Contents

Preface

Scope

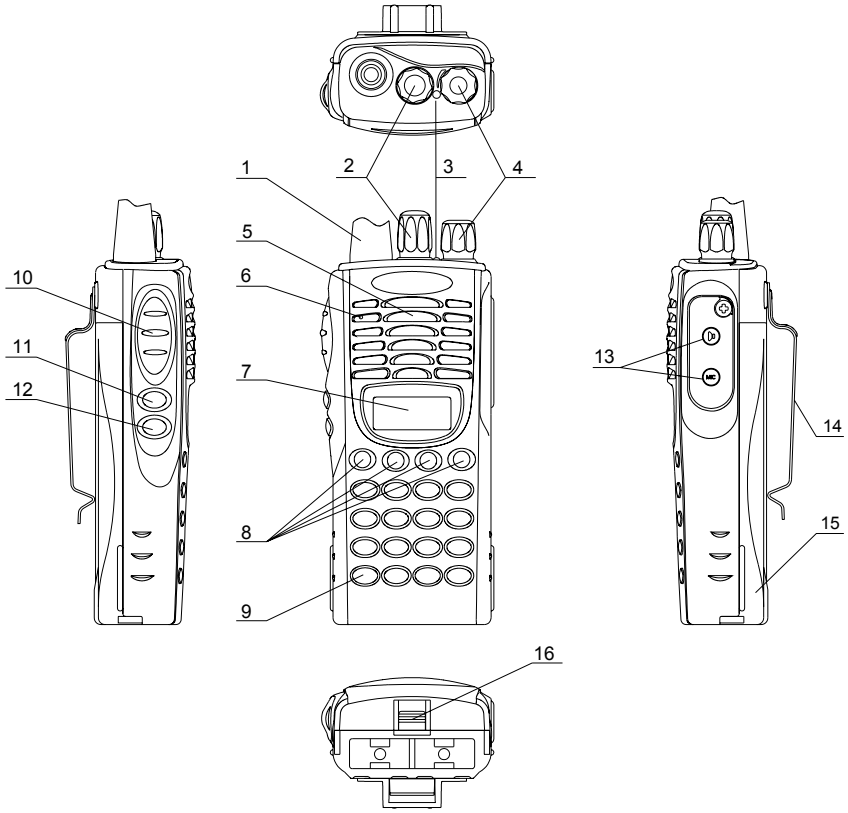
This manual is intended for use by qualified technicians familiar with similar types of communication equipment. It contains all service information and data required for the equipment.

Caution

The following precautions are recommended for personnel safety:

- DO NOT transmit until all RF connectors are verified secure and all connectors are properly terminated.
- SHUT OFF the power and DO NOT operate this equipment near electrical blasting caps or in a potential explosive atmosphere.
- This equipment should be serviced by qualified technicians only.

Brief Introduction



(1) ANTENNA

(2) CHANNEL SELECTOR KNOB

Used to select channel and squelch level. In addition, it can be programmed by the dealer to delete undesired channels from scan list or to select a CTCSS frequency.

(3) LED INDICATOR

- Is red when transmitting
- Is green when receiving
- Flashes red when the battery voltage is low and approaching the cut-off point
- Flashes orange, when the radio receives proper DTMF or Two Tone decode signals.

(4) ON-OFF/VOLUME KNOB

Rotate the volume control knob clockwise to turn the unit “on” and fully counter clockwise to turn the unit “off”. Increase or decrease volume by adjusting the volume control accordingly.

(5) SPEAKER

(6) MICROPHONE

(7) LCD

Used to display channel and operation status.

(8) (●,○,■,□) PROGRAMMABLE SOFT KEYS

Used to enable auxiliary functions. Press each key to enable its corresponding function.

(9) KEYPAD

Used to enter, store or send DTMF codes.

(10) PTT BUTTON

Used to switch between transmit and receive mode.

(11) LAMP BUTTON

Used to turn on/off the LCD backlight. Press the **[LAMP]** button, the backlight will illuminate for about 5 seconds and then automatically turn off. Press any key other than **[LAMP]** button, the timer will retime. If you press the **[LAMP]** button, the backlight will light off.

(12) MONI BUTTON

Used to monitor the selected channels.

(13) EXTERNAL SPEAKER-MICROPHONE JACK

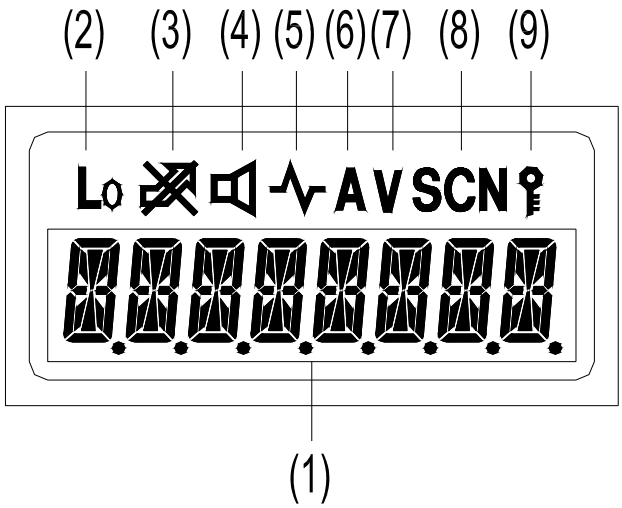
Used to connect with external speaker-microphone, programming cable, or cloning cable.

(14) BELT CLIP

(15) BATTERY

(16) BATTERY LATCH

LCD



(1) Displays the selected channel number, channel frequency, channel label, squelch level or DTMF code. When selective call is enabled, messages received are also displayed here.

Note: The “soft keys” can be programmed to toggle between display modes.

Channel Number– Displays channel number. Factory default.

Channel Frequency– Displays the channel frequency.

Channel Label– Displays characters of the channel label (up to 16 alphanumeric characters can be programmed. Any label over 8 characters will scroll across the display).

(2) Appears when Low Power is selected.

(3) Appears when selected channel is busy.

(4) Appears when MONI button is pressed to disable CTCSS, CDCSS, DTMF or 2-Tone.

(5) Appears when MONI button is pressed to switch the speaker on.

(6) Appears when current channel is in the scan list. Radio only scans channels in scan list.

(7) Appears when enter number during channel label programming. Appears when CDCSS decoder is reversed in destination set mode.

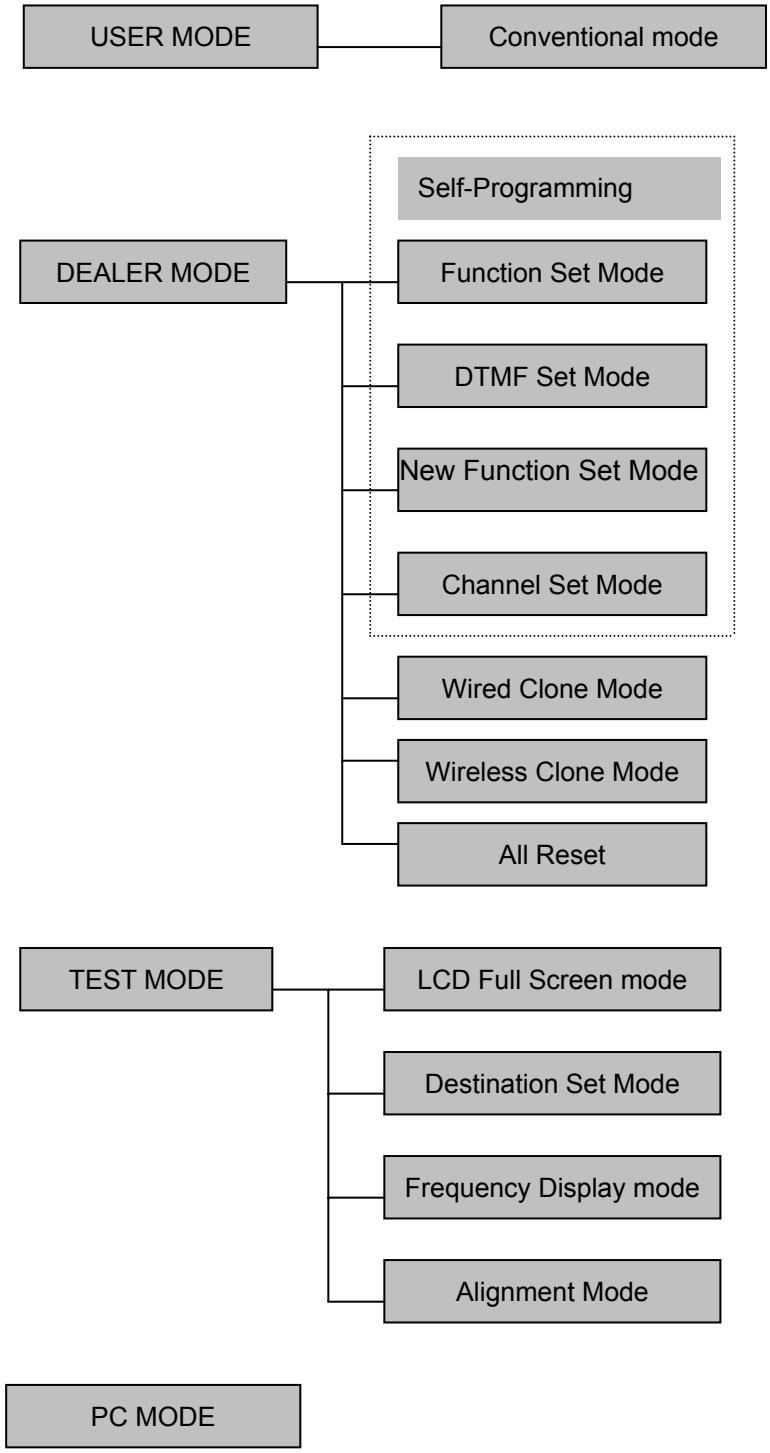
(8) Appears in scan mode.

(9) Appears when keypad lock is on.

Radio Modes

1. Frame of Radio Modes

Select the function you want from the modes and make the necessary settings.



2. Description of Mode Functions

MODE		FUNCTION
USER MODE		Conventional mode
		User Set Mode
DEALER MODE		Dealer set the following modes: Function set mode, DTMF set mode, Channel set mode, Wired clone mode, Wireless clone mode, All Reset
USER SET MODE		1. Priority Channel 2. No.1 Home channel 3. No.2 Home channel 4. Programmable key 1 [●] 5. Programmable key 2 [○] 6. Programmable key 3 [■] 7. Programmable key 4 [□] 8. Power On Password
Self Programming (FUNCTION SET MODE)		The dealer set the following functions ON/OFF according to the user operating needs. 1.Monitor 2.Scan 3.Dial 4. Talk around 5.Low 6.Priority 7.Priority Channel 8.Look Back A 9.Look Back B 10.Revert Channel 11.TX Dwell time 12.Dropout Delay Time 13.Time out Timer 14.Tramsmit Warning 15.TOT Rekey Time 16.TOT Reset Time 17.Squelch Level 18.BEEP 19.Signalling 20.Battery Save 21.Selectable CTCSS 22.DELETE/ADD 23.Dealer Mode-Test Mode
Self Programming (DTMF SET MODE)		The dealer set the following functions ON/OFF according to the user operating needs. 24.Digit Time 25.Inter Digit Time 26.First Digit Time 27.Rise Time 28.Rise Time with CTCSS 29.PTT ID 30.Dial ID 31.Connect ID 32.Disconnect ID 33. NO. of DTMF key 34.DTMF Hold Time 35.Store & Send 36.D key Assignment 37.DTMF Signaling 38.Intermediate Code 39.Group Code 40 SQ. Auto Reset Time 41.Call Alert/ Transpond
Self Programming (CHANNEL SET MODE)		The dealers use this mode to set channel frequencies and signaling according to the user operating needs. 1.Channel Selection 2.RX Frequency 3.RX Signaling 4.TX Frequency 5.TX Signaling 6.DTMF/2-Tone signaling 7.PTT ID Enable 8.Scan DEL/ADD 9.Busy Channel Lockout 10.Clock Frequency Shift 11.TX Power 12.Wide/narrow Band 13. ID Code/RX 2-Tone 14. TX 2-Tone 15. Channel Label
Self Programming (NEW FUNCTION MODE)		45.Group Tone 46. Group Tone Duration 47. Channel Label Size 48. Programmable Key 1 [●] 49. Programmable Key 2 [○] 50. Programmable Key 3 [■] 51. Programmable Key 4 [□] 52. Power On Password 53. Data Password 54. Power On Text
WIRED CLONE MODE		In this mode data is copied from one radio to another through a cable.
WIRELESS CLONE MODE		In this mode data is copied from one radio to another without cable by means of the DTMF signal.
ALL RESET		In this mode transmit/receive frequencies of each channel and function settings are initialized.
TEST MODE	MENU MODE	This mode is used to enter the following setting options.
	ADJUSTMENT MODE	This mode is for alignment of radio operation.
	FREQUENCY TEST MODE	This mode is for checking the frequencies and repairing the radio.
	ADJUSTMENT DATA CLONE MODE	This mode is used to clone adjustment data from one radio to another.
	LCD FULL SCREEN MODE	All characters and signs on the LCD are displayed.
	DESTINATION SET MODE	This mode sets radio destination.

3. Keypad Entry for Mode Startup

MODE		Key	Remarks
USER MODE	Conventional Mode	POWER ON	Turn on the power to enter Conventional Mode
	User Set Mode	While holding down [MONI] key, turn on the power	
DEALER MODE	Function Set Mode	While holding down [LAMP] and [○] key simultaneously, turn on the power (in 2 seconds)	Press [●] key to enter Function Set Mode.
	DTMF Set Mode	As above	Press [○] key to enter DTMF Set Mode.
	Channel Set Mode	As above	Press [■] key to enter Channel Set Mode.
	New function set mode	As above	Press [□] key to enter New Function Set Mode.
	Wired Clone Mode	As above	Press [LAMP] to enter Wired Clone Mode.
	Wireless Clone Mode	As above	Press [MONI] to enter Wireless Clone Mode.
	All Reset	As above	Press [□] key and [PTT] simultaneously.
TEST MODE	Menu Mode	While holding down [LAMP] and [■] key simultaneously, turn on the power (in 2 seconds).	Press [□] key to enter test mode and [■] key to return to Menu Mode.
	Adjustment Mode	Select "ADJUST" in menu mode.	Press [□] key to enter the mode and [■] key to exit.
	Frequency Test Mode	Select "FREQ TST" in menu mode.	
	Adjustment Data Clone Mode	Select "TUNE CLN" in menu mode.	
	LCD Full Screen Mode	Select "FULL LCD" in menu mode.	
	Destination Set Mode	Select "DEST SET" in menu mode.	

Note: When power on password is enabled, you can enter the user mode only after inputting correct password. And if data password is enabled, you can enter the dealer mode and test mode only after inputting correct data password.

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

Prohibit entering dealer mode and test mode

- Dealer mode and test mode can be prohibited by programming to prevent users from changing the parameters with self-programming feature or with external programmer.
- Cancel the Prohibit

  Short the dealer mode control point and the test mode control point and then the prohibit will be cancelled at POWER-ON. Or use the programming software to cancel.

  Note:

  The dealer mode control point and the test mode control point locate over LCD and marked with SELF.

DEALER MODE

◆ **Self-Programming** (Function Setting)

1. Turn on the power while pressing [LAMP] and [○] key, in 2 seconds the radio enters the dealer mode, and "SEL" appears on LCD.

   Note: If data password is enabled, you can enter the dealer mode and test mode only after inputting correct data password.

   In dealer mode, press [●] key to enter function set mode.
2. Use Channel Selector knob to set functions ON or OFF or to select the setting.
3. After a function is set, press [PTT] to store the setting and the menu goes to the next function option.
4. Press [●] key to return to Dealer Mode from current option, and the current data shown on the display will not be stored.
5. Press [PTT] to store current function setting and a beep will sound to confirm the action.
6. END appears when settings in function mode are completed.

Function No.	Function Name	Settings (Defaults are underlined)	Display	Remarks
1	MONITOR	OFF	MONI OFF	Invalid
		Monitor Momentary	MONI 1	Signaling squelch is temporarily disabled while [MONI] button is held down.
		Monitor Lock	MONI 2	Signaling squelch is temporarily disabled while [MONI] button is pressed. Each time press can toggle between squelch disable and enable.
		SQ OFF Momentary	MONI 3	Squelch is disabled while [MONI] button is held down.
2	SCAN	OFF	SCAN OFF	Invalid
		CO	SCAN CO	"Carrier Operated" function
		TO	SCAN TO	"Time Operated" function
3	[DIAL]	Disable	DIAL OFF	Disables the [DIAL] key.
		Enable	DIAL ON	Enables the [DIAL] key.
4	TALK AROUND	Disable	TARE OFF	Invalid
		Talk Around	TARE TA	"Talk around" function is enabled
		Reverse	TARE RE	" Frequency Reverse" function is enabled

5	[LO]	Disable	LO OFF	Disables [LO] key.
		Enable	LO ON	Enables [LO] key.
6	PRIORITY	OFF	PRIO OFF	NO priority setting
		Fixed	PRIO FIX	Fixed priority channel
		Selected	PRIO SEL	Variable priority channel
7	PRIORITY CHANNEL	1 ~ 99 1	PRICH 1	Priority channel (Only valid when “fixed priority” is enabled)
			PRICH 99	
8	LOOK BACK A	0.3s ~1.5s 0.5s (0.1s/1STEP)	LBA 300	The period time between radio back scanning a priority channel from a normal channel when there is no activity on priority channel
			LBA 1500	
9	LOOK BACK B	0.5s ~ 5.0s 2.0s (0.5s/1STEP)	LBB 500	The period time between radio back scanning a priority channel from a normal channel when there is activity on priority channel but not matching its signaling.
10	REVERT CHANNEL	Selected	REV SEL	Channel where scan starts.
		Last Call	REV LSTC	During scanning, it’s the latest channel at pause; during scan stopping, it’s the channel stopped; if scan never stops, it’s the start channel.
		Last Used	REV LSTU	During scanning, it’s the latest transmit channel; during scan stopping, it’s the channel stopped; if scan never stops, it’s the start channel.
		Selected + Talk Back	SEL TALK	During scanning, it’s the start channel; during scan stopping, it’s the channel stopped.
		Priority	REV PRIO	Priority channel
		Priority + Talk Back	PRI TALK	During scanning, it’s the priority channel; when scan stopping, it’s the channel stopped.
11	TX-SCAN DWELL TIME	0.5s ~ 5.0s 3.0s (0.5s/1STEP)	TSDT 0.5	Duration before scan restarts when it stops by transmission.
			TSDT 5.0	
12	DROP OUT DELAY TIME	0.5s ~ 5.0s 3.0s (0.5s/1STEP)	DODT 0.5	Duration before scan restarts when it stops by signal input.
			DODT 5.0	
13	TIME OUT TIMER	OFF 30s~300s 60s (30s/1STEP)	TOT OFF	When OFF, in order to protect power amplifier, max. time of continuous transmission is set as 10 minutes.
			TOT 30	Maxi. time of continuous transmission
			TOT 300	
14	TOT PRE ALERT TIME	OFF 1 ~ 60 (1s/1STEP)	TOTA OFF	TOT off.
			TOTA 1	When this feature is enabled, the radio will call an alert at the set time. Transmission will be prohibited by TOT after this time.
			TOTA 60	
15	TOT REKEY TIME	OFF 1s ~ 60s OFF (1s/1STEP)	TOTK OFF	Duration until transmission is allowed after radio returning to receive mode by TOT.
			TOTK 1	Transmit prohibited until preset time elapses.
			TOTK 60	

16	TOT RESET TIME	OFF 1s ~15s OFF (1s/1STEP)	TOTS OFF	TOT is immediately reset after transmission stops.
			TOTS 1	TOT won't reset until preset time elapses, even if transmission has stopped.
			TOTS 15	
17	SQUELCH LEVEL	0 ~9 5 (1s/1STEP)	SQL 0	Squelch level is set higher (tighter), as the figure increases.
			SQL 9	
18	BEEP	NO	BEEP OFF	No beep tone
		YES	BEEP ON	Beep tone sounds
19	SIGNALING	AND	SGNL AND	Squelch is opened when both match.
		OR	SGNL OR	Squelch is opened when either matches.
20	BATTERY SAVE	Disable	BATT OFF	No Battery Save function.
		Enable	BATT ON	Battery Save function.
21	SELECTABLE CTCSS	Disable	VQT OFF	Prohibit Selectable CTCSS
		Enable	VQT ON	Permit Selectable CTCSS
22	DELETE/ ADD ENABLE	Disable	SADD OFF	Prohibit Delete/Add
		Enable	SADD ON	Permit Delete/Add
23	DEALER MODE/ TEST MODE ENABLE	Disable	MODE OFF	Prohibit dealer mode and test mode
		Enable	MODE ON	Permit dealer mode and test mode
END			END	

When END is displayed, press [PTT] to return to Function Setting.

Note:

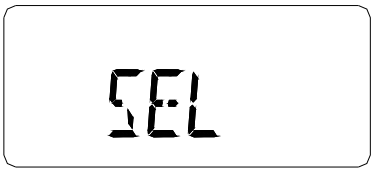
LOOK BACK: When radio is scanning a non-priority channel, the status of the priority channel will be detected periodically. The time interval for this detecting is as the following:

A is period when there is no activity on the priority channel.

B is period when there is activity on the priority channel, however not matching its signaling.

◆ Self-Programming (DTMF setting)

1. Turn on the power while pressing [LAMP] and [○] key simultaneously, and in 2 seconds the radio enters the dealer mode.



In dealer mode, press [○] key to enter DTMF Set Mode.

2. Use Channel Selector knob and the 16 keys (0~9, *, #, A~D) to set DTMF function ON/OFF or select the setting.
3. Press [PTT] to store the selected settings, except functions 31 and 32, which are stored with the 16 keys, and the menu goes to next function option.

4. Press [○] key to return to Dealer Mode. The current setting displayed on LCD will not be stored.
5. Press [PTT] to store function settings and a Beep sounds to confirm the action.
6. END appears when all DTMF function settings are completed.
7. While pressing and holding [MONI], turn the channel selector to confirm the settings of each function option.

Function No.	Function Name	Setting (Defaults are underlined)	Display	Remarks	
24	DIGIT TIME	50ms ~ 200ms 50ms (10ms/1STEP)	DIGT 50 DIGT 200	One digit transmitting time during DTMF code transmission.	
25	INTER DIGIT TIME	50ms ~ 200ms 50ms (10ms/1STEP)	IDT 50 IDT 200	Interval time between digits during DTMF transmission.	
26	FIRST DIGIT TIME	50ms ~ 200ms 50ms (10ms/1STEP)	FDT 50 FDT 200	1st digit transmitting time during DTMF transmission.	
27	RISE TIME	100ms~1000ms 300ms (50ms/1STEP)	RISE 100 RISE1000	Set the time between unmodulated carrier transmission and the DTMF code transmission	Note: when DTMF function is enabled together with the Battery Save and CTCSS functions on, transmit delay time should be over 300 ms.
28	RISE TIME WITH CTCSS	100ms~1000ms 300ms (50ms/1STEP)	RTQT 100 RTQT1000	Set time	
29	PTT ID	OFF	P.ID OFF	Not send PTT ID.	
		Connect	P.IDBEGIN	Press [PTT], PTT ID is sent.	
		Disconnect	P.ID END	Release [PTT], PTT ID is sent.	
		Both	P.ID BOTH	Send PTT ID when both CONNECT and DISCONNECT.	
30	DIAL ID	OFF	D.ID OFF	Prohibit Dial ID	
		ON	D.ID ON	Permit Dial ID	
31	CONNECT ID	Blank 0 × 1 ~ # × 16	P.IDBEGIN	Display about one second when entering this setting.	
			--------	CONNECT ID is not set	
			0 FFFFFFFF	CONNECT ID is input (if more than 8, scroll it)	
32	DISCONNECT ID	Blank 0 × 1 ~ # × 16	P.ID END	Display about one second when entering this setting.	
			--------	Connect ID is not set.	
			0 FFFFFFFF	CONNECT ID is input (if more than 8, scroll it)	
33	NO. of DTMF KEY	12keys (0 ~ 9,*,#)	DTMFK 12	Disable [A] [B] [C][D] keys.	
		16keys (0 ~ 9,*,#,A ~ D)	DTMFK 16	Enable [A] [B] [C][D] keys.	

34	DTMF HOLD TIME	Disable	DHT OFF	Do not Hold	Function that continues transmission for two seconds even if manual DIAL key is released.
		Enable	DHT ON	Hold	
35	STORE & SEND	OFF	STSD OFF	Prohibit Store & Send function.	
		ON	STSD ON	Permit Store & Send function.	
36	D KEY ASSIGNMENT	D Code	DKEYA D	Send the code for D.	
		1s ~ 16s (1s/1STEP)	DKEYA 1	Make unmodulated transmission for preset time.	
			DKEYA 16		
37	DTMF SIGNALING	OFF	DTMF OFF	NO DTMF signaling.	
		Code SQ	DTMF CSQ	Code Squelch	
		SEL CALL	DTMF SEL	Selective Call	
38	INTERMEDIATE CODE	0 ~ 9	IMC 0	Selected code is set as intermediate code.	
			IMC 9		
		A ~ D	IMC A		
			IMC D		
		*	IMC E		
		#	IMC F		
39	GROUP CODE	OFF	GRPC OFF	No group code	
		A ~ D	GRPC A	Selected code is set as group code.	
			GRPC D		
		*	GRPC E		
		#	GRPC F		
40	SQ AUTO RESET TIME	OFF	SART OFF	Do not perform Auto Reset.	Time until coincidence state is canceled after DTMF/2-Tone signaling coincides.
		1s ~ 15s 10s (1s/1STEP)	SART 1	Auto Reset is performed for preset time.	
			SART 15		
41	CALL ALERT/ TRANSPOND	OFF	CAT OFF	No operation	
		Call Alert (Ringing)	CAT RING	The Call Alert (Ringing) tone sounds.	
		Call Alert (Beep)	CAT BEEP	The Call Alert (Beep) tone sounds.	
		TRANSPOND (Call Alert)	CAT CALT	Responder of Call Alert.	
		TRANSPOND (ID Code)	CAT IDCD	Responder of ID Code.	
		TRANSPOND (Transpond Code)	CAT TRCD	Responder of code set in Auto Dial 0.	
42	2 TONE SIDE TONE	OFF	SIDET OFF	No side tone sounds when transmitting 2-Tone.	
		ON	SIDET ON	Side tone sounds simultaneously when transmitting 2-Tone.	
End			End		

When END appears, press [PTT], the radio returns to setting of "24. DIGIT TIME".

Notes:

When changing and storing the new setting of “DTMF SIGNALING” (function No. 37), the ID CODE setting in channel mode will be reset to “000”. And in self-programming set, the two-tone in all the channels will be reset to “1”.

Notes in self-programming mode:

In self-programming set, when the basic function is OFF, corresponding settings in the below table can be set, but not valid.

Function name	Settings	Disable conditions
2-TONE/ DTMF	DTMF	37.DTMF signaling is OFF
2.[SCN]	TO	7.Priority is fixed or selected.
6.Priority	Fixed, Selected	2.[SCN] is OFF
7.Priority CH		6.Priority is OFF or fixed.
8.Look Back A		6.Priority is OFF
9.Look Back B		6.Priority is OFF
10.Revert CH	Priority, Priority + Selected	6.Priority is OFF
11.Dwell Time		2.[SCN] is OFF
12.Dropout Delay Time		2.[SCN] is OFF
14.TOT Pre-Alert		13.Time Out Time is OFF
15.TOT Rekey Time		13.Time Out Time is OFF
16.TOT Reset Time		13.Time Out Time is OFF
31.Connect ID		29.PTT ID is OFF or disconnected and 30. Dial ID is OFF
32.Disconnect ID		29.PTT ID is OFF or connected and 30. Dial ID is OFF.
38.Intermediate Code		37.DTMF/2-TONE signaling is OFF or is code SQ.
40.Unsquelch Time		37.DTMF/2-TONE signaling is OFF.
41.Call Alert/Transpond		37.DTMF/2-TONE signaling is OFF.

◆ Self- Programming (New Functions Setting)

1. Turn on the power while pressing [LAMP] and [○] key, the radio enters the DEALER MODE in 2 seconds.

2. In dealer mode, press [□] key, radio enters “new function set mode”.
3. Rotate the channel selector knob to select the function setting.
4. Press [PTT], the setting is stored and the menu goes to the next function option.
5. Press [□] key again, display returns to “SEL” from current function setting, and the setting will not be stored.
6. When setting function options, press [PTT], the settings will be stored and a BEEP sounds to confirm the operation.

7. End is displayed when all new functions settings are completed.

Function No.	Function Name	Settings (Defaults are underlined)	Display	Remarks
45	Group Tone Type	NO GROUP TONE	GRPT OFF	2-tone group tone off.
		A TONE	GRPT A	Set 2-tone group tone as tone A.
		B TONE	GRPT B	Set 2-tone group tone as tone B.
46	Group Tone Duration	0.5~10s 0.5s （step: 0.1s）	GTDUR 0.5	Group tone time.
47	Channel Label Size	OFF	SIZE OFF	Channel label display mode is disabled.
		1~16 (step: 1)	SIZE 1 SIZE 16	
48	KEY1	No Function	K1 OFF	
		SCAN	K1 SCAN	<- Default
		DIAL	K1 DIAL	
		TA	K1 TARE	
		LO	K1 LO	
		Display Label	K1 DCHAR	
		Display Frequency	K1 DFREQ	
		Display Mode	K1 DMODE	
		Scan ADD/DEL	K1 SADD	
		Key Lock	K1 KLOCK	
		Variable QT	K1 VQT	
		SQL	K1 SQL	
		Nuisance Channel Delete	K1 NUISA	Temporarily remove a "nuisance" channel.
		Priority Channel Delete	K1 PDEL	Temporarily remove the priority channel.
		Home Channel	K1 HOME	
49	KEY2	No Function	K2 OFF	
		SCAN	K2 SCAN	
		DIAL	K2 DIAL	<- Default
		TA	K2 TARE	
		LO	K2 LO	
		Display Label	K2 DCHAR	
		Display Frequency	K2 DFREQ	
		Display Mode	K2 DMODE	
		Scan ADD/DEL	K2 SADD	
		Key Lock	K2 KLOCK	
		Variable QT	K2 VQT	
		SQL	K2 SQL	
		Nuisance Channel Delete	K2 NUISA	Temporarily remove a "nuisance" channel.
		Priority Channel Delete	K2 PDEL	Temporarily remove the priority channel.
		Home Channel	K2 HOME	

50	KEY3	No Function	K3 OFF	
		SCAN	K3 SCAN	
		DIAL	K3 DIAL	
		TA	K3 TARE	<- Default
		LO	K3 LO	
		Display Label	K3 DCHAR	
		Display Frequency	K3 DFREQ	
		Display Mode	K3 DMODE	
		Scan ADD/DEL	K3 SADD	
		Key Lock	K3 KLOCK	
		Variable QT	K3 VQT	
		SQL	K3 SQL	
		Nuisance Channel Delete	K3 NUISA	Temporarily remove a "nuisance" channel.
		Priority Channel Delete	K3 PDEL	Temporarily remove the priority channel.
		Home Channel	K3 HOME	
51	KEY4	No Function	K4 OFF	
		SCAN	K4 SCAN	
		DIAL	K4 DIAL	
		TA	K4 TARE	
		LO	K4 LO	<- Default
		Display Label	K4 DCHAR	
		Display Frequency	K4 DFREQ	
		Display Mode	K4 DMODE	
		Scan ADD/DEL	K4 SADD	
		Key Lock	K4 KLOCK	
		Variable QT	K4 VQT	
		SQL	K4 SQL	
		Nuisance Channel Delete	K4 NUISA	Temporarily remove a "nuisance" channel.
		Priority Channel Delete	K4 PDEL	Temporarily remove the priority channel.
		Home Channel	K4 HOME	
52	Power On Password	Power On Password	POWERKEY	Display about one second when entering this setting.
		--------	--------	No password is input
		20040101	20040101	Max. 8 digit (0-9)
53	Data Password	Data Password	DATA KEY	Display about one second when entering this setting.
		--------	--------	No password is input
		20040404	20040404	Max. 8 digit (0-9)
54	Power On Text	Power On Text	POWERTXT	Display about one second when entering this setting.
		--------	--------	No text is input
		123ABC@#	123ABC@#	Maximum 8 characters (0-9,A-Z, symbols) (Refer to appendix 1: channel label programming)

◆ Self-programming (channel setting)

1. Turn on the power while pressing [LAMP] and [○] key, radio enters the dealer mode in 2 seconds.
2. In dealer mode, press [■] key, radio enters Channel Set Mode.
3. Using Channel Selector knob and 16 keys (0~9, *, #, A~D) to select channel functions or settings.
4. Press [PTT], the settings are stored and the menu moves to the next function set.
5. Press [■] key, radio returns to Dealer Mode from current function set. And current setting displayed on LCD will not be stored.
6. During functions setting, pressing [PTT] can store selected settings, which will be confirmed by a Beep.
7. END is displayed when all Channel settings are completed.

Function Name	Settings (Defaults are underlined)	Display	Remarks
Channel Select	1CH ~ 99CH <u>1CH</u>	CH 1 CH 99	◆ "RX FREQUENCY" setting follows this setting.
RX FREQUENCY	<u>Blank</u>	----------	◆ frequency change→Channel Selector knob ◆Toggle between 6.25/2.5KHz steps→ [●] key (Dot means 6.25KHz) ◆ Toggle between blank/frequency→[□] key ◆ Change to 1MHz steps→[LAMP] + Channel Selector knob ◆ The initial value when changing from blank to frequency display is the initial value of the
	100.000MHz or more Under 550MHz (2.5KHz steps)	100.00000 549.99750	
	100.000MHz or more Under 550.000.MHz (6.25KHz steps)	100.00000 549.99375	
RX CTCSS SIGNALING	<u>OFF</u>	OFF	◆ Code selection → Channel Selector knob ◆ CTCSS changes in 0.1 Hz step increment → [●] key ◆ CDCSS changes in 1 step increment,→ [●] key ◆ Toggle signaling between CDCSS and –CDCSS→[○]. ◆ Toggle among blank, CTCSS frequency and CDCSS→[□] key
	CTCSS (standard) 67.0Hz ~ 250.3Hz	<u>QT 67.0</u> QT 250.3	
	CTCSS (not standard) (0.1Hz step) 67.0Hz ~ 250.3 Hz	<u>QT 67.0</u>* QT 250.3*	
	CDCSS (standard)	<u>DQT023N</u> DQT754I	
	CDCSS (not standard) (step:1) 000.~777. (octonary)	DQT000N* DQT777I*	

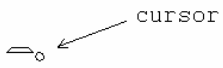
TX FREQUENCY	Blank	----------	◆ frequency change → Channel Selector knob ◆Toggle between 6.25/2.5KHz step increment → [●] key ◆ Toggle between Blank/ CTCSS display→[□] key ◆Change to 1MHz step increment → [LAMP]+Channel Selector knob ◆ The initial value from blank to frequency display is the value set in RX FREQUENCY ◆ If blank is set, menu enters to the option of "DTMF SIGNALING".	
	100.000MHz or more Under 550MHz (2.5KHz steps)	100.00000		
		549.99750		
	100.000MHz or more Under 550.000MHz (6.25KHz steps)	100.00000		
		549.99375		
TX CTCSS SIGNALING	OFF	OFF	◆select codes → Channel Selector knob ◆CTCSS changes in 0.1Hz step increment →[●] key. ◆CDCSS changes in 1 step increment→[●] key. ◆Toggle signaling between CDCSS and –CDCSS→[○] key. ◆Toggle among blank, CTCSS frequency and CDCSS→ [□] key. ◆"DTMF SIGNALING/2-Tone" settings follow this setting	
	CTCSS (standard) 67.0 HZ ~ 250.3Hz	QT 67.0		
		QT 250.3		
	CTCSS (not standard) (0.1Hz step mode) 67.0Hz ~ 250.3Hz	QT 67.0*		
		QT 250.3*		
	CDCSS (standard)	DQT023N		
		DQT754I		
	CDCSS (not standard) (step:1) 000.~777. (octonary)	DQT000N*		
		DQT777I*		
DTMF/2-TONE SIGNALING	OFF	SIG OFF	No DTMF Signaling/2 Tones	[ANI] function setting follows this setting.
	DTMF	SIG DTMF	Use DTMF Signaling	
	2 Tones	SIG TTS	Use 2 Tones	
ANI	OFF	ANI OFF	Disable ANI	
	ON	ANI ON	Enable ANI	
SCAN DELETE/ADD	ADD	SCAN ADD	Set in scan list	
	DELETE	SCAN DEL	Delete from scan list	
BUSY CHANNEL LOCK OUT	OFF	B.C.L.O	Busy channel lock out is disabled	
	LOCKOUT 1	B.C.L.O 1	Transmission is prohibited if a signal appears with incompatible CTCSS/CDCSS;	
	LOCKOUT 2	B.C.L.O 2	Transmission is prohibited if a signal appears with incompatible CTCSS/CDCSS or DTMF/2-Tone.	
CLOCK SHIFT	Disable	SHFT OFF	Do not shift clock frequency	
	Enable	SHFT ON	Shift clock frequency	
TX POWER	High	TXPWR H	Permit switching between High/Low Power	
	Low	TXPWR L	Permit only Low Power	

Wideband/Narrowband	Wide	WIDE	Wide mode
	Narrow	NARROW	Narrow mode
ID CODE (DTMF)		ID	Display about one seconds when entering this setting.
	000	-------0	ID is input, enter number→[10 digit keys(0-9)]
	9999999999	9999999999	If more than 8, scroll it
2-Tone signaling	RX 2-TONE 1-16 1	TTS_R 1	◆Code selection→Channel selector knob ◆ Return to "Channel Select" function when 99 channels are not all set. ◆When 99 channels are all set, END is displayed.
	TX 2-TONE 1-16 1	TTS_T 1	
Channel Label		CH LABEL	Display about one seconds when entering this setting.
	--------	-------	No channel label is input
	Label (1 to 16 alphanumeric characters can be used)	123ABC@#	Maximum 16 characters (0-9,A-Z, symbols) (Refer to appendix 1: channel label programming)
END		END	Only appears in 99th channel

Note:

1. If DTMF or DTMF/2-Tone is disabled, "ID code" function option is automatically skipped.
2. DTMF and 2-Tone cannot be enabled simultaneously.

◆ Appendix 1: Channel Label Programming

KEY	CHARACTER INPUT						NUMBER INPUT	REMARKS
	Number of times key is pressed							
	1	2	3	4	5	6		
1	Space						1	 Cursor: current input position will toggle between char/num and cursor display. 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				2	
3	D	E	F				3	
4	G	H	I				4	
5	J	K	L				5	
6	M	N	O				6	
7	P	Q	R	S			7	
8	T	U	V				8	
9	W	X	Y	Z			9	
0	A ~ Z						0	
A	@	#	$	%	^	*	A	
B	,	.	‘	“	?	:	B	
C	+	-	\	/	=	_	C	
D	<	>	(	)	[	]	D	
* /T9	Press to toggle between Character and Number. "V" on LCD indicates number input.							
#	→ (Next alphanumeric)							
PTT	Enter (Complete programming and store channel label)							
Channel selector knob	←, → (Move cursor backward/forward)							

◆ Appendix 2: CTCSS Frequency

No.	Frequency [Hz]	No.	Frequency [Hz]	No.	Frequency [Hz]	No.	Frequency [Hz]
1	67.0	11	94.8	21	131.8	31	186.2
2	69.3	12	97.4	22	136.5	32	192.8
3	71.9	13	100.0	23	141.3	33	203.5
4	74.4	14	103.5	24	146.2	34	210.7
5	77.0	15	107.2	25	151.4	35	218.1
6	79.7	16	110.9	26	156.7	36	225.7
7	82.5	17	114.8	27	162.2	37	233.6
8	85.4	18	118.8	28	167.9	38	241.8
9	88.5	19	123.0	29	173.8	39	250.3
10	91.5	20	127.3	30	179.9		

◆ Appendix 3: 2-Tone frequency (Default)

No.	Tone A Freq [Hz]	Tone B Freq [Hz]	Tone A Dur. (s)	Tone B Dur. (s)	Gap Time (s)
1	400	1141	0.5	0.5	0.5
2	456	1301	0.5	0.5	0.5
3	520	1483	0.5	0.5	0.5
4	593	1690	0.5	0.5	0.5
5	675	1927	0.5	0.5	0.5
6	770	2197	0.5	0.5	0.5
7	878	2504	0.5	0.5	0.5
8	1001	2855	0.5	0.5	0.5
9	1141	400	0.5	0.5	0.5
10	1301	456	0.5	0.5	0.5
11	1483	520	0.5	0.5	0.5
12	1690	593	0.5	0.5	0.5
13	1927	675	0.5	0.5	0.5
14	2197	770	0.5	0.5	0.5
15	2504	878	0.5	0.5	0.5
16	2855	1001	0.5	0.5	0.5

Wired Clone Mode

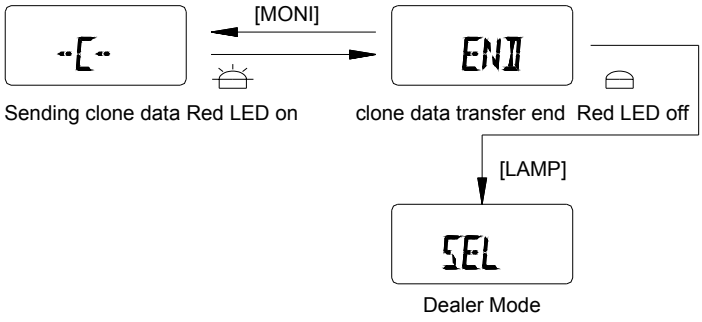
Connect the source radio and the target radio with an interface cable.

◆ Source radio

Operation

1. Turn POWER ON while holding down [LAMP] and [○] key, in about 2 seconds the radio enters the Dealer Mode. Then press [LAMP] to enter Clone Mode.

2. Transmit the clone data by pressing [MONI], red LED glows during data transfer. When data transfer is completed, “END” is displayed on LCD, and the red LED turns off.
3. When “End” is displayed, press [MONI] button to continue to clone another radio or press [LAMP] to return to Dealer Mode.



◆ Target radio

Operation

1. Turn On the power. When data is being sent from the master, busy mark and "-PC-" appears on LCD.

2. When all data is received, “END” displays on LCD.
   After the “END” appears, operation is same as the source radio operation 3.

Note:
During cloning, do not execute any action that might interrupt the cloning such as shutting off power.

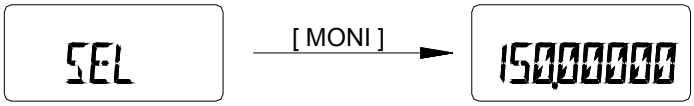
Wireless Clone Mode

Setup the source side and target side.

◆ Source Side

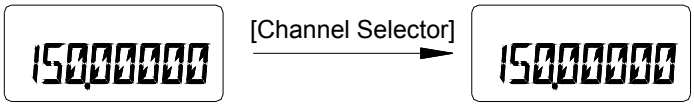
Operation

1. Turn POWER ON while holding down [LAMP] and [○] key, in about 2 seconds radio enters the Dealer Mode. Then press [MONI], radio enters Wireless Clone Mode, now the frequency displayed on LCD is the initial frequency matching the destination.



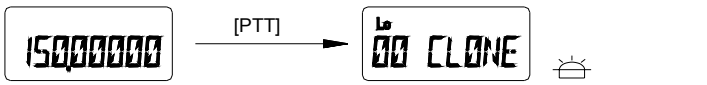
Dealer Mode Clone Mode

2. Turn Channel Selector knob to select the frequency used for the wireless clone.



Dealer Mode Clone Mode

3. Start the first half (00-50%) data transmission by pressing [PTT]. “00 CLONE” is displayed on LCD and red LED glows. The leftmost digits (00) on LCD show data transfer rate, and as data transmission proceeds, the digits count upwards in increments of 1. Transmit power is set as LOW POWER.

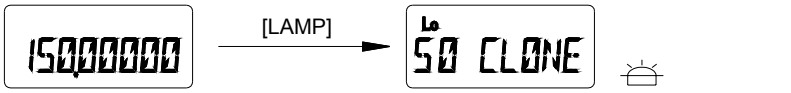


Clone Mode Clone Mode Red LED lights up

4. When the first half data transfer is completed, the LED turns off and “END” is displayed. Press [MONI], radio returns to Clone Mode and you can clone another half by pressing [LAMP] or return to Dealer Mode by pressing [MONI] key.

Clone Mode　　Clone Mode

5. You can continue to clone another half (50-100%) data mainly about channel label after one minute to avoid long time transmission.
6. Start another half (50-100%) data transmission by pressing [LAMP]. “50 CLONE” is displayed on LCD and red LED glows. The leftmost digits (50) on LCD show data transfer rate, and as data transmission proceeds, the digits count upwards in increments of 1. Transmit power is set as LOW POWER.



Clone Mode　　Clone Mode　　Red LED lights up

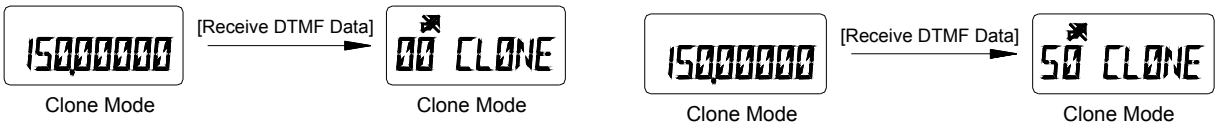
7. When the second half data transfer is completed, the LED turns off and “END” is displayed. Press [MONI], radio returns to Clone Mode and you can clone another radio or press [MONI] to return to Dealer Mode.

Clone Mode　　Clone Mode

◆ Target Side

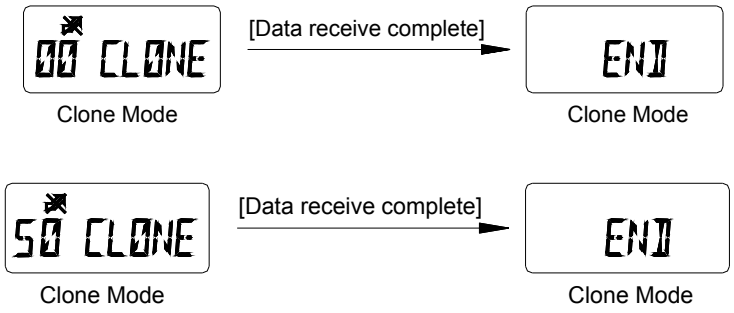
Operation

1. Turn POWER ON while pressing [LAMP] and [○] key, in about 2 seconds radio enters the Dealer Mode. Then press [MONI] to enter Wireless Clone Mode. The frequency displayed on LCD is the initial frequency matching the destination.
2. The display changes to “00 CLONE” or “50 CLONE” correspondingly when the radio receives data from the master and the BUSY mark appears. The leftmost digits (00) or (50) on the LCD show the data transfer rate and as data reception proceeds, the digits count upwards in increments of 1.



Clone Mode　　Clone Mode　　Clone Mode　　Clone Mode

3. When all data is received, “END” displays. The display of first half and second half transfer is shown as following respectively.



4. When “END” displays, the next operation is same as the source side operation 4.

Please confirm the following operations:

(1) Attach the antenna to the source radio.

(2) Remove the antenna from the target radio.

(3) Keep radios as close as possible.

Note:

During cloning do not execute any action that might interrupt the cloning such as shutting off power.

TEST MODE

◆ Menu Mode

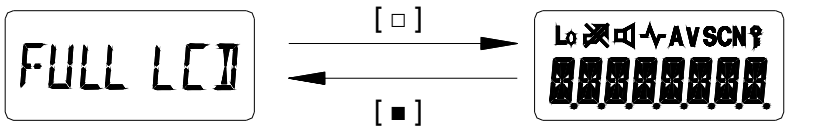
1. Turn the power ON while pressing [LAMP] and [■] key, in about 2 seconds the radio enters Test Mode and LCD displays “TEST”. After two seconds, the first setting option “ADJUST” is displayed on LCD. Turn Channel Selector knob to select from the following menu:
   ADJUST
   FREQ TST
   TUNE CLN
   FULL LCD
   DEST SET

2. Press [□] key to enter Adjustment Mode, Frequency Test Mode, Adjustment Data Clone Mode, LCD Full Screen Mode or Destination Set Mode.

3. Press [■] key to return to the Menu Mode.

◆ LCD Full Screen Mode

1. Turn the power ON while pressing [LAMP] and [■] key simultaneously, in about 2 seconds the radio enters the menu of Test Mode.
2. Turn Channel Selector knob to select the setting option: “FULL LCD”.
3. Now press [□] key to enter LCD Full Screen Mode.
4. Press [■] key to exit from LCD Full Screen Mode. LCD displays “FULL LCD”.



Test Mode LCD Full Screen Mode

◆ Adjustment Data Clone Mode

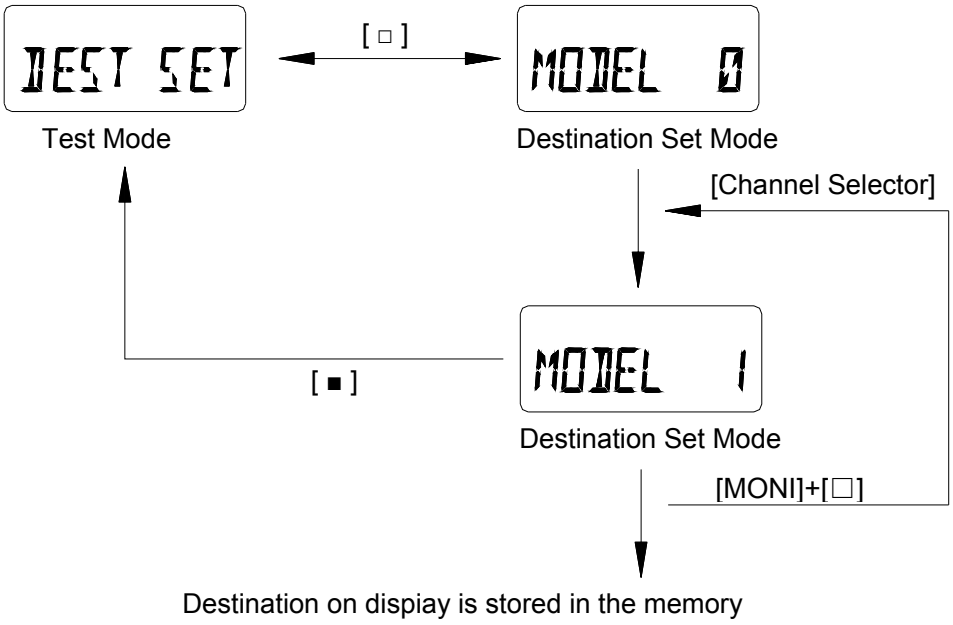
1. Turn the power ON while pressing [LAMP] and [■] key, in about 2 seconds the radio enters the menu of Test Mode.
2. Turn Channel Selector knob to select the setting option “TUNE CLN”.
3. Connect the source radio and the target radio with an interface cable.
4. Turn the target radio on.
5. Now press [□] key to enter Adjustment Data Clone Mode. LCD displays “–C–“.
6. Press [MONI] key to transmit the adjustment data.
7. Red LED glows during data transfer. When data transfer is completed, “END” is displayed on LCD and red LED turns off.
8. When “End” is displayed, press [MONI] to continue to clone another radio.
9. Press [■] key to exit from Adjustment Data Clone Mode. LCD displays “TUNE CLN”.

◆ Destination Set Mode

Operation

1. Turn the power ON while pressing [LAMP] and [■] key, in about 2 seconds the radio enters the menu of Test Mode.
2. Turn Channel Selector knob to select the setting option “DEST SET”.

3. Now press [□] key to enter Destination Set Mode, LCD displays " MODEL X". (X=0~15)
4. Turn Channel Selector knob to change the destination number. (Display numbers change from 0 to 15).
5. Hold down [MONI] key and then press [□] key to select the display number that you need as the destination.
6. Press [LAMP] key to reverse CDCSS decoder and LCD displays "V". (For factory setting only).
7. Press [■] key to exit from Destination Set Mode. LCD displays "DEST SET".



Note:

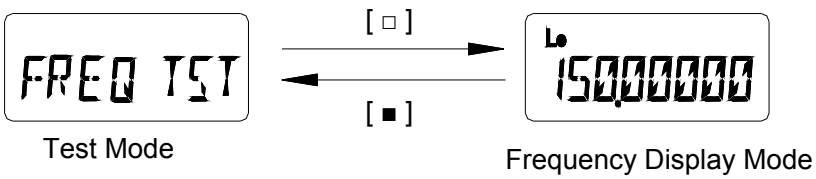
1. Once the destination is set, previous channel settings (frequencies, CTCSS and channel functions) will be deleted and some functions are also changed. Therefore, do not make destination set except when EEPROM is replaced or other unavoidable conditions happened.
2. Destination of RPV599APlus is set as 8, frequency is 148~174MHz. And destination of RPU499APlus is 11, frequency 450-470MHz.

◆ **Frequency Test Mode** (for frequencies checking and radios repairing)

Operation

1. Turn POWER ON while pressing [LAMP] and [■] key, in about 2 seconds the radio enters the menu of Test Mode.
2. Turn Channel Selector knob to select the setting option "FREQ TST".

3. Press [□] key to enter Frequency Display Mode. LCD displays frequency.
4. Turn Channel Selector knob to increase/decrease the frequency.
5. Press [○] key to switch the step increments.
6. Press [□] key to toggle between High and Low Power.
7. Press [●] key, the radio enters scan mode.
8. Press [PTT] to transmit and [MONI] to monitor.
9. Hold down [LAMP] and then press [○] key, the radio enters CTCSS set mode.
10. Press [■] key to exit from Frequency Display Mode, LCD displays “FREQ TST”.



Test Mode

Frequency Display Mode

Notes:

1. The reset (initial) frequency varies according to the destination.
2. Set initial transmit power to LO POWER.

◆ Changing the Frequency

Operation

1. In Frequency Test Mode, turn Channel Selector knob clockwise, the frequency increases in step increments. Turn the knob counterclockwise, the frequency decreases in step increments.
2. Hold down the [LAMP] key, and then turn the Channel Selector knob to change the frequency in 1MHz step increments.
3. Press [○] key, the step increment is switched in the following order.

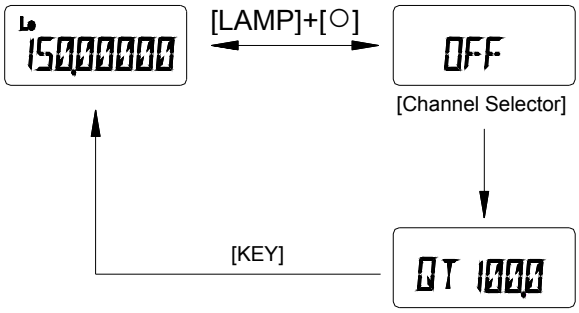
Notes:

1. The frequency display range is between 100MHz and 550MHz. When PLL is unlocked, “beeps” sound. The frequency should not be out of corresponding frequency spectrum.
2. Step increment is not displayed on LCD.

◆ CTCSS

Operation

1. In Frequency Test Mode, hold down [LAMP] and then press [○] key, the radio enters CTCSS set mode.
   Turn Channel Selector knob to change the CTCSS frequency.
2. Press any key to select the CTCSS you need and the radio returns to frequency display mode.



Notes:

1. The selected CTCSS is set for both transmit and receive.
2. The selected CTCSS frequency cannot be changed in 0.1Hz step increments.
3. During test scan, even if [○] key and [LAMP] are simultaneously held down, the radio will not enter CTCSS set mode.

◆ **Adjustment Mode** (Adjustment procedure used during radio repairing)

Menu Mode

1. Turn POWER ON while pressing [LAMP] and [■] key, in about 2 seconds, the radio enters the menu of Test Mode. LCD displays “TEST” for 2 seconds and then begins to display “ADJUST”.
2. Turn Channel Selector knob to select the setting option “ADJUST”.
3. Now press [□] key to enter Adjustment Mode, the first option “HI POWER” is displayed on LCD.

4. Turn Channel Selector knob to select a setting option from the following menu:
   HI POWER
   LO POWER
   BATT REF
   CTCSS W
   CDCSS W
   CTCSS N
   CDCSS N
   SQL CEN
   SQL LOW
   SQL HIGH

5. Press [□] key to adjust the Transmit High Power, Transmit Low Power, Battery Reference Value, CTCSS Deviation (Wideband), CDCSS Deviation (Wideband), CTCSS Deviation (Narrowband), CDCSS Deviation (Narrowband), BUSY Reference Value (Center Frequency), BUSY Reference Value (Low Frequency) and BUSY Reference Value (High Frequency) individually.

6. Press [■] key to exit from the Adjustment Mode and return to the menu of Test Mode. LCD displays "ADJUST".

Adjusting Transmit High Power

Use this procedure to adjust the transmit High Power level.

1. Connect the power meter to the radio.
2. Turn Channel Selector knob to select the setting option "HI POWER".
3. Transmission is performed automatically at High Power when the [□] key is pressed. After the frequency is displayed for one second, the display "HPWR XXX" now appears. (XXX=0 to 255)
4. Turn the channel selector knob while observing the power meter to obtain the transmit power needed. Turn the channel selector knob clockwise for an increase in power, and counterclockwise for a decrease in power.
5. Press [□] key to store the alignment value into the memory and return to the "LO POWER" display.

   Press [■] key to cancel the alignment value and return to the "HI POWER" display.

Adjusting Transmit Low Power

Use this procedure to adjust the transmit Low Power level.

1. Connect the power meter to the radio.
2. Turn Channel Selector knob to select the setting option “LO POWER”.
3. Transmission is performed automatically at Low Power when the [□] key is pressed. After the frequency is displayed for one second, the display “LPWR XXX” now appears. (XXX=0 to 255)
4. Turn the channel selector knob while observing the power meter to obtain the transmit power needed. Turn the channel selector knob clockwise for an increase in power, and counterclockwise for a decrease in power.
5. Press [□] key to store the alignment value into the memory and return to the “BATT REF” display. Press [■] key to cancel the alignment value and return to the “LO POWER” display.

Adjusting the Battery Reference Value

Use this procedure to adjust the reference value for issuing battery low voltage alarms.

1. Using an external power supply feed in the reference value at which you wish to trigger the alarm.
2. Turn Channel Selector knob to select the setting option “BATT REF”.
3. Transmission is performed automatically at High Power when the [□] key is pressed. After the frequency is displayed for one second, the display “BATT XXX” now appears. (XXX=1 to 255).
4. Adjust by turning the Channel Selector knob counterclockwise so that the red LED lights up and turning clockwise so that the red LED flashes. The point where the red LED is flashing indicates detection of the low voltage.
5. Press [□] key to store the alignment value into the memory and return to the “CTCSS W” display. Press [■] key to cancel the alignment value and return to the “BATT REF” display.

Adjusting CTCSS Deviation (Wideband)

Use this procedure to adjust the transmit CTCSS deviation (Wideband).

1. Connect the modulation analyzer to the radio.
2. Turn Channel Selector knob to select the setting option “CTCSS W”.
3. Transmission is performed automatically at Low Power and the preset CTCSS is sent when the [☐] key is pressed. After the frequency is displayed for one second, the display “CTCW XXX” now appears (XXX=1 to 255). If the CTCSS is set OFF, then 67.0Hz is sent.
4. Hold down [LAMP] button to observe CTCSS and adjust CTCSS by turning Channel Selector knob.
5. While observing the modulation analyzer, adjust the deviation with the Channel Selector knob.
6. Press [☐] key to store the alignment value into the memory and return to the “CDCSS W” display. Press [MONI] to cancel the alignment value and return to the “CTCSS W” display.

Adjusting CDCSS Deviation (Wideband)

Use this procedure to adjust the transmit CDCSS deviation (Wideband).

1. Connect the modulation analyzer to the radio.
2. Turn Channel Selector knob to select the setting option “CDCSS W”.
3. Transmission is performed automatically at Low Power and the preset CDCSS is sent when the [☐] key is pressed. After the frequency is displayed for one second, the display “CDCW XXX” now appears (XXX=1 to 255). If the CDCSS is set OFF, then 023 is sent.
4. While observing the modulation analyzer, adjust the deviation with the [CHANNEL SELECTOR].
5. Press [☐] key to store the alignment value into the memory and return to the “CTCSS N” display. Press [■] key to cancel the alignment value and return to the “CDCSS W” display.

Adjusting CTCSS Deviation (Narrowband)

Use this procedure to adjust the transmit CTCSS deviation (Narrowband).

1. Connect the modulation analyzer to the radio.
2. Turn Channel Selector knob to select the setting option “CTCSS N”.
3. Transmission is performed automatically at Low Power and the preset CTCSS is sent when the [□] key is pressed. After the frequency is displayed for one second, the display “CTCN XXX” now appears (XXX=1 to 255). If the CTCSS is set OFF, then 67.0Hz is sent.
4. Hold down [LAMP] button to observe CTCSS and adjust CTCSS by turning Channel Selector knob.
5. While observing the modulation analyzer, adjust the deviation with the Channel Selector knob.
6. Press [□] key to store the alignment value into the memory and return to the “CDCSS N” display. Press [■] key to cancel the alignment value and return to the “CTCSS N” display.

Adjusting CDCSS Deviation (Narrowband)

Use this procedure to adjust the transmit CDCSS deviation (Narrowband).

1. Connect the modulation analyzer to the radio.
2. Turn Channel Selector knob to select the setting option “CDCSS N”.
3. Transmission is performed automatically at Low Power and the preset CDCSS is sent when the [PTT] key is pressed. After the frequency display for one second, the display “CDCN XXX” now appears (XXX=1 to 255). If the CDCSS is set OFF, then 023 is sent.
4. While observing the modulation analyzer, adjust the deviation with the Channel Selector knob.
5. Press [□] key to store the alignment value into the memory and return to the “SQL CEN” display. Press [■] key to cancel the alignment value and return to the “CDCSS N” display.

Adjusting the BUSY Reference Value (Center Frequency)

Use this procedure to align squelch level 3 and 9 at center frequency.

1. Connect the signal generator to the radio.
2. Turn Channel Selector knob to select the setting option “SQL CEN”.
3. Input a signal at the level at which you want squelch 9 to open.

4. Press [☐] key to receive this signal. After the center frequency is displayed for one second, the display "SQL9 XXX" now appears. (XXX =1 to 255)
5. Turn Channel Selector knob to the position where you want the squelch to open. Rotate Channel Selector knob clockwise, the squelch is tightened.
6. Press and hold [LAMP] button to observe the center frequency and adjust the frequency by Channel Selector knob.
7. Press [■] key to cancel the setting and return to the "SQL CEN" display. Press [☐] key to save the alignment value into the memory and continue to the alignment of squelch 3, and now "SQL3 XXX" displays. (XXX=1 to 255)
8. Then output a signal from the signal generator at which you want squelch 3 to open. Adjust by using the Channel Selector knob just same as with squelch 9.
9. Press [☐] key to store the alignment value into the memory and return to the "SQL LOW" display. Press [■] key to cancel the alignment value and return to the "SQL CEN" display.

Adjusting the BUSY Reference Value (Low Frequency)

Use this procedure to align squelch level 3 and 9 at low frequency.

1. Connect the signal generator to the radio.
2. Turn Channel Selector knob to select the setting option "SQL LOW".
3. Input a signal at the level at which you want squelch 9 to open.
4. Press [☐] key to receive this signal. After the low frequency is displayed for one second, the display "SQL9 XXX" now appears. (XXX =1 to 255)
5. Turn Channel Selector knob to the position where you want the squelch to open. Rotate Channel Selector knob clockwise, the squelch is tightened.
6. Press and hold [LAMP] button to observe the low frequency and adjust the frequency by Channel Selector knob.

7. Press [■] key to cancel the setting and return to the “SQL LOW” display. Press [□] key to save the alignment value into the memory and continue to the alignment of squelch 3, and now “SQL3 XXX” displays. (XXX=1 to 255)
8. Then output a signal from the signal generator at which you want squelch 3 to open. Adjust by using the Channel Selector knob just same as with squelch 9.
9. Press [□] key to store the alignment value into the memory and return to the “SQL HIGH” display. Press [■] key to cancel the alignment value and return to the “SQL LOW” display.

Adjusting the BUSY Reference Value (High Frequency)

Use this procedure to align squelch level 3 and 9 at high frequency.

1. Connect the signal generator to the radio.
2. Turn Channel Selector knob to select the setting option “SQL HIGH”.
3. Input a signal at the level at which you want squelch 9 to open.
4. Press [□] key to receive this signal. After the high frequency is displayed for one second, the display “SQL9 XXX” now appears. (XXX =1 to 255)
5. Turn Channel Selector knob to the position where you want the squelch to open. Rotate Channel Selector knob clockwise, the squelch is tightened.
6. Press and hold [LAMP] button to observe the high frequency and adjust the frequency by Channel Selector knob.
7. Press [■] key to cancel the setting and return to the “SQL HIGH” display. Press [□] key to save the alignment value into the memory and continue to the alignment of squelch 3, and now “SQL3 XXX” displays. (XXX=1 to 255)
8. Then output a signal from the signal generator at which you want squelch 3 to open. Adjust by using the Channel Selector knob just same as with squelch 9.
9. Press [□] key to store the alignment value into the memory and return to the “HI POWER” display. Press [■] key to cancel the alignment value and return to the “SQL HIGH” display.

Destination Set

model	Default Frequency (MHz)	DTMF	CTCSS /CDCSS	CDCSS TX/RX with Same Phase	2-Tone	Busy Channel Lockout 1	Busy Channel Lockout 2	First IF(MHz)	Busy Channel Lockout	Center (MHz)	Low (MHz)	High (MHz)
						CTCSS/ CDCSS	DTMF/ 2-Tone					
0	143	√	√	√	√	√	√	45.05	*1、*2	143	136	150
1	160	√	√	√	√	√	√	45.05	1、2	160	148	174
2	410	√	√		√	√	√	46.35	1、2	410	400	420
3	455	√	√		√	√	√	45.05	1、2	455	440	470
4	460	√	√		√	√	√	45.05	1、2	460	450	470
5	480	√	√		√	√	√	45.05	1、2	480	470	490
6	490	√	√		√	√	√	46.35	1、2	490	480	500
7	140	√	√	√	√	√	√	45.05	1、2	140	136	150
8	160	√	√	√	√	√	√	45.05	1、2	160	148	174
9	410	√	√		√	√	√	46.35	1、2	410	400	420
10	455	√	√		√	√	√	45.05	1、2	455	440	470
11	460	√	√		√	√	√	45.05	1、2	460	450	470
12	480	√	√		√	√	√	45.05	1、2	480	470	490
13	490	√	√		√	√	√	46.35	1、2	490	480	500
14	360	√	√		√	√	√	46.35	1、2	360	350	370
15	380	√	√		√	√	√	45.05	1、2	380	370	390

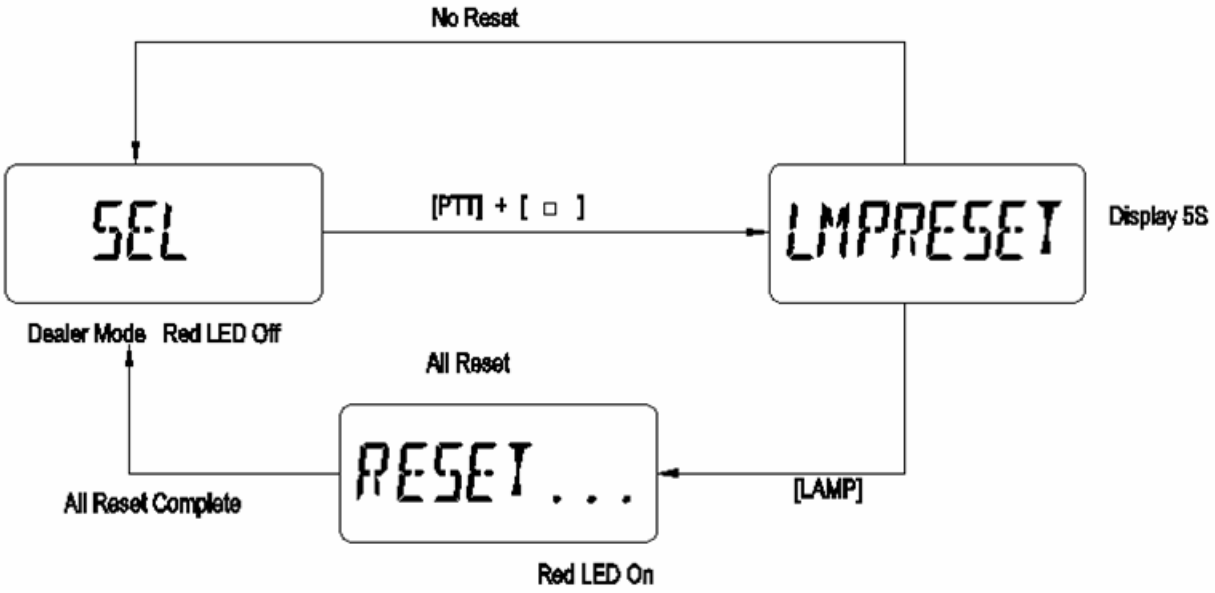
Note: About busy channel lockout

* 1: Transmission is prohibited if a signal appears with incompatible CTCSS/CDCSS;
* 2: Transmission is prohibited if a signal appears with incompatible CTCSS/CDCSS or DTMF/2-Tone.

ALL RESET MODE

Operation

1. Turn POWER ON while pressing [LAMP] and [○] key, in about 2 seconds, the radio enters the Dealer Mode.
2. In dealer mode, press [PTT] and [□] key simultaneously to enter All Reset Mode. LCD displays “LMPRESET” for 5 seconds.
3. Press [LAMP] key in 5 seconds, the EEPROM data is reset. LCD displays “RESET…” during reset, and red LED glows. LCD displays “SEL” and LED turns off when All Reset is completed.
4. If no key is pressed in 5 seconds, no reset occurs and the radio will return to Dealer Mode.



PC MODE

Connection procedures

1. Connect the radio of RPV599APlus/RPU499APlus to the personal computer with an interface cable.
2. Run the program on the computer and Turn ON the power of the radio.
3. You can read, programme or adjust the radio via RPV599APlus/RPU499APlus programming software.

Please refer to “RPV599APlus/RPU499APlus Editing Software User Manual” for details.

RPV599APlus Circuit Description

1. FREQUENCY CONFIGURATION

The receiver utilizes double conversion. The first IF is 45.05 MHz and the second IF is 455KHz. The first local oscillator signal comes from the PLL circuit.
The PLL circuit in the transmitter generates the necessary frequencies (See Fig.1).

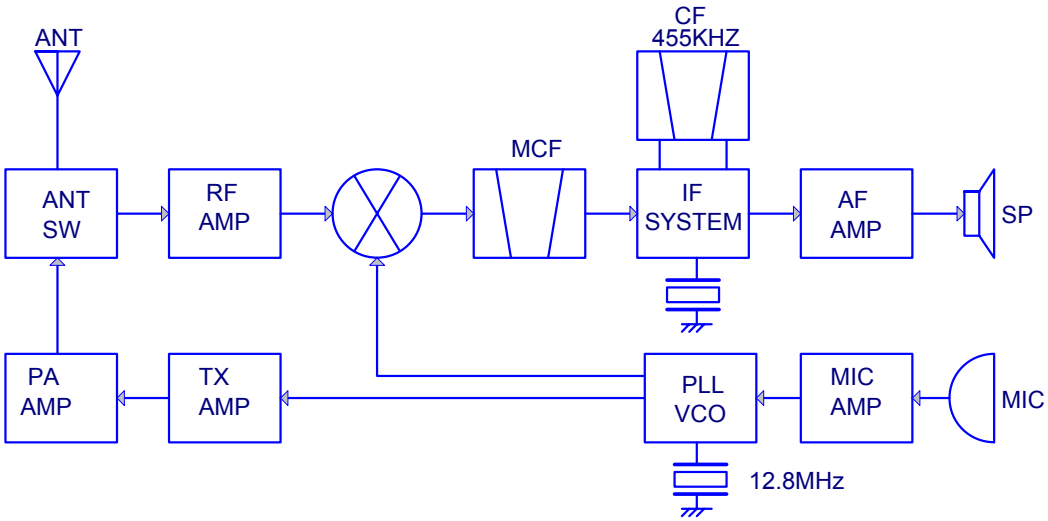


Fig.1

2. RECEIVER SYSTEM

The frequency configuration of the receiver is shown as following fig.2

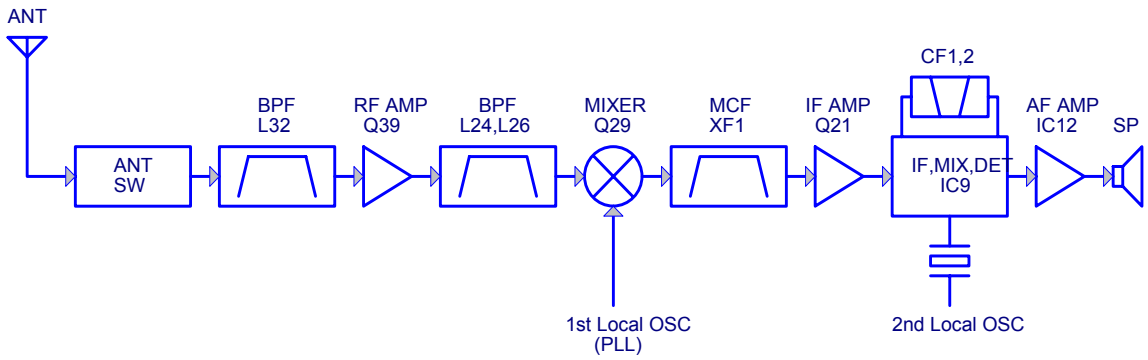


Fig.2

1) RF AMP

The signal coming from the antenna passes through the transmit/receive switching diode circuit, passes through a BPF [L32], and is amplified by the RF amplifier [Q39]. The resulting signal passes through a BPF [L26] and goes to the mixer.

2) First mixer

The signal from the front end is mixed with the first local oscillator signal generated in the PLL circuit by Q29 to produce a first IF frequency of 45.05 MHz.

The resulting signal passes through the XF1 MCF to cut the adjacent spurious and provide the optimum characteristics, such as adjacent frequency selectivity.

3) IF amplifier

The signal then passes through the first IF amplifier [Q21], and is amplified and goes to the IF IC (IC9). IC9 integrates the second OSC, second mixer, second IF amplifier, detector, noise amplifier, and noise detector.

The signal input to the IC is mixed with the RF signal of the second OSC to produce a 455KHz second IF signal. The signal is amplified by the IF amplifier. The signal is switched by Wide/Narrow switch diode and then passes through the ceramic filters (CF1 and CF2) to provide the necessary selectivity. Finally, the signal is detected by the IC and output as an AF signal.

4) AF amplifier

The AF signal from the IF IC is amplified by IC8 (1/2) and passes through the high-pass filter (Q25 and Q28) to remove 300 Hz and lower frequencies to suppress the sub-audio signal.

The signal then passes through the de-emphasis circuit to restore the audio frequency characteristics. The signal passes through AF VOL and enters the IC12 audio power amplifier to drive the speaker.(See Fig.3)

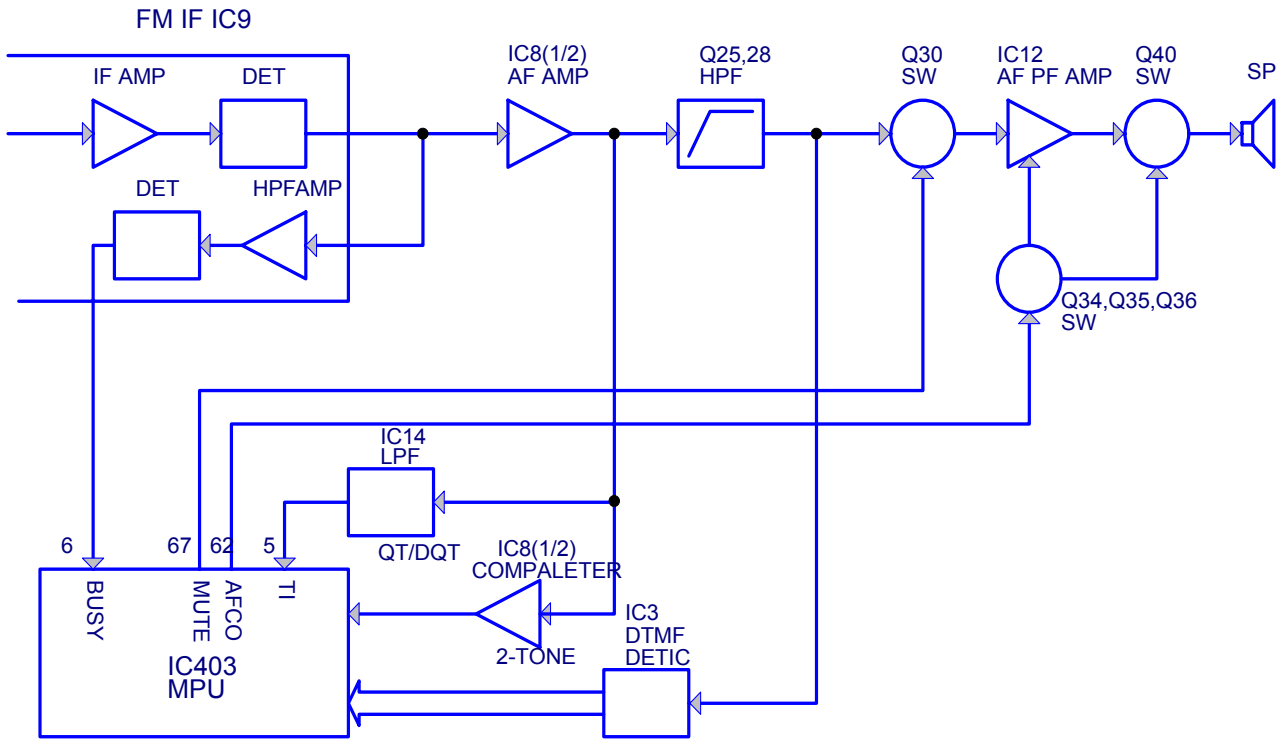


Fig.3

5) Squelch

Part of the AF signal from the IC enters the FM IC again, and the noise component is amplified and rectified by a filter and an amplifier to produce a DC voltage corresponding to the noise level.
The DC signal from the FM IC goes to the analog port of the microprocessor (IC1). IC1 determines whether to output sounds from the speaker by checking whether the input voltage is higher or lower than the preset value.
To output sounds from the speaker, IC1 sends a high level to the MUTE and AFCO lines and turns IC12 on through Q30, Q35, Q34, Q36 and Q40.

6) Receive signaling

(1) CTCSS

300Hz-and-higher audio frequencies of the signal output from IF IC are cut by a low-pass filter (IC14). The resulting signal enters the microprocessor (IC1). IC1 determines whether the CTCSS matches the preset value and controls the MUTE and AFCO and the speaker output sounds in line with the squelch results of that content.

(2) DTMF

The part of the received AF signal passes through a high- pass filter (Q25 and Q28) and goes to IC3.
IC3 detects a DTMF signal and sends received DTMF data to IC1. IC1 carries out various operations, such as sound output, according to the DTMF data. (See Fig.3)

(3) 2-TONE

Part of the receive AF signal output from the AF amplifier (IC8 1/2) goes to the other IC8 (1/2), is compared, and goes to IC1. IC1 checks whether 2-TONE data is necessary. If it matches, IC1 carries out a specified operation, such as turning the speaker on.

3. PLL

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

1) PLL

The receiver has a VCO Q16, and the transmitter has another VCO (Q18).
The generated signal passes through the Q20 buffer and Q14 amplifier and enters the IC6 PLL IC. IC6 incorporates the reference oscillation divider and phase comparator functions. The input signal is divided into a 2.5 or 6.25KHz signal according to divide ratio data from the microcomputer (IC1). This signal and the 2.5 or 6.25KHz signal divided from the reference signal enter the phase comparator to produce a differential signal. The frequency control signal is output from the charge pump.
This signal passes through the passive LPF and goes to the varicap to control the VCO frequency (See Fig. 4).

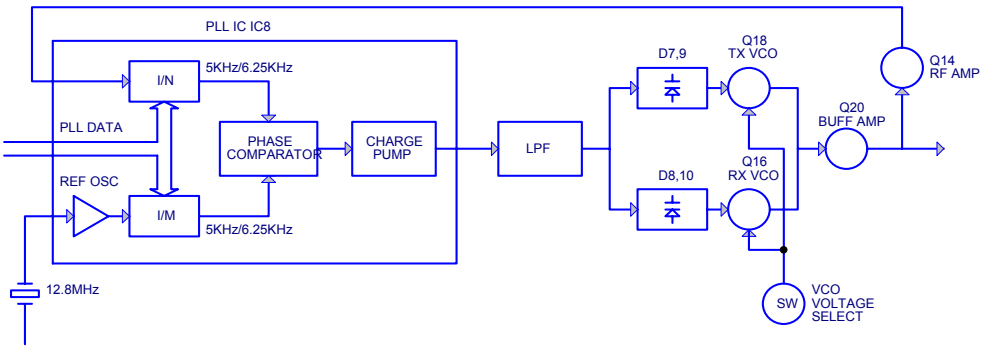


Fig.4

2) Reference Oscillator Circuit

The reference oscillator circuit in the PLL IC produces the 12.8MHz PLL reference frequency. Crystal X2 is a temperature compensate one.

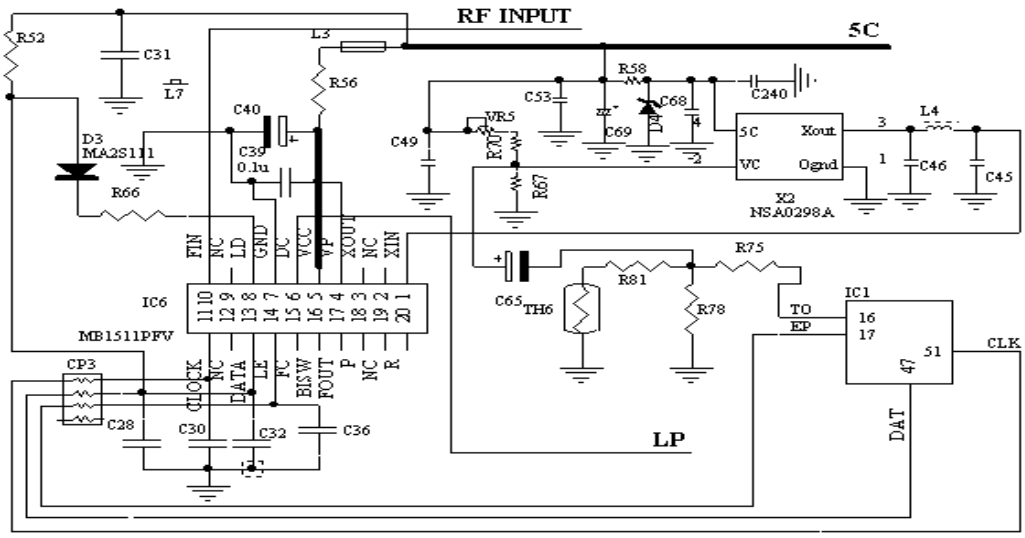


Fig.5

4.TRANSMITTER

1) Transmit audio

The modulation signal from the microphone is amplified by IC10 (1/2), passes through a pre-emphasis circuit, and is amplified by the other IC10 (1/2) to perform IDC operation.

The signal then passes through a low-pass filter (splatter filter) Q22 and Q17, and cuts 3 KHz and higher frequencies. The resulting signal goes to the VCO through the VCO modulation terminal for direct FM modulation.

2) CTCSS encoder

A necessary signal for CTCSS encoding is generated by IC1 and is FM-modulated to the PLL reference signal. Since the reference OSC does not modulate the loop characteristic frequency or higher, modulation is performed at the VCO side by adjusting the balance.

3) DTMF

The DTMF encode signal is also generated by IC1. This signal goes to IC10, and follows the same route as for ordinary modulation.

Q32 and Q37 mute the microphone line when sending the DTMF to prevent a malfunction resulting from audio signals (See Fig.6)

.

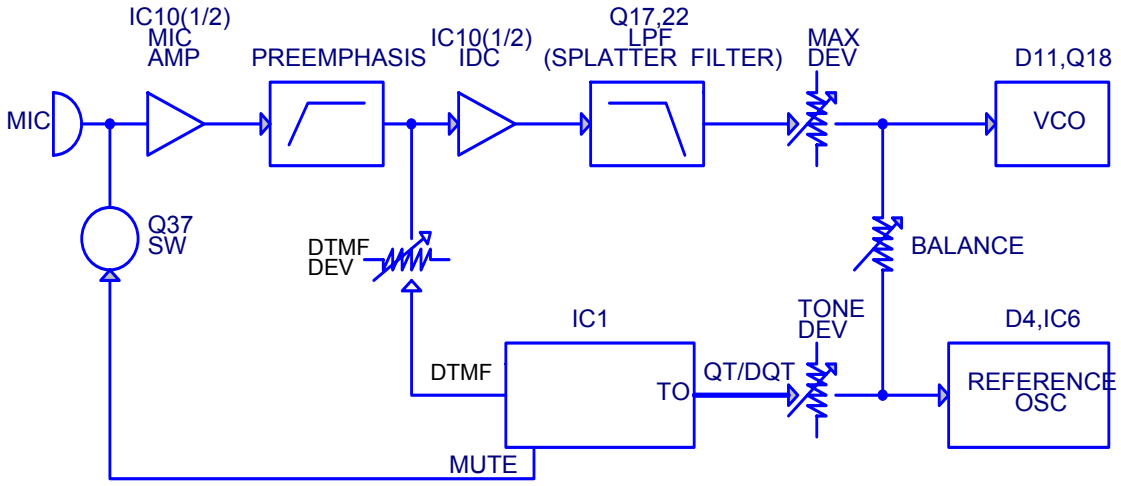


Fig.6

4) VCO and RF amplifier

The modulation signal is modulated to VCO by D11. The RF signal from the PLL is amplified by Q26 and Q31 to the sufficient level to drive the power module.

5) Final module

The MOS FET-type power module (IC11) is used to amplify the transmission power.

6) ANT switch and LPF

The signal from the module passes through the D22 SW and L31 LPF and is output from the ANT terminal. D17 and D16 are used to switch between transmission and reception. The chip-type LPF is used to provide required attenuation.

7) APC

The APC keeps the current constant to the final module. The current to the final module is output as a voltage by detecting the potential difference between R215, R217 and R218 by IC13 (1/2). IC13 (1/2) compares the signal with the APC voltage from IC1 and controls the voltage so that they have the same value. The output becomes the IC11 power control voltage, and the current is kept constant in this loop.

The APC voltage from IC1 has the preset high or low power level. (See Fig.7)

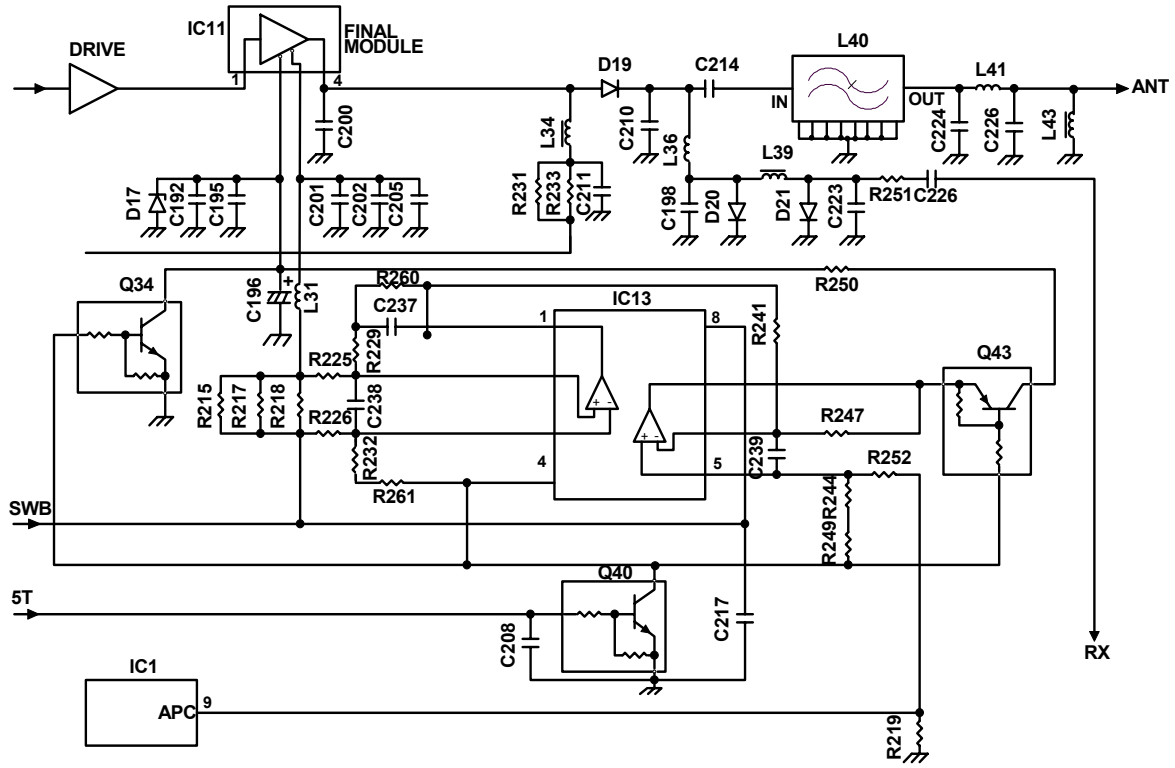


Fig. 7

5. POWER SUPPLY

There are four 5V power supplies for the microcomputer: 5V, 5C, 5R, and 5T. 5V for the microcomputer is always output while the power is on.

5C is common 5V and is output when SAVE is not set at OFF.

5R is 5V for reception and is output during reception.

5T is 5V for transmission and is output during transmission.

6. CONTROL SYSTEM

The IC1 CPU operates at 8.38-MHz clocks. This oscillator has a circuit that shifts the frequency according to EEPROM data.

IC1 controls the LCD driver and keys.

Key and rotary encoder circuit is shown as fig.8. The signal from keys and rotary encoder is input to microprocessor directly. (See Fig.8)

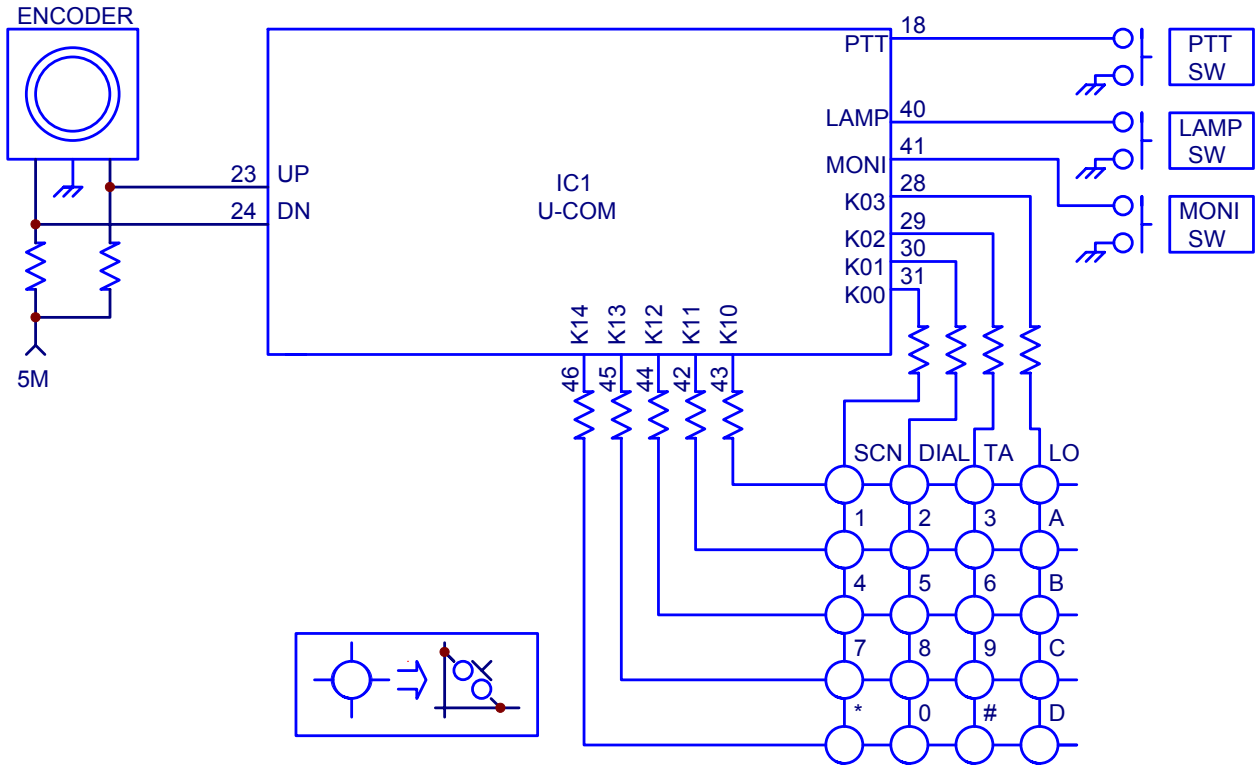


Fig. 8

RPU499APlus Circuit Description

1. FREQUENCY CONFIGURATION

The receiver utilizes double conversion. The first IF is 45.05 MHz and the second IF is 455KHz. The first local oscillator signal comes from the PLL circuit.

The PLL circuit in the transmitter generates the necessary frequencies (See Fig.1).

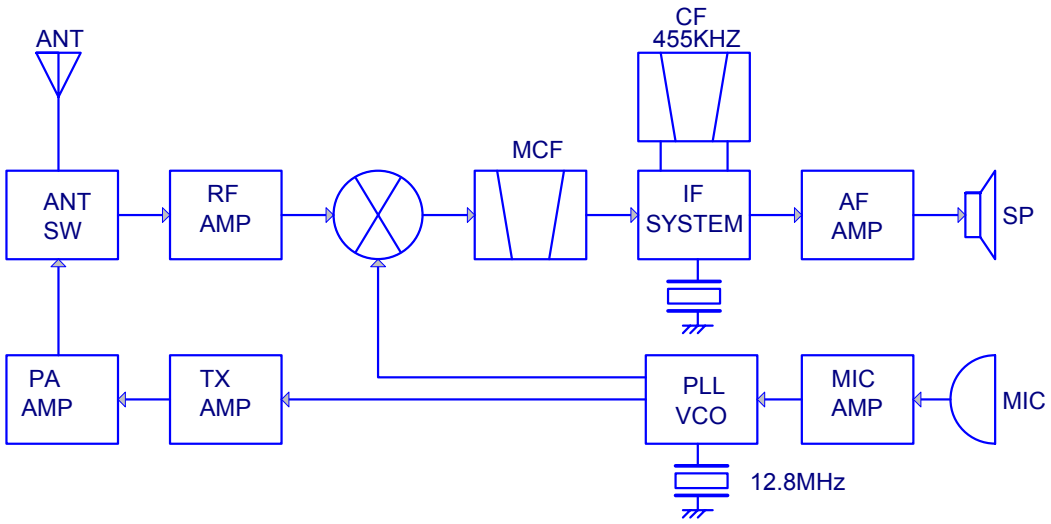


Fig.1

2. RECEIVER SYSTEM

The frequency configuration of the receiver is shown following fig.2

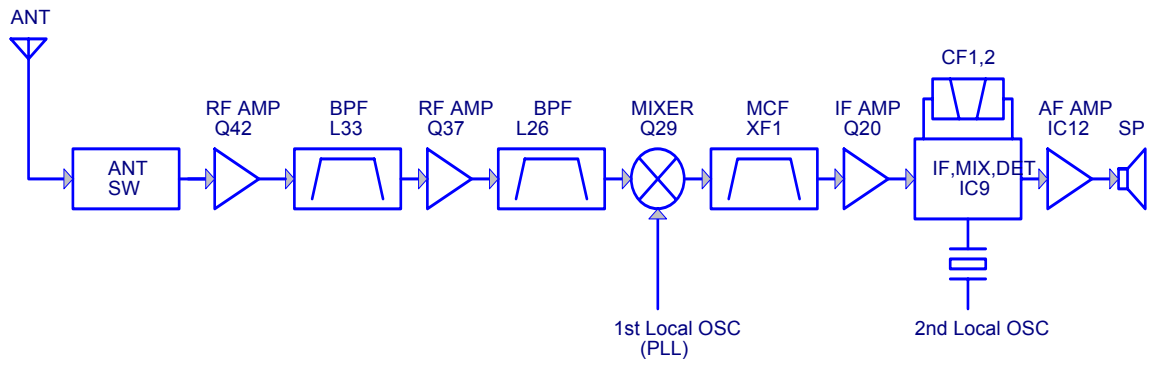


Fig.2

1) RF AMP

The signal coming from the antenna passes through the transmit/receive switching diode circuit, amplified by Q42 and then passes through a BPF [L33], and is amplified by the RF amplifier [Q37]. The resulting signal passes through a BPF [L26] and goes to the mixer.

2) First mixer

The signal from the front end is mixed with the first local oscillator signal generated in the PLL circuit by Q29 to produce a first IF frequency of 45.05 MHz.

The resulting signal passes through the XF1 MCF to cut the adjacent spurious and provide the optimum characteristics, such as adjacent frequency selectivity.

3) IF amplifier

The signal then passes through the first IF amplifier [Q20], and is amplified and goes to the IF IC (IC9). IC9 integrates the second OSC, second mixer, second IF amplifier, detector, noise amplifier, and noise detector.

The signal input to the IC is mixed with the RF signal of the second OSC to produce a 455KHz second IF signal. The signal is amplified by the IF amplifier. The signal is switched by Wide/Narrow switch diode and then passes through the ceramic filters (CF1 and CF2) to provide the necessary selectivity. Finally, the signal is detected by the IC and output as an AF signal.

4) AF amplifier

The AF signal from the IF IC is amplified by IC8 (1/2) and passes through the high-pass filter (Q25 and Q28) to remove 300 Hz and lower frequencies to suppress the sub-audio signal.

The signal then passes through the de-emphasis circuit to restore the audio frequency characteristics. The signal passes through AF VOL and enters the IC12 audio power amplifier to drive the speaker. (See Fig.3)

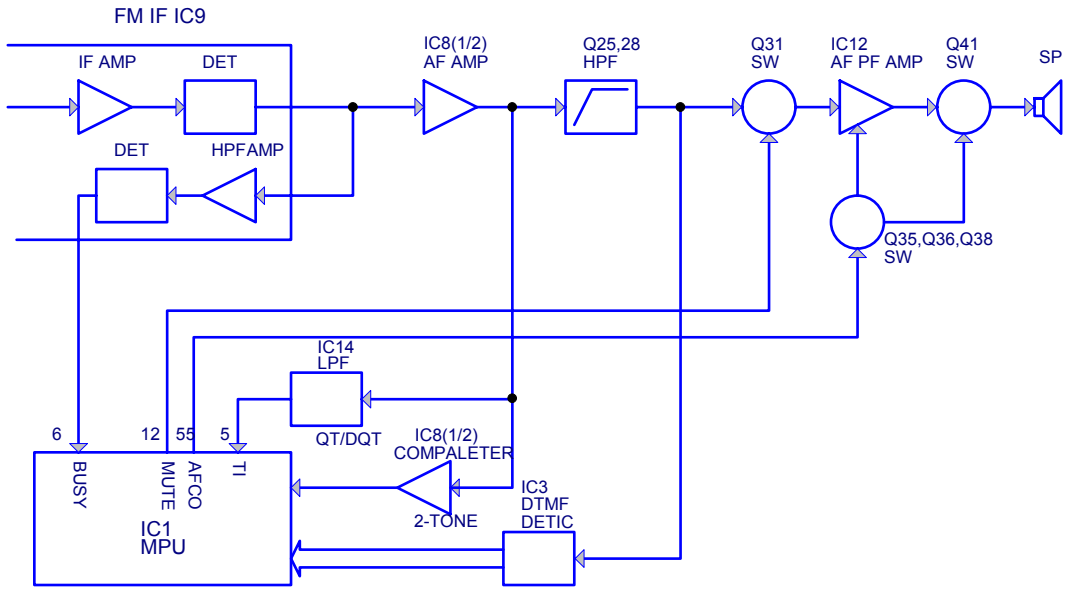


Fig.3

5) Squelch

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

The DC signal from the FM IC goes to the analog port of the microprocessor (IC1). IC1 determines whether to output sounds from the speaker by checking whether the input voltage is higher or lower than the preset value.

To output sounds from the speaker, IC1 sends a high level to the MUTE and AFCO lines and turns IC12 on through Q31, Q35, Q36, Q38 and Q41.

6) Receive signaling

(1) CTCSS

300Hz-and-higher audio frequencies of the signal output from IF IC are cut by a low-pass filter (IC14). The resulting signal enters the microprocessor (IC1). IC1 determines whether the CTCSS matches the preset value and controls the MUTE and AFCO and the speaker output sounds in line with the squelch results of that content.

(2) DTMF

The part of the received AF signal passes through a high- pass filter (Q25 and Q28) and goes to IC3. IC3 detects a DTMF signal and sends received DTMF data to IC1. IC1 carries out various operations, such as sound output, according to the DTMF data. (See Fig.3)

(3) 2-TONE

Part of the receive AF signal output from the AF amplifier (IC8 1/2) goes to the other IC8 (1/2), is compared, and goes to IC1. IC1 checks whether 2-TONE data is necessary. If it matches, IC1 carries out a specified operation, such as turning the speaker on.

3. PLL

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

1) PLL

The receiver has a VCO Q15, and the transmitter has another VCO (Q18).

The generated signal passes through the Q21 buffer and Q14 amplifier and enters the IC6 PLL IC. IC6 incorporates the reference oscillation divider and phase comparator functions. The input signal is divided into a 2.5 or 6.25KHz signal according to divide ratio data from the microcomputer (IC1). This signal and the 2.5 or 6.25KHz signal divided from the reference signal enter the phase comparator to produce a differential signal. The frequency control signal is output from the charge pump.

This signal passes through the passive LPF and goes to the varicap to control the VCO frequency (See Fig. 4).

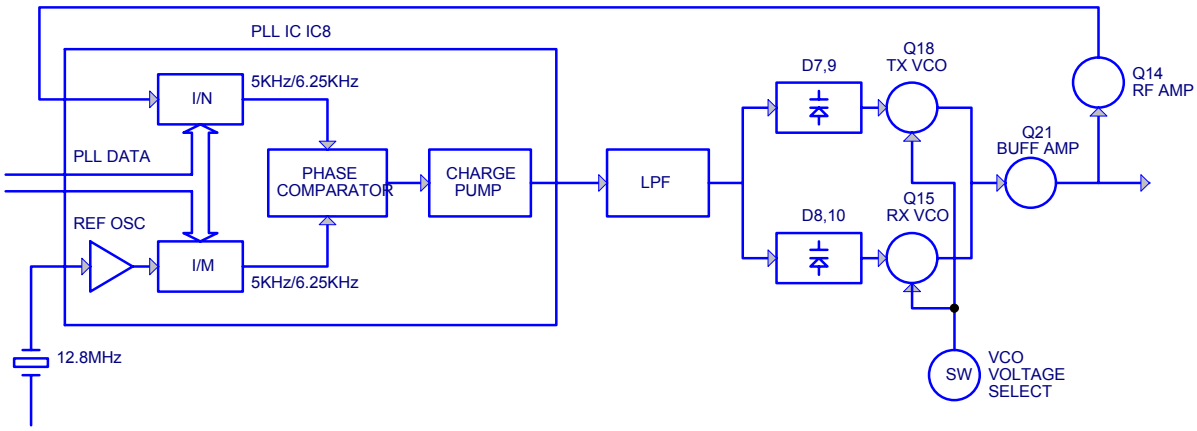


Fig.4

2) Reference Oscillator Circuit

The reference oscillator circuit in the PLL IC produces the 12.8MHz PLL reference frequency. Crystal X2 is a temperature compensate one.

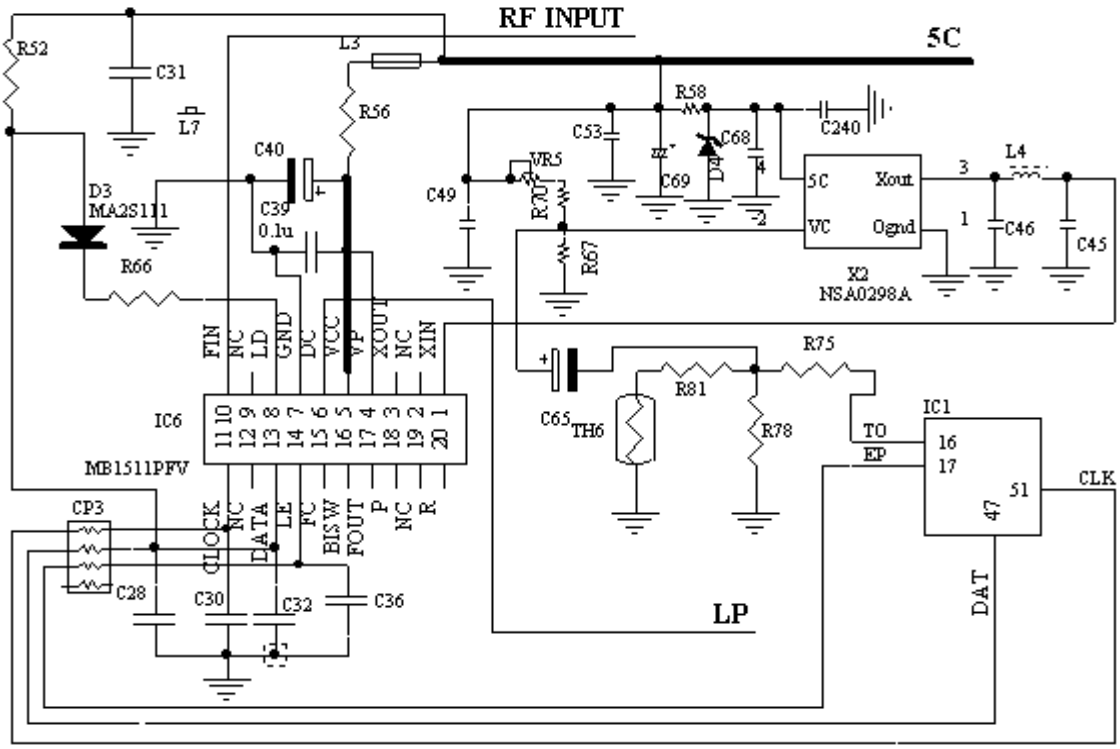


Fig.5

4. TRANSMITTER

1) Transmit audio

The modulation signal from the microphone is amplified by IC10 (1/2), passes through a pre-emphasis circuit, and is amplified by the other IC10 (1/2) to perform IDC operation.

The signal then passes through a low-pass filter (splatter filter) Q22 and Q16, and cuts 3 KHz and higher frequencies. The resulting signal goes to the VCO through the VCO modulation terminal for direct FM modulation.

2) CTCSS encoder

A necessary signal for CTCSS encoding is generated by IC1 and is FM-modulated to the PLL reference signal. Since the reference OSC does not modulate the loop characteristic frequency or higher, modulation is performed at the VCO side by adjusting the balance.

3) DTMF

The DTMF encode signal is also generated by IC1. This signal goes to IC10, and follows the same route as for ordinary modulation.

Q39 mutes the microphone line when sending the DTMF to prevent a malfunction resulting from audio signals. (See Fig.6)

.

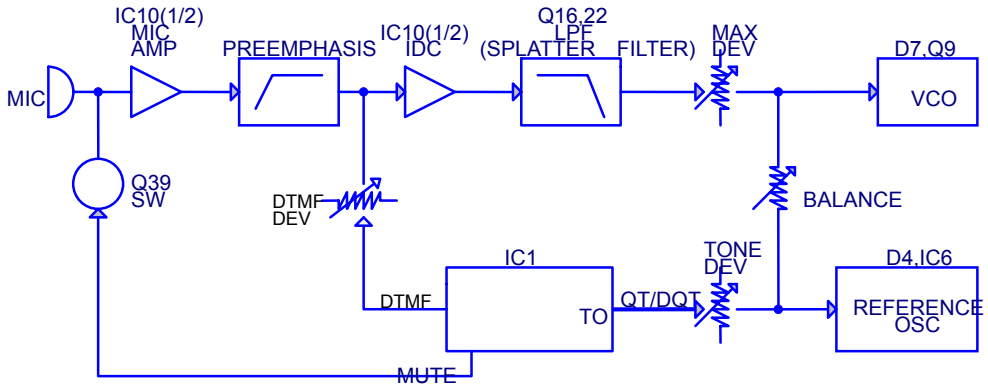


Fig.6

4) VCO and RF amplifier

The modulation signal is modulated to VCO by D11. The RF signal from the PLL is amplified by Q30 and Q32 to the sufficient level to drive the power module.

5) Final module

The MOS FET-type power module (IC11) is used to amplify the transmission power.

6) ANT switch and LPF

The signal from the module passes through the D19 SW and L40 LPF and is output from the ANT terminal. D15 and D14 are used to switch between transmission and reception. The chip-type LPF is used to provide required attenuation.

7) APC

The APC keeps the current constant to the final module. The current to the final module is output as a voltage by detecting the potential difference between R218, R220 and R223 by IC13 (1/2). IC13 (1/2) compares the signal with the APC voltage from IC1 and controls the voltage so that they have the same value. The output becomes the IC11 power control voltage, and the current is kept constant in this loop.

The APC voltage from IC1 has the preset high or low power level. (See Fig.7)

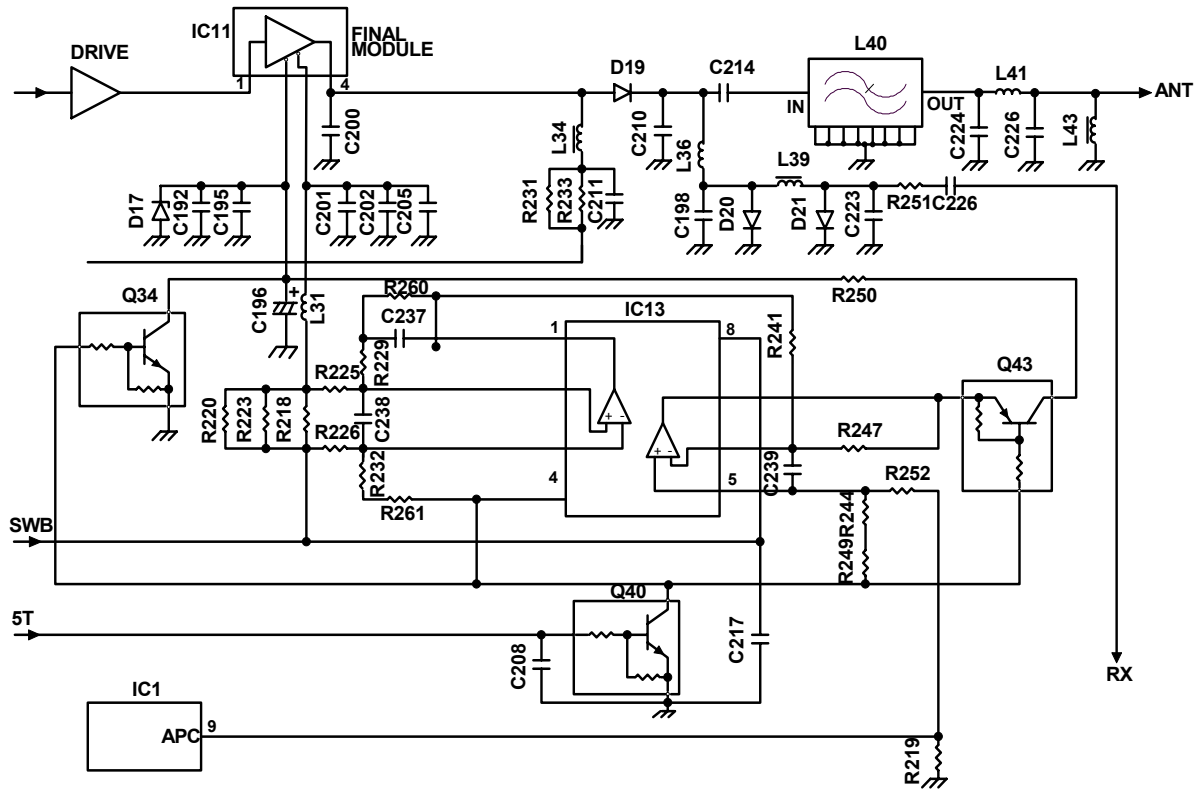


Fig. 7

5. POWER SUPPLY

There are four 5V power supplies for the microcomputer: 5V, 5C, 5R, and 5T. 5V for the microcomputer is always output while the power is on.

5C is common 5V and is output when SAVE is not set at OFF.

5R is 5V for reception and is output during reception.

5T is 5V for transmission and is output during transmission.

6. CONTROL SYSTEM

The IC1 CPU operates at 8.38MHz clocks. This oscillator has a circuit that shifts the frequency according to EEPROM data.

IC1 controls the LCD driver and keys.

Key and rotary encoder circuit is shown as fig. 8.

The signal from keys and rotary encoder is input to microprocessor directly. (See Fig.8)

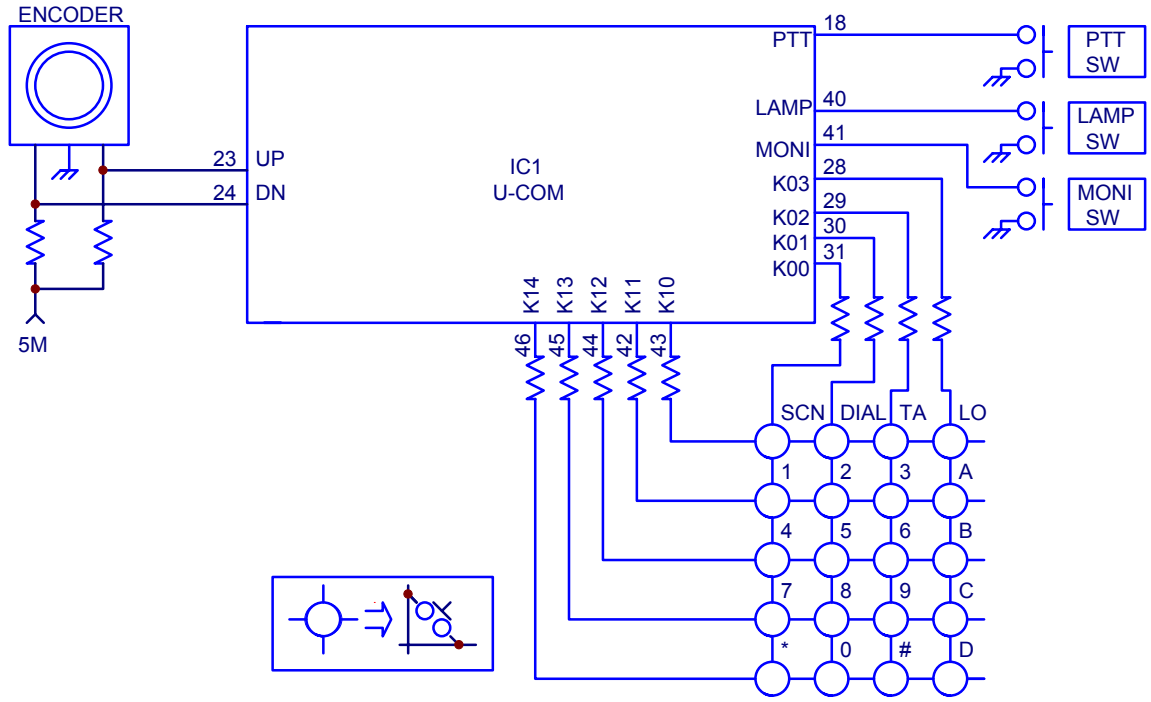

ENCODER
5M
23
UP
24
DN
IC1
U-COM
18
PTT
PTT SW
40
LAMP
LAMP SW
41
MONI
MONI SW
28
K03
29
K02
30
K01
31
K00
K14
K13
K12
K11
K10
46
45
44
42
43
SCN
DIAL
TA
LO
1
2
3
A
4
5
6
B
7
8
9
C
*
0
#
D

Fig. 8

RPV599APlus Part list

RP-599 Plus Part List 1 (Main Unit)					
No.	**Part No.**	**Material Name**	**Qty**	**Ref.No.**	**Adress**
1	3001050000000	Chip resistor 0402 0Ω J	3	R173	B4F
2				R267	B4F
3				R268	B4F
4	3001051240000	Chip resistor 0402 120KΩ J	1	R260	B4F
5	3001052210000	Chip resistor 0402 220Ω J	1	R193	B5F
6	3001053300010	Chip resistor 0402 33Ω J	1	R179	B5F
7	3001054730000	Chip resistor 0402 47KΩ J	1	R261	B4F
8	3001060000000	Chip resistor 0603 0Ω J 0W	12	R127	B4D
9				R203	T4L
10				R212	T4J
11				R243	B1B
12				R250	B5K
13				R252	B5I
14				R270	B5J
15				R3	T4H
16				R309	T2L
17				R311	B4J
18				R49	T4G
19				R92	B1G
20	3001061000000	Chip resistor 0603 10Ω J 0	3	R251	B5K
21				R33	T1J
22				R34	T2I
23	3001061010000	Chip resistor 0603 100Ω J	4	R178	B1F
24				R202	T4L
25				R247	T5I
26				R248	T4I
27	3001061020010	Chip resistor 0603 1KΩ J 0	28	R140	B4C
28				R152	B4C
29				R16	T4I
30				R161	B3G
31				R17	T1H
32				R190	T5J
33				R192	T4J
34				R246	T5K
35				R28	T4L
36				R31	T2G
37				R32	T2H
38				R37	T1E
39				R38	T1D
40				R39	T1C
41				R40	T1B
42				R41	T2A
43				R44	T2F
44				R45	T3F
45				R46	T3F
46				R47	T4F
47				R50	T2G
48				R54	B3B
49				R63	B1G

RPV599APlus Part list

RP-599 Plus Part List 1 (Main Unit)					
No.	**Part No.**	**Material Name**	**Qty**	**Ref.No.**	**Adress**
50				R64	T1J
51				R65	B3A
52				R86	B4F
53				R90	B4K
54				R97	B1G
55	3001061030010	Chip resistor 0603 10KΩ J	17	R101	B4K
56				R105	B4K
57				R11	T4I
58				R112	B4K
59				R132	T2K
60				R139	B5H
61				R147	T2K
62				R191	B4F
63				R200	B4K
64				R21	T2I
65				R237	B2B
66				R25	T5G
67				R43	B4A
68				R61	T4L
69				R74	T5I
70				R87	B2J
71				R99	B3K
72	3001061040010	Chip resistor 0603 100KΩ J	18	R10	T4H
73				R104	B1G
74				R109	B4G
75				R121	B4F
76				R128	B4H
77				R145	B3G
78				R146	B4D
79				R151	B3D
80				R163	B3C
81				R168	B4C
82				R216	B1B
83				R245	B1B
84				R26	T1G
85				R27	T1H
86				R5	T4H
87				R51	T2J
88				R57	T1H
89				R6	T4H
90	3001061050010	Chip resistor 0603 1MΩ J 0	1	R242	B1C
91	3001061210000	Chip resistor 0603 120Ω J	1	R254	B5J
92	3001061220000	Chip resistor 0603 1.2KΩ J	2	R182	B3F
93				R88	T5I
94	3001061230000	Chip resistor 0603 12KΩ J	1	R165	B2F
95	3001061240010	Chip resistor 0603 120KΩ J	3	R118	B3I
96				R143	B2G
97				R71	B1I
98	3001061500000	Chip resistor 0603 15Ω J 0	2	R305	B5H

RPV599APlus Part list

RP-599 Plus Part List 1 (Main Unit)					
No.	**Part No.**	**Material Name**	**Qty**	**Ref.No.**	**Adress**
99				R56	B1G
100	3001061510000	Chip resistor 0603 150Ω J	4	R22	T5G
101				R234	B3D
102				R80	B2I
103				R81	B2I
104	3001061520000	Chip resistor 0603 1.5KΩ J	4	R117	B4G
105				R150	B5G
106				R196	T3K
107				R308	T2L
108	3001061530010	Chip resistor 0603 15KΩ J	6	R204	B4K
109				R213	T4L
110				R219	T4L
111				R223	T4L
112				R302	B5H
113				R306	B4H
114	3001061540000	Chip resistor 0603 150KΩ J	7	R159	B4D
115				R160	B4D
116				R175	B4C
117				R176	B4C
118				R186	T2L
119				R52	B1G
120				R76	B1J
121	3001061540010	Chip resistor 0603 150KΩ D	7	R141	B3D
122				R210	B2C
123				R211	B2C
124				R220	B2C
125				R221	B2C
126				R224	B2C
127				R228	B2C
128	3001061810000	Chip resistor 0603 180Ω J	1	R169	B2F
129	3001061820000	Chip resistor 0603 1.8KΩ J	1	R239	T4I
130	3001061830010	Chip resistor 0603 18KΩ J	3	R124	T2K
131				R137	B3J
132				R36	T1J
133	3001061840000	Chip resistor 0603 180KΩ J	2	R116	B4G
134				R167	B3D
135	3001061850000	Chip resistor 0603 1.8MΩ J	2	R136	T2K
136				R153	T2K
137	3001062220000	Chip resistor 0603 2.2KΩ J	4	R106	B4G
138				R199	T5I
139				R20	T1J
140				R209	B4J
141	3001062230000	Chip resistor 0603 22KΩ J	6	R232	T5J
142				R300	B4J
143				R301	B5I
144				R303	B4I
145				R304	B4I
146				R307	B4J
147	3001062240010	Chip resistor 0603 220KΩ J	1	R60	T1H

RPV599APlus Part list

RP-599 Plus Part List 1 (Main Unit)					
No.	**Part No.**	**Material Name**	**Qty**	**Ref.No.**	**Adress**
148	3001062710000	Chip resistor 0603 270Ω J	4	R129	B2H
149				R135	B3G
150				R227	B3C
151				R230	B3D
152	3001062720000	Chip resistor 0603 2.7KΩ J	2	R55	B3B
153				R68	B3B
154	3001062730010	Chip resistor 0603 27KΩ J	2	R125	B4J
155				R240	B1B
156	3001063300000	Chip resistor 0603 33Ω J 0	1	R201	B3F
157	3001063310010	Chip resistor 0603 330Ω J	4	R197	B3F
158				R236	T5I
159				R244	B1D
160				R58	B1I
161	3001063320000	Chip resistor 0603 3.3KΩ J	7	R100	B4G
162				R111	B4G
163				R130	T2K
164				R162	B1F
165				R172	T2L
166				R59	B3B
167				R62	B3B
168	3001063330010	Chip resistor 0603 33KΩ J	5	R114	B2I
169				R138	T2K
170				R158	T2K
171				R198	B4F
172				R233	B5K
173	3001063340000	Chip resistor 0603 330KΩ J	1	R42	T4G
174	3001063910000	Chip resistor 0603 390Ω J	2	R30	T5L
175				R79	B2I
176	3001063920000	Chip resistor 0603 3.9KΩ J	4	R156	B4D
177				R164	B4C
178				R171	B4C
179				R180	B4C
180	3001063930010	Chip resistor 0603 39KΩ J	5	R108	B3J
181				R142	T3K
182				R166	T2L
183				R70	B1J
184				R73	B2J
185	3001064700000	Chip resistor 0603 47Ω J 0	2	R188	B3F
186				R225	B3E
187	3001064710000	Chip resistor 0603 470Ω J	1	R241	T4J
188	3001064720000	Chip resistor 0603 4.7KΩ J	8	R155	B4G
189				R177	T2L
190				R18	T5H
191				R19	T5H
192				R195	B3F
193				R229	B3E
194				R29	T1J
195				R48	T2G
196	3001064730000	Chip resistor 0603 47KΩ J	12	R110	B4H

RPV599APlus Part list

RP-599 Plus Part List 1 (Main Unit)					
No.	**Part No.**	**Material Name**	**Qty**	**Ref.No.**	**Adress**
197				R115	B3J
198				R119	B4K
199				R174	B3D
200				R194	B4F
201				R208	B4I
202				R23	T3L
203				R24	T3L
204				R310	B4J
205				R35	T2H
206				R53	T2J
207				R72	B1J
208	3001064740010	Chip resistor 0603 470KΩ J	1	R238	B4K
209	3001065610000	Chip resistor 0603 560Ω J	1	R181	B5F
210	3001065620010	Chip resistor 0603 5.6KΩ J	2	R107	B3K
211				R185	B4C
212	3001065630000	Chip resistor 0603 56KΩ J	1	R231	B5K
213	3001065640000	Chip resistor 0603 560KΩ J	1	R149	B5G
214	3001066810010	Chip resistor 0603 680Ω J	2	R148	B2G
215				R157	B5G
216	3001066820000	Chip resistor 0603 6.8KΩ J	1	R98	B2I
217	3001066830000	Chip resistor 0603 68KΩ J	1	R94	B2I
218	3001066840000	Chip resistor 0603 680KΩ J	3	R113	B4K
219				R120	B3J
220				R222	T3K
221	3001068210010	Chip resistor 0603 820Ω J	1	R69	B3B
222	3001068230010	Chip resistor 0603 82KΩ J	1	R131	B4J
223	3001080590000	Chip resistor 1206 0.5Ω J 4	3	R215	B4B
224				R217	B5B
225				R218	B5B
226	3002996830009	Trimmer resistor 68KΩ	4	VR1	B2J
227				VR2	B3J
228				VR3	T4J
229				VR5	B1I
230	3003992220000	Thermister 0603 2.2KΩ J 10	1	TH5	B1I
231	3005991020019	Array resistor 3.2*1.6*1.5) 1KΩ	3	CP1	T2H
232				CP2	T2H
233				CP5	T4H
234	3005991030019	Array resistor 0603 10KΩ J	1	CP3	B1G
235	3005994720019	Array resistor 0603 4.7KΩ*4 J 1	1	CP4	T2J
236	3101054710010	Chip capacitor 0402 470PF K 50	1	C234	B4E
237	3101054730000	Chip capacitor 0402 0.047UF K	1	C256	B5K
238	3101060300000	Chip capacitor 0603 3PF C 50V	4	C15	T1I
239				C189	B4E
240				C204	B3E
241				C230	B1A
242	3101060400000	Chip capacitor 0603 4PF C 50V	1	C170	B4F
243	3101060500000	Chip capacitor 0603 5PF C 50V	1	C99	B3H
244	3101060590000	Chip capacitor 0603 0.5PF C 50	1	C120	B3G
245	3101060590010	Chip capacitor 0603 0.5PF B 50	1	C123	B3G

RPV599APlus Part list

RP-599 Plus Part List 1 (Main Unit)					
No.	**Part No.**	**Material Name**	**Qty**	**Ref.No.**	**Adress**
246	3101060600020	Chip capacitor 0603 6PF D 50V	2	C144	T5G
247				C215	B3D
248	3101060700010	Chip capacitor 0603 7PF D 50V	1	C218	B1B
249	3101060900020	Chip capacitor 0603 9PF D 50V	1	C104	B3G
250	3101061000010	Chip capacitor 0603 10PF D 50V	8	C135	B2G
251				C16	T1I
252				C162	T2L
253				C221	B2A
254				C223	B3C
255				C45	B1I
256				C46	B1H
257				C8	T2I
258	3101061010010	Chip capacitor 0603 100PF J 50	5	C193	B2C
259				C30	B1G
260				C32	B2H
261				C36	B2H
262				C85	B4K
263	3101061020000	Chip capacitor 0603 1000PF K 5	59	C108	B3J
264				C109	B2H
265				C111	B3G
266				C12	T4L
267				C126	B4G
268				C129	B2G
269				C142	B4C
270				C143	B3G
271				C149	B2F
272				C153	B2F
273				C154	T2K
274				C157	B5F
275				C158	T5I
276				C166	B5F
277				C168	T5J
278				C171	B3F
279				C174	B3F
280				C176	B3F
281				C179	B3F
282				C184	B4K
283				C185	B2D
284				C19	T4G
285				C191	T3K
286				C194	B2D
287				C196	B2E
288				C20	T4G
289				C200	B3E
290				C203	B2C
291				C207	B3C
292				C210	B2B
293				C211	B3D
294				C213	B2B

RPV599APlus Part list

RP-599 Plus Part List 1 (Main Unit)					
No.	**Part No.**	**Material Name**	**Qty**	**Ref.No.**	**Adress**
295				C220	B4B
296				C225	T5I
297				C227	T2H
298				C228	T4H
299				C229	T4L
300				C233	B4F
301				C24	T1J
302				C25	T4G
303				C27	T4H
304				C3	T5G
305				C31	B1G
306				C33	T3L
307				C35	B4C
308				C41	B4B
309				C43	B4B
310				C44	T4K
311				C47	T4K
312				C48	B3B
313				C51	T5K
314				C53	B1I
315				C58	B2B
316				C6	B4A
317				C63	B1J
318				C70	B2I
319				C78	B3H
320				C79	B2I
321				C84	B3J
322	3101061030010	Chip capacitor 0603 0.01UF K 2	17	C10	T1J
323				C103	T2K
324				C106	B3G
325				C113	B2H
326				C115	B5H
327				C152	T2K
328				C155	B5F
329				C159	B4C
330				C160	T3K
331				C195	B2D
332				C217	T4A
333				C232	B4F
334				C34	B4B
335				C4	T3L
336				C5	T3L
337				C82	B4H
338				C88	B5G
339	3101061040010	Chip capacitor 0603 0.1UF K 16	22	C102	B4H
340				C116	B4H
341				C117	B4J
342				C122	B4F
343				C164	T3K

RPV599APlus Part list

RP-599 Plus Part List 1 (Main Unit)					
No.	**Part No.**	**Material Name**	**Qty**	**Ref.No.**	**Adress**
344				C165	B4B
345				C173	B4J
346				C18	T4G
347				C197	T4A
348				C198	T5J
349				C209	T5I
350				C28	B1G
351				C300	B5H
352				C301	B5H
353				C302	B5H
354				C303	B5H
355				C39	B1G
356				C69	B1J
357				C7	T2J
358				C75	B4K
359				C92	B4H
360				C95	B4G
361	3101061050060	Chip capacitor 0603 1UF K 10V	4	C37	B4B
362				C49	B1J
363				C52	B2B
364				C55	T5K
365	3101061200000	Chip capacitor 0603 12PF J 50V	4	C161	B5F
366				C202	B2C
367				C219	B3C
368				C222	B3D
369	3101061230000	Chip capacitor 0603 0.012UF K	2	C72	B4K
370				C73	B4K
371	3101061300000	Chip capacitor 0603 13PF J 50V	1	C206	B2C
372	3101061500010	Chip capacitor 0603 15PF J 50V	4	C100	B2H
373				C114	B5H
374				C121	B5G
375				C138	B2F
376	3101061800000	Chip capacitor 0603 18PF J 50V	1	C182	B3E
377	3101061820000	Chip capacitor 0603 1800PF K 5	1	C76	B3K
378	3101062000000	Chip capacitor 0603 20PF J 50V	1	C105	B3G
379	3101062200010	Chip capacitor 0603 22PF J 50V	1	C156	B3F
380	3101062210000	Chip capacitor 0603 220PF J 50	13	C11	T1B
381				C13	T1D
382				C14	T2A
383				C17	T1C
384				C21	T2F
385				C22	T3F
386				C23	T3F
387				C257	T5J
388				C26	T4F
389				C80	B4G
390				C86	B4G
391				C9	T1F
392				C93	B3G

PV599APlus Part list

RP-599 Plus Part List 1 (Main Unit)					
No.	Part No.	Material Name	Qty	Ref.No.	Adress
393	3101062220010	Chip capacitor 0603 2200PF K 5	1	C172	T4J
394	3101062230020	Chip capacitor 0603 0.022UF K	3	C167	T3L
395				C177	T4L
396				C81	B2I
397	3101062240000	Chip capacitor 0603 0.22UF K 1	1	C56	B2I
398	3101062700010	Chip capacitor 0603 27PF J 50V	2	C110	B5H
399				C208	B3B
400	3101062720000	Chip capacitor 0603 2700PF K 5	1	C137	T2L
401	3101062730000	Chip capacitor 0603 0.027UF K	3	C1	T5H
402				C125	B4D
403				C2	T5H
404	3101063300000	Chip capacitor 0603 33PF J 50V	1	C133	B2G
405	3101063320000	Chip capacitor 0603 3300PF K 5	1	C118	T2K
406	3101063330030	Chip capacitor 0603 0.033UF K	3	C132	B4D
407				C145	B4C
408				C62	T5I
409	3101063920000	Chip capacitor 0603 3900PF K 5	1	C57	T5I
410	3101063930000	Chip capacitor 0603 0.039UF K	1	C151	B3D
411	3101064700000	Chip capacitor 0603 47PF J 50V	2	C71	B4G
412				C96	B2H
413	3101064710000	Chip capacitor 0603 470PF K 50	8	C112	B3C
414				C187	B1C
415				C192	B4E
416				C224	B1C
417				C226	B1B
418				C304	T2L
419				C67	B1G
420				C89	B4G
421	3101064720000	Chip capacitor 0603 4700PF K 5	1	C74	B4G
422	3101064730000	Chip capacitor 0603 47NF K 16V	6	C127	T3K
423				C148	T2L
424				C150	B3C
425				C163	B4C
426				C178	B4K
427				C251	B5J
428	3101064740020	Chip capacitor 0603 0.47UF Z 1	2	C188	B2E
429				C199	B2D
430	3101065610000	Chip capacitor 0603 560PF K 50	1	C139	T2K
431	3101065620010	Chip capacitor 0603 5600PF K 5	1	C130	B3D
432	3101066810020	Chip capacitor 0603 680PF K 50	2	C119	T2K
433				C68	B2I
434	3101066820000	Chip capacitor 0603 6800PF K 5	1	C175	T5I
435	3101066830000	Chip capacitor 0603 0.068UF K	2	C134	B4D
436				C141	B4C
437	3101068200000	Chip capacitor 0603 82PF J 50V	1	C94	B4G
438	3102992000009	Trimmer capacitor 3.2*2.3* 1.45 6	2	TC2	B2H
439				TC3	B3H
440	3104071050000	Ta-capacitor 0805 1UF K 6.3V	3	C180	T1K
441				C50	B3B

RPV599APlus Part list

RP-599 Plus Part List 1 (Main Unit)					
No.	**Part No.**	**Material Name**	**Qty**	**Ref.No.**	**Adress**
442				C83	B3I
443	3104071560020	Ta-capacitor 0805 15UF M 6.3V	1	C254	B5J
444	3104072250000	Ta-capacitor 0805 2.2UF M 4V	1	C101	T2K
445	3104072250010	Ta-capacitor 0805 2.2UF M 10V	1	C255	B4J
446	3104076840000	Ta-capacitor 0805 0.68UF M 10	2	C65	B2I
447				C66	B2J
448	3104081560019	Ta-capacitor 1206 15UF	3	C140	B3G
449				C38	T1I
450				C42	B1E
451	3104084750000	Ta-capacitor 1206 4.7UF K 16V	4	C169	T4L
452				C40	B1G
453				C64	B1I
454				C90	B3J
455	3104086850000	Ta-capacitor 1206 6.8UF±20%	1	C190	B3D
456	3104202270000	Ta-capacitor 220UF M 6.3V	1	C214	B5K
457	3199060758000	Chip capacitor 0603 0.75PF B 5	1	C91	B3H
458	3210107101009	Framework inductor 0805 100nH	1	L13	B2G
459	3210107560009	Multilayer inductor 0805 56nH	1	L22	B3E
460	3210108230019	Framework inductor 1206 23nH	1	L9	B2H
461	3210108270000	Framework inductor 1206 27nH	1	L10	B3H
462	3210108330009	Framework inductor 1206 33nH	1	L33	B3C
463	3210209102019	Framework inductor 1210 1uH	1	L36	T1L
464	3210306101009	Multilayer inductor 0603 100nH	1	L15	B2F
465	3213209471009	Multilayer inductor 1210 470nH	1	L27	B4E
466	3213212101010	Multilayer inductor 1008 100nH	1	L28	B3C
467	3213212561000	Multilayer inductor 1008 0.56uH	1	L41	B1I
468	3213306102000	Multilayer inductor 0603 1uH	2	L11	B5H
469				Lx	B2H
470	3213306151009	Multilayer inductor 0603 0.15uH	1	L20	B4F
471	3213306181009	Multilayer inductor 0603 0.18uH	1	L19	B4E
472	3213306221019	Multilayer inductor 0603 0.22uH	3	L1	T4H
473				L2	T2I
474				L4	T4H
475	3213306681009	Multilayer inductor 0603 0.68uH	1	L16	B5E
476	3213306682009	Multilayer inductor 0603 6.8uH 1	4	L12	B3H
477				L6	B3H
478				L7	B3H
479				L8	B2H
480	3221506601009	Chip ferrite bead 0603 600Ω±25	6	L14	B3G
481				L17	T1J
482				L18	T4K
483				L23	B3F
484				L3	B1G
485				L5	B2I
486	3221507300009	Chip ferrite bead 0805 30Ω±25%	2	L25	B3D
487				L35	B4B
488	3231051510009	Coil 0.50*1.5*10TL	2	L30	B3B
489				L34	B1A
490	3302020200019	Constant voltage diode MAZ806200LSMD	1	D20	B1D

RPV599APlus Part list

RP-599 Plus Part List 1 (Main Unit)					
No.	**Part No.**	**Material Name**	**Qty**	**Ref.No.**	**Adress**
491	3303010500019	Switching diode 1SS373(TPH3)	1	D5	T5K
492	3303010500029	Switching diode 1SS372 (TE85L)	1	D19	T1K
493	3303020100029	Switching diode MA2S11100L	2	D14	B4G
494				D3	B1G
495	3303020100079	Switching diode MA2Z07700L	1	D22	B2C
496	3303020100089	Switching diode MA2S07700L	3	D16	B3F
497				D17	B3F
498				D23	B3B
499	3303030100019	Switching diode DAN222	1	D21	T4J
500	3303030100029	Switching diode DAN235ESOF416	2	D300	B4I
501				D301	B5H
502	3304010100019	Varactor 1SV214(T3.M)	1	D11	B3H
503	3304010100109	Varactor 1SV283 (TPH3)	4	D10	B2H
504				D7	B3H
505				D8	B2H
506				D9	B3G
507	3307110400019	LED KPA-3010QGC-VF	1	D1	T5H
508	3307150100009	LED BRPG1201W 3.0*	1	D2	B4A
509	3301031200009	Diode rectifier ISR154-400TE25	1	D24	T5L
510	3399990000229	Didode UDZ3.0B S	1	D4	B1I
511	3401001000039	Transistor 2SA1362	1	Q34	B4J
512	3401002000099	Transistor 2SC5108-Y	3	Q20	B2G
513				Q21	B5G
514				Q26	B2F
515	3403007000009	Transistor DTA114EE	1	Q15	B4F
516	3403007000029	Transistor DTA114YE	1	Q12	B2A
517	3403007000079	Transistor DTA144EE	4	Q300	B4J
518				Q302	B5H
519				Q32	T5I
520				Q41	B1D
521	3403008000019	Transistor DTC114EE	4	Q1	T5G
522				Q2	T4L
523				Q3	T4L
524				Q38	B2C
525	3403008000059	Transistor DTC114YE	1	Q4	T2H
526	3403008000079	Transistor DTC144EE	4	Q303	B5I
527				Q304	B4J
528				Q35	B4K
529				Q36	T4A
530	3403009000019	Transistor UMG3N	2	Q5	B3B
531				Q9	B3B
532	3406001000009	Transistor 2SC4988FRTR	1	Q31	B3F
533	3411002000009	Transistor 2SC5343EG	6	Q17	T2K
534				Q22	T2K
535				Q24	B4G
536				Q25	B4D
537				Q28	B4C
538				Q37	T5J
539	3499000000119	Transistor 2SC4619TLP	1	Q14	B2G

RPV599APlus Part list

RP-599 Plus Part List 1 (Main Unit)					
No.	**Part No.**	**Material Name**	**Qty**	**Ref.No.**	**Adress**
540	3499000000159	(Exclusive) transistor UMC4N	1	Q23	B3G
541	3499000000189	Transistor UFMMT717	2	Q8a	B3B
542				Q8b	B3B
543	3501010000009	FET 2SK12151GETL	1	Q39	B3E
544	3501020000019	FET 3SK318YB	1	Q29	B4F
545	3502010000009	FET 2SK1875-V	2	Q16	B2H
546				Q18	B3G
547	3503010000019	FET 2SJ243-T1	1	Q19	B3G
548	3503020000019	FET 2SK1588-T1	1	Q40	B5L
549	3503020000039	FET 2SK1824-T1	3	Q30	T5J
550				Q301	T2L
551				Q33	B3D
552	3503040000009	FET UPA572T	1	Q6	B3B
553	3602028004599	Audio amplification IC KIA6278F	1	IC12	B5J
554	3603002005419	IF progressing IC TA31136FN	1	IC9	B5H
555	3604007004819	PLL MB1511PFV-G-BND	1	IC6	B1H
556	3605002005459	Operational amplifier TA75W01FU	2	IC14	B3D
557				IC8	B4J
558	3605008005019	Operational amplifier NJM2100V	1	IC10	T3L
559	3605008005079	Operational amplifier NJM2904V	1	IC13	B1C
560	3608015000000	Power IC (voltage regulator) XC6201P5	1	IC7	T5K
561	3609004005179	Reset IC PST9140NR MITSU	1	IC2	T4G
562	3610004000749	SCM M38268MCL072GP 8	1	IC1	T3H
563	3612031004439	Memory AT24C32AN-10SI-2	1	IC4	T2K
564	3613029004629	Base band processing IC DTMF Receiver	1	IC3	T2J
565	3619006005210	Low power detecting IC R3111N451C 0.	1	IC5	T4H
566	3701012850019	TCXO 12.8MHz NSA0	1	X2	B1I
567	3701838830009	Cystal 8.388MHz SMD-49 1	1	X1	T1I
568	3801045530009	Ceramic filter 455KHz ±4.5K C	1	CF1	B5I
569	3801045530079	Ceramic filter 455KHz ±7.5KHZ	1	CF2	B4I
570	3804001020009	Printed filter 161.0MHz 26MHz	1	L31	B2B
571	4002000000059	★Fuse R429003 3.0A/32	1	F1	T4K
572	4100599100000	RPV599+ revised PCB FR4 1.	1		
573	4510181000009	IF chip 50MHZ A638AN-A	2	L24	B4E
574				L26	B4F
575	4510182000009	IF chip 50MHZ A638AN-1	1	L32	B3E
576	3104081060080	Ta-capacitor 1206 10UF M 10V	6 SZ-1000164	C128	B3I
577				C136	B3C
578				C147	B3C
579				C216	T4I
580				C59	B2J
581				C77	B4H

RPU499APlus Part list

RP-499 Part list 1					
No.	**Part No.**	**Materail Name**	**Qty.**	**Ref.No**	**Address**
1	3001050000000	Chip resistor 0402 0Ω J 1/16W	1	R280	B3D
2	3001050000000	Chip resistor 0402 0Ω J 1/16W	1	R272	B4E
4	3001053300010	Chip resistor 0402 33Ω J 1/16W	1	R170	B5E
5	3001051040010	Chip resistor 0402 100KΩ J 1/16W	1	R169	B3D
6	3001051040010	Chip resistor 0402 100KΩ J 1/16W	1	R281	B3D
7	3001051040010	Chip resistor 0402 100KΩ J 1/16W	1	R275	B4E
8	3001051040010	Chip resistor 0402 100KΩ J 1/16W	1	R277	B4E
9	3001051510000	Chip resistor 0402 150Ω J 1/16W	1	R189	B4E
10	3001053340000	Chip resistor 0402 330KΩ J 1/16W	1	R253	B3D
11	3001055610000	Chip resistor 0402 560Ω J 1/16W	1	R273	B5E
12	3001055630000	Chip resistor 0402 56KΩ J 1/16W	1	R274	B4E
13	3001055630000	Chip resistor 0402 56KΩ J 1/16W	1	R276	B4E
14	3001056830000	Chip resistor 0402 68KΩ J 1/16W	1	R282	B3D
15	3001060000000	Chip resistor 0603 0Ω J 1/10W	1	R217	B2F
16	3001060000000	Chip resistor 0603 0Ω J 1/10W	1	R251	B3C
17	3001060000000	Chip resistor 0603 0Ω J 1/10W	1	R126	B4D
18	3001060000000	Chip resistor 0603 0Ω J 1/10W	1	R271	B4J
19	3001060000000	Chip resistor 0603 0Ω J 1/10W	1	R49	T4G
20	3001060000000	Chip resistor 0603 0Ω J 1/10W	1	R3	T4H
22	3001060000000	Chip resistor 0603 0Ω J 1/10W	1	R214	T5I
21	3001060000000	Chip resistor 0603 0Ω J 1/10W	1	R270	T5I
23	3001060000000	Chip resistor 0603 0Ω J 1/10W	1	R203	T5L
24	3001061000000	Chip resistor 0603 10Ω J 1/10W	1	R178	B1F
25	3001061000000	Chip resistor 0603 10Ω J 1/10W	1	R56	B1G
26	3001061000000	Chip resistor 0603 10Ω J 1/10W	1	R305	B4H
27	3001061000000	Chip resistor 0603 10Ω J 1/10W	1	R238	B5K
28	3001061000000	Chip resistor 0603 10Ω J 1/10W	1	R35	T1J
29	3001061000000	Chip resistor 0603 10Ω J 1/10W	1	R34	T2I
30	3001061010000	Chip resistor 0603 100Ω J 1/10W	1	R131	B2H
31	3001061010000	Chip resistor 0603 100Ω J 1/10W	1	R237	B3D
32	3001061010000	Chip resistor 0603 100Ω J 1/10W	1	R148	B3G
33	3001061010000	Chip resistor 0603 100Ω J 1/10W	1	R91	B3J
34	3001061010000	Chip resistor 0603 100Ω J 1/10W	1	R207	B4F
35	3001061010000	Chip resistor 0603 100Ω J 1/10W	1	R130	B4G
36	3001061010000	Chip resistor 0603 100Ω J 1/10W	1	R255	T5I
37	3001061010000	Chip resistor 0603 100Ω J 1/10W	1	R215	T5J

RPU499APlus Part list

RP-499 Part list 1					
No.	**Part No.**	**Materail Name**	**Qty.**	**Ref.No**	**Address**
38	3001061010000	Chip resistor 0603 100Ω J 1/10W	1	R256	T5J
39	3001061010000	Chip resistor 0603 100Ω J 1/10W	1	R202	T5L
40	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R66	B1G
41	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R54	B3B
42	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R65	B3B
43	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R192	B3C
44	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R134	B3D
45	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R90	B3I
46	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R98	B3J
47	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R139	B4D
48	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R158	B4G
49	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R40	T1B
50	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R39	T1C
51	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R38	T1D
52	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R37	T1E
53	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R17	T1H
54	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R43	T1J
55	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R41	T2A
56	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R44	T2F
57	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R31	T2G
58	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R50	T2G
59	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R32	T2H
60	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R119	T2K
61	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R45	T3F
62	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R46	T3F
63	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R263	T3L
64	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R106	T4E
65	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R47	T4F
66	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R16	T4I
67	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R28	T4L
68	3001061020010	Chip resistor 0603 1KΩ J 1/10W	1	R254	T5J
69	3001061030010	Chip resistor 0603 10KΩ J 1/10W	1	R241	B1B
70	3001061030010	Chip resistor 0603 10KΩ J 1/10W	1	R94	B2I
71	3001061030010	Chip resistor 0603 10KΩ J 1/10W	1	R87	B2J
72	3001061030010	Chip resistor 0603 10KΩ J 1/10W	1	R188	B3D
73	3001061030010	Chip resistor 0603 10KΩ J 1/10W	1	R101	B3J

RPU499APlus Part list

RP-499 Part list 1					
No.	**Part No.**	**Materail Name**	**Qty.**	**Ref.No**	**Address**
74	3001061030010	Chip resistor 0603 10KΩ J 1/10W	1		
75	3001061030010	Chip resistor 0603 10KΩ J 1/10W	1		
76	3001061030010	Chip resistor 0603 10KΩ J 1/10W	1		
77	3001061030010	Chip resistor 0603 10KΩ J 1/10W	1		
78	3001061030010	Chip resistor 0603 10KΩ J 1/10W	1		
79	3001061030010	Chip resistor 0603 10KΩ J 1/10W	1		
80	3001061030010	Chip resistor 0603 10KΩ J 1/10W	1		
81	3001061030010	Chip resistor 0603 10KΩ J 1/10W	1		
82	3001061030010	Chip resistor 0603 10KΩ J 1/10W	1		
83	3001061030010	Chip resistor 0603 10KΩ J 1/10W	1		
84	3001061030010	Chip resistor 0603 10KΩ J 1/10W	1		
85	3001061030010	Chip resistor 0603 10KΩ J 1/10W	1		
86	3001061040010	Chip resistor 0603 100KΩ J 1/10W	1		
87	3001061040010	Chip resistor 0603 100KΩ J 1/10W	1		
88	3001061040010	Chip resistor 0603 100KΩ J 1/10W	1		
89	3001061040010	Chip resistor 0603 100KΩ J 1/10W	1		
90	3001061040010	Chip resistor 0603 100KΩ J 1/10W	1		
91	3001061040010	Chip resistor 0603 100KΩ J 1/10W	1		
92	3001061040010	Chip resistor 0603 100KΩ J 1/10W	1		
93	3001061040010	Chip resistor 0603 100KΩ J 1/10W	1		
94	3001061040010	Chip resistor 0603 100KΩ J 1/10W	1		
95	3001061040010	Chip resistor 0603 100KΩ J 1/10W	1		
96	3001061040010	Chip resistor 0603 100KΩ J 1/10W	1		
97	3001061040010	Chip resistor 0603 100KΩ J 1/10W	1		
98	3001061040010	Chip resistor 0603 100KΩ J 1/10W	1		
99	3001061040010	Chip resistor 0603 100KΩ J 1/10W	1		
102	3001061040010	Chip resistor 0603 100KΩ J 1/10W	1		
100	3001061040010	Chip resistor 0603 100KΩ J 1/10W	1		
101	3001061040010	Chip resistor 0603 100KΩ J 1/10W	1		
103	3001061050010	Chip resistor 0603 1MΩ J 1/10W			
104	3001061050010	Chip resistor 0603 1MΩ J 1/10W			
105	3001061210000	Chip resistor 0603 120Ω J 1/10W			
106	3001061220000	Chip resistor 0603 1.2KΩ J 1/10W			
107	3001061230000	Chip resistor 0603 12KΩ J 1/10W			
108	3001061240010	Chip resistor 0603 120KΩ J 1/10W	1		
109	3001061240010	Chip resistor 0603 120KΩ J 1/10W	1		

RPU499APlus Part list

RP-499 Part list 1					
No.	**Part No.**	**Materail Name**	**Qty.**	**Ref.No**	**Address**
110	3001061240010	Chip resistor 0603 120KΩ J 1/10W	1	R142	B3G
111	3001061510000	Chip resistor 0603 150Ω J 1/10W	1	R22	T5G
112	3001061520000	Chip resistor 0603 1.5KΩ J 1/10W	1	R79	B2I
113	3001061520000	Chip resistor 0603 1.5KΩ J 1/10W	1	R201	B3F
114	3001061520000	Chip resistor 0603 1.5KΩ J 1/10W	1	R115	B4G
115	3001061530010	Chip resistor 0603 15KΩ J 1/10W	1	R302	B5H
116	3001061530010	Chip resistor 0603 15KΩ J 1/10W	1	R306	B5H
117	3001061530010	Chip resistor 0603 15KΩ J 1/10W	1	R118	T2K
118	3001061540010	Chip resistor 0603 150KΩ D 1/10W	1	R232	B1B
119	3001061540010	Chip resistor 0603 150KΩ D 1/10W	1	R260	B2B
120	3001061540010	Chip resistor 0603 150KΩ D 1/10W	1	R225	B2C
121	3001061540010	Chip resistor 0603 150KΩ D 1/10W	1	R226	B2C
122	3001061540010	Chip resistor 0603 150KΩ D 1/10W	1	R229	B2C
123	3001061540010	Chip resistor 0603 150KΩ D 1/10W	1	R261	T1B
124	3001061540000	Chip resistor 0603 150KΩ J 1/10W	1	R78	B1J
125	3001061540000	Chip resistor 0603 150KΩ J 1/10W	1	R150	B3C
126	3001061540000	Chip resistor 0603 150KΩ J 1/10W	1	R156	B4B
127	3001061540000	Chip resistor 0603 150KΩ J 1/10W	1	R157	B4B
128	3001061540000	Chip resistor 0603 150KΩ J 1/10W	1	R175	B4C
129	3001061540000	Chip resistor 0603 150KΩ J 1/10W	1	R176	B4C
130	3001061540000	Chip resistor 0603 150KΩ J 1/10W	1	R107	T4E
131	3001061810000	Chip resistor 0603 180Ω J 1/10W	1	R248	B3D
132	3001061820000	Chip resistor 0603 1.8KΩ J 1/10W	1	R221	B3F
133	3001061820000	Chip resistor 0603 1.8KΩ J 1/10W	1	R308	T2L
134	3001061820000	Chip resistor 0603 1.8KΩ J 1/10W	1	R243	T4I
135	3001061830010	Chip resistor 0603 18KΩ J 1/10W	1	R125	B4J
136	3001061830010	Chip resistor 0603 18KΩ J 1/10W	1	R36	T1J
137	3001061840000	Chip resistor 0603 180KΩ J 1/10W	1	R166	B4D
138	3001061850000	Chip resistor 0603 1.8MΩ J 1/10W	1	R151	T2K
139	3001062200000	Chip resistor 0603 22Ω J 1/10W	1	R196	B2F
140	3001062200000	Chip resistor 0603 22Ω J 1/10W	1	R200	B3F
141	3001062200000	Chip resistor 0603 22Ω J 1/10W	1	R141	B3H
142	3001062220000	Chip resistor 0603 2.2KΩ J 1/10W	1	R250	B1B
143	3001062220000	Chip resistor 0603 2.2KΩ J 1/10W	1	R20	T1J
144	3001062220000	Chip resistor 0603 2.2KΩ J 1/10W	1	R193	T4J
145	3001062230000	Chip resistor 0603 22KΩ J 1/10W	1	R262	B3J

RPU499APlus Part list

RP-499 Part list 1					
No.	**Part No.**	**Materail Name**	**Qty.**	**Ref.No**	**Address**
146	3001062230000	Chip resistor 0603 22KΩ J 1/10W	1	R301	B5H
147	3001062230000	Chip resistor 0603 22KΩ J 1/10W	1	R300	B5I
148	3001062230000	Chip resistor 0603 22KΩ J 1/10W	1	R303	B5I
149	3001062230000	Chip resistor 0603 22KΩ J 1/10W	1	R304	B5I
150	3001062240010	Chip resistor 0603 220KΩ J 1/10W	1	R60	T1H
151	3001062710000	Chip resistor 0603 270Ω J 1/10W	1	R231	B2C
152	3001062710000	Chip resistor 0603 270Ω J 1/10W	1	R233	B2C
153	3001062710000	Chip resistor 0603 270Ω J 1/10W	1	R137	B3G
154	3001062720000	Chip resistor 0603 2.7KΩ J 1/10W	1	R55	B2B
155	3001062720000	Chip resistor 0603 2.7KΩ J 1/10W	1	R68	B2B
156	3001062720000	Chip resistor 0603 2.7KΩ J 1/10W	1	R146	B5G
157	3001062720000	Chip resistor 0603 2.7KΩ J 1/10W	1	R124	T2K
158	3001062730010	Chip resistor 0603 27KΩ J 1/10W	1	R244	B1B
159	3001062730010	Chip resistor 0603 27KΩ J 1/10W	1	R184	T2L
160	3001063030000	Chip resistor 0603 30KΩ J 1/10W	1	R228	T3L
161	3001063310010	Chip resistor 0603 330Ω J 1/10W	1	R58	B1I
162	3001063310010	Chip resistor 0603 330Ω J 1/10W	1	R205	B3F
163	3001063310010	Chip resistor 0603 330Ω J 1/10W	1	R73	T5I
164	3001063320000	Chip resistor 0603 3.3KΩ J 1/10W	1	R249	B1B
165	3001063320000	Chip resistor 0603 3.3KΩ J 1/10W	1	R159	B2F
166	3001063320000	Chip resistor 0603 3.3KΩ J 1/10W	1	R173	B2F
167	3001063320000	Chip resistor 0603 3.3KΩ J 1/10W	1	R194	B2F
168	3001063320000	Chip resistor 0603 3.3KΩ J 1/10W	1	R59	B3B
169	3001063320000	Chip resistor 0603 3.3KΩ J 1/10W	1	R62	B3B
170	3001063320000	Chip resistor 0603 3.3KΩ J 1/10W	1	R99	B4G
171	3001063320000	Chip resistor 0603 3.3KΩ J 1/10W	1	R100	B4H
172	3001063320000	Chip resistor 0603 3.3KΩ J 1/10W	1	R224	T4L
173	3001063330010	Chip resistor 0603 33KΩ J 1/10W	1	R75	B1J
174	3001063330010	Chip resistor 0603 33KΩ J 1/10W	1	R245	B3D
175	3001063330010	Chip resistor 0603 33KΩ J 1/10W	1	R113	B3I
176	3001063330010	Chip resistor 0603 33KΩ J 1/10W	1	R307	B4J
177	3001063330010	Chip resistor 0603 33KΩ J 1/10W	1	R258	B5K
178	3001063330010	Chip resistor 0603 33KΩ J 1/10W	1	R164	T2L
179	3001063330010	Chip resistor 0603 33KΩ J 1/10W	1	R140	T3K
180	3001063330010	Chip resistor 0603 33KΩ J 1/10W	1	R227	T3L
181	3001063340000	Chip resistor 0603 330KΩ J 1/10W	1	R42	T4G

RPU499APlus Part list

RP-499 Part list 1					
No.	**Part No.**	**Materail Name**	**Qty.**	**Ref.No**	**Address**
182	3001063910000	Chip resistor 0603 390Ω J 1/10W	1	R191	T3K
183	3001063910000	Chip resistor 0603 390Ω J 1/10W	1	R30	T4L
184	3001063920000	Chip resistor 0603 3.9KΩ J 1/10W	1	R154	B4B
185	3001063920000	Chip resistor 0603 3.9KΩ J 1/10W	1	R162	B4B
186	3001063920000	Chip resistor 0603 3.9KΩ J 1/10W	1	R171	B4C
187	3001063920000	Chip resistor 0603 3.9KΩ J 1/10W	1	R179	B4C
188	3001063920000	Chip resistor 0603 3.9KΩ J 1/10W	1	R172	T2L
189	3001063930010	Chip resistor 0603 39KΩ J 1/10W	1	R67	B1I
190	3001053930000	Chip resistor 0402 39KΩ J 1/16W	1	R110	B3I
191	3001064700000	Chip resistor 0603 47Ω J 1/10W	1	R190	B2F
192	3001064710000	Chip resistor 0603 470Ω J 1/10W	1	R95	B1G
193	3001064710000	Chip resistor 0603 470Ω J 1/10W	1	R76	B2I
194	3001064710000	Chip resistor 0603 470Ω J 1/10W	1	R246	T4J
195	3001064720000	Chip resistor 0603 4.7KΩ J 1/10W	1	R153	B2G
196	3001064720000	Chip resistor 0603 4.7KΩ J 1/10W	1	R29	T1L
197	3001064720000	Chip resistor 0603 4.7KΩ J 1/10W	1	R48	T2G
198	3001064720000	Chip resistor 0603 4.7KΩ J 1/10W	1	R198	T4J
199	3001064720000	Chip resistor 0603 4.7KΩ J 1/10W	1	R18	T5H
200	3001064720000	Chip resistor 0603 4.7KΩ J 1/10W	1	R19	T5H
201	3001064730000	Chip resistor 0603 47KΩ J 1/10W	1	R70	B1I
202	3001064730000	Chip resistor 0603 47KΩ J 1/10W	1	R93	B2I
203	3001064730000	Chip resistor 0603 47KΩ J 1/10W	1	R257	B3D
204	3001064730000	Chip resistor 0603 47KΩ J 1/10W	1	R117	B3H
206	3001064730000	Chip resistor 0603 47KΩ J 1/10W	1	R103	B3I
205	3001064730000	Chip resistor 0603 47KΩ J 1/10W	1	R92	B3I
207	3001064730000	Chip resistor 0603 47KΩ J 1/10W	1	R180	B4C
208	3001064730000	Chip resistor 0603 47KΩ J 1/10W	1	R210	B4L
209	3001064730000	Chip resistor 0603 47KΩ J 1/10W	1	R25	T2H
210	3001064730000	Chip resistor 0603 47KΩ J 1/10W	1	R53	T2J
211	3001064730000	Chip resistor 0603 47KΩ J 1/10W	1	R23	T3L
212	3001064730000	Chip resistor 0603 47KΩ J 1/10W	1	R24	T3L
213	3001064740010	Chip resistor 0603 470KΩ J 1/10W	1	R242	B5K
214	3001065610000	Chip resistor 0603 560Ω J 1/10W	1	R167	B1F
215	3001065610000	Chip resistor 0603 560Ω J 1/10W	1	R197	B3F
216	3001065610000	Chip resistor 0603 560Ω J 1/10W	1	R222	B4F
217	3001065610000	Chip resistor 0603 560Ω J 1/10W	1	R211	B4L

RPU499APlus Part list

RP-499 Part list 1					
No.	**Part No.**	**Materail Name**	**Qty.**	**Ref.No**	**Address**
218	3001065620010	Chip resistor 0603 5.6KΩ J 1/10W	1	R163	B2F
219	3001068220000	Chip resistor 0603 8.2KΩ J 1/10W	1	R183	B4C
220	3001065620010	Chip resistor 0603 5.6KΩ J 1/10W	1	R109	B4I
221	3001065620010	Chip resistor 0603 5.6KΩ J 1/10W	1	R177	T2L
222	3001065630000	Chip resistor 0603 56KΩ J 1/10W	1	R259	B5K
223	3001066810010	Chip resistor 0603 680Ω J 1/10W	1	R80	B2I
224	3001066820000	Chip resistor 0603 6.8KΩ J 1/10W	1	R186	B2F
225	3001066820000	Chip resistor 0603 6.8KΩ J 1/10W	1	R128	B3G
226	3001066820000	Chip resistor 0603 6.8KΩ J 1/10W	1	R104	B3J
227	3001066830000	Chip resistor 0603 68KΩ J 1/10W	1	R116	B3I
228	3001066830000	Chip resistor 0603 68KΩ J 1/10W	1	R155	T2K
229	3001066840000	Chip resistor 0603 680KΩ J 1/10W	1	R112	B4I
230	3001066840000	Chip resistor 0603 680KΩ J 1/10W	1	R120	B4J
231	3001066840000	Chip resistor 0603 680KΩ J 1/10W	1	R145	B5G
232	3001068210010	Chip resistor 0603 820Ω J 1/10W	1	R69	B3B
233	3001068210010	Chip resistor 0603 820Ω J 1/10W	1	R235	T5J
234	3001068220000	Chip resistor 0603 8.2KΩ J 1/10W	1	R129	B3G
235	3001068220000	Chip resistor 0603 8.2KΩ J 1/10W	1	R127	T2K
236	3001068230010	Chip resistor 0603 82KΩ J 1/10W	1	R132	B4J
237	3001068230010	Chip resistor 0603 82KΩ J 1/10W	1	R135	T2K
238	3001068240000	Chip resistor 0603 820KΩ J 1/10W	1	R133	T2K
239	3001068240000	Chip resistor 0603 820KΩ J 1/10W	1	R114	T5E
240	4002000000059	★Fuse R429003 3.0A/32V	1	F1	T4K
241	3001070000000	Chip resistor 0805 0Ω J 1/8W	1	R96	T3E
242	3099080398000	Chip resistor 1206 0.39Ω J 1/4W	1	R223	B4B
243	3099080398000	Chip resistor 1206 0.39Ω J 1/4W	1	R218	B5B
244	3099080398000	Chip resistor 1206 0.39Ω J 1/4W	1	R220	B5B
245	3002992230019	Trimmer resistor 2.7*2.0*1.6 22KΩ ±25%	1	VR3	T4J
246	3002996830009	Trimmer resistor 68KΩ	1	VR5	B1J
247	3002996830009	Trimmer resistor 68KΩ	1	VR1	B3J
248	3002994730019	Trimmer resistor 2.8*2.3*1.2 47KΩ ±25%	1	VR2	B3J
249	3003992220000	Thermister 0603 2.2KΩ J 100mW	1	TH6	B1I
250	3003994730000	Thermister 0603 47KΩ J 100mW	1	TH4	T3K
251	3005991020019	Array resistor 3.2*1.6*1.5) 1KΩ±5%	1	CP1	T2H
252	3005991020019	Array resistor 3.2*1.6*1.5) 1KΩ±5%	1	CP2	T2H
253	3005991020019	Array resistor 3.2*1.6*1.5) 1KΩ±5%	1	CP5	T4H

RPU499APlus Part list

RP-499 Part list 1					
No.	**Part No.**	**Materail Name**	**Qty.**	**Ref.No**	**Address**
254	3005991030019	Array resistor 0603 10KΩ J 1/16W	1	CP3	B1G
255	3005994720019	Array resistor 0603 4.7KΩ*4 J	1	CP4	T2J
256	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C147	B3D
258	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C166	B4E
257	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C255	B4E
259	3101051020010	Chip capacitor 0402 1000PF K 50V	1	C160	B5E
260	3101051030020	Chip capacitor 0402 0.01UF K 25V	1	C262	B5E
261	3101051040060	Chip capacitor 0402 0.1UF K 16V	1	C164	B4E
263	3101050800000	Chip capacitor 0402 8PF B 50V	1	C162	B4E
262	3101051200020	Chip capacitor 0402 12PF J 50V	1	C168	B4E
264	3101053000010	Chip capacitor 0402 30PF J 50V	1	C231	B3C
265	3101054700010	Chip capacitor 0402 47PF J 50V	1	C263	B3I
266	3101054710010	Chip capacitor 0402 470PF K 50V	1	C227	B3D
267	3101054710010	Chip capacitor 0402 470PF K 50V	1	C256	B3D
268	3101054710010	Chip capacitor 0402 470PF K 50V	1	C257	B3D
269	3101054710010	Chip capacitor 0402 470PF K 50V	1	C161	B4E
270	3101054730000	Chip capacitor 0402 0.047UF K 10V	1	C135	B3D
271	3101060100010	Chip capacitor 0603 1PF B 50V	1	C126	B3H
272	3101060200000	Chip capacitor 0603 2PF C 50V	1	C71	B1G
273	3101060200000	Chip capacitor 0603 2PF C 50V	1	C224	B2A
274	3101060200000	Chip capacitor 0603 2PF C 50V	1	C223	B3C
275	3101060700000	Chip capacitor 0603 7PF C 50V	1	C153	T5H
276	3101060300000	Chip capacitor 0603 3PF C 50V	1	C200	B2C
278	3101060300000	Chip capacitor 0603 3PF C 50V	1	C140	B3C
279	3101060300000	Chip capacitor 0603 3PF C 50V	1	C15	T1I
280	3101060400000	Chip capacitor 0603 4PF C 50V	1	C179	B2F
282	3101060400000	Chip capacitor 0603 4PF C 50V	1	C111	B2H
281	3101060400000	Chip capacitor 0603 4PF C 50V	1	C98	B2H
283	3101060400000	Chip capacitor 0603 4PF C 50V	1	C188	B3F
284	3101060500000	Chip capacitor 0603 5PF C 50V	1	C101	B2H
286	3101061500010	Chip capacitor 0603 15PF J 50V	1	C228	B3C
285	3101062490000	Chip capacitor 0603 2.4PF B 50V	1	C232	B3C
287	3101060500000	Chip capacitor 0603 5PF C 50V	1	C110	B3H
288	3101060600020	Chip capacitor 0603 6PF D 50V	1	C163	B2F
289	3101060600020	Chip capacitor 0603 6PF D 50V	1	C138	B2G
290	3101060600020	Chip capacitor 0603 6PF D 50V	1	C91	B3H

RPU499APlus Part list

RP-499 Part list 1					
No.	**Part No.**	**Materail Name**	**Qty.**	**Ref.No**	**Address**
291	3101060600020	Chip capacitor 0603 6PF D 50V	1	C96	B3H
292	3101060700000	Chip capacitor 0603 7PF C 50V	1	C117	B3G
293	3101060700000	Chip capacitor 0603 7PF C 50V	1	C108	B3H
294	3101060800000	Chip capacitor 0603 8PF D 50V	1	C184	B4F
295	3101060590010	Chip capacitor 0603 0.5PF B 50V	1	C128	B3G
296	3101060590010	Chip capacitor 0603 0.5PF B 50V	1	C104	B3H
297	3101061000000	Chip capacitor 0603 10PF C 50V	1	C45	B1I
298	3101061000000	Chip capacitor 0603 10PF C 50V	1	C46	B1I
299	3101061000000	Chip capacitor 0603 10PF C 50V	1	C118	B3G
300	3101061000010	Chip capacitor 0603 10PF D 50V	1	C16	T1I
301	3101061000010	Chip capacitor 0603 10PF D 50V	1	C8	T2I
302	3101061000010	Chip capacitor 0603 10PF D 50V	1	C169	T2L
303	3101061010010	Chip capacitor 0603 100PF J 50V	1	C30	B1G
304	3101061010010	Chip capacitor 0603 100PF J 50V	1	C237	B2B
305	3101061010010	Chip capacitor 0603 100PF J 50V	1	C192	B2D
306	3101061010010	Chip capacitor 0603 100PF J 50V	1	C201	B2D
307	3101061010010	Chip capacitor 0603 100PF J 50V	1	C32	B2H
308	3101061010010	Chip capacitor 0603 100PF J 50V	1	C36	B2H
309	3101061010010	Chip capacitor 0603 100PF J 50V	1	C81	B3G
310	3101061010010	Chip capacitor 0603 100PF J 50V	1	C89	B4I
311	3101061020000	Chip capacitor 0603 1000PF K 50V	1	C53	B1I
312	3101061020000	Chip capacitor 0603 1000PF K 50V	1	C214	B2C
313	3101061020000	Chip capacitor 0603 1000PF K 50V	1	C122	B2H
314	3101061020000	Chip capacitor 0603 1000PF K 50V	1	C82	B2I
315	3101061020000	Chip capacitor 0603 1000PF K 50V	1	C241	B4J
316	3101061020000	Chip capacitor 0603 1000PF K 50V	1	C185	B5L
317	3101061020000	Chip capacitor 0603 1000PF K 50V	1	C244	T1J
318	3101061020000	Chip capacitor 0603 1000PF K 50V	1	C24	T2H
319	3101061020000	Chip capacitor 0603 1000PF K 50V	1	C243	T4H
320	3101061020000	Chip capacitor 0603 1000PF K 50V	1	C54	T4J
321	3101061030010	Chip capacitor 0603 0.01UF K 25V	1	C202	B2D
322	3101061030010	Chip capacitor 0603 0.01UF K 25V	1	C33	B3B
323	3101061030010	Chip capacitor 0603 0.01UF K 25V	1	C70	B3I
325	3101061030010	Chip capacitor 0603 0.01UF K 25V	1	C305	B3J
324	3101061030010	Chip capacitor 0603 0.01UF K 25V	1	C80	B3J
326	3101061030010	Chip capacitor 0603 0.01UF K 25V	1	C165	B4B

RPU499APlus Part list

RP-499 Part list 1					
No.	**Part No.**	**Materail Name**	**Qty.**	**Ref.No**	**Address**
327	3101061030010	Chip capacitor 0603 0.01UF K 25V	1	C78	B4H
328	3101061030010	Chip capacitor 0603 0.01UF K 25V	1	C173	B4J
329	3101061030010	Chip capacitor 0603 0.01UF K 25V	1	C99	B5G
330	3101061030010	Chip capacitor 0603 0.01UF K 25V	1	C222	B5K
331	3101061030010	Chip capacitor 0603 0.01UF K 25V	1	C10	T1J
332	3101061030010	Chip capacitor 0603 0.01UF K 25V	1	C159	T2L
333	3101061030010	Chip capacitor 0603 0.01UF K 25V	1	C4	T3L
334	3101061030010	Chip capacitor 0603 0.01UF K 25V	1	C5	T3L
335	3101061030010	Chip capacitor 0603 0.01UF K 25V	1	C121	T5F
336	3101061030010	Chip capacitor 0603 0.01UF K 25V	1	C180	T5I
337	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C28	B1G
338	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C39	B1G
339	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C240	B1I
340	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C49	B1J
341	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C194	B2G
342	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C130	B4B
343	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C172	B4C
344	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C95	B4G
346	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C301	B4H
345	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C93	B4H
348	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C302	B4I
347	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C79	B4I
349	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C251	B4K
350	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C181	B4L
351	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C300	B5H
352	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C303	B5H
353	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C233	B5L
354	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C7	T1J
355	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C18	T4G
356	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C178	T4J
357	3101061040010	Chip capacitor 0603 0.1UF K 16V	1	C213	T5I
358	3101061200000	Chip capacitor 0603 12PF J 50V	1	C212	B3D
359	3101061230000	Chip capacitor 0603 0.012UF K 25V	1	C76	B3J
360	3101061230000	Chip capacitor 0603 0.012UF K 25V	1	C77	B4K
361	3101061500010	Chip capacitor 0603 15PF J 50V	1	C120	T5E
362	3101061830000	Chip capacitor 0603 0.018UF K 25V	1	C109	T2K

99 RPU499APlus Part list

RP-499 Part list 1					
No.	**Part No.**	**Materail Name**	**Qty.**	**Ref.No**	**Address**
363	3101062200010	Chip capacitor 0603 22PF J 50V	1	C144	B2F
364	3101062200010	Chip capacitor 0603 22PF J 50V	1	C75	B4G
365	3101062210000	Chip capacitor 0603 220PF J 50V	1	C92	B3H
366	3101062210000	Chip capacitor 0603 220PF J 50V	1	C11	T1B
367	3101062210000	Chip capacitor 0603 220PF J 50V	1	C17	T1C
368	3101062210000	Chip capacitor 0603 220PF J 50V	1	C13	T1D
369	3101062210000	Chip capacitor 0603 220PF J 50V	1	C9	T1F
370	3101062210000	Chip capacitor 0603 220PF J 50V	1	C14	T2A
371	3101062210000	Chip capacitor 0603 220PF J 50V	1	C21	T2F
372	3101062210000	Chip capacitor 0603 220PF J 50V	1	C125	T2K
373	3101062210000	Chip capacitor 0603 220PF J 50V	1	C145	T2K
374	3101062210000	Chip capacitor 0603 220PF J 50V	1	C22	T3F
375	3101062210000	Chip capacitor 0603 220PF J 50V	1	C23	T3F
376	3101062710000	Chip capacitor 0603 270PF J 50V	1	C86	T4E
377	3101062210000	Chip capacitor 0603 220PF J 50V	1	C26	T4F
378	3101062710000	Chip capacitor 0603 270PF J 50V	1	C85	T4F
379	3101062230020	Chip capacitor 0603 0.022UF K 25V	1	C116	B4J
380	3101062700010	Chip capacitor 0603 27PF J 50V	1	C114	B5H
381	3101062700010	Chip capacitor 0603 27PF J 50V	1	C236	T4L
382	3101062700010	Chip capacitor 0603 27PF J 50V	1	C204	T5J
383	3101063330030	Chip capacitor 0603 0.033UF K 16V	1	C171	B4C
384	3101062730020	Chip capacitor 0603 0.027UF J 16V	1	C207	T4L
385	3101062730020	Chip capacitor 0603 0.027UF J 16V	1	C1	T5H
386	3101062730020	Chip capacitor 0603 0.027UF J 16V	1	C2	T5H
387	3101063300000	Chip capacitor 0603 33PF J 50V	1	C97	B3I
388	3101061800010	Chip capacitor 0603 18PF J 50V	1	C127	B5G
389	3101063330030	Chip capacitor 0603 0.033UF K 16V	1	C129	B3C
390	3101063330030	Chip capacitor 0603 0.033UF K 16V	1	C137	B3C
391	3101063330030	Chip capacitor 0603 0.033UF K 16V	1	C152	B4B
392	3101063330030	Chip capacitor 0603 0.033UF K 16V	1	C182	T3K
393	3101063330030	Chip capacitor 0603 0.033UF K 16V	1	C61	T5I
394	3101063920000	Chip capacitor 0603 3900PF K 50V	1	C60	T5I
395	3101063330010	Chip capacitor 0603 0.033UF K 16V	1	C131	B3C
396	3101063930000	Chip capacitor 0603 0.039UF K 16V	1	C139	B4B
397	3101063930000	Chip capacitor 0603 0.039UF K 16V	1	C157	B4C
398	3101063590000	Chip capacitor 0603 3.5PF C 50V	1	C210	B2C

RPU499APlus Part list

RP-499 Part list 1					
No.	**Part No.**	**Materail Name**	**Qty.**	**Ref.No**	**Address**
399	3101060300000	Chip capacitor 0603 3PF C 50V	1	C170	B4E
400	3101064710000	Chip capacitor 0603 470PF K 50V	1	C208	B1B
401	3101064710000	Chip capacitor 0603 470PF K 50V	1	C217	B1B
402	3101064710000	Chip capacitor 0603 470PF K 50V	1	C230	B1B
403	3101064710000	Chip capacitor 0603 470PF K 50V	1	C239	B1C
404	3101064710000	Chip capacitor 0603 470PF K 50V	1	C141	B1F
405	3101064710000	Chip capacitor 0603 470PF K 50V	1	C156	B1F
406	3101064710000	Chip capacitor 0603 470PF K 50V	1	C158	B1F
407	3101064710000	Chip capacitor 0603 470PF K 50V	1	C66	B1G
408	3101064710000	Chip capacitor 0603 470PF K 50V	1	C68	B1I
409	3101064710000	Chip capacitor 0603 470PF K 50V	1	C35	B2B
410	3101064710000	Chip capacitor 0603 470PF K 50V	1	C43	B2B
411	3101064710000	Chip capacitor 0603 470PF K 50V	1	C211	B2C
412	3101064710000	Chip capacitor 0603 470PF K 50V	1	C238	B2C
413	3101064710000	Chip capacitor 0603 470PF K 50V	1	C174	B2F
414	3101064710000	Chip capacitor 0603 470PF K 50V	1	C177	B2F
415	3101064710000	Chip capacitor 0603 470PF K 50V	1	C133	B2G
416	3101064710000	Chip capacitor 0603 470PF K 50V	1	C150	B2G
417	3101064710000	Chip capacitor 0603 470PF K 50V	1	C31	B2I
418	3101064710000	Chip capacitor 0603 470PF K 50V	1	C42	B3A
419	3101064710000	Chip capacitor 0603 470PF K 50V	1	C48	B3A
420	3101064710000	Chip capacitor 0603 470PF K 50V	1	C58	B3B
421	3101064710000	Chip capacitor 0603 470PF K 50V	1	C175	B3C
422	3101064710000	Chip capacitor 0603 470PF K 50V	1	C216	B3D
423	3101064710000	Chip capacitor 0603 470PF K 50V	1	C221	B3D
424	3101064710000	Chip capacitor 0603 470PF K 50V	1	C183	B3F
425	3101064710000	Chip capacitor 0603 470PF K 50V	1	C186	B3F
426	3101064710000	Chip capacitor 0603 470PF K 50V	1	C113	B3G
427	3101054710010	Chip capacitor 0402 470PF K 50V	1	C88	B3I
428	3101064710000	Chip capacitor 0603 470PF K 50V	1	C225	B4A
429	3101064710000	Chip capacitor 0603 470PF K 50V	1	C235	B4A
430	3101064710000	Chip capacitor 0603 470PF K 50V	1	C112	B4D
431	3101064710000	Chip capacitor 0603 470PF K 50V	1	C189	B4F
432	3101064710000	Chip capacitor 0603 470PF K 50V	1	C190	B4F
433	3101064710000	Chip capacitor 0603 470PF K 50V	1	C73	B4G
434	3101064710000	Chip capacitor 0603 470PF K 50V	1	C34	T1H

RPU499APlus Part list

RP-499 Part list 1					
No.	**Part No.**	**Materail Name**	**Qty.**	**Ref.No**	**Address**
435	3101064710000	Chip capacitor 0603 470PF K 50V	1	C29	T2H
436	3101064710000	Chip capacitor 0603 470PF K 50V	1	C151	T2K
437	3101064710000	Chip capacitor 0603 470PF K 50V	1	C304	T2L
438	3101064710000	Chip capacitor 0603 470PF K 50V	1	C19	T4G
439	3101064710000	Chip capacitor 0603 470PF K 50V	1	C20	T4G
440	3101064710000	Chip capacitor 0603 470PF K 50V	1	C25	T4G
441	3101064710000	Chip capacitor 0603 470PF K 50V	1	C27	T4H
443	3101064710000	Chip capacitor 0603 470PF K 50V	1	C44	T4K
444	3101064710000	Chip capacitor 0603 470PF K 50V	1	C51	T4K
442	3101064710000	Chip capacitor 0603 470PF K 50V	1	C6	T4K
445	3101064710000	Chip capacitor 0603 470PF K 50V	1	C12	T4L
446	3101064710000	Chip capacitor 0603 470PF K 50V	1	C3	T5G
447	3101064710000	Chip capacitor 0603 470PF K 50V	1	C229	T5I
448	3101064710000	Chip capacitor 0603 470PF K 50V	1	C47	T5K
449	3101064720000	Chip capacitor 0603 4700PF K 50V	1	C74	B4H
450	3101064730000	Chip capacitor 0603 47NF K 16V	1	C250	B4K
451	3101064730000	Chip capacitor 0603 47NF K 16V	1	C215	B5K
452	3101064730000	Chip capacitor 0603 47NF K 16V	1	C155	T2L
453	3101064730000	Chip capacitor 0603 47NF K 16V GRM39X7R473K16PT	1	C132	T3K
454	3101065620010	Chip capacitor 0603 5600PF K 50V	1	C134	B3C
455	3101065620010	Chip capacitor 0603 5600PF K 50V	1	C124	T2K
456	3101065620010	Chip capacitor 0603 5600PF K 50V	1	C143	T2L
457	3101065690000	Chip capacitor 0603 5.6PF C 50V	1	C226	B2A
458	3101068200000	Chip capacitor 0603 82PF J 50V	1	C306	B5G
459	3101066810020	Chip capacitor 0603 680PF K 50V	1	C197	T3K
460	3101066830000	Chip capacitor 0603 0.068UF K 16V	1	C203	T3L
461	3101068200000	Chip capacitor 0603 82PF J 50V	1	C94	B5G
462	3101071040000	Chip capacitor 0805 0.1UF K 25V	1	C142	B1F
463	3101071040000	Chip capacitor 0805 0.1UF K 25V	1	C105	B4H
464	3101071040000	Chip capacitor 0805 0.1UF K 25V	1	C123	B4H
465	3101071040000	Chip capacitor 0805 0.1UF K 25V	1	C167	T1K
466	3101071050010	Chip capacitor 0805 1UF K 10V	1	C37	B4A
467	3101071540000	Chip capacitor 0805 0.15UF K 25V	1	C107	T2K
468	3101074740000	Chip capacitor 0805 0.47UF K 16V	1	C195	B2E
469	3101074740000	Chip capacitor 0805 0.47UF K 16V	1	C205	B3D
470	3101074740000	Chip capacitor 0805 0.47UF K 16V	1	C234	B4K

RPU499APlus Part list

RP-499 Part list 1					
No.	**Part No.**	**Materail Name**	**Qty.**	**Ref.No**	**Address**
471	3101081050010	Chip capacitor 1206 1UF	1	C55	T5K
472	3102992000049	Trimmer capacitor 3.2*2.5*1.25mm 10P 55V	1	TC3	B2I
473	3102992000049	Trimmer capacitor 3.2*2.5*1.25mm 10P 55V	1	TC2	B3G
474	3210209102019	Framework inductor 1210 1uH	1	L43	T1L
475	3210107560009	Multilayer inductor 0805 56nH	1	L46	B3C
476	3210108230019	Framework inductor 1206 23nH	1	L12	B3H
477	3210108230019	Framework inductor 1206 23nH	1	L13	B3H
478	3213306102000	Multilayer inductor 0603 1uH	1	L16	T5E
525	3213306181009	Multilayer inductor 0603 0.18uH	1	L21	B5E
479	3213306221019	Multilayer inductor 0603 0.22uH	1	L2	T2I
480	3213306221019	Multilayer inductor 0603 0.22uH	1	L1	T4H
481	3213306221019	Multilayer inductor 0603 0.22uH	1	L48	T4H
482	3213306332000	Multilayer inductor 0603 3.3uH	1	L15	B2H
483	3213306332000	Multilayer inductor 0603 3.3uH	1	L10	B3H
484	3213306332000	Multilayer inductor 0603 3.3uH	1	L7	B3H
526	3213306681009	Multilayer inductor 0603 0.68uH	1	L20	B5E
485	3213212102009	Multilayer inductor 1008 1uH	1	L34	B2C
486	3213212561000	Multilayer inductor 1008 0.56uH	1	L4	B1I
487	4511234000009	IF chip 360MHZ F492S-1234A	1	L33	B3E
488	4511234000009	IF chip 360MHZ F492S-1234A	1	L26	B4F
489	3804004030009	Printed filter 485MHz ±70MHz	1	L40	B2B
490	3221506601009	Chip ferrite bead 0603 600Ω±25%	1	L3	B1G
491	3221506601009	Chip ferrite bead 0603 600Ω±25%	1	L29	B3F
492	3221506601009	Chip ferrite bead 0603 600Ω±25%	1	L18	B3G
493	3221506601009	Chip ferrite bead 0603 600Ω±25%	1	L5	B3H
494	3221506601009	Chip ferrite bead 0603 600Ω±25%	1	L9	B4H
495	3221506601009	Chip ferrite bead 0603 600Ω±25%	1	L49	T1J
496	3221506601009	Chip ferrite bead 0603 600Ω±25%	1	L50	T4K
497	3221506601009	Chip ferrite bead 0603 600Ω±25%	1	L52	T5I
498	3221507300009	Chip ferrite bead 0805 30Ω±25%	1	L31	B3D
499	3221507300009	Chip ferrite bead 0805 30Ω±25%	1	L42	B4B
500	3231501540009	Coil 0.50-1.5-4TL	1	L41	B2A
501	3231501540009	Coil 0.50-1.5-4TL	1	L36	B3C
502	3212106100009	Multilayer inductor 1608 10nH	1	L38	B3E
503	3212106100009	Multilayer inductor 1608 10nH	1	L51	B3F
504	3212106101009	Multilayer inductor 0603	1	L14	B2H

RPU499APlus Part list

RP-499 Part list 1					
No.	**Part No.**	**Materail Name**	**Qty.**	**Ref.No**	**Address**
505	3212106101009	Multilayer inductor 0603	1	L8	B2I
506	3212106150009	Multilayer inductor 0603 15nH	1	L25	B2F
507	3212106150009	Multilayer inductor 0603 15nH	1	L28	B3F
508	3212106180009	Multilayer inductor 0603 18nH	1	L22	B1F
509	3212106180009	Multilayer inductor 0603 18nH	1	L6	B1G
510	3212106180009	Multilayer inductor 0603 18nH	1	L19	B2F
511	3212106220009	Multilayer inductor 0603 22nH	1	L45	B3D
512	3212106220009	Multilayer inductor 0603 22nH	1	L17	B3G
513	3212106330009	Multilayer inductor 0603 33nH	1	L32	B3F
514	3212106270009	Multilayer inductor 0603 27nH	1	L23	B4E
515	3212106390000	Multilayer inductor 0603 39nH	1	L47	B4F
516	3212106470009	Multilayer inductor 0603 47nH	1	L37	B3D
517	3212106470009	Multilayer inductor 0603 47nH	1	L44	B3D
518	3212106560000	Multilayer inductor 0603 56nH	1	L11	B2I
519	3212106689009	Multilayer inductor 0603 6.8nH	1	L39	B3C
520	3212106689009	Multilayer inductor 0603 6.8nH	1	L30	B4F
521	3303010500029	Switching diode 1SS372	1	D16	T1K
522	3303010500019	Switching diode 1SS373 15V 150mW	1	D5	T5K
527	3307110400019	LED KPA-3010QGC-VFS green	1	D1	T5H
528	3307150100009	LED BRPG1201W 3.0*2.5mm	1	D2	B4A
529	3303030100019	Switching diode SOT416 1.2V 70V 100mA	1	D18	T4J
530	3303030100029	Switching diode 1.0V 35V 10nA	1	D300	B5I
531	3303030100029	Switching diode 1.0V 35V 10nA	1	D301	B5I
533	3303210200009	Switching dioden 7 3.6P 0.3Ω 6V	1	D10	B2H
532	3303210200009	Switching diode 7 3.6P 0.3Ω 6V	1	D8	B2H
534	3303210200009	Switching diode 7 3.6P 0.3Ω 6V	1	D7	B3H
535	3303210200009	Switching diode 7 3.6P 0.3Ω 6V	1	D9	B3H
536	3303020100029	Switching diode 0.95V 80V 100nA	1	D3	B1G
537	3303020100029	Switching diode 0.95V 80V 100nA	1	D12	B2G
538	3399990000169	Diode MAZ36000L	1	D11	B3H
539	3303020100079	Switching diode 35V 100mA	1	D19	B2C
540	3302020200019	Zener diode 150mW 6.0V 200mA 100Ω	1	D17	B3E
541	3303020100089	Switching diode MA2S07700L	1	D14	B2F
542	3303020100089	Switching diode MA2S07700L	1	D15	B2F
543	3303020100089	Switching diode MA2S07700L	1	D20	B3C
544	3303020100089	Switching diode MA2S07700L	1	D21	B3C

RPU499APlus Part list

RP-499 Part list 1					
No.	**Part No.**	**Materail Name**	**Qty.**	**Ref.No**	**Address**
545	3399990000229	Diode UDZ3.0B 3.2V 5mA	1	D4	B1I
546	3301031200009	Rectifier diode 1.1V 1A 400V	1	D22	T5L
547	3401001000039	Transistor 2SA1362	1	Q35	B4L
548	3408002000039	Transistor 2SC4226-R24	1	Q18	B3G
549	3499000000119	Transistor 200mW 3.2V 50mA 120Ω	1	Q20	B5G
550	3406001000009	Transistor 2SC4988FRTR	1	Q32	B3F
551	3401002000099	Transistor 2SC5108-Y	1	Q26	B1F
552	3401002000099	Transistor 2SC5108-Y	1	Q30	B2F
553	3401002000099	Transistor 2SC5108-Y	1	Q14	B2G
554	3401002000099	Transistor 2SC5108-Y	1	Q21	B3G
555	3411002000009	Transistor 2SC5343EG	1	Q24	B2G
556	3411002000009	Transistor 2SC5343EG	1	Q25	B4B
557	3411002000009	Transistor 2SC5343EG	1	Q28	B4C
558	3411002000009	Transistor 2SC5343EG	1	Q16	T2K
559	3411002000009	Transistor 2SC5343EG	1	Q22	T2K
560	3411002000009	Transistor 2SC5343EG	1	Q39	T5J
561	3503020000109	FET 3 N-CH 5V	1	Q15	B2H
562	3403007000009	Transistor DTA114EE	1	Q17	B4H
563	3403007000029	Transistor DTA114YE	1	Q12	B3B
564	3403007000079	Transistor DTA144EE	1	Q43	B1B
565	3403007000079	Transistor DTA144EE	1	Q302	B4I
566	3403007000079	Transistor DTA144EE	1	Q300	B4J
567	3403008000019	Transistor DTC114EE	1	Q40	B1B
568	3403008000019	Transistor DTC114EE	1	Q2	T4L
569	3403008000019	Transistor DTC114EE	1	Q3	T4L
570	3403008000019	Transistor DTC114EE	1	Q1	T5G
571	3403008000059	Transistor DTC114YE	1	Q4	T2H
572	3403008000079	Transistor DTC144EE	1	Q34	B1D
573	3403008000079	Transistor DTC144EE	1	Q304	B3J
574	3403008000079	Transistor DTC144EE	1	Q303	B4H
575	3403008000079	Transistor DTC144EE	1	Q36	B5L
576	3403008000079	Transistor DTC144EE	1	Q38	B5L
577	3499000000159	(Exclusive)Transistor UMC4N	1	Q23	B3G
578	3403009000019	Transistor UMG3N	1	Q5	B3B
579	3403009000019	Transistor UMG3N	1	Q9	B3B
580	3503040000009	FET UPA572T	1	Q6	B2B

RPU499APlus Part list

RP-499 Part list 1					
No.	**Part No.**	**Materail Name**	**Qty.**	**Ref.No**	**Address**
581	3499000000189	Transistor UFMMT717	1	Q8a	B3B
582	3499000000189	Transistor UFMMT717	1	Q8b	B3B
583	3503010000019	FET 2SJ243-T1	1	Q19	B4G
584	3501010000009	FET 2SK12151GETL	1	Q37	B4F
585	3503020000019	FET 2SK1588-T1	1	Q41	B5K
586	3503020000039	FET 2SK1824-T1	1	Q31	B4C
587	3503020000039	FET 2SK1824-T1	1	Q301	T2L
588	3501020000019	FET 3SK318YB	1	Q42	B3D
589	3501020000019	FET 3SK318YB	1	Q29	B4E
590	3608015000000	Power IC (voltage regulator) XC6201P502PR 5V	1	IC7	T5K
591	3619006005210	Low battery detesting IC R3111N451C 0.7v-10v	1	IC5	T4H
592	3604007004819	PLL MB1511PFV-G-BND 1.1GHz	1	IC6	B1H
593	3605008005019	Operational amplifier NJM2100V	1	IC10	T3K
594	3612031004439	Memory AT24C32AN-10SI-2.7 32K	1	IC4	T2K
595	3605008005079	Operational amplifier NJM2904V	1	IC13	B1C
596	3603002005419	IF processing IC 455MHz	1	IC9	B5H
597	3610004000749	SCM M38268MCL072GP 8-BIT	1	IC1	T3H
598	3602028004599	Audio amplification IC KIA6278F 1W	1	IC12	B4K
599	3613029004629	Base band processing IC DTMF	1	IC3	T2J
600	3605002005459	Operational amplifier TA75W01FU	1	IC14	B4D
601	3605002005459	Operational amplifier TA75W01FU	1	IC8	B4I
602	3609004005179	Reset IC PST9140NR	1	IC2	T5G
603	3701838830009	Crystal 8.388MHz 11*4.6*4.2mm	1	X1	T1I
604	3701012850019	TXCO 12.8MHz NSA0298A	1	X2	B1I
605	3801045530079	Ceramic filter 455KHz ±7.5KHZ CFWC455F	1	CF2	B5I
606	3801045530009	Ceramic filter 455KHz ±4.5K CFWC455G	1	CF1	B5J
607	3104072250000	Ta-capacitor 0805 2.2UF M 4V	1	C187	T1K
608	3104071050000	Ta-capacitor 0805 1UF 6.3V	1	C50	B3B
609	3104071050000	Ta-capacitor 0805 1UF 6.3V	1	C87	B3I
610	3104071060010	Ta-capacitor 0805 10UF M 6.3V	1	C69	B1J
612	3104071560020	Ta-capacitor 0805 15UF M 6.3V	1	C253	B4K
613	3104072250010	Ta-capacitor 0805 2.2UF M 10V	1	C254	B4K
614	3104074750010	Ta-capacitor 0805 4.7UF M 6.3V	1	C65	B1I
615	3104074750010	Ta-capacitor 0805 4.7UF M 6.3V	1	C146	B2G
616	3104081560019	Ta-capacitor 1206 15UF 6.3V	1	C41	B1E
617	3104081560019	Ta-capacitor 1206 15UF 6.3V	1	C63	T1G

RPU499APlus Part list

RP-499 Part list 1					
No.	**Part No.**	**Materail Name**	**Qty.**	**Ref.No**	**Address**
618	3104081060080	Ta-capacitor 1206 10UF M 10V	1	C196	B3E
619	3104081060080	Ta-capacitor 1206 10UF M 10V	1	C154	B4B
620	3104081060080	Ta-capacitor 1206 10UF M 10V	1	C72	B4H
621	3104081060080	Ta-capacitor 1206 10UF M 10V	1	C220	T4I
622	3104082250020	Ta-capacitor 1206 2.2UF K 16V	1	C57	B2J
623	3104084750000	Ta-capacitor 1206 4.7UF M 16V	1	C40	B1G
624	3104084750000	Ta-capacitor 1206 4.7UF M 16V	1	C119	B4D
625	3104084750000	Ta-capacitor 1206 4.7UF M 16V	1	C90	B4I
626	3104084750000	Ta-capacitor 1206 4.7UF M 16V	1	C242	B4J
627	3104084750000	Ta-capacitor 1206 4.7UF M 16V	1	C191	T4L
628	3104084740000	Ta-capacitor 1206 0.47UF±20% 25V	1	C56	B2J
629	3104081040000	Ta-capacitor 1206 0.1UF±20% 35V	1	C59	B2J
630	3104082240000	Ta-capacitor 1206 0.22UF±20% 35V	1	C62	B2J
631	3104202270000	Ta-capacitor C-packing 220UF M 6.3V	1	C218	B5L
632	4100499100200	RPU499PLUS PCB FR4/1.0T/6L/4P	1		

RPV599APlus Adjustment Description

Required Test Equipment

◆ Stabilized Power supply

1. The supply voltage can be changed between 5V and 8V, and the current is 3A or more.
2. The standard voltage is 7.5V.

DC Ammeter

1. Class 1 ammeter (17 ranges and other features).
2. The full scale can be set to either 300mA or 3A.
3. A cable of less internal loss must be used.

Digital Voltmeter

1. Voltage range: FS=18V or so
2. Input resistance: 1MΩ or more

Oscilloscope

1. Measuring range: DC to 30MHz
2. Provides highly accurate measurements for 5 to 25MHz.

Dummy Load

8Ω, 3W or more

RADIO COMMUNICATION TESTER

2955B

Spectrum Analyzer

SG815

◆ Initialization

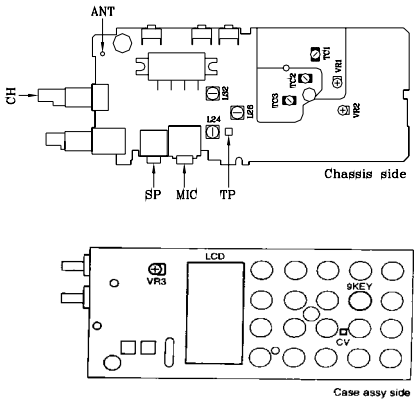
The model of RPV599APlus is 8. Frequency range is 148-174MHz.

Notes:

1. Use a non-conductive rod such as a Bakelite rod for adjustment (especially of trimmers and coils)
2. When adjusting receiver unit, do not send signal. Then the standard signal generator can be protected.
3. The output level of standard signal generator is the maximum.

◆ Adjustment specifications

TC1: Frequency adjustment
TC2: Receive lock voltage adjustment
TC3: Transmit lock voltage adjustment
VR1: CTCSS/CDCSS waveform adjustment
VR2: DEV adjustment
L24:
L26: } B.P.F waveform adjustment
L32:
TP: B.P.F test point
ANT: Antenna connector
SP: Speaker jack



MIC: Microphone jack

CH: Channel selector

VR3: DTMF/TTS DEV adjustment

9 Key: DTMF9 key terminal

CV: Lock voltage test terminal

◆ Use the jig as the following

1. Insert the coaxial antenna connector into the jig.
2. Place the unit on the jig and fix it with four screws.
3. Solder the antenna terminal to the terminal of the unit.

Notes:

1. Do not install the Ni-Cd battery when using the jig for adjustment, repair, or checking. If the Ni-Cd battery is installed, the relay terminal (+) may be damaged.
2. Using an external power supply as the radio power.
3. Please refer to the “adjustment mode” in “Radio Modes” to adjust.

RPV599APlus VCO adjustment

Item	Condition	Measurement		Adjustment		Specifications /Remarks
		Test equipment	Terminal	Parts	Method	
1.Setting	Power supply voltage Battery terminal: 7.5V					
2.VCO lock voltage	1) TX HI	Digital voltmeter	CV	TC3	3.8 ±0.1V	
	2) TX LOW	Digital voltmeter	CV		≥0.7V	Check
	3) RX HI	Digital voltmeter	CV	TC2	3.8 ±0.1V	
	4) RX LOW	Digital voltmeter	CV		≥0.8V	Check

RPV 599APlus Receiver adjustment

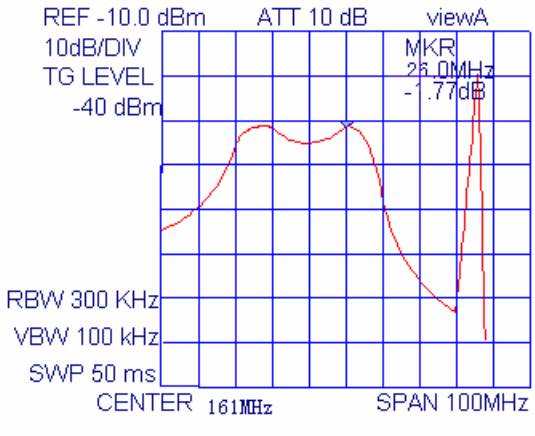


Fig.9

Item	Condition	Measurement		Adjustment		Specifications /Remarks
		Test equipment	Terminal	Parts	Method	
1. Band-pass filter	1) Given frequency 2) Trapezium generator output –40 dBm. Connect the spectrum analyzer to the T.P terminal.	Trapezium generator Spectrum analyzer	ANT TP	L24 L26 L32	Adjust the frequency so that it becomes the spectrum waveform shown above Fig.(See Fig. 9)	
2. Sensitivity	CH: RX LO CH: RX Center CH: RX HI At each frequency: SSG output: -121dBm MOD: 1KHz DEV:±3KHz	SSG Oscilloscope AF.V.M Distortion meter	ANT SP		Check	SINAD: 12dB or higher
3. Signal-to-Noise	SSG output：66dBμV				Check	⩾40 dB
4. Distortion	SSG output：66dBμV				Check	⩽3.5%
5.Squelch	1) Level 9 CH: RX Center SSG output: -117dBm	SSG Oscilloscope AF.V.M Distortion meter	ANT S.P	Channel selector	Level 9 Adjust to close the squelch with the channel selector.	Squelch must be closed.
	2) Level 3 CH: RX Center SSG output:: -128dBm				Level 3 Adjust to close the squelch with the channel selector.	Squelch must be closed.
	3) Refer to adjustment mode.					

RPV599APlus Transmitter adjustment

Item	Condition	Measurement		Adjustment		Specifications /Remarks
		Test equipment	Terminal	Parts	Method	
1.Transmit frequency	CH: TX Center PTT: ON	Frequency counter	ANT	TC1	Adjust to ±200 Hz.	Within ±200Hz
2. CTCSS/ CDCSS Balance	1) Refer to adjustment mode. CTCSS is 67Hz.	Modulation analyzer or linear detector Oscilloscope	ANT	VR1	Adjust VR1 to make the frequency deviation of 67Hz consistent with that of 250.3Hz	67Hz CTCSS
	Refer to adjustment mode. CTCSS is 250.3Hz. LPF: 300Hz					250.3Hz CTCSS
3. Full Power	1) CH: TX Center Battery terminal: 7.5V PTT: ON	Power meter Ammeter	ANT	Channel selector	Turn the channel selector to increase the value. Verify that it is 5W or higher	5W or higher
	2) Refer to adjustment mode					
4. High Power	1) CH: TX Center Battery terminal: 7.5V PTT: ON	Power meter Ammeter	ANT	Channel selector	Adjust it to 5W ± 0.1W with the channel selector.	5W± 0.1W 2.0A or lower
	2) Refer to adjustment mode.					
	3) CH: TX HI, Lo Battery terminal: 7.5V PTT: ON				Check	⩾4.5W 2.0A or lower

5.Low power	1) CH: TX Center, LO PTT: ON	Power meter Amperometer	ANT	Channel selector	Adjust it to 1.0W ± 0.1W with the channel selector.	1.0 ± 0.1W 1.0A or lower
	2) Refer to adjustment Mode.					
	3) CH: TX HI, Lo PTT: ON				Check	0.5~1.5W
6.Modulation	1) CH: TX HI	Modulation analyzer or linear detector Oscilloscope Low-frequency oscillator AF.V.M.	ANT MIC	VR2	Adjust it to ±4KHz ±100Hz MOD METER L.P.F 15KHz	4.0KHz ±100Hz
	2) Low-frequency oscillator output: 1 KHz 50mV PTT:ON					
	3) CH: TX Center Low-frequency oscillator output 20 dBm 1KHz: 10mV				Check	±2.2KHz ~±3.6KHz
7. Modulation distortion	Low-frequency oscillator output 1KHz: 10mV				Check	⩽3.5%
8.Transmit S/N	CH: TX Center HPF: 300Hz LPF: 3KHz DEMP: 750μs	Modulation analyzer or linear detector Oscilloscope Low-frequency oscillator AF.V.M	ANT MIC		Check	40dB or higher
9.CTCSS DEV (wideband)	1) CH: TX Center	Modulation analyzer or linear detector Oscilloscope Low-frequency oscillator AF.V.M	ANT MIC	Channel selector	Adjust it to 0.7KHz±50Hz with the channel selector.	0.7KHz ±50Hz
	2) CTCSS: 151.4Hz					
	3) Refer to adjustment mode (wideband). LPF: 300Hz					
10.CDCSS DEV (wideband)	1) CH: TX Center	Modulation analyzer or linear detector Oscilloscope Low-frequency oscillator AF.V.M	ANT MIC	Channel selector	Adjust it to 0.7KHz±50Hz with the channel selector.	0.7KHz ±50Hz
	2) CDCSS: 023					
	3) Refer to adjustment mode (wideband). LPF: 300Hz					
11.CTCSS DEV (narrowband)	1) CH: TX Center	Modulation analyzer or linear detector Oscilloscope Low-frequency oscillator AF.V.M	ANT MIC	Channel selector	Adjust it to 0.4KHz±50Hz with the channel selector.	0.4KHz ±50Hz
	2) CTCSS: 151.4Hz					
	3) Refer to adjustment mode (wideband). LPF: 300Hz					
12. CDCSS DEV (narrowband)	1) CH: TX Center	Modulation analyzer or linear detector Oscilloscope Low-frequency oscillator AF.V.M	ANT MIC	Channel selector	Adjust it to 0.4KHz±50Hz with the channel selector.	0.4KHz ±50Hz
	2) CDCSS: 023					
	3) Refer to adjustment mode (wideband). LPF: 300Hz					

13. DTMF/TTS DEV (wideband)	1) CH: TX Center 2) use the [9] key: PTT: ON LPF: 15KHz	Modulation analyzer or linear detector Oscilloscope	ANT	VR3	Adjust it to 3.5KHz±0.5 KHz	3.5KHz ±0.5KHz
14. DTMF/TTS DEV (narrowband)	1) CH: TX Center 2) use the [9] key: PTT: ON LPF: 15KHz	Modulation analyzer or linear detector Oscilloscope	ANT	check	Adjust it to 1.8KHz±0.5 KHz	1.8KHz ±0.5KHz
15. Battery warning	Battery terminal: 5.8V 2) Refer to adjustment mode. 3) Battery terminal: 6.3V PTT: ON			Channel selector	Adjust so that the LED flashes by using the channel selector. Verify that the LED glows.	The LED flashes. Check

RPU499APlus Adjustment Description

Required Test Equipment

◆ Stabilized Power supply

1. The supply voltage can be changed between 5V and 8V, and the current is 3A or more.
2. The standard voltage is 7.5V.

◆ DC Ammeter

1. Class 1 ammeter (17 ranges and other features).
2. The full scale can be set to either 300mA or 3A.
3. A cable of less internal loss must be used.

◆ Digital Voltmeter

1. Voltage range: FS=18V or so
2. Input resistance: 1MΩ or more

◆ Oscilloscope

1. Measuring range: DC to 30MHz
2. Provides highly accurate measurements for 5 to 25MHz.

◆ Dummy Load

8Ω, 3W or more

◆ Synthetical Test

2955B

◆ Scanner

SG815

Initialization

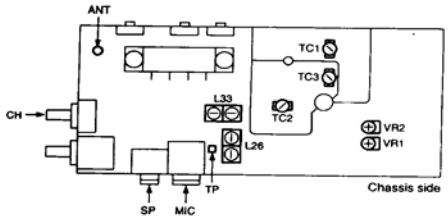
The model of RPU499APlus is 11. Frequency range is 450-470MHz.

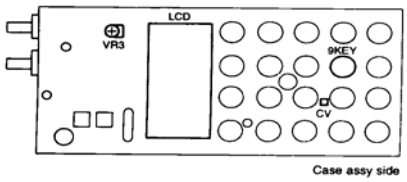
Notes:

1. Use a non-conductive rod such as a Bakelite rod for adjustment (especially of trimmers and coils)
2. When adjusting receiver unit, do not send signal. Then the standard signal generator can be protected.
3. The output level of standard signal generator is the maximum.

Adjustment specifications:

TC1: Frequency adjustment
TC2: Transmit lock voltage adjustment
TC3: Receive lock voltage adjustment
VR1: CTCSS/CDCSS balance adjustment
VR2: DEV adjustment
L26: } B.P.F waveform adjustment
L33: }
TP: B.P.F test point
ANT: Antenna terminal
SP: Speaker jack
MIC: Microphone jack
CH: Channel selector
VR3: DTMF/TTS DEV adjustment
9 Key: DTMF9 key terminal
CV: Lock voltage test terminal





Notes:

1. Do not install the Ni-Cd battery when using the jig for adjustment, repair, or checking. If the Ni-Cd battery is installed, the relay terminal (+) may be damaged.
2. Using an external power supply as the radio power. (The relay terminal is “+” and jig (chassis) “-“.)
3. Please refer to the “adjustment mode” in “Radio Modes” to adjust.

◆ RPU499APlus VCO adjustment

Item	Condition	Measurement		Adjustment		Remarks
		Test equipment	Terminal	Parts	Specifications	
1.Setting	Power supply voltage: 7.5V					
2.VCO lock voltage	1) CH: TX HI	Digital voltmeter	CV	TC3	3.5V± 0.3V	
	2) CH: TX LO	Digital voltmeter	CV		≥0.7V	Check
	3) CH: RX HI	Digital voltmeter	CV	TC2	3.5V± 0.3V	
	4) CH: RX LO	Digital voltmeter	CV		≥0.8V	Check

◆ RPU499APlus Receiver adjustment

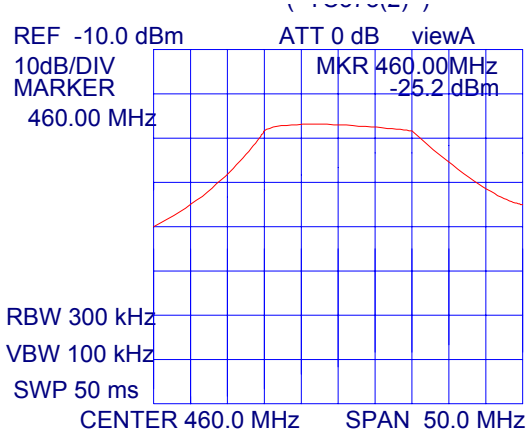


Fig. 10

Item	Condition	Measurement		Adjustment		Remarks
		Test equipment	Terminal	Parts	Specifications	
1. Band-pass filter	1) Given frequency 2) Trapezium generator output –40 dBm Connect the spectrum analyzer to the T.P terminal.	Trapezium generator Spectrum analyzer	ANT T.P	L26 L33	Adjust according to the spectrum waveform	See the figure above
2.Sensitivity	CH: RX LO CH: RX CENTER CH: RX HI At each frequency: SSG output: -120dBm MOD: 1KHz DEV:±3KHz	SSG Oscilloscope AF.V.M Distortion meter	ANT S.P		Check	SINAD: 12dB or higher
3.S/N	SSG output：66dBμV				Check	≥40 dB
4. Distortion	SSG output：66dBμV				Check	≤5%
5.Squelch	1) Level 9 CH: RX Center SSG output: -119dBm	SSG Oscilloscope AF.V.M Distortion meter	ANT S.P	Channel selector	Level 9 Set with the channel selector. Adjust to close the squelch with the channel selector.	The squelch must be closed.
	2) Level 3 CH: RX Center SSG output: -123dBm				Level 3 Adjust to close the squelch with the channel selector.	The squelch must be closed.
	3) Refer to adjustment mode.					

◆ RPU499APlus Transmitter adjustment

Item	Condition	Measurement		Adjustment		Specifications
		Test equipment	Terminal	Parts	Method	
1.Transmit frequency	CH: TX Center PTT: ON	Frequency counter	ANT	TC1	Adjust to ±200 Hz.	Within±200Hz
2. CTCSS/ CDCSS Balance	1) Refer to adjustment mode. CTCSS is 67Hz.	Modulation analyzer or linear detector Oscilloscope	ANT	VR1	Adjust VR1 so that the frequency deviation of 67Hz CTCSS is equal to that of 250.3Hz CTCSS and the difference is no more than 50Hz	67Hz CTCSS
	Refer to adjustment mode. CTCSS is 250.3Hz. LPT: 300Hz					250.3Hz CTCSS
3. Full Power	1) CH: TX Center Battery terminal: 7.5V PTT: ON	Power meter Ammeter	ANT	Channel selector	Adjust it to more than 4W with the channel selector	4W or higher
	2) Refer to adjustment mode.					
4.High Power	1) CH: TX Center Battery terminal: 7.5V PTT: ON	Power meter Ammeter	ANT	Channel selector	Adjust it to 4W ± 0.3W with the channel selector.	4W ± 0.3W 2.0A or lower
	2) Refer to adjustment mode.					
	3) CH: TX HI, Lo Battery terminal: 7.5V PTT: ON				Check	⩾4W 2.0A or lower
5. Low Power	1) CH: TX Center PTT: ON	Power meter Ammeter	ANT	Channel selector	Adjust it to 1.0W ± 0.1W with the channel selector.	1.0W±0.1W 1.0A or lower
	2) Refer to adjustment mode.					
	3) CH: TX HI, Lo PTT: ON				Check	0.5W~1.5W
6. Modulation (wide)	1) CH: TX HI	Modulation analyzer or linear detector Oscilloscope Low-frequency oscillator AF.V.M.	ANT MIC	VR2	Adjust it to 3.9KHz±50Hz MOD METER L.P.F 15KHz	4.0KHz±100Hz
	2)Low-frequency oscillator output: 1 KHz 50mV PTT:ON					
	3) CH: TX Center Low-frequency oscillator output 20 dBm 1KHz: 10mV				Check	2.2KHz ~±3.6KHz
7. Modulation distortion	Low-frequency oscillator output: 1 KHz 10mV				Check	⩽5%
8.Transmit S/N	CH: TX Center HPF: 300Hz LPF: 3KHz DEMP: 750 μ s	Modulation analyzer or linear detector Oscilloscope Low-frequency oscillator AF.V.M	ANT MIC		Check	40dB or higher

9.CTCSS DEV (wide)	1) CH: TX Center 2) CTCSS: 151.4Hz 3) Refer to adjustment mode (wide). LPF: 300Hz	Modulation analyzer or linear detector Oscilloscope Low-frequency oscillator AF.V.M	ANT MIC	Channel selector	Adjust it to 0.75KHz ± 50Hz with the channel selector.	0.75KHz± 50Hz
10. CDCSS DEV (wide)	1) CH: TX Center 2) CDCSS: 023 3) Refer to adjustment mode (wide). LPF: 300Hz	Modulation analyzer or linear detector Oscilloscope Low-frequency oscillator AF.V.M	ANT MIC	Channel selector	Adjust it to 0.75KHz ± 50Hz with the channel selector.	0.75KHz± 50Hz
11. CTCSS DEV (narrow)	1) CH: TX Center 2) CTCSS: 151.4Hz Refer to adjustment mode (narrow). LPF: 300Hz	Modulation analyzer or linear detector Oscilloscope Low-frequency oscillator AF.V.M	ANT MIC	Channel selector	Adjust it to 0.4KHz±50Hz with the channel selector.	0.4KHz ± 50Hz
12. CDCSS DEV (narrow)	1) CH: TX Center 2) CDCSS: 023 3) Refer to adjustment mode (narrow). LPF: 300Hz	Modulation analyzer or linear detector Oscilloscope Low-frequency oscillator AF.V.M	ANT MIC	Channel selector	Adjust it to 0.4KHz±50Hz with the channel selector.	0.4KHz ± 50Hz
13. DTMF/TTS DEV (wide)	1) CH: TX Center 2) Use [9] key: PTT: ON LPF: 15KHz	Modulation analyzer or linear detector	ANT	VR3	Adjust it to 3.5KHz±0.5KHz	3.5KHz ± 0.5KHz
14. DTMF/TTS DEV (narrow)	1) CH: TX Center 2) Set using the [9] key: PTT: ON LPF: 15KHz	Modulation analyzer or linear detector	ANT	Check	Adjust it to 1.8KHz±0.5KHz	1.8KHz ± 0.5KHz
15.Battery warning	1) Battery terminal: 5.8V 2) Refer to adjustment mode. 3) Battery terminal: 6.3V PTT: ON			Channel selector	Adjust so that the LED flashes using the channel selector. Verify that the LED glows.	The LED flashes. Check

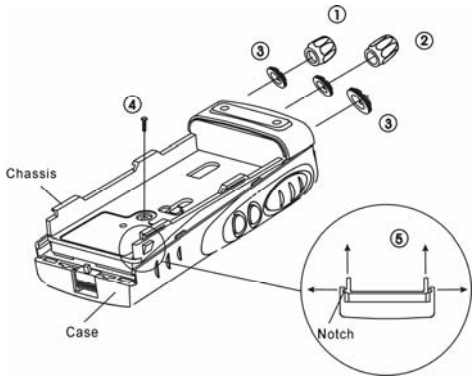
Pin function of CPU

Pin No.	Port name	I/O	Function
1	UL	I	PLL unlock detection pin
2	SD	I	Serial data from DTMF IC
3	PD	O	DTMF IC power down pin H: Power down
4	TIB1	I	CTCSS external circuit center point input
5	T1	I	CTCSS signal input
6	BUSY	I	Busy input
7	BATT	I	Battery voltage detection
8	TCIN	I	TCXO voltage input
9	APC	O	Auto power control D/A output
10	DTMF	O	DTMF output
11	2TN	I	2-Tone input
12	MUTE	O	Reception audio mute and Mic mute H: Mic mute L: Reception audio mute
13	RED	O	Red LED control H: Light
14	GRN	O	Green LED control H: Light
15	LAMP	O	LED lamp control H: Light
16	TO	O	CTCSS/CDCSS output
17	EP	O	PLL IC enabled PLL IC latches data when this signal high
18	PTT	I	[PTT] key input Connected to RXD
19	TXD	O	RS-232C output Connected to SP/MIC test (REM)
20	RXD	I	RS-232C input Connected to [PTT] line
21	4.19	O	8.38/2=4.19MHz output
22	STD	I	Signal input interrupt from DTMF IC
23	UP	I	Encoder input
24	DN	I	Encoder input
25	TC3	O	Switch port for temperature correction
26	TC2	O	Switch port for temperature correction
27	TC1	O	Switch port for temperature correction
28	KO3	O	Key matrix output Nch open drain output
29	KO2	O	Key matrix output Nch open drain output
30	KO1	O	Key matrix output Nch open drain output
31	KO0	O	Key matrix output Nch open drain output
32	INTO	I	Microcomputer stop input
33	RESET	I	Microcomputer reset pin
34	NC	I	Not connected
35	NC	O	Not connected
36	XIN	I	8.388608MHz oscillator
37	XOUT	O	8.388608MHz oscillator
38	VSS	-	Ground

39	BS	O	Beet shift pin H: Shift
40	LAMP	I	[LAMP] key input
41	MONI	I	[MONI] key input
42	KI1	I	Key matrix input
43	KI0	I	Key matrix input
44	KI2	I	Key matrix input
45	KI3	I	Key matrix input
46	KI4	I	Key matrix input
47	DAT	O	Common data output
48	SDA	I/O	EEPROM data line
	L/K	I	[LAMP]+[key] enable judgement
49	ECK	O	EEPROM clock line
50	SAVE	O	Battery save line (5c) control H: Save off L: Save on
51	CLK	O	Common clock output
52	5TC	O	Transmission power supply (5T) control H: Power supply on
53	RX	O	TX/RX VCO select H:RX L: TX
54	5RC	O	Reception power supply (5R) control L: Power supply on
55	AFC0	O	AF amp power supply H: Power supply on
56	BN_BAND	O	Wide/narrow band control H : Narrow L: Wide
57-64	S31-S24	O	LCD segment
65 ~ 88	S23-S0	O	LCD segment
89	VDD	-	Microcomputer power supply, 5V input
90	VREF	I	A/D conversion reference voltage; connected to Vcc
91	AVSS	I	A/D converter power supply; connected to Vss
92	COM3	O	LCD common
93	COM2	O	LCD common
94	COM1	O	LCD common
95	COM0	O	LCD common
96	VL3	I	LCD drive power supply Vcc
97	VL2	I	2/3 VL3
98	NC	I	Not connected
99	NC	I	Not connected
100	VL1	I	1/3 VL3

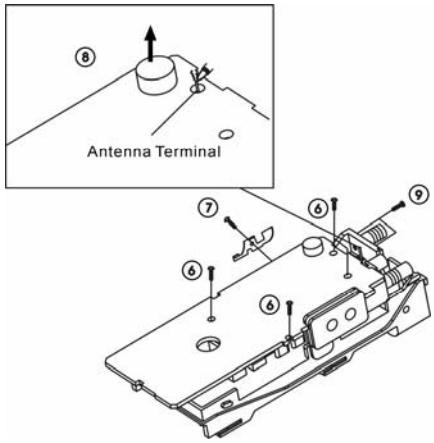
Disassembly and Reassembly for Repair

Separate the case assembly from the aluminum chassis



1. Remove the two knobs ①and ②;
2. Remove three round nuts（③）;
3. Remove the one screw（④）;
4. Expand the right and left sides of the bottom of the case assembly, lift the chassis, and remove it from the case assembly (⑤).

Separate the chassis from the unit



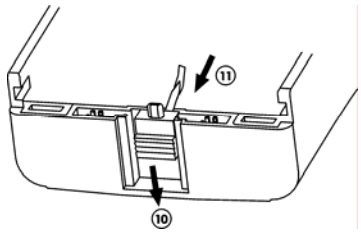
1. Remove the four screws（⑥）;
2. Remove the one screw（⑦）and the fitting;
3. Remove the solder from the antenna terminal using a soldering iron and lift the unit off.(⑧)
4. Remove the two screws（⑨）and remove the antenna connector.

Note:

When reassembling the unit in the chassis, be sure to solder the antenna terminal.

Remove the lever

Raise the lever on the lower case（⑩）. Insert a small normal screwdriver into the clearance between the case and lever, open the case carefully (11), and lift the lever off.



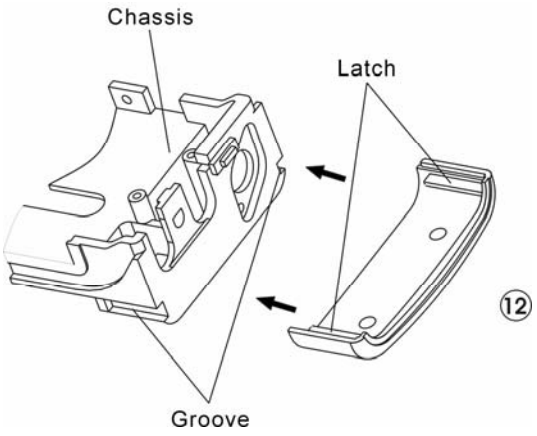
Note: Do not force to separate the case from the lever.

Protecting the ground terminal of the RF power amplifier

Take special care to prevent damage to the ground terminal of the RF power amplifier. Do not attach the silicon compound coated on the RF power amplifier to the ground terminal.

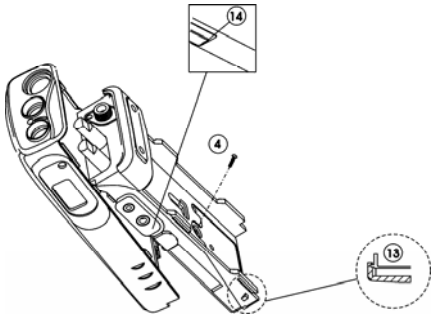
Reassembling the panel

When assembling the panel, push in the panel to the aluminum chassis with fingers (12),fit the claw on the panel into the notch in the chassis until the panel lies in the right place.



Reassembly the case assembly and the aluminum chassis

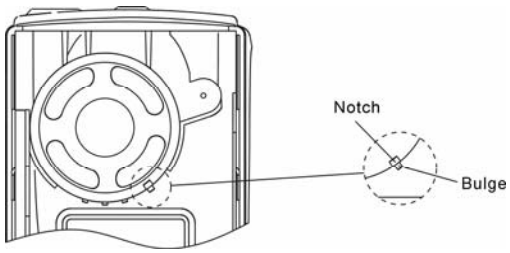
1. When assembling the chassis into the case assembly, insert the channel selector knob and antenna pedestal on the chassis into the hole on the case, and push in the chassis slowly.
2. Tighten the one screw（④）.



Note:
After assembling the chassis, check whether the claw shown in Fig.13 fits into the notch in verify that the packing does not protrude to the outside(14).

Speaker installation location

1. When installing the speaker, align the notch in the speaker with the line on the case assembly.
2. After determining the installation location, push in the speaker gently.



Do not lose the inter-connector

Do not lose the inter-connector because it may fall when disassembling, reassembling, or adjusting the case assembly, chassis, or unit.

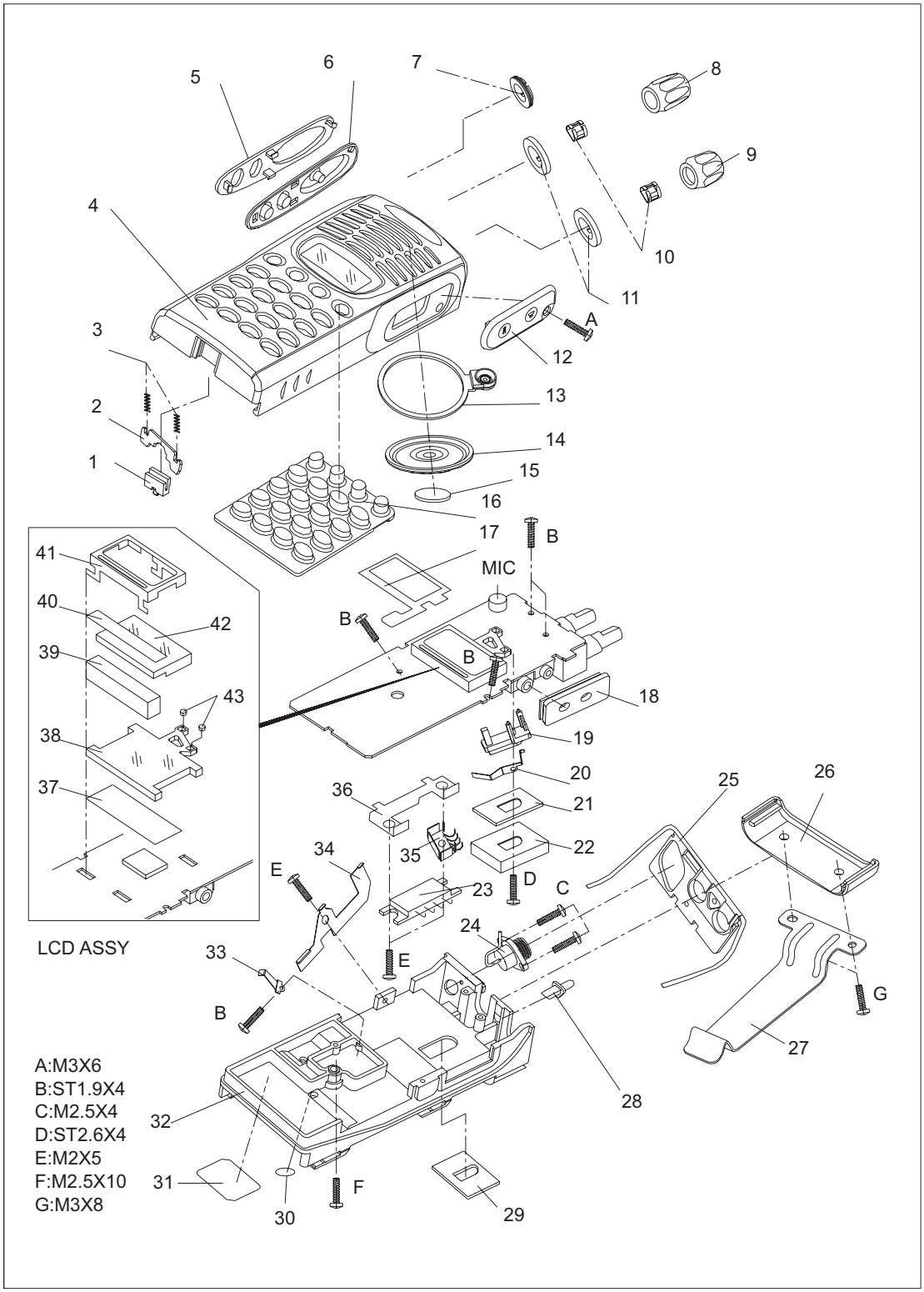
Description of main component

Ref. No.	Parts NO.	Description
IC1	M38268MCL072GP	IC, MICRO PROCESSOR
IC2	PST9140NR	IC, RESET SWITCH
IC3	LC73881M	IC, DTMF DECODER
IC4	AT24C32AN	IC, EEPROM
IC5	R3111N451C	IC, VOLTAGE DETECT
IC6	MB1511PFV-G-BND	IC, PHASE LOCKED LOOP SYSTEM
IC7	XC6201P502PR	IC, VOLTAGE REGULATER
IC8	TA75W01FU	IC, AUDIO AMP ACTIVE FILTER
IC9	TA31136FN	IC, IF SYSTEM
IC10	NJM2100V	IC, AUDIO AMP
IC11	RA07M4047M	IC, RF POWER AMP
IC11	RA07M1317M	IC, RF POWER AMP
IC12	KIA6278F	IC, AUDIO POWER AMP
IC13	NJM2904V	IC, APC
IC14	TA75W01FU	IC, ACTIVE FILTER
Q1~Q3	DTC114EE	TRANSISTOR, DC SWITCH
Q4	DTC114YE	TRANSISTOR, CLOCK FREQUENCY SHIFT
Q5	UMG3N	TRANSISTOR, DC SWITCH
Q6	UPA572T	FET, DC SWITCH
Q8	FMMT591	TRANSISTOR, DC SWITCH
Q9	UMG3N	TRANSISTOR, DC SWITCH
Q12	DTA114YE	TRANSISTOR, DC SWITCH
Q14	2SC5108	TRANSISTOR, RF AMP（499）（锁相环反馈）
Q14	2SC4619TLP	TRANSISTOR, RF AMP（599）
Q15	DTA114EE	TRANSISTOR, AF MUTE SWITCH(V)
Q17	DTA114EE	TRANSISTOR, AF MUTE SWITCH(U)
Q15	2SK508NV（K52）	FET, VCO RX（499）
Q16	2SK1875(V)	FET, VCO RX（599）
Q16	2SC5343EG(S)	TRANSISTOR, ACTIVE FILTER(499)
Q17	2SC5343EG(S)	TRANSISTOR, ACTIVE FILTER(599)
Q18	2SC4226(R24)	TRANSISTOR, VCO TX
Q18	2SK1875(V)	TRANSISTOR, VCO TX
Q19	2SJ243	FET, DC SWITCH
Q20	2SC5108(Y)	TRANSISTOR, RF BUFFER AMP(599)
Q21	2SC5108(Y)	TRANSISTOR, RF BUFFER AMP(499)
Q21	2SC5108(Y)	TRANSISTOR, IF AMP(599)
Q20	2SC4619TLP	TRANSISTOR, IF AMP(499)
Q22	2SC5323EG(S)	TRANSISTOR, ACTIVE FILTER(V/U)
Q23	UMC4	TRANSISTOR, DC SWITCH(499 无)

Q24	2SC5323EG(S)	TRANSISTOR, RIPPLE FILTER
Q25	2SC5323EG(S)	TRANSISTOR, ACTIVE FILTER
Q26	2SC5108(Y)	TRANSISTOR, RF AMP
Q28	2SC5323EG(S)	TRANSISTOR, ACTIVE FILTER
Q29	3SK318	FET, MIXER
Q30	2SK1824	FET, AUDIO MUTE SWITCH(599)
Q31	2SK1824	FET, AUDIO MUTE SWITCH(499)
Q31	2SC4988	TRANSISTOR, TX DRIVE(599)
Q31	2SK1824	TRANSISTOR, TX DRIVE(499)
Q32	DTA144EE	TRANSISTOR, AUDIO MUTE SWITCH
Q34	2SA1362(GR)	TRANSISTOR, DC SWITCH
Q35 Q36	DTC144EE	TRANSISTOR, DC SWITCH
Q37	2SC5343EG	TRANSISTOR, AUDIO MUTE SWITCH(599)
Q39	2SC5343EG	TRANSISTOR, AUDIO MUTE SWITCH(499)
Q38	DTC114EE	TRANSISTOR, DC SWITCH(599)
Q40	DTC114EE	TRANSISTOR, DC SWITCH(499)
Q39	2SK1215(E)	FET, RF AMP
Q40	2SK1588	FET, AUDIO MUTE SWITCH
Q41	DTA144EE	TRANSISTOR, DC SWITCH
D1	KPA-3010QGC-VF	LED, LCD BACKLIGHT
D2	BRPG1201W	LED, TX BUSY LED
D3	MA2S111	DIODE, UNLOCK DETECT
D4	UDZ3.0B	VARIABLE CAPACITANCE DIODE, FREQUENCY CON
D5	1SS373	DIODE, REVERSE-FLOW PREVENTION
D7~D11010	1SV283	VARIABLE CAPACITANCE DIODE, FREQUENCY CON
D11	1SV214	VARIABLE CAPACITANCE DIODE, TX MODULATION
D12	MA2S111	DIODE, CURRENT STEERING(499)
D15	MA2S07700L	DIODE, LIMITTER
D16,D17	MA2S077	DIODE, RF SWITCH
D19	1SS372	DIODE, AGC DETECT(599)
D16	1SS372	DIODE, AGC DETECT(499)
D20	MA8062	ZENER DIODE, VOLTAGE PROTECTION
D21	DAN222	DIODE, REVERCE PROTECTION(599)
D18	DAN222	DIODE, REVERCE PROTECTION(499)
D19	MA2Z07700L	DIODE, ANT SWITCH(499)
D22	MA2Z07700L	DIODE, ANT SWITCH(599)
D23	MA2S077	DIODE, ANT SWITCH（599）
D22	1SR154-400	DIODE, REVERCE PROTECTION（499）
D24	1SR154-400	DIODE, REVERCE PROTECTION（599）
Q30	2SK1824	FET, AUDIO MUTE SWITCH(599)

Q31	2SK1824	FET, AUDIO MUTE SWITCH(499)
Q31	2SC4988	TRANSISTOR, TX DRIVE(599)
Q31	2SK1824	TRANSISTOR, TX DRIVE(499)
Q32	DTA144EE	TRANSISTOR, AUDIO MUTE SWITCH
Q34	2SA1362(GR)	TRANSISTOR, DC SWITCH
Q35 Q36	DTC144EE	TRANSISTOR, DC SWITCH
Q37	2SC5343EG	TRANSISTOR, AUDIO MUTE SWITCH(599)
Q39	2SC5343EG	TRANSISTOR, AUDIO MUTE SWITCH(499)
Q38	DTC114EE	TRANSISTOR, DC SWITCH(599)
Q40	DTC114EE	TRANSISTOR, DC SWITCH(499)
Q39	2SK1215(E)	FET, RF AMP
Q40	2SK1588	FET, AUDIO MUTE SWITCH
Q41	DTA144EE	TRANSISTOR, DC SWITCH
D1	KPA-3010QGC-VF	LED, LCD BACKLIGHT
D2	BRPG1201W	LED, TX BUSY LED
D3	MA2S111	DIODE, UNLOCK DETECT
D4	UDZ3.0B	VARIABLE CAPACITANCE DIODE, FREQUENCY CON
D5	1SS373	DIODE, REVERSE-FLOW PREVENTION
D7~D11010	1SV283	VARIABLE CAPACITANCE DIODE, FREQUENCY CON
D11	1SV214	VARIABLE CAPACITANCE DIODE, TX MODULATION
D12	MA2S111	DIODE, CURRENT STEERING(499)
D15	MA2S07700L	DIODE, LIMITTER
D16,D17	MA2S077	DIODE, RF SWITCH
D19	1SS372	DIODE, AGC DETECT(599)
D16	1SS372	DIODE, AGC DETECT(499)
D20	MA8062	ZENER DIODE, VOLTAGE PROTECTION
D21	DAN222	DIODE, REVERCE PROTECTION(599)
D18	DAN222	DIODE, REVERCE PROTECTION(499)
D19	MA2Z07700L	DIODE, ANT SWITCH(499)
D22	MA2Z07700L	DIODE, ANT SWITCH(599)
D23	MA2S077	DIODE, ANT SWITCH（599）
D22	1SR154-400	DIODE, REVERCE PROTECTION（499）
D24	1SR154-400	DIODE, REVERCE PROTECTION（599）
Q300	DTA144EE	TRANSISTOR, DC SWITCH
Q301	2SK1824	TRANSISTOR, DC SWITCH
Q302	DTA144EE	TRANSISTOR, DC SWITCH
Q303	DTC144EE	TRANSISTOR, DC SWITCH
Q304	DTC144EE	TRANSISTOR, DC SWITCH

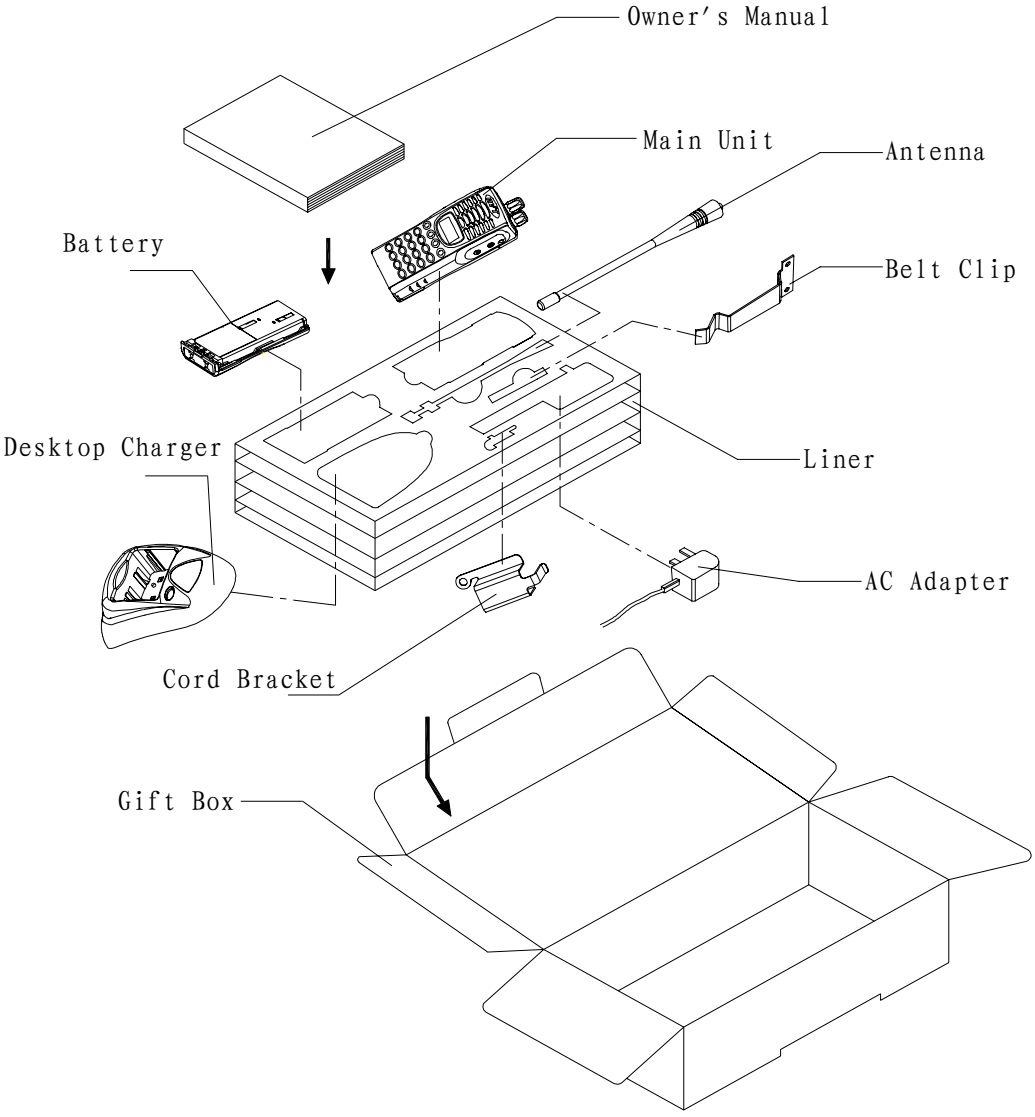
Exploded View



Specification

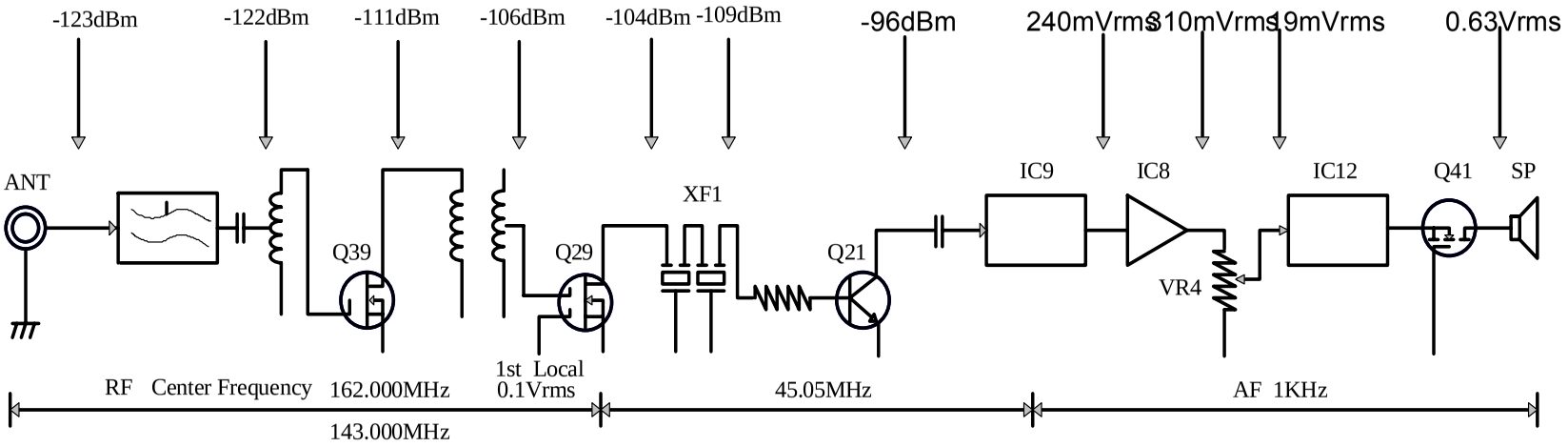
Item	RPV599APlus RPU499APlus
Frequency Range	148 -174MHz 450-470MHz
Number of Channels	99
Channel Spacing	25KHz/12.5KHz
Operation Voltage	7.5V
Battery Life	More than 8 hours
Operation Temperature	-30℃～60℃
Sensitivity	0.25 μV/ 0.28 μV
Modulation Acceptance	±7KHz/ ±3.5KHz
Channel Selectivity	More than 70 dB /60dB
Intermodulation	More than 65dB/ 60dB
Spurious Response	More than 65dB
Audio Power Output	500mW (distortion less than 5%)
Frequency Stability	$\pm 5\times 10^{-6}$
RF Power Output（High/Low）	5W/1W 4W/1W
Spurious and Harmonics	Less than –70dB/–60dB
Modulation	16KØF3E
Max. Frequency Deviation	±5 KHz/ ±2.5 KHz
FM Noise	-45dB
Modulation Distortion	Less than 5%

Packing


Owner's Manual
Main Unit
Antenna
Battery
Belt Clip
Desktop Charger
Liner
AC Adapter
Cord Bracket
Gift Box

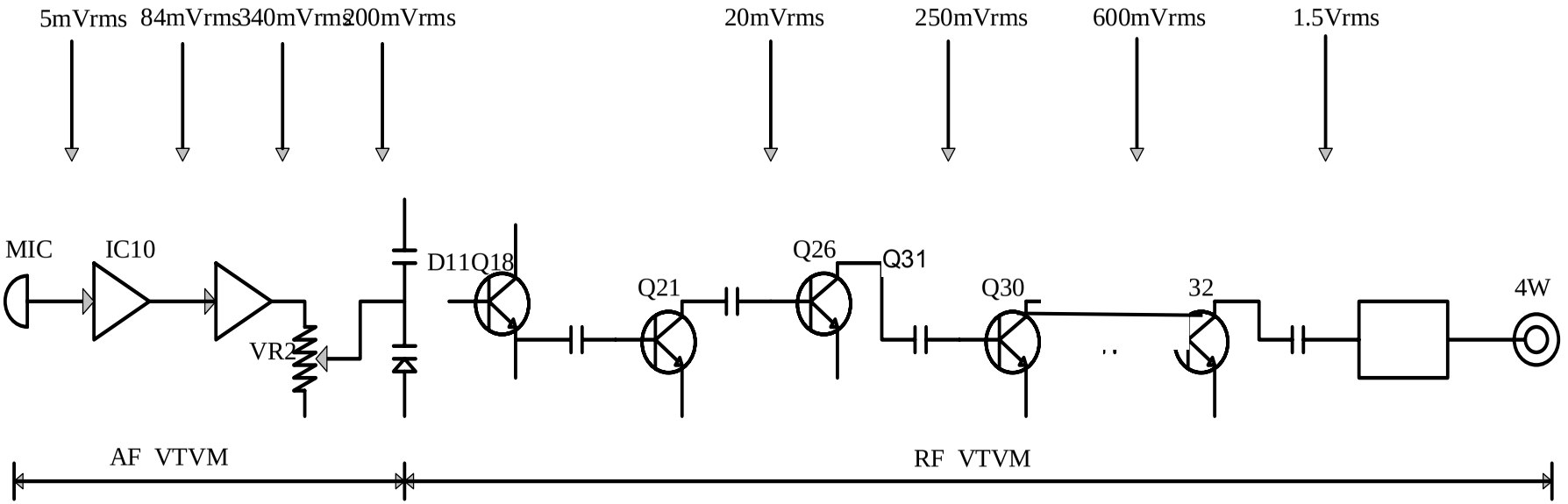
RPV599APlus Level Diagram

Rx Section



The supply voltage is 7.5V. The input signal in an RF level is set of f=1KHz and ±3KHzDEV, and the output signal in an AF level is adjusted to 0.63V in a load of 8Ω. The RF and IF level is a SINAD input level of 12dB in which signal are input from SSG to each point through a 1000pF capacitor.

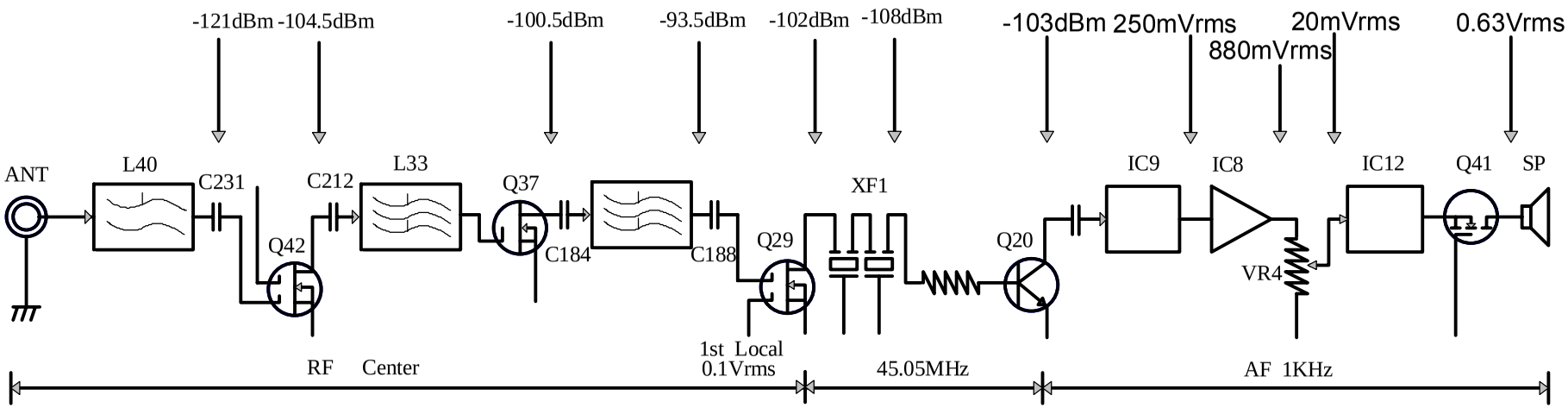
Tx Section



The AF level is measured by an AF VTVM. The RF level is measured by an RF VTVM. Each of levels measured at high impedance. The transmitting frequency is 162.000MHz and 143.000MHz. The audio generator is controlled so that the input signal at MIC pin has a deviation of ±3KHz for a modulation frequency of 1KHz.

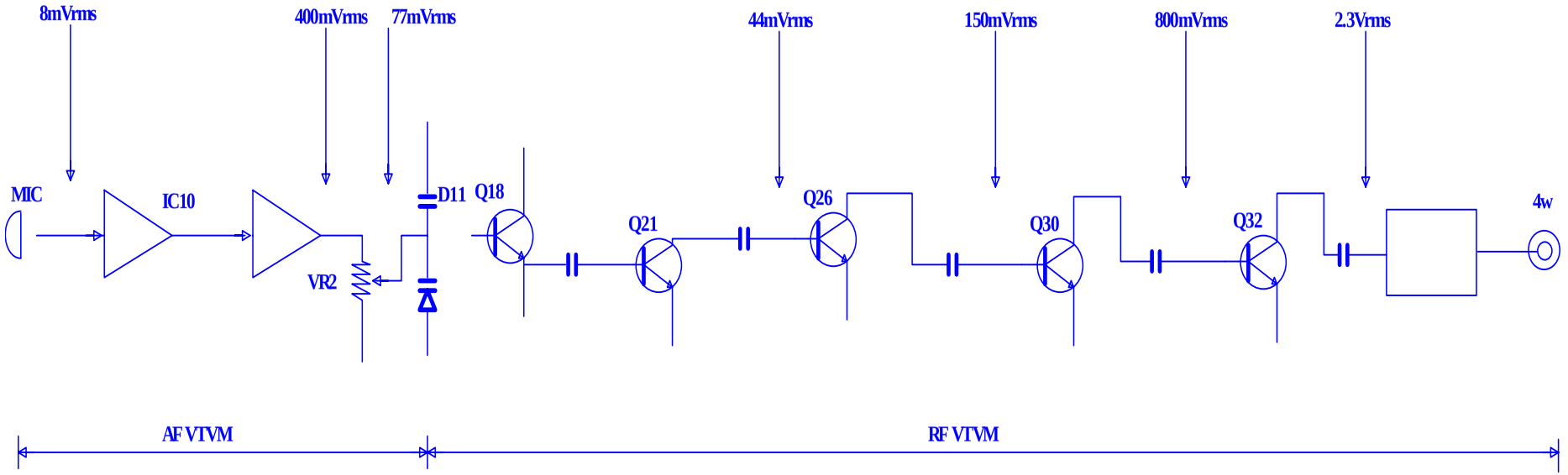
RPU499APlus Level Diagram

Rx Section



Each of the levels plotted from RF to the first IF is the level that can provide a 12dB SINAD for an SSG signal through a 470pFb ceramic capacitor. The first local level is the value measured by an RF VTVM. The AF level is the value measured by an AF VTVM when an SSG signal of -53dBm modulated with 1KHz MOD and ±3KHz(K，M，TM type)，±1.5KHz ((N)K，(N)M type)DEV, is received and the AF output is adjusted to 0.63Vrms(8Ω) using the AF volume control.

TX Section



The AF level is measured by an AF VTVM. The RF level is measured by an RF VTVM. Each of levels measured at high impedance. The transmitting frequency is center frequency. The audio generator is controlled so that the input signal at MIC pin has a deviation of ±3KHz (K, M, TM type), ±1.5KHz ((N) K, (N) M type) for a modulation frequency of 1KH