

ICOM

INSTRUCTION MANUAL

VHF MARINE TRANSCEIVER
IC-M3A

This device complies with Part 15 of the
FCC Rules. Operation is subject to the
condition that this device does not cause
harmful interference.

Icom Inc.



FOREWORD

Thank you for purchasing this Icom product. The IC-M3A VHF MARINE TRANSCEIVER is designed and built with Icom's superior technology and craftsmanship. With proper care this product should provide you with years of trouble-free operation.

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-M3A.

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.

FEATURES

-  **Water-resistant construction**
Built tough to withstand the punishing marine environment, the IC-M3A meets JIS water-resistant specification grade 4.
-  **Dual watch and tri-watch functions**
Convenient functions which allow you to monitor the distress channel (ch 16) while receiving a channel of your choice—dual watch; or monitor the distress channel and another channel while receiving a channel of your choice—tri-watch.
-  **Large, easy-to-read LCD**
With dimensions of 18(H) × 32(W) mm, the IC-M3A's function display is easy to read and shows operating conditions at a glance. Backlighting and contrast can be adjusted to suit your preferences.
-  **Simple operation**
Ergonomic design with a minimum number of switches and controls provides simple intuitive operation.

CAUTIONS

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

⚠ **WARNING! NEVER** hold the transceiver so that the antenna is very close to, or touching exposed parts of the body, especially the face or eyes, while transmitting. The transceiver will perform best if the microphone is 5 to 10 cm away from the lips and the transceiver is vertical.

NEVER connect the transceiver to a power source other than the BP-204. Such a connection will ruin the transceiver.

AVOID using or placing the transceiver in direct sunlight or in areas with temperatures below -20°C (-4°F) or above $+60^{\circ}\text{C}$ ($+140^{\circ}\text{F}$).

KEEP the transceiver out of the reach of children.

KEEP the transceiver at least 1 meter away from your vessel's magnetic navigation compass.

IN CASE OF EMERGENCY

If your vessel requires assistance, contact other vessels and the Coast Guard by sending a distress call on channel 16.

○ **USING CHANNEL 16**

DISTRESS CALL PROCEDURE

1. "MAYDAY MAYDAY MAYDAY."
2. "THIS IS" (name of vessel)
3. Your call sign or other indication of the vessel.
4. "LOCATED AT" (your position)
5. The nature of the distress and assistance required.
6. Any other information which might facilitate the rescue.

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◇ Priorities

- Read all rules and regulations pertaining to priorities and keep an up-to-date copy handy. Safety and distress calls take priority over all others.
- You must monitor channel 16 when you are not operating on another channel.
- False or fraudulent distress calls are prohibited under law.

◇ Privacy

- Information overheard but not intended for you cannot lawfully be used in any way.
- Indecent or profane language is prohibited.

◇ Radio licenses

SHIP STATION LICENSE

When your craft is equipped with a VHF FM transceiver, you must have a current radio station license before using the transceiver. It is unlawful to operate a ship station which is not licensed.

Inquire through your dealer or the appropriate government agency for a Ship-Radiotelephone license. This license includes the call sign which is your craft's identification for radio purposes.

OPERATOR'S LICENSE

A restricted Radiotelephone Operator Permit is the license most often held by small vessel radio operators when a radio is not required for safety purposes.

The Restricted Radiotelephone Operator Permit must be posted near the transceiver or be kept with the operator. Only a licensed radio operator may operate a transceiver.

However, non-licensed individuals may talk over a transceiver if a licensed operator starts, supervises, ends the call and makes the necessary log entries.

A current copy of the applicable government rules and regulations is only required to be on hand for vessels in which a radio telephone is compulsory. However, even if you are not required to have these on hand it is your responsibility to be thoroughly acquainted with all pertinent rules and regulations.

NOTE: Even though the IC-M3A is capable of operation on VHF marine channels 3, 21, 23, 61, 64, 81, 82 and 83, according to FCC regulations these simplex channels cannot be lawfully used by the general public in USA waters.

■ Front panel

① DUALWATCH /TRI-WATCH SWITCH [DW•TRI]

- Starts dualwatch when pushed momentarily.
- Starts tri-watch when pushed for 1 sec.
- Stops dualwatch/tri-watch when either is activated.

② SQUELCH SWITCH [SQL]

- Push this switch, then set the squelch level with the UP/DOWN [▲]/[▼] switches. (p. 6)

③ CHANNEL 16 SWITCH [16 • 9]

- Selects channel 16 when pushed.
- Selects the call channel when pushed for 1 sec.
- Enters call channel write mode when the call channel is selected and this switch is pushed for 3 sec.

④ CHANNEL/WEATHER CHANNEL SWITCH [CH/WX•U/I/C]

- Selects and toggles the regular channels and weather channel when pushed momentarily.
- Selects one of 3 regular channels in sequence when pushed for 1 sec.

- International, U.S.A. and Canadian channels are available.

⑤ SCAN/TAG SWITCH [SCAN • TAG]

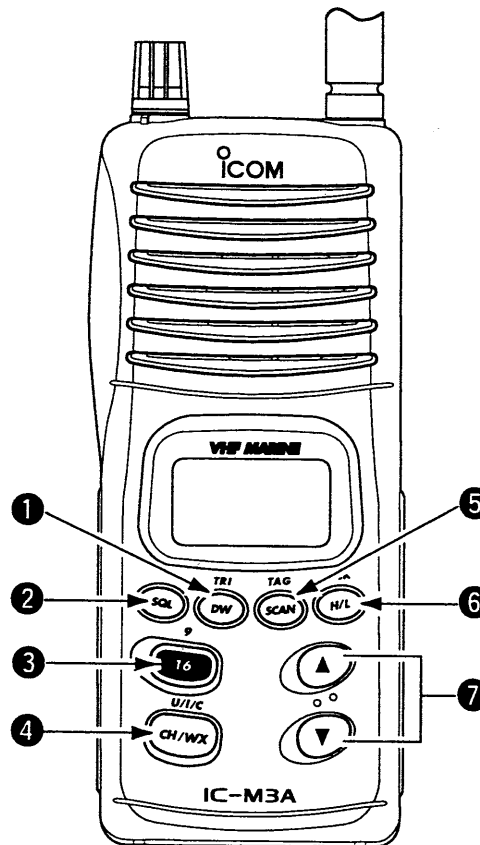
- Starts and stops normal or priority scan when tag channels are programmed.
- Sets and clears the displayed channel as a tag (scanned) channel when pushed for 1 sec.
- While pushing this switch, turn the power ON to clear all tag channels in the selected regular channel group.

⑥ TRANSMIT POWER/LOCK SWITCH [H/L • LOCK]

- Toggles high and low power when pushed.
- Toggles the lock function ON/OFF when pushed for 1 sec.

⑦ CHANNEL UP/DOWN SWITCHES [▲]/[▼]

- Select an operating channel in the selected channel group.
- Selects the set mode condition of the item.



■ Top and side panels

❶ PTT SWITCH [PTT]

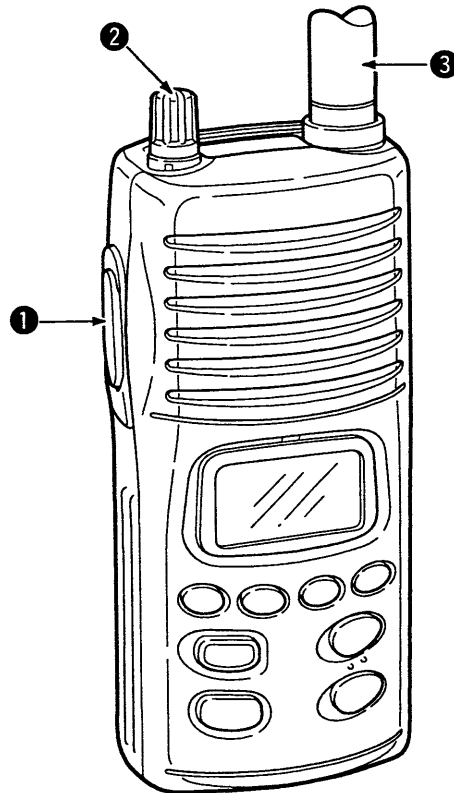
Push and hold to transmit; release to receive.

❷ VOLUME CONTROL [OFF/VOL]

Turns power ON and adjusts the audio level.

❸ ANTENNA CONNECTOR

Connects the supplied antenna.



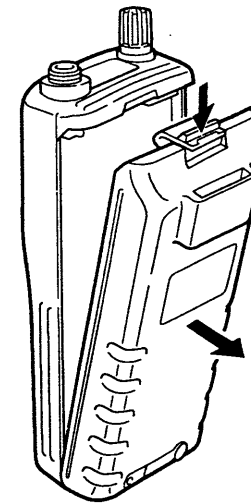
◇ BATTERY CASE RELEASE BUTTON

To remove the battery case:

Push and hold the battery release button downwards, then open the battery case as shown below.

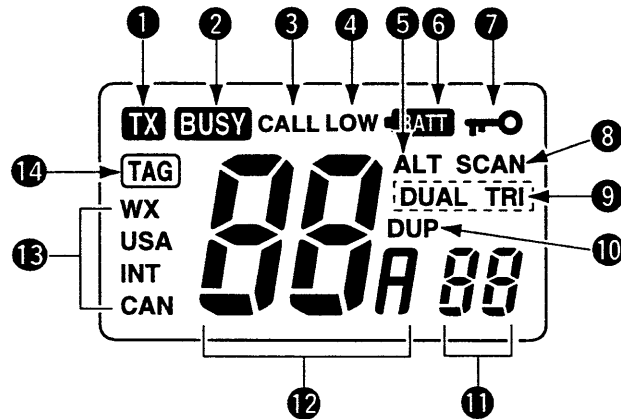
To attach the battery case:

Mate the notched ends of the transceiver and battery case, and click the battery case into place.



2 PANEL DESCRIPTION

■ Function display



① TRANSMIT INDICATOR

Appears while transmitting. (p. 8)

② BUSY INDICATOR

Appears when receiving a signal or when the squelch level is set to the "OFF" position. (p. 8)

③ CALL CHANNEL INDICATOR

Appears when the call channel is selected. (p. 9)

④ LOW POWER INDICATOR

Shows that low output power is selected.

⑤ WEATHER ALERT INDICATOR

Appears while the weather alert function is activated; blinks when an alert tone is received.

⑥ LOW BATTERY INDICATOR

Blinks when the battery voltage drops to approx. 6 V or below. The attached Ni-Cd batteries require charging in this

case.

⑦ LOCK INDICATOR

Appears while the lock function activated.

⑧ SCAN INDICATOR

Blinks while scanning.

⑨ DUALWATCH/TRI-WATCH INDICATORS

"DUAL" appears during dualwatch; "TRI" appears during tri-watch. (p. 10)

⑩ DUPLEX INDICATOR

Appears when a duplex channel is selected.

⑪ SET MODE INDICATOR

Shows the set mode items. (pgs. 13)

⑫ CHANNEL INDICATOR

- Indicates the selected operating channel number. (p. 6)
- In set mode, indicates the selected condition. (p. 13)

⑬ MODE INDICATORS (p. 6)

- "USA" shows that USA channels are selected.
- "CAN" shows that Canadian channels are selected.
- "INT" shows that international channels are selected.
- "WX" shows that weather channels are selected.

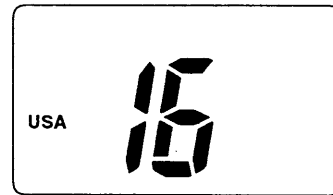
⑭ TAG CHANNEL INDICATOR

Appears when a tag channel is selected.

Channel selection

◇ Channel 16

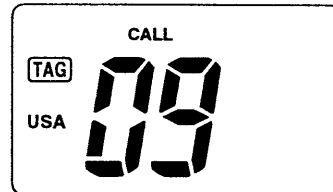
Channel 16 is the distress channel. It is used for establishing initial contact with another station and for emergency communications. Channel 16 is monitored during dualwatch/tri-watch. While standing by you are required to monitor channel 16.



◇ Channel 9 (Call channel)

Channel 9 is the leisure-use call channel. Each regular channel group has a separate call channel. The call channel is monitored during tri-watch. The call channels can be programmed (p. 9) and are used to store your most often-used channels in each channel group for quick recall.

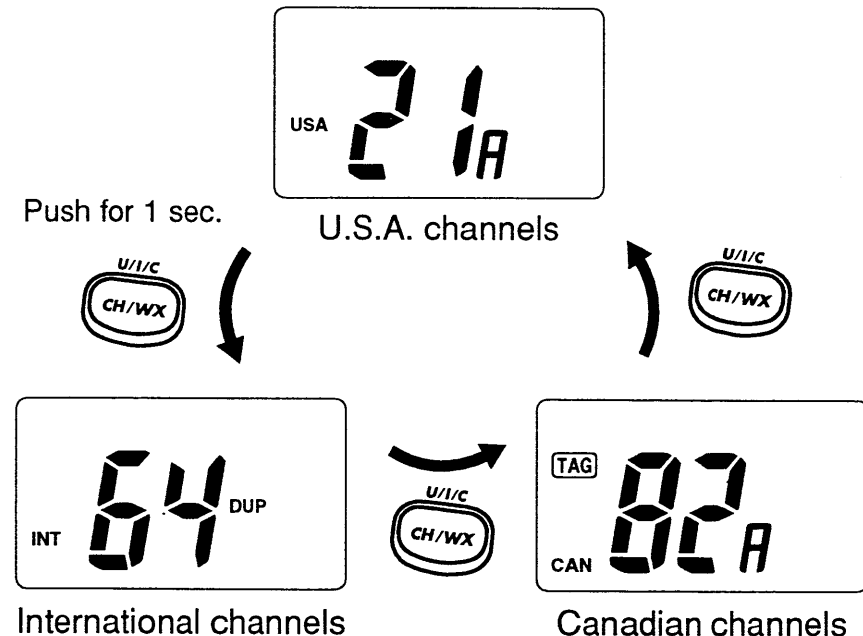
- Push [16 • 9] for 1 sec. to select the call channel for the selected channel group.
 - "CALL" and call channel number appear.
 - Each channel group can have its own call channel after changing a call channel.



◇ U.S.A., Canadian and international channels

There are 61 U.S.A., 57 Canadian and 57 international channels. These channel groups may be specified for the operating area.

- ① Push [CH/WX] to select a regular channel.
 - If a weather channel appears, push [CH/WX] again.
- ② Push [▲]/[▼] switches to select a channel.
 - "DUP" appears for duplex channels.
- ③ To change the channel group, push [CH/WX • U/I/C] for 1 sec.
 - U.S.A., Canadian and international channels can be selected in sequence.



3 BASIC OPERATION

◇ Weather channels

There are 10 weather channels. These are used for monitoring weather channels from the NOAA (National Oceanographic and Atmospheric Administration) broadcasts.

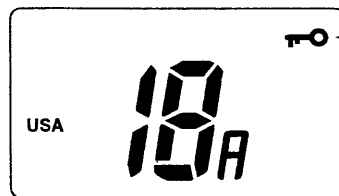
The IC-M3A can detect a weather alert tone on a selected weather channel while scanning. See the “SET mode items” on p. 12.

- Push [CH/WX] to select weather channels.

■ Lock function

This function electronically locks all keys and switches to prevent accidental frequency changes and function access.

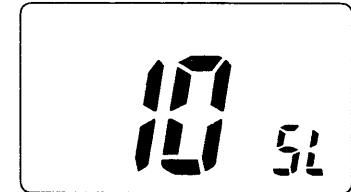
- Push [H/L • LOCK] for 1 sec. to turn the lock function ON and OFF.
 - Only [PTT], [H/L] and [SQL] are functional.



Appears when the lock function is in use.

■ Adjusting the squelch level

The IC-M3A has a squelch even though there is no control knob for it. In order to receive signals properly, as well as for scan to function, the squelch must be adjusted to a suitable level.



Level 10: Max. squelch level

- ① Push [SQL], then select the squelch level with the [▲]/[▼] keys.
 - There are 11 squelch levels to choose from: OFF is completely open; 10 is the maximum squelch level.
 - When no key pushes within 5 sec., the display returns to normal indication.
- ② Push [SQL] once more when the desired squelch level is indicated in the function display.
 - The display returns to normal indication.

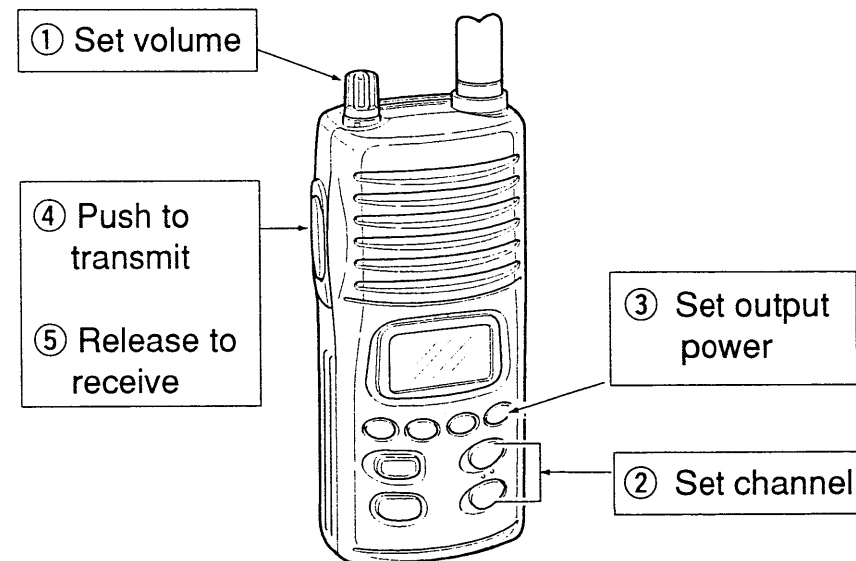
■ Receiving and transmitting

CAUTION: Transmitting without an antenna may damage the transceiver.

- ① Rotate [OFF/VOL] clockwise to turn power ON, then set to the 10 o'clock position.
 - Use the squelch function to mute any audio noise if necessary. Refer to the previous page for details.
- ② Push [▲]/[▼] to select the desired channel.
 - When receiving a signal, **BUSY** appears and audio is emitted from the speaker.
 - Further adjustment of [OFF/VOL] may be necessary at this point.
- ③ Push [H/L] to select the output power if necessary.
 - "LOW" appears when low power is selected.
 - Choose low power to conserve battery power, choose high power for longer distance communications.
 - Some channels are for low power only.
- ④ Push and hold [PTT] to transmit, then speak into the microphone.
 - **TX** appears.
 - Channel 70 cannot be used for transmission (for GMDSS use).
- ⑤ Release [PTT] to receive.

IMPORTANT: To maximize the readability of your transmitted signal, pause a few sec. after pushing [PTT], hold the microphone 5 to 10 cm (2 to 4 inches) from your mouth and speak at a normal voice level.

NOTE: The transceiver has power save function to conserve the battery power and cannot be turned OFF. The power save function activates automatically when no signal is received for 5 sec.

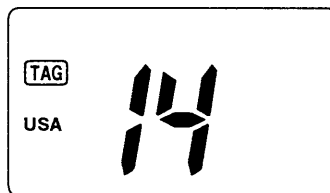


3 BASIC OPERATION

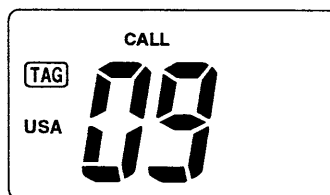
■ Call channel programming

The call channel switch is used to select channel 9 by default, however, you can program your most often-used channels in each channel group for quick recall.

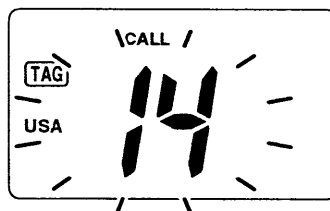
- ① Push [CH/WX • U/I/C] for 1 sec. several times to select the desired channel group (USA, INT, CAN) to be programmed.



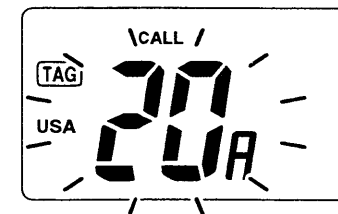
- ② Push [16 • 9] for 1 sec. to select the call channel of the selected channel group.
- "CALL" and call channel number appear.



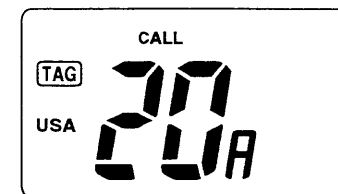
- ③ Push [16 • 9] again for 3 sec. (until long beep changes to 2 short beeps) to enter call channel programming condition.
- Call channel number and channel group to be programmed flash.



- ④ Push [▲]/[▼] to select the desired channel.



- ⑤ Push [16 • 9] to program the displayed channel as the call channel.
- The call channel number and channel group stop flashing.



■ Automatic backlighting

This function is convenient for nighttime operation. The automatic backlighting can be activated in SET mode. (p. 12)

- Push any key except for [PTT] to turn the backlighting ON.
- The backlighting is automatically turned OFF after 5 sec. of inactivity.

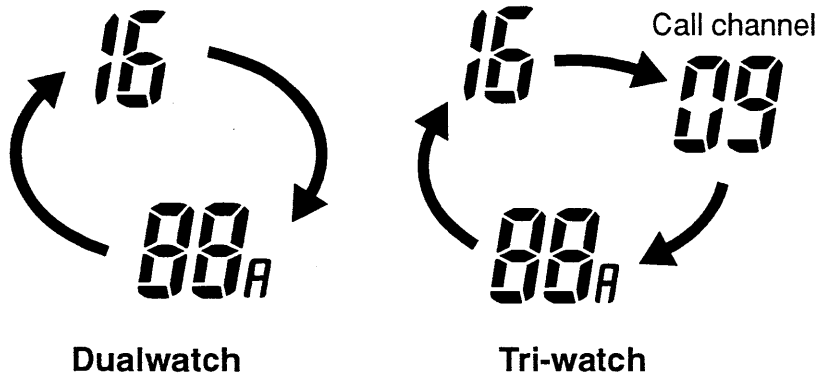
■ Description

Dualwatch monitors channel 16 while you are receiving another channel; tri-watch monitors channel 16 and the call channel while receiving another channel.

■ Operation

- ① Select the desired operating channel.
- ② Push [DW • TRI] momentarily to start dualwatch; push [DW • TRI] for 1 sec. to start tri-watch.
 - "DUAL" flashes during dualwatch; "TRI" flashes during tri-watch.
 - Beep tones sound when a signal is received on channel 16.
 - Tri-watch becomes dualwatch when receiving a signal on the call channel.
- ③ To cancel dualwatch/tri-watch, push [DW • TRI] again.

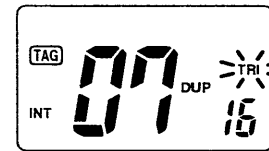
DUALWATCH/TRIWATCH SIMULATION



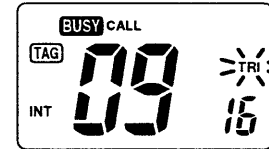
- If a signal is received on channel 16, dualwatch/tri-watch pauses on channel 16 until the signal disappears.
- If a signal is received on the call channel during tri-watch, tri-watch becomes dualwatch until the signal disappears.
- To transmit on the selected channel during dualwatch/tri-watch, push and hold [PTT].

[Example]: Operating tri-watch on INT channel 07.

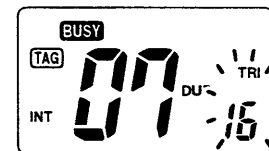
Push for 1 sec.



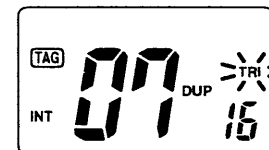
Tri-watch starts.



Signal is received on call channel.



Signal received on channel 16 takes priority.



Tri-watch resumes after the signal disappears.

■ Scan types

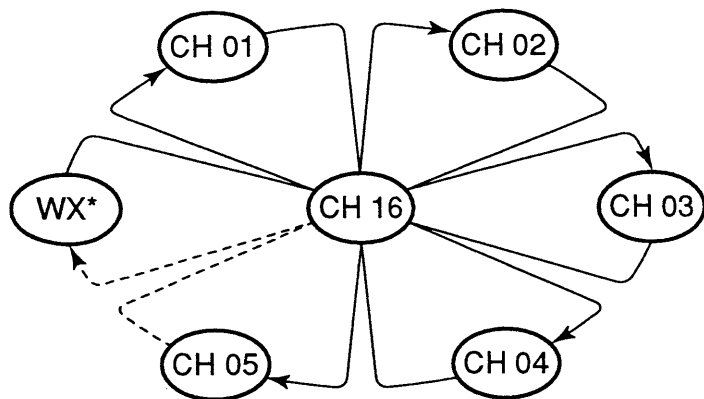
Scanning is an efficient way to locate signals quickly over a wide frequency range. The transceiver has a priority scan and a normal scan.

In addition, weather alert functions is available for standby convenience. (p. 13)

Set the tag channels (channels to be scanned) before scanning. Clear the tag channels which inconveniently stop scanning, such as those used for digital communications.

/// **NOTE:** Choose priority or normal scan in SET mode. (P. 12)

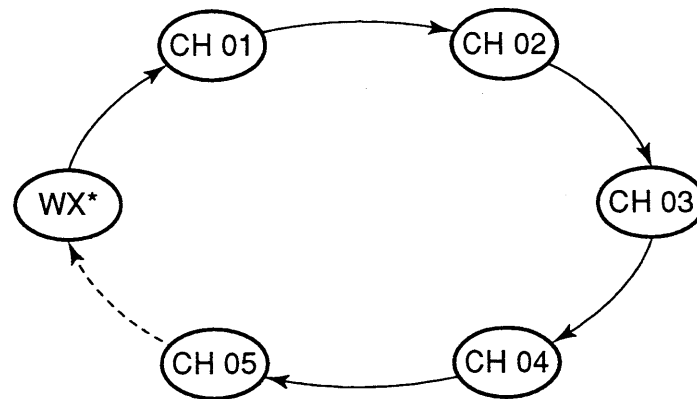
PRIORITY SCAN



* Previously selected weather channel when weather alert function is ON.

Priority scan searches through all tag channels in sequence while monitoring channel 16. When a signal is detected on channel 16, scan pauses until the signal disappears; when a signal is detected on a channel other than channel 16, scan becomes dualwatch until the signal disappears.

NORMAL SCAN



* Previously selected weather channel when weather alert function is ON.

Normal scan, like priority scan, searches through all tag channels in sequence. However, unlike priority scan, channel 16 is not checked unless channel 16 is set as a tag channel.

■ Setting tag channels

For more efficient scanning, add desired channels as tag channels or clear tag channels for unwanted channels. Channels set as non-tag channels will be skipped during scanning. Tag channels can be assigned to each channel group (USA, CAN, INT) independently.

- ① Select the desired channel group (USA, CAN, INT) by pushing [CH/WX • U/I/C] for 1 sec., if desired.
- ② Select the desired channel to set as a tag channel.
- ③ Push [SCAN • TAG] for 1 sec. to set the displayed channel as a tag channel.
 - [TAG] appears in the function display.
- ④ To cancel the tag channel setting, push [SCAN • TAG] for 1 sec.
 - [TAG] disappears.

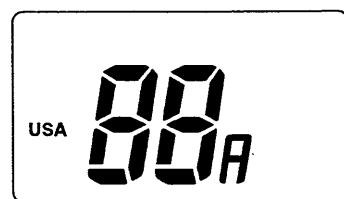
• **Clearing all tag channels in the selected channel group**
While pushing [SCAN • TAG], turn the power ON to clear all tag channels in the channel group.

■ Starting a scan

Set scan type, weather alert function and scan resume timer in advance using SET mode. (p. 13)

- ① Select the desired channel group (USA, CAN, INT) by pushing [CH/WX • U/I/C] for 1 sec., if desired.
 - When the weather alert function is in use, select the desired weather channel with [CH/WX] and the channel selector.
- ② Push [SCAN • TAG] to start priority or normal scan.
 - "SCAN" appears and flashes in the function display.
 - "16" appears during priority scan.
 - When a signal is detected, scan pauses until the signal disappears or resumes after pausing 5 sec. according to SET mode setting. (Channel 16 is still monitored during priority scan.)
 - Push [▲]/[▼] to check tag channels, to change the scanning direction or resume the scan manually.
- ③ To stop the scan, push [SCAN • TAG].
 - "SCAN" disappears.
 - Pushing [PTT], [16 • 9], [CH/WX] or [DW • TRI] also stops the scan.

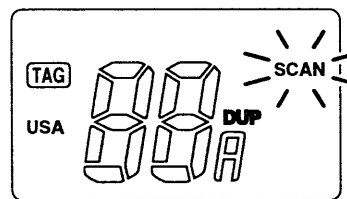
[Example]: Starting a normal scan.



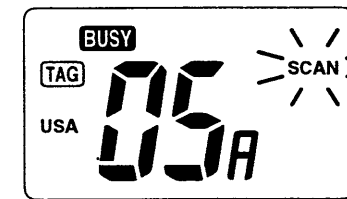
Push



Scan starts.



Scan pauses when receiving a signal and audio is emitted.



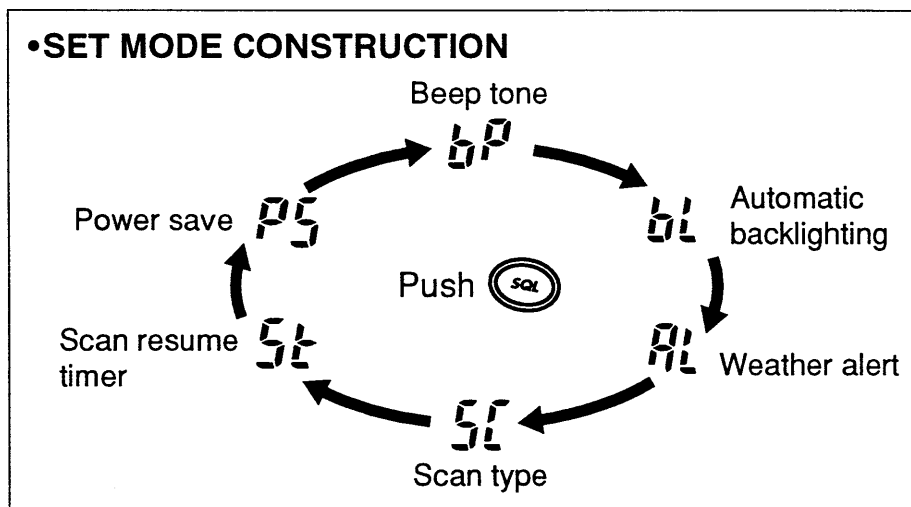
Push to stop the scan.



■ SET mode programming

SET mode is used to change the conditions of 6 transceiver functions: the beep tone function, the automatic backlighting, weather alert function, normal/priority scan, scan resume timer and power save function.

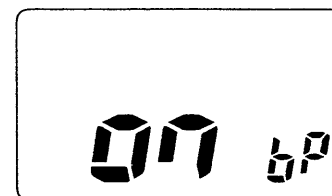
- ① Turn power OFF.
- ② While pushing [SQL], turn power ON and continue pushing [SQL] until "bP" appears.
- ③ Release [SQL].
- ④ Push [SQL] to select the desired item, if necessary.
- ⑤ Push [▲]/[▼] to select the desired condition of the item.
- ⑥ To exit SET mode, turn the power OFF, then ON again.



■ SET mode items

◇ Beep tone "bP"

You can select silent operation by turning beep tones OFF or you can have confirmation beeps sound at the push of a switch by turning beep tones ON. The beep tone volume is linked with [OFF/VOL].



Beep tone ON (default)

◇ Automatic backlighting "bL"

This function is convenient for nighttime operation. The automatic backlighting turns the backlighting ON when pushing any key except for [PTT].

- The backlighting is automatically turned OFF after 5 sec. of inactivity.

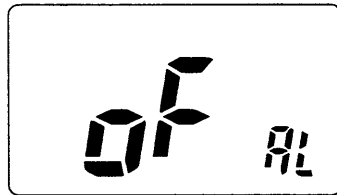


Automatic backlighting ON (default)

◇ **Weather alert function “AL”**

NOAA broadcast stations transmit weather alert tones before important weather announcements. When the weather alert function is turned ON, the transceiver detects the alert, then flashes the “ALT” indicator until the transceiver is operated. The previously selected (used) weather channel is checked periodically during standby or while scanning.

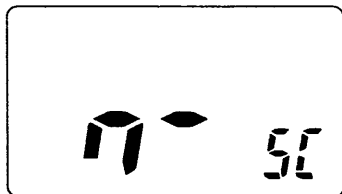
- “ALT” appears when the function is set ON.



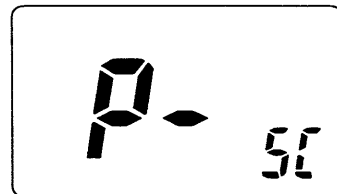
Weather alert function OFF (default)

◇ **Scan type selection “SC”**

The transceiver has 2 scan types: normal scan and priority scan. Normal scan searches all tag channels in the selected channel group. Priority scan searches all tag channels in sequence while monitoring channel 16.



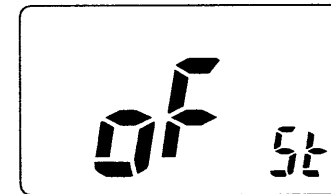
Normal scan (default)



Priority scan

◇ **Scan resume timer “St”**

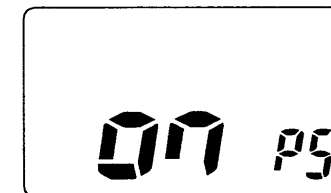
The scan resume timer can be selected as a pause (OFF) or timer scan (ON). When OFF is selected, the scan pauses until a received signal disappears. When ON is selected, the scan pauses for 5 sec. after receiving a signal and then resumes even if the signal is still being received.



Scan timer OFF (default)

◇ **Auto power save function “PS”**

The power save function reduces current drain by deactivating the receiver circuit for preset intervals.



Power save ON (default)

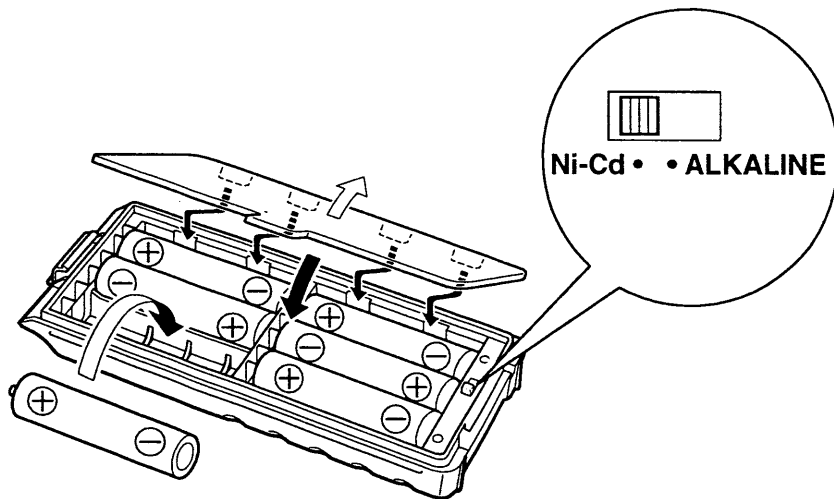
■ Installing batteries in the battery case

When using a battery case attached to the transceiver, install 6 AA(R6) size Ni-Cd or alkaline batteries as illustrated below.

- ① Remove the battery case from the transceiver.
- ② Install 6 × AA(R6) size Ni-Cd or alkaline batteries.
 - Be sure to observe the correct polarity.

CAUTION:

- When installing batteries, make sure they are all the same brand, type and capacity. Also, do not mix new and old batteries together.
- Keep battery contacts clean. It's a good idea to clean battery terminals once a week.



■ Battery charging

Prior to using the transceiver for the first time, the Ni-Cd batteries must be fully charged for optimum life and operation.

CAUTION: To avoid damage to the transceiver, turn it OFF while charging.

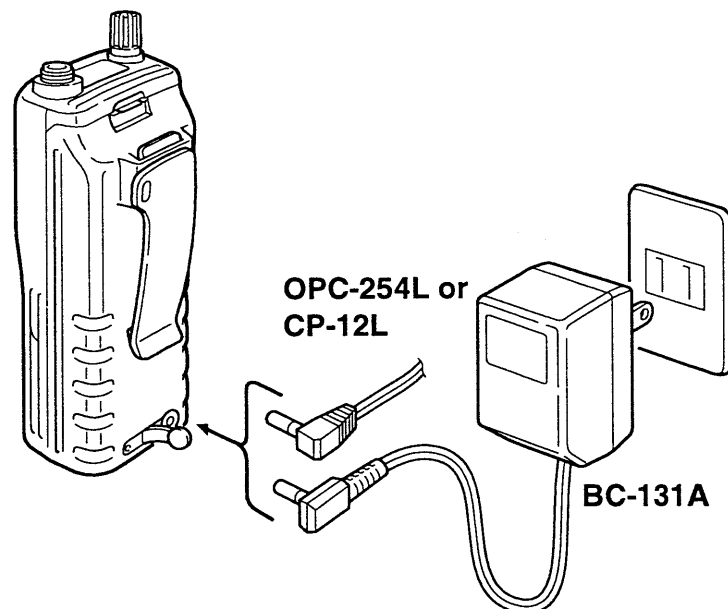
- Recommended temperature range for charging: +50°F to +104°F (+10°C to +40°C)
- Use the supplied AC adapter (BC-131A) only. **NEVER** use other adapters.
- An optional cable OPC-254L (for 12 V power source) or CP-12L (for 12 V cigarette lighter socket) can be used instead of the supplied AC adapter.

Before connecting DC power, make sure the internal switch is set to the proper battery type—Ni-Cd or alkaline. **NEVER** connect DC power to the battery case when installing alkaline batteries. Such a connection will damage the transceiver.

◇ Charging connections

- ① Install 6 AA(R6) size Ni-Cd batteries into the battery case.
- ② Turn the battery selector switch to the Ni-Cd position.
- ③ Connect the AC adapter (BC-131A) or optional cable (CP-12L or OPC-254L) as shown below.
 - The charge indicator lights red.
- ④ Charge the Ni-Cd batteries for 15 hours.

CAUTION: Make sure the [CHARGE] switch is in the ALKALINE position when operating the transceiver with alkaline batteries.



■ Battery cautions

NEVER incinerate used Ni-Cd batteries. Internal battery gas may cause an explosion.

NEVER immerse batteries in water. If the battery case becomes wet, be sure to wipe it dry **BEFORE** attaching it to the transceiver.

NEVER short terminals of the battery case. Also, current may flow into nearby metal objects so be careful when placing battery cases in handbags, etc.

If your Ni-Cd batteries seem to have no capacity even after being charged, completely discharge them by leaving the power ON overnight. Then, fully charge the Ni-Cd batteries again. If the Ni-Cd batteries still do not retain a charge (or very little), new Ni-Cd batteries must be purchased.

◇ Recycling information



The product that you have purchased contains a rechargeable battery. The battery is recyclable. At the end of its life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Call 1-800-8-BATTERY for battery recycling options in your area or contact your dealer.

◇ Supplied accessories

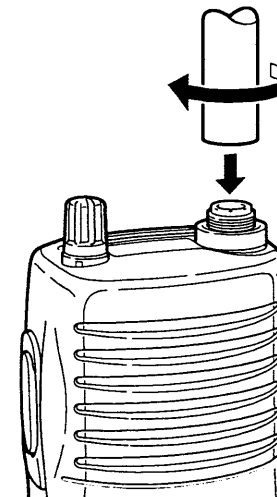
The following accessories are supplied:

	Qty.
① Flexible antenna	1
② Belt clip	1
③ Handstrap	1
④ Battery case (BP-204) with 6 Ni-Cd (AA) batteries ...	1
⑤ AC adapter (BC-131A)	1

◇ Flexible antenna

Connect the supplied flexible antenna to the antenna connector.

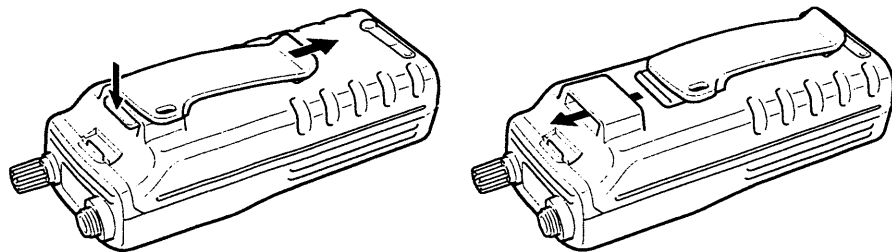
CAUTION: Transmitting without an antenna may damage the transceiver.



◇ Belt clip

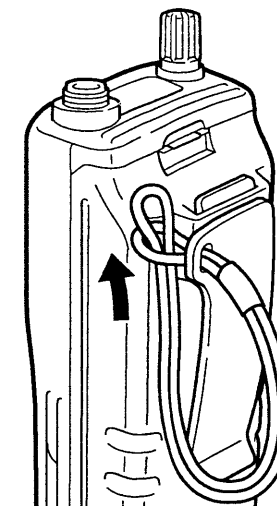
To attach: Slide the belt clip into the plastic loop on the back of the battery case.

To remove: Push the top of the belt clip towards the transceiver and out at the same time, then push it downwards and free of the plastic loop.



◇ Handstrap

Slide the handstrap through the loop on the side of the transceiver as illustrated at right. Facilitates carrying.



PROBLEM	POSSIBLE CAUSE	SOLUTION	REF.
No power comes ON.	<ul style="list-style-type: none"> • The battery is exhausted. • Bad connection to the battery pack. 	<ul style="list-style-type: none"> • Recharge the battery pack. • Check the connection to the transceiver. 	p. 15 p. 3
No sound comes from the speaker.	<ul style="list-style-type: none"> • Squelch level is too deep. • Volume level is too low. • Speaker has been exposed to water. 	<ul style="list-style-type: none"> • Set squelch to the threshold point. • Set [OFF/VOL] to a suitable level. • Drain water from the speaker. 	p. 6 p. 7 —
Transmitting is impossible, or high power can not be selected.	<ul style="list-style-type: none"> • Some channels are for low power or receive only. • The battery is exhausted. • The output power is set to low. 	<ul style="list-style-type: none"> • Change channels. • Recharge the battery pack. • Push [H/L] to select high power. 	pgs. 2,4 p. 15 p. 2
The display channel cannot be changed.	<ul style="list-style-type: none"> • Lock function is activated. 	<ul style="list-style-type: none"> • Push [H/L • LOCK] for 1 sec. to cancel the function. 	p. 2
Scan does not start.	<ul style="list-style-type: none"> • "TAG" channels are not programmed. 	<ul style="list-style-type: none"> • Set the desired channels as "TAG" channels. 	p. 11
No beeps sound.	<ul style="list-style-type: none"> • Beep tones are turned OFF. 	<ul style="list-style-type: none"> • Turn the beep tones ON in SET mode. 	p. 13

10 CHANNEL LIST

Channel number			Frequency (MHz)	
USA	INT	CAN	Transmit	Receive
	01	01	156.050	160.650
01A			156.050	156.050
	02	02	156.100	160.700
02A			156.100	156.100
	03	03	156.150	160.750
03A			156.150	156.150
	04		156.200	160.800
04A		04A	156.200	156.200
	05		156.250	160.850
05A		05A	156.250	156.250
06	06	06	156.300	156.300
	07		156.350	160.950
07A		07A	156.350	156.350
08	08	08	156.400	156.400
09	09	09	156.450	156.450
10	10	10	156.500	156.500
11	11	11	156.550	156.550
12	12	12	156.600	156.600
13 [†]	13	13 [†]	156.650	156.650
14	14	14	156.700	156.700
15 [†]	15 [†]	15 [†]	156.750	156.750
16	16	16	156.800	156.800
17 [†]	17	17 [†]	156.850	156.850
	18		156.900	161.500
18A		18A	156.900	156.900

Channel number			Frequency (MHz)	
USA	INT	CAN	Transmit	Receive
	19		156.950	161.550
19A		19A	156.950	156.950
20	20	20 [†]	157.000	161.600
20A			157.000	157.000
	21	21	157.050	161.650
21A		21A	157.050	157.050
	22		157.100	161.700
22A		22A	157.100	157.100
	23	23	157.150	161.750
23A			157.150	157.150
24	24	24	157.200	161.800
25	25	25	157.250	161.850
26	26	26	157.300	161.900
27	27	27	157.350	161.950
28	28	28	157.400	162.000
	60	60	156.025	160.625
60A			156.025	156.025
	61		156.075	160.675
61A		61A	156.075	156.075
	62		156.125	160.725
62A		62A	156.125	156.125
	63		156.175	160.775
63A			156.175	156.175
	64	64	156.225	160.825
64A		64A	156.225	156.225

Channel number			Frequency (MHz)	
USA	INT	CAN	Transmit	Receive
	65		156.275	160.875
65A	65A	65A	156.275	156.275
	66		156.325	160.925
66A	66A	66A [†]	156.325	156.325
67 [†]	67	67	156.375	156.375
68	68	68	156.425	156.425
69	69	69	156.475	156.475
70 [†]	70 [†]	70 [†]	156.525	156.525
71	71	71	156.575	156.575
72	72	72	156.625	156.625
73	73	73	156.675	156.675
74	74	74	156.725	156.725
75	75	75	Guard	Guard
76	76	76	Guard	Guard
77 [†]	77	77 [†]	156.875	156.875
	78		156.925	161.525
78A		78A	156.925	156.925
	79		156.975	161.575
79A		79A	156.975	156.975
	80		157.025	161.625
80A		80A	157.025	157.025
	81		157.075	161.675
81A		81A	157.075	157.075
	82		157.125	161.725
82A		82A	157.125	157.125

Channel number			Frequency (MHz)	
USA	INT	CAN	Transmit	Receive
	83	83	157.175	161.775
83A		83A	157.175	157.175
84	84	84	157.225	161.825
84A			157.225	157.225
85	85	85	157.275	161.875
85A			157.275	157.275
86	86	86	157.325	161.925
86A			157.325	157.325
87	87	87	157.375	161.975
87A			157.375	157.375
88	88	88	157.425	162.025
88A			157.425	157.425
WX channel	Frequency (MHz)			
	Transmit	Receive		
01	RX only	162.550		
02	RX only	162.400		
03	RX only	162.475		
04	RX only	162.425		
05	RX only	162.450		
06	RX only	162.500		
07	RX only	162.525		
08	RX only	161.650		
09	RX only	161.775		
10	RX only	163.275		

[†]Low power only. [‡]Receive only.

NOTE: Simplex channels 3, 21, 23, 61, 64, 81, 82 and 84 CANNOT be used by the general public in USA waters.

■ Specifications

• GENERAL

Frequency coverage	: Transmit 156–157.5 MHz Receive 156–163 MHz
Mode	: FM (16K0G3E)
Channel spacing	: 25 kHz
Current drain (at 7.2 V)	: TX High (5 W) 1.6A typical. Max. audio 230 mA typical Standby 60 mA typical Power saved 20 mA typical
Frequency stability	: ± 10 ppm (-20°C to $+60^{\circ}\text{C}$)
Useable temperature range	: -20°C to $+60^{\circ}\text{C}$; -4°F to $+140^{\circ}\text{F}$
Dimensions (Projections not included)	: 58 (W) \times 140.5(H) \times 43.5(D) mm 2.3 (W) \times 5.5 (H) \times 1.7 (D) in
Weight	: 410g (14.4 oz)

• TRANSMITTER

Output power (at 7.2 V)	: 5 W and 1 W
Modulation system	: Variable reactance phase modulation
Max. frequency deviation	: ± 5.0 kHz
Spurious emissions	: Less than -65 dB

• RECEIVER

Receive system	: Double-conversion superheterodyne
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Sensitivity (12 dB SINAD)	: 0.25 μV typical
Squelch sensitivity: Threshold	: Less than 0.35 μV
Tight	: Less than 2.00 μV
Intermodulation rejection ratio	: 70 dB typical
Spurious response rejection ratio	: 70 dB typical
Adjacent channel selectivity	: 70 dB typical
Audio output power	: 500 mW at 10% distortion with an 8 Ω load

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

■ Options

- **CP-12L CIGARETTE LIGHTER CABLE WITH NOISE FILTER**
Connects to a ship's or vehicle's cigarette lighter socket (12V).
- **OPC-254L DC POWER CABLE**
Used for charging with an external power supply.
- **BP-204 BATTERY CASE**
Battery case for R6(AA) \times 6 alkaline or Ni-Cd cells.
- **BC-110D/V AC ADAPTER**
Regular charge battery packs attached to the transceiver in 15 to 20 hrs. BC-110D for Europe (AC 230 V), BC-110V for Australia (AC 240 V).

