

BOW ELECTRONICS CO., LTD.

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FRS PLL FM TRANSCEIVER

BR-100

INSTRUCTION MANUAL

BOW ELECTRONICS CO., LTD.

FCC ID: INJBR-100

EXHIBIT #: 8A

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## FRS PRODUCT DESCRIPTION

The Family Radio Service(FRS) is the newest generation in personal two - way communications. FRS radios operate in a license-free band ( No FCC license for operation), on one of 14 license-free channels.

BOW's BF-114 is a lightweight, palm-sized two-way radio that you can carry almost anywhere. Use it at shopping malls, sporting events, amusement parks, or any other activity where communications are needed for convenience or safety.

The radio provides about a two miles range of communications - allowing you to keep in touch with family, friends or a neighborhood watch group.

The BF-114 is a 14-channel model with a LCD panel and has multi-functional facilities. You can talk to another person using any FRS radio, provided that you can set your FRS radio on the same frequency channel and same private code. Channel programming is described in this manual.

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## CONTROLS AND FUNCTIONS

- PTT(Push-To Talk) button - Permits radio transmissions
- TX/RX LED indicator - Lights red while transmitting, Lights green while receiving signals.
- Antenna
- Power/Volume Control - Used to turn the radio on/off, and Adjust the listening volume
- Microphone/Speaker
- LCD (Liquid Crystal Display) Panel - A multi-functional display which shows channel and other radio status/icons.
- Mode Button - Allow you to program channels, CTCSS private channel codes, and other option settings
- Call Button - Used to transmit call signal
- Up and Down Buttons - Used to change channels, CTCSS private channel codes, and option setting during programming mode.
- Monitor Button - Used to monitor channel prior to transmitting in case it is being used by other users.
- Belt Clip - Used to secure the radio to a belt, or another convenient location.
- Battery Compartment - Houses 4 "AAA" type batteries which provide power to the unit.(Located on back of unit)
- Battery Cover Latch - Secures the battery cover in place.

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## OPERATING INSTRUCTIONS

### Battery Installation

1. Release the battery cover latch located on the rear side of the radio.
2. Lift up the battery cover from battery compartment.
3. Install four new "AAA" type batteries, the (-) flat bottom of the battery rests on the (-) terminal of the battery compartment, and the (+) top contacts the (+) terminal.  
Refer to figure 1 for installing battery.
4. Replace the battery cover, and lock the battery cover latch into position.

### NOTE:

- When not using the radio, conserve battery power by turning the **Power/volume** knob to off.
- Remove the batteries if the radio will not be used for long periods of time.

### Radio ON/OFF

- Turn the **Power/volume** knob clockwise. The radio will beep and the LCD panel will briefly display a self-test screen.
- Turn the **Power/volume** knob fully counter-clockwise until you hear a click. The LCD panel will turn blank.

### Adjusting the Speaker Volume

- Turn the **Power/volume** knob clockwise to increase volume.
- Rotate the **Power/volume** knob counter-clockwise to decrease volume.

### To Transmit

- Hold the radio 2-3 inches from your mouth, Press the **PTT** button on the radio side, and speak clearly into the microphone area of the radio. For best quality, Speak slowly and to a normal tone of voice. There is no need to speak loudly.

NOTE: In order for other persons to receiver your transmission, they must also be on the same channel you are currently using.

### To Receive

- When you have finished transmitting, release the **PTT** button to receive. You will hear another person talking from the **Speaker**.

### To Monitor

- Press and hold the **Monitor** button for at least four seconds to hear if anyone is transmitting on the channel.

### To Change The Channel

1. Press and hold the **Mode** button until the channel number digit flashes on the LCD panel.
2. While the channel number is flashing, press **Up** or **Down** button to select a new channel.
3. Press the **PTT** button to select the desired channel.

NOTE: See "FRS Channel Table" section of this manual.

### To Select CTCSS Codes

CTCSS(Continuous Tone Coded Squelch System) allows you to hear only specific users, effectively blocking out unwanted calls from other users on the same channel you are using. The BF-114 has 38 CTCSS codes available.

To select CTCSS codes:

1. Press and hold the **Mode** button until the LCD panel flashes the channel number.
2. Press the **Mode** button again the LCD panel flashes the CTCSS code.
3. While the code is flashing, press **Up** or **Down** button to select a new CTCSS code.
4. Press the **PTT** button to select the desired CTCSS code.
5. To turn the CTCSS feature off, select the CTCSS code to zero (0). You will hear everyone in the channel if the CTCSS feature is turned off.

NOTE: See " CTCSS Code Table" section of this manual.

### Scan Mode

This feature is used to monitor a number of channels.

· To start the scanning:

1. Press and hold the **Mode** button until the LCD panel flashes the channel number
2. Continue to press the **Mode** button two times again until the LCD panel flashes the scan symbol.
3. Press the **Up** or **Down** buttons, and the radio will start to scan the number of all channels on your radio.

· To stop the scanning:

Press the **Monitor** or **PTT** button if a conversation is detected on any of the channels. The radio will stop that channel and you will be able to hear the conversation.

### Keypad Lock Mode

This feature is used to prevent inadvertently changing the channel and other features. The Keypad Lock disables the **Up**, **Down**, **Call** and **Mode** buttons when the Keypad Lock mode is turned ON.

- To turn Keypad Lock ON, press the **Mode** and **Monitor** buttons at the same time until the Keypad Lock symbol appears.
- To turn Keypad Lock OFF, press the **Mode** and **Monitor** buttons at the same time until the Keypad Lock symbol disappears on the LCD panel.

NOTE: Only the **PTT** button and **Monitor** key function during Keypad Lock mode.

### To Send Call Signal

You can use Call Signal to call the other user or to identify yourself.

- Press and hold the **Call** button.
- While holding the **Call** button, your Call Signal will transmit.

## \*\*OPTION SETTINGS\*\*

### Power Save

This feature conserves battery power by turning off automatically when not in use. Factory default is OFF(Power Save disabled).

1. Ensure that the radio is turned OFF by turning the **Power/volume** knob fully counter-clockwise.
2. Press and hold the **Mode** button while turning ON the **Power/volume** knob. The LCD panel will show "PS-OFF" or "PS-ON".
3. Press the **Up(▲)** or **Down(▼)** buttons to toggle the Power Save setting OFF(OFF) or ON(ON).

### Talk Confirmation Tone

This feature is used to send others a special tone for indicating the completion of your transmission (at this time of releasing the **PTT** button). And they can know it's clear to talk. Factory default is OFF( Talk Confirmation Tone disabled).

1. Ensure that the radio is turned OFF by turning the **Power/volume** knob fully counter-clockwise.
2. Press and hold the **Mode** button while turning ON the **Power/volume** knob.
3. Continue to press the **Mode** button until the LCD panel shows "tC-Of".
4. Press the Up(▲) or Down(▼) buttons to toggle the Talk Confirmation tone setting OFF(OF) or ON(ON).

#### **Beep Tone**

When you press the buttons to change the radio's feature, you can hear Beep Tone that confirms a change of its status. Factory default is ON(Beep Tone enabled)

1. Ensure that the radio is turned OFF by turning the **Power/volume** knob fully counter-clockwise.
2. Press and hold the **Mode** button while turning ON the **Power/volume** knob.
3. Continue to press the **Mode** button until the LCD panel shows "bP-on" or "bP-Of".
4. Press the Up(▲) or Down(▼) buttons to toggle the Beep Tone setting OFF(OF) or ON(ON).

#### **Time Out Timer(TOT)**

This option limits maximum transmission time(in minutes) to conserve battery power. Factory default is OFF (TOT disabled).

1. Ensure that the radio is turned OFF by turning the **Power/volume** knob fully counter-clockwise.
2. Press and hold the **Mode** button while turning ON the **Power/volume** knob.
3. Continue to press the **Mode** button until the LCD panel shows "to-Of"
4. Press the Up(▲) or Down(▼) buttons to select the desired timer limit(form 1 to 60 minutes).

NOTE: To disable TOT, select the TOT limit to "to-Of"(factory default).

#### **Busy Channel Lockout(BCL)**

This option prevents transmission while in BUSY(receiving) mode. Factory default is OFF(enables transmission even while receiving).

1. Ensure that the radio is turned OFF by turning the **Power/volume** knob fully counter-clockwise.
2. Press and hold the **Mode** button while turning ON the **Power/volume** knob.
3. Continue to press the **Mode** button until the LCD panel shows "bL-Of".
4. Press the Up(▲) or Down(▼) buttons to toggle Busy Channel Lockout(BCL) setting OFF(OF) or ON(ON).

#### **Default setting**

This option initializes the status(factory default) of radio.

1. Ensure that the radio is turned OFF by turning the **Power/volume** knob fully counter-clockwise.
2. Press the **Mode** and **PTT** buttons at the same time while turning ON the **Power/volume** knob.

**Default status:**

- Channel: 1
- CTCSS Code: NONE
- Beep Tone: ON
- Keypad Lock: Unlock
- Power save: OFF
- Talk Confirmation Tone: OFF
- TOT: OFF
- BCL: OFF
- SCAN: OFF

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## GENERAL SPECIFICATIONS

Number of Channels: 14,  
Frequency Control: PLL Synthesizer  
Frequency range: 462.5625~467.7125MHz  
Modulation type: FM  
Antenna Impedance: 50 $\Omega$   
Loudspeaker: 8 $\Omega$  0.5w  
Microphone: Condenser Type  
Power Supply: 4 AAA alkaline Cells(6.0v dc)  
Range(open field) : about 2miles  
Size: 58\*35\*110mm( Without ANT. )  
Weight: 113g ( Without BATT. )

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## RECEIVER PERFORMANCE SPECIFICATIONS

TEST ITEM	UNIT	NORMAL	LIMIT
1. SENSITIVITY (12DB SINAD)	$\mu$ V	0.28	0.35
2. SQUELCH	$\mu$ V	0.25	0.28
3. AUDIO OUTPUT @10% THD	mW	265	250
4. HUM & NOISE RATIO (UNSQUELCHED)	dB	40	34
5. STANDBY CURRENT · SQUELCHED · POWER SAVING MODE	mA mA	45 14	55 20
6. AUDIO FREQUENCY RESPONSE	300KHz 1KHz 3KHz	dB dB dB	+6 0 -9.5
			+3 to +11.5 0 -8.5 to -15.5
7. AUDIO DISTORTION @130mW	%	3	10
8. SPURIOUS EMISSIONS (CONDUCTED)	dBm	-60	-57
9. SPURIOUS REJECTION RATIO	dB	60	50
10. IMAGE REJECTION RATIO	dB	60	50
11. ADJACENT CHANNEL REJECTION	dB	60	50
12. INTERMODULATION REJECTION	dB	60	50
13. BATTERY LOW	V	4.2	$\pm 0.2$

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## TRANSMITTER PERFORMANCE SPECIFICATIONS

TEST ITEM	UNIT	NORMAL	LIMIT
1. CARRIER OUTPUT POWER (CONDUCTED)	W	0.45	0.5
2. SPURIOUS EMISSION (CONDUCTED)	dBc	-55	-50
3. ADJACENT CHANNEL POWER	dBc	-64	-60
3 AUDIO FREQUENCY RESPONSE			
300HZ	dB	-10.5	-16.5 to -9.5
1KHZ	dB	0	0
3KHZ	dB	+9.5	+10.5 to +5
4. MAXIMUM DEVIATION	KHZ	+/- 2.4	+/- 2.5
5. HUM & NOISE	dB	38	36
6. DISTORTION	%	3	5
7. CARRIER FREQUENCY TOLERANCE	HZ	±300	±500
8. MIC SENSITIVITY	mV	6	10

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### FCC WARNING:

THIS EQUIPMENT GENERATES OR USES RADIO FREQUENCY ENERGY.  
CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED IN WRITING MAY  
CAUSE HARMFUL INTERFERENCE AND VOID THE USER'S AUTHORITY TO  
OPERATE THIS EQUIPMENT.

### FCC INFORMATION

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 RECEIVER, INCLUDING  
INTERFERENCE THAT MAY CAUSE UNDESIRE OPERATION.
- PRIVACY OF COMMUNICATIONS MAY NOT BE ENSURED WHEN USING THIS  
EQUIPMENT.

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