ICOM

INSTRUCTION MANUAL

SmarTrunk II™ Compatible

VHF TRANSCEIVER
IC-F1610
UHF TRANSCEIVER
IC-F2610

Multi Function
Icom "F" Mobile

Icom Inc.

IMPORTANT

READ ALL INSTRUCTIONS carefully and completely before using the transceiver.

SAVE THIS INSTRUCTION MANUAL—This instruction manual contains important operating instructions for the IC-F1610 VHF TRANSCEIVER or IC-F2610 UHF TRANSCEIVER.

EXPLICIT DEFINITIONS

WORD	DEFINITION
⚠WARNING	Personal injury, fire hazard or electric shock may occur.
CAUTION	Equipment damage may occur.
NOTE	If disregarded, inconvenience only. No risk of personal injury, fire or electric shock.

CE Versions of the transceiver which display the "CE" on the serial number seal, comply with the essential requirements of the 89/336/EEC directive for Electromagnetic Compatibility.

CAUTIONS

⚠**WARNING! NEVER** connect the transceiver to an AC outlet. This may pose a fire hazard or result in an electric shock.

NEVER connect the transceiver to a power source of more than 16 V DC such as a 24 V battery. This connection will ruin the transceiver.

NEVER cut the DC power cable between the DC plug and fuse holder. If an incorrect connection is made after cutting, the transceiver might be damaged.

NEVER place the transceiver where normal operation of the vehicle may be hindered or where it could cause bodily injury.

Place unit in a secure place to avoid inadvertent use by children.

NEVER expose the transceiver to rain, snow or any liquids.

USE supplied microphones only. Other microphones have different pin assignments and may damage the transceiver.

SmarTrunk II™ is a trademark of SmarTrunk Systems, Inc.

DO NOT connect the transceiver to a power source using reverse polarity. This connection will not only blow fuses but also may damage the transceiver.

DO NOT use or place the transceiver in areas with temperatures below –20°C or above +55°C or, in areas subject to direct sunlight, such as the dashboard.

AVOID operating the transceiver without running the vehicle's engine. The vehicle's battery will quickly run out if the transceiver is in transmission while the vehicle's engine is off.

AVOID placing the transceiver is excessively dusty environments.

AVOID placing the transceiver against walls. This will obstruct heat dissipation.
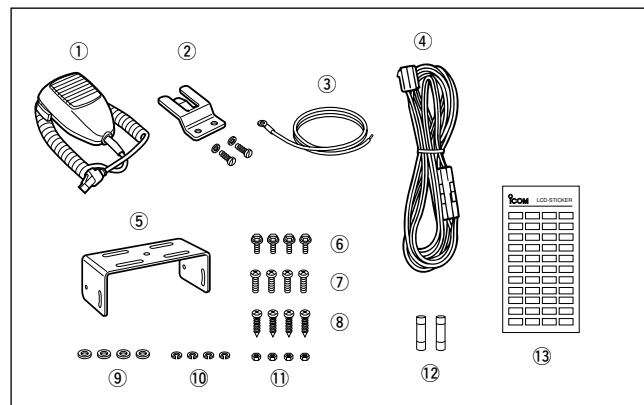
AVOID the use of chemical agents such as benzine or alcohol when cleaning, as they can damage the transceiver's surfaces.

BE CAREFUL! The transceiver will become hot when operating continuously for long periods.

TABLE OF CONTENTS

SUPPLIED ACCESSORIES

① Microphone (HM-100) 1
② Microphone hanger and
    screw set . . . . 1 set
③ Microphone cable 1
④ DC power cable
    (OPC-345) 1
⑤ Mounting bracket 1
⑥ Bracket bolts 4

⑦ Mounting screws (M5 × 12) 4
⑧ Self-tapping screws
    (M5 × 20) 4
⑨ Flat washers 4
⑩ Spring washers 4
⑪ Nuts 4
⑫ Fuses (15A) 2
⑬ Function name stickers 1 set

NOTE: Some versions include the SP-22 EXTERNAL SPEAKER.

◇ **Function name stickers**
Use these to label the programmable function keys ([P0] to [P4]) according to their assigned functions.

■ **Front panel**

VOLUME CONTROL   FUNCTION DISPLAY (p. 6)   CH UP/DOWN KEYS (p. 2)
(programmable)

LOW

MICROPHONE
CONNECTOR

PROGRAMMABLE
FUNCTION KEYS
(pgs. 2–6)

POWER
SWITCH

KEYPAD
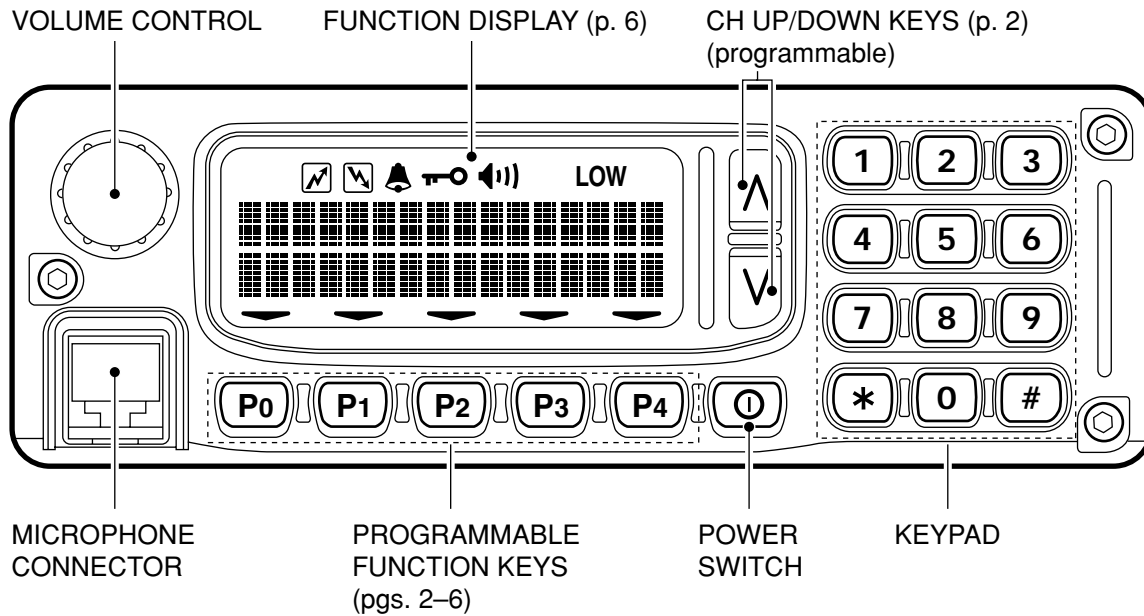
VOLUME CONTROL

Adjusts the audio output

• Minimum audio level (when setting control maximum counter clock-wise) is pre-programmed.

CHANNEL UP/DOWN KEYS [∧]/[∨]([CH UP]/[CH DN])

Push to select an operating channel.

• Can be programmed for one of several functions by your dealer.

POWER SWITCH

Turns the power on and off.

• The following functions are available at power on as options:
  - ➥ Automatic scan start
  - ➥ Password prompt

KEYPAD

The keypad allows you to enter digits to:

➥ Select memory channels

➥ Select tone channels

➥ Select DTMF codes (during transmit)

➥ Set SmarTrunk II™ codes

MICROPHONE CONNECTOR

Connects the supplied microphone or optional DTMF microphone for SmarTrunk II™ operation.

NEVER connect other microphones. The pin assignments may be different and the transceiver may be damaged.

MICROPHONE

The supplied microphone has a PTT switch and a cradle. The following functions are available when the microphone is taken off the cradle or put back on hook:

➥ Automatic scan start when putting on hook

➥ Automatic priority channel selection when taken off hook

➥ Set to 'inaudible' (mute condition) when putting on hook

➥ Set to 'audible' (unmute condition) when taken off hook

■ Programmable keys

The following functions can be assigned to the programmable function keys. Assigned function names can be affixed to the corresponding keys using the supplied stickers*.

*Some functions do not have supplied stickers.

◇ Programmable functions with supplied stickers

MEMORY CHANNEL KEYS

| MR–1 | Select a memory channel directly. |

| MR–2 |

| MR–3 |

| MR–4 |

BANK KEY

BANK   Selects a memory bank.

PRIORITY CHANNEL KEYS

PRI A   Select priority A or priority B channel.

PRI B

SCAN KEYS

SCN A   Start/stop scan A or scan B.

SCN B

SCAN TAG KEY

TAG   Adds or deletes the selected channel to the scan group.

• " ➤ " appears above the [TAG] key when the channel belongs to the scan group.

MONITOR KEY

MONI   Activates one of (or two of) the following functions on each channel independently.

• Push and hold the key to unmute the channel (audio is emitted; 'audible' condition).

• Push the key to toggle the mute and unmute conditions (toggles 'audible' and 'inaudible').

• Push the key to mute the channel (sets to 'inaudible' only).

• Push the key to unmute the channel (sets to 'audible' only).

• Push the key after communication is finished to send a 'reset code.'

☞ **NOTE:** The unmute condition ('audible' conditions) may automatically return to the mute condition ('inaudible' condition) after a specified period.

PUBLIC ADDRESS KEY

PA   When an optional OPC-617 ACC CABLE is installed, the audio output via the cable can be controlled from the transceiver separately from the [VOLUME] control.

• This audio output can be used as a 'public address' function when an external audio amplifier and speaker are connected additionally.

• Push this key, then speak into the microphone while pushing the PTT switch.

• The [CH UP]/[CH DN] keys allow you to set the audio output level from minimum to maximum.

EXTERNAL SPEAKER KEY

SP   When external connections are made for the 'public address' function, the external speaker drive function is also available simultaneously. The received audio can be heard via the external speaker when this key is pushed.

• This function is useful when you are out of the vehicle.

• The audio output level is linked to the transceiver's volume control.

LOCK KEY

LOCK   Electronically locks all programmable keys except

the following:
[CALL] (incl. CAL A and CAL B), [MONI] and [EMER] keys.

OUTPUT POWER SELECTION KEYS

LOW1
LOW2
Select the transmit output power temporarily or permanently, depending on the pre-setting.
• Ask your dealer or system operator for the output power level for each selection.

BEEP KEY

BEEP
Push to toggle beep tones on and off.
• These are the confirmation beep tones that by default are emitted each time a key is pushed.

LIGHT KEY

LITE
Push to select the keypad and LCD backlighting condition.
ON : Turns backlighting on continously.
OFF : Turns backlighting off.
AUTO : Turns backlighting on or off depending on the ACC socket pin 1 voltage.
ON: low (0 V) OFF: high (12 V)

CONTINUOUS TONE CHANNEL ENTRY KEY

TONE
Push this key, then input a continous tone memory channel number via the keypad to change the tone frequency.

TALK AROUND KEY

TA
Toggles the talk around function on and off.
• The talk around function equalizes the transmit frequency to the receive frequency for mobile-to-mobile communication.

WIDE/NARROW KEY

W/N
Push [W/N] to toggle the bandwidth between wide and narrow operation.
• This function is available for wide/narrow transceiver versions only.

DTMF CHANNEL SELECT KEY

DTMF
➥ Push this key to select a DTMF channel.
• Push this key, then select the desired DTMF channel using the [CH UP]/[CH DN] keys.
➥ Push and hold this key to transmit the selected DTMF code.

CALL KEYS

CALL
CAL A
CAL B
Transmit a 5-tone call.
• Call transmission is necessary before you call another station, depending on your signalling system.
• The [CAL A] and/or [CAL B] keys may be available when your system employs selective 'Individual/Group' calls. Ask your system operator which call is assigned to each key.

EMERGENCY KEY

EMER Push and hold the key to transmit an emergency call.

• If you want to cancel the emergency call, push (or push and hold) the key again before transmitting the call.

• The emergency call is transmitted one time only or repeatedly until receiving a control code, depending on the pre-settting.

TX CODE KEY

CODE Selects a transmit 5-tone code (station code) channel.

• Push and hold to change the contents of the station code using the [CH UP]/[CH DN] keys.

• Push to select a TX 5-tone code channel using the [CH UP]/[CH DN] keys after pushing this key.

ID MEMORY READ KEY

ID MR ➡ Recalls detected ID codes.
    • Push this key, then push [CH UP]/[CH DN] for selection.
  • Up to 5 ID's are remembered.
➡ Push and hold this key to erase all memorized ID's.

OPT **OPTION KEY**

TRUNKING GROUP KEY

GRP Push to select a trunking group (when operating in SmarTrunk II™ mode).

◇ **Programmable functions without supplied stickers**

TX CODE CHANNEL UP/DOWN KEY

Push to select a TX code channel directly.

CHANNEL UP/DOWN FUNCTION

When a key is assigned this function, push it to increment or decrement the operating channel.

CHANNEL SELECT FUNCTION

When a key is assigned this function, push it to increment or decrement the operating channel.

BANK UP/DOWN FUNCTION

When a key is assigned this function, push it to increment or decrement the selected channel bank.

PRIORITY CHANNEL A REWRITE FUNCTION

When a key is assigned this function:
➡ Push momentarily to select PRIO A channel.
➡ Push and hold to set the current channel to PRIO A.

DTMF RE-DIAL FUNCTION

When a key is assigned this function, push it to automatically re-dial the most recent (manually transmitted) DTMF code.

TX CODE CHANNEL UP/DOWN FUNCTION
When a key is assigned this function, push it to increment or decrement the TX code channel.

TURBO SpeeDial A/B/C/D FUNCTIONS
During SmarTrunk II™ operation, when a key is assigned this function, push it to automatically dial a commonly used number with one push.

■ Function display

❶ **TRANSMIT INDICATOR**
Appears while transmitting or sending a 5-tone code.

❷ **BUSY INDICATOR**
Appears while the channel is busy.

❸ **BELL INDICATOR**
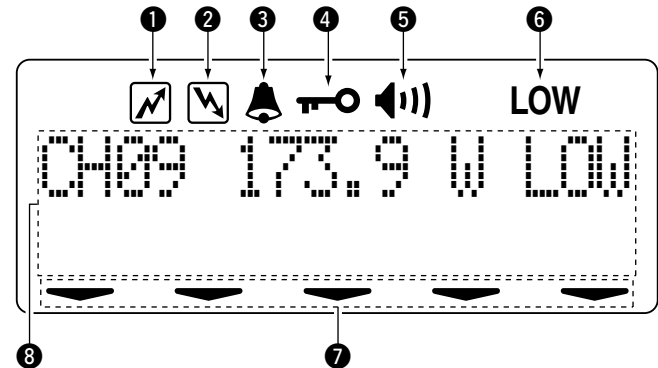Appears or flashes when the specified 5-tone call is received.

❹ **LOCK INDICATOR**
Appears when the lock function is activated.

❺ **AUDIBLE INDICATOR**
Appears when the channel is in the 'audible' condition (unmute) condition.

❻ **LOW POWER INDICATOR**
Appears when the selected channel is set for low power output.

❼ **ACTIVATED KEY INDICATOR**
Appears or flashes to indicate the key directly below it has been activated.

❽ **DOT MATRIX INDICATORS**
These 2 lines of 16 characters each display operating information such as the selected channel, frequency, etc.

■ Turning power on

① Push [⏻] to turn power on.
  • A power-up alert tone sounds for about 1 sec. and an opening message may appear.
② If the transceiver is programmed with a startup password, input the code from the keypad as instructed by your system operator.
③ When the password prompt does not clear after inputting the code, you may have input the code incorrectly. In such a case, turn power off, then on again.

■ Channel selection

The method for selecting channels may differ according to your system.

NON-BANK TYPE:
Push the [CH UP]/[CH DN] keys to select the desired operating channel, in sequence or;
push one of the digit keys on the keypad to select a channel directly.

BANK TYPE:
① Push [BK S], then push [CH UP]/[CH DN] to select the desired bank number; or
  Push [BD UP] or [BK DN] if the transceiver has these keys.
② Push [CH UP]/[CH DN] to select the desired channel in the selected bank.

AUTOMATIC SCAN TYPE:
Channel setting is not necessary for this type. When turning the power ON, the transceiver automatically starts scanning. Scanning stops when receiving a call or taking the microphone off from the microphone hanger.

■ Receiving and transmitting

RECEIVING:
① Push [①] to turn power ON.
② Push [CH UP]/[CH DN] to select a channel.
③ When receiving a call, adjust the volume to comfortable listening level.

TRANSMITTING:
④ Lift the microphone off the microphone hanger.
  • 5-tone mute may be released (the 'audible' condition is selected and "[◀))]" appears.
  • A priority channel may be selected automatically.
⑤ Wait for the channel to become clear.
  • The channel is busy when "[☒]" appears.
⑥ Push the [CALL] key when initiating a call from your side.
  • Coded audio may be heard from the transceiver, then "[◀))]" appears.
  • This step may not be necessary depending on your signalling system. Ask your system operator or dealer.
⑦ While pushing and holding [PTT], speak into the microphone at your normal voice level.
⑧ Release [PTT] to receive.

IMPORTANT: To maximize the readability of your signal:
• Pause briefly after pushing [PTT].
• Hold the microphone 15 to 20 cm from your mouth, then speak into the microphone at a normal voice level.

◇ Transmitting notes
• Transmit inhibit function
The transceiver has several lockout/inhibit functions which restricts the transmission under the following conditions:
➥ The channel is in mute condition ('inaudbile' condition; "[◀))]" does not appear).
➥ Channel is busy.
➥ Not matched (or matched) CTCSS is being received.
➥ The selected channel is a 'receive only' channel.

• Time-out timer
After continuous transmission for a pre-programmed period, the time-out timer is activated causing the transceiver to stop transmitting and automatically select receive.

• Penalty timer
Once the time-out timer is activated, transmission is further inhibited for a period determined by the penalty timer.

◇ Tx code channel selection

If the transceiver has the [TX CH] key, display can be toggled with the operating channel number (or name) and Tx code channel number (or name). When the Tx code channel number (or name) is displayed, the [∧]/[∨] key selects the Tx code channel.

TO SELECT A TX CHANNEL:
① Push [TX CH]—a Tx code channel appears.
② Push [∧]/[∨] to select the desired Tx code channel.
③ Push [CALL] to transmit the selected Tx code.
④ Push [TX CH] again to return to the channel display.

FOR TX CODE CHANNEL TYPE:
When the [STN UP] and/or [STN DN] are available on the transceiver, a TX code channel may appear constantly. In this case, these keys select the TX code channel directly.

◇ Tx code number selection

If the transceiver has the [CODE] key, Tx code contents can be changed within the allowable digits.

TO SELECT A TX CODE:
① Push [CODE]—a Tx code number appears and an allowable digit flashes.
② Enter the desired number directly using the keypad.
  • Repeat from step ① when you want to enter another Tx code.
③ Push [CALL] to transmit the selected Tx code.

◇ DTMF transmission

If the transceiver has the [CODE] key, the automatic DTMF transmission function is available. Up to 10 DTMF channels may be available.
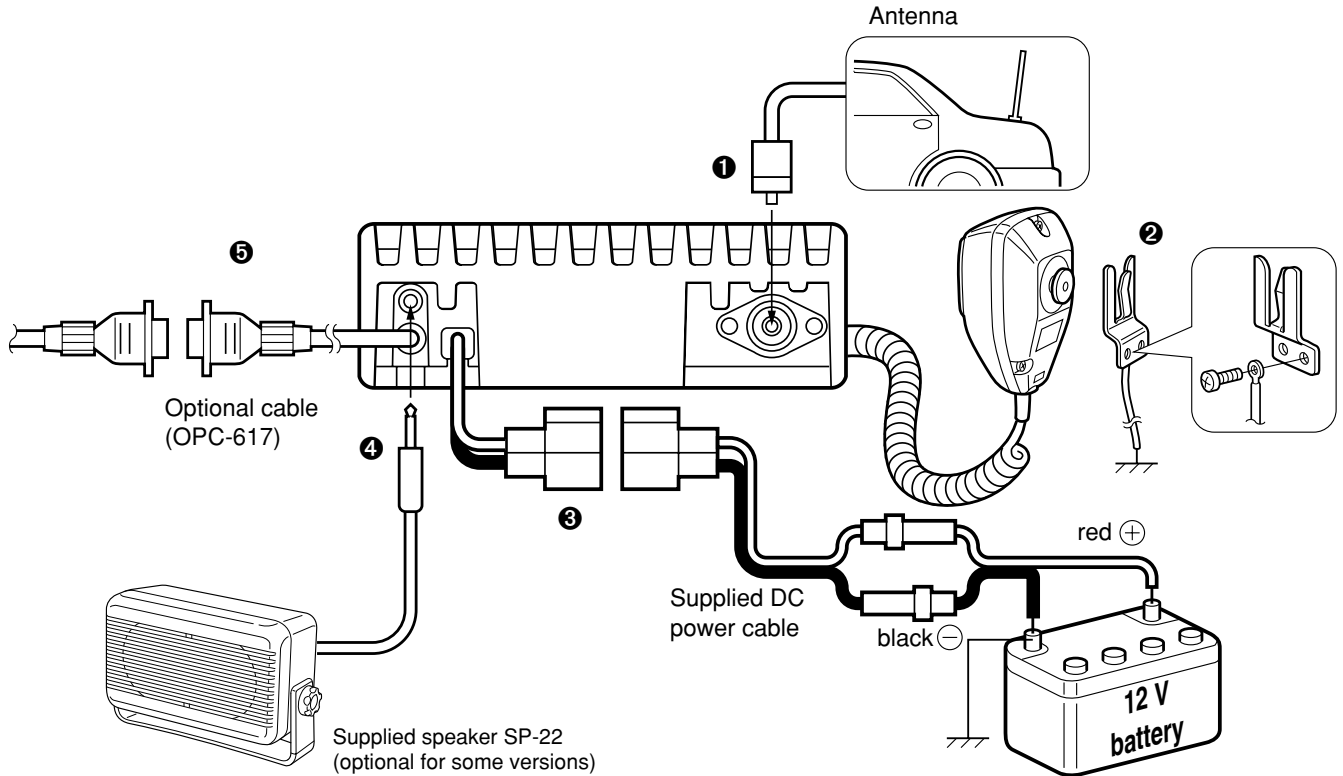
TO SELECT A TX CODE:
① Push [DTMF]—a DTMF channel appears.
② Push [∧]/[∨] to select the desired DTMF channel.
③ Push and hold [DTMF] to transmit the DTMF code in the selected DTMF channel.

3 **CONNECTION AND INSTALLATION**

■ **Rear panel and connections**

Antenna

❶

❷

❺

Optional cable
(OPC-617)

❹

❸

Supplied DC
power cable

red ⊕

black ⊖

12 V
battery

Supplied speaker SP-22
(optional for some versions)

❶ ANTENNA CONNECTOR
Connects to an antenna. Ask your dealer about antenna se-
lection and optimal antenna locations.

❷ MICROPHONE HANGER
Connects the supplied microphone hanger to the vehicle's
ground for the hanger function.

❸ DC POWER RECEPTACLE
Connects to a 12 V DC battery. Pay attention to polarities.
NEVER connect to a 24 V battery. This could damage the
transceiver.

❹ EXTERNAL SPEAKER JACK
Connects the supplied external speaker.

❺ OPTIONAL CABLE (OPC-617)
Connects an external modem unit, LCD backlight control,
audio amplifier for the 'public address' function, etc.

■ Mounting

Flat washer

Spring washer

When using
self-tapping screws

■ Separation

① Separate the front panel from the transceiver main unit using the allen wrench ($\frac{1}{32}$″).
② Connect the optional OPC-609 cable to both the front and main unit attachments (figures 1 and 2).
  • Remove the rear plate of the attachment.
  • Use the supplied screw to connect a cable lug.
  • For the main unit attachment, attach to the main unit using the supplied screws, in advance.
③ Attach the front panel and attachment with the 3 removed allen socket bolts (fig. 3).

Separation (using RMK-1)

Attachment
(for front panel)

Rear plate

OPC-609

Fig. 1

Fig. 2

Attachment
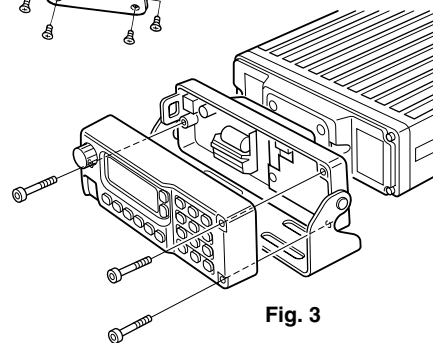(for main unit)

Supplied screws
with the RMK-1

Fig. 3
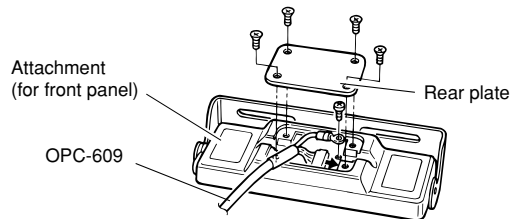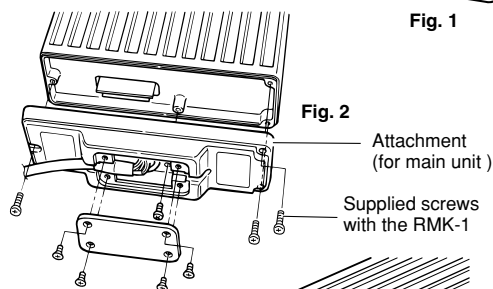
■ Optional UT-105 installation

The Optional UT-105 provides SmarTrunk II™ functions. Install the unit as follows:

① Turn power off, then disconnect the DC power cable.
② Unscrew the 4 screws, then remove the bottom cover.

③ Install the unit as shown in the diagram below.
④ Replace the bottom cover and screws, then the DC power cable.

4 OPTIONAL SmarTrunk II™ OPERATION
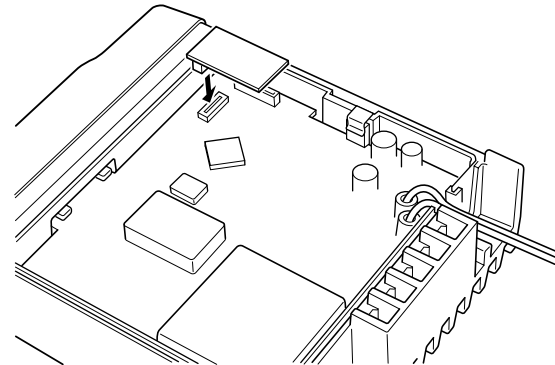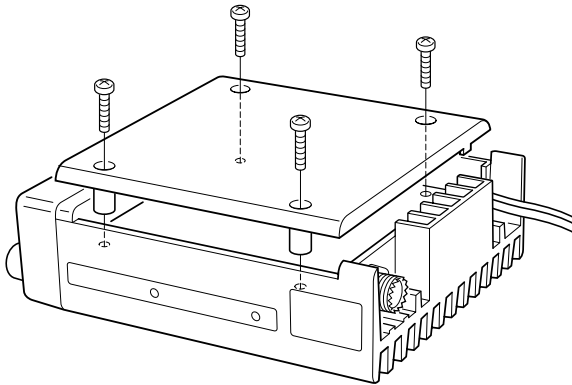
■ SmarTrunk II™ and conventional modes

This transceiver has SmarTrunk II™ compatible capabilities. The optional UT-105 allows communication in conventional channels or SmarTrunk II™ channels. Select a channel bank for SmarTrunk II™ before trunking operation.

Push [**BK UP**] or [**BK DN**] one or more times to select a channel bank for conventional channels or SmarTrunk II™ channels.
• Pushing [**CH UP**] or [**CH DN**] while pushing [**BK S**] can also select the channel bank.
• Scanning starts when a channel bank for SmarTrunk II™ is selected.
• Contact your dealer for channel bank details.

☞ **NOTE:** Depending on how your transceiver has been set up, the keypad or an optional DTMF microphone can be used to input SmarTrunk II™ commands. Contact your dealer for details.

■ SmarTrunk II™ operation

These features are enabled by a dealer or system operator and may not be available in your system. Contact your dealer for details.

◊ Placing a telephone call
Enter the phone number followed by [1], [✳].
• A high-pitched beep indicates that the number is accepted.
• When the called party answers, push the [PTT] switch to talk, and release it to listen.

◊ Calling another local system subsriber
Enter the subscriber number followed by [3], [✳].
• A high-pitched beep indicates that the number is accepted.
• You hear ringing, then two short beeps when the subscriber answers.
• If the other subscriber is on another call or out of range, you hear a fast busy signal and the call terminates automatically.

◊ Receiving a call
When you hear ringing, push [✳] to answer.
• For a group call, you hear a short ring followed by two short beeps. You do not have to answer a group call to hear it over the air.

◇ **Terminating a call**

After completing a call, push [#] to disconnect (hang up).

IMPORTANT: If one person in the conversation terminates a call, all participants will be cut off.

◇ **Last number redial**

Push [✳], [✳] to automatically redial the last number called.
• A high-pitched beep indicates that the number is accepted.

◇ **Memory speed-dialing**

To automatically dial a commonly used number from memory: Push [✳] followed by the memory location (0–9).

◇ **Turbo SpeeDial**

To automatically dial a commonly used number with one push:
Push one of the turbo SpeeDials ([A], [B], [C] or [D]).

◇ **Programming memory speed dial**

① Push and hold [✳] until you hear a high-pitched beep.
② Enter the memory location (0–9, A, B, C, D), the telephone or subscriber number, then [1], [✳] (or [3], [✳] if for another system subscriber).
  • A high-pitched beep indicates successful programming.
  • Memories [A]–[D] are used for Turbo SpeeDial.

◇ **System busy indication**

If all calls are busy, three low beeps sound after you initiate a call. Try the call again later.

◇ **PTT dispatch operation**

① Push [PTT] once (without dialing) to initiate a dispatch call.
② Begin talking after you hear three beeps (one short, high-pitched, two very short, low-pitched).
③ Receiving a dispatch call is indicated by the same three beep sequence.
  • It is not necessary to push [✳] to answer a dispatch call.

◇ **Emergency call**

Push [0], [✳] to initiate an emergency call.
• Contact your dealer for details.

4 OPTIONAL SmarTrunk II™ OPERATION
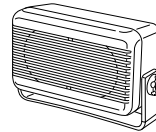
◇ Clear channel alerting

If all channels are busy the transceiver automatically begins searching for an open channel and beeps every ten seconds. When two short beeps (low-pitched, then high-pitched) are heard, a channel is available. Push [∗], [∗] immediately to re-dial the last number.

☞ **NOTE:** For additional operating instructions, contact your dealer for details.
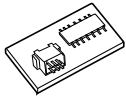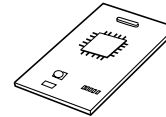
EX-1761 MEMORY EXPANSION UNIT
Expands the number of available memory channels to 256 for large system operation.

HM-100T DTMF MICROPHONE
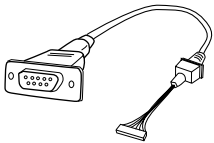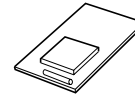
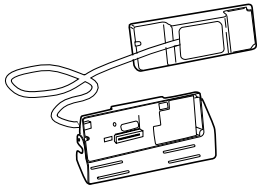**OPC-617** ACC CABLE
Provides external terminal connection.

OPC-822 INTERFACE CABLE

RMK-1 SEPARATION KIT
+ **OPC-609** SEPARATION CABLE
Allows you to install the transceiver main unit separately from the front panel for operating convenience (1.9 m).

SP-22 EXTERNAL SPEAKER
Supplied with some versions.
Input impedance: 4 Ω
Max. input power: 5 W

UT-96 5-TONE UNIT
Provides 5-tone decoder capabilities (supplied with some versions).

UT-105 SmarTrunk II™ LOGIC BOARD*
For SmarTrunk II™ operation.
*SmarTrunk II™ is a trademark of SmarTrunk Systems Inc.

Count on us!

Icom Inc.
6-9-16 Kamihigashi, Hirano-ku, Osaka 547-0002 Japan