEPDAT	I/O	EEPROM data input/output
75	P13	EEPCLK	O	EEPROM clock output
		DACLK	O	DA clock output
76	P12	PLLUL	I	PLL unlock detect Unlock: L
77	P11	PLLSTB	O	PLL strobe output Lock: L
78	P10	AFMUTE	O	AF Mute (RX) Mute: H
79~86	D7~ D0	D7~ D0		FLASHROM address bus
87	P10	PWR	I	[PWR] key input On: L
88	P10	IGN	I	Ignition sense input H: off L: on
89	P10	PLLDAT	O	PLL data output
		DADAT	O	DA data output
90	P10	PLLCLK	O	PLL clock output
91	AN3	TEMP	I	Temperature input
92	AN2	RSSQL	I	RSSI input
93	AN1	ANLSQL	I	SQL input (analogue)
94	AVss	AVss	I	GND
95	AN0	TI	I	CTCSS/CDCSS signal input
96	VREF	VREF	I	Reference voltage input
97	AVCC	AVCC	I	GND
98	P97/Sin4	DTMFPD	O	DTMF chip power supply control No power: H
99	P96/Sout4	DTMFCLK	O	DTMF chip decode clock output
100	P95/Clk4	DTMFDAT	I	DTMF chip decode clock input

Component Description

1. TX-RX Unit

Ref. No.	Part Name	Type	Description
IC102	IC	Power module	Power module
IC103	IC	AT29C02-90T1	Flash ROM
IC104	IC	NJM2904V	Single-supply dual operational amplifier
IC105	IC	AT2408N12.5S	EEPROM
IC106	IC	AK2346	Audio processor
IC107	IC	TA75W558FU	Dual operational amplifier
IC108	IC	TC75W51FU	Dual operational amplifier
IC109	IC	NJM4558M	Dual operational amplifier
IC110	IC	NJM2904V	Single-supply dual operational amplifier
IC111	IC	XC62FP3302P	Positive voltage regulator
IC113	IC	TA7805F	Positive voltage regulator
IC114	IC	TA78L09	Positive voltage regulator
IC115	IC	TA7805S	Positive voltage regulator
IC116	IC	TA75S01F	Single operational amplifier
IC117	IC	TA75S01F	Single operational amplifier
IC118	IC	TA75W01FU	Dual operational amplifier
IC119	IC	TA31136FN	IF detector
IC120	IC	M16C	CPU
IC121	IC	BU4066BCFV	Quad analog switch
IC122	IC	LC73872M	DTMF Receiver
IC125	IC	M62364FP	D/A converter with buffer amplifiers
IC126	IC	TDA8561Q	Power amplifier
IC127	IC	TC4013BF	Dual D-type Flip-flop

2. DISPLAY UNIT

Ref. No.	Part Name	Type	Description
IC501	IC	TA7805F	Voltage supply.
IC 502	IC	R3111H421C	Voltage detector.
IC 503	IC	UPD780112	Display CPU.

Part List 1

Tx-RxUnit

Ref. No.	Material No.	Description	Address	Ref. No.	Material No.	Description	Address
R168	01021012	Resistor 0402 100Ω J	B8M	R178	01031022	Resistor 0603 1KΩ J	B3M
R172	01021012	Resistor 0402 100Ω J	B9M	R146	01031022	Resistor 0603 1KΩ J	B5F
R389	01030002	Resistor 0603 0Ω J	B10H	R232	01031022	Resistor 0603 1KΩ J	B6F
R385	01030002	Resistor 0603 0Ω J	B3K	R350	01031022	Resistor 0603 1KΩ J	B6F
R386	01030002	Resistor 0603 0Ω J	B3K	R256	01031022	Resistor 0603 1KΩ J	B7C
R364	01030002	Resistor 0603 0Ω J	B3L	R144	01031022	Resistor 0603 1KΩ J	B7E
R383	01030002	Resistor 0603 0Ω J	B3L	R273	01031022	Resistor 0603 1KΩ J	B9K
R107	01030002	Resistor 0603 0Ω J	B3M	R127	01031022	Resistor 0603 1KΩ J	B9L
R263	01030002	Resistor 0603 0Ω J	B4D	R166	01031022	Resistor 0603 1KΩ J	T4H
R211	01030002	Resistor 0603 0Ω J	B4K	R344	01031022	Resistor 0603 1KΩ J	T6E
R340	01030002	Resistor 0603 0Ω J	B5J	R349	01031022	Resistor 0603 1KΩ J	T6E
R324	01030002	Resistor 0603 0Ω J	B6J	R234	01031022	Resistor 0603 1KΩ J	T6H
R317	01030002	Resistor 0603 0Ω J	B7J	R602	01031022	Resistor 0603 1KΩ J	T7M
R318	01030002	Resistor 0603 0Ω J	B7J	R288	01031022	Resistor 0603 1KΩ J	T8C
R335	01030002	Resistor 0603 0Ω J	B7J	R368	01031032	Resistor 0603 10KΩ J	B10H
R270	01030002	Resistor 0603 0Ω J	B7K	R176	01031032	Resistor 0603 10KΩ J	B3L
R375	01030002	Resistor 0603 0Ω J	B7L	R356	01031032	Resistor 0603 10KΩ J	B3M
R314	01030002	Resistor 0603 0Ω J	B8E	R259	01031032	Resistor 0603 10KΩ J	B4E
R281	01030002	Resistor 0603 0Ω J	B9K	R260	01031032	Resistor 0603 10KΩ J	B5E
R212	01030002	Resistor 0603 0Ω J	T10M	R150	01031032	Resistor 0603 10KΩ J	B5G
R390	01030002	Resistor 0603 0Ω J	T5D	R380	01031032	Resistor 0603 10KΩ J	B5M
R210	01030002	Resistor 0603 0Ω J	T7D	R239	01031032	Resistor 0603 10KΩ J	B6E
R290	01030002	Resistor 0603 0Ω J	T8D	R242	01031032	Resistor 0603 10KΩ J	B6E
R193	01030002	Resistor 0603 0Ω J	T8E	R326	01031032	Resistor 0603 10KΩ J	B6G
R817	01030002	Resistor 0603 0Ω J	T8H	R311	01031032	Resistor 0603 10KΩ J	B7E
R112	01031002	Resistor 0603 10Ω J	T8G	R139	01031032	Resistor 0603 10KΩ J	B8F
R113	01031002	Resistor 0603 10Ω J	T8G	R118	01031032	Resistor 0603 10KΩ J	B8H
R114	01031002	Resistor 0603 10Ω J	T8G	R806	01031032	Resistor 0603 10KΩ J	B8H
R811	01031002	Resistor 0603 10Ω J	T8G	R807	01031032	Resistor 0603 10KΩ J	B8H
R812	01031002	Resistor 0603 10Ω J	T8G	R286	01031032	Resistor 0603 10KΩ J	B8J
R813	01031002	Resistor 0603 10Ω J	T8H	R285	01031032	Resistor 0603 10KΩ J	B8K
R265	01031002	Resistor 0603 10Ω J	T9L	R135	01031032	Resistor 0603 10KΩ J	B9F
R266	01031002	Resistor 0603 10Ω J	T9L	R115	01031032	Resistor 0603 10KΩ J	T5D
R267	01031002	Resistor 0603 10Ω J	T9L	R240	01031032	Resistor 0603 10KΩ J	T6H
R268	01031002	Resistor 0603 10Ω J	T9L	R238	01031032	Resistor 0603 10KΩ J	T6J
R251	01031012	Resistor 0603 100Ω J	B4E	R249	01031032	Resistor 0603 10KΩ J	T6L
R221	01031012	Resistor 0603 100Ω J	B7H	R250	01031032	Resistor 0603 10KΩ J	T6L
R140	01031012	Resistor 0603 100Ω J	B8F	R200	01031032	Resistor 0603 10KΩ J	T7E
R236	01031012	Resistor 0603 100Ω J	T6H	R248	01031032	Resistor 0603 10KΩ J	T7L
R229	01031012	Resistor 0603 100Ω J	T6I	R196	01031032	Resistor 0603 10KΩ J	T8A
R130	01031012	Resistor 0603 100Ω J	T8I	R199	01031032	Resistor 0603 10KΩ J	T8A
R228	01031012	Resistor 0603 100Ω J	T8I	R205	01031032	Resistor 0603 10KΩ J	T8B
R177	01031022	Resistor 0603 1KΩ J	B2L	R287	01031032	Resistor 0603 10KΩ J	T8C
R361	01031022	Resistor 0603 1KΩ J	B3K	R370	01031032	Resistor 0603 10KΩ J	T8C

Ref. No.	Material No.	Description	Address	Ref. No.	Material No.	Description	Address
R371	01031032	Resistor 0603 10KΩ J	T8C	R347	01031542	Resistor 0603 150KΩ J	T6E
R372	01031032	Resistor 0603 10KΩ J	T8C	R292	01031542	Resistor 0603 150KΩ J	T8C
R808	01031032	Resistor 0603 10KΩ J	T8G	R369	01031542	Resistor 0603 150KΩ J	T8C
R392	01031032	Resistor 0603 10KΩ J	T8H	R145	01031812	Resistor 0603 180Ω J	B5F
R214	01031032	Resistor 0603 10KΩ J	T9L	R148	01031812	Resistor 0603 180Ω J	B5F
R261	01031032	Resistor 0603 10KΩ J	T9L	R258	01031822	Resistor 0603 1.8KΩ J	B7C
R179	01031042	Resistor 0603 100KΩ J	B2M	R217	01031832	Resistor 0603 18KΩ J	T8D
R366	01031042	Resistor 0603 100KΩ J	B3K	R291	01031832	Resistor 0603 18KΩ J	T9A
R365	01031042	Resistor 0603 100KΩ J	B3L	R181	01031842	Resistor 0603 180KΩ J	B5D
R171	01031042	Resistor 0603 100KΩ J	B5D	R331	01031842	Resistor 0603 180KΩ J	B6G
R257	01031042	Resistor 0603 100KΩ J	B5E	R207	01031842	Resistor 0603 180KΩ J	T7D
R325	01031042	Resistor 0603 100KΩ J	B6J	R208	01031842	Resistor 0603 180KΩ J	T7D
R801	01031042	Resistor 0603 100KΩ J	B7H	R104	01031842	Resistor 0603 180KΩ J	T7E
R277	01031042	Resistor 0603 100KΩ J	B7K	R216	01031842	Resistor 0603 180KΩ J	T8D
R802	01031042	Resistor 0603 100KΩ J	B8H	R154	01032202	Resistor 0603 22Ω J	B5H
R803	01031042	Resistor 0603 100KΩ J	B8H	R312	01032202	Resistor 0603 22Ω J	B7D
R108	01031042	Resistor 0603 100KΩ J	B8I	R109	01032202	Resistor 0603 22Ω J	B9H
R352	01031042	Resistor 0603 100KΩ J	T6D	R355	01032212	Resistor 0603 220Ω J	B6H
R353	01031042	Resistor 0603 100KΩ J	T6D	R388	01032212	Resistor 0603 220Ω J	B6I
R346	01031042	Resistor 0603 100KΩ J	T6E	R132	01032212	Resistor 0603 220Ω J	T8H
R601	01031042	Resistor 0603 100KΩ J	T6M	R809	01032212	Resistor 0603 220Ω J	T8H
R304	01031042	Resistor 0603 100KΩ J	T7C	R149	01032222	Resistor 0603 2.2KΩ J	B5G
R374	01031042	Resistor 0603 100KΩ J	T7C	R153	01032222	Resistor 0603 2.2KΩ J	B5H
R203	01031042	Resistor 0603 100KΩ J	T8B	R342	01032222	Resistor 0603 2.2KΩ J	B5J
R319	01031042	Resistor 0603 100KΩ J	T8C	R143	01032222	Resistor 0603 2.2KΩ J	T7I
R215	01031042	Resistor 0603 100KΩ J	T8D	R378	01032232	Resistor 0603 22KΩ J	B5L
R321	01031042	Resistor 0603 100KΩ J	T8D	R220	01032232	Resistor 0603 22KΩ J	B6H
R607	01031042	Resistor 0603 100KΩ J	T8M	R226	01032232	Resistor 0603 22KΩ J	B6I
R608	01031042	Resistor 0603 100KΩ J	T9M	R339	01032232	Resistor 0603 22KΩ J	B7G
R301	01031052	Resistor 0603 1.0MΩ J	T10B	R306	01032232	Resistor 0603 22KΩ J	B7M
R294	01031052	Resistor 0603 1.0MΩ J	T8C	R278	01032232	Resistor 0603 22KΩ J	B9J
R213	01031212	Resistor 0603 120Ω J	T9K	R283	01032232	Resistor 0603 22KΩ J	B9J
R343	01031222	Resistor 0603 1.2KΩ J	T5E	R231	01032232	Resistor 0603 22KΩ J	T6I
R810	01031222	Resistor 0603 1.2KΩ J	T9I	R302	01032232	Resistor 0603 22KΩ J	T7C
R603	01031502	Resistor 0603 15Ω J	T7M	R209	01032232	Resistor 0603 22KΩ J	T7D
R155	01031522	Resistor 0603 1.5KΩ J	B5H	R298	01032232	Resistor 0603 22KΩ J	T8C
R116	01031522	Resistor 0603 1.5KΩ J	B8H	R126	01032232	Resistor 0603 22KΩ J	T9E
R123	01031522	Resistor 0603 1.5KΩ J	B8I	R204	01032232	Resistor 0603 22KΩ J	T9E
R165	01031522	Resistor 0603 1.5KΩ J	B9K	R323	01032242	Resistor 0603 220KΩ J	B7G
R341	01031522	Resistor 0603 1.5KΩ J	B9K	R110	01032242	Resistor 0603 220KΩ J	B9H
R124	01031522	Resistor 0603 1.5KΩ J	T10J	R187	01032242	Resistor 0603 220KΩ J	T9D
R329	01031532	Resistor 0603 15KΩ J	B6G	R254	01032702	Resistor 0603 27Ω J	B6C
R227	01031532	Resistor 0603 15KΩ J	T6F	R246	01032712	Resistor 0603 270Ω J	B6D
R219	01031532	Resistor 0603 15KΩ J	T6H	R247	01032712	Resistor 0603 270Ω J	B6D
R201	01031532	Resistor 0603 15KΩ J	T7D	R244	01032712	Resistor 0603 270Ω J	B6E
R218	01031532	Resistor 0603 15KΩ J	T8E	R245	01032712	Resistor 0603 270Ω J	B6E

Ref. No.	Material No.	Description	Address	Ref. No.	Material No.	Description	Address
R309	01032712	Resistor 0603 270Ω J	T10K	R604	01034722	Resistor 0603 4.7KΩ J	T7M
R310	01032712	Resistor 0603 270Ω J	T10L	R373	01034722	Resistor 0603 4.7KΩ J	T8C
R804	01032722	Resistor 0603 2.7KΩ J	T8H	R134	01034722	Resistor 0603 4.7KΩ J	T8I
R805	01032722	Resistor 0603 2.7KΩ J	T9H	R271	01034732	Resistor 0603 47KΩ J	B2K
R147	01033302	Resistor 0603 33Ω J RCT03330JTP	B4F	R362	01034732	Resistor 0603 47KΩ J	B2K
R316	01033302	Resistor 0603 33Ω J RCT03330JTP	B7E	R387	01034732	Resistor 0603 47KΩ J	B2K
R137	01033302	Resistor 0603 33Ω J RCT03330JTP	T8H	R174	01034732	Resistor 0603 47KΩ J	B3A
R338	01033312	Resistor 0603 330Ω J RCT03331JTP	B7F	R175	01034732	Resistor 0603 47KΩ J	B3A
R328	01033312	Resistor 0603 330Ω J RCT03331JTP	B7K	R363	01034732	Resistor 0603 47KΩ J	B3L
R141	01033312	Resistor 0603 330Ω J RCT03331JTP	B8F	R105	01034732	Resistor 0603 47KΩ J	B4L
R142	01033312	Resistor 0603 330Ω J RCT03331JTP	B8F	R131	01034732	Resistor 0603 47KΩ J	B5E
R605	01033312	Resistor 0603 330Ω J RCT03331JTP	T8M	R173	01034732	Resistor 0603 47KΩ J	B5E
R819	01033312	Resistor 0603 330Ω J RCT03331JTP	T9H	R345	01034732	Resistor 0603 47KΩ J	B5J
R330	01033322	Resistor 0603 3.3KΩ J	B6K	R348	01034732	Resistor 0603 47KΩ J	B5K
R337	01033322	Resistor 0603 3.3KΩ J	B7F	R377	01034732	Resistor 0603 47KΩ J	B5K
R334	01033322	Resistor 0603 3.3KΩ J	B7G	R235	01034732	Resistor 0603 47KΩ J	B6F
R313	01033332	Resistor 0603 33KΩ J RCT03333J	B10K	R332	01034732	Resistor 0603 47KΩ J	B7F
R367	01033332	Resistor 0603 33KΩ J RCT03333J	B2L	R191	01034732	Resistor 0603 47KΩ J	B7K
R357	01033332	Resistor 0603 33KΩ J RCT03333J	B3L	R272	01034732	Resistor 0603 47KΩ J	B7K
R305	01033332	Resistor 0603 33KΩ J RCT03333J	B6M	R279	01034732	Resistor 0603 47KΩ J	B8J
R128	01033332	Resistor 0603 33KΩ J RCT03333J	B7K	R274	01034732	Resistor 0603 47KΩ J	B8K
R138	01033332	Resistor 0603 33KΩ J RCT03333J	B8F	R280	01034732	Resistor 0603 47KΩ J	B8K
R183	01033332	Resistor 0603 33KΩ J RCT03333J	T9D	R491	01034732	Resistor 0603 47KΩ J	B8K
R169	01033342	Resistor 0603 330KΩ J	B5E	R120	01034732	Resistor 0603 47KΩ J	B9J
R336	01033342	Resistor 0603 330KΩ J	B6F	R180	01034732	Resistor 0603 47KΩ J	B9L
R327	01033342	Resistor 0603 330KΩ J	B7J	R611	01034732	Resistor 0603 47KΩ J	T10C
R197	01033342	Resistor 0603 330KΩ J	T8A	R237	01034732	Resistor 0603 47KΩ J	T6H
R225	01033922	Resistor 0603 3.9KΩ J	B7G	R300	01034732	Resistor 0603 47KΩ J	T7B
R103	01033942	Resistor 0603 390KΩ J RCT03394JTP	T7E	R182	01034732	Resistor 0603 47KΩ J	T7C
R151	01034702	Resistor 0603 47Ω J	B5G	R320	01034732	Resistor 0603 47KΩ J	T7D
R159	01034702	Resistor 0603 47Ω J	T7L	R190	01034732	Resistor 0603 47KΩ J	T8D
R606	01034702	Resistor 0603 47Ω J	T7M	R198	01034732	Resistor 0603 47KΩ J	T9A
R136	01034702	Resistor 0603 47Ω J	T8I	R186	01034732	Resistor 0603 47KΩ J	T9D
R358	01034712	Resistor 0603 470Ω J	B3L	R194	01034732	Resistor 0603 47KΩ J	T9E
R129	01034712	Resistor 0603 470Ω J	B5I	R816	01034732	Resistor 0603 47KΩ J	T9I
R351	01034722	Resistor 0603 4.7KΩ J	B5K	R381	01034742	Resistor 0603 470KΩJ	B5M
R376	01034722	Resistor 0603 4.7KΩ J	B5L	R382	01034742	Resistor 0603 470KΩJ	B5M
R230	01034722	Resistor 0603 4.7KΩ J	B6F	R106	01034742	Resistor 0603 470KΩJ	B8I
R315	01034722	Resistor 0603 4.7KΩ J	B7E	R111	01034742	Resistor 0603 470KΩJ	B9H
R282	01034722	Resistor 0603 4.7KΩ J	B8J	R297	01034742	Resistor 0603 470KΩJ	T8D
R284	01034722	Resistor 0603 4.7KΩ J	B8K	R185	01034742	Resistor 0603 470KΩJ	T9D
R192	01034722	Resistor 0603 4.7KΩ J	B9J	R818	01034742	Resistor 0603 470KΩJ	T9I
R125	01034722	Resistor 0603 4.7KΩ J	T10B	R609	01035122	Resistor 0603 5.1KΩ J	B10L
R121	01034722	Resistor 0603 4.7KΩ J	T10C	R490	01035122	Resistor 0603 5.1KΩ J	B8K
R122	01034722	Resistor 0603 4.7KΩ J	T10C	R195	01035132	Resistor 0603 51KΩ J	T8A
R360	01034722	Resistor 0603 4.7KΩ J	T3D	R253	01035602	Resistor 0603 56Ω J	B6C

Ref. No.	Material No.	Description	Address	Ref. No.	Material No.	Description	Address
R223	01035602	Resistor 0603 56Ω J	T8H	CP101	012D101J	Resistor array YC122 0402*2 100Ω5%	B9M
R820	01035612	Resistor 0603 560Ω J	T9H	CP102	012D101J	Resistor array YC122 0402*2 100Ω5%	B9M
R206	01035632	Resistor 0603 56KΩ J	T8C	CP111	012D101J	Resistor array YC122 0402*2 100Ω5%	B9M
R303	01035632	Resistor 0603 56KΩ J	T9C	CP112	012D101J	Resistor array YC122 0402*2 100Ω5%	B9M
R275	01035R62	Resistor 0603 5.6Ω J	B7C	CP113	012D101J	Resistor array YC122 0402*2 100Ω5%	B9M
R152	01035R62	Resistor 0603 5.6Ω J	B9D	CP128	012D102J	Resistor array 0402 1K*2 RAC102D 102J	B7K
R189	01036232	Resistor 0603 62KΩ J	T8E	CP126	012D102J	Resistor array 0402 1K*2 RAC102D 102J	B7L
R222	01036822	Resistor 0603 6.8KΩ J	B6G	CP127	012D102J	Resistor array 0402 1K*2 RAC102D 102J	B7L
R224	01036822	Resistor 0603 6.8KΩ J	B6I	CP130	012D102J	Resistor array 0402 1K*2 RAC102D 102J	B8K
R255	01036822	Resistor 0603 6.8KΩ J	B7C	CP110	012D102J	Resistor array 0402 1K*2 RAC102D 102J	B9K
R117	01036822	Resistor 0603 6.8KΩ J	T5D	CP129	012D102J	Resistor array 0402 1K*2 RAC102D 102J	B9K
R322	01036832	Resistor 0603 68KΩ J	B6J	CP131	012D102J	Resistor array 0402 1K*2 RAC102D 102J	B9K
R295	01036832	Resistor 0603 68KΩ J	T7C	CP104	012D102J	Resistor array 0402 1K*2 RAC102D 102J	B9L
R101	01036832	Resistor 0603 68KΩ J	T9E	CP105	012D102J	Resistor array 0402 1K*2 RAC102D 102J	B9L
R307	01038212	Resistor 0603 820Ω J RCT03821JTP	B7C	CP106	012D102J	Resistor array 0402 1K*2 RAC102D 102J	B9L
R308	01038212	Resistor 0603 820Ω J RCT03821JTP	B7C	CP107	012D102J	Resistor array 0402 1K*2 RAC102D 102J	B9L
R241	01038212	Resistor 0603 820Ω J RCT03821JTP	B9D	CP108	012D102J	Resistor array 0402 1K*2 RAC102D 102J	B9L
R243	01038212	Resistor 0603 820Ω J RCT03821JTP	B9D	TH101	0139104J	Thermistor 100k NCP18WF104J03RB	T5M
R289	01038222	Resistor 0603 8.2KΩ J	T8D	VR101	013Y473S	Variable resistor 47KΩ EVM3ESX50BQ4	T5J
R102	01038232	Resistor 0603 82KΩ J	T7E	F103	0175A24V	Fuse 1812 0.75A(MINISMDM075/24-02)	B10G
R202	01039122	Resistor 0603 9.1KΩ J	T8B	C119	0203030B	Capacitor 0603 3P B 50V	T8H
R188	01039132	Resistor 0603 91KΩ J	T9E	C120	0203030B	Capacitor 0603 3P B 50V	T8H
R133	01050002	Resistor 0805 0Ω J	T10M	C371	0203040B	Capacitor 0603 4P B 50V	T4F
R157	01051802	Resistor 0805 18Ω J	B5H	C301	0203050B	Capacitor 0603 5P B 50V	T10L
R161	01051802	Resistor 0805 18Ω J	T3F	C249	0203060B	Capacitor 0603 6P B 50V	B7D
R160	01052712	Resistor 0805 270Ω J	T3F	C244	0203060B	Capacitor 0603 6P B 50V	B7E
R163	01052712	Resistor 0805 270Ω J	T3F	C248	0203070B	Capacitor 0603 7P B 50V	B6D
R156	01054702	Resistor 0805 47Ω J	B5H	C245	0203070B	Capacitor 0603 7P B 50V	B6E
F102	0111A16V	Fuse 1812 1.1A(MINISMDC110F/16-02)	B10I	C374	0203080B	Capacitor 0603 8P B 50V	B6F
F101	0111A16V	Fuse 1812 1.1A(MINISMDC110F/16-02)	B1K	C132	0203090B	Capacitor 0603 9P B 50V	B8E
R814	01201022	Resistor 2010 1KΩ0.5W J	B9G	C602	0203090B	Capacitor 0603 9P B 50V	T6M
R170	01201212	Resistor 2010 120Ω J	B5D	C607	0203090B	Capacitor 0603 9P B 50V	T7M
R158	01202202	Resistor 2010 22Ω J	T5F	C611	0203090B	Capacitor 0603 9P B 50V	T8M
R359	01204712	Resistor 2010 470Ω J	T4D	C615	0203090B	Capacitor 0603 9P B 50V	T8M
CP118	012D101J	Resistor array YC122 0402*2 100Ω5%	B7L	C618	0203090B	Capacitor 0603 9P B 50V	T9M
CP119	012D101J	Resistor array YC122 0402*2 100Ω5%	B7L	C621	0203090B	Capacitor 0603 9P B 50V	T9M
CP120	012D101J	Resistor array YC122 0402*2 100Ω5%	B7L	C178	02030R5B	Capacitor 0603 0.5P B 50V	T2M
CP121	012D101J	Resistor array YC122 0402*2 100Ω5%	B7L	C179	02030R5B	Capacitor 0603 0.5P B 50V	T2M
CP126	012D101J	Resistor array YC122 0402*2 100Ω5%	B7L	C171	02030R5B	Capacitor 0603 0.5P B 50V	T3N
CP127	012D101J	Resistor array YC122 0402*2 100Ω5%	B7L	C172	02030R5B	Capacitor 0603 0.5P B 50V	T3N
CP122	012D101J	Resistor array YC122 0402*2 100Ω5%	B8K	C239	02031000	Capacitor 0603 10P C 50V	B6F
CP103	012D101J	Resistor array YC122 0402*2 100Ω5%	B8M	C110	02031000	Capacitor 0603 10P C 50V	B8H
CP109	012D101J	Resistor array YC122 0402*2 100Ω5%	B8M	C606	02031000	Capacitor 0603 10P C 50V	T6M
CP114	012D101J	Resistor array YC122 0402*2 100Ω5%	B8M	C614	02031000	Capacitor 0603 10P C 50V	T8M
CP115	012D101J	Resistor array YC122 0402*2 100Ω5%	B8M	C620	02031000	Capacitor 0603 10P C 50V	T9M
CP116	012D101J	Resistor array YC122 0402*2 100Ω5%	B9K	C204	02031012	Capacitor 0603 100P J 50V	B10F

Ref. No.	Material No.	Description	Address	Ref. No.	Material No.	Description	Address
C205	02031012	Capacitor 0603 100P J 50V	B10F	C144	02031023	Capacitor 0603 1000P K 50V	B5G
C206	02031012	Capacitor 0603 100P J 50V	B10F	C146	02031023	Capacitor 0603 1000P K 50V	B5H
C209	02031012	Capacitor 0603 100P J 50V	B10J	C148	02031023	Capacitor 0603 1000P K 50V	B5I
C210	02031012	Capacitor 0603 100P J 50V	B10J	C150	02031023	Capacitor 0603 1000P K 50V	B5I
C356	02031012	Capacitor 0603 100P J 50V	B10K	C323	02031023	Capacitor 0603 1000P K 50V	B5K
C357	02031012	Capacitor 0603 100P J 50V	B10K	C256	02031023	Capacitor 0603 1000P K 50V	B6C
C355	02031012	Capacitor 0603 100P J 50V	B10L	C324	02031023	Capacitor 0603 1000P K 50V	B6E
C203	02031012	Capacitor 0603 100P J 50V	B1L	C330	02031023	Capacitor 0603 1000P K 50V	B6E
C106	02031012	Capacitor 0603 100P J 50V	B2L	C360	02031023	Capacitor 0603 1000P K 50V	B6F
C303	02031012	Capacitor 0603 100P J 50V	B8E	C314	02031023	Capacitor 0603 1000P K 50V	B6J
C207	02031012	Capacitor 0603 100P J 50V	T5C	C365	02031023	Capacitor 0603 1000P K 50V	B6M
C208	02031012	Capacitor 0603 100P J 50V	T5C	C154	02031023	Capacitor 0603 1000P K 50V	B7C
C225	02031012	Capacitor 0603 100P J 50V	T7I	C306	02031023	Capacitor 0603 1000P K 50V	B7D
C265	02031012	Capacitor 0603 100P J 50V	T7L	C308	02031023	Capacitor 0603 1000P K 50V	B7D
C300	02031023	Capacitor 0603 1000P K 50V	B10G	C238	02031023	Capacitor 0603 1000P K 50V	B7E
C302	02031023	Capacitor 0603 1000P K 50V	B10G	C310	02031023	Capacitor 0603 1000P K 50V	B7E
C305	02031023	Capacitor 0603 1000P K 50V	B10I	C220	02031023	Capacitor 0603 1000P K 50V	B7G
C307	02031023	Capacitor 0603 1000P K 50V	B10I	C317	02031023	Capacitor 0603 1000P K 50V	B7J
C352	02031023	Capacitor 0603 1000P K 50V	B10J	C184	02031023	Capacitor 0603 1000P K 50V	B7K
C353	02031023	Capacitor 0603 1000P K 50V	B10K	C127	02031023	Capacitor 0603 1000P K 50V	B8F
C354	02031023	Capacitor 0603 1000P K 50V	B10K	C128	02031023	Capacitor 0603 1000P K 50V	B8F
C358	02031023	Capacitor 0603 1000P K 50V	B10K	C129	02031023	Capacitor 0603 1000P K 50V	B8F
C359	02031023	Capacitor 0603 1000P K 50V	B10K	C131	02031023	Capacitor 0603 1000P K 50V	B8F
C107	02031023	Capacitor 0603 1000P K 50V	B1K	C232	02031023	Capacitor 0603 1000P K 50V	B8F
C291	02031023	Capacitor 0603 1000P K 50V	B1K	C109	02031023	Capacitor 0603 1000P K 50V	B8G
C294	02031023	Capacitor 0603 1000P K 50V	B1K	C114	02031023	Capacitor 0603 1000P K 50V	B8G
C212	02031023	Capacitor 0603 1000P K 50V	B1L	C801	02031023	Capacitor 0603 1000P K 50V	B8H
C213	02031023	Capacitor 0603 1000P K 50V	B1L	C231	02031023	Capacitor 0603 1000P K 50V	B9F
C292	02031023	Capacitor 0603 1000P K 50V	B1L	C108	02031023	Capacitor 0603 1000P K 50V	B9G
C293	02031023	Capacitor 0603 1000P K 50V	B1L	C122	02031023	Capacitor 0603 1000P K 50V	B9I
C295	02031023	Capacitor 0603 1000P K 50V	B1L	C327	02031023	Capacitor 0603 1000P K 50V	B9I
C296	02031023	Capacitor 0603 1000P K 50V	B1L	C331	02031023	Capacitor 0603 1000P K 50V	B9I
C367	02031023	Capacitor 0603 1000P K 50V	B1M	C155	02031023	Capacitor 0603 1000P K 50V	T10M
C368	02031023	Capacitor 0603 1000P K 50V	B1M	C335	02031023	Capacitor 0603 1000P K 50V	T3D
C211	02031023	Capacitor 0603 1000P K 50V	B2L	C336	02031023	Capacitor 0603 1000P K 50V	T3D
C214	02031023	Capacitor 0603 1000P K 50V	B2L	C160	02031023	Capacitor 0603 1000P K 50V	T3J
C176	02031023	Capacitor 0603 1000P K 50V	B3A	C334	02031023	Capacitor 0603 1000P K 50V	T4D
C180	02031023	Capacitor 0603 1000P K 50V	B3A	C337	02031023	Capacitor 0603 1000P K 50V	T4D
C342	02031023	Capacitor 0603 1000P K 50V	B3K	C411	02031023	Capacitor 0603 1000P K 50V	T4D
C254	02031023	Capacitor 0603 1000P K 50V	B4E	C251	02031023	Capacitor 0603 1000P K 50V	T4F
C133	02031023	Capacitor 0603 1000P K 50V	B4F	C264	02031023	Capacitor 0603 1000P K 50V	T4G
C139	02031023	Capacitor 0603 1000P K 50V	B4F	C153	02031023	Capacitor 0603 1000P K 50V	T4H
C173	02031023	Capacitor 0603 1000P K 50V	B5D	C159	02031023	Capacitor 0603 1000P K 50V	T4J
C142	02031023	Capacitor 0603 1000P K 50V	B5E	C152	02031023	Capacitor 0603 1000P K 50V	T5F
C141	02031023	Capacitor 0603 1000P K 50V	B5G	C149	02031023	Capacitor 0603 1000P K 50V	T5G
C143	02031023	Capacitor 0603 1000P K 50V	B5G	C162	02031023	Capacitor 0603 1000P K 50V	T5K

Ref. No.	Material No.	Description	Address	Ref. No.	Material No.	Description	Address
C304	02031023	Capacitor 0603 1000P K 50V	T5M	C326	02031033	Capacitor 0603 0.01uF K 25V	T4B
C325	02031023	Capacitor 0603 1000P K 50V	T6D	C322	02031033	Capacitor 0603 0.01uF K 25V	T4G
C338	02031023	Capacitor 0603 1000P K 50V	T6L	C166	02031033	Capacitor 0603 0.01uF K 25V	T5K
C601	02031023	Capacitor 0603 1000P K 50V	T6M	C242	02031033	Capacitor 0603 0.01uF K 25V	T6H
C284	02031023	Capacitor 0603 1000P K 50V	T7B	C236	02031033	Capacitor 0603 0.01uF K 25V	T6I
C287	02031023	Capacitor 0603 1000P K 50V	T7B	C604	02031033	Capacitor 0603 0.01uF K 25V	T6M
C275	02031023	Capacitor 0603 1000P K 50V	T7C	C193	02031033	Capacitor 0603 0.01uF K 25V	T7E
C288	02031023	Capacitor 0603 1000P K 50V	T7C	C623	02031033	Capacitor 0603 0.01uF K 25V	T7M
C332	02031023	Capacitor 0603 1000P K 50V	T7L	C344	02031033	Capacitor 0603 0.01uF K 25V	T8C
C608	02031023	Capacitor 0603 1000P K 50V	T7N	C347	02031033	Capacitor 0603 0.01uF K 25V	T8C
C113	02031023	Capacitor 0603 1000P K 50V	T8G	C258	02031033	Capacitor 0603 0.01uF K 25V	T8K
C116	02031023	Capacitor 0603 1000P K 50V	T8G	C610	02031033	Capacitor 0603 0.01uF K 25V	T8M
C118	02031023	Capacitor 0603 1000P K 50V	T8G	C617	02031033	Capacitor 0603 0.01uF K 25V	T9M
C804	02031023	Capacitor 0603 1000P K 50V	T8G	C339	02031043	Capacitor 0603 0.1uF K 16V	B2K
C812	02031023	Capacitor 0603 1000P K 50V	T8G	C340	02031043	Capacitor 0603 0.1uF K 16V	B4L
C126	02031023	Capacitor 0603 1000P K 50V	T8H	C333	02031043	Capacitor 0603 0.1uF K 16V	B4M
C221	02031023	Capacitor 0603 1000P K 50V	T8H	C363	02031043	Capacitor 0603 0.1uF K 16V	B5L
C802	02031023	Capacitor 0603 1000P K 50V	T8H	C267	02031043	Capacitor 0603 0.1uF K 16V	B6K
C803	02031023	Capacitor 0603 1000P K 50V	T8H	C289	02031043	Capacitor 0603 0.1uF K 16V	B7M
C125	02031023	Capacitor 0603 1000P K 50V	T8I	C351	02031043	Capacitor 0603 0.1uF K 16V	B7M
C229	02031023	Capacitor 0603 1000P K 50V	T8I	C216	02031043	Capacitor 0603 0.1uF K 16V	B8I
C622	02031023	Capacitor 0603 1000P K 50V	T8M	C343	02031043	Capacitor 0603 0.1uF K 16V	B8J
C182	02031023	Capacitor 0603 1000P K 50V	T9D	C815	02031043	Capacitor 0603 0.1uF K 16V	B9G
C228	02031023	Capacitor 0603 1000P K 50V	T9J	C164	02031043	Capacitor 0603 0.1uF K 16V	T3J
C377	02031033	Capacitor 0603 0.01uF K 25V	B2M	C329	02031043	Capacitor 0603 0.1uF K 16V	T4B
C297	02031033	Capacitor 0603 0.01uF K 25V	B4K	C156	02031043	Capacitor 0603 0.1uF K 16V	T4H
C167	02031033	Capacitor 0603 0.01uF K 25V	B5D	C161	02031043	Capacitor 0603 0.1uF K 16V	T4J
C252	02031033	Capacitor 0603 0.01uF K 25V	B6C	C234	02031043	Capacitor 0603 0.1uF K 16V	T6F
C241	02031033	Capacitor 0603 0.01uF K 25V	B6F	C233	02031043	Capacitor 0603 0.1uF K 16V	T6H
C318	02031033	Capacitor 0603 0.01uF K 25V	B6G	C277	02031043	Capacitor 0603 0.1uF K 16V	T7C
C341	02031033	Capacitor 0603 0.01uF K 25V	B6H	C348	02031043	Capacitor 0603 0.1uF K 16V	T7C
C361	02031033	Capacitor 0603 0.01uF K 25V	B6H	C280	02031043	Capacitor 0603 0.1uF K 16V	T7D
C219	02031033	Capacitor 0603 0.01uF K 25V	B6I	C235	02031043	Capacitor 0603 0.1uF K 16V	T7I
C230	02031033	Capacitor 0603 0.01uF K 25V	B6I	C624	02031043	Capacitor 0603 0.1uF K 16V	T7M
C257	02031033	Capacitor 0603 0.01uF K 25V	B7C	C345	02031043	Capacitor 0603 0.1uF K 16V	T8C
C309	02031033	Capacitor 0603 0.01uF K 25V	B7C	C276	02031043	Capacitor 0603 0.1uF K 16V	T8D
C217	02031033	Capacitor 0603 0.01uF K 25V	B7H	C158	02031043	Capacitor 0603 0.1uF K 16V	T8E
C115	02031033	Capacitor 0603 0.01uF K 25V	B8I	C185	02031043	Capacitor 0603 0.1uF K 16V	T8E
C270	02031033	Capacitor 0603 0.01uF K 25V	B8J	C188	02031043	Capacitor 0603 0.1uF K 16V	T8E
C269	02031033	Capacitor 0603 0.01uF K 25V	B8K	C279	02031043	Capacitor 0603 0.1uF K 16V	T8E
C112	02031033	Capacitor 0603 0.01uF K 25V	B9I	C215	02031043	Capacitor 0603 0.1uF K 16V	T8F
C187	02031033	Capacitor 0603 0.01uF K 25V	B9J	C262	02031043	Capacitor 0603 0.1uF K 16V	T8K
C268	02031033	Capacitor 0603 0.01uF K 25V	B9J	C197	02031043	Capacitor 0603 0.1uF K 16V	T9C
C227	02031033	Capacitor 0603 0.01uF K 25V	T10J	C202	02031043	Capacitor 0603 0.1uF K 16V	T9E
C260	02031033	Capacitor 0603 0.01uF K 25V	T10K	C101	02031053	Capacitor 0603 1uF K 10V	B10N
C261	02031033	Capacitor 0603 0.01uF K 25V	T10L	C362	02031053	Capacitor 0603 1uF K 10V	B5K

Ref. No.	Material No.	Description	Address	Ref. No.	Material No.	Description	Address
C102	02031053	Capacitor 0603 1uF K 10V	B9M	C224	02032702	Capacitor 0603 27P J 50V	T8H
C281	02031053	Capacitor 0603 1uF K 10V	T7B	C282	02032723	Capacitor 0603 2700P K 50V	T8C
C151	02031202	Capacitor 0603 12P J 50V	B4I	C346	02032723	Capacitor 0603 2700P K 50V	T8C
C199	02031233	Capacitor 0603 0.012uF K 25V	T7D	C253	02033302	Capacitor 0603 33P J 50V	B7C
C130	02031502	Capacitor 0603 15P J 50V	B7F	C190	02033302	Capacitor 0603 33P J 50V	T8A
C240	02031502	Capacitor 0603 15P J 50V	B8E	C195	02033302	Capacitor 0603 33P J 50V	T8B
C140	02031502	Capacitor 0603 15P J 50V	B9E	C312	02033313	Capacitor 0603 330P K 50V	B7G
C124	02031502	Capacitor 0603 15P J 50V	T8H	C183	02033313	Capacitor 0603 330P K 50V	T9E
C223	02031502	Capacitor 0603 15P J 50V	T8H	C145	02033902	Capacitor 0603 39P J 50V	B4H
C226	02031502	Capacitor 0603 15P J 50V	T8H	C104	02034702	Capacitor 0603 47P J 50V	T8D
C609	02031502	Capacitor 0603 15P J 50V	T8N	C266	02034713	Capacitor 0603 470P K 50V	B7L
C250	02031512	Capacitor 0603 150P J 50V	B6C	C319	02034723	Capacitor 0603 4700P K 50V	B7G
C243	02031512	Capacitor 0603 150P J 50V	B6F	C271	02034723	Capacitor 0603 4700P K 50V	B8K
C320	02031512	Capacitor 0603 150P J 50V	B6F	C157	02034733	Capacitor 0603 0.047uF K 16V	B5E
C321	02031512	Capacitor 0603 150P J 50V	B6F	C290	02034733	Capacitor 0603 0.047uF K 16V	B7M
C198	02031512	Capacitor 0603 150P J 50V	T8B	C328	0203474Z	Capacitor 0603 0.47uF Z 16V	B9I
C616	02031512	Capacitor 0603 150P J 50V	T9M	C200	0203474Z	Capacitor 0603 0.47uF Z 16V	T8B
C189	02031543	Capacitor 0603 0.15uF 25V K	T8A	C194	02035613	Capacitor 0603 560P K 50V	T8B
C147	02031802	Capacitor 0603 18P J 50V	B5H	C315	02036802	Capacitor 0603 68P J 50V	B7G
C247	02031802	Capacitor 0603 18P J 50V	B7D	C273	02036802	Capacitor 0603 68P J 50V	B9J
C192	02031812	Capacitor 0603 180P J 50V	T7E	C813	02036833	Capacitor 0603 0.068uF K 16V	B8H
C246	02032202	Capacitor 0603 22P J 50V	B6D	C105	02036833	Capacitor 0603 0.068uF K 16V	T7D
C349	02032202	Capacitor 0603 22P J 50V	B6K	C196	02036833	Capacitor 0603 0.068uF K 16V	T7E
C350	02032202	Capacitor 0603 22P J 50V	B6L	C364	02051053	Capacitor 0805 1uF K 10V	B5L
C222	02032202	Capacitor 0603 22P J 50V	B7G	C410	02051053	Capacitor 0805 1uF K 10V	B5M
C237	02032202	Capacitor 0603 22P J 50V	T6I	C103	02051053	Capacitor 0805 1uF K 10V	T9D
C285	02032202	Capacitor 0603 22P J 50V	T9A	C186	02051543	Capacitor 0805 0.15uF K 25V	T8D
C286	02032202	Capacitor 0603 22P J 50V	T9C	C814	02052243	Capacitor 0805 0.22uF K 25V	B9G
C255	02032212	Capacitor 0603 220P J 50V	B7C	C807	02052243	Capacitor 0805 0.22uF K 25V	T9H
C603	02032212	Capacitor 0603 220P J 50V	T6M	C311	02053343	Capacitor 0805 0.33uF 16V K	B6J
C605	02032212	Capacitor 0603 220P J 50V	T6M	C111	02060400	Capacitor 1206 4P C 500V	T3N
C612	02032212	Capacitor 0603 220P J 50V	T8M	C117	02060801	Capacitor 1206 8P D 500V	T2M
C613	02032212	Capacitor 0603 220P J 50V	T8M	C174	02061001	Capacitor 1206 10P D 500V	T2L
C619	02032212	Capacitor 0603 220P J 50V	T9M	C175	02061001	Capacitor 1206 10P D 500V	T4M
C201	02032223	Capacitor 0603 2200P K 50V	T7D	C170	02061023	Capacitor 1206 1000P K 630V	T4M
C313	02032233	Capacitor 0603 0.022uF K 25V	B6J	C169	02061023	Capacitor 1206 1000P K 630V	T5K
C316	02032233	Capacitor 0603 0.022uF K 25V	B7K	C263	02061502	Capacitor 1206 15P J 500V	T5N
C283	02032233	Capacitor 0603 0.022uF K 25V	T9C	C181	02061802	Capacitor 1206 18P J 500V	T2L
C299	02032243	Capacitor 0603 0.22uF K 10V	B2L	C165	02061802	Capacitor 1206 18P J 500V	T4K
C163	02032243	Capacitor 0603 0.22uF K 10V	B5E	C177	02062202	Capacitor 1206 22P J 500V	T3M
C134	02032702	Capacitor 0603 27P J 50V	B4F	C259	02062202	Capacitor 1206 22P J 500V	T5M
C135	02032702	Capacitor 0603 27P J 50V	B8E	L125	03063310	Inductor 0.33uH MLF1608DR33K	B7C
C272	02032702	Capacitor 0603 27P J 50V	B8J	L122	03063310	Inductor 0.33uH MLF1608DR33K	B7G
C138	02032702	Capacitor 0603 27P J 50V	B9E	L127	03063310	Inductor 0.33uH MLF1608DR33K	B7G
C274	02032702	Capacitor 0603 27P J 50V	B9K	L128	03063310	Inductor 0.33uH MLF1608DR33K	B7G
C168	02032702	Capacitor 0603 27P J 50V	T4K	L142	03081010	Inductor 100nH NL252018T-R10J	T7L

Ref. No.	Material No.	Description	Address	Ref. No.	Material No.	Description	Address
L141	03081020	Inductor 1uH NL252018T-1R0J	B6F	D132	04003550	Diode 1SS355 (TE17)	B3K
L114	03081030	Inductor 10uH NL252018T-100J	B6C	D118	04003550	Diode 1SS355 (TE17)	B3M
L140	03081030	Inductor 10uH NL252018T-100J	B6F	D101	04003550	Diode 1SS355 (TE17)	B5E
L108	03081030	Inductor 10uH NL252018T-100J	B8H	D123	04003550	Diode 1SS355 (TE17)	B5F
L601	03081030	Inductor 10uH NL252018T-100J	T7M	D130	04003550	Diode 1SS355 (TE17)	B6J
L112	03083301	Inductor 33nH NL252018T-033J	B5G	D131	04003550	Diode 1SS355 (TE17)	B9I
L109	03083301	Inductor 33nH NL252018T-033J	B8E	D603	04012280	Diode 1SV228	T6M
L110	03083301	Inductor 33nH NL252018T-033J	B9E	D602	04012280	Diode 1SV228	T8M
L111	03083301	Inductor 33nH NL252018T-033J	B9E	D601	04012280	Diode 1SV228	T9M
L137	03083901	Inductor 39nH NL252018T-039J	B7D	D116	04032350	Diode DAN235E	T6F
L113	03086801	Inductor 68nH NL252018T-068J	B5I	D115	04032350	Diode DAN235E	T6H
L115	03086820	Inductor 6.8uH NL252018T-6R8J	T8K	D124	04071250	Diode MA4P1250	T4M
L603	03088200	Inductor 82nH NL252018T-082J	T7N	D129	04072S11	Diode MA2S11100L	B7K
L602	03088200	Inductor 82nH NL252018T-082J	T8M	D801	04072S11	Diode MA2S11100L	B8H
L135	03104530	450KHZ Frequency discriminating coil (049798713)	T6I	D105	04077420	Diode MA3J74200L	B3A
L136	0312601S	BLM18AG601SN1D	B10F	D106	04077420	Diode MA3J74200L	B3B
L107	0312601S	BLM18AG601SN1D	B10N	D110	04077420	Diode MA3J74200L	B6J
L106	0312601S	BLM18AG601SN1D	B7K	D111	04077420	Diode MA3J74200L	B7F
L105	0312601S	BLM18AG601SN1D	B7L	D103	04077420	Diode MA3J74200L	T7D
L145	0312601S	BLM18AG601SN1D	B7L	D102	04077420	Diode MA3J74200L	T8D
L146	0312601S	BLM18AG601SN1D	B7L	D112	04101710	Diode UDZSTE-1710B	B2L
L144	0312601S	BLM18AG601SN1D	B8M	D121	04101715	Diode UDZSTE-1715B	B2K
L143	0312601S	BLM18AG601SN1D	B9H	D136	04101718	Diode UDZSTE-1718B	B3K
L101	0312601S	BLM18AG601SN1D	B9M	D120	04101747	Diode UDZSTE-174.7B	T6H
L102	0312601S	BLM18AG601SN1D	T4H	D107	04101751	Diode UDZSTE-175.1B	B10F
L801	0312601S	BLM18AG601SN1D	T8H	D108	04101751	Diode UDZSTE-175.1B	B10F
L103	0313416A	Inductor1806 BLM41P600SPT	T4J	D113	04101751	Diode UDZSTE-175.1B	T4H
L104	0313416A	Inductor1806 BLM41P600SPT	T4J	D119	04111310	Diode HVC131	B6C
L126	03178682	Transmission coil 4BLH (49798682)	T10L	D122	04111310	Diode HVC131	B6C
L117	03178682	Transmission coil 4BLH (49798682)	T8L	D138	04111310	Diode HVC131	B6E
L116	03178682	Transmission coil 4BLH (49798682)	T9K	D139	04111310	Diode HVC131	B6E
L118	03181010	Inductor 100nH LQG18HNR10J00D	T8H	D117	04111310	Diode HVC131	T7I
L133	03198011	Air-core coil 0.8×3.0×11TR	B2B	D114	04111310	Diode HVC131	T8I
L138	03198050	Air-core coil 0.8×3.0×5TR	T2M	D104	04191230	Diode HSB123	B5H
L131	03198050	Air-core coil 0.8×3.0×5TR	T3M	D135	04193001	Diode DSM3MA1	B3E
L132	03198050	Air-core coil 0.8×3.0×5TR	T3M	D128	04197090	Diode XB15A709	T5N
L129	03198050	Air-core coil 0.8×3.0×5TR	T4K	Q142	05001641	Triode 2SA1641(S.T)	T3D
L134	03198050	Air-core coil 0.8×3.0×5TR	T5M	Q806	05001832	Triode 2SA1832(GR)	B8H
L130	03198060	Air-core coil 0.8×3.0×6TR	T5K	Q131	05011132	Triode 2SB1132T100R	B5J
L123	03203900	Inductor 39nH HK1608 39NJ	T8H	Q132	05011132	Triode 2SB1132T100R	B5K
L124	03203900	Inductor 39nH HK1608 39NJ	T8H	Q121	05022412	Triode 2SC2412K	B7J
L120	03205600	Inductor 56nH HK1608 56NJ	B5F	Q119	05022412	Triode 2SC2412K	T6H
L121	03205600	Inductor 56nH HK1608 56NJ	B5F	Q127	05023357	Triode 2SC3357-T1	B5G
L119	03208200	Inductor 82nH HK1608 82NJ	B8F	Q128	05023357	Triode 2SC3357-T1	B5I
D133	04003550	Diode 1SS355 (TE17)	B2K	Q125	05023357	Triode 2SC3357-T1	B6C
D109	04003550	Diode 1SS355 (TE17)	B2L	Q147	05023357	Triode 2SC3357-T1	B8D

Ref. No.	Material No.	Description	Address	Ref. No.	Material No.	Description	Address
Q601	05023357	Triode 2SC3357-T1	T7M	IC127	07401300	IC TC4013BF	B3L
Q123	05024116	Triode 2SC4116(GR)	B8I	IC109	074558M0	IC NJM4558M	B6G
Q116	05024116	Triode 2SC4116(GR)	T10J	IC107	07558FU0	IC TA75W558FU (TE12L)	T7D
Q803	05024116	Triode 2SC4116(GR)	T8H	IC118	077501FU	IC TA75W01FU (TE12L)	B5E
Q805	05024116	Triode 2SC4116(GR)	T9H	IC108	077551FU	IC TC75W51FU (TE12L)	T8C
Q804	05024116	Triode 2SC4116(GR)	T9I	IC116	0775S01F	IC TA75S01F	B8I
Q807	05024116	Triode 2SC4116(GR)	T9I	IC117	0775S01F	IC TA75S01F	T8D
Q118	05024215	Triode 2SC4215(Y)	B6F	IC125	07762364	IC M62364FP	T5E
Q120	05025108	Triode 2SC5108-Y(TE85L)	B7H	IC122	07773872	IC LC73872M	B7L
Q126	05025108	Triode 2SC5108-Y(TE85L)	B8F	IC113	07780500	IC TA7805F	T4B
Q124	05025108	Triode 2SC5108-Y(TE85L)	T8I	IC114	0778L09F	IC TA78L09F	B9I
Q138	05045080	Triode 2SK508NV(K52)	T9L	IC801	07ADF411	IC ADF4111BRU	T8G
Q144	05045080	Triode 2SK508NV(K52)	T9L	IC106	07AK2346	IC AK2346	T9B
Q145	05045080	Triode 2SK508NV(K52)	T9L	IC121	07BU4066	IC BU4066BCFV	T7C
Q146	05045080	Triode 2SK508NV(K52)	T9L	IC111	07FP3502	IC XC62FP3502PR	T8F
Q133	0505114E	Triode DTA114EE(TL)	B6K	J112	08140050	5P patch plug (1.25mm)	T5C
Q136	0505114K	Triode DTA114EKA	B2K	J102	08140150	15P patch plug	T10D
Q137	0505114K	Triode DTA114EKA	B3K	J109	08140150	15P patch plug	T10F
Q135	0505114K	Triode DTA114EKA	B3L	X101	10168000	TCXO 16.8MHzTCVCXO -ENE 3148A	B9H
Q141	0505114K	Triode DTA114EKA	B3M	X102	10198304	Crystal 9.8304MHz-NX804SGB(5*8)	B9J
Q101	0506114E	Triode DTC114EE(TL)	B3M	X104	10357956	Crystal 3.579545MHz(NX1255GB)	B6L
Q104	0506114E	Triode DTC114EE(TL)	B4K	X103	10368640	Crystal oscillator 3.6864MHz-NX1255GB	T9B
Q110	0506114E	Triode DTC114EE(TL)	B5J	C385	T2016476	Ta-Capacitor 47uF 16V C type	T10K
Q111	0506114E	Triode DTC114EE(TL)	B5K	C396	D2162261	Electrolytic capacitor 22U 16V 105°C	T5F
Q115	0506114E	Triode DTC114EE(TL)	B5L	C372	D2162261	Electrolytic capacitor 22U 16V 105°C	T8F
Q105	0506114E	Triode DTC114EE(TL)	B6K	C373	D2162261	Electrolytic capacitor 22U 16V 105°C	T9F
Q801	0506114E	Triode DTC114EE(TL)	B8H	C401	D2254761	Electrolytic capacitor 47U 25V 105°C	T2C
Q802	0506114E	Triode DTC114EE(TL)	B8H	C376	D2254761	Electrolytic capacitor 47U 25V 105°C	T2D
Q109	0506114E	Triode DTC114EE(TL)	T7B	C409	D2254761	Electrolytic capacitor 47U 25V 105°C	T5C
Q108	0506114E	Triode DTC114EE(TL)	T7C	C408	D2254761	Electrolytic capacitor 47U 25V 105°C	T6C
Q134	0506114K	Triode DTC114EKA	B2L	C137	NC	#N/A	B9E
Q139	0506114K	Triode DTC114EKA	B2L	C387	T0606156	Ta-Capacitor 1206 TMCSA1J156MTR.15UF/6.3V.M	T6I
Q112	0506114K	Triode DTC114EKA	B3L	C381	T0606226	Ta-Capacitor 1206 22uF 6.3V	T9C
Q113	0506114K	Triode DTC114EKA	B3L	C389	T0610106	Ta-Capacitor 1206 10uF 10V.M	B7L
Q106	0506114K	Triode DTC114EKA	B7G	C382	T0610106	Ta-Capacitor 1206 10uF 10V.M	T8F
Q114	0506363U	Triode DTC363EU	B5L	C369	T0610106	Ta-Capacitor 1206 10uF 10V.M	T9D
Q143	06002430	FET 2SJ243-T1	B5M	C123	T0610226	Ta-Capacitor 1206 22uF 10V	T10K
Q102	06011824	FET 2SK1824-T1	B2K	C399	T0610335	Ta-Capacitor 1206 TMCMA1A335MTR.3.3UF/10V	B3M
Q140	06011824	FET 2SK1824-T1	B6F	C391	T0610475	Ta-Capacitor 1206 4.7UF/10V.M	B6G
Q117	06011824	FET 2SK1824-T1	B9J	C392	T0610475	Ta-Capacitor 1206 4.7UF/10V.M	B7F
IC105	0724C064	IC AT24C64AN10SI2.7	B7J	C404	T0610475	Ta-Capacitor 1206 4.7UF/10V.M	B8J
IC110	072904M0	IC NJM2904M	T6E	C370	T0610475	Ta-Capacitor 1206 4.7UF/10V.M	B9H
IC104	072904V0	IC NJM2904V	T9D	C397	T0610475	Ta-Capacitor 1206 4.7UF/10V.M	T4B
IC103	0729C020	IC AT29C020-90TI (ATMEL)	B9M	C406	T0610475	Ta-Capacitor 1206 4.7UF/10V.M	T5D
IC120	0730620P	CPU M30620FCPGP	B8L	C379	T0610475	Ta-Capacitor 1206 4.7UF/10V.M	T7D
IC119	07311360	IC TA31136FN (EL)	T8H	C386	T0610475	Ta-Capacitor 1206 4.7UF/10V.M	T7H

Ref. No.	Material No.	Description	Address
C405	T0610475	Ta-Capacitor 1206 4.7UF/10V.M	T8C
C383	T0610475	Ta-Capacitor 1206 4.7UF/10V.M	T8D
C384	T0610475	Ta-Capacitor 1206 4.7UF/10V.M	T8D
C390	T0610475	Ta-Capacitor 1206 4.7UF/10V.M	T8D
C393	T0616105	Ta-Capacitor 1206 TMCSA1C105MTR	B6J
C298	T0616106	Ta-Capacitor 1206 TMCMA1C106MTR 10uF 16V	B2L
C810	T0616106	Ta-Capacitor 1206 TMCMA1C106MTR 10uF 16V	T8H
C811	T0616106	Ta-Capacitor 1206 TMCMA1C106MTR 10uF 16V	T9H
C809	T0616225	Ta-Capacitor 1206 2.2uF 16V K	T8G
C402	T0616475	Ta-Capacitor 1206 TMCMA1C475KTR.4.7uF 16V.K	B4L
C805	T0616475	Ta-Capacitor 1206 TMCMA1C475KTR.4.7uF 16V.K	B7H
C398	T0616475	Ta-Capacitor 1206 TMCMA1C475KTR.4.7uF 16V.K	B9I
C806	T0625474	Ta-Capacitor 1206 TMCSA1E474MTR.0.47uF 25V.M	T9I
C380	T0635105	Ta-Capacitor 1206 35V 1uF(F931V105MAA)	T8A
C378	T0635105	Ta-Capacitor 1206 35V 1uF(F931V105MAA)	T8B
C808	T0635334	Ta-Capacitor 1206 TMCSA1V334MTR.0.33uF 35V.M	T9H
C395	T1006686	Ta-Capacitor 1410 68uF 6.3V.B	T5D
J1		10pin patch plug	T10B
Assembly Components			
K101	19140090	Electrical relay G5V-1 9VDC(OMRON)	T3B
D137	01401022	Voltage dependent resistor ERZV10D220	T3I
J110	08140002	External SP Jack (HSJ1456-010320)	T1B
J101	08140110	11P plug-in Jack (1.5mm)	T10I
J111	08140152	15P plug-in Jack(2.29mm)(5510-15S-01-03)	T1C
CF101	1100450F	●Ceramic filter ALFYM450F(6K)	T6G
CF103	1145001G	●Ceramic filter ALFYM450G(4.5K)	T6F
CF102	1145001D	●Ceramic filter ALFYM450D(10K)	T6G
CF104	1145001E	●Ceramic filter ALFYM450E(7.5K)	T6G
XF102/XF104	11499500	Two-mesh crystal filter 49.95MHz-49S10BB-MN53-068A	T6J/T6K
XF101/XF103	11499575	●Two-mesh crystal filter 49.95MHZ-490S75B-MN53-069A	T6J/T6K
C403	C2254772	●Electrolytic capacitor 470uF 25V 105°C(13mm)	T4H
IC126	07856100	●IC TDA8561Q	T5B
C407	C2251070	Electrolytic capacitor 100uF 25V	T5C
IC115	07TA7808	IC TA7808S	T4B
IC102	07H1317M	Amplification module RA60H1317M	T2I
XF104	1614004A	TM-800 Crystal silicagel cushion	T6K
XF102	1614004A	TM-800 Crystal silicagel cushion	T6J
XF103	1614004A	TM-800 Crystal silicagel cushion	T6K
XF101	1614004A	TM-800 Crystal silicagel cushion	T6J
	18000107	TM800V PCB FR4 1.6T/4L/2P	

VCO Unit

Ref. No.	Material No.	Description	Address
R706	01030002	Resistor 0603 0Ω J	T2H
R705	01030002	Resistor 0603 0Ω J	T2I
R707	01030002	Resistor 0603 0Ω J	T2I
R713	01031012	Resistor 0603 100Ω J	T2G
R714	01031012	Resistor 0603 100Ω J	T2G
R702	01031022	Resistor 0603 1KΩ J	T1G
R701	01031022	Resistor 0603 1KΩ J	T2G
R709	01031032	Resistor 0603 10KΩ J	T1G
R708	01031032	Resistor 0603 10KΩ J	T2G
R710	01031042	Resistor 0603 100KΩ J	T2G
R716	01032212	Resistor 0603 220Ω J	T1G
R711	01032232	Resistor 0603 22KΩ J	T2H
R715	01032242	Resistor 0603 220KΩ J	T2G
R703	01033302	Resistor 0603 33Ω J RCT03330JTP	T2H
R704	01033312	Resistor 0603 330Ω J RCT03331JTP	T2H
R712	01033912	Resistor 0603 390Ω J	T2G
R718	01034722	Resistor 0603 4.7KΩ J	T1G
R717	01034722	Resistor 0603 4.7KΩ J	T2G
R719	01034722	Resistor 0603 4.7KΩ J	T2G
R720	01034722	Resistor 0603 4.7KΩ J	T2G
C11	01036832	Resistor 0603 68KΩ J	T2H
C720	0203010B	Capacitor 0603 1P B 50V	T1G
C719	0203010B	Capacitor 0603 1P B 50V	T2G
C716	0203090B	Capacitor 0603 9P B 50V	T2G
C717	0203090B	Capacitor 0603 9P B 50V	T2G
C707	02031023	Capacitor 0603 1000P K 50V	T1G
C708	02031023	Capacitor 0603 1000P K 50V	T1G
C706	02031023	Capacitor 0603 1000P K 50V	T1I
C703	02031023	Capacitor 0603 1000P K 50V	T2G
C705	02031023	Capacitor 0603 1000P K 50V	T2G
C709	02031023	Capacitor 0603 1000P K 50V	T2G
C704	02031023	Capacitor 0603 1000P K 50V	T2H
C712	02031000	Capacitor 0603 10P C 50V	T1G
C713	02031502	Capacitor 0603 15P J 50V	T1G
C714	02031502	Capacitor 0603 15P J 50V	T1G
C710	02031502	Capacitor 0603 15P J 50V	T2H
C711	02031502	Capacitor 0603 15P J 50V	T2H
C702	02033302	Capacitor 0603 33P J 50V	T2G
C722	02034702	Capacitor 0603 47P J 50V	T1H
C12	02034702	Capacitor 0603 47P J 50V	T2H

Ref. No.	Material No.	Description	Address
C721	02031012	Capacitor 0603 100P J 50V	T1H
C701	02036802	Capacitor 0603 68P J 50V	T2H
C715	0203R75B	Capacitor 0603 0.75P B 50V	T2G
TC702	022Z06A0	Variable Capacitor TZVY02Z060A110.6P	T1H
TC701	022Z06A0	Variable Capacitor TZVY02Z060A110.6P	T2H
L708	03082720	●Inductor 2.7uH NL252018T-2R7J	T1G
L709	03082720	●Inductor 2.7uH NL252018T-2R7J	T1G
L707	03082720	●Inductor 2.7uH NL252018T-2R7J	T1H
L706	03082720	●Inductor 2.7uH NL252018T-2R7J	T1I
L703	03083320	Inductor 3.3uH NL252018T-3R3J	T2G
L702	03083320	Inductor 3.3uH NL252018T-3R3J	T2H
L701	03083320	Inductor 3.3uH NL252018T-3R3J	T2I
L704	03181010	Inductor 100nH LQG18HNR10J00D	T2H
L705	03293500	●Inductor C6328A-35NG	T2H
L710	03295000	●Inductor C6342A-50NG	T1H
D709	04012780	●Diode 1SV278	T2G
D707	04012820	●Diode 1SV282	T1H
D708	04012820	●Diode 1SV282	T1H
D705	04012820	●Diode 1SV282	T1I
D706	04012820	●Diode 1SV282	T1I
D701	04012820	●Diode 1SV282	T2H
D704	04012820	●Diode 1SV282	T2H
D702	04012820	●Diode 1SV282	T2I
D703	04012820	●Diode 1SV282	T2I
Q704	05024116	Triode 2SC4116(GR)	T2G
Q705	05024116	Triode 2SC4116(GR)	T2G
Q703	05025108	Triode 2SC5108-Y(TE85L)	T2G
Q702	05045080	Triode 2SK508NV(K52)	T1G
Q701	05045080	Triode 2SK508NV(K52)	T2G
Q706	0506114E	Triode DTC114EE(TL)	T1G
C718	T0610106	Ta-capacitor 1206 10uF 10V.M	T2H
Assembly Components:			
	18000107	TM800V-2005-0407E	
	08141160	6P Pin	

Display Unit

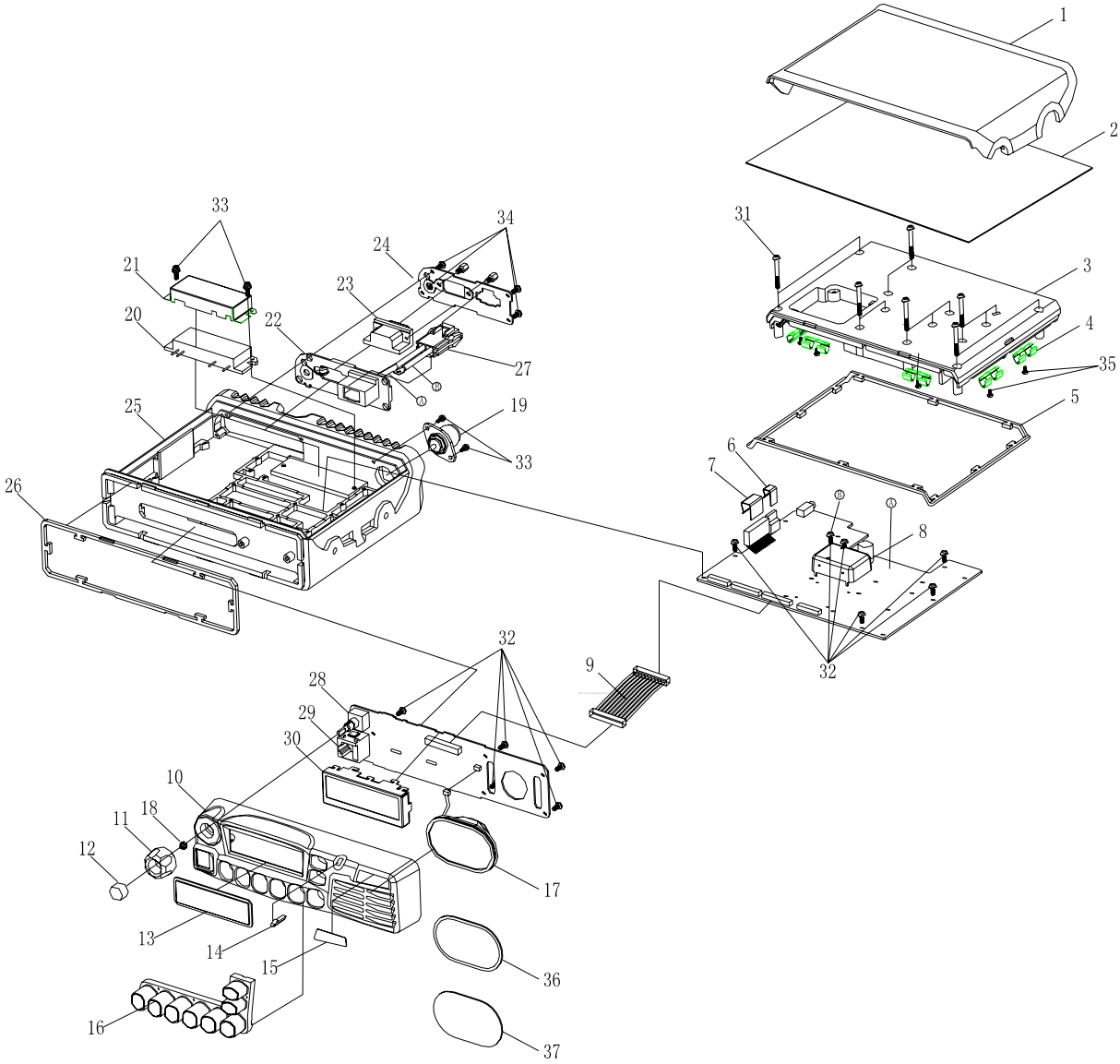
Ref. No.	Material No.	Description	Address
X501	10198304	Crystal 9.8304MHz-NX804SGB(5*8)	B1B
F501	0102A30V	Fuse 1812 0.2A(MINISMDC020-2)	B2A
R505	01030002	Resistor 0603 0Ω J	B1B
R506	01030002	Resistor 0603 0Ω J	B1C
R511	01030002	Resistor 0603 0Ω J	B1C
R522	01030002	Resistor 0603 0Ω J	B1C
R548	01030002	Resistor 0603 0Ω J	B1C
R555	01030002	Resistor 0603 0Ω J	B2B
R544	01031022	Resistor 0603 1KΩ J	B1A
R540	01031022	Resistor 0603 1KΩ J	B1C
R541	01031022	Resistor 0603 1KΩ J	B1C
R542	01031022	Resistor 0603 1KΩ J	B1C
R543	01031022	Resistor 0603 1KΩ J	B1C
R538	01031022	Resistor 0603 1KΩ J	B1D
R539	01031022	Resistor 0603 1KΩ J	B1D
R532	01031022	Resistor 0603 1KΩ J	B2B
R533	01031022	Resistor 0603 1KΩ J	B2B
R534	01031022	Resistor 0603 1KΩ J	B2B
R535	01031022	Resistor 0603 1KΩ J	B2B
R536	01031022	Resistor 0603 1KΩ J	B2B
R537	01031022	Resistor 0603 1KΩ J	B2B
R509	01031032	Resistor 0603 10KΩ J	B1C
R510	01031032	Resistor 0603 10KΩ J	B1C
R508	01031032	Resistor 0603 10KΩ J	B2C
R502	01031042	Resistor 0603 100KΩ J	B2A
R503	01031042	Resistor 0603 100KΩ J	B2A
R501	01031042	Resistor 0603 100KΩ J	B2B
R512	01031812	Resistor 0603 180Ω J	B1C
R513	01031812	Resistor 0603 180Ω J	B1C
R549	01032242	Resistor 0603 220KΩ J	B2A
R521	01032732	Resistor 0603 27KΩ J	B1C
R507	01033922	Resistor 0603 3.9KΩ J	B2B
R547	01034722	Resistor 0603 4.7KΩ J	B1B
R516	01034732	Resistor 0603 47KΩ J	B1A
R517	01034732	Resistor 0603 47KΩ J	B1A
R551	01034732	Resistor 0603 47KΩ J	B1B
R552	01034732	Resistor 0603 47KΩ J	B1B
R553	01034732	Resistor 0603 47KΩ J	B1B
R554	01034732	Resistor 0603 47KΩ J	B1B

Ref. No.	Material No.	Description	Address
R556	01034732	Resistor 0603 47KΩ J	B1B
R557	01034732	Resistor 0603 47KΩ J	B1C
R514	01034732	Resistor 0603 47KΩ J	B2B
R515	01034732	Resistor 0603 47KΩ J	B2B
R524	01034732	Resistor 0603 47KΩ J	B2B
R525	01034732	Resistor 0603 47KΩ J	B2B
R526	01034732	Resistor 0603 47KΩ J	B2B
R527	01034732	Resistor 0603 47KΩ J	B2B
R528	01034732	Resistor 0603 47KΩ J	B2B
R529	01034732	Resistor 0603 47KΩ J	B2B
R530	01034732	Resistor 0603 47KΩ J	B2B
R531	01034732	Resistor 0603 47KΩ J	B2B
R504	01035622	Resistor 0603 5.6KΩ J	B1B
R558	01036822	Resistor 0603 6.8KΩ J	B1D
R545	01201010	Resistor 2010 100Ω 1/2W	B2C
R520	01202702	Resistor 2010 27Ω J	B1D
R518	01202R22	Resistor 2010 2.2Ω J	B1D
R519	01202R22	Resistor 2010 2.2Ω J	B2D
VR1	01220472	Variable Resistor 4.7KΩ MVR22HXBRN472	B1A
C515	02031012	Capacitor 0603 100P J 50V	B1C
C516	02031012	Capacitor 0603 100P J 50V	B1C
C526	02031012	Capacitor 0603 100P J 50V	B1C
C530	02031012	Capacitor 0603 100P J 50V	B2A
C531	02031012	Capacitor 0603 100P J 50V	B2A
C532	02031012	Capacitor 0603 100P J 50V	B2A
C533	02031012	Capacitor 0603 100P J 50V	B2A
C534	02031012	Capacitor 0603 100P J 50V	B2A
C527	02031023	Capacitor 0603 1000P K 50V	B1C
C522	02031023	Capacitor 0603 1000P K 50V	B2A
C528	02031023	Capacitor 0603 1000P K 50V	B2A
C529	02031023	Capacitor 0603 1000P K 50V	B2A
C538	02031023	Capacitor 0603 1000P K 50V	B2B
C506	02031023	Capacitor 0603 1000P K 50V	B2C
C519	02031023	Capacitor 0603 1000P K 50V	B2C
C520	02031023	Capacitor 0603 1000P K 50V	B2C
C521	02031023	Capacitor 0603 1000P K 50V	B2C
C523	02031023	Capacitor 0603 1000P K 50V	B2C
C525	02031023	Capacitor 0603 1000P K 50V	B2C
C511	02031033	Capacitor 0603 0.01uF K 25V	B1A
C512	02031033	Capacitor 0603 0.01uF K 25V	B1A

Ref. No.	Material No.	Description	Address
C502	02031033	Capacitor 0603 0.01uF K 25V	B1B
C509	02031033	Capacitor 0603 0.01uF K 25V	B2C
C510	02031033	Capacitor 0603 0.01uF K 25V	B2C
C503	02031053	Capacitor 0603 1uF K 10V	B2A
C505	02032202	Capacitor 0603 22P J 50V	B1B
C517	02032202	Capacitor 0603 22P J 50V	B1B
C501	02032233	Capacitor 0603 0.022uF K 25V	B2B
C507	02034713	Capacitor 0603 470P K 50V	B1D
C508	02034713	Capacitor 0603 470P K 50V	B1D
C518	02036802	Capacitor 0603 68P J 50V	B1B
L502	03081020	Inductor 1uH NL252018T-1R0J	B2A
L503	03081020	Inductor 1uH NL252018T-1R0J	B2A
L501	0312601S	BLM18AG601SN1D	B1B
L504	0312601S	BLM18AG601SN1D	B1B
D507	04021901	LED GREEN (KPT-1608CGCK)	T1C
D511	04021901	LED GREEN (KPT-1608CGCK)	T1C
D512	04021901	LED GREEN (KPT-1608CGCK)	T2A
D509	04021901	LED GREEN (KPT-1608CGCK)	T2B
D510	04021901	LED GREEN (KPT-1608CGCK)	T2B
D505	04021901	LED GREEN (KPT-1608CGCK)	T2C
D508	04021901	LED GREEN (KPT-1608CGCK)	T2C
D506	04021901	LED GREEN (KPT-1608CGCK)	T2D
D515	04023528	LED RED&GREEN KAA-3528 (SURKCGKC)	T1D
D517	04101718	Diode UDZSTE-1718B	B2A
D501	04191230	Diode HSB123	B1C
D502	04191230	Diode HSB123	B1C
D503	04191230	Diode HSB123	B1C
D504	04191230	Diode HSB123	B1C
D514	04191230	Diode HSB123	B1C
D516	04191230	Diode HSB123	B1C
Q505	05001641	Triode 2SA1641(S.T)	B1C
Q501	05011132	Triode 2SB1132T100R	B2B
Q503	05024617	Triode 2SC4617TLS	B1C
Q504	05024617	Triode 2SC4617TLS	B1C
Q508	0506114E	Triode DTC114EE(TL)	B2B
Q502	0506114E	Triode DTC114EE(TL)	B2C
Q507	06002430	FET 2SJ243-T1	B2A
Q506	06011824	FET 2SK1824-T1	B1B
IC502	07111H42	IC R3111H421C	B2B
IC503	07780112	MPU μPD78F0112H	B1B

Ref. No.	Material No.	Description	Address
IC501	07780500	IC TA7805F	B2C
J501	08140000	MIC jack RJ45	T2A
J503	08140080	8P SMT jack FFC (0.5mm)	B1B
J504	08140111	11P SMT jack FFC (1.5mm)	B2D
J505	08141020	2P couple jack	B2D
K509	1914000A	Waveband switch EC11EBB24C(F1371793M)	T1A
	19140070	TM-800 LCD(FSTN)	
	20140215	Speaker 2 core wire 150mm (with jack)	
C513	T0610106	Ta-Capacitor 1206 10uF 10V.M	B1C
C535	T0610106	Ta-Capacitor 1206 10uF 10V.M	B2A
C537	T0610106	Ta-Capacitor 1206 10uF 10V.M	B2A
C514	T0616475	Ta-Capacitor 1206 TMCMA1C475KTR.4.7uF 16V.K	B2C

Exploded View



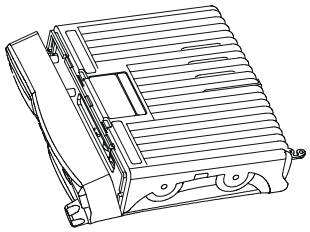
Part List 2

No.	Part No.	Part Description	Material	QTY	Remark
1	1514001A	Rear cover	PC+ABS (C1200HF)	1	
2	1714026A	Absorbing sponge	EVA	1	
3	1414001A	Shield cover	ADC12	1	
4	1414013A	Shield sheet copper	Phosphor Bronze (C5210P)	1	
5	1614000A	Seal gasket (shield)	Silica gel	1	
6	1414011A	Clip (power module cooler)	SUS304-1/2H	1	
7	1414010A	Clip (power amplification cooler)	SUS304-1/2H	1	
8	1414006A	VCO cover	Brass (C2680)	1	
9	2014003A	Connecting line (mobile radio)		1	100mm
10	1514000A	Control panel	PC+ABS (C1200HF)	1	
11	1514004A	Knob (vol)	ABS700	1	
12	1514005A	Switch button	ABS700	1	
13	1514008A	LCD lens	PC (2450)	1	
14	1514007A	Light guide	PMMA	1	
15	1714018A	LOGO Label	Stainless steel	1	
16	1614001A	Numeric key	Silica gel	1	
17	08141607A	Speaker		1	
18	1414008A	Inner liner knob (vol)	SUS304-1/2H	1	
19	1414031A	Antenna pedestal	Bronze	1	
20	07H4452M	Power amplification module		1	
21	1414022A	Shield cover (power amplification module)	SUS301-1/2H	1	
22	1614002A	Seal gasket (external board)	Silica gel	1	
23	08140152	15PIN Plug		1	
24	1414004A	External board	SUS304-1/2B	1	
25	1414000A	Aluminum chassis base	ADC12	1	
26	1614003A	Seal ring (front case)	Silica gel	1	
27	2014002A	Power cable (mobile radio)		1	
28	1914000A	Switch (channel)		1	
29	08140000	Jack (Remote SP MIC)		1	
30	19140070	LCD	FSTN	1	
31	14142623	Self-tapping screws 2.6*23	Mild steel	14	
32	14042660	Self-tapping screws 2.6*6	Mild steel	11	
33	14142580	Machine screws M2.5*8	Stainless steel	4	
34	14142660	T8-head self-tapping screws 2.6*6	Mild steel	4	
35	14162041	Bolt PTSΦ2X4	Mild steel	7	
36	1614005A	Speaker silica gel gasket	Silica gel	1	
37	1714002B	Speaker net		1	

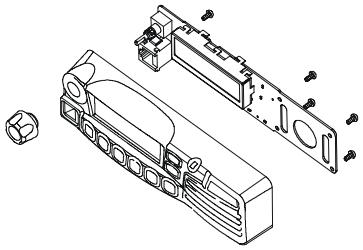
Disassembly and Reassembly for Repair

Disassembly

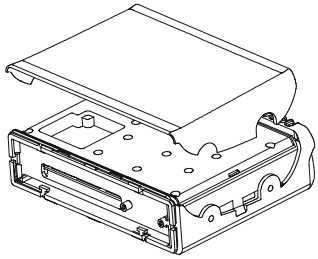
1. Power off the transceiver; disconnect the power cable and screw out the antenna connector.
2. Lift the tabs on the bottom of the transceiver, and then remove the panel from the transceiver.



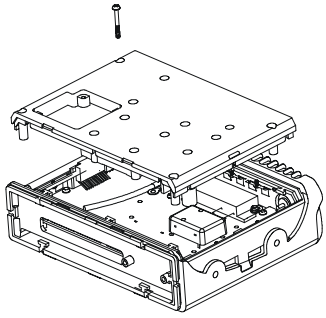
3. Pull out the selector knob, loosen the five screws and then remove the PCB board from the panel.



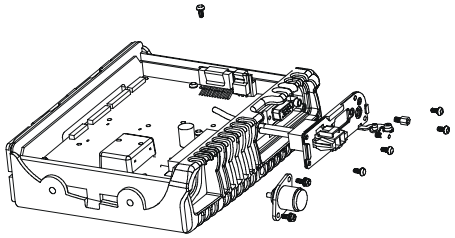
4. Lift the tabs on both sides of the transceiver, and then remove the rear cover.



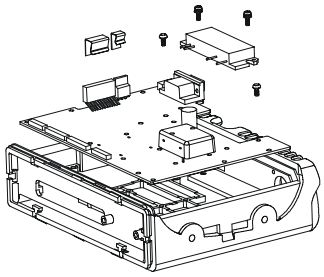
5. Loosen the screw, lift the tabs on the shield cover and then remove the shield cover.



6. Loosen the screw that binds the power cable (black) to the PCB board; loosen the screws on the external board and d15-pin plug; remove the external board and the waterproof packing.



7. Loosen the screw on the power amplification module; loosen by welding the connector that connects power amplification module to the main PCB, and then pull out the module.

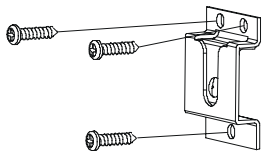


8. Loosen the screws on the main PCB board; lift the two clips (power amplification cooler), and take out the main PCB.

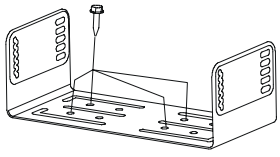
Reassembly

For the reassembly of the transceiver, please refer to “Disassembly”. Other procedures are as follows:

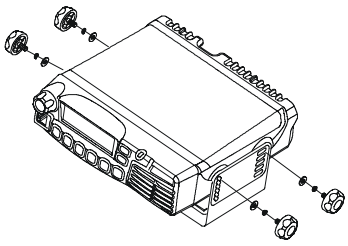
1. Fix the bracket (Remote SP MIC) by using three self-tapping screws(white,4.0×16).



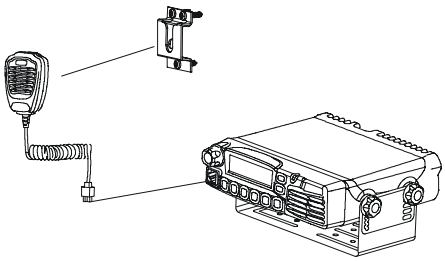
2. Fix the bracket (main unit of the tranceiver) by using four or six self-tapping screws （black,4.8X20）.



3. Screw on the four adjustment screws (each with one shrapnel and one shim).



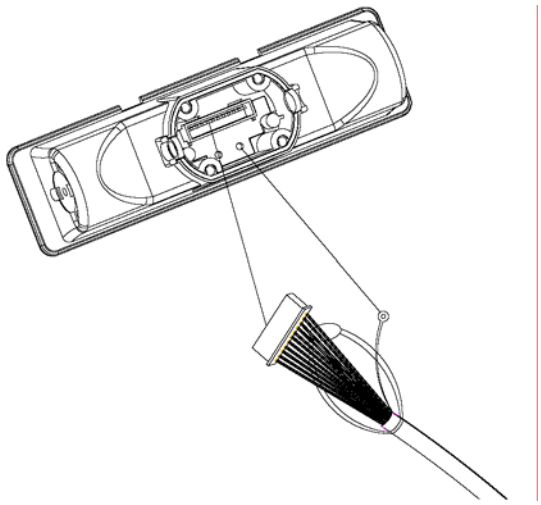
4. Plug the connector (Remote SP MIC) to the jack (Remote SP MIC); when the remote SP MIC is not in use, hang it on the bracket (Remote SP MIC).



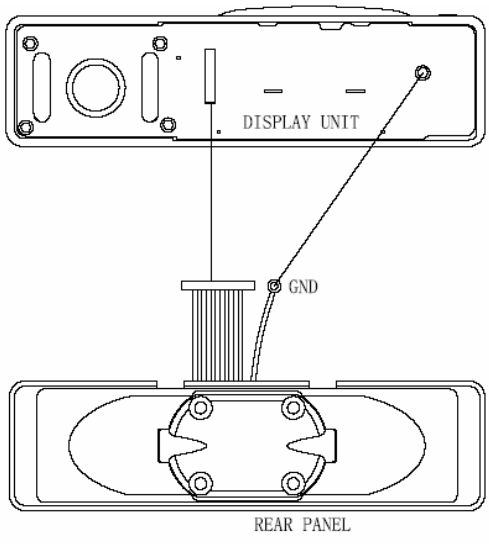
Remote Kit Installation (Optional)

The remote kit is optional, the steps of installation as follow:

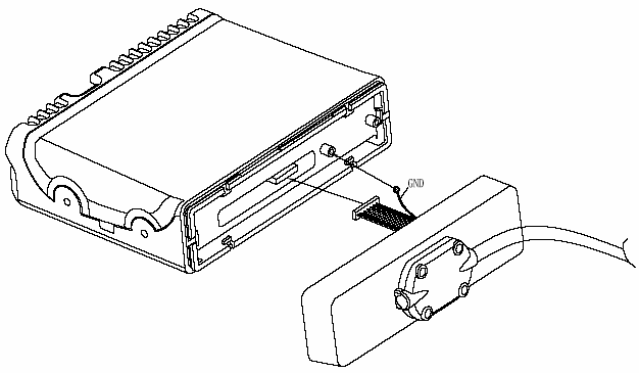
1. Lift the tab on the bottom of transceiver, and then pull the panel away from the transceiver.
2. Remove the connector that binds the display unit to the TX-RX unit.
3. As shown in the below figure, make sure that the rubber seal is placed above the cable, then plug the 11-pin connector into the rear panel socket.



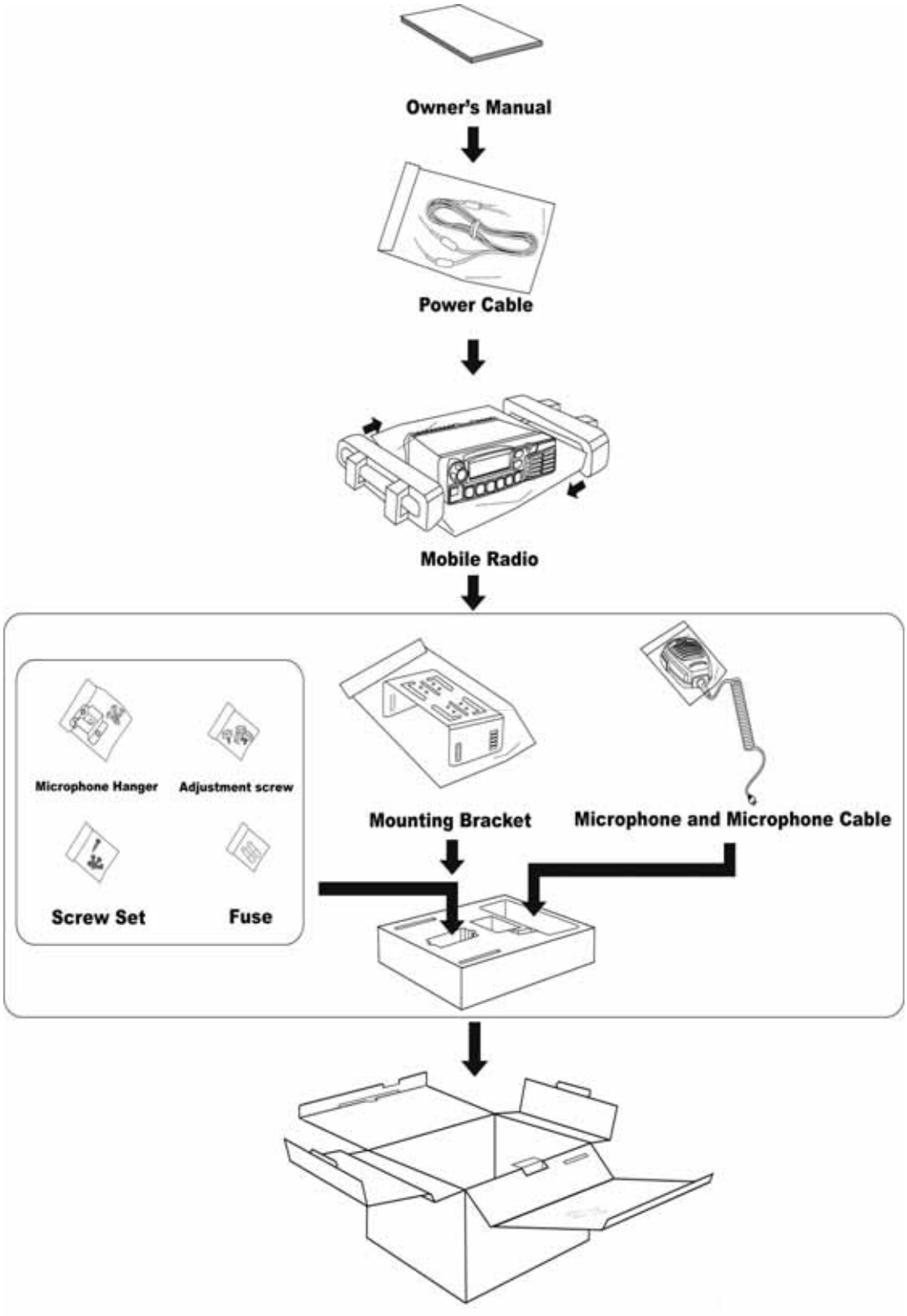
4. As shown in the above figture, affix the ground wire to the front panel chassis with the supplied screw.
5. Choose the remote wire position (right side or left side), then place the seal within the guide rail. Attach and secure the cover using the 4 binding screws.
6. Plug the 11-pin connector (from the front panel) to the PCB of Display unit socket, as shown in the below figure. Push the 11-pin connector (from the front panel) into the chassis so that the 6 tabs on top and bottom are securely fixed.



7. For the first three steps of the rear panel installation, please refer to step 3, 4 and 5.
8. Plug the connector from the front panel into the socket, as shown following. Affix the ground wire (from the rear panel) to the chassis with the supplied screw. Push and secure the main panel so that the 6 tabs on the top and bottom of panel are securely fixed.



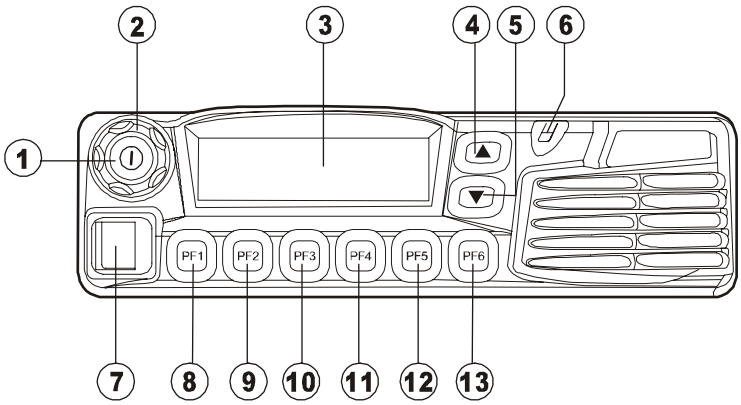
Packing


Owner's Manual
Power Cable
Mobile Radio
Microphone Hanger
Adjustment screw
Screw Set
Fuse
Mounting Bracket
Microphone and Microphone Cable

Adjustment

1. Key Functions

1-1 Front Panel



1. Power switch. 2. Selector Knob. 3. LCD Display. 4. Down key. 5. Up key.

6. Indicator light. 7. Microphone Jack. 8. PF1 key. 9. PF2 key. 10. PF3 key.

11. PF4 key. 12. PF5 key. 13. PF6 key.

1-2 Panel Test Mode

■ **When the Function is Off(▽ does not appear)**

Controls	Function	Description
Up	Volume up.	
Down	Volume down.	
PF1	Wide/narrow changeover.	
PF2	Noise squelch switch.	When the squelch is on, appears.
PF3	Test mode/ Tuning mode changeover.	
PF4	Active expand function.	After pressing PF4 key, press PF1, PF2 and PF3 to active the following functions (See the table below).
PF5	Signalling up.	
PF6	Signalling down.	
Selector Knob	Test channel up/down.	

■ **When the Function is On (press PF4, ▽ appears)**

Controls	Function	Description
PF1	Compander on/off.	When compander opens, ▼ appears.
PF2	Beat shift on/off.	When the remove frequency is on, “A” appears.
PF3	MSK 1200/2400bps changeover.	When MSK is 2400bps，“✉” appears.
PF4	Return to test mode.	
PF5	No function.	
PF6	No function.	

1-3 Panel Tuning Mode

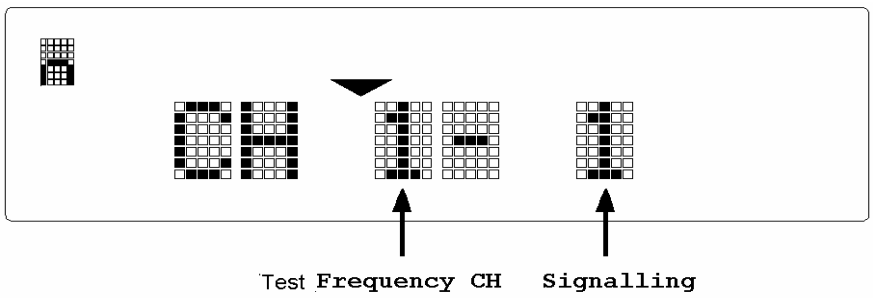
Controls	Function	Description
Up	Volume up.	
Down	Volume down.	
PF1	Test mode/tuning mode changeover.	
PF2	Noise squelch switch.	When the squelch is on, 🔊 appears.
PF3	No function.	
PF4	Tuning item down.	
PF5	Tuning item up.	
PF6	Tuning value save and then move to the next tuning item.	
Selector Knob	Tuning value up/down.	

2. Panel Test Mode

The transceiver’s transmission output, receiver sensitivity, and other items are measured and QT, DQT, 2-Tone, MSK and DTMF signalling is decoded in this mode.

2-1. To Enter the Test Mode

Hold down [PF2] key and turn the power switch on to enter test mode. The test frequency channel and test signalling channel will be displayed.



2-2. Test Frequency Channel (MHz)

In this mode, the test channel frequency (center(C)、low(L)、high(H) frequency) can be modified through the programming software.

Model	RX/TX	1 (C)	2 (L)	3 (H)	4	5	6	7	8
0 (V)	RX(MHz)	155.15	136.15	173.85	145.55	164.55	155.00	155.20	155.40
	TX(MHz)	155.00	136.00	174.00	145.50	164.50	155.00	155.20	155.40
1 (U1)	RX(MHz)	481.15	450.15	511.85	465.55	496.55	481.00	481.20	481.40
	TX(MHz)	481.00	450.00	512.00	465.50	496.50	481.00	481.20	481.40
2 (U2)	RX(MHz)	375.15	350.15	399.85	362.55	387.55	375.00	375.20	375.40
	TX(MHz)	375.00	350.00	400.00	362.50	387.50	375.00	375.20	375.40
3 (U3)	RX(MHz)	435.15	400.15	469.85	417.55	452.55	435.00	435.20	435.40
	TX(MHz)	435.00	400.00	470.00	417.50	452.50	435.00	435.20	435.40
4 (U4)	RX(MHz)	465.15	440.15	489.85	452.55	477.55	465.00	465.20	465.40
	TX(MHz)	465.00	440.00	490.00	452.50	477.50	465.00	465.20	465.40
5 (U5)	RX(MHz)	503.15	480.15	525.85	491.75	515.25	503.00	503.20	503.40
	TX(MHz)	503.00	480.00	526.00	491.70	515.20	503.00	503.20	503.40
6 (U6)	RX(MHz)	425.15	400.15	449.85	412.55	437.55	425.00	425.20	425.40
	TX(MHz)	425.00	400.00	450.00	412.50	437.50	425.00	425.20	425.40

3. Panel Tuning Mode

The Transceiver is adjusted in this mode.

3-1 To Enter The Panel Tuning Mode.

Press the [PF3] key in the panel test mode.

The adjustment items, the frequency and signalling, other than the maximum deviation and sensitivity, return to the values that were effective for the test frequency channel and test signalling channel before entering the panel tuning mode.

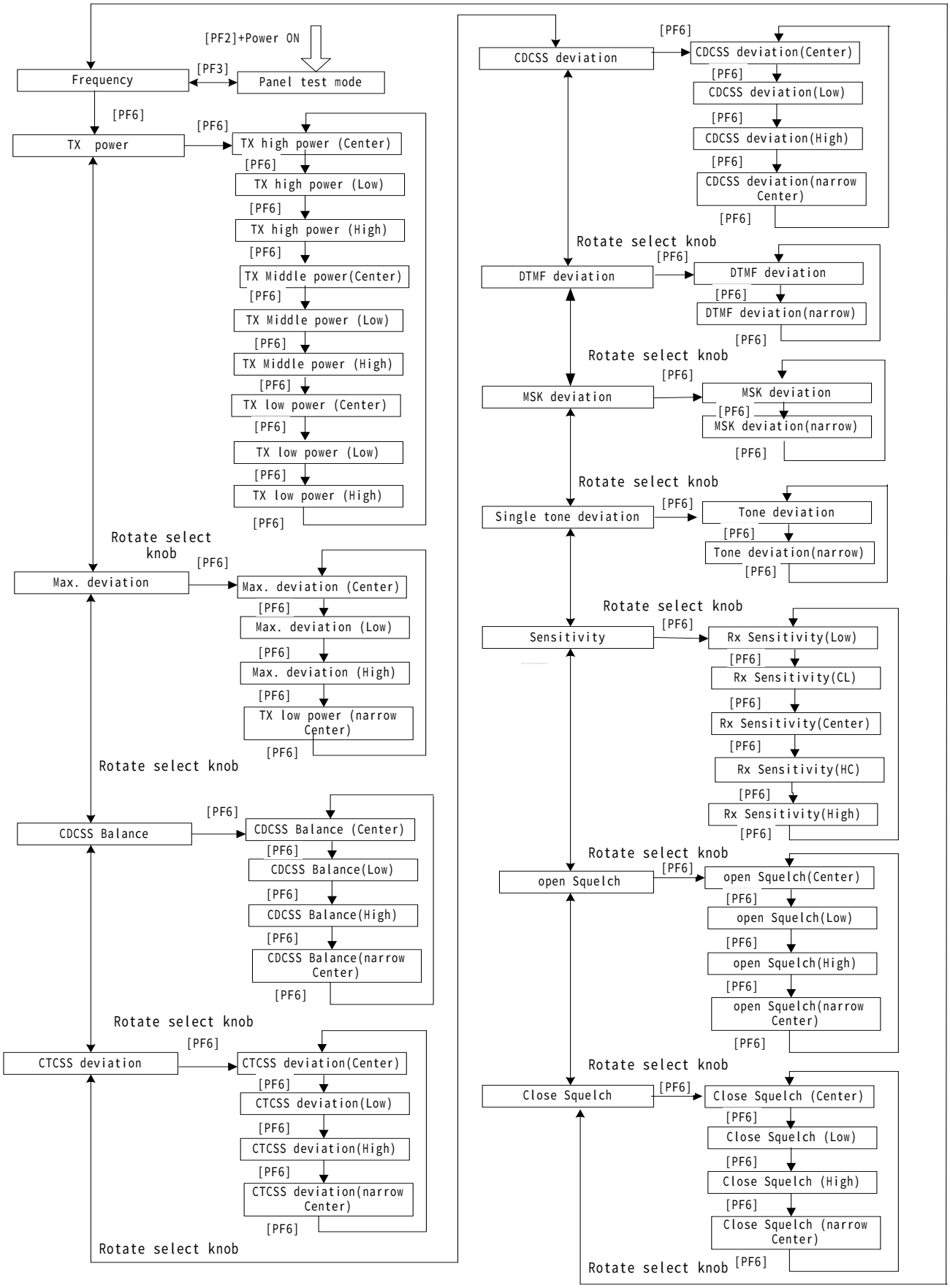
No.	Dealer Mode	LCD Display
1	Frequency stability	Frequency
2	TX power	Tx Power
3	Max. frequency deviation	Max.Deviate
4	CDCSS balance	CDCSSBalance
5	CTCSS frequency deviation	CTCSSDeviate
6	CDCSS frequency deviation	CDCSSDeviate
7	DTMF frequency deviation	CDCSS Deviate
8	MSK frequency deviation	MSK Deviate
9	Single tone frequency deviation	Tone Deviate
10	RX sensitivity	Rx Sensitivi
11	Squelch open level	OpenSQL
12	Squelch close level	CloseSQL

3-2. Tuning Item and Display

Refer to “5. Setting Items” in “Test Mode”.

3-3. Flow Chart

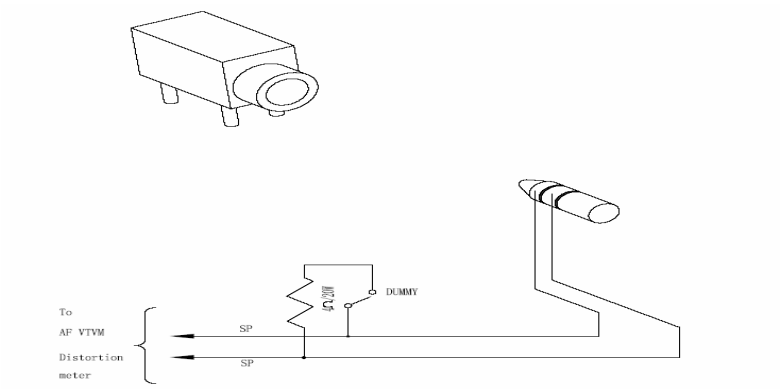
1. ◄⟷► : Use the [PF4] and [PF5] keys.
2. ⟶► : Use the [PF6] key.
3. Use the [SELECTOR] knob to set an adjustment value (1 to 256) for each adjustment item.
4. Use the [PF6] key to move to the next item.


[PF2]+Power ON
Frequency
[PF3]
Panel test mode
[PF6]
TX power
TX high power (Center)
TX high power (Low)
TX high power (High)
TX Middle power(Center)
TX Middle power (Low)
TX Middle power (High)
TX low power (Center)
TX low power (Low)
TX low power (High)
Rotate select knob
Max. deviation
Max. deviation (Center)
Max. deviation (Low)
Max. deviation (High)
TX low power (narrow Center)
Rotate select knob
CDCSS Balance
CDCSS Balance (Center)
CDCSS Balance(Low)
CDCSS Balance(High)
CDCSS Balance(narrow Center)
Rotate select knob
CTCSS deviation
CTCSS deviation(Center)
CTCSS deviation(Low)
CTCSS deviation(High)
CTCSS deviation(narrow Center)
Rotate select knob
CDCSS deviation
CDCSS deviation(Center)
CDCSS deviation(Low)
CDCSS deviation(High)
CDCSS deviation(narrow Center)
Rotate select knob
DTMF deviation
DTMF deviation
DTMF deviation(narrow)
Rotate select knob
MSK deviation
MSK deviation
MSK deviation(narrow)
Rotate select knob
Single tone deviation
Tone deviation
Tone deviation(narrow)
Rotate select knob
Sensitivity
Rx Sensitivity(Low)
Rx Sensitivity(CL)
Rx Sensitivity(Center)
Rx Sensitivity(HC)
Rx Sensitivity(High)
Rotate select knob
open Squelch
open Squelch(Center)
open Squelch(Low)
open Squelch(High)
open Squelch(narrow Center)
Rotate select knob
Close Squelch
Close Squelch (Center)
Close Squelch (Low)
Close Squelch (High)
Close Squelch (narrow Center)
Rotate select knob
[PF6]

4. Test Equipment Required for Alignment

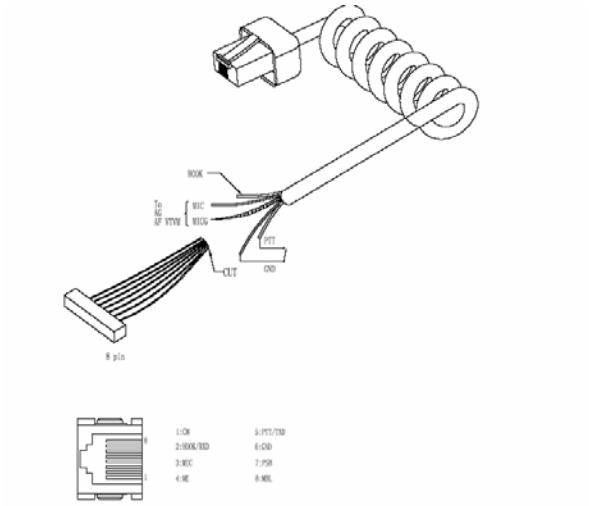
Test Equipment	Method	Major Specifications
Standard Signal Generator (SSG)	Frequency Modulation Output	136 to 174 MHz Frequency modulation and external modulation 0.1uV to greater than 1mV
Power Meter	Input Impedance Operation Frequency Measurement Capability	50Ω 136 to 174 MHz or more Vicinity of 50W
Deviation Meter	Frequency Range	136 to 174 MHz
Digital Volt Meter (DVM)	Measuring Range Accuracy	1 to 20V DC High input impedance for minimum circuit loading
Oscilloscope		DC through 30MHz
High Sensitivity Frequency Counter	Frequency Range Frequency Stability	10Hz to 600MHz 0.2ppm or less
Ammeter		13A or more
AF Volt Meter (AF VTVM)	Frequency Range Voltage Range	50Hz to 10kHz 3mV to 3V
Audio Generator (AG)	Frequency Range Output	50Hz to 5kHz 0 to 1V
Distortion Meter	Capability Input level	3% or less at 1kHz 50mV to 10Vrms
Voltmeter	Measuring Range Input Impedance	10 to 1.5V DC or less 50kΩ/V or greater
4Ω Dummy Load		Approx.4Ω,20W
Regulated Power Supply		13.6V,approx.20A (adjustable from 9 to 20V) Useful if anneter required

4-1 Test Cable for Speaker Output



4-2. Test Cable for Microphone input

The following test cable is recommended.



5. Warnings When Removing or Installing the Shield Cover

1. When handling with the shielding cover, do not damage the components on the TX-RX unit.
2. When installing the shielding cover, insert the cover from the rear side.
3. When removing the shielding cover, squeeze the hole marked with an arrow as shown on the diagram and pull it straight up.

Adjustment Description

The radio can be adjusted by PC programming software or by manual adjustment. Manual adjustment procedure of TM800 is as follows. (Refer to “Test Mode” and “Adjustment mode” in the section Radio Modes.)

Instrument:

Radio Communication Test Set	1 set
Scanner	1 set
20A/30V Power Supply	1 set
Digital Voltmeter	1 set
Power Meter	1 set
Signal Line (with dummy load)	1 pcs

Adjustment:

1. Download

- Connect the radio with PC by programming cable; Turn the radio on.
- Click “Download” on software interface;
- Select the desired program and click “Open”, download starts.
- Click “End” when download is completed.
- Turn the radio off and remove the programming cable.

2. Initialization

It’s necessary to set the frequency and initialize the radio before adjustment because there is no needed information in FLASHROM when the radio is manufactured.

- Turn the power on while holding down [PF2], then press [PF3], [PF4] and [PF6] in sequence.
- The LED on control panel turns green from red, indicating that the initialization is completed.

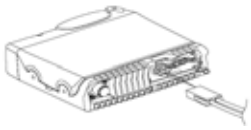
3. Adjustment

Some items can be adjusted in conventional mode and the others in manual adjust mode.

- Turn the power on to enter conventional mode.
- Switch the power off and back on while holding down [PF6], the radio enters manual adjust mode. The channel number is displayed on the LCD.
- Frequency list

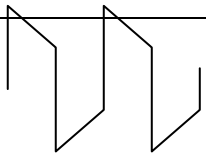
Model	RX/TX	1 (FC)	2 (F L)	3 (FH)	4	5	6	7	8
0 (V)	RX(MHz)	155.15	136.15	173.85	145.55	164.55	155.00	155.20	155.40
	TX(MHz)	155.00	136.00	174.00	145.50	164.50	155.00	155.20	155.40
1 (U1)	RX(MHz)	481.15	450.15	511.85	465.55	496.55	481.00	481.20	481.40
	TX(MHz)	481.00	450.00	512.00	465.50	496.50	481.00	481.20	481.40
2 (U2)	RX(MHz)	375.15	350.15	399.85	362.55	387.55	375.00	375.20	375.40
	TX(MHz)	375.00	350.00	400.00	362.50	387.50	375.00	375.20	375.40
3 (U3)	RX(MHz)	435.15	400.15	469.85	417.55	452.55	435.00	435.20	435.40
	TX(MHz)	435.00	400.00	470.00	417.50	452.50	435.00	435.20	435.40
4 (U4)	RX(MHz)	465.15	440.15	489.85	452.55	477.55	465.00	465.20	465.40
	TX(MHz)	465.00	440.00	490.00	452.50	477.50	465.00	465.20	465.40
5 (U5)	RX(MHz)	503.15	480.15	525.85	491.75	515.25	503.00	503.20	503.40
	TX(MHz)	503.00	480.00	526.00	491.70	515.20	503.00	503.20	503.40
6 (U6)	RX(MHz)	425.15	400.15	449.85	412.55	437.55	425.00	425.20	425.40
	TX(MHz)	425.00	400.00	450.00	412.50	437.50	425.00	425.20	425.40

VCO

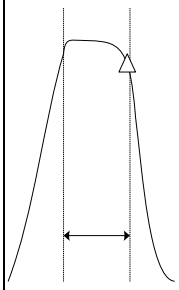
<table>
<tr><th rowspan="2">Item</th><th rowspan="2">Condition</th><th colspan="2">Measurement</th><th colspan="2">Adjustment</th><th rowspan="2">Specification / Remarks</th></tr>
<tr><th>Test Instrument</th><th>Terminal</th><th>Part</th><th>Method</th></tr>
<tr><td>1. Power supply</td><td>1.Power supply voltage DC13.6V</td><td colspan="5"> 
Note: 1. This radio may be installed in negative ground electrical systems only. Reverse polarity will cause the cable fuse to blow. Check the vehicle ground polarity before installation to prevent wasted time and effort.
2. If DC power is to be controlled by the vehicle ignition switch, a switching relay should be used to switch the positive power lead. The vehicle ignition switch then controls DC to the relay coil.</td></tr>
<tr><td rowspan="2">2. VCO lock voltage (TX)</td><td>1.CH: TX HI</td><td rowspan="4">Digital Voltmeter</td><td rowspan="4">CV</td><td rowspan="2">TC1</td><td>7.1V±0.1V</td><td></td></tr>
<tr><td>2.CH: TX LO</td><td>Check</td><td>＞1.5V</td></tr>
<tr><td rowspan="2">3. VCO lock voltage (RX)</td><td>1.CH: RX HI</td><td rowspan="2">TC2</td><td>7.5V±0.1V</td><td></td></tr>
<tr><td>2.CH: RX LO</td><td>Check</td><td>＞1.5V</td></tr>
</table>

Transmitter

Item	Condition	Measurement		Adjustment		Specification /Remarks
		Test Instrument	Terminal	Part	Method	
4.TX Frequency	Enter adjustment item “ 1 ”, each Ch corresponds to a specific TX Freq	Radio Communication Test Set	ANT	Adjust software settings	Adjust to Ch frequency	Error <50Hz
5.TX Power	Each Ch corresponds to a specific TX Freq, enter adjustment item “2”, adjust H/M/L power	Radio Communication Test Set Ammeter	ANT	Adjust software setting (first value is 220) and VR101, press [PF6] to save and enters the next item.	High power: PO=50±0.5W I≤12.0A	Check High power
					Middle power: PO=25±0.5W I≤8.0A	Check Middle power
					Low power: PO=5±0.5W I≤5.0A	Check Low power
6. Max. Deviation	1. Each Ch corresponds to a specific TX Freq, enter adjustment item “3”, turn to CH (C), CH(L), CH(H), CH(nC)	Radio Communication Test Set FILTER: 0.05-15KHz AF:1KHz 50mV	ANT— MIC Jack	Adjust software settings, press [PF6] to save and enters the next item	Check deviation at CH L/C/H: 3.75±0.1KHz (W)	
					Check deviation at CH L/C/H: 1.75±0.1KHz (N)	
7. Modulation Sensitivity	1. Each Ch corresponds to a specific TX Freq	Radio Communication Test Set FILTER: 0.05-15KHz AF:1KHz 7mV	ANT MIC Jack		Check deviation: 2.6KHz-3.4KHz (W) 1.3KHz-1.7KHz (N)	Check
8. Modulation Distortion					≤5%	

9.CDCSS Balance	Each Ch corresponds to a specific TX Freq, enter adjustment item “4”	Radio Communication Test Set FILTER LPF: 300Hz	ANT	Change CDCSS settings with Selector Knob		Check waveform
10. CTCSS Deviation	Each Ch corresponds to a specific TX Freq, enter adjustment item “5”, adjust 67Hz/127.3Hz/254.1Hz CTCSS	Radio Communication Test Set FILTER LPF: 300Hz	ANT	Change CTCSS settings with Selector Knob	Adjust deviation to 0.75KHz±0.10KHz (W) 0.37KHz±0.05KHz (N)	
11. CDCSS Deviation	Each Ch corresponds to a specific TX Freq, enter adjustment item“6”	Radio Communication Test Set FILTER LPF: 300Hz	ANT	Change CDCSS settings with Selector Knob	Adjust deviation to 0.75KHz±0.10KHz (W) 0.37KHz±0.05KHz (N)	
12. DTMF Deviation	Each Ch corresponds to a specific TX Freq, enter adjustment item “7”	Radio Communication Test Set FILTER LPF: 3KHz	ANT	Change DTMF settings with Selector Knob	3.0KHz±0.1KHz (W) 1.5KHz±0.1KHz (N)	
13. MSK	Each Ch corresponds to a specific TX Freq, enter adjustment item “8”	Radio Communication Test Set FILTER LPF: 3KHz	ANT	Change MSK settings with Selector Knob	3.0KHz±0.1KHz (W) 1.5KHz±0.1KHz (N)	
14. 2-TONE/ 5-TONE	Each Ch corresponds to a specific TX Freq, enter adjustment item “9”	Radio Communication Test Set FILTER LPF: 3KHz	ANT	Change 2-tone/ 5-tone settings with Selector Knob	Adjust deviation to 3.0KHz±0.10KHz (W) 1.5KHz±0.1KHz (N)	

Receiver

Item	Condition	Measurement		Adjustment		Specification /Remarks
		Test Instrument	Terminal	Part	Method	
15. RF bandpass filter	Enter adjustment item “10”, each Ch corresponds to a specific RX Freq	Scanner	ANT . TP1	Adjust software settings	Adjust the gain to the Max. value, the corresponding freq is on the rightmost to bandpass waveform. Press [PF6] to save.	
16. max SINAD	CH: RX Center, turn to CH1(C); corresponds to a specific RX Freq	Radio Communication Test Set SSG output: -47dBm MOD:1KHz DEV:±3KHz(W) ±1.5KHz(N) FILTER: 0.3-3.0KHz	ANT SP Jack	L135	Adjust the L135,make SINAD is max	The max volume : 4.8V or higher
17. Sensitivity	1.CH: RX Center, turn to CH1(C) in manual adjust mode 2. CH: RX LO, turn to CH2(L) in manual adjust mode 3.CH:RX HI, turn to CH3(H) in manual adjust mode	Radio Communication Test Set SSG output: -118dBm MOD:1KHz DEV:±3KHz(W) ±1.5KHz(N) FILTER: 0.3-3.0KHz	ANT SP Jack	W/N switch (turn on power while holding down [PF6] to enter Channel Set Mode)	[UP]/ [DOWN] to change channel Check	SINAD: 12dB or higher

18. SQ Open	Enter adjustment item “11”, turn to CH (H), CH(C), CH (L)	Radio Communication Test Set SSG output: -120dBm (level 3) SSG output -112dBm (level 9)	ANT SP Jack	Adjust software setting	Adjust software settings at SQL3 and SQL9，press [PF6] to save.	Press [PF2] to adjust software settings , open the squelch while the value is changeless
19.SQ Close	Enter adjustment item “12”, turn to CH (H), CH(C), CH (L)	Radio Communication Test Set SSG output: -122dBm (level 3) SSG output: -114dBm (level 9)			Adjust software settings at SQL3 and SQL9，press [PF6] to save.	Press [PF2] to adjust software settings, close the squelch while the value is changeless
20. Distortion	1.CH: RX Center	Radio Communication Test Set SSG output: -60dBm	ANT SP Jack	FILTER: 0.3-3.0KHz	Check	DIS≤5%
21. S/N						S/N≥48 (W) S/N≥42 (N)

Note: The radio must be covered with aluminum chassis when adjusting sensitivity; Connect an RF power meter to the antenna connector while TX; Connect a SINAD meter with a 16ohm load to the external [SP] jack.

Terminal Function

1. Display Unit

Pin No.	Name	Description
J501 (To MIC Jack)		
1	MBL	MIC backlight control signal output. “H”: On, “L”:Off.
2	PSB	Power outputs after power switch (13.6V±15%).
3	GND	Ground.
4	PTT/TXD	PTT signal input/ Serial data output.
5	ME	MIC ground.
6	MIC	MIC signal input.
7	HOOK/RXD	Hook signal input/ Serial data input.
8	CM	Serial data input for keypad MIC.
J503(To DISPLAY UNIT)		
1	VCC	+5V.
2	E	Ground.
3	LCDCK	Clock output for LCD driver.
4	LCDW	LCD data write.
5	LCDR	LCD data read.
6	LCDCS	LCD control signal output.
7	LCD	LCD display contrast.
8	LAMP	Power for backlight.
J504 (To DISPLAY UNIT)		
1	ME	MIC ground.
2	MIC	MIC signal output.
3	E	Ground.
4	REST	Reset signal input.
5	TXD2	Serial data output.
6	RXD2	Serial data input.
7	E	Ground.
8	PSW	Power switch control signal output.
9	SB	Power input after power switch (13.6V±15%).
10	SP1	BTL input for remote speaker output.
11	SP2	BTL input for remote speaker output...
J505 (To Speaker)		
1	SP1	BTL input for remote speaker output.
2	SP2	BTL input for remote speaker output.

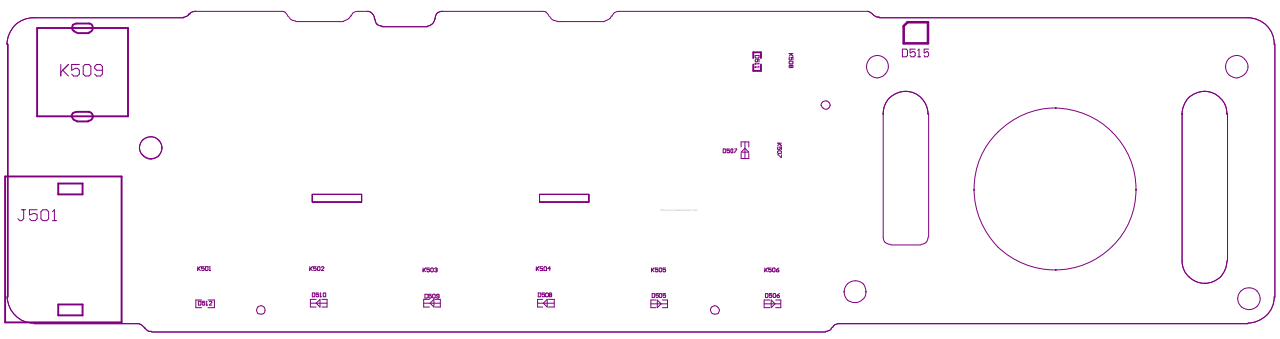
2. TX-RX Unit

Pin No.	Name	Description
J101 (To DISPLAY UNIT)		
1	ME	MIC ground.
2	MIC	MIC signal output.
3	E	Ground.
4	REST	Reset signal input.
5	TXD2	Serial data output.
6	RXD2	Serial data input.
7	E	Ground.
8	PSW	Power switch control signal output.
9	SB	Power input after power switch (13.6V±15%).
10	SP1	BTL input for remote speaker output.
11	SP2	BTL input for remote speaker output.
J104 (To VCO UNIT)		
1	ST	TX RX switch.
2	HT	RF output.
3	E	GND.
4	8C	+8V.
5	MD	Modulate output.
6	CV	Control voltage.
J108(To POWER)		
1	+B	+13.6V±0.5V
J110(To EXTSP)		
Pin No.	**Name**	**Description**
1	OUT2	Output to speaker.
2	SP2	BTL input for remote speaker output.
3	SP1	BTL input for remote speaker output.
4	GND	GND.

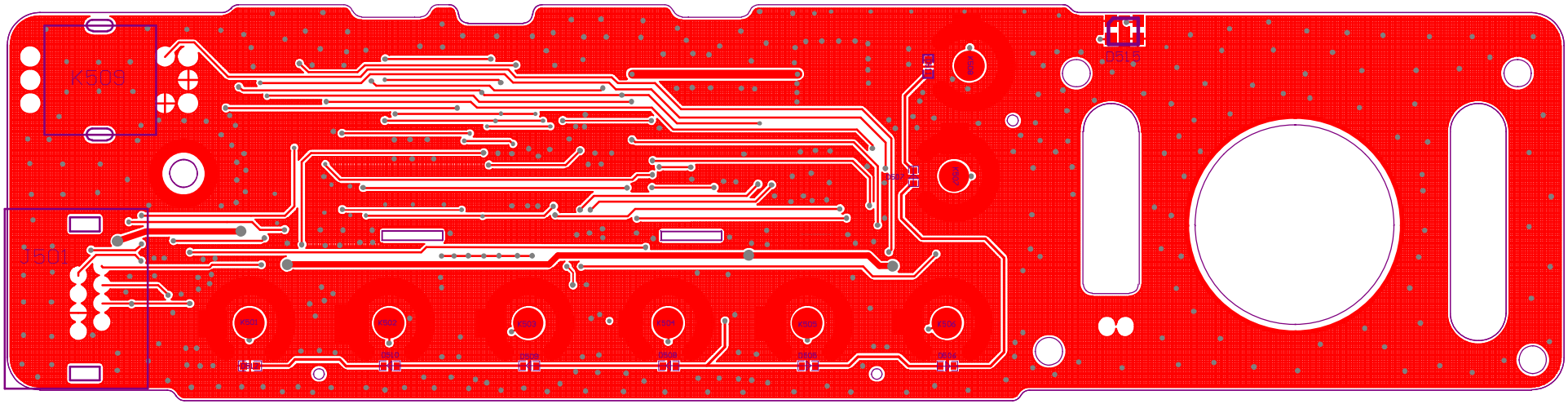
Pin No.	Name	Description
J111 (at the rear panel; to Secondary Development Interface)		
1	TXD0	Serial data input.
2	RXD0	Serial data output.
3	MIC2	External MIC signal output.
4	ME	MIC ground.
5	AFO	Filtered Audio output.
6	AUX5	Programmable auxiliary port.
7	AUX4	Programmable auxiliary port.
8	AUX3	Programmable auxiliary port.
9	HRO	Horn Relay Output.
10	HRI	Horn Relay Input.
11	PA1	MIC signal output.
12	PA2	MIC signal output.
13	E	Ground.
14	SB	Power input after power switch (13.6V±15%).
15	IGN	Ignition sense input.
J109 (To Secondary Development Interface or Data Encryption and Decryption)		
1	8C	+8V.
2	E	GND.
3	SB	Power input after power switch (13.6V±15%).
4	AUX1	Programmable auxiliary port.
5	AUX6	Programmable auxiliary port.
6	AUX7	Programmable auxiliary port.
7	NC	No Connection.
8	RSSI	Receiver Signal Strength Indication.
9	CTO	CDCSS signal output.
10	PCO	Transmitting Power Control Output.
11	UL	Unlock detection signal output.
12	MII	Transmitting audio input.
13	MIO	Transmitting audio output.
14	AFI	Filtered Audio input.
15	AFO	Filtered Audio output.
J102 (To Secondary Development Interface or SMARTUNK)		
1	TXD1	Serial data output.
2	RXD1	Serial data input.
3	AUX5	Programmable auxiliary port.
4	DEO	Receive signal detection.
5	DI	Data modulate input.
6	ALT	Alert hint input.
7	5V	+5V.

8	E	GND.
9	AUX1	Programmable auxiliary port.
10	AUX3	Programmable auxiliary port.
11	AUX4	Programmable auxiliary port.
12	AUX2	Programmable auxiliary port.
13	DTMFIO	DTMF input/output.
14	TXD0	Serial data output.
15	RXD0	Serial data input.
J112 (To GPS)		
1	TXD1	Serial data output.
2	RXD1	Serial data input.
3	3.3V	+3.3V.
4	E	Ground.
5	5V	+5V.

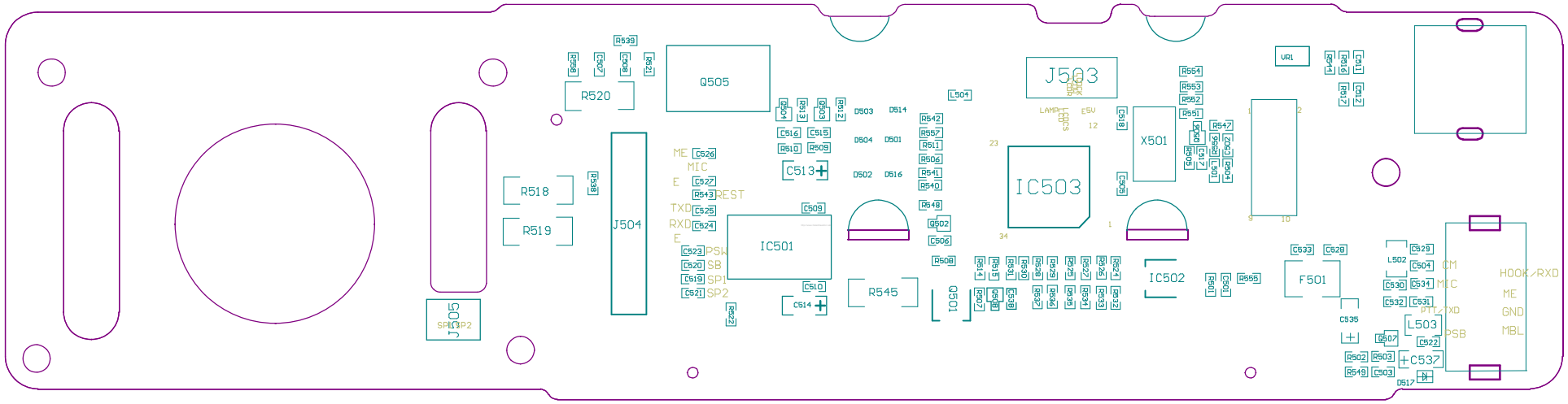
TM-800 Display Unit (Top Overlay)



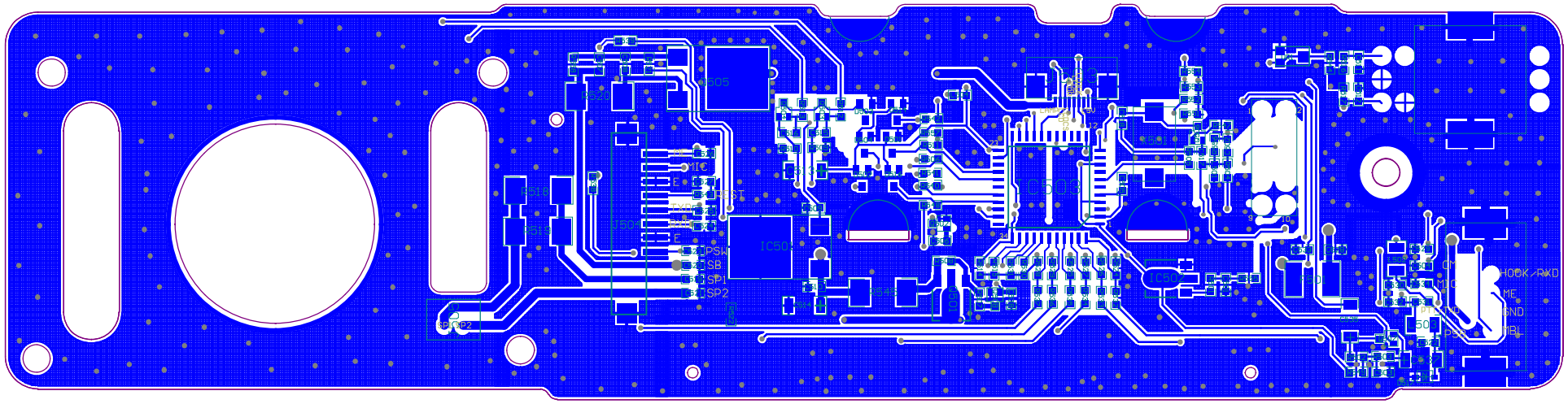
TM-800 Display Unit (Top Layer)



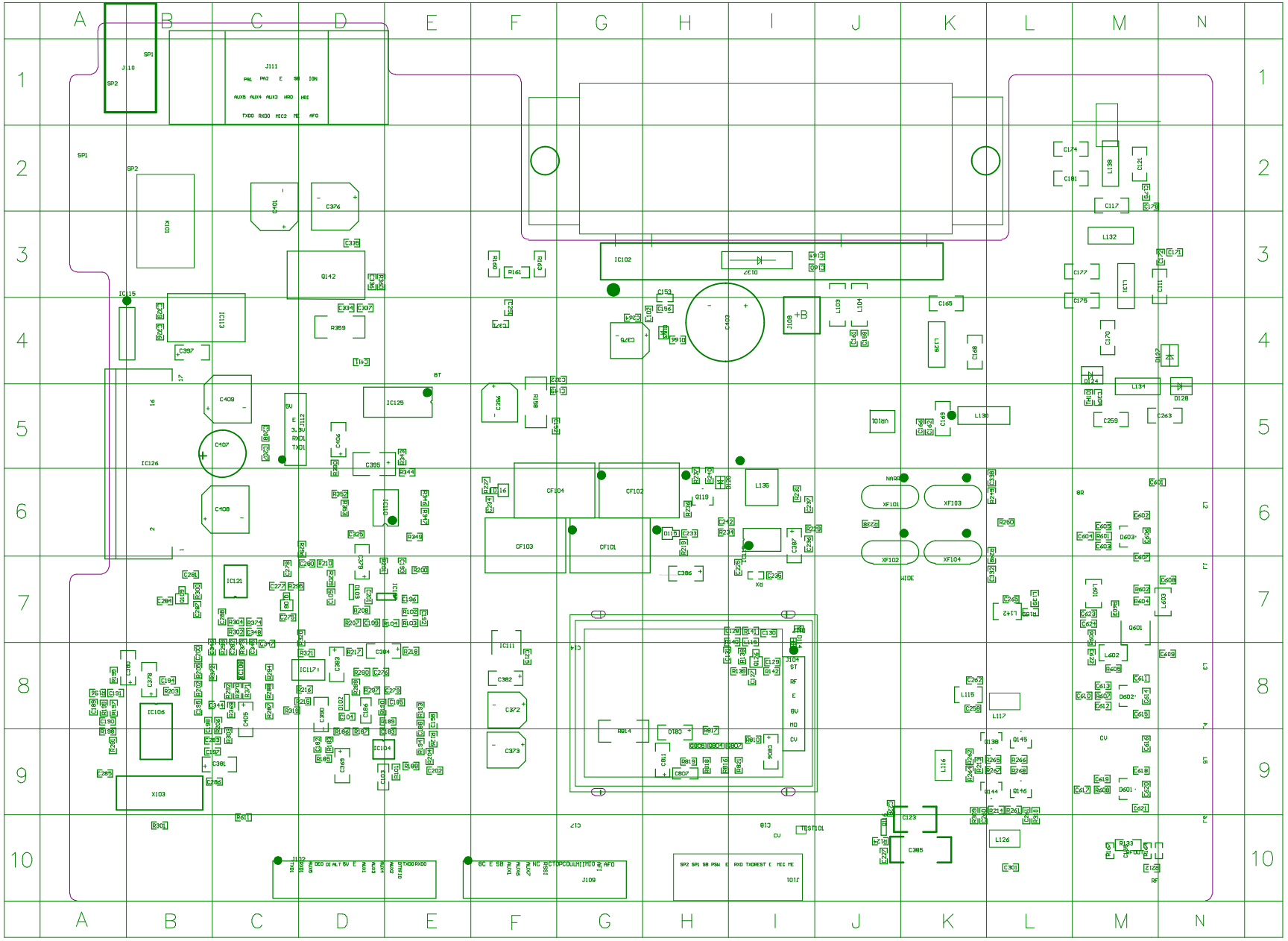
TM-800 Display Unit (Bottom Overlay)



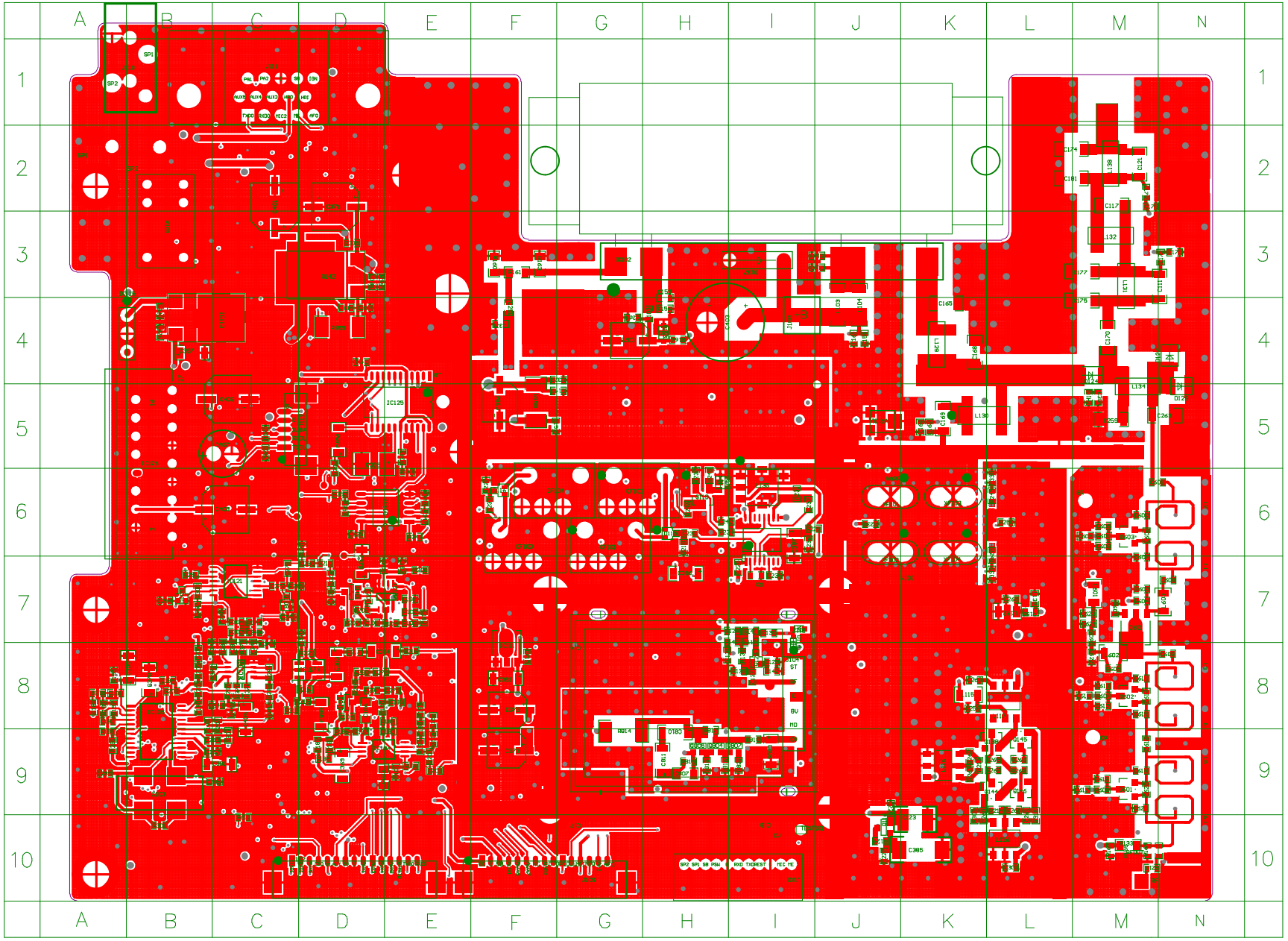
TM-800 Display Unit (Bottom Layer)



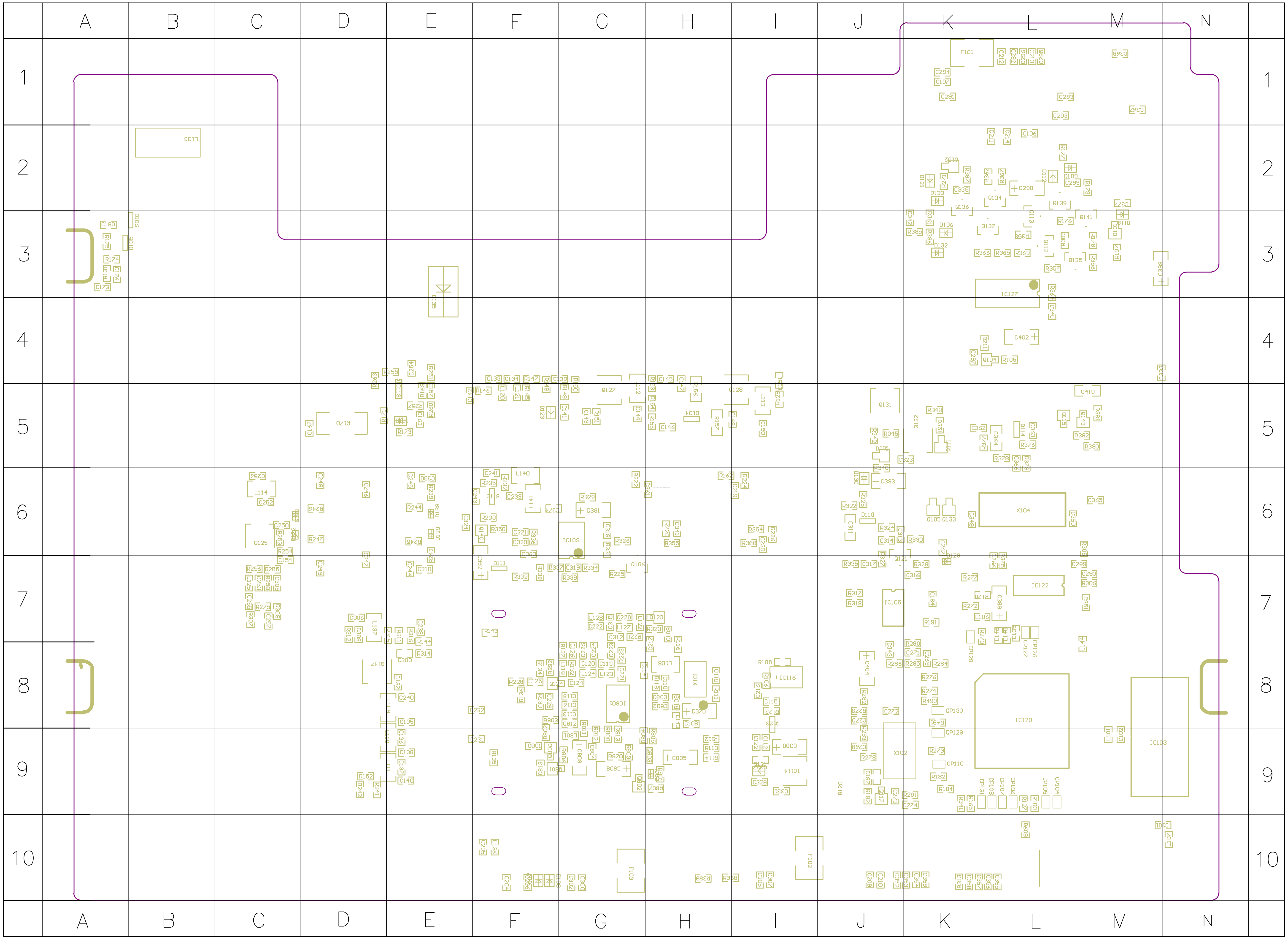
TM-800 Tx-Rx Unit (Top Overlay)



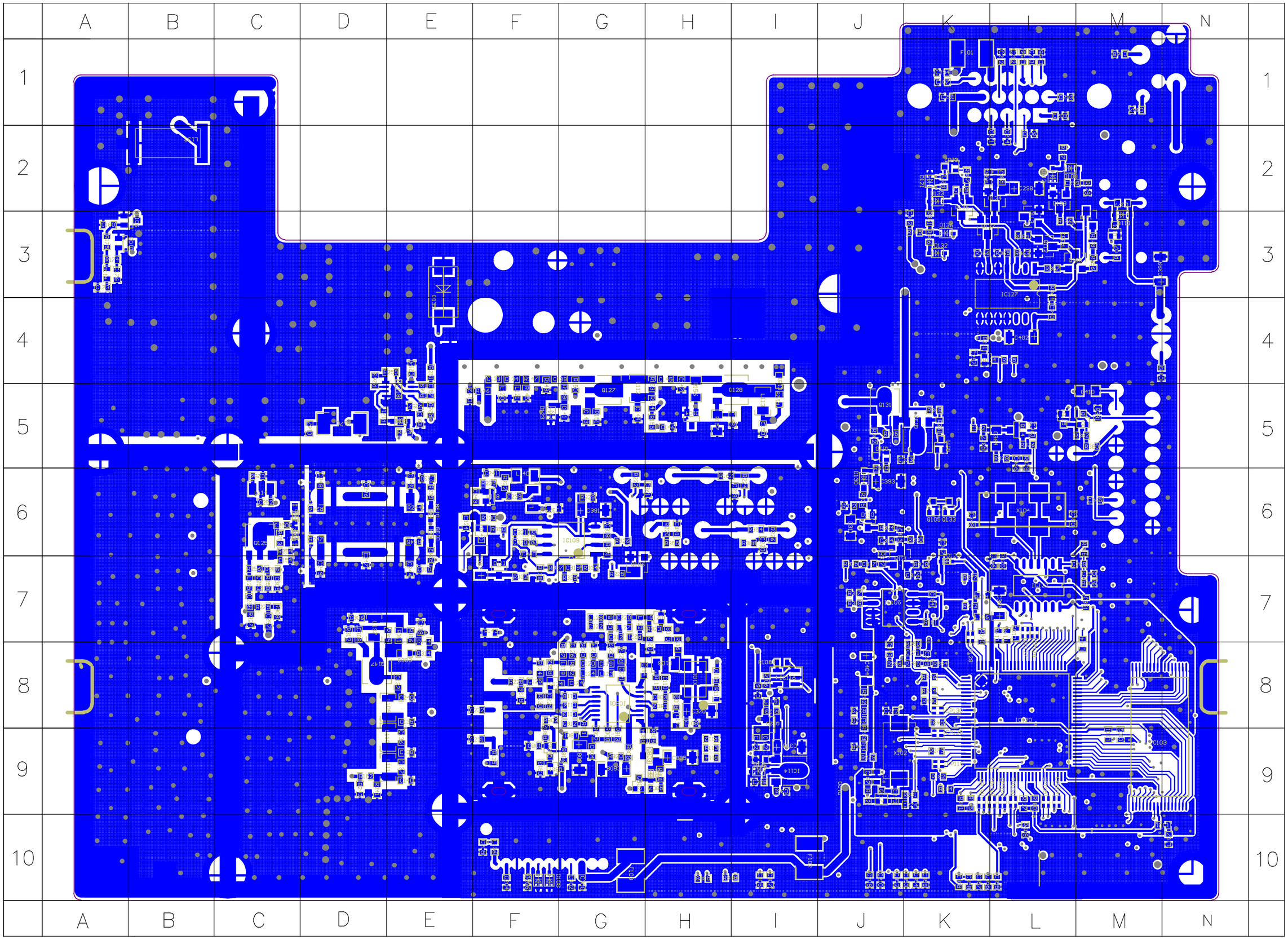
TM-800 Tx-Rx Unit (Top Layer)



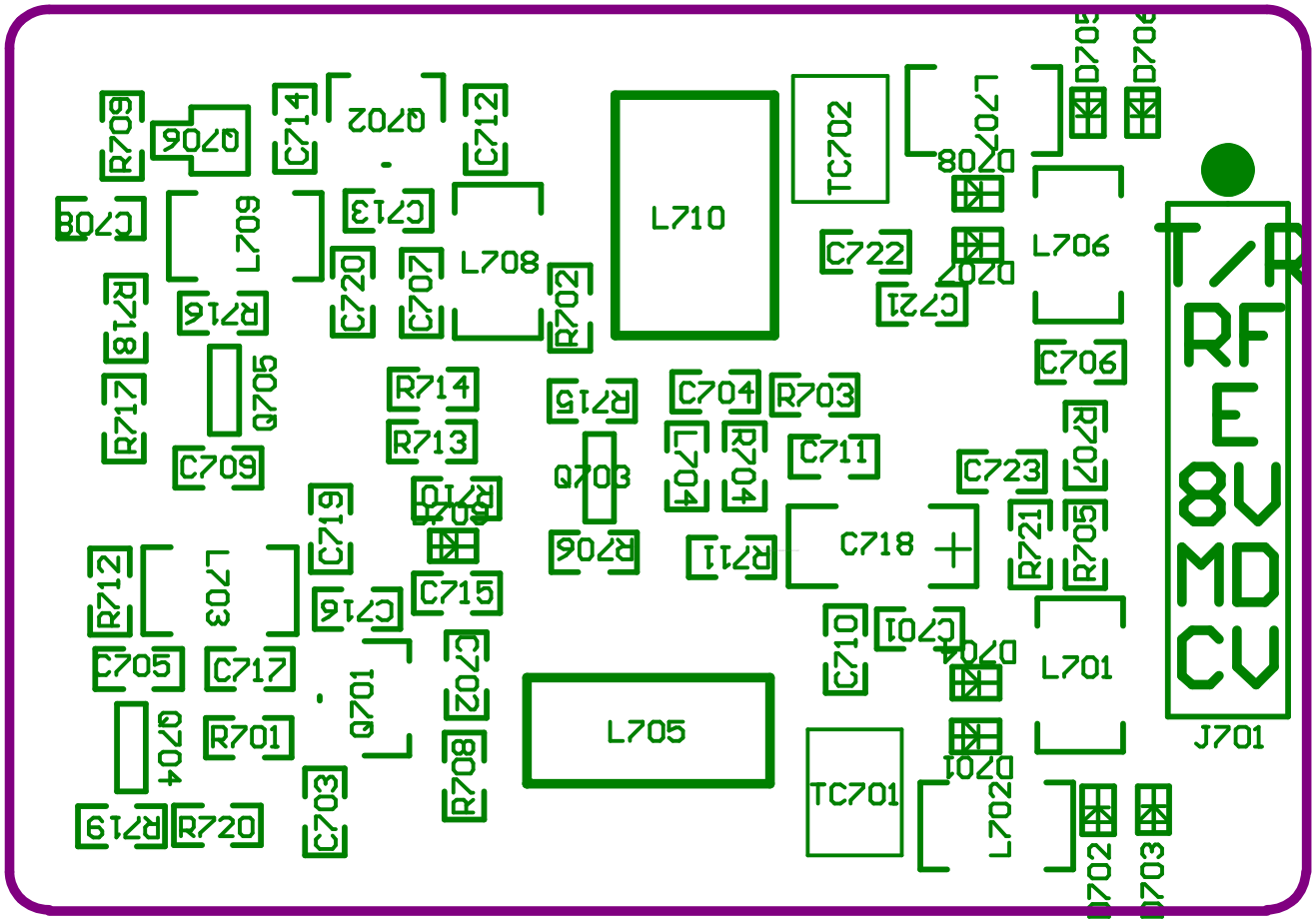
TM-800 Tx-Rx Unit (Bottom Overlay)



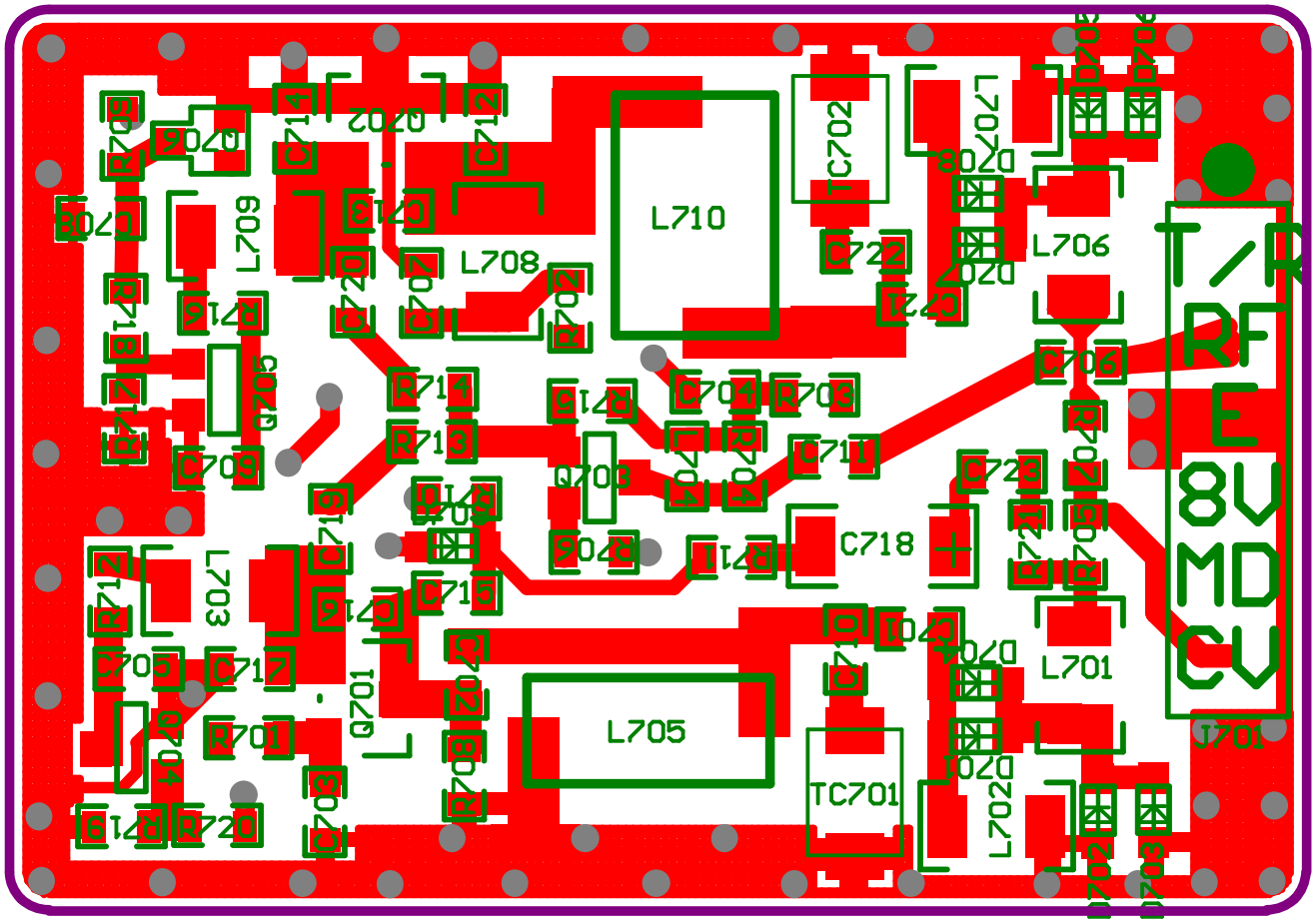
TM-800 Tx-Rx Unit (Bottom Layer)



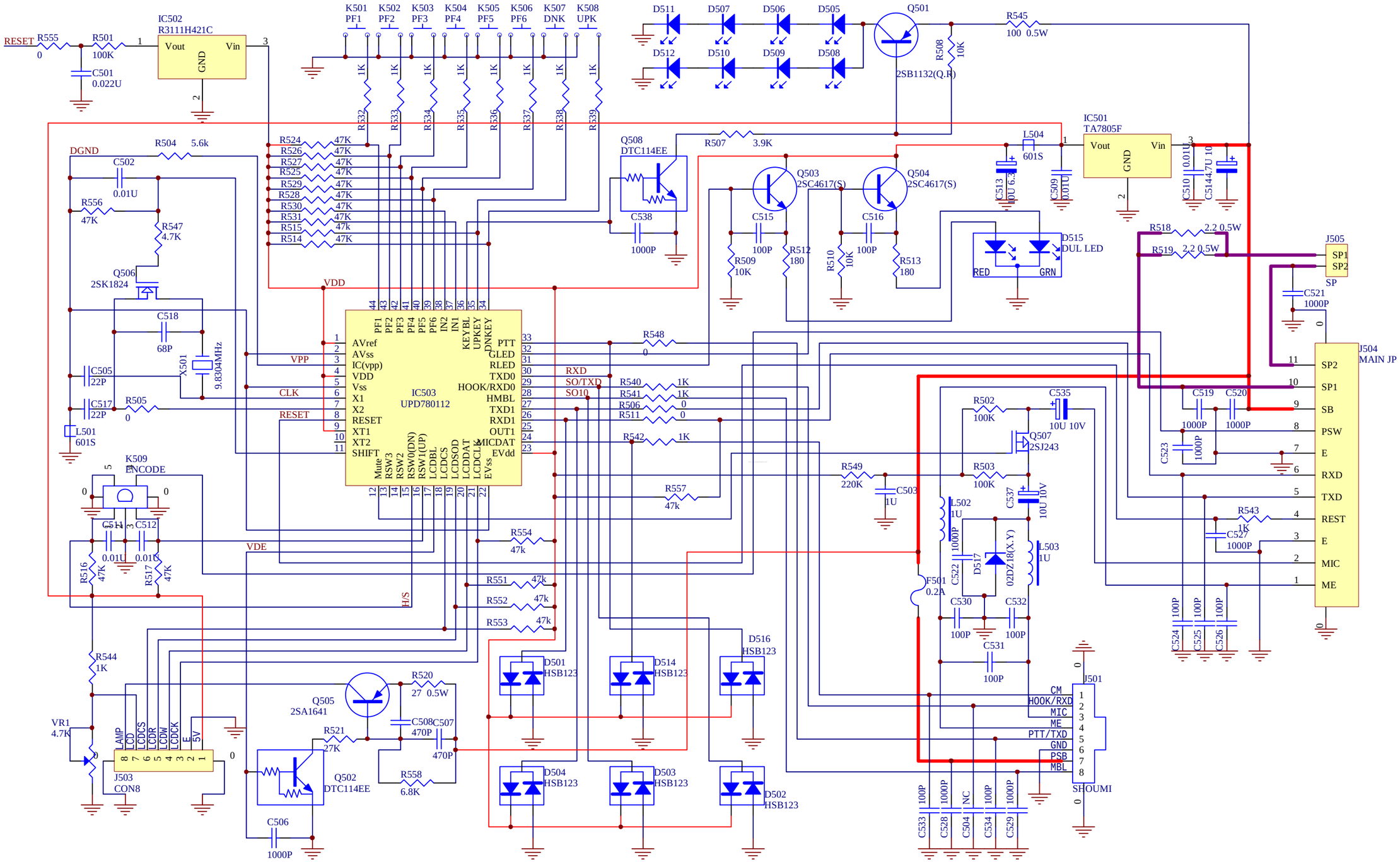
TM-800 VCO (Top Overlay)



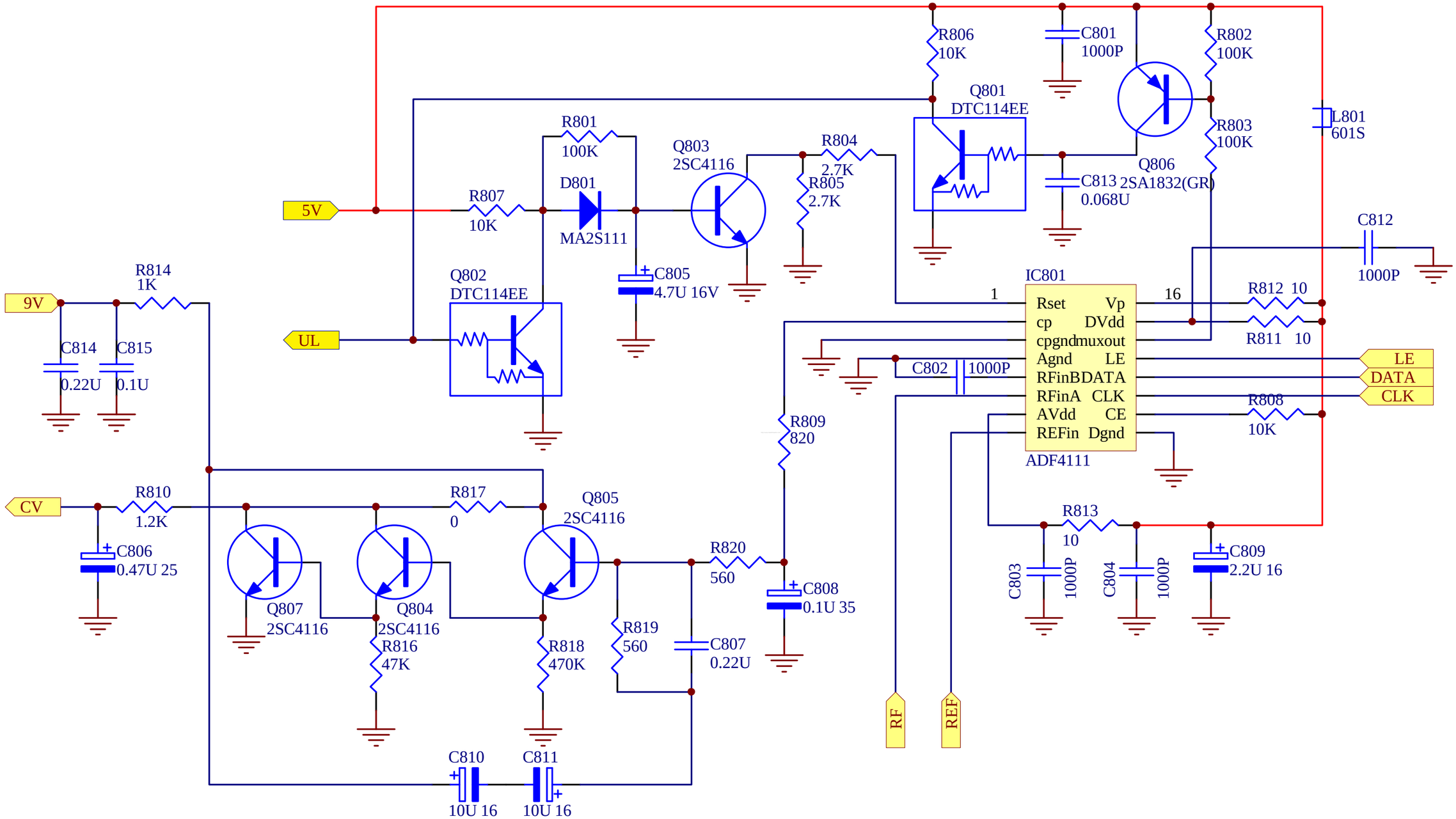
TM-800 VCO (Top Layer)



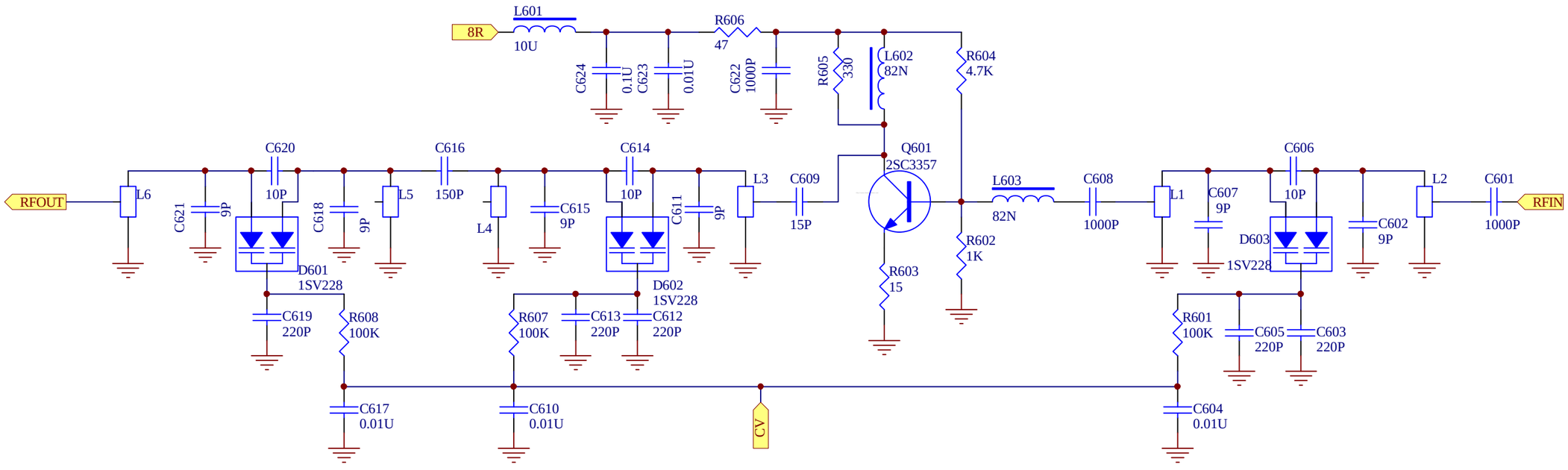
TM-800 Schematic Diagram (Display Unit)



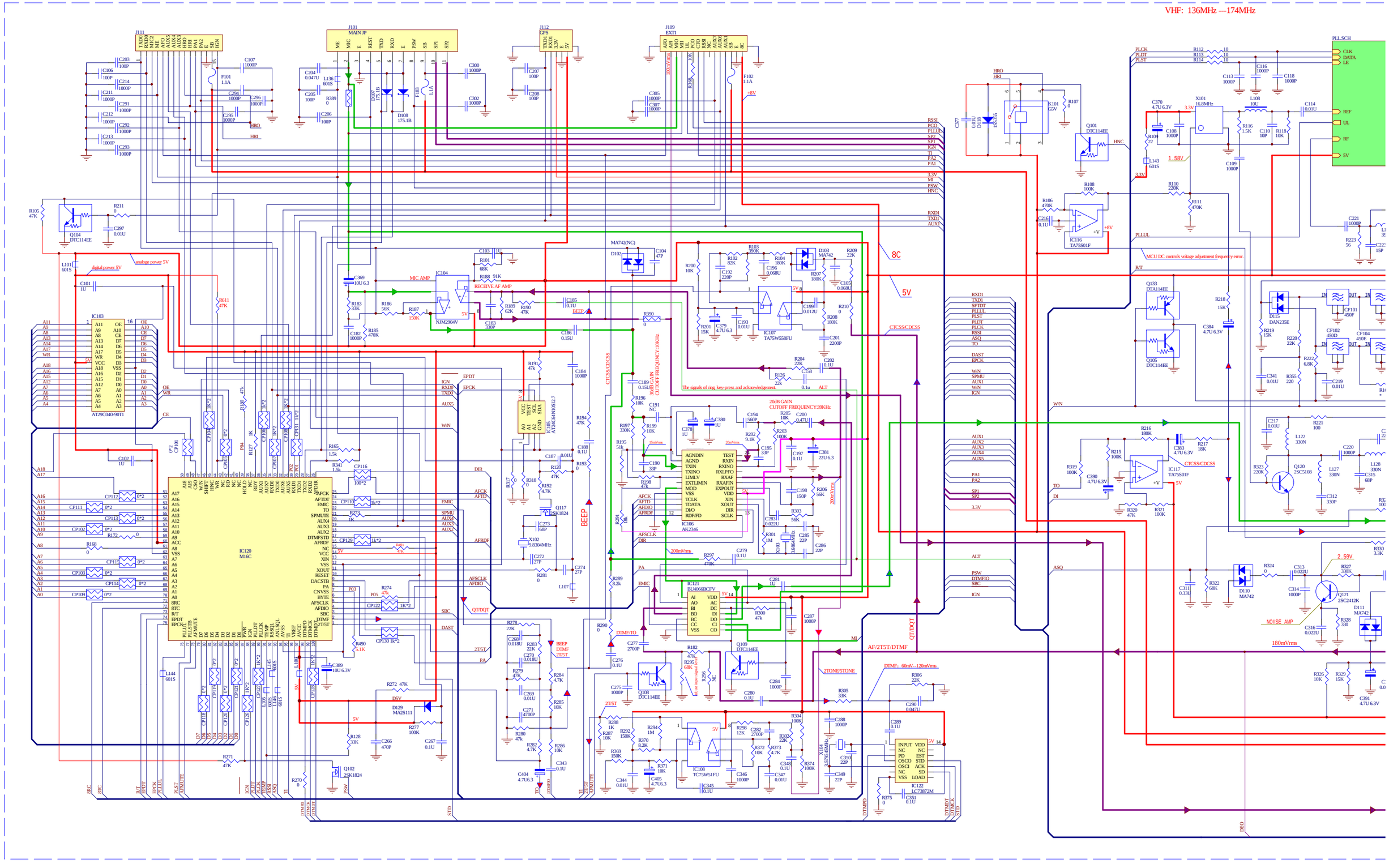
TM-800 Schematic Diagram (Tx-Rx-PLL)



TM-800 Schematic Diagram (Tx-Rx-BPF)



TM-800 Schematic Diagram (Tx-Rx)



VCO UNIT

NOISE AMPLIFIER SWITCH

Narrow

Wide

IC102 POWER MODULE

IC119 TA31136FN

IC109 NJM4558M

IC110 NJM2904M

IC111 XC62FP3302P

IC125 M62364FP

IC126 TDA8561Q

IC127 TC4013BF

IC118 TA75W01FU

IC113 TA7805F

IC114 TA78L09

IC115 TA7808S

PLL.SCH

BPF.SCH

Temperature protection

ANTENNA

double balance mixer

Requiring local oscillation input level no less than 6dBm.

The gain of BPF is 9~10dB.

The gain of frequency conversion is about -8dB.

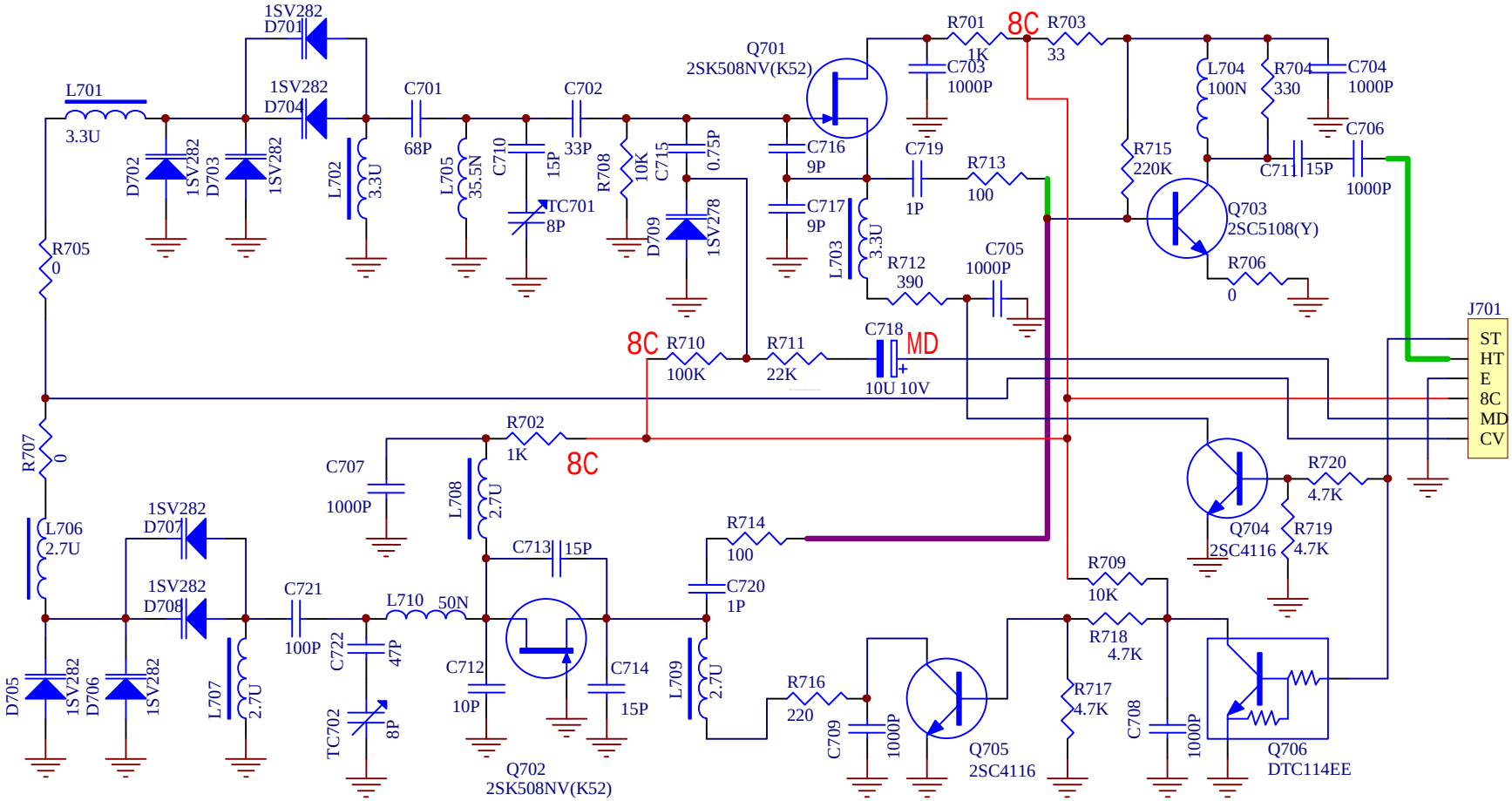
WIDE/NARROW switchover attenuation Keeping AF output signal level consistently.

MCU DC controls voltage adjustment frequency error.

electric volume control

IGN(Ignition sensor) "1" OFF "0" ON

TM-800 Schematic Diagram (VCO)



Specifications

Frequency Range	136-174MHz
Number of Channels (Zone)	Conventional CH:Max.256 (1 zone×256ch – 256 zones×1ch)
Channel Spacing	25、30KHz/12.5、15KHz
PLL Step	2.5/5/6.25/7.5
Power Supply	13.6V±15%
Duty Cycle	Transmit: 20%
Operation Temperature	-30℃+60℃
Frequency Stability	±2.0ppm
Antenna Impedance	50Ω
Dimensions (W×H×D)	175mm×48mm×170mm
Weight(net)	1.9kg
Transmitter	
RF Power Output (H/M/L)	25W/10W/5W, 50W/25W/5W
Adjacent Channel Power	70(W)/60dB(N)
Modulation Limit (CTCSS/CDCSS)	5/2.5KHz
Spurious Response	80dB
FM S/N	48(W)/42dB(N)
AM S/N	34dB
MIC Sensitivity	91dB
Modulation Distortion	<3%
Modulation S/N (CTCSS/CDCSS)	35dB(W)/30dB(N)
Receiver	
Sensitivity	0.28μV (W) / 0.35μV(N)
Adjacent Channel Selectivity	75 dB (W) / 65dB(N)
Intermodulation	70 dB (W) / 65dB(N)
Spurious and Image Rejection	80dB
Type of Emission	Wide:16K0F3E,20K0F1D/Narrow:11K0F3E,11K2F1D
FM S/N	48(W)/42dB(N)
External Audio Output	12W (@4Ω 3% distortion),13W (@4Ω 5% distortion)
Internal Audio Output	3.2W (@16Ω 3% distortion),3.5W (@4Ω 5% distortion)

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■ Appendix 1 Entering Characters

Entering characters with an optional microphone keypad

KEY	CHARACTER								NUMBER	REMARKS
	Number of times key is pressed									
	1	2	3	4	5	6	7	8		
1	Space								1	Each key can generate numeric and character information. Pressing a key will cause the first character of the key's character cycle to appear on the LCD; Subsequent pressing of the same key will cause subsequent characters in the cycle to appear. For example, to enter the character "S", press the "7" key four (4) times.
2	A	B	C	a	b	c			2	
3	D	E	F	d	e	f			3	
4	G	H	I	g	h	i			4	
5	J	K	L	j	k	l			5	
6	M	N	O	m	n	o			6	
7	P	Q	R	S	p	q	r	s	7	
8	T	U	V	t	u	v			8	
9	W	X	Y	Z	w	x	y	z	9	
0									0	
A	@	!	#	$	%	^	&	~		
B	+	-	*	/	=	\	_	|		
C	(	)	<	>	[	]	{	}		
D	,	.	?	:	;	"	'	`		
*	Press to toggle between number and character									
#	Press to clear the input									
PTT	Enter (Complete programming and store)									

Entering characters without a keypad

① Turn Selector Knob to choose the character to be entered.
② Press the [PF2] key to toggle among number, uppercase letter, lowercase letter and symbol.
③ Press the [PF3] / [PF4] key to move the cursor forward/backward.
④ Press the [PF1] key to clear the input.
⑤ Press the [PF6] key to confirm the input.