ICOM

OPERATING MANUAL

SATELLITE PTT

# IC-SAT100M


INTRODUCTION

1 PANEL DESCRIPTIONS

2 BASIC OPERATION

3 OTHER FUNCTIONS

4 MENU SCREEN

5 CONNECTING AND MAINTENANCE

6 SPECIFICATIONS AND OPTIONS

7 TROUBLESHOOTING


Icom Inc.

# INTRODUCTION

Thank you for choosing this Icom product.
This product is designed and built with Icom's state of the art technology and craftsmanship.
With proper care, this product should provide you with years of trouble-free operation.

## Important

**READ ALL INSTRUCTIONS** carefully before using the transceiver.

This **OPERATING MANUAL** contains advanced features and operating instructions for the IC-SAT100M.

**READ** also the **BASIC MANUAL** that is supplied with the transceiver.

**KEEP THE MANUALS**, because it contains important operating information that may be useful in the future.

## Supplied accessories

Speaker microphone

Antenna unit

Angle bracket

Bolts (M4×8 mm), Flat washers, Spring washers for mounting the antenna

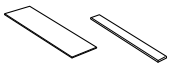
Mast clamp

U-bolt

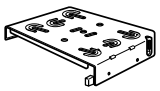
Wing nut, Nuts, Flat washers, and Spring washers for attaching to a mast

Self-tapping screws for attaching to a wall (M6×30 mm)

Cushion and sheet for the mounting bracket

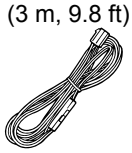


Mounting bracket



Mounting screws (M5×12 mm), Self-tapping screws (M5×20 mm), Nuts, Flat washers, and Spring washers for mounting the transceiver

DC power cable (3 m, 9.8 ft)



LAN cable (20 m, 65.6 ft)

Terminals for DC power cable (R2-6)

Microphone hanger and screw set

Spare fuses (5A)

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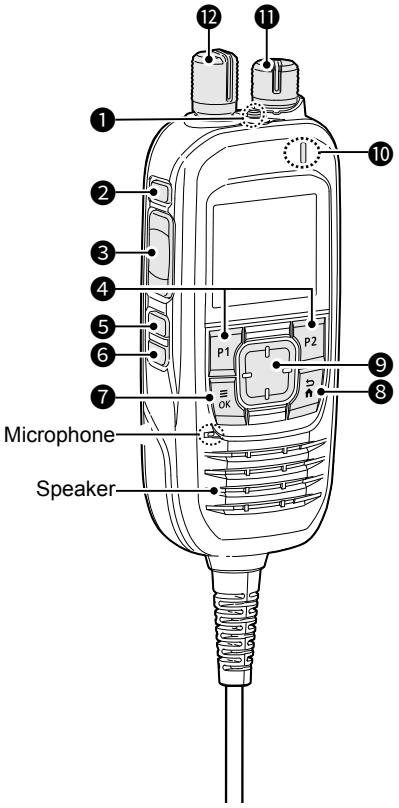
# 1 PANEL DESCRIPTIONS

## Microphone Description




❶ **EMERGENCY KEY [EMER]**
Hold down to transmit an Emergency call.

❷ **SIDE 1 KEY [S1]**
Push to display the Message List.

❸ **PTT SWITCH [PTT]**
Hold down to transmit, release to receive.

❹ **P1/P2 KEYS [P1]/[P2]**
Push to use the function assigned in the “Key Setup” menu.
[OK] > Functions > **Key Setup**

❺ **SIDE 2 KEY [S2]**
Hold down to turn the RX Speaker function ON or OFF.

❻ **SIDE 3 KEY [S3]**
Push to display the Public Address.

❼ **MENU/OK KEY [OK]**
- Push to enter the Menu screen.
- Push to select an item in the Menu screen.

❽ **BACK/HOME KEY [BACK]**
- Push to return to the previous Menu screen.
- Hold down to exit the Menu screen.

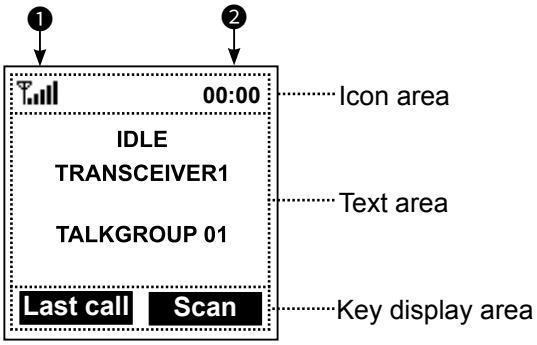
❾ **DIRECTIONAL KEY [UP]/[DOWN]/[LEFT]/[RIGHT]**
Push to select a menu item, setting, and so on.

❿ **STATUS INDICATOR**
- Lights green while receiving.
- Blinks green while in the “OPEN” status.
- Lights red while transmitting.
- Blinks orange while registering, or no satellites are found.

⓫ **VOLUME/POWER CONTROL [VOL]**
- Hold down to turn the transceiver ON or OFF.
- Rotate to adjust the audio output level.

⓬ **TALKGROUP SELECTOR**
Rotate to select a talkgroup.

# Function display




ⓘ The display is shown in English as an example. Select other languages on the Menu screen, if necessary.
([OK] > Display > **Language**)

## ◇ Icon Area

### Indicators

**❶ SIGNAL STRENGTH**
Displays the relative receive signal strength level.

**NOTE:** The antenna indicator " " disappears if the connection with a satellite is not established. Keep the antenna vertical and wait until you are connected, or move your position to a place with a clear view of the sky.

**❷ CLOCK**
Displays the current time.

### Icons

The following icons are displayed in the Icon Area.

**LOCK**
Displayed when the Lock function is ON.

**SURVEILLANCE**
Displayed when the Surveillance function is ON.

**Bluetooth®**
- " " is displayed when Bluetooth is activated.
- " " is displayed when a Bluetooth device is connected.

**MESSAGE**
- Displayed when a message has been received.
- Displayed if unread messages are still in the Message memory.

**RECORD**
Displayed when the Record function is ON.

**SCAN**
- Displayed when a scan is paused.
- Blinks while scanning.

**RX Speaker**
Displayed when the RX Speaker function is activated.

## ◇ Text Area

Displays the status, preset transceiver name, and selected Talkgroup Name.

| Status | Description |
|---|---|
| IDLE | The selected Talkgroup is not active. |
| OPEN | The selected talkgroup is active, but no one is talking. |
| REQUESTING | Requesting the transmission. |
| TALKING | Transmitting |
| LISTENING | Receiving |
| SCANNING | Scanning a call |
| BUSY | Cannot transmit because the audio is being received. |

## ◇ Key Display Area

Displays the names of the function assigned to [P1] and [P2].

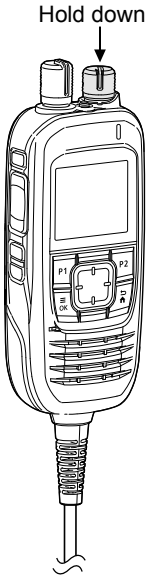
# 2 BASIC OPERATION

## Receiving and transmitting

### ◇ Turning ON the transceiver

● Hold down [VOL] for 1 second to turn ON the transceiver.
- The transceiver searches a satellite.
- When the transceiver connected and registered to the satellite, the status “IDLE,” transceiver name, and Talkgroup name is displayed.

ⓘ Push [Last Call] to playback the received call.
ⓘ Push [UP] or [DOWN] to display the Talkgroup List.
ⓘ Rotate Talkgroup selector to select a talkgroup.




### ◇ Receiving

When receiving, “LISTENING,” and the source transceiver’s name are displayed, and audio should be heard.

ⓘ Rotate [VOL] to adjust the audio output level.

### ◇ Transmitting

**CAUTION: DO NOT** transmit without an antenna.

1. Hold down [PTT].
   ⓘ “REQUESTING” is displayed while the transceiver requests the transmission.
2. When “TALKING” is displayed, speak at your normal voice level.
   ⓘ You can continuously transmit up to the period of time allowed by the system.

**NOTE:**
- If the connection becomes poor while transmitting, the transceiver sounds the beep “PuPu” in 1.5 second intervals.
- You cannot transmit while listening to the received audio. Before transmitting, confirm the receiving is finished by the beep “Pi” and the display “OPEN.”

### ◇ Scan and Ignore

ⓘ Assign the function to the [P2] key in the Menu screen to use Scan function.

[OK] > Functions > Key Setup > **P2 Key**

**[Scan]**

Push [P2] to scan a call.
- “Z” blinks while scanning.
- “Z” is displayed when a scan is paused.

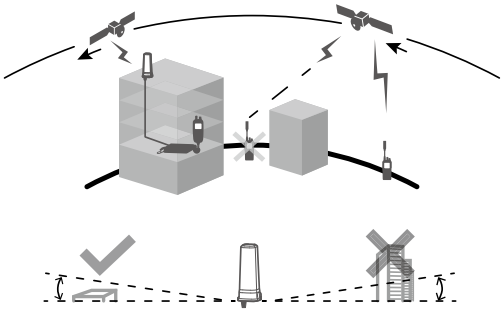
ⓘ When a Scan is paused by detecting a signal, [P2 key] changes from Scan to Ignore.

**[Ignore]**

Push [P2] to ignore the received call.
- The scan starts again except in the selected Talkgroup.

ⓘ Push [P2] to exit the Scan function.

**NOTE:** The transceiver receives and transmits using several satellites orbiting the same orbit. Receiving and transmitting may fail, depending on the satellite position or any obstacles between the transceiver and satellites.



# 3 OTHER FUNCTIONS

## Using the Message function

The transceiver can receive and send short messages.

### ◇ Receiving

When receiving, a received message's header and the Talkgroup name are displayed.

ⓘ Push [RX MSG] to display a received message.

### ◇ Transmitting

**CAUTION: DO NOT** transmit without an antenna.

1. Rotate TALKGROUP SELECTOR to select a talkgroup.
2. Push [S1] to open the "Message List".
   ⓘ You can also assign [P1] key as a shortcut to the "Message List" (p. 8).
3. Select a message to send.

**TIP:** Writing a new message

1. Select a blank on the "Message List" screen, and then push [OK].
   • The "Message Display" screen is displayed.
2. Push [OK] again to display the cursor.
3. Enter a message of up to 100 characters.

ⓘ To enter a character, push [Up] or [Down].
Usable characters: a ~ z, A ~ Z, 0 ~ 9,
/ + - = \ . ! ? ' , * # "
ⓘ To move the cursor, push [Right] or [Left].
ⓘ To insert a space, push [P1].
ⓘ To delete, push [P2] or [BACK].

4. Push [PTT] to send the message.

### ◇ Received message list

You can read received messages on the "Received Message" screen.

[OK] > PTT Options > Received Message

ⓘ You can also read received messages to push [P2].

## Using the Emergency mode

In the Emergency mode, the transceiver can transmit an Emergency call, as shown below.

ⓘ Confirm the transceiver is connected and registered to a satellite.

1. Hold down [EMER] for 2 seconds.
   • Beep sounds, and the transceiver enters the Emergency mode.
   ⓘ "REQUESTING" is displayed while the transceiver requests the transmission.
2. When "TALKING" is displayed, the transceiver transmits the mic audio for 5 seconds.

## Using the Key Lock function

You can use the Key Lock function to prevent accidental or unnecessary function access.

1. Assign the function to the [P2] key in the Menu screen.

   [OK] > Functions > Key Setup > **P2 Key**

2. Push [P2] until "Lock ON" or "Lock OFF" is displayed to turn the function ON or OFF.
   • "🔒" is displayed while the function is ON.

### ◇ Auto Key Lock function

The transceiver locks the keypad* when no key is pushed for 30 seconds.

* Except for [EMER], [PTT], [VOL], and Talkgroup selector.

● Turn the function ON or OFF in the Menu screen.

[OK] > Functions > **Auto Key Lock**

• "🔒" is displayed while the function is ON.
ⓘ Push [P2] until "Lock OFF" is displayed to turn OFF the function.

## Using the Surveillance function

When this function is turned ON, the beep is not heard and the backlight and the Status indicator do not light, even when a signal is received, or a key is pushed.

1. Assign the function to the [P1] key in the Menu screen.
   [OK] > Functions > Key Setup > **P1 Key**
2. Hold down [BACK] for 1 second to exit the Menu screen.
3. Push [Surveillan] to turn the function ON or OFF.
   ⓘ "" is displayed while the function is ON.

## Using the AquaQuake function

The AquaQuake water draining function removes water from the speaker grill by vibrating the internal speaker.

1. Assign the function to the [P1] key in the Menu screen.
   [OK] > Functions > Key Setup > **P1 Key**
2. Hold down [BACK] for 1 second to exit the Menu screen.
3. Hold down [AquaQu...] to use the function.
   ⓘ Water in the speaker grill may muffle the sound coming from the speaker.
   ⓘ After the specified period of time, the function automatically stops, even if you continue holding down the key.
   ⓘ The function works with only the internal speaker.

## Using the Last Call Play function

The transceiver can playback the previously received call.
ⓘ You can playback up to 6 latest calls.
ⓘ Confirm the Call Recorder function is turned ON.
[OK] > PTT Options > Call Recorder

1. Assign the function to the [P1] key in the Menu screen.
   [OK] > Functions > Key Setup > **P1 Key**
2. Hold down [BACK] for 1 second to exit the Menu screen.
3. Push [Last Call] to playback the received call.
   ⓘ Push [Last Call] to change the previously received call.

## Using the RX Speaker function

The transceiver can output received call audio to an external device through the D-Sub 25-pin (22 pin: EXAFO).

**NOTE:** To use this function, connect an external audio amplifier (user supplied).

- Hold down the [S2] key to turn the RX Speaker function ON or OFF.
  • "" is displayed when the function is ON.
  ⓘ When the transceiver is turned OFF, this function is also turned OFF.

## Using the Public Address function

The Public Address function can output the audio from the supplied transceiver microphone to an external device through the D-Sub 25-pin (22 pin: EXAFO).

**NOTE:** To use this function, connect an external audio amplifier (user supplied).

- Push [S3] key to turn the Public Address function ON or OFF.
  • Enters the Public Address function.
  ⓘ Push DIRECTIONAL KEY to change the volume.
  ⓘ When the transceiver turns OFF or received a message, this function also turns OFF.

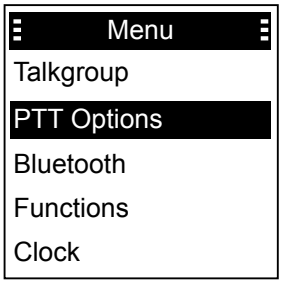
# 4 MENU SCREEN

## Using the Menu screen

You can use the Menu screen to set infrequently changed values or function settings.

The Menu screen is constructed in a tree structure. You can go to the next tree level by pushing [RIGHT] or [OK], go back a level pushing [LEFT] or [BACK]. To select an item, push [UP] or [DOWN].

**NOTE:** The menu items contained in the transceiver may differ, depending on the its version or presettings.




## Menu items

### ◇ Talkgroup

#### Refresh Talkgroup

Select the item, and then push [OK] to refresh the Talkgroup list.

#### Talkgroup List

Displays the Talkgroup list.
ⓘ "P" is displayed for the Priority Talkgroup.

### ◇ PTT Option

#### Talk Timer

The Talk Timer displays the time remaining for the current talk period.
- OFF: Turns OFF the function.
- ON: Displays the remaining time while transmitting.

#### Mic Gain

Sets the microphone sensitivity to between -5 and 5.
ⓘ Higher values make the microphone more sensitive to the user's voice.

#### Call Recorder

Turn the Call Recorder function ON or OFF.
- OFF: Turns OFF the function.
- ON: Records the received call audio.

#### Received Message

Displays the Received message list.

#### Message List

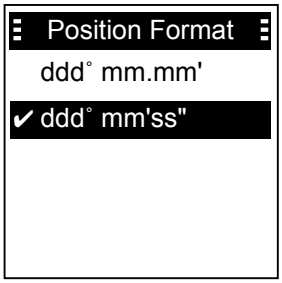
Displays the Created message list.

#### Location Sharing

Turn the Location Sharing function ON or OFF.
- OFF: Turns OFF the function.
- ON: Share your location with other Talkgroup participants.

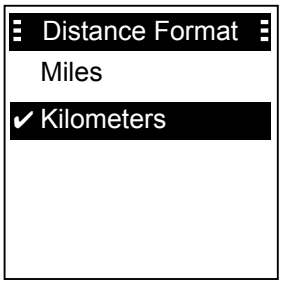
#### Position Format

Select a format to display your position data.




#### Distance Format

Select a format to display the distance.



Menu items

## ◇ Bluetooth

You can pair 2 types of Bluetooth devices: a Headset and a Data device.

**Number of maximum pairing devices**

- Up to 5 Bluetooth headsets and data devices such as Android smartphone can be paired. (Headset 1~4, Data device 1~4)
- Up to 2 iOS devices (Bluetooth LE) can be paired.

### Bluetooth ON/OFF

Turn the Bluetooth function ON or OFF.

### BT Device List

Displays the paired Bluetooth headsets and Bluetooth data devices.

#### ❍Find Device

Search for a Bluetooth headset, or smartphone or tablet to pair.

- Headset: Search for a Bluetooth headset.
- Data Device: Search for an Android device.
- LE device: Search for an iOS device.

**NOTE:** To pair an iOS device, update the IC-SAT100M main firmware to Revision 1.2. Ask your dealer for details.

### Bluetooth Reset

Initialize the built-in Bluetooth unit.

### BT Auto Connect

Select whether or not to automatically connect to the last bonded Bluetooth device.

- OFF: The user must manually connect to a bonded device.
- ON: Automatically connects to the last bonded device.

### BT Audio Setting

Select the audio output device for when the Bluetooth headset is connected.

- BT Only: Sets the Bluetooth headset as the Audio Output device.
- BT & SP: Sets the Bluetooth headset and the transceiver's speaker as the audio output devices.

### BT Device Info

Displays the Bluetooth device information such as the device name, address, support profile, version, and so on.

### Key Beep (VS-3)

Turn the optional VS-3 Bluetooth headset's key beep ON or OFF.

### PWR Save (VS-3)

Select whether or not to operate using the Bluetooth headset's battery saving mode while the optional VS-3 Bluetooth headset is connected.

- OFF: The Power Save mode is OFF.
- ON: The Power Save mode is activated when there is no communication or operation for 120 seconds.

### PTT Beep (VS-3)

Set the beep sound when pushing [PTT] on the optional VS-3 Bluetooth headset.

- OFF: No beep sounds when pushing PTT.
- ON: A beep sounds when pushing PTT.

### One-touch PTT

Set the One-Touch PTT function while the optional VS-3 Bluetooth headset is connected.
The function enables you to communicate with a single push of the VS-3's [PTT].

- OFF: Push [PTT] to transmit and release to receive.
- ON: Push [PTT] to transmit and push again to receive.

### Waiting Pairing

Waits for the pairing request from a Bluetooth headset or data device.

Menu items

## ◇ Functions

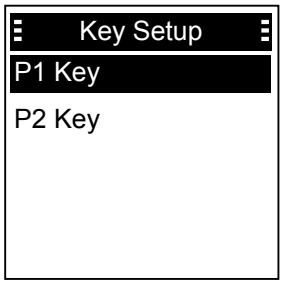
### Auto Key Lock

Turn the Auto Keypad Lock function ON or OFF.

- OFF: Turns OFF the function.
- ON: The transceiver locks the keypad* when no key is pushed for 30 seconds.
  * Except for [EMER], [PTT], [VOL], and Talkgroup selector.

### Key Setup

Assign functions to the [P1] and [P2] keys.




#### ❍Assignable functions

| [P1] | [P2] |
|---|---|
| OFF (No function is assigned) | OFF (No function is assigned) |
| Talkgroup List (p. 6) | Scan Start/Stop (p. 3) |
| My Position (p. 9) | Lock (p. 4) |
| Surveillance (p. 5) | |
| AquaQuake (p. 5) | |
| Last Call Play (p. 5) | |
| Message List (p. 6) | |

### PC Command

Select a connecting method to connect the transceiver to a PC.

- OFF: Nothing is selected.
- D-Sub25: Select when connect to a PC using a connection cable with D-Sub25 pin.
- Bluetooth: Select when connect to a PC using a Bluetooth device.
- TCP: Select when connect a VE-PG4 using a LAN cable

### Auto TX Mic Sel

Select the microphone for transmitting an Emergency call.

- Front Mic: Select the speaker microphone connected to the main unit.
- External Port: Select the microphone connected to the D-sub 25 pin.
- BT Mic: Select the microphone connected using Bluetooth.

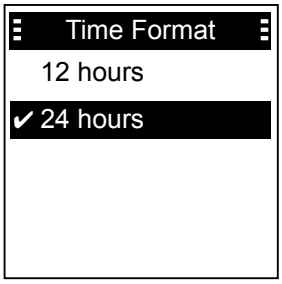
## ◇ Clock

### Clock Display

Select whether or not to display the clock on the Main screen.

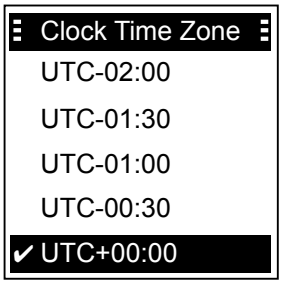
### Time Format

Select time format for the clock.




### Clock Time Zone

Select your local time zone.




### DST

Selects whether or not to use Daylight Saving Time (DST) for the clock.

Menu items

## ◇ Display

### Backlight

Select a Backlight setting.

- OFF: The backlight is always OFF.
- ON: The backlight is always ON.
- Auto (Key): When any switch except [PTT] is pushed, the backlight lights for 5 seconds.
- Auto (Dim): The backlight automatically becomes dark when the D-sub 25 pin function is active.
- Dim: The backlight is darker than “ON”.

### Contrast

Adjust the contrast level.

### Language

Select a Language for the user interface.

## ◇ Beep

Sets the transceiver’s beep level.

**TIP:** When you set the beep level to between “1 (Linked)” and “5 (Linked),” you can adjust the beep level within the range of 0 and selected level by rotating [VOL].

### System Beep Lv

Sets the system beep output level.
The beep sounds when connecting to or blocked from the system.

### Emer Beep Lv

Sets the beep output level when in the Emergency mode.

### Key Beep Lv

Sets the key beep output level.

### Ringer Lv

Sets the ringer output level.

### Opening Beep Lv

Sets the opening beep output level.
The transceiver beeps when it is turned ON.

## ◇ Information

### Battery Info

Displays the battery voltage.

### RSSI

Displays the Received Signal Strength Indication (RSSI).

### My Position

Displays your current position.

### Firmware Info

Displays the transceiver’s firmware information.

### Satellite Info

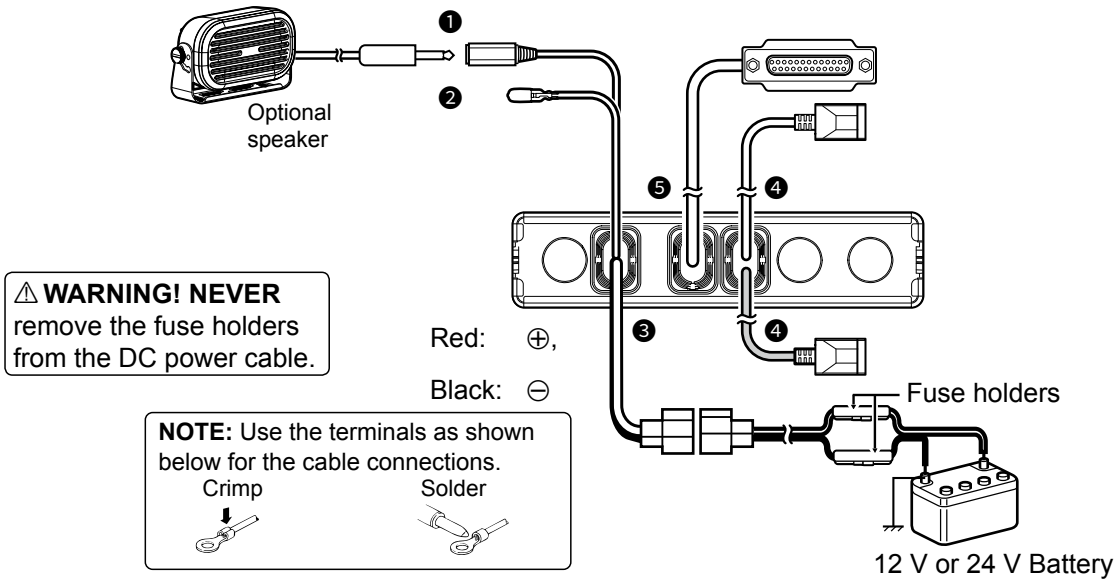
Displays satellite information.

### Certification

Displays the certifications acquired with the transceiver.

# 5 CONNECTING AND MAINTENANCE

## Rear panel connection




❶ **EXTERNAL SPEAKER JACK**
Connect a 4 Ω external speaker.

❷ **IGNITION LEAD**
Connect to an ignition line.

**CAUTION: DO NOT** put pressure on this lead. Binding to the DC power cable is recommended.

❸ **DC POWER CONNECTOR**
Connect to a 12 V or 24 V DC battery.
Pay attention to polarities.
Red line: ⊕, Black line: ⊖
ⓘ You can also connect the transceiver to an outlet with the optional AC adapter.

**CAUTION: DO NOT** reverse the DC power cable polarity when connecting to a power source. This could damage the transceiver.

**ⓘ Low Voltage beep function**
The IC-SAT100M has the Low Voltage beep function to prevent battery over-discharge.
When the battery voltage drops below 11 V or 10 V, the Low Voltage beep 1 or 2 sounds every 3 seconds.

- The Low Voltage beep 1 (“Pi”) sounds below 11 V.
- The Low Voltage beep 2 (“PiPi”) sounds below 10 V.

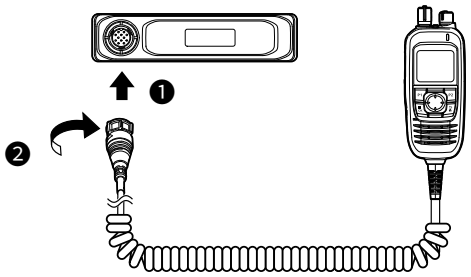
❹ **LAN CABLE**
(Gray: for antenna, Black: for IP Network)
Connect the supplied antenna or network devices such as a HUB.
ⓘ External power supply output (Gray LAN Cable)
PoE output voltage: 54V
PoE output current: 0.6A

**CAUTION: DO NOT** connect other than network devices, such as microphone. This could damage the transceiver.

❺ **D-Sub 25-pin**
Connect to use the function extension.
Ask your dealer for details.

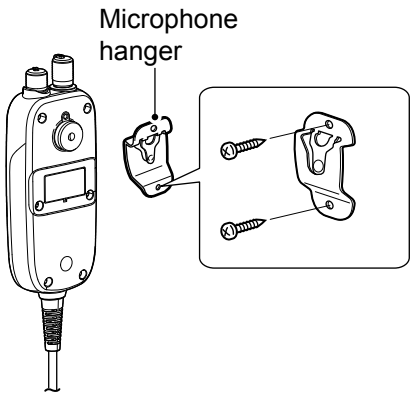
### ◇ Connecting the supplied microphone

Connect the supplied microphone as illustrated below.




### ◇ Connecting the microphone hanger

Connect the microphone hanger as illustrated below.




## ◇ Cleaning

If the transceiver becomes dusty or dirty, wipe it clean with a soft, dry cloth.

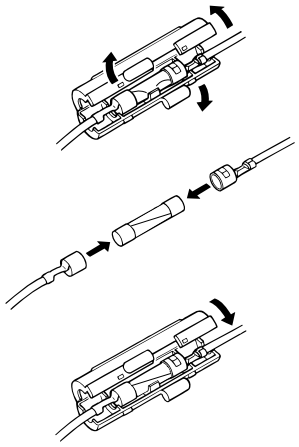
**DO NOT** use harsh solvents such as Benzine or alcohol when cleaning, as they damage the transceiver's surfaces.

## ◇ Fuse replacement

Fuses are installed in the supplied DC power cable. If a fuse blows, track down the source of the problem, repair it, and then replace the damaged fuse with a new rated one.

ⓘ **Fuse coding explanation**
Fuse coding: FUSE 125V 5A
Fuse voltage rating: 125 Volt
Fuse current rating: 5 Amperes

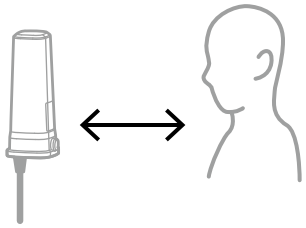
**NOTE:** Use only 5 A fuses.



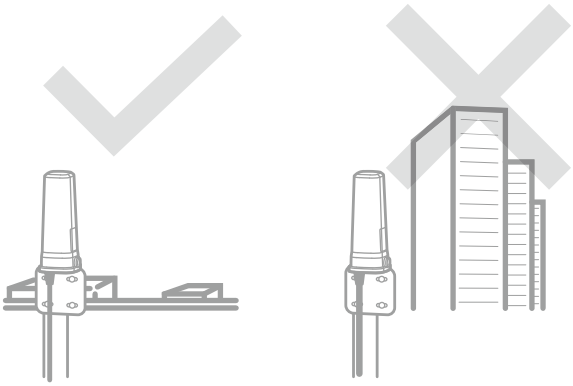
# Installing the antenna

### ◇ About the antenna position

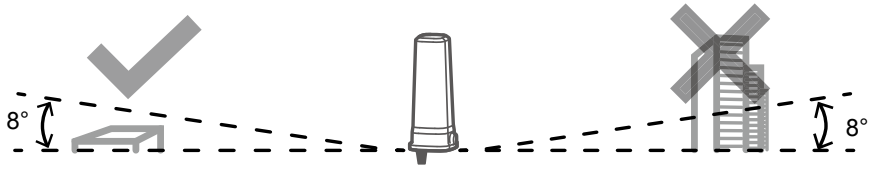
Keep a minimum of 20 cm (7.9 inch) between the Antenna unit and your body.



Move away from buildings and use the transceiver in areas with an open sky.



Install the outdoor antennas in a place with a clear view of the sky. Make sure that there are no obstacles, such as buildings or trees, at higher than about 8 degrees around the antenna.




⚠ **WARNING HIGH RF VOLTAGE! NEVER** touch an antenna or antenna connector while transmitting. This could cause an electrical shock or burn.
⚠ **WARNING HIGH RF VOLTAGE! NEVER** install the antenna at any place that person easily touch the antenna while transmitting. This could cause an electrical shock or burn.

## ◇ About the antenna unit

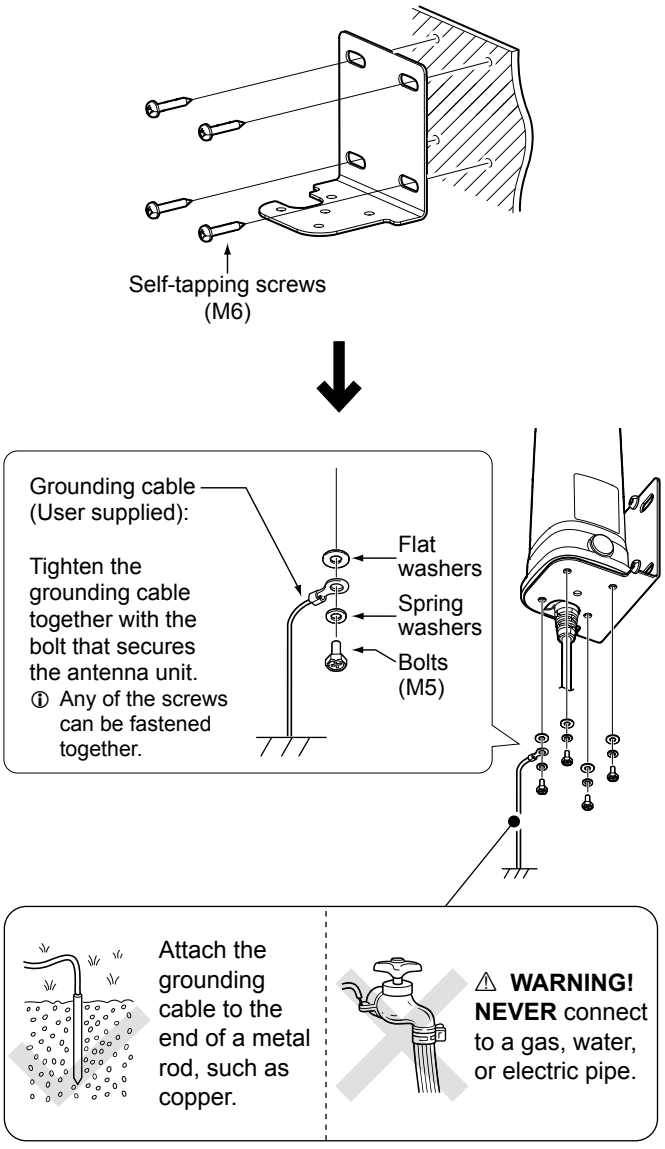
**IMPORTANT!**
The antenna unit must have an adequate ground connection. Otherwise, the antenna circuit may be damaged by a lightning strike or static electricity. Interference, RF feedback, and electrical shocks from other equipment could also occur. Contact your dealer for details of how to install them.

**NOTE:**
- Confirm that the serial numbers of the antenna unit and the main unit are the same.
- The Main unit provides electrical power to the antenna unit by POE (Power over Ethernet). The supplied LAN cable is a Shielded Ethernet Cable, so that use the supplied cable to connect the antenna and the main unit.

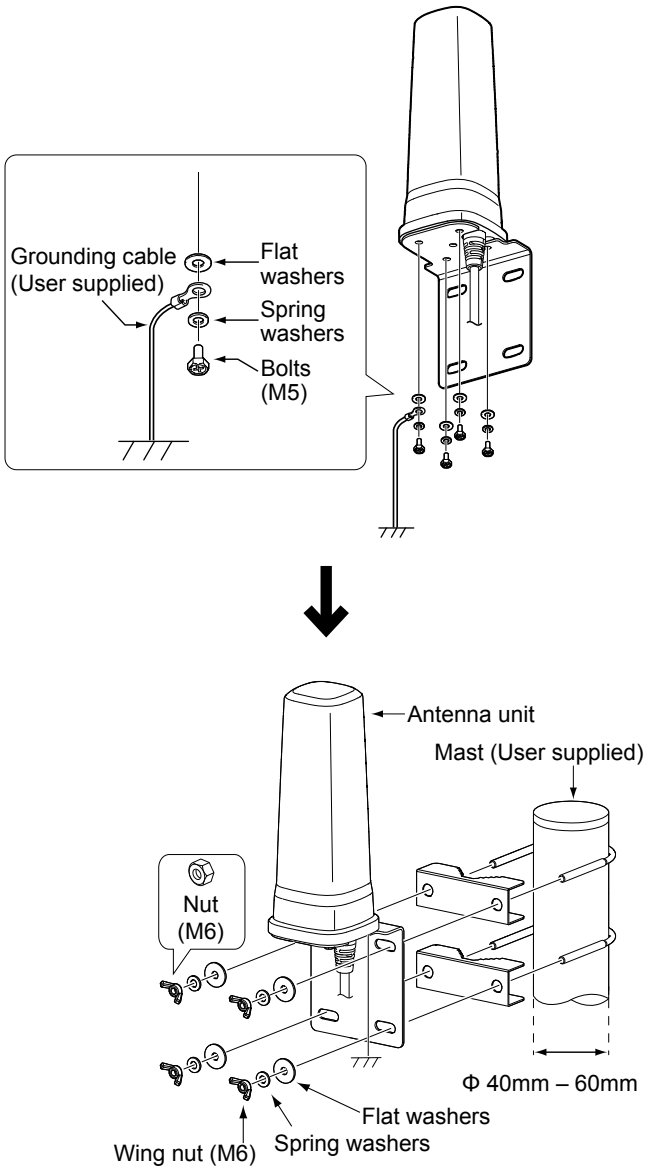
## ◇ Installation example

Use wing nuts or regular nuts, if necessary.

**On a wall:**




**On a mast:**




## ◇ Grounding information

- For best results, connect a heavy gauge wire or strap to a long ground rod.
- Make the distance between the antenna unit and the ground rod as short as possible.
- **DO NOT** connect the grounding cables together. The independent grounding cables follow a large amount of current to the ground.

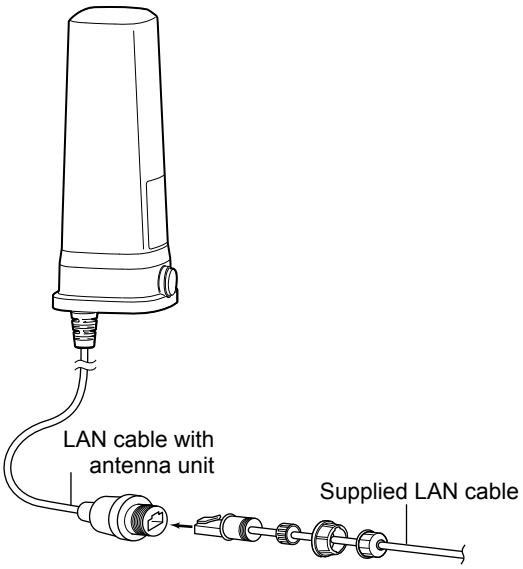
## ◇ Connect the antenna unit and the LAN cable

• Connect the main unit and the supplied LAN cable (Length: approximately 20 m) as describe below.
ⓘ The supplied LAN cable is a Shielded Ethernet Cable, so that use the supplied cable to connect the units.

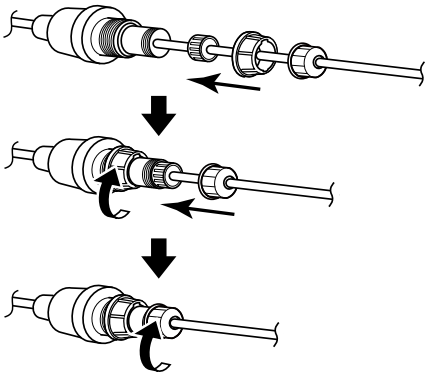
**CAUTION:** Be sure to ground the antenna unit . Otherwise, the antenna circuit may be damaged by a lightning strike or static electricity. Also, interference, RF feedback, and electrical shocks from other equipment could occur.

• You can also use a user supplied LAN cable (Category 5e or higher) up to 100 m.
• In addition to the grounding cable, using a lightning protection device (user supplied) for the LAN cable is recommended.

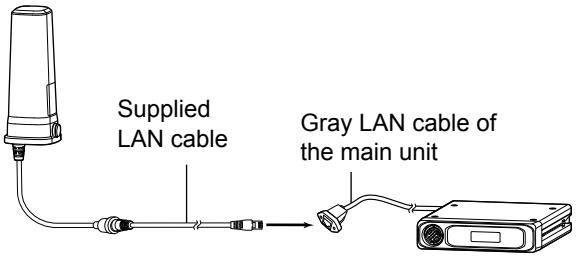
1. Remove the cover attached to the LAN cable.
2. Insert it into the antenna cable.



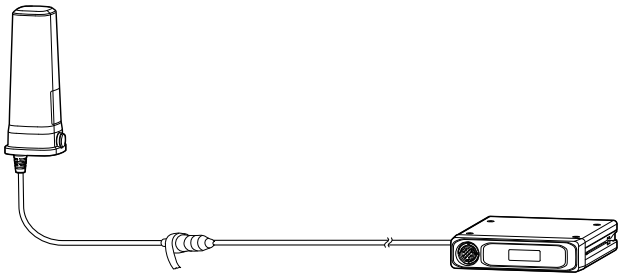

3. Attach the cover attached to the LAN cable as shown.



4. Connect to the gray LAN cable with the main unit.




ⓘ After connecting the Antenna cable and the LAN cable, wrap the connectors with rubber vulcanizing tape to help in waterproofing.

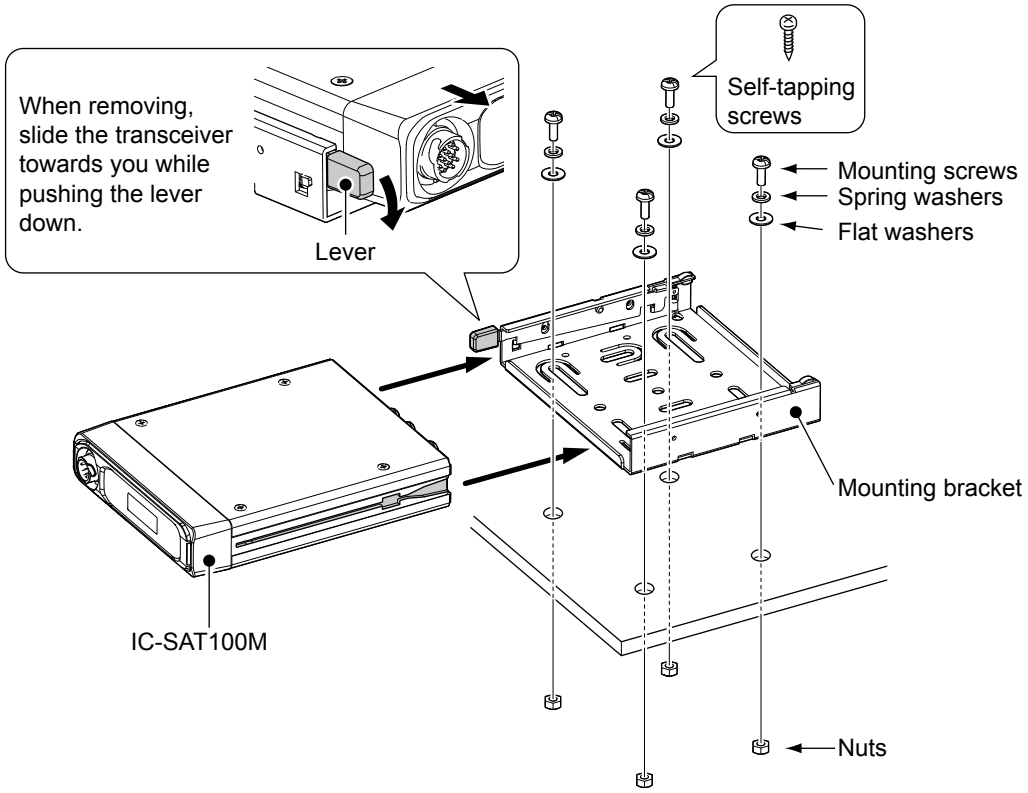


**ⓘ Information**
When the transceiver is connected to network devices, change the static IP address.
Before using the transceiver, enter a static IP address for the antenna unit and the main unit.
Ask your dealer for details.

| Default | |
|---|---|
| IP address: | 192.168.0.1 (Main unit ) |
| | 192.168.0.2 (Antenna unit) |
| Subnet Mask: | 255.255.255.0 |
| Default Gateway: | 192.168.0.254 |

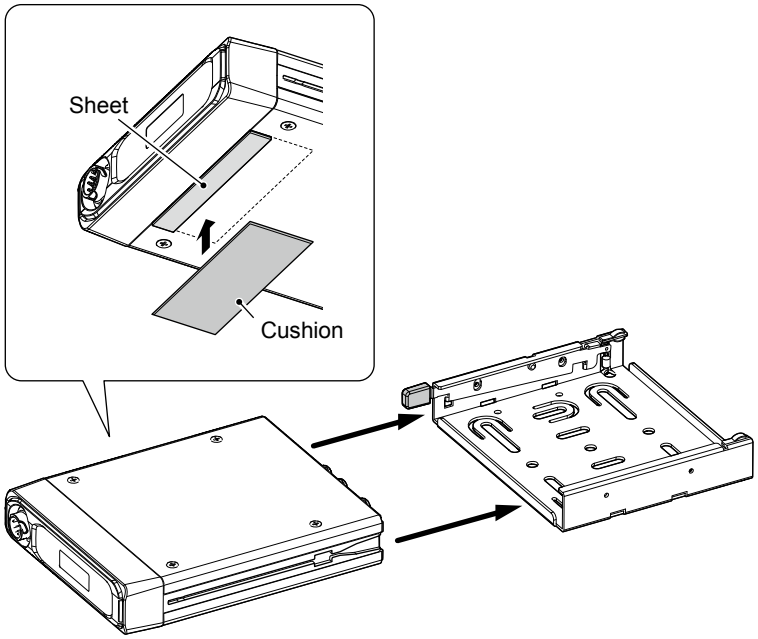
## Mounting the transceiver

The universal mounting bracket supplied with your transceiver enables various mounting positions.




To reduce vibration, place the cushion on the transceiver and put the sheet on it.

ⓘ When mounting the bracket on the bottom side, attach the cushion and the sheet to the bottom of the transceiver.



# 6 SPECIFICATIONS AND OPTIONS

## Specifications

ⓘ All stated specifications are subject to change without notice or obligation.

### ◇ General

| | |
|---|---|
| • Frequency range: | 1616 ~ 1626.5 MHz |
| • Number of channels: | 240 Channels |
| • Type of emission: | 41K7Q7W |
| • Duplexing method: | TDD (Time Domain Duplex) |
| • Multiplexing method: | TDMA/FDMA |
| • Antenna impedance: | 50 Ω nominal |
| • Output impedance (audio): | 4 Ω |
| • Operating temperature range: | –30˚C ~ +60˚C, –22˚F ~ +140˚F |
| • Power supply voltage: | 10.5 to 32 V DC nominal<br>Negative ground |
| • Power Over Ethernet | IEEE 802.3at standard: 25 W maximum for PD (Powered device),<br>30 W maximum for PSE (Power sourcing equipment) |
| • Current drain: | Receive stand-by (Digital Mode): 550 mA<br>Receive max.audio: 800 mA (Internal Speaker), 1.1 A (External Speaker)<br>Transmit High (7W): Less than 2.5 A, Average 0.7A |
| • Dimensions*: | Main unit: 125 (W) × 29 (H) × 156.5 (D) mm,<br>(4.9 (W) × 1.1 (H) × 6.2 (D) inches)<br>Command Microphone: 59.5 (W) × 134.6 (H) × 30.1 (D) mm<br>(2.3 (W) × 5.3 (H) × 1.2 (D) inches)<br>Antenna unit: 76.8 (W) × 200 (H) × 76.8 (D) mm,<br>(3.0 (W) × 7.9 (H) × 3.0 (D) inches) |
| • Weight (approximate): | Main unit: 0.95 kg, 2.1 lb<br>Main unit + Microphone: 1.2 kg, 2.6 lb<br>Antenna unit: 0.5 kg 1.1 lb |

### ◇ Transmitter

| | |
|---|---|
| • Output power: | 7.0 W maximum |
| • Modulation: | DE-QPSK/DE-BPSK |
| • Channel spacing: | 41.667 kHz |
| • Frequency stability: | ±1.5 ppm |
| • Spurious emissions: | 0.25 µW (1 GHz or less)<br>1.0 µW (More than 1 GHz) |
| • Audio harmonic distortion: | 0.8% typical (at AF 1 kHz) |

### ◇ Receiver

| | |
|---|---|
| • Sensitivity: | –115 dBm typical |
| • Audio output power (At 5% distortion): | 1.5 W (Typical) into an 8 Ω load (Internal speaker)<br>4.0 W (Typical) into an 4 Ω load (External speaker) |

* Projections not included.

# Options

## ◇ Headset

• **VS-3** Bluetooth HEADSET
The Bluetooth headset with a [PTT] switch.
**About the third party Bluetooth headsets:**
Icom has checked the PTT operation with some 3M Peltor headsets such as the WS Headset XP, WS ProTac XP and WS Alert XP. (Compatibility not guaranteed.)

## ◇ External speakers

• **SP-30, SP-35/SP-35L** EXTERNAL SPEAKERS
Input impedance: 4 Ω

| | |
|---|---|
| **SP-30:** | Rated input 20 W |
| | Maximum input 30 W |
| **SP-35/35L:** | Rated input 5 W |
| | Maximum input 7 W |

## ◇ Cables

• **OPC-2429** MIC EXTENSION CABLE
Length: 2.0 m (6.6 ft)

• **OPC-2422** COAXIAL CABLE FOR AH-40
Length: 5.0 m (16.4 ft)

• **OPC-2357** PROGRAMMING CABLE

## ◇ Others

• **AH-40** ANTENNA
The antenna with a magnet base and cable
Length: 1.5 m (4.9 ft)

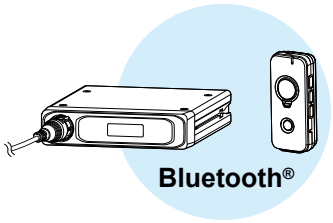
• **BC-157S** AC ADAPTER

• **RS-SAT100** APPLICATION SOFTWARE.
The RS-SAT100 is an application that enables you to text chat through a satellite communication network by connecting an IC-SAT100M. See the RS-SAT100 INSTRUCTIONS for details.

ⓘ Some options may not be available in some countries. Ask your dealer for details.

# Using a Bluetooth® headset

The transceiver can operate with Bluetooth headsets. The communication range of Bluetooth is approximately 10 meters (33 ft).




Bluetooth headset
(Example: Optional VS-3)

**NOTE:** The Bluetooth communication range may vary, depending on the environment where you operate the device.

## ◇ Electromagnetic Interference

When you use a Bluetooth device, pay attention to the following:
Bluetooth devices operate in the 2.4 GHz band. The 2.4 GHz band is also used by other devices, such as Wireless LAN products, microwave ovens, RFID systems, amateur radio stations, and so on.
When using this device near such devices, interference may occur, causing a decrease in communication speed, and an unstable connection. In such cases, use this device away from the other devices, or stop using those devices.

## ◇ Pairing with a headset

You can pair a maximum of 4 Bluetooth headsets to the transceiver.

ⓘ These instructions describe pairing with the VS-3 Bluetooth® headset, as an example.

### 1. Turning ON the transceiver's Bluetooth function

1. Select "Bluetooth ON/OFF," in the Menu screen, and then push [OK].
   [OK] > Bluetooth > **Bluetooth ON/OFF**
2. Select "ON," and then push [OK] to turn ON the Bluetooth function.
3. Hold down [BACK] for 1 second to exit the Menu screen.
   • "✱" is displayed.

### 2. Entering the VS-3 Pairing mode

1. Confirm the VS-3 is turned OFF.
2. Hold down [⏻] for 6 seconds.
   • The LED alternatively blinks red and blue, and then the headset enters the Pairing mode.

### 3. Pairing and connecting the Bluetooth headset

1. Select "Find Device," and then push [OK].
   [OK] > Bluetooth > BT Device List > **Find Device**
2. Select "Headset," and then push [OK].
   • The transceiver searches for a headset.
   ⓘ Push [BACK] to cancel searching.
3. Select the headset to pair and connect, and then push [OK].
   ⓘ A passkey or PIN code may be required to pair, depending on the headset. Refer to your headset or device's instructions for details.
4. Hold down [BACK] for 1 second to exit the Menu screen.
   • "✱" is displayed if the headset or device is correctly connected.

## ◇ Disconnecting a paired device

You can disconnect a paired Bluetooth device if it is not being used.

1. Select "BT Device List," and then push [OK].
   [OK] > Bluetooth > **BT Device List**
2. Select the device to disconnect, and then push [OK].
3. Select "Disconnect," and then push [OK].
4. Hold down [BACK] for 1 second to exit the Menu screen.
   • "✱" is displayed if the headset or device is correctly disconnected.

## ◇ Deleting a headset

Disconnect a connected headset before deleting it.

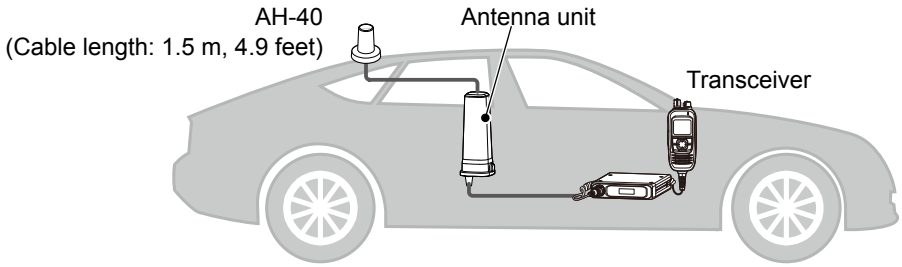
1. Select "BT Device List," and then push [OK].
   [OK] > Bluetooth > **BT Device List**
2. Select the headset to delete, and then push [OK].
3. Select "Delete," and then push [OK] to delete the headset.
4. Hold down [BACK] for 1 second to exit the Menu screen.

# Installing the AH-40

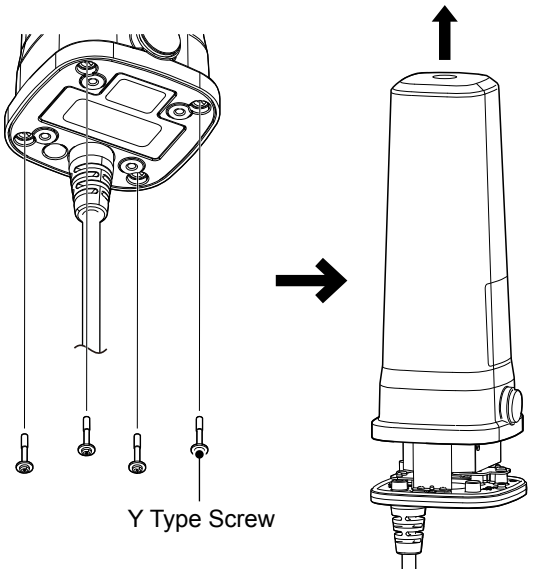
For vehicle use, the optional AH-40 ANTENNA is recommended to reduce obstacles around the antenna.
When you operate a transceiver in a vehicle, you can replace the antenna element with a AH-40, and mount it on the roof instead of the Antenna unit.

ⓘ The optional OPC-2422 COAXIAL CABLE (Length: 5.0 m, 16.4 feet) can be used between the transceiver and the AH-40.
ⓘ See also Installing the antenna (p. 12) for details on the AH-40 installing environment.

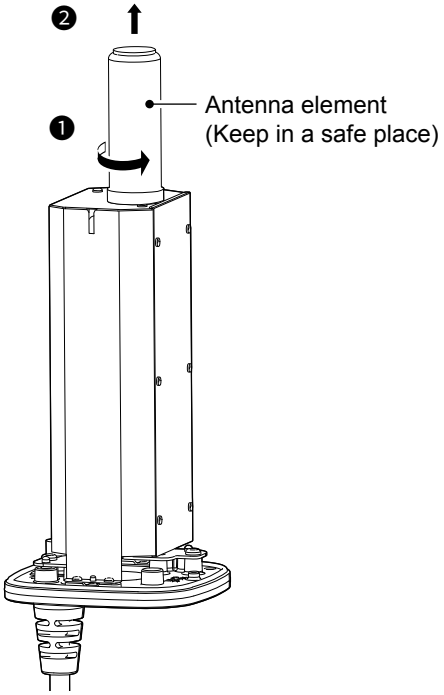
**NOTE:**
- Install the antenna unit in the car. The antenna unit loses its waterproof protection by making a hole on the antenna unit cover.
- The AH-40 includes a strong magnet to mount on the roof of your vehicle. Be sure to route the coaxial cable so it will not be pinched or cut.

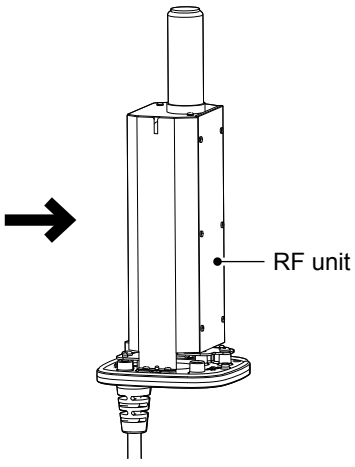



1. Remove the antenna unit cover.



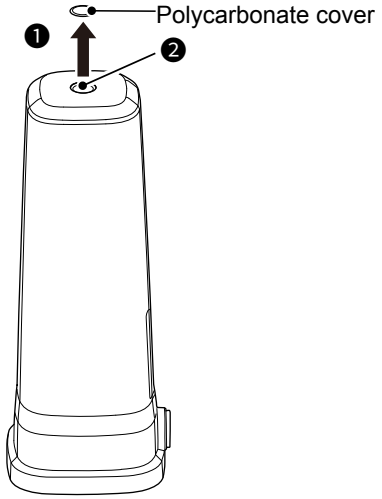

2. Remove the antenna element.



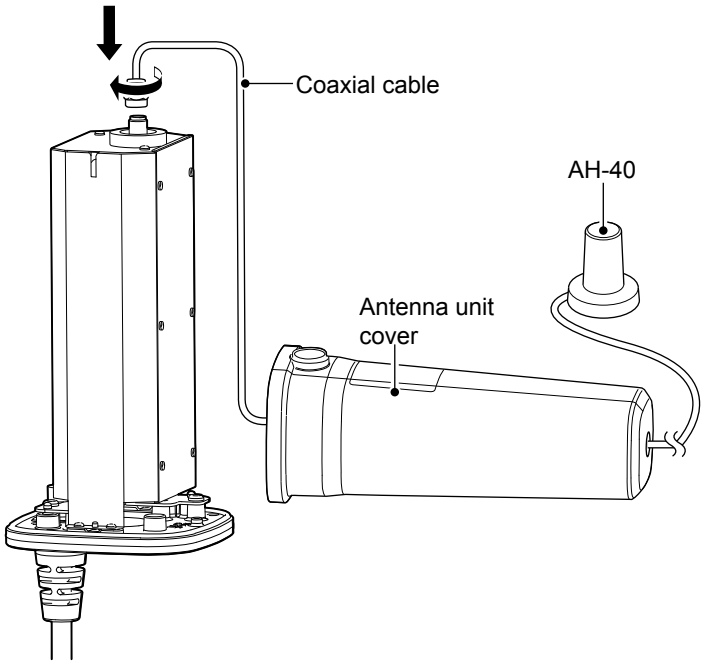



## Installing the AH-40

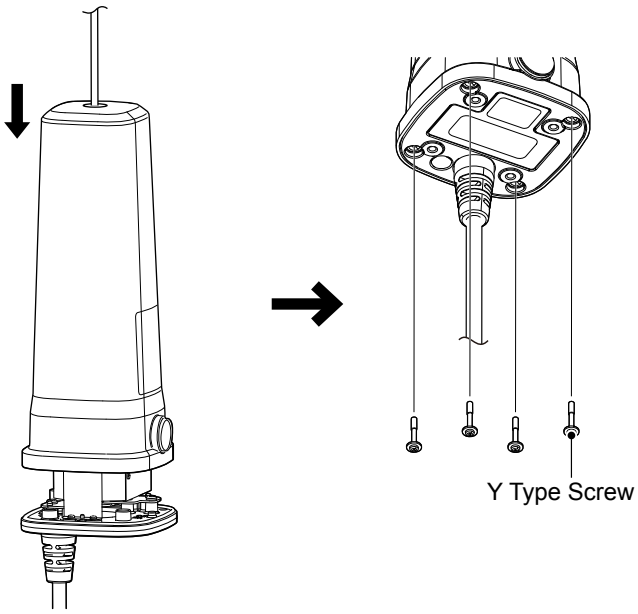
3. Remove the Polycarbonate cover on the top of the antenna unit cover (❶), and then make a hole on the antenna unit cover(❷).
   ⓘ Appropriate hole diameter:
   10 mm, 0.39 inches
   13 mm, 0.51 inches (When using the OPC-2422)




4. Insert the coaxial cable through the antenna unit cover, and then attach it to the RF unit.




5. Attach the antenna unit cover.




### ◇ AH-40 Specifications

- Frequency range: 1616 ~ 1626.5 MHz
- Antenna impedance: 50 Ω nominal
- Operating temperature range: –40˚C ~ +85˚C, –40˚F ~ +185˚F
- VSWR: 2.0:1 (At resonance point)
- Dimensions: 36 (d) × 52.3 (H) mm, (1.4 (d) × 2.1 (H) inches)
- Weight (approximate): 55 g, 1.9 oz
- Connector: SMA

ⓘ All stated specifications are subject to change without notice or obligation.

# 7 TROUBLESHOOTING

## Troubleshooting

| PROBLEM | POSSIBLE CAUSE | SOLUTION | REF. |
|---|---|---|---|
| No power comes ON | • Bad connection to the power supply.<br>• Fuse is blown. | • Check the connection to the transceiver and power supply.<br>• Find the cause, repair, and then replace the fuse. | p. 10<br>p. 11 |
| “Antenna Unit No Detect” is displayed. | • The serial numbers of the antenna unit and the main unit are different. | • Connect the transceiver and antenna with the same serial number. | – |
| Little or no sound comes from the speaker. | • Volume level is set too low.<br>• Does not connect to the microphone or the external speaker. | • Rotate [DIAL] to adjust the volume level. | p. 1 |
| You cannot transmit. | • An obstacle may exist between the satellite and transceiver.<br>• “Waiting for Registration…” is displayed. | • Retry transmitting in a place without obstacles.<br>• Wait until “IDLE” is displayed. | |
| No reply is received. | • The talkgroup is not correct.<br>• The operator is away from the transceiver, or the transceiver is turned OFF. | • Confirm the talkgroup.<br>• Wait until the operator is back, or ask your system manager. | p. 6 |
| You cannot use the keypad. | • The Key Lock function is ON. | • Push [P2] until “Lock OFF” is displayed to turn OFF the function. | p. 4 |
| No beep sounds. | • The Key beep is set to OFF.<br>• The audio output level is low. | • Adjust the key beep level in the Menu screen.<br>([OK] > Beep > **Key Beep Lv**)<br>• Rotate [VOL] to adjust the audio output level. | p. 9<br>p. 1 |
| Failed to pair your Bluetooth headset | • The Bluetooth headset is not in the Pairing mode.<br>• There are other active Bluetooth devices nearby.<br>• There are other devices that are operating in the 2.4 GHz band. | • Confirm the Bluetooth headset is in the Pairing mode, and then try again.<br>• Stop using other Bluetooth devices.<br>• Use the transceiver away from other Bluetooth devices.<br>• Use the transceiver away from the other devices, or stop using those devices. | p. 18 |

How the World Communicates

A7597-2EX-5a
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