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7. Instruction Manual

1) General
a) General
This equipment, MURS is called 2 way portable handheld radios.
The frequency range is 151.8200   154.6000MHz, VHF operating channels for International 2 way portable radios.

b) Characteristic
a. All active device in this radio is composed of semiconductor and high density IC.

b. To design this radio in compact and weight approximately 140g including battery.

c. CPU of this equipment is HD4048912 from HITACHI.

d. It's power can operate by use of alcaline 4 cell(1.5V AA) battery.

c) Composition
This radio is composed of following.

a. Transmitter(W/Antenna)

b. Belt clip

c. Ni-MH battery(option)

2) Specification
a) General Specification
a. Frequency Range : 151.8200   154.6000MHz

b. Output Impedance : 50   Unbalanced

c. Modulation Type : 8K0F3E

d. Communication Mode : Half duplex

e. Channel Capacity : 5 channel

f. Channel spacing : 12.5 KHz

g. Power : 6.0V(alkaline)

h. Battery Life : ALCA.1100mAh >40 hours (Tx5%, Rx5%, Stand-by 90%)

i. Operating Temperature : -30   +60

j. Dimension : 95.5(H)x 50(W)x 26(D)mm

k. Weight : 140g(with Battery)

b) Electrical Specification
a. Transmitter

1. Output power : Max. 2.0W

2. Frequency Stability : $\pm$ 5.0 ppm(-30   +60   )

3. Modulation Method : FM

4. Oscillation Method : PLL SYNTHESIZER

5. Max. Frequency Deviation : < $\pm$ 2.5 KHz (with tone)
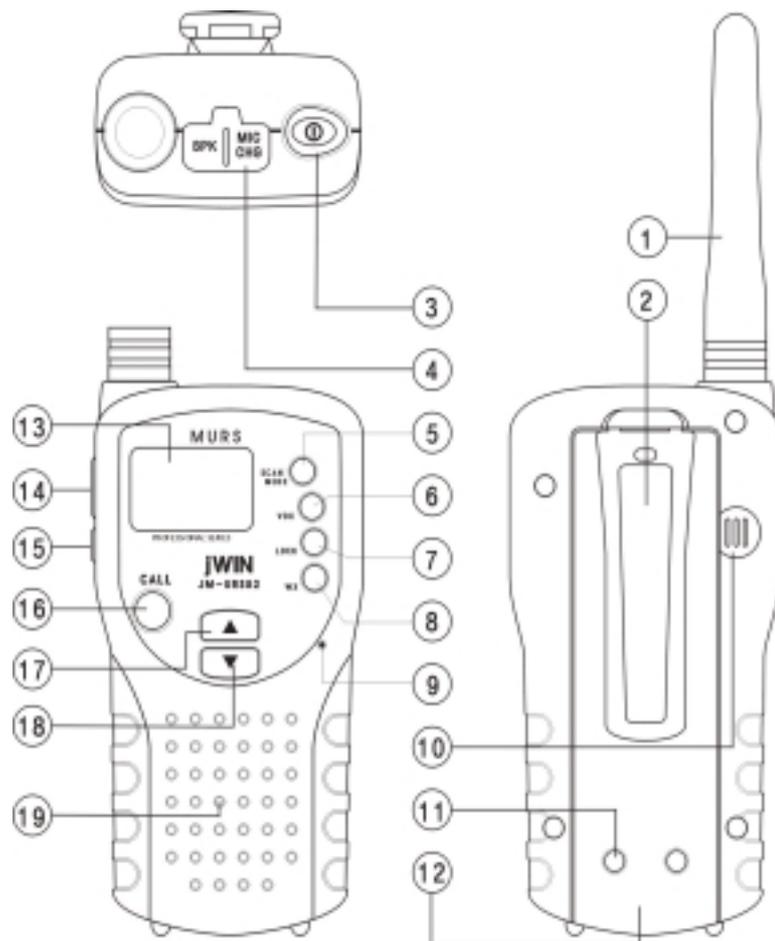
6. Cooling Method : air-cooling Method

7. Spurious Emission : < -53dBc

8. FM Hum/Noise : > -40dB(1kHz 60% modulation,w/CCITT)

9. Distortion : < 5% (1kHz 60% modulation)

10. Tx Audio Response : 6dB /OCT $\pm$ 3dB PRE-EMPHASIS(300Hz 2.5kHz)

b. Receiver

1. Receive Method : Double Super Heterodyne

2. Receive Sensitivity : 0.282uV from 0.158uV

3. Squelch Sensitivity : Auto 0.282uV from 0.158uV

4. Bandwidth : > 3kHz(6dB ATT point)

5. Selectivity : < -60dB(12.5kHz)

6. Local Frequency Stability : $\pm$ 5ppm(-30 +60)

7. Spurious Rejection : > 50dB

8. Image Rejection : > 40dB

9. Intermodulation : > 40dB

8. Audio output : Max 300mW(Internal 8 load THD 10%) Ext.100mW

9. Distortion : < 5% (1kHz 60% Modulation)

10. RX Audio Response : 6dB/OCT $\pm$ 3dB DE-EMPHASIS(300Hz 2.5kHz)

11. S/N Ratio : < 40dB(1kHz 60% modulation w/CCITT)

12. IF : 1'st IF = 21.7MHz

2'nd IF = 450kHz

13. Local Frequency : 1st Local Frequency = fc - 21.7MHz

2nd Local Frequency = 21.25MHz

3) Operation
a) Key Name

1. Antenna
2. Belt clip
3. Power (Red button)
4. Speaker/Microphone/Charger jack
5. Mode/Scan
6. VOX (Voice Activated Operation)
7. Lock
8. WX (Weather Broadcast Channels)
9. Scroll key
10. Microphone
11. Battery cover
12. Charging pads
13. Battery cover latch
14. Backlit LCD
15. Push-to-talk
16. Monitor/Lamp
17. Call
18. Speaker

b) Turn The Radio On/Off
1. Press the power button(Red). You will hear a confirming melody to Indicate the unit is on and the LCD displays ready saved channel settings.
2. To turn the unit off, press and hold the power button(Red) for at least 2 seconds. You will hear a confirming melody to indicate the unit is off.

c) Adjust Volume
1. With the unit powered on, press the Up button (   ) to increase volume and the down button (   ) to decrease volume.
2. The volume level has 8 steps, and the display will indicate the current volume level by the 0 from 7 to.

d) Transmitting a Call Tone
1. You can alert another party that you wish to communicate.
2. Press and release **Call** button, well then the LCD will display ***CALL***, then the unit you are calling will hear a two second ringing tone.
3. This MURS2 radio has 5 different Call Tones. Please refer to **Menu** chapter to set different Call Tone.

e) Receiving a Call
1. The radio is continuously in receiving mode when powered on.
2. Incoming signal can be heard only when both (transmitter & receiver) radio are on the same channel & CTCSS.
3. RSSI bar icon appears when a signal is being received. The icon consists of five bars to indicate the received signal level.

f) Transmitting a Call
1. Press and hold the **push-to-talk** button, and speak gently into the microphone about 3 inches away from the radio.
2. The LCD will display this 📶 icon when press and hold the PTT (Push-To-Talk) button.
3. Release the PTT button when finished transmission.

g) Monitor/Display Backlight Button
This feature turns off the Automatic Squelch feature momentarily. This allows your unit to receive all signals to its maximum range, but it may pick up static signals as well. You can set the speaker volume by the noise of the static. ***Do not transmit if you hear conversation.***
To activate this, press the Monitor button for up to 0.5 seconds. To restore the

automatic squelch, release the Monitor button.

By pressing the momentarily, the LCD backlight is turned on; the LCD backlight will turn off automatically in about 5 seconds, or when the monitor button is pressed momentarily once again.

h) Mode/Scan

This feature allows you to monitor all channels automatically for valid signals. While scanning, you can transmit and receive. When a signal is received, the scan is interrupted and will return to scan mode 5 seconds after reception is terminated.

1. Press and hold **MODE/SCAN** button, *SCAN* icon will appear on the LCD display.
2. The radio will display each channel (1-5) in order as the scan mode operates to find an active main channel.
3. When unit doesn't find any signals and you want to transmit, press the PTT switch to return to home channel operation. The transceiver will automatically resume scanning approximately 5 seconds after the communication is completed.
4. If there is no activity and you want to leave the scan mode, press the PTT button and the unit will return to normal operation.
   SCAN icon will disappear from the LCD display.

i) VOX Mode

This feature enables you to have hand-free conversation. Your voice or nearby sound is detected and the radio transmits without the need to press the PTT button.

To set radio for VOX operation,

From MURS2 standby mode, press the **VOX** button, *VOX* icon will appear on the LCD display.

j) Set The Channel

In order to communicate with other MURS2 units, both transmitting and receiving party must to the same frequency.

Before transmitting on the selected channel, press the Monitor (M) button to check the activity on that channel. If there is activity on the selected channel, change to another channel that is clear.

1. The MURS2 radio has 5 channels and 38 CTCSS channels.
2. From MURS2 standby mode. Press the Mode/Scan button until the channel number flashes.
3. Press the Up button briefly to move to the next higher main channel number.
4. Press the Down button briefly to move the next lower main channel number.

5. Refer to **MODE/SCAN** section if you would like to set CTCSS channel. Default setting is channel 1 and CTCSS 0.

k) Lock Mode

This feature locks the channel adjustment button on the front of the unit so that the channel does not move accidentally.

Press the **LOCK** button, ⛌ icon will appear on the LCD display.

l) WX Mode (Weather Broadcast Channel)

This feature provides access to 10 weather broadcast channels. To select a weather channel, the unit must be in the weather channel mode. Press the **WX** button, ☂ icon will appear on the LCD display, together with a channel number in the band. To change the channel,

1. Press the Up button briefly to move to the next higher main channel number.
2. Press the Down button briefly to move the next lower main channel number.

m) Illuminating The Display

1. Press Lamp button to illuminate the LCD when in the darkness.
2. The LCD is illuminated for 5 seconds unless Lamp button is pressed again.

n) LCD Icons

1. Active Channel number
2. Active CTCSS channel number
3. Transmission indicator
4. RSSI (Receiving signal strength indicator)
5. Automatic Power saver indicator
6. Scanning indicator
7. Transmitter power indicator: Keep transmitter power **Hi (High)** if receiving party is far beyond 2 miles. Unless otherwise keep it **Lo (Low)** all the way,

or your radio may override other transceivers of same channel.

8. VOX (voice activated transmission)
9. WX (10 Weather broadcast channel)
10. Roger beep indicator
11. Battery status indicator
12. Keypad lock indicator
13. Keystroke tone indicator
14. Receiving indicator
15. Transmission indicator

4) Special Feature

a) Automatic Squelch

Your MURS2 is equipped with automatic squelch circuitry, which filters out weak transmission and unwanted noise. These signals may be picked up as background static, and are usually caused by terrain conditions, or if you have reached the limit of your range.

b) Automatic Power Saver

Your MURS2 unit has special circuitry designed to extend the life of your battery. When the radio is not used for 5 seconds, it will switch itself into a Power Saving mode.

Illuminating the display
Press the Lamp button to illuminate the LCD display for 5 seconds.

c) Transmit Power Selection Mode

This feature allows selection of the transmitting power level to high or low. Using low power the unit will have a lower transmit range but battery life will be increased.
To access the transmitter power selection function:

1. Press the **MODE/SCAN** button (7 times) until the *PHL* icon appears with a flashing *HI* or *LO* indication on the display.
2. Press the Up or Down button to toggle between the High and Low selections. Press the **PTT** button to confirm selection. The display will indicate the current setting in standby mode.

d) Roger Beep Tone

The Roger Beep is a tone which is automatically transmitted whenever the PTT button is released. This tone alerts the receiving party that the transmission has been terminated intentionally.
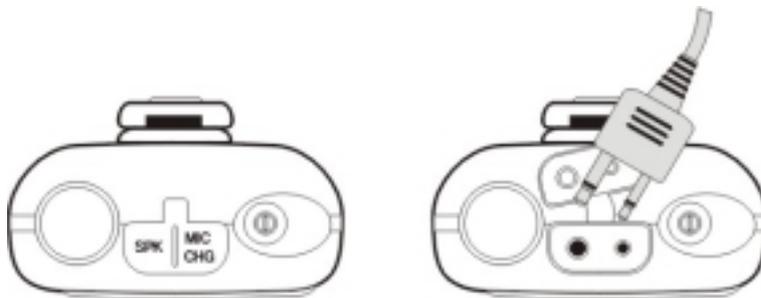
To enable and disable the Roger Beep tone:
1. Press the **MODE/SCAN** button 4 times until *ROGER* icon appears on the display.
2. Press the Up or Down button to select the tone on or off as desired.
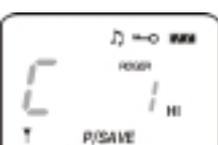3. Press the PTT button momentarily to confirm selection.

e) External Speaker/Microphone/Charger Jack

This MURS2 radio can be fitted with an external microphone/speaker, (not included) freeing your hands for other tasks. To attach the external speaker/microphone:
1. Open SPK/MIC/CHG tab on top of unit.
2. Insert plug into the SPK/MIC/CHG jack.

f) Menu-Option Setting Chart (MENU/SCAN Section)

LCD prompt	Option setting	Key operation
	• Channel	• Menu • up/down (select) • push-to-talk (quit)
	• CTCSS	• Menu (twice) • up/down (select) • push-to-talk (quit)
	• Key stroke on/off	• Menu (3 times) • up/down • push-to-talk
	• Roger beep	• Menu (4 times) • up/down • push-to-talk
	• Time out Timer	• Menu (5 times) • up/down • push-to-talk
	• Call Tone melody	• Menu (6 times) • up/down • push-to-talk
	• Power Hi/Low	• Menu (7 times) • up/down • push-to-talk

g) Frequency table

1. Frequency & channel assignment

Channel	Freq. MHz	Channel	Freq. MHz
1	151.820	4	154.570
2	151.880	5	154.600
3	151.940		

2. Weather frequency & channel assignment

Channel	Freq. MHz	Channel	Freq. MHz
1	162.550	6	162.500
2	162.400	7	162.525
3	162.475	8	161.650
4	162.425	9	161.775
5	162.450	10	163.275

3. CTCSS tone frequency

Code	Freq. (Hz)	Code	Freq. (Hz)	Code	Freq. (Hz)	Code	Freq. (Hz)
1	67.0	11	97.4	21	136.5	31	192.8
2	71.9	12	100.0	22	141.3	32	203.5
3	74.4	13	103.5	23	146.2	33	210.7
4	77.0	14	107.2	24	151.4	34	218.1
5	79.7	15	110.9	25	156.7	35	225.7
6	82.5	16	114.8	26	162.2	36	233.6
7	85.4	17	118.8	27	167.9	37	241.8
8	88.5	18	123.0	28	173.8	38	250.3
9	91.5	19	127.3	29	179.9		
10	94.8	20	131.8	30	186.2		

6. Safety Information

Safety Information For MURS UNIT

Your wireless handheld portable transceiver contains a low power(2watts) transmitter.

When the Push-to Talk(PTT) button is pushed it sends out radio frequency(RF) signals. This device is authorized to operate at a duty factor not to exceed 50%.

In August 1996, the Federal Communications Commission(FCC) adopted RF exposure guidelines with safety levels for hand-held wireless devices.

Important Note: To maintain compliance with the FCC's RF exposure guidelines, hold the transmitter and antenna at least 1 inch(2.5 centimeters) from your face and speak in a normal voice, with the antenna pointed up and away from the face.

If you wear the handset on your body while using the headset accessory, use only the manufacturers supplied belt clip for this product and ensure that the antenna is at least 1 inch(2.5 centimeters)from your body when transmitting.

Use only the supplied antenna. Unauthorized antennas, modifications, or attachments could damage the transmitter and may violate FCC regulations.

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:
(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND
(2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.