

■ Digital mode operation

The IC-9100 can be operated in the digital voice mode, including low-speed data operation, for both transmit and receive. It can also be connected to a GPS receiver* to transmit/receive position data.

*Compatible with an RS-232 output/NMEA format/4800bps/9600 bps

■ Call sign setting

Set the desired "UR," "R1," "R2" and "MY" call signs to be used for DV operation, as described below.

NOTE: In the DR mode, you can set only "MY" call sign in the "CS" screen (Call Sign).

- ① Push [DV•DR] to select the DV mode.
- ② Push [MENU] one or more times to display the "M3" screen (Menu 3).
 - In the DR mode, push [MENU] once or twice to select the "D1" screen.
- ③ Push [CS](F-1) to display the "CS" screen (Call Sign).
 - You can push [F-4] to toggle between the call sign and the name.
- ④ Push [▼](F-1) one or more times to display the "UR," "R1," "R2" or "MY" screen.
- ⑤ Rotate [MAIN DIAL] to select the desired call sign.
 - UR : "CQCQCQ," individual station call signs (U01–U99) or destination repeater call signs*1 is selected.
 - R1 : Your access/area repeater's call sign is selected.
 - R2 : "NOT USE*" or a link/gateway repeater call sign is selected.
 - MY : Your own call signs is selected (MY1–MY6).
 - First selecting the call sign group by pushing [TS•GRP] or [GRP](F-5)*3 makes it more convenient when "UR," "R1" or "R2" is displayed. See the right column for details of the repeater call sign group selection.
- ⑥ Push [SET](F-4) to set the selected call sign to be used for DV operation.
- ⑦ Repeat steps ④ to ⑥ to set the other call signs.
- ⑧ Push [▼](F-1) one or more times to return to the "CS" screen.

NOTE: You can toggle between displaying the repeater name or the repeater call sign by pushing [NAME](F-4) in the R1 and R2 screens.

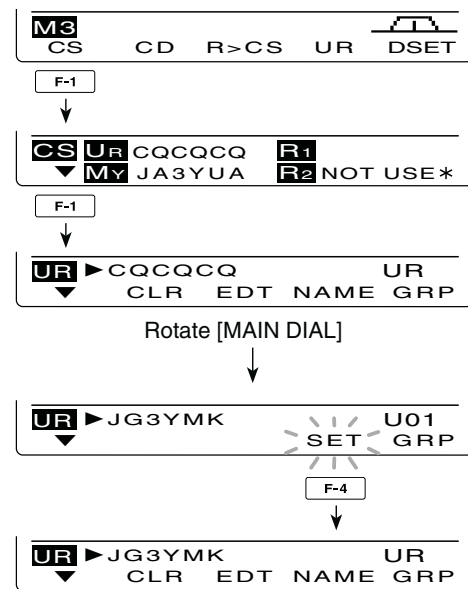
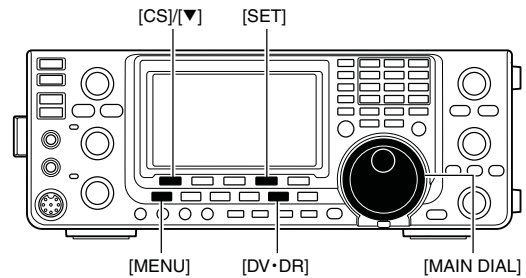
*1 '/' is displayed in front of the repeater call sign. The repeater call sign with '/' is used for the gateway CQ calling.

*2 For an area (local) repeater communication only (Link repeater is not used.)

*3 [GRP](F-5) is not used in the DR mode.

About the Time-Out Timer function

The IC-9100 has a Time-Out Timer function for digital repeater operation. The timer limits a continuous transmission to approximately 10 minutes. Warning beeps will sound approximately 30 seconds before time-out and then again immediately before time-out. Be sure to turn ON the function before operating in the digital mode. (p. 162)



How to select the repeater call sign group:

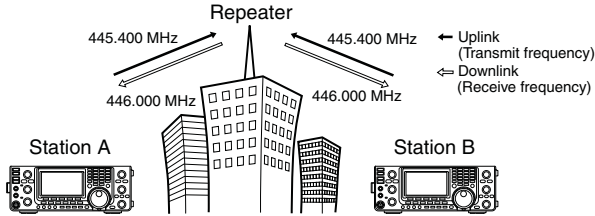
Hold down [TS•GRP] or [GRP](F-5)*3 for 1 second to enter the group selection mode. Then rotate [MAIN DIAL] to select the desired group. After selecting, push [TS•GRP] or [GRP](F-5)*3 to display the repeater call signs in the group.

Or, you can select the repeater group using the keypad key.

- Only repeaters assigned to groups are selectable.

■ Receiving a D-STAR repeater

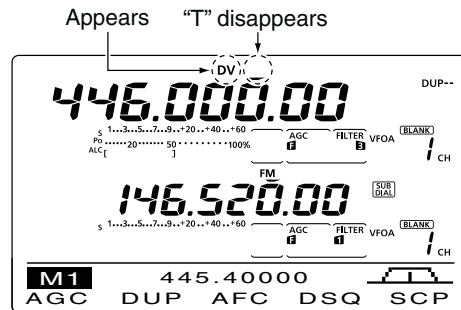
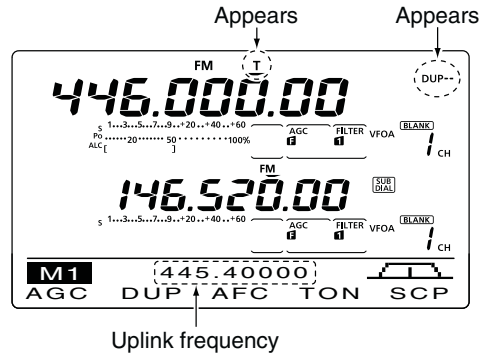
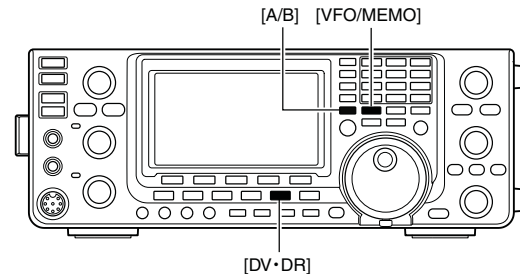
When the IC-9100 receives a signal from a D-STAR repeater, it receives four call signs: the calling station's call sign, the called station's call sign, the R1 repeater call sign (the repeater that receives a signal from the calling station on the uplink frequency), and the R2 repeater call sign (the repeater that transmits a signal on the downlink frequency). You can copy the received call signs into your radio, and reply to the call.



• Presetting

- ① Select the desired frequency band. (p. 35)
- ② Push [VFO/MEMO] to select the VFO mode.
- ③ Push [A/B] once or twice to select VFO A.
- ④ Set the desired repeater transmit (downlink) frequency. (p. 37)
 - Adjust the output power, if desired. (p. 46)
- ⑤ Push [MENU] to display the “M1” screen (Menu 1).
- ⑥ Hold down [DUP](F-2) for 1 second to turn ON the One-touch repeater function.
 - “T” and “DUP-” appear.
 - The repeater receive (uplink) frequency appears at the bottom of the function display.
- ⑦ Push [DUP](F-2) once or twice to switch the offset to the desired direction.
 - “DUP-” or “DUP+” appears.
 - When the Auto Repeater function is in use, this selection is not necessary (Only U.S.A. and Korean versions). (p. 67)
- ⑧ Push [DV•DR] to select the DV mode. (p. 43)
 - “DV” appears.
 - “T” disappears.
- ⑨ When a signal is received, the calling station's call sign is displayed on the LCD.
 - If the calling station has programmed a note or message, it is displayed after the call sign.

See the next page to view the received call sign.
To reply to the calling station, see page 96.



Received call signs

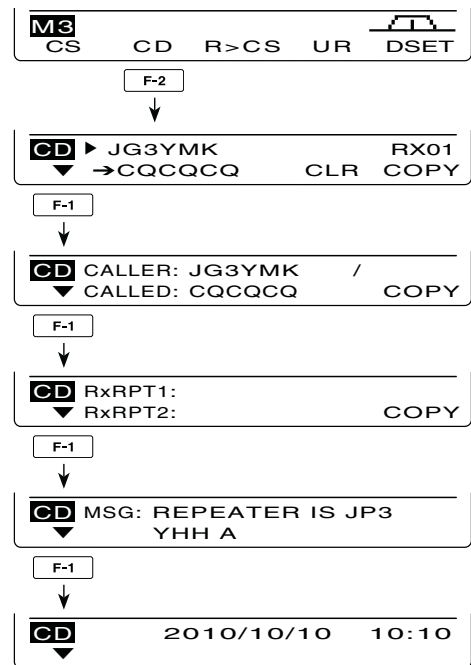
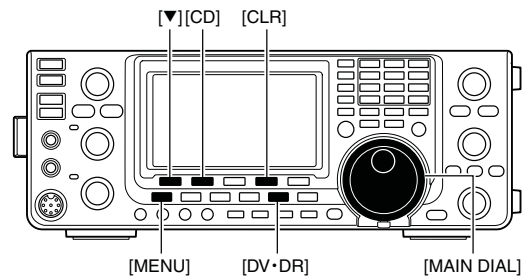
When a call is received in the DV mode, the calling station and repeater call signs being used can be stored in the received call record. The stored call signs can be displayed in the following manner. Up to 20 calls can be stored.

Desired call record display

- ① Push [DV•DR] to select the DV mode.
- ② Push [MENU] one or more times to display the “M3” screen (Menu 3).
 - In the DR mode, push [MENU] once or twice to select the “D1” screen.
- ③ Push [CD](F-2) to display the “CD” screen (Call Record).
- ④ Rotate [MAIN DIAL] to select the desired record channel (RX01 to RX20).
 - Hold down [CLR](F-4) for 1 second to clear the selected record channel.
- ⑤ Push [▼](F-1) one or more times to display the call record.
 - CALLER : The calling station’s call sign.
 - / : A four character note from the station that made the call.
 - CALLED : The call sign of the station that was called, or “CQCQCQ.”
 - RXRPT1 : The call sign of the repeater the calling station accessed, or the call sign of the gateway repeater the calling station used.
 - RXRPT2 : The call sign of the repeater you heard the call on.
 - MSG : Any received message is displayed.

After the MSG screen, the date and time information are displayed. If the received date and time are unknown, the elapsed time after the call was received is displayed (e.g. “(-12:34)”). If the power is turned OFF, then ON, or 48 hours have passed, “- - - - / - - / - - - - : - -” is displayed.

- ⑥ Push [▼](F-1) one or more times to return to the “CD” screen.



◇ **One-touch reply using the call record**

The calling station's call sign, which is stored in the call record, can be used to quickly and easily reply.

- First, set your own call sign (MY). (p. 85)

• **After receiving a call**

- ① Push [MENU] one or more times to display the "M3" screen (Menu 3).
 - In the DR mode, push [MENU] once or twice to select the "D1" screen.
- ② Hold down [R>CS](F-3) for 1 second to set the other station's call sign.
 - The received call sign is displayed while holding down [R>CS](F-3), and after releasing, two beeps sound.
 - When a call sign has not been received correctly, error beeps sound, and no call sign is set.
- ③ Push [PTT] on the microphone to reply the call. (or push [TRANSMIT] on the transceiver)
- ④ Release [PTT] to receive. (or push [TRANSMIT] again)

• **Selecting a call record**

- ① Push [MENU] one or more times to display the "M3" screen (Menu 3).
 - In the DR mode, push [MENU] once or twice to select the "D1" screen.
- ② While holding down [R>CS](F-3), rotate [MAIN DIAL] to select the desired record channel, then release [R>CS](F-3) to set it.
- ③ Push [PTT] on the microphone to reply the call. (or push [TRANSMIT] on the transceiver)
- ④ Release [PTT] to receive. (or push [TRANSMIT] again)

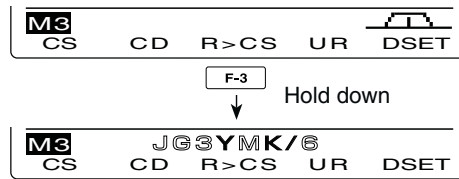
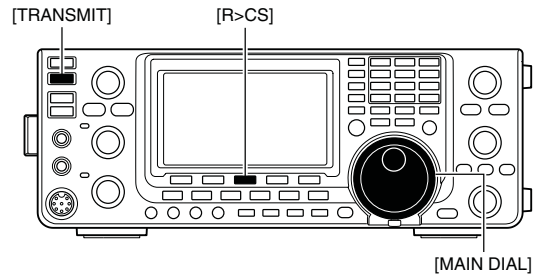
✓ **For your information**

When you receive a call addressed to your own call sign, the call signs of the calling station and the repeaters they used can be automatically set for a quick reply. The set call signs are overwritten if another call is received.

The following items must be set to "Auto" in the DV Set mode.

These functions are not available in the DR mode.

- "RX Call Sign Write" item (p. 118):
The calling station's call sign is automatically set to "UR."
- "RX RPT Write" item (p. 119):
The repeater call signs are automatically set to "R1" and "R2," if necessary.



The received call sign is displayed while holding down [R>CS](F-3).

Important!
One-touch call signs are for only temporary use. They are not saved in a call sign memory. Therefore, when another call sign is set, the previous call sign will be over-written.
If you want to save the set call sign, see 'Copying the call record contents into call sign memory' for details. (p. 98)

■ Copying the call sign

◇ Copying the call sign memory contents

The memorized UR call sign can be copied into another call sign memory.

NOTE:

First, make sure that the “Edit Record” item is set to “Auto” or “Select” in the DV Set mode. (p. 119)

- ① Push [DV•DR] to select the DV mode.
- ② Push [MENU] one or more times to display the “M3” screen (Menu 3).
 - In the DR mode, push [MENU] once or twice to select the “D1” screen.
- ③ Push [CS](F-1) to display the “CS” screen (Call Sign).
- ④ Push [▼](F-1) to display the “UR” screen.
- ⑤ Rotate [MAIN DIAL] to select the desired UR call sign channel to be copied.
 - U01 to U99 can be selected.
- ⑥ Push [EDT](F-3) to enter the call sign programming mode.
 - The 1st digit of the selected call sign blinks.

The displayed contents from step ⑦ are different, depending on the “Edit Record” item setting. (p. 119)

When the “Edit Record” item is set to “Auto”

A blank channel is automatically selected, and the call sign channel’s data, selected in step ⑤ above, is displayed.

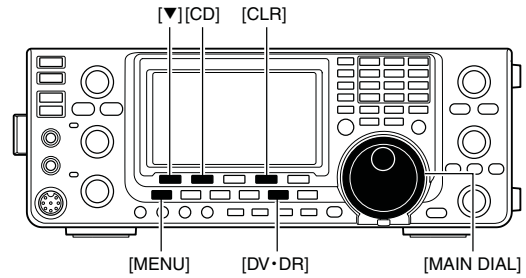
- ⑦ Edit the displayed call sign as described in page 86.
- ⑧ Push [MENU] to store the edited call sign into the channel.

NOTE: If there are no blank channels in the station call sign memory, “Full” appears instead of the channel number. In this case, follow the steps in ‘When the “Edit record” item is set to “Select”,’ as shown below.

When the “Edit Record” item is set to “Select”

The selected call sign channel’s data is displayed.

- ⑦ Edit the displayed call sign as described in page 86.
- ⑧ Push [MENU] to set.
- ⑨ Rotate [MAIN DIAL] to select the desired call sign channel to store the data in.
- ⑩ Hold down [SET](F-5) for 1 second to store or overwrite the edited call sign into the selected channel.



[F-1]



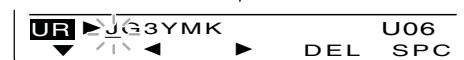
[F-1]



Rotate [MAIN DIAL]



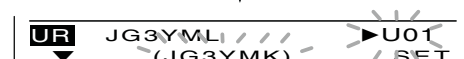
[F-3]



When the “Edit Record” item is set to “Auto.”



[MENU]

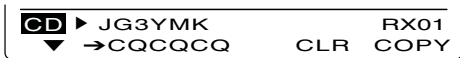


When the “Edit Record” item is set to “Select.”

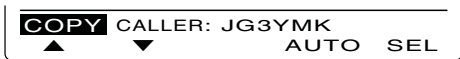
◇ Copying the call record contents into call sign memory

This is a way to copy the call record data (“CALLER,” “RXRPT1” and “RXRPT2”) into call sign memory “UR” and a repeater all at the same time, or individually.

- ① Push [DV•DR] to select the DV mode.
- ② Push [MENU] one or more times to display the “M3” screen (Menu 3).
 - In the DR mode, push [MENU] once or twice to select the “D1” screen.
- ③ Push [CD](F-2) to display the “CD” screen (Call Record).
- ④ Rotate [MAIN DIAL] to select the desired record channel (RX01 to RX20).
- ⑤ Push [COPY](F-5) to enter the copy item selection mode.



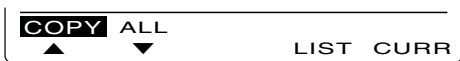
- ⑥ Push [▲](F-1) or [▼](F-2) to select the item to be copied.
 - ALL : The CALLER, RXRPT1 and RXRPT2 call signs.
 - CALLER : The calling station’s call sign
 - RXRPT1: The call sign of the repeater the calling station accessed, or the call sign of the gateway repeater the calling station used.
 - RXRPT2: The call sign of the repeater your heard the call on.



/// The options in step ⑦ are different, depending on your selection in step ⑥.

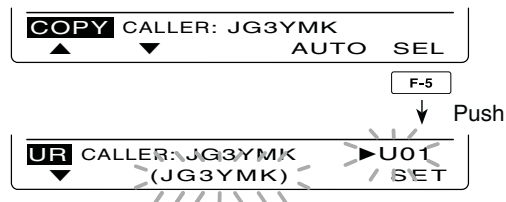
When “ALL” is selected in step ⑥:

- ⑦ Select the desired copy destination.
 - LIST : Hold down [LIST](F-4) for 1 second to automatically search a blank call sign memory channel, then copy the call signs of CALLER, RXRPT1 and RXRPT2 into the channel.
 - CURR : Hold down [CURR](F-5) for 1 second to copy the call signs of CALLER, RXRPT1 and RXRPT2 into the current “UR,” “R1” and “R2” memory.



When “CALLER” is selected in step ⑥:

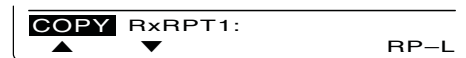
- ⑦ Select the desired copy destination
 - AUTO : Hold down [AUTO](F-4) for 1 second to automatically search for a blank call sign memory channel, and copy the selected call sign into the detected one.
 - SEL : Push [SEL](F-5) to enter the call sign memory channel selection mode. Rotate [MAIN DIAL] to select the desired channel to be pasted.
 - The contents of the selected channel is displayed in parentheses.
- Hold down [SET](F-5) for 1 second to paste the calling station’s call sign into the selected channel. If a call sign has already been programmed, the selected channel will be overwritten.



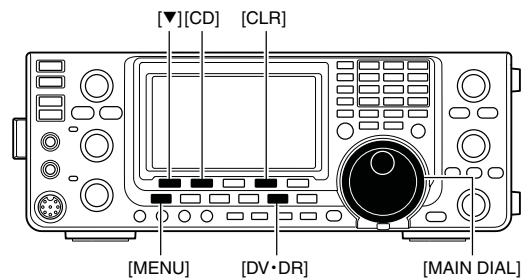
When “SEL” is selected, memory channel number and call sign blink.

When “RXRPT1” or “RXRPT2” is selected in step ⑥:

- ⑦ Hold down [RP-L](F-5) to copy the repeater call sign into the repeater list “R1” or “R2.”



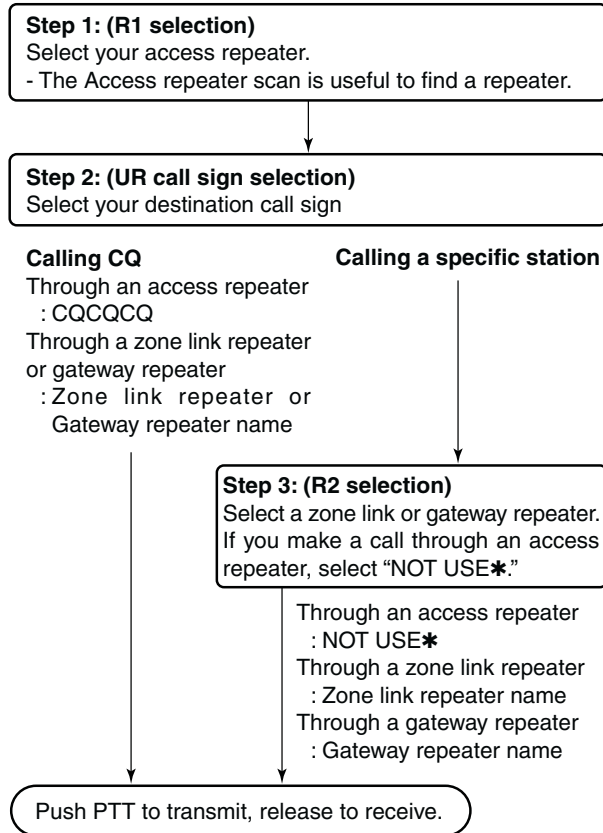
- ⑧ After copying has been completed, transceiver automatically returns to the “CD” screen.



■ DR (D-STAR Repeater) mode operation

DR (D-STAR Repeater) mode is used for D-STAR repeater operation. In this mode, you can select the pre-programmed repeaters and UR call sign by using [MAIN DIAL].

• DR mode operation flow chart



• Repeater settings can be stored into a repeater memory channel (Repeater list).

◇ Communication Form

- **Local area call** (pp. 101, 103)
To call a station through your local area (access) repeater.
- **Zone call** (pp. 102, 104)
To call a station through your local area (access) repeater and a link repeater in the same zone.
- **Gateway call** (pp. 102, 104)
To call a station through your local area (access) repeater, gateway repeater and your destination repeater by accessing the internet.

```

D1 R1: HIRANO43 GRP3
CS CD R>CS UR DSET
    
```

Access/Area repeater (R1) selection

```

D1 UR: CQCQCQ CQ
CS CD R>CS UR DSET
    
```

UR call sign (CQ) selection

```

D1 UR: JG3YMK UR
CS CD R>CS UR DSET
    
```

UR call sign (specific station) selection

```

D1 R2: NARA43
CS CD R>CS UR DSET
    
```

R2 (destination repeater) selection

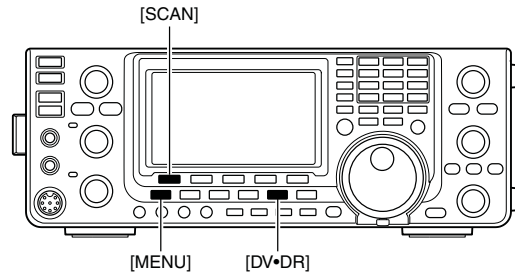
NOTE:

- Programming the repeater list is required for DR mode operation. (pp. 89 to 92)
- You cannot make an Internet call if the selected repeater (R2) has no gateway call sign.
- While operating voice communication or low-speed data communication via the internet network, some packets may be lost due to network error (poor data throughput performance). In such a case, the transceiver displays "P" on the display to indicate Packet Loss has occurred.

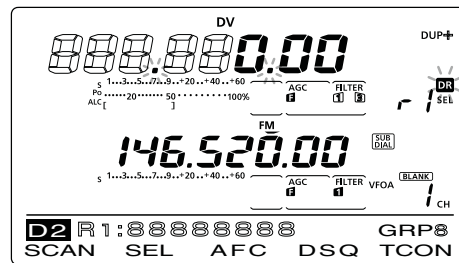
◇ Access repeater scan

The Access repeater scan is useful to find a repeater. For rapidly find, the Access repeater scan skips the repeaters which are not specified as a scan target. You can select the desired repeaters as a scan target. See page 90 or 'Access repeater scan's target setting' as described below.

- ① Hold down [DV•DR] for 1 second to select the DR mode.
 - The DV mode is automatically selected.
 - The access repeater selection screen is displayed.
 - Only the repeaters, specified as a scan target are displayed.
- ② Push [MENU] one or more time to display the "D2" screen.
- ③ Push [SCAN](F-1) to start the Access repeater scan.
 - The MHz and kHz decimal points, and "DR" blink while scanning.
 - Hold down [SCAN](F-1) for 1 second to enter the Scan set mode. Push [MENU] to exit the Scan set mode.
 - If "Up/Down" is selected as the "MAIN DIAL (SCAN)" option in the Scan Set mode, rotating [MAIN DIAL] changes the scanning direction. (p. 147)
 - The scan pauses when a signal is received.
- ④ Push [SCAN](F-1) to cancel the scan.



F-1



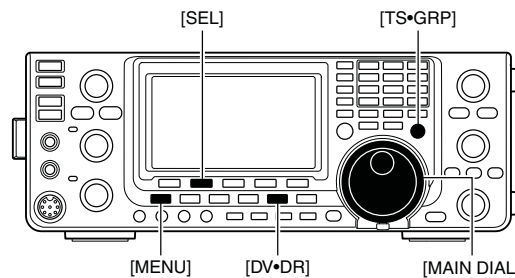
While Access repeater scanning

• Access repeater scan's target setting

You can select the desired repeaters as a scan target, for faster selection and scanning. Non-selected repeaters are skipped during scanning.

When a repeater is specified as a non-scan target, its "R1USE" setting is automatically set to NO. In this case, the repeater cannot be selected as the access repeater. (p. 90)

- ① In the DR mode, push [MENU] one or more times to display the "D2" screen.
- ② Rotate [MAIN DIAL] to select the desired access repeater.
 - First selecting the repeater call sign group makes it more convenient, if you have programmed repeaters into Groups. See the description in page 93 for details of the repeater call sign group selection.
- ③ Hold down [SEL](F-2) for 1 second to set the select setting to ON.
 - "SEL" appears.
- ④ Push [SEL](F-2) to set the select setting to OFF.
 - "SEL" disappears.
- ⑤ Push [MENU] to return to the "D2" screen.



Rotate [MAIN DIAL]



F-2 Hold down



F-2 Push



When the select setting is OFF.

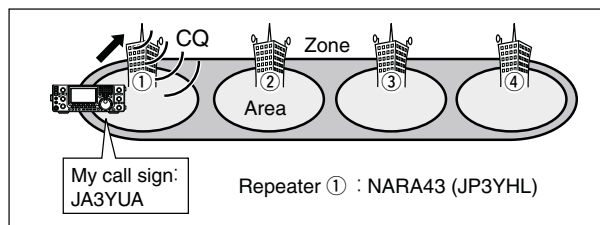
■ Calling CQ

First, program a MY call sign in step ①.
 Next program the repeater list (p. 89). After that, follow this guide to access a D-STAR repeater.
 The optional CS-9100* cloning software is helpful for programming call signs and programming the repeater list.
 *Cloning cable is required.

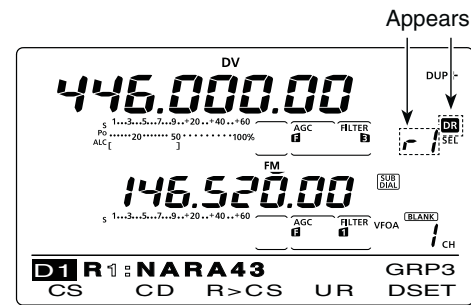
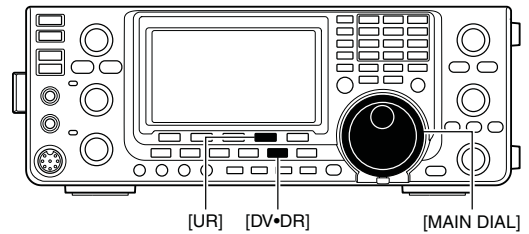
- ① Set your own call sign (MY). (p. 85)
- ② Hold down [DV•DR] for 1 second to select the DR mode.
 - The last used access repeater is displayed.
 - If the displayed frequency band on the SUB Band is the same as that of the last used access repeater, selecting the DR mode on the MAIN Band will automatically move the frequency band on the SUB Band to the Main Band display, and turn OFF the SUB Band display.
- ③ Rotate [MAIN DIAL] to select the desired access repeater.
 - Only the repeaters, whose “R1USE” setting is set to YES, or Access repeater scan targets are displayed. (pp. 90, 100)
 - First selecting the repeater call sign group makes it more convenient, if you have programmed repeaters into Groups. (p. 93)
 - Access repeater scan can be used for the selection. (p. 100)
- ④ Push [UR](F-4) to enter the UR call sign selection mode.

Steps ⑤ through ⑦ differ, depending on the communication form.

Making a CQ call through your local area (access) repeater (Local Area CQ)



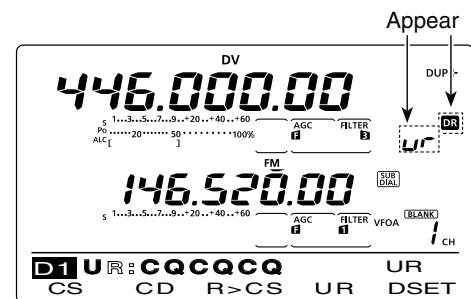
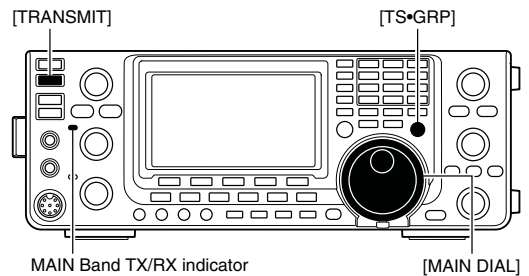
- ⑤ Rotate [MAIN DIAL] to select “CQCQCQ.”
 - First selecting a call sign group as “CQCQCQ” by pushing [TS•GRP] makes it more convenient.
- ⑥ Push [PTT] on the microphone to transmit. (or [TRANSMIT] on the transceiver)
 - The MAIN Band TX/RX indicator lights red.
- ⑦ Release [PTT] to receive. (or push [TRANSMIT] again)



Access repeater selection screen



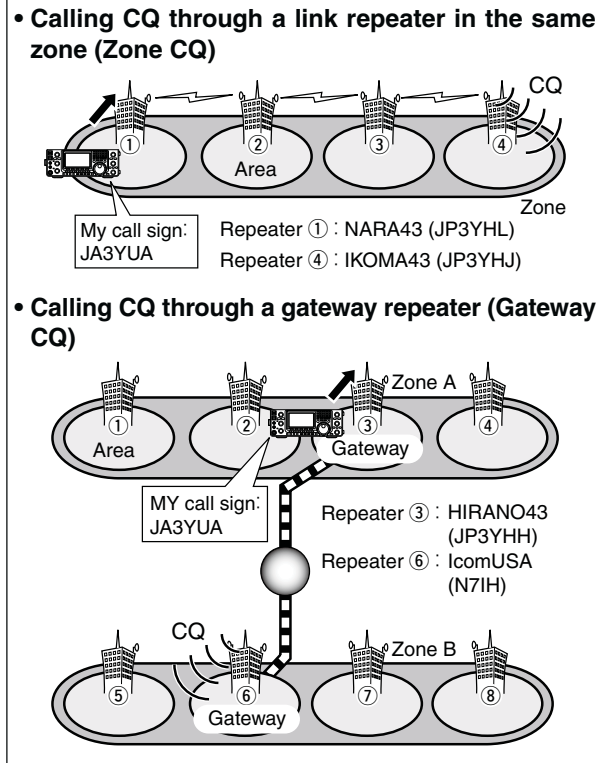
Repeater group selection screen



UR call sign selection screen

Making a Zone CQ/Gateway CQ call

NOTE: The settings are the same between Zone CQ and Gateway CQ call.

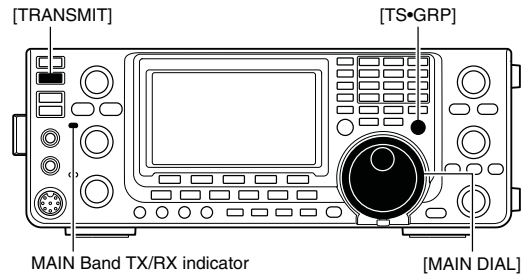


- ⑤ Rotate [MAIN DIAL] to select a desired destination repeater.
 - First selecting the repeater call sign group makes it more convenient, if you have programmed repeaters into Groups. (p. 93)
- ⑥ Push [PTT] on the microphone to transmit. (or [TRANSMIT] on the transceiver)
 - The MAIN Band TX/RX indicator lights red.
- ⑦ Release [PTT] to receive. (or push [TRANSMIT] again)

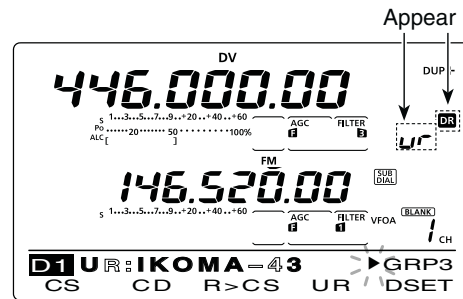
◇ Storing the set data

You can save the temporary setting in the following manner.

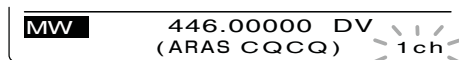
- ① After setting, push [MW] to enter the memory select write mode, then rotate [MAIN DIAL] or [M-CH] to select the desired Memory channel, Call channel or Program scan edge channel.
- ② Hold down [MW] again for 1 second to store the setting.



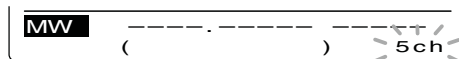
8



Repeater selection screen



The selected channel number blinks.



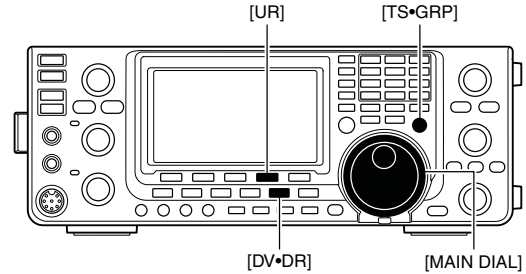
When a blank channel is selected.

■ Calling a specific station

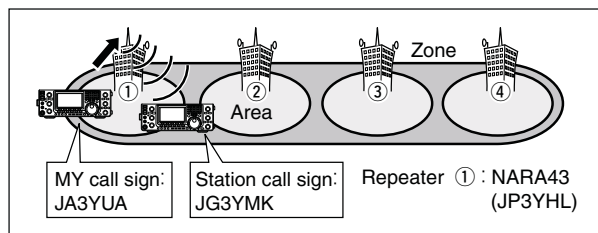
This section describes how to call a specific station using the DR mode.

When the Link repeater (R2) is set to “GW,” the designated gateway repeater is automatically set as the Link repeater, and you can make a call to a specific station through the internet.

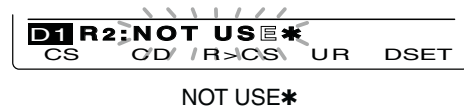
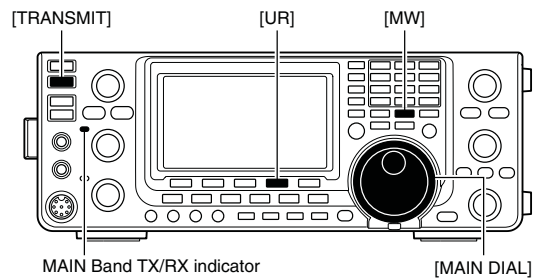
- ① Set your own call sign.
- ② Hold down [DV•DR] for 1 second to select the DR mode.
 - The last used access repeater is displayed.
 - If the displayed frequency band on the SUB Band is the same as that of the last used access repeater, selecting the DR mode on the MAIN Band will automatically move the frequency band on the SUB Band to the Main Band display, and turn OFF the SUB Band display.
- ③ Rotate [MAIN DIAL] to select the desired access repeater.
 - Only the repeaters, whose “R1USE” setting is set to YES, or Access repeater scan targets are displayed. (pp. 90, 100)
- ④ Push [UR](F-4) to enter the UR call sign selection mode.
- ⑤ Rotate [MAIN DIAL] to select a individual station call sign.
 - First selecting the station call sign memory groups (U01–U99) by pushing [TS•GRP] makes it more convenient.
- ⑥ Hold down [UR](F-4) for 1 second to enter the Link/Gateway repeater (R2) selection mode.



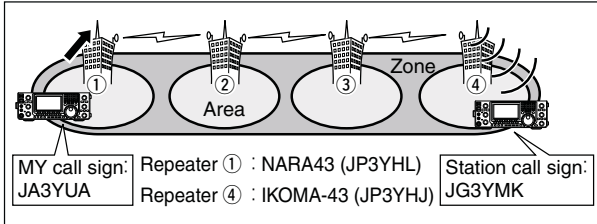
Making a call to an individual station through your local area (access) repeater (Local Area call)



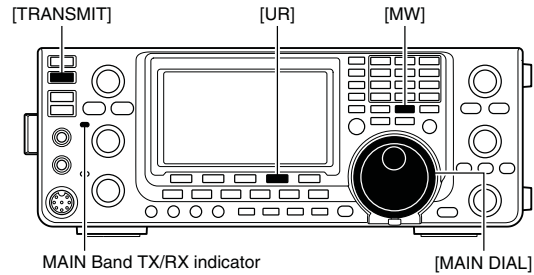
- ⑦ Rotate [MAIN DIAL] to select “NOT USE*.”
- ⑧ Push [UR](F-4) to exit the Link repeater (R2) selection mode.
- ⑨ Push [PTT] on the microphone to transmit. (or [TRANSMIT] on the transceiver)
 - The MAIN Band TX/RX indicator lights red.
- ⑩ Release [PTT] to receive. (or push [TRANSMIT] again)
 - After transmitting, push [MW] to enter the memory select write mode. (p. 102)



Making a call to an individual station through a link repeater in the same zone (Zone call)

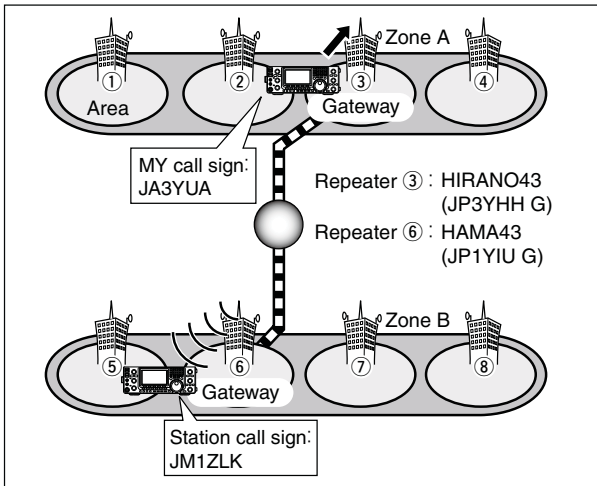


- ⑦ Rotate [MAIN DIAL] to select the link repeater in the same zone.
 - Only repeaters with the same gateway repeater appear.
- ⑧ Push [UR](F-4) to exit the selection mode.
- ⑧ Push [PTT] on the microphone to transmit. (or [TRANSMIT] on the transceiver)
 - The MAIN Band TX/RX indicator lights red.
- ⑩ Release [PTT] to receive. (or push [TRANSMIT] again)
 - After transmitting, push [MW] to enter the memory select write mode. (p. 102)

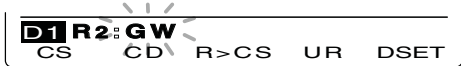
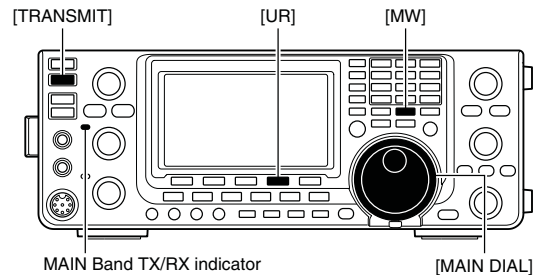


Link repeater in the same zone

Making a call to an individual station through a gateway repeater (Gateway call)



- ⑦ Rotate [MAIN DIAL] to select "GW."
 - The pre-programmed gateway repeater is set as R2.
 - Only repeaters with the same gateway repeater appear.
- ⑧ Push [UR](F-4) to exit the Link repeater (R2) selection mode.
- ⑨ Push [PTT] on the microphone to transmit. (or [TRANSMIT] on the transceiver)
 - The MAIN Band TX/RX indicator lights red.
- ⑩ Release [PTT] to receive. (or push [TRANSMIT] again)
 - After transmitting, push [MW] to enter the memory select write mode. (p. 102)



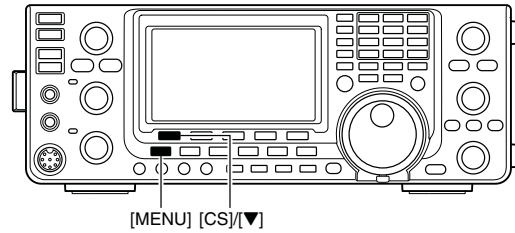
Gateway repeater "GW"

NOTE: If other station has accessed a repeater at least once, the D-STAR system will automatically connect to the last repeater the station accessed, even if you don't know where the station is. So it is no need to select the destination repeater.

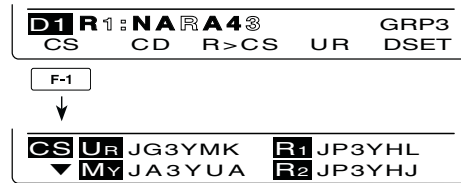
■ Calling a specific station (Continued)

◇ **Confirming the setting**

- ① In the DR mode, push [MENU] one or more times to display the “D1” screen.
- ② Push [CS](F-1) to display the “CS” screen (Call Sign).
- ③ Push [▼](F-1) one or more times to sequentially display the “UR,” “R1,” “R2” or “MY” to confirm the current call sign setting.



/// **NOTE:** In the DR mode, you can change only the “MY” call sign in the “CS” screen (Call Sign).



◇ **Settings for “UR” and “R2,” depending on the communication form**

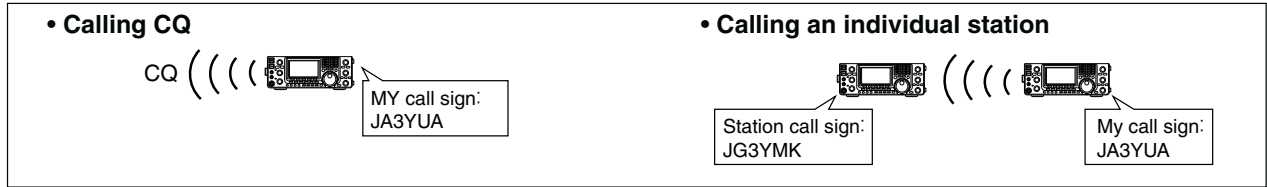
Destination: CQ
<p><Communication form: Local area call></p> <ul style="list-style-type: none"> • UR setting: CQCQCQ • R2 setting : N/A
<p><Communication form: Zone call></p> <ul style="list-style-type: none"> • UR setting: Destination repeater to send CQ in the same zone • R2 setting : N/A
<p><Communication form: Gateway call></p> <ul style="list-style-type: none"> • UR setting: Destination repeater to send CQ • R2 setting : N/A

Destination: An individual station
<p><Communication form: Local area call></p> <ul style="list-style-type: none"> • UR setting: An individual station • R2 setting : NOT USE*
<p><Communication form: Zone call></p> <ul style="list-style-type: none"> • UR setting: An individual station • R2 setting : Destination repeater in the same zone
<p><Communication form: Gateway call></p> <ul style="list-style-type: none"> • UR setting: An individual station • R2 setting : GW

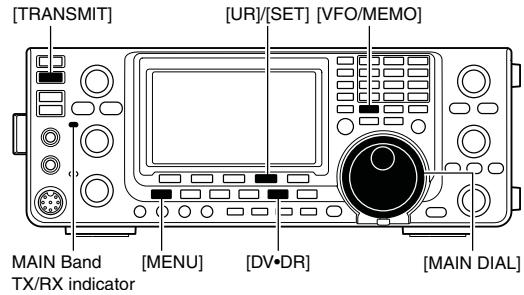
/// **NOTE:** R1 setting is set to your access repeater’s call sign.

■ Simplex operation using the VFO

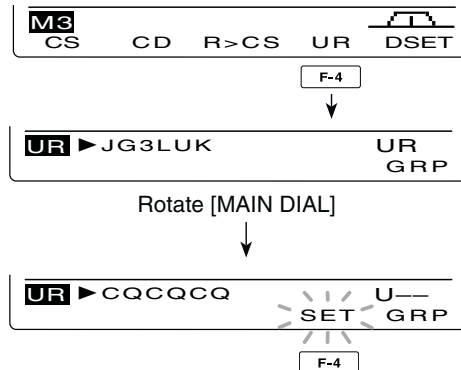
◇ Making a simplex CQ call or a call to an individual station



- ① Select the desired frequency band. (p. 35)
- ② Push [VFO/MEMO] to select the VFO mode.
- ③ Push [DV•DR] to select the DV mode.
- ④ Set the desired frequency. (p. 37)
 - Select the output power, if desired. (p. 46)
 - When the duplex operation is selected, push [MENU] one or more times to display the “M1” screen (Menu 1) and push [DUP](F-2) one or more times to turn it OFF.
- ⑤ Push [MENU] twice to display the “M3” screen (Menu 3).
- ⑥ Set your own call sign as the current MY call sign. (p. 85)
- ⑦ Push [UR](F-4) to enter the UR call sign selection mode.
- ⑧ Rotate [MAIN DIAL] to select UR call sign.
 - First selecting the call sign memory groups by pushing [TS•GRP] or [GRP](F-5) makes it more convenient.
 - When calling CQ : Select “CQCQCQ”
 - When calling an individual station : Select the station’s call sign
- ⑨ Push [SET](F-4) to return to the “M3” screen (Menu 3).
- ⑩ Push [PTT] on the microphone to transmit. (or [TRANSMIT] on the transceiver)
 - The MAIN Band TX/RX indicator lights red.
- ⑪ Release [PTT] to receive. (or push [TRANSMIT] again)
 - If another station replies, its call sign will be received.
 - Received call signs can be automatically stored into the received call record. See page 95 for details.
 - After transmitting, rotate [M-CH] to select a memory channel, then hold down [MW] for 1 second to save this temporary programmed data into the channel.



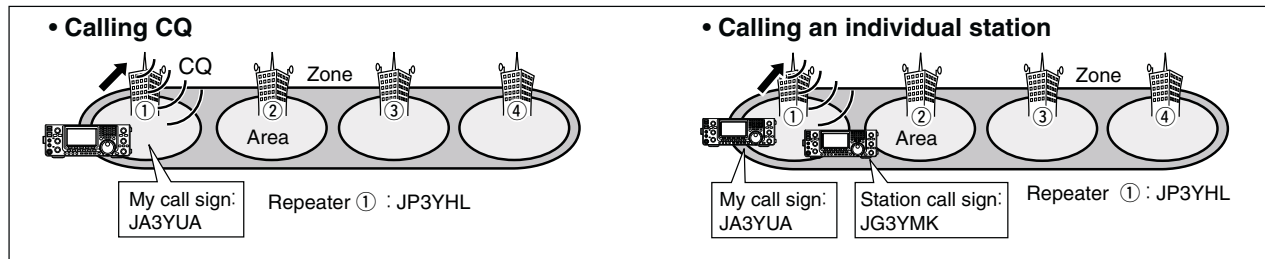
• When calling CQ



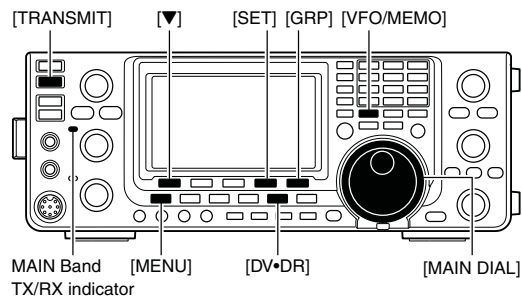
NOTE: The digital mode is vastly different than the FM mode. One of the differences is that changing the squelch setting in the digital mode will not open it to hear the hiss of “white noise,” like it does in the FM mode. It is only activated for digital squelch functions such as CSQL (Digital code squelch) or DSQL (Digital call sign squelch).

■ Repeater operation using the VFO

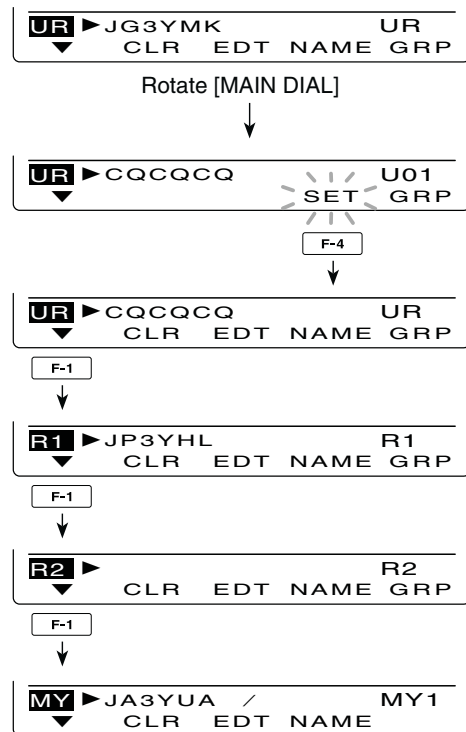
◇ Making a CQ call or a call to an individual station through your local area (access) repeater (Local Area call)



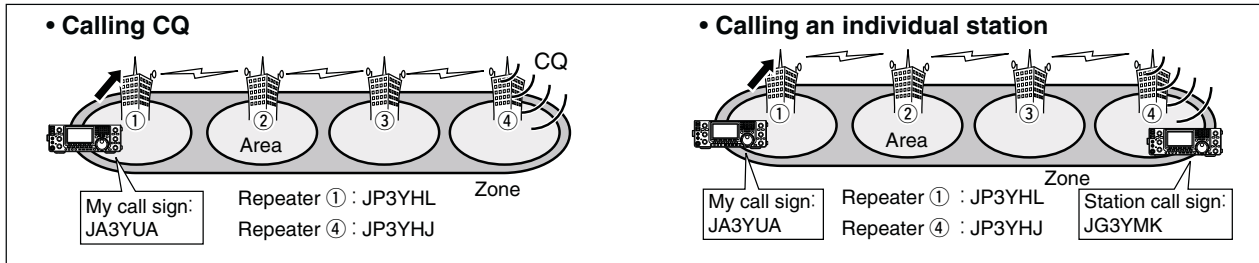
- ① Select the desired frequency band. (p. 35)
- ② Push [VFO/MEMO] to select the VFO mode.
- ③ Push [DV•DR] to select the DV mode.
- ④ Set the repeater's transmit frequency, duplex direction and offset. (pp. 37, 65, 163)
- ⑤ Push [MENU] one or more times to display the "M3" screen (Menu 3).
- ⑥ Push [CS](F-1) to display the "CS" screen (Call Sign).
- ⑦ Push [▼](F-1) to display the "UR" screen, and rotate [MAIN DIAL] to select UR call sign, then push [SET] (F-4).
 - First selecting the call sign memory groups by pushing [TS•GRP] or [GRP](F-5) makes it more convenient.
 - When calling CQ : Select "CQCQCQ"
 - When calling an individual station : Select the station's call sign
- ⑧ Push [▼](F-1) to display the "R1" screen, and rotate [MAIN DIAL] to select the access repeater call sign, then push [SET](F-4).
 - First selecting the repeater call sign group makes it more convenient, if you have programmed repeaters into Groups. (p. 93)
 - Push [NAME](F-4) to toggle the call sign and repeater name display, if the name has been programmed.
- ⑨ Push [▼](F-1) to display the "R2" screen, and rotate [MAIN DIAL] to set R2 to "NOT USE*," then push [SET](F-4).
- ⑩ Push [▼](F-1) to display "MY," and set your own call sign if necessary, then push [SET](F-4).
- ⑪ Push [PTT] on the microphone to transmit. (or [TRANSMIT] on the transceiver)
 - The MAIN Band TX/RX indicator lights red.
- ⑫ Release [PTT] to receive. (or push [TRANSMIT] again)
 - If another stations replies, it's call sign will be stored in the receive log.
 - Received call signs can be automatically stored into the received call record. See page 95 for details.
 - After transmitting, rotate [M-CH] to select a memory channel, then hold down [MW] for 1 second to save this temporary programmed data into the channel.



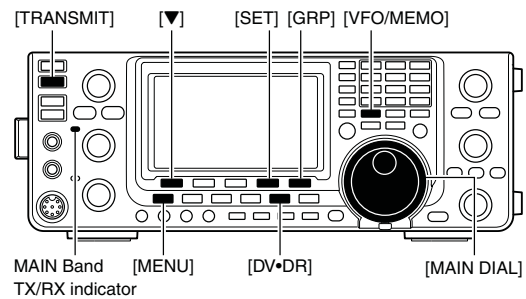
• When calling CQ through a single repeater



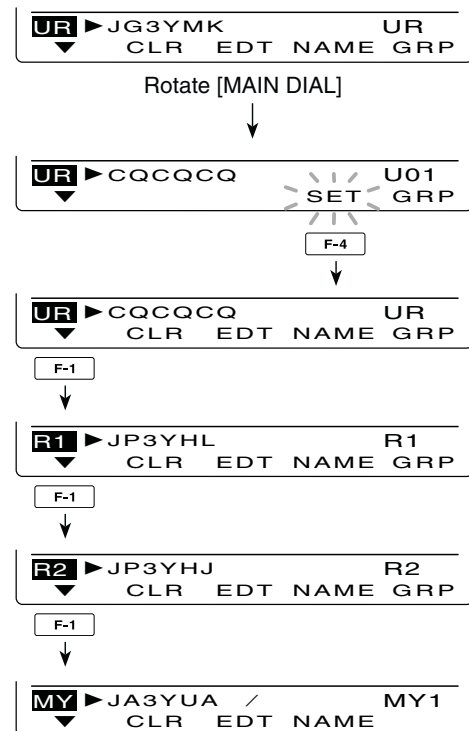
◇ Making a CQ call or a call to an individual station through a link repeater in the same zone (Zone call)



- ① Select the desired frequency band. (p. 35)
- ② Push [VFO/MEMO] to select the VFO mode.
- ③ Push [DV•DR] to select the DV mode.
- ④ Set the repeater's transmit frequency, duplex direction and offset. (pp. 37, 65, 163)
- ⑤ Push [MENU] one or more times to display the "M3" screen (Menu 3).
- ⑥ Push [CS](F-1) to display the "CS" screen (Call Sign).
- ⑦ Push [▼](F-1) to display the "UR" screen, and rotate [MAIN DIAL] to select UR call sign, then push [SET] (F-4).
 - First selecting the call sign memory groups by pushing [TS•GRP] or [GRP](F-5) makes it more convenient.
 - When calling CQ : Select "CQCQCQ"
 - When calling an individual station : Select the station's call sign
- ⑧ Push [▼](F-1) to display the "R1" screen, and rotate [MAIN DIAL] to select the access repeater call sign, then push [SET](F-4).
 - First selecting the repeater call sign group makes it more convenient, if you have programmed repeaters into Groups. (p. 93)
 - Push [NAME](F-4) to toggle the call sign and repeater name display, if the name has been programmed.
- ⑨ Push [▼](F-1) to display the "R2" screen, and rotate [MAIN DIAL] to select the link repeater call sign in the same zone, then push [SET](F-4).
- ⑩ Push [▼](F-1) to display "MY," and set your own call sign if necessary, then push [SET](F-4).
- ⑪ Push [PTT] on the microphone to transmit. (or [TRANSMIT] on the transceiver)
 - The MAIN Band TX/RX indicator lights red.
- ⑫ Release [PTT] to receive. (or push [TRANSMIT] again)
 - If another stations replies, it's call sign will be stored in the receive log.
 - Received call signs can be automatically stored into the received call record. See page 95 for details.
 - After transmitting, rotate [M-CH] to select a memory channel, then hold down [MW] for 1 second to save this temporary programmed data into the channel.

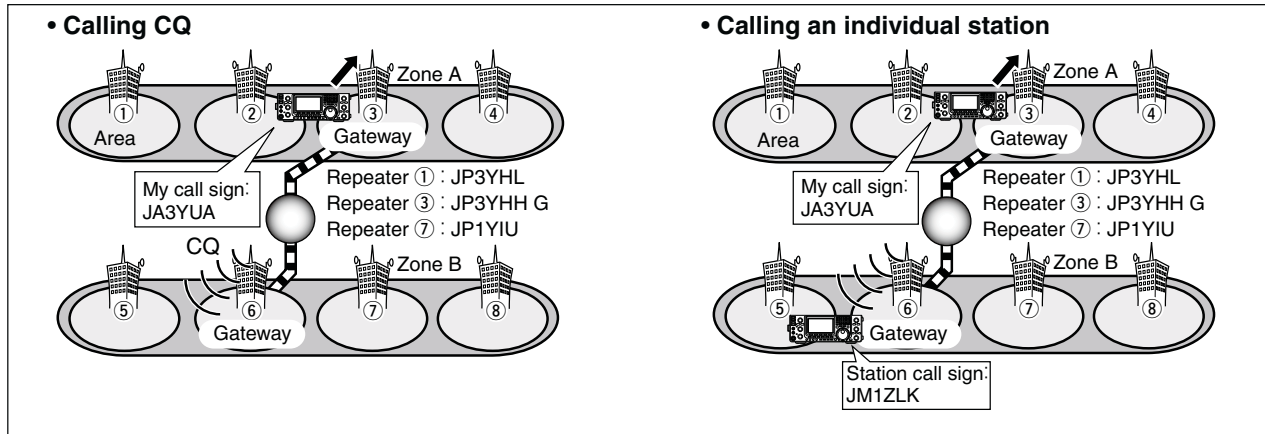


• Calling CQ in the same zone (Zone CQ)

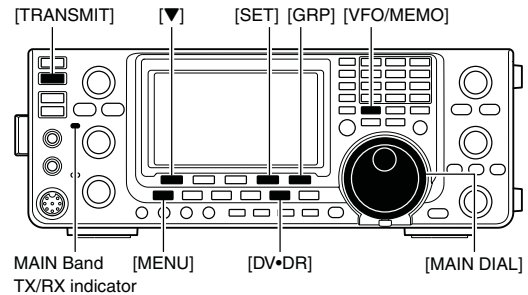


■ Repeater operation in the VFO (Continued)

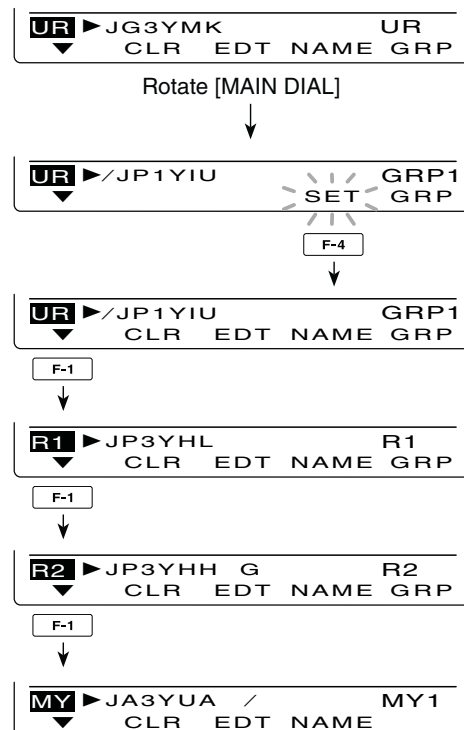
◇ Making a CQ call or a call to an individual station through gateway repeaters (Gateway call)



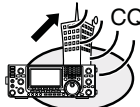
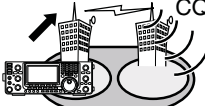
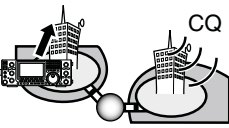
- ① Select the desired frequency band. (p. 35)
- ② Push [VFO/MEMO] to select the VFO mode.
- ③ Push [DV•DR] to select the DV mode.
- ④ Set the repeater's transmit frequency, duplex direction and offset. (pp. 37, 65, 163)
- ⑤ Push [MENU] one or more times to display the "M3" screen (Menu 3).
- ⑥ Push [CS](F-1) to display the "CS" screen (Call Sign).
- ⑦ Push [▼](F-1) to display the "UR" screen, and rotate [MAIN DIAL] to select UR call sign, then push [SET](F-4).
 - First selecting the call sign memory groups by pushing [TS•GRP] or [GRP](F-5) makes it more convenient.
 - When calling CQ : Select a link repeater call sign for sending CQ
 - When calling an individual station : Select the station's call sign
- ⑧ Push [▼](F-1) to display the "R1" screen, and rotate [MAIN DIAL] to select the access repeater call sign, then push [SET](F-4).
 - First selecting the repeater call sign group makes it more convenient, if you have programmed repeaters into Groups. (p. 93)
 - Push [NAME](F-4) to toggle the call sign and repeater name display.
- ⑨ Push [▼](F-1) to display "R2," and rotate [MAIN DIAL] to select your gateway repeater call sign, then push [SET](F-4).
- ⑩ Push [▼](F-1) to display "MY," and set your own call sign if necessary, then push [SET](F-4).
- ⑪ Push [PTT] on the microphone to transmit. (or [TRANSMIT] on the transceiver)
 - The MAIN Band TX/RX indicator lights red.
- ⑫ Release [PTT] to receive. (or push [TRANSMIT] again)
 - If another stations replies, it's call sign will be stored in the receive log.
 - Received call signs can be automatically stored into the received call record. See page 95 for details.
 - After transmitting, rotate [M-CH] to select a memory channel, then hold down [MW] for 1 second to save this temporary programmed data into the channel.

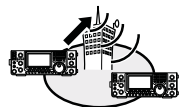

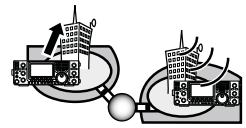


• Calling CQ through the gateway



◇ Settings for “UR” and “R2,” depending on the communication form

Destination: CQ
<p style="text-align: center;"><Communication form: Local area call></p> <div style="text-align: center;">  </div> <ul style="list-style-type: none"> • UR setting: CQCQCQ • R2 setting : NOT USE*
<p style="text-align: center;"><Communication form: Zone call></p> <div style="text-align: center;">  </div> <ul style="list-style-type: none"> • UR setting: CQCQCQ • R2 setting : Destination repeater to send CQ in the same zone
<p style="text-align: center;"><Communication form: Gateway call></p> <div style="text-align: center;">  </div> <ul style="list-style-type: none"> • UR setting: Destination repeater to send CQ • R2 setting : Your gateway repeater

Destination: An individual station
<p style="text-align: center;"><Communication form: Local area call></p> <div style="text-align: center;">  </div> <ul style="list-style-type: none"> • UR setting: An individual station • R2 setting : NOT USE*
<p style="text-align: center;"><Communication form: Zone call></p> <div style="text-align: center;">  </div> <ul style="list-style-type: none"> • UR setting: An individual station • R2 setting : Destination repeater in the same zone
<p style="text-align: center;"><Communication form: Gateway call></p> <div style="text-align: center;">  </div> <ul style="list-style-type: none"> • UR setting: An individual station • R2 setting : Your gateway repeater

/// **NOTE:** R1 setting is set to your access repeater’s call sign.

Message operation

TX message programming

The transceiver has a total of 5 message memories to store short messages to transmit during DV mode operation. Message of up to 20 characters can be programmed for each memory.

- ① In the DV mode, push [MENU] one or more times to display the "M3" screen (Menu 3).
 - In the DR mode, push [MENU] once or twice to select the "D1" screen.
- ② Push [DSET](F-5) to display the "DSET" screen.
- ③ Push [TXM](F-3) to display the "TXM" screen (Transmit message).
- ④ Rotate [MAIN DIAL] to select the desired transmit message channel.
 - TM1 to TM5 and OFF are selectable.
- ⑤ Push [EDT](F-1) to enter the transmit message programming mode.
 - A cursor appears and blinks.
- ⑥ Push [F-1] one or more times to select the desired character type.

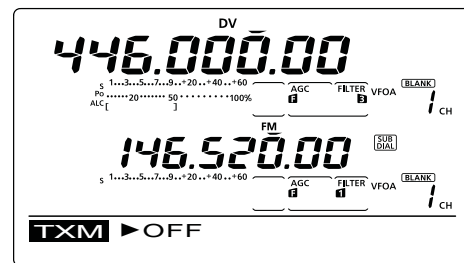
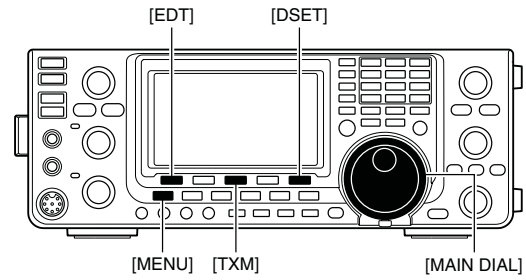
Character type	Selectable characters
ABC	A to Z
abc	a to z
etc	! # \$ % & \ ? " ' ` ^ + - * / . , ; = < > () [] { } _ ` @

- ⑦ Rotate [MAIN DIAL] to select the first character to input.

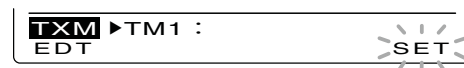
When inputting numbers or a decimal point, push the appropriate keypad key.

 - Push [DEL](F-4) to delete the selected character, symbol or number.
 - Push [SPC](F-5) to input a space.
 - When all 20 characters have been programmed, an error beep sounds. If you want to reprogram, push [◀](F-2) or [▶](F-3) to select a character, then push [DEL](F-4) to delete it.
- ⑧ Push [◀](F-2) to move the cursor backward, or push [▶](F-3) to move the cursor forward.
- ⑨ Repeat steps ⑥ through ⑧ to program a message of up to 20 characters.
- ⑩ Push [MENU] to save the programmed message.

While [SET](F-5) is blinking, push it to set the displayed channel as the first appearance channel when [TXM](F-3) is pushed in step ③.



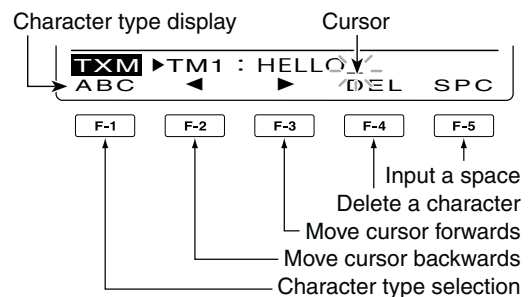
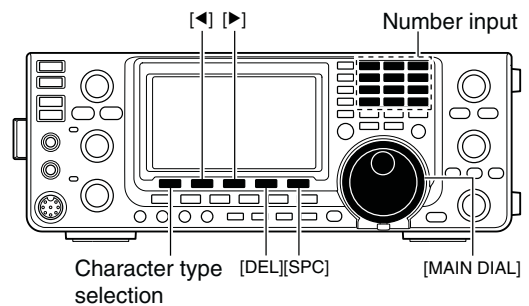
Rotate [MAIN DIAL]



[F-1]



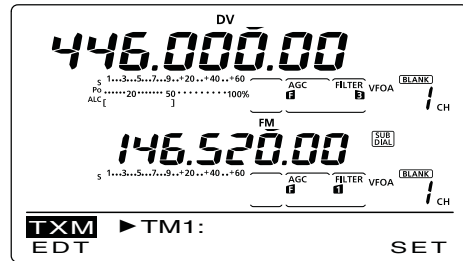
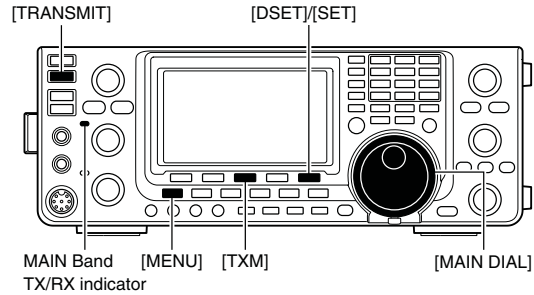
Programming a transmit message



◇ Message Transmission

You can select a message channel (TM1–TM5) to turn ON the message transmission function. When a message channel is selected, the transceiver transmits the pre-programmed text message. The default setting is OFF.

- ① Set the operating frequency, call signs and other settings, such as those for repeater operation, as desired.
- ② In the DV mode, push [MENU] one or more times to display the “M3” screen (Menu 3).
 - In the DR mode, push [MENU] once or twice to select the “D1” screen.
- ③ Push [DSET](F-5) to display the “DSET” screen.
- ④ Push [TXM](F-3) to display the “TXM” screen (Transmit message).
- ⑤ Rotate [MAIN DIAL] to select the desired transmit message channel, then push [SET](F-5).
 - TM1 to TM5 are selectable.
 - When OFF is selected, the message is not transmitted.
- ⑥ Push [MENU] to return to the “DSET” screen.
- ⑦ Push [PTT] on the microphone to transmit the message. (or push [TRANSMIT] on the transceiver)
 - The message is transmitted each time you push [PTT] (or [TRANSMIT]).
 - The message is automatically transmitted every 30 seconds during continuous transmission.
 - The MAIN Band TX/RX indicator lights red.



✓ For your information

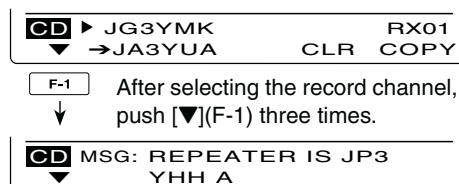
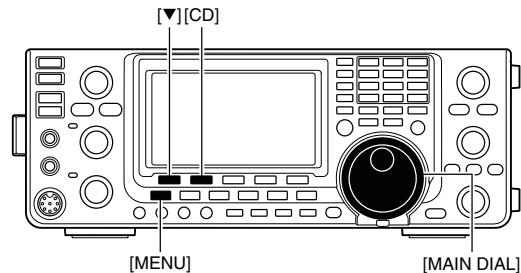
When a call with a message is received, the call sign and the message scrolls across the function display. The received call sign and/or message display functions can be turned OFF in the DV SET mode, if desired.

- ➡ “RX Message Disp” item (p. 119)
- ➡ “RX Call Sign Disp” item (p. 119)

◇ RX message display

- ① In the DV mode, push [MENU] one or more times to display the “M3” screen (Menu 3).
 - In the DR mode, push [MENU] once or twice to select the “D1” screen.
- ② Push [CD](F-2) to display the “CD” screen (Call Record).
- ③ Rotate [MAIN DIAL] to select the desired record channel (RX01 to RX20).
- ④ Push [▼](F-1) three times to select “MSG” item.
 - The received message is displayed.
- ⑤ Push [▼](F-1) or [MENU] to return to the record channel, selected in step ③.

NOTE: Up to 20 messages can be stored, but only one message can be stored for each call sign. The oldest message is cleared when 21st message is received.

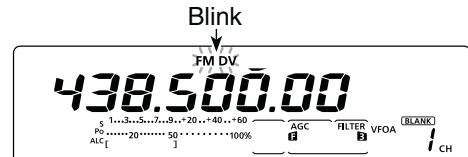
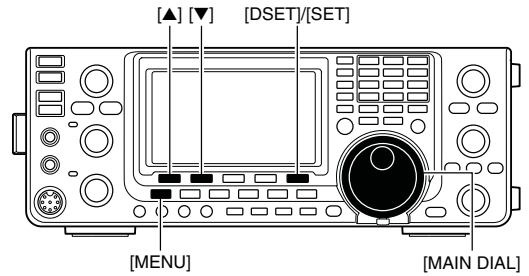


■ DV automatic detection

When a non-digital signal is received during DV mode operation, the “DV” and “FM” icons simultaneously blink. The transceiver automatically selects the FM mode to monitor the signal, if the DV Auto Detect function is turned ON.

- ① In the DV mode, push [MENU] one or more times to display the “M3” screen (Menu 3).
 - In the DR mode, push [MENU] once or twice to select the “D1” screen.
- ② Push [DSET](F-5) to display the “DSET” screen.
- ③ Push [SET](F-5) to enter the DV Set mode.
- ④ Push [▲](F-1) or [▼](F-2) to select “DV Auto Detect.”
- ⑤ Rotate [MAIN DIAL] to turn ON the DV automatic detect function.
 - The operating mode is set to DV if this setting is “OFF.”
- ⑥ Push [MENU] to return to the “DSET” screen.

▨ The received FM audio may be distorted when using this function.



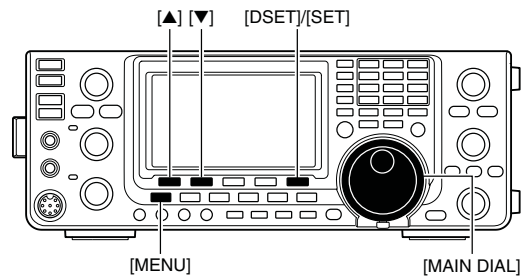
While receiving a non-digital signal while in the DV mode

■ Automatic Reply function

When a call addressed to own your call sign is received, the Automatic Reply function automatically replies with your call sign.

- ① In the DV mode, push [MENU] one or more times to display the “M3” screen (Menu 3).
 - In the DR mode, push [MENU] once or twice to select the “D1” screen.
- ② Push [DSET](F-5) to display the “DSET” screen.
- ③ Push [SET](F-5) to enter the DV Set mode.
- ④ Push [▲](F-1) or [▼](F-2) to select “Auto Reply.”
- ⑤ Rotate [MAIN DIAL] to turn ON the Automatic reply function.
- ⑥ Push [MENU] to return to the “DSET” screen.

▨ **NOTE:** The Automatic reply function is automatically turned OFF, when [PTT] (or [TRANSMIT]) is pushed to transmit.



When the Automatic reply function is ON.

Digital squelch functions

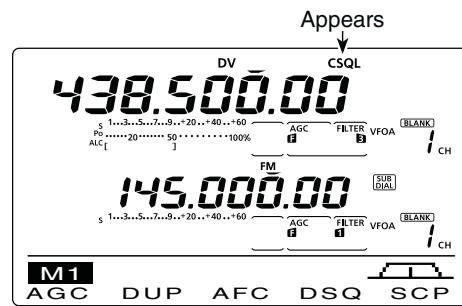
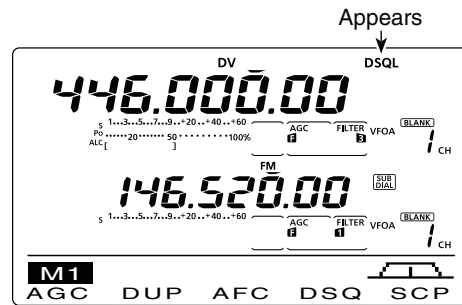
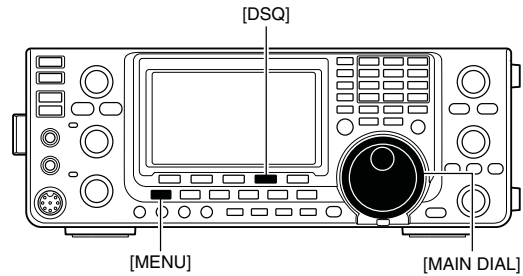
The digital squelch opens only when receiving a signal addressed to your own call sign, or a signal that includes a matching digital code. You can silently wait for calls from others.

NOTE: Use digital code squelch function when communicating with two or more stations, because the digital call sign squelch function opens only when receiving a signal addressed to your own call sign. Thus the digital call sign squelch function can be used when communicating with only one station.

- ① Select the desired frequency band. (p. 35)
- ② In the DV mode, push [MENU] one or more times to display the “M1” screen (Menu 1).
 - In the DR mode, push [MENU] once or twice to select the “D2” screen.
 - The setting can be respectively made in the DV mode and the DR mode.
- ③ Push [DSQ](F-4) one or more times to turn ON the digital call sign squelch or digital code squelch.
 - “DSQL” appears when the digital call sign squelch is ON.
 - “CSQL” appears when the digital code squelch is ON.

When digital call sign squelch is turned ON in step ③, skip steps ④ and ⑤, and go to step ⑥.

- ④ When digital code squelch is turned ON in step ③, hold down [DSQ](F-4) for 1 second to display the “DSQ” screen. And rotate [MAIN DIAL] to select the desired code between 00 and 99.
 - Hold down [F-3] for 1 second to reset to the default setting, if desired.
- ⑤ Push [MENU] to return to the “M1” screen (Menu 1).
 - In the DR mode, return to the “D2” screen.
- ⑥ When the received signal includes a matching call sign/code, the squelch opens and the signal can be heard.
 - When the received signal’s call sign/code does not match, digital call sign/digital code squelch does not open; however, the S-meter shows signal strength.

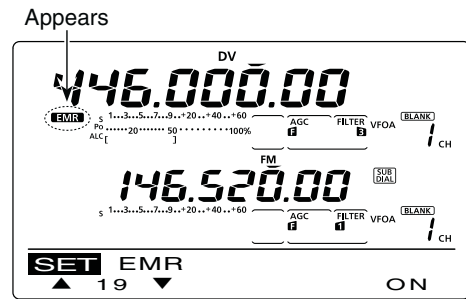
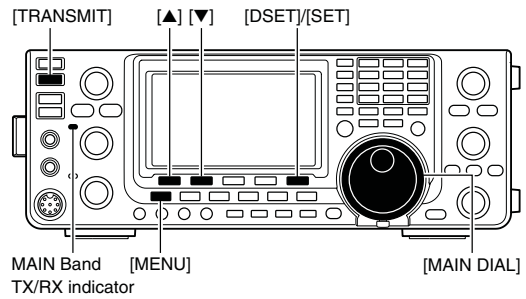


“DSQ” screen (Digital code setting)

EMR communication

The EMR (Enhanced Monitor Receive) communication mode can be used in only the DV mode. In the EMR mode, no call sign setting is necessary. When an EMR mode signal is received, the audio (voice) will be heard at the specified level, even if the volume setting level is set to the minimum level, or digital call sign/digital code squelch is in use.

- ① Select the desired frequency band. (p. 35)
- ② Set the desired frequency. (p. 37)
- ③ In the DV mode, push [MENU] one or more times to display the "M3" screen (Menu 3).
 - In the DR mode, push [MENU] once or twice to select the "D1" screen.
- ④ Push [DSET](F-5) to display the "DSET" screen.
- ⑤ Push [SET](F-5) to enter the DV Set mode.
- ⑥ Push [▲](F-1) or [▼](F-2) to select "EMR."
- ⑦ Rotate [MAIN DIAL] to turn ON the EMR mode.
 - "EMR" appears.
- ⑧ Push [MENU] to return to the "DSET" screen.
- ⑨ Push [PTT] on the microphone to transmit. (or [TRANSMIT] on the transceiver)
 - The MAIN Band TX/RX indicator lights red.
- ⑩ Release [PTT] to receive. (or push [TRANSMIT] again)
 - "EMR" blinks when receiving an EMR signal.



When the EMR communication mode is ON.

NOTE: The EMR communication function is automatically turned OFF when the transceiver is turned OFF.

Adjusting the EMR AF level

The audio output level when an EMR signal is received is adjustable.

When an EMR signal is received, the audio will be heard at the preset level, or the [AF] control level, whichever is higher.

- ① In the DV mode, push [MENU] one or more times to display the "M3" screen (Menu 3).
 - In the DR mode, push [MENU] once or twice to select the "D1" screen.
- ② Push [DSET](F-5) to display the "DSET" screen.
- ③ Push [SET](F-5) to enter the DV Set mode.
- ④ Push [▲](F-1) or [▼](F-2) to select "EMR AF Level."
- ⑤ Rotate [MAIN DIAL] to adjust the EMR audio output level between 0% (minimum) and 100% (maximum).
 - Hold down [F-3] for 1 second to reset to the default setting, if desired.
- ⑥ Push [MENU] to return to the "DSET" screen.

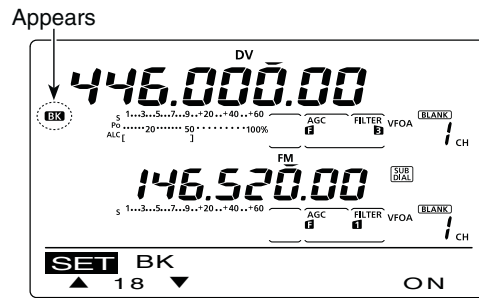
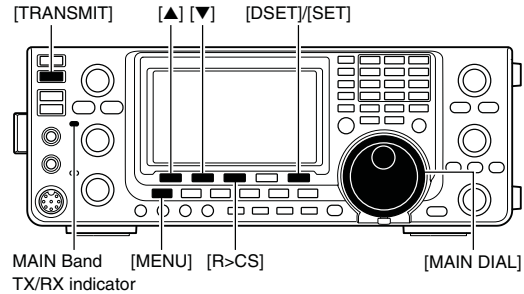


50% (default)

■ Break-in communication

The break-in function allows you to break into a conversation, where the two other stations are communicating with call sign squelch enabled.

- ① While receiving another station's communication in the DV mode, push [MENU] one or more times to display the "M3" screen (Menu 3).
 - In the DR mode, push [MENU] once or twice to select the "D1" screen.
- ② Hold down [R>CS](F-3) for 1 second to set the other station's call sign.
 - When a call sign has not been received correctly, error beeps sound, and no call sign is set. Try to capture the call sign of the signal again, or enter it manually.
- ③ Push [DSET](F-5) to display the "DSET" screen.
- ④ Push [SET](F-5) to enter the DV Set mode.
- ⑤ Push [▲](F-1) or [▼](F-2) to select "BK."
- ⑥ Rotate [MAIN DIAL] to turn ON the break-in function.
 - "BK" appears.
- ⑦ Push [MENU] to return to the "DSET" screen.
- ⑧ When both stations are in standby, push [PTT] on the microphone to transmit. (or push [TRANSMIT] on the transceiver)
 - The programmed call sign station receives the break-in call as well as your call sign.
 - The MAIN Band TX/RX indicator lights red.
- ⑨ Release [PTT] to receive. (or push [TRANSMIT] again)
 - Wait for a reply call from the station who received the break-in call.
- ⑩ After receiving the reply call, communicate normally.
 - "BK" blinks when receiving a break-in call.
- ⑪ To cancel the break-in function, turn OFF the Break-in function in the DV Set mode as shown in steps ④ through ⑥.



When the Break in function is ON.

NOTE: The break-in function is automatically turned OFF when transceiver is turned OFF.

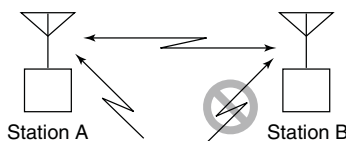
How to use break-in?

While using digital call sign squelch, the squelch never opens (no audio sounds) even if a call is received, unless your own call sign ("MY") is specified. (p. 93)

However, when a call including the "BK ON" signal (break-in call) is received, the squelch will open and audio sounds even if the call is specified for another station.

• Station C calling to Station A with "BK OFF"

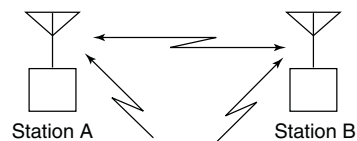
Station A and B are communicating using the digital call sign squelch.



Station B never hears that Station C is calling Station A.

• Station C calling to Station A with "BK ON"

Station A and B are communicating using the digital call sign squelch.



Station B also hears that Station C is calling Station A.

■ Low-speed data communication

In addition to digital voice communication, low-speed data communication can be made.

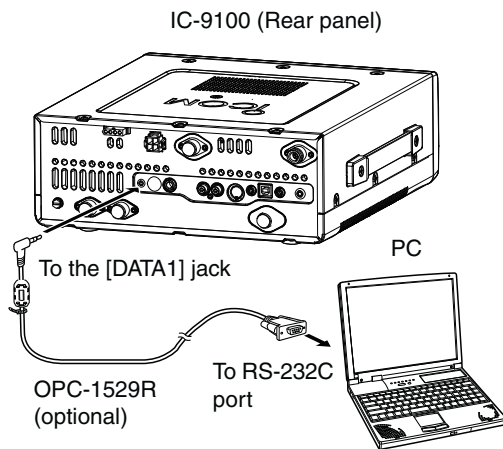
Use the optional OPC-1529R DATA COMMUNICATION CABLE with a third-party serial data communication software.

- A USB port can also be used for the low-speed data communication, depending on the “USB2/DATA1 Func (63)” item setting in the Set mode. (p. 164)

NOTE: First, turn OFF the “GPS TX Mode” item in the GPS Set mode to send the low-speed data. (p. 134)

◇ Connection

Connect the transceiver to your PC using the optional OPC-1529R cable, as illustrated below.



■ Packet loss indication

While operating voice communication or low-speed data communication through the internet, some packets may be lost due to network error (poor data throughput performance). In such a case, the IC-9100 displays “**PL**” on the display to indicate Packet Loss has occurred.

◇ Low-speed data communication application setting

Configure the serial data communication software as follows.

- Port : The COM port number which is used by the IC-9100.*1
- Baud rate : 9600/4800 bps*2
- Data : 8 bit
- Parity : None
- Stop : 1 bit
- Flow control : Xon/Xoff

*1 Depending on the PC environment, the COM port number used by the IC-9100 may be higher than 5. In such case, use the application which can set to higher than 5.

*2 Set the baud rate in the “DVdat/GPS Out Baud” item of the Set mode. (p. 168)

◇ Low-speed data communication operation

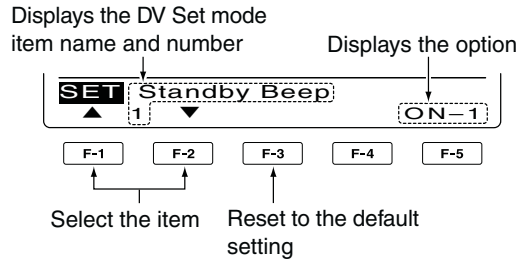
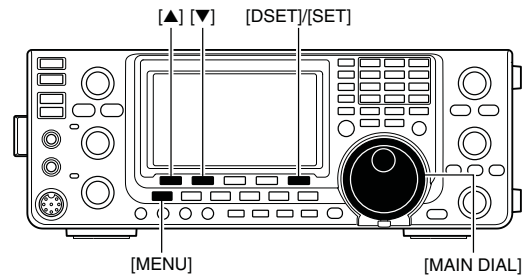
- ① Set the desired call signs as described in ‘Call sign setting.’ (p. 93)
- ② Follow the instructions of the data communication application software.
- ③ Push [PTT] on the microphone to transmit the data and an audio signal. (or push [TRANSMIT] on the transceiver)
 - The MAIN Band TX/RX indicator lights red.
 - The input data from the [DATA1] jack are automatically transmitted when “AUTO” is selected in the “DV Data TX” item of the DV Set mode. (p. 118)

■ DV Set mode description

The DV Set mode is used for programming infrequently changed values or functions in the DV mode.

◇ DV Set mode settings

- ① In the DV mode, push [MENU] one or more times to display the “M3” screen (Menu 3).
 - In the DR mode, push [MENU] once or twice to select the “D1” screen.
- ② Push [DSET](F-5) to display the “DSET” screen.
- ③ Push [SET](F-5) to enter the DV Set mode.
- ④ Push [▲](F-1) or [▼](F-2) to select the desired item.
- ⑤ Rotate [MAIN DIAL] to select the desired option.
 - Hold down [F-3] for 1 second to reset to the default setting, if desired.
- ⑥ Push [MENU] to save, and return to the “DSET” screen.



1. Standby Beep (Default: ON-1)

Turn the Standby beep function ON or OFF. This function sounds a beep when the other station stops transmitting.

- OFF : Turns OFF the function.
- ON-1 : Turns ON the function to sound a beep.
- ON-2 : Turns ON the function to sound a beep. If the call was sent to your call sign, the beep has a higher pitch.

2. Auto Reply (Default: OFF)

Turn the automatic reply function ON or OFF. This function automatically replies to a call addressed to your own call sign, even if you are away from the transceiver.

This function is automatically turned OFF after you push [PTT] (microphone) or [TRANSMIT].

- OFF : Turns OFF the function.
- ON : The transceiver automatically replies to the call with your own call sign.

3. DV Data TX (Default: PTT)

For low-speed data communication, select whether to transmit the input data manually or automatically.

- PTT : Push [PTT] (microphone) or [TRANSMIT] to manually transmit the input data.
- Auto : When data is input from a PC through the [DATA1] jack, the transceiver automatically transmits it.

4. Digital Monitor (Default: Auto)

Select the RX monitoring mode by holding down [XFC] while in the DV mode.

- Auto : Monitors in the DV mode or FM mode, depending on the received signal.
- Digital : Monitors in the DV mode.
- Analog : Monitors in the FM mode.

5. Digital RPT Set (Default: ON)

Turn the digital repeater setting function ON or OFF. When accessing a repeater that has a call sign different than the transceiver’s “R1” setting, this function reads the repeater’s downlink signal and automatically sets the correct repeater call sign into “R1.”

- OFF : Turns OFF the function.
- ON : Automatically sets the repeater call sign.

6. RX Call Sign Write (Default: OFF)

Turn the RX call sign automatic write function ON or OFF.

When receiving a call addressed to your own call sign, this function automatically sets the call sign of the calling station into “UR.”

While in the DR mode, this function is disabled.

- OFF : Turns OFF the function.
- Auto : Automatically sets the call sign of the calling station into “UR.”

■ DV Set mode description (Continued)

7. RX RPT Write (Default: OFF)

Turn the repeater call sign automatic write function ON or OFF.

When you receive a call addressed to your own call sign through a repeater, this function automatically sets the repeater call signs included in the signal, into your current "R1" and "R2."

While in the DR mode, this function is disabled.

OFF : Turns OFF the function.

Auto : Automatically sets the call sign of the used repeater into your "R1" and "R2."

8. DV Auto Detect (Default: OFF)

Turn the DV mode automatic detect function ON or OFF.

When receiving other than a DV mode signal, during DV mode operation, this function automatically switches to the FM mode.

- OFF : Turns OFF the function. The operating mode is fixed to the DV mode.
- ON : Automatically selects the FM mode for temporary operation.

/// The received FM audio may be distorted when receiving an FM signal with this function.

9. Edit Record (Default: Auto)

Select an option for the call sign edit record function. When a call sign in the memory is edited, this function saves the new call sign in a different memory than the original one.

- OFF : Turns OFF the function. The previously set call sign is overwritten with the edited call sign.
- Select : The edited call sign is programmed into the selected call sign memory.
- Auto : The edited call sign is automatically programmed into a blank memory.

10. Gateway Auto Set (Default: Auto)

Turn the gateway automatic set function ON or OFF for calling an individual station in the DR mode.

This function enables the transceiver to automatically set the pre-programmed gateway repeater in "R2."

- OFF : Even selecting an individual station in "UR," the previously used repeater call sign remains in R2.
- Auto : After selecting an individual station in "UR," the pre-programmed gateway repeater is automatically set in R2.

11. RX Record (RPT) (Default: ALL)

The transceiver can record data of up to 20 individual calls.

Select whether to record all calls or only the latest call whose called station did not reply, or whose Link repeater was not found.

- ALL : Records all calls.
- Latest Only : Records only the latest call.

12. RX Call Sign Disp (Default: Auto)

When a call is received, the call sign of the calling station can be automatically displayed.

- OFF : Turns OFF the function.
- Auto : Automatically displays the call sign of the calling station.

13. TX Call Sign Disp (Default: UR)

Select whether or not to display the programmed call sign (MY or UR) at the beginning of your transmission.

- OFF : Turns OFF the function.
- UR : Displays the call sign of the station you called.
- MY : Displays your own call sign.

14. RX Message Disp (Default: Auto)

Select whether or not to display and scroll a received message.

- OFF : Does not display the message. To check the message, push [CD] (F-2) in M3, and then select MSG.
- Auto : Automatically displays and scrolls the message.

15. Scroll (Default: Fast)

Select the scrolling speed of a message or call sign.

- Slow : Sets the scrolling speed to "Slow."
- Fast : Sets the scrolling speed to "Fast."

16. DR Call Sign Popup (Default: ON)

Select whether or not to display a selected station or repeater call sign when the DR mode is selected, or when you switch the "UR," "R1" and "R2" display while in the DR mode.

- OFF : A call sign is not displayed.
- ON : A call sign is displayed.

17. Opening Call Sign (Default: OFF)

Select whether or not to display MY call sign on the LCD when the transceiver is turned ON.

- OFF : Turns OFF the function.
- ON : Displays MY call sign at power ON.

18. BK (Default: OFF)

The break-in function allows you to break into a conversation where two other stations are communicating with call sign squelch enabled.

See page 116 for details.

- OFF : The break-in function is set to OFF.
- ON : The break-in function is set to ON.
 - “**BK**” appears on the display.

/// **NOTE:** The break-in function is automatically turned OFF when the transceiver is turned OFF.

19. EMR (Default: OFF)

The EMR communication mode can be used for digital mode operation. In the EMR mode, no call sign setting is necessary. When an EMR mode signal is received, the audio (voice) will be heard at the specified level even if the volume setting level is set to minimum level, or digital call sign/digital code squelch is in use.

See page 115 for details.

- OFF : The EMR function is set to OFF.
- ON : The EMR function is set to ON.
 - “**EMR**” appears on the display.

/// **NOTE:** The EMR communication function is automatically turned OFF when the transceiver is turned OFF.

20. EMR AF Level (Default: 50%)

Enter a number between 0 % (minimum) and 100 % (maximum) to set the audio output level when an EMR signal is received.

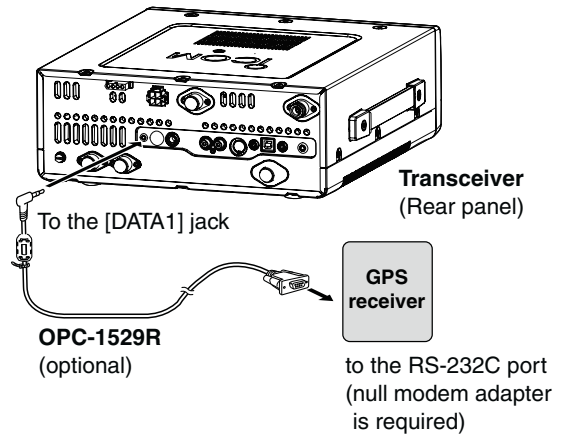
When an EMR signal is received, the audio will be heard at the programmed level, or the [AF] control level, whichever is higher.

■ GPS operation

You can display your own GPS data in all operating modes. You can also transmit GPS data when in the DV mode. To receive GPS data, connect a third-party GPS receiver that has an RS-232C output and NMEA data format. Third-party GPS receivers connect to the [DATA1] jack of the transceiver.

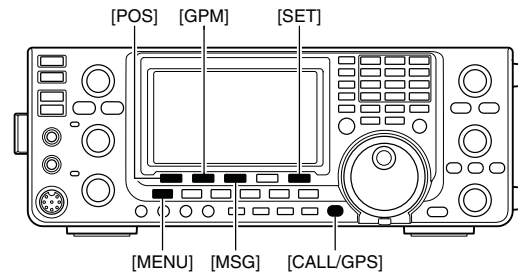
In addition, GPS messages can also be transmitted in the GPS mode.

• To connect the GPS receiver

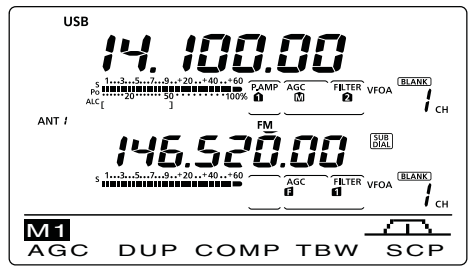


◇ GPS screen construction

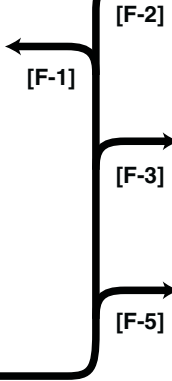
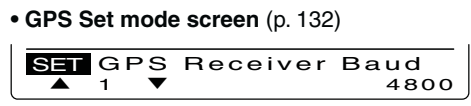
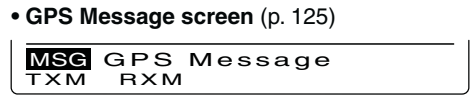
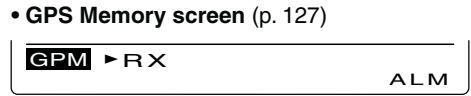
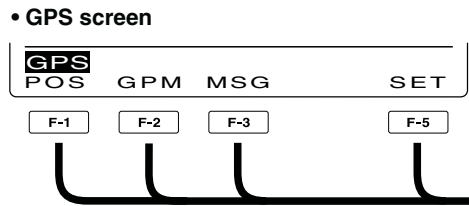
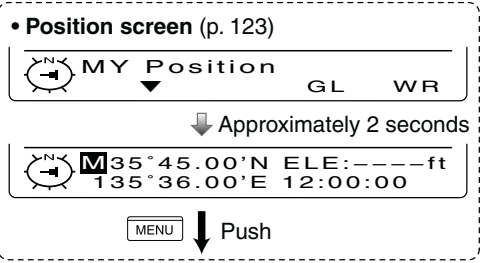
- ① Hold down [CALL/GPS] for 1 second to display the "GPS" screen.
 - ② Push [POS](F-1), [GPM](F-2), [MSG](F-3) or [SET] (F-5) to select the desired menu.
- See the diagram below.
- Push [MENU] to return to the previous display.



The screen you want to appear first can be selected between GPS and Position in the "GPS 1st Menu" item of the Set mode. (p. 165)



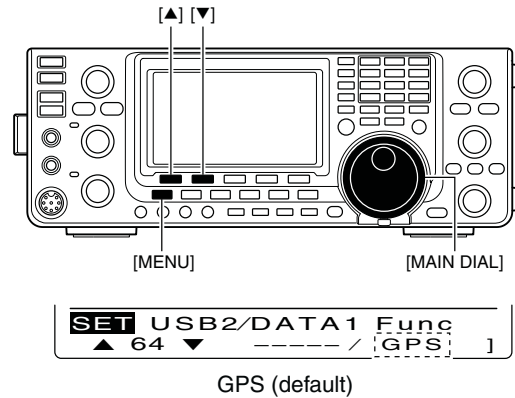
[CALL/GPS] ↓ Hold down



◇ GPS data communication

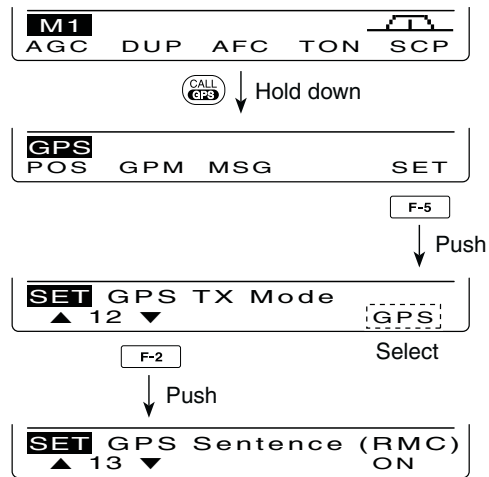
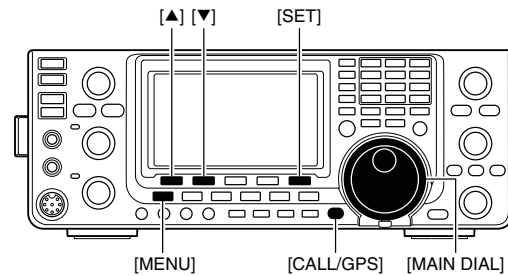
The transceiver transmits GPS data or low-speed data to the PC through the [DATA1] jack, depending on the Set mode setting. (p. 168)

- ① Hold down [MENU] for 1 second to enter the Set mode.
- ② Push [▲](F-1) or [▼](F-2) to select “USB2/DATA1 Func.” (64)
- ③ Rotate [MAIN DIAL] to select “GPS” as the function of the [DATA1] jack to be used for position data input.
- ④ Push [MENU] to save, and exit the Set mode.



◇ Sentence formatter setting

- ① Hold down [CALL/GPS] for 1 second to display the “GPS” screen.
- ② Push [SET](F-5) to enter the GPS Set mode.
- ③ Push [▲](F-1) or [▼](F-2) to select “GPS TX Mode.”
- ④ Rotate [MAIN DIAL] to select “GPS.”
 - If “Disable” or “GPS-A” is selected, the sentence formatter items as described in step ⑤ will not appear.
- ⑤ Push [▲](F-1) or [▼](F-2) to select the desired GPS sentence.
 - A total of 6 sentences, RMC, GGA, GLL, GSA, VTG and GSV are selectable.
- ⑥ Rotate [MAIN DIAL] to turn the sentence ON or OFF.
 - Hold down [F-3] for 1 second to reset to the default setting, if desired.
- ⑦ Repeat steps ⑤ and ⑥ to select another GPS sentence.
 - Up to four GPS sentences can be selected.
- ⑧ Push [MENU] to save, and return to the “GPS” screen.



When RMC sentence usage is set to ON.

NOTE:

Set the GSV sentence to OFF when sending the GPS message to conventional digital transceivers (IC-2820H, IC-E2820, ID-800H, IC-91AD, IC-E91, IC-V82, IC-U82, IC-2200H, ID-1). The GSV sentence is incompatible with them. Those transceivers will not display GPS messages properly if a GSV sentence is sent from the IC-9100.

■ GPS operation (Continued)

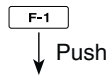
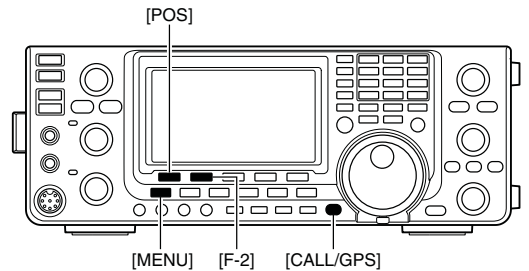
◇ Position display

- ① Hold down [CALL/GPS] for 1 second to display the “GPS” screen.
- ② Push [POS](F-1) to display the position data. Then push [F-2] one or more times to display your current position, received position or GPS memory alarm position information.
 - While the position data is displayed, push [F-1] to select North or South as the top of the compass.
 - **MY Position** : Displays your own latitude, longitude, direction*, elevation* and the time*.
 - * These items do not appear when “Manual” is selected as the “MY Position” item option in the GPS Set mode. (p. 132)
 - **RX Position** : Displays the caller’s (other station) latitude, longitude, call sign, direction and distance from your position.
 - **GPM Position**: Displays the GPS Memory channel’s latitude, longitude, direction and distance from your position, if the GPS Alarm function is set to the channel.
 - If the GPS Alarm function is set to all channels or a bank, “-” is displayed instead of the position information.
- ③ Push [MENU] to return to the “GPS” screen.

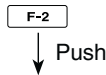
/// **NOTE:** Depending on the GPS signals, your position/elevation may change even though you are stationary.

These sample indications assume that “Position Format” is selected as “ddd°mm.mm,” and “Units” is selected as “feet/mile.” (p. 132)

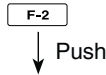
“TIME” data may not be displayed, depending on the connected GPS receiver.



↓ Approximately 2 seconds



↓ Approximately 2 seconds

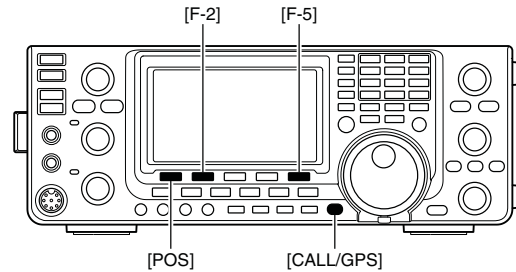


↓ Approximately 2 seconds



◇ Saving your own or received position data

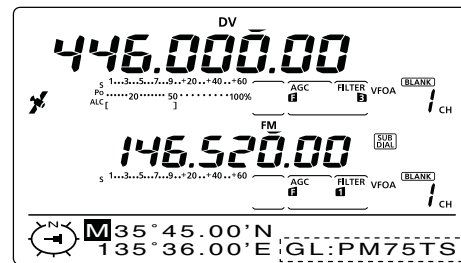
- ① Hold down [CALL/GPS] for 1 second to display the “GPS” screen.
- ② Push [POS](F-1), then push [F-2] once or twice to display your own or the caller’s (other station) position information.
 - You cannot save the data on the “GPM Position” screen.
- ③ Hold down [F-5] for 1 second to save the position data to GPS memory (G00).
 - The Memory channel number advances automatically if the next Memory channel already contains information.
 - 50 GPS Memory channel are available.



◇ Display the Grid Locator information

The Grid Locator expresses the latitude and longitude position data in a short string of characters. The IC-9100 can display it on the LCD.

- ① Hold down [CALL/GPS] for 1 second to display the “GPS” screen.
- ② Push [POS](F-1), then push [F-2] one or more times to display the position information.
- ③ While holding down [F-4], the grid locator information is displayed.



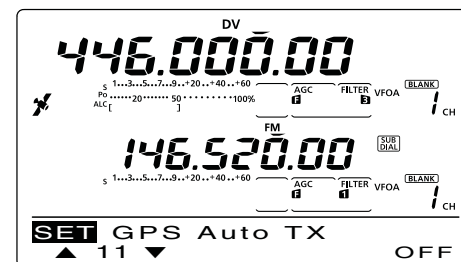
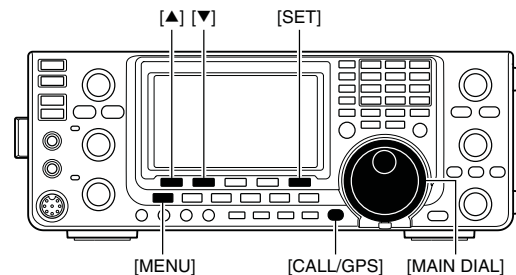
F-4
Hold down

◇ GPS automatic transmission

In the DV mode, this function automatically transmits the GPS receiver’s current position data, at a selected interval.

When a GPS message is programmed, the transceiver transmits it along with the position data. See page 125 for the GPS message programming.

- ① Hold down [CALL/GPS] for 1 second to display the “GPS” screen.
- ② Push [SET](F-5) to enter the GPS Set mode.
- ③ Push [▲](F-1) or [▼](F-2) to select “GPS Auto TX.”
- ④ Rotate [MAIN DIAL] to select the desired position data transmitting interval to 5*, 10 or 30 seconds; 1, 3, 5, 10 or 30 minutes, or OFF.
 - *If four GPS sentences are selected in GPS Set mode on page 122, “5 sec.” cannot be selected.
 - The GPS message is also transmitted, if programmed.
- ⑤ Push [MENU] to save, and return to the “GPS” screen.



OFF (default)

NOTE:

- Your own call sign must be entered to activate the GPS automatic transmission. (p. 93)
- Use GPS automatic transmission in only the simplex mode.
- GPS automatic transmission through a repeater may interfere with other communications.

■ GPS operation (Continued)

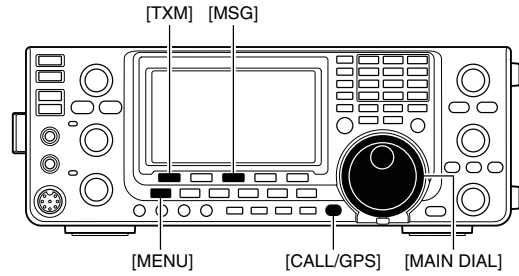
◇ GPS message programming

Enter a GPS message of up to 20 characters to be transmitted with the position data.

- ① Hold down [CALL/GPS] for 1 second to display the “GPS” screen.
- ② Push [MSG](F-3) to display the “MSG” screen (GPS Message).
- ③ Push [TXM](F-1) to display the “TXM” screen (TX Message Edit).
 - A cursor appears and blinks.
- ④ Push [F-1] one or more times to select the desired character type.

Character type	Selectable characters
ABC	A to Z
abc	a to z
etc	! # \$ % & \ ? " ' ` ^ + - * / . , ; = < > () [] { } _ ` @

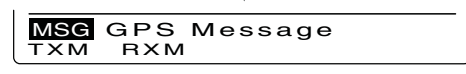
- ⑤ Rotate [MAIN DIAL] to select the first character or symbol to input.
 - When inputting numbers or a decimal point, push the appropriate keypad key.
 - Push [DEL](F-4) to delete the selected character, symbol or number.
 - Push [SPC](F-5) to input a space.
 - When all 20 characters have been programmed, an error beep sounds. If you want to reprogram, push [◀](F-2) or [▶](F-3) to select a character, then push [DEL] (F-4) to delete it.
- ⑥ Push [◀](F-2) to move the cursor backward, or push [▶](F-3) to move the cursor forward.
- ⑦ Repeat steps ④ to ⑥ to program a message of up to 20 characters.
- ⑧ Push [MENU] to save the message, and return to the “MSG” screen (GPS Message).
- ⑨ Push [MENU] again to return to the “GPS” screen.



Hold down



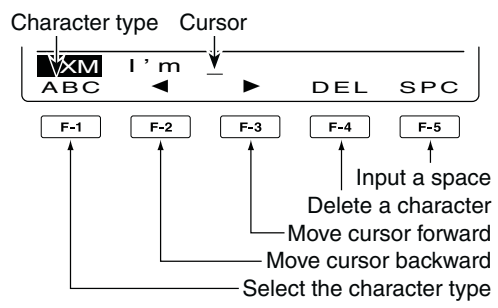
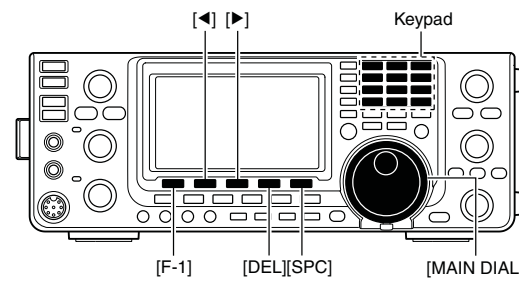
Push



Push

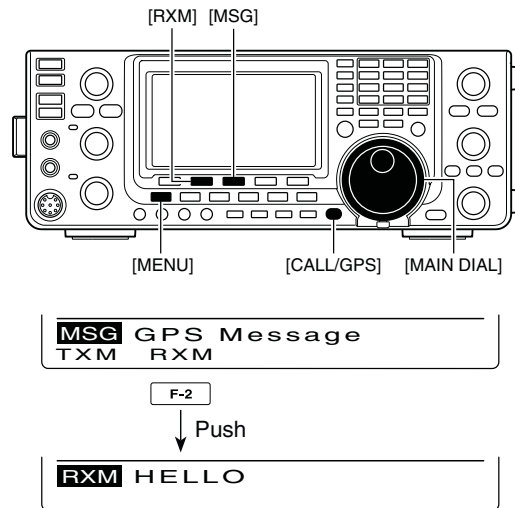


• To program a message



◇ Received GPS message display

- ① Hold down [CALL/GPS] for 1 second to display the “GPS” screen.
- ② Push [MSG](F-3) to display the “MSG” screen (GPS Message).
- ③ Push [RXM](F-2) to display the “RXM” screen (RX message).
 - Messages of up to 36 characters can be displayed. When the received GPS message includes more than 36 characters, push [F-1] to display the rest of the message.
- ④ Push [MENU] to return to the “MSG” screen (GPS Message).
- ⑤ Push [MENU] to return to the “GPS” screen.



■ GPS memory operation

The transceiver has 50 GPS memory channels to store the received position data, or other-used position data, along with an alphanumeric channel name.

◆ Add a GPS memory

- ① Hold down [CALL/GPS] for 1 second to display the “GPS” screen.
- ② Push [GPM](F-2) to display the “GPM” screen (GPS Memory).
- ③ Rotate [MAIN DIAL] to select “ALL” or a desired memory bank.
 - The bank can be selected in ‘Memory bank setting,’ as described on page 128.
- ④ Push [LIST](F-1), then push [ADD](F-1) to enter the “ADD” screen (GPS Memory Add) to manually add new data.

To cancel the programmed data:
 When the “ADD” screen is selected, push [MENU] to display “Cancel OK?.” Push [YES] (F-4) to cancel programming and return to the “GPM” screen, or push [NO](F-5) to keep programming and return to the “ADD” screen.

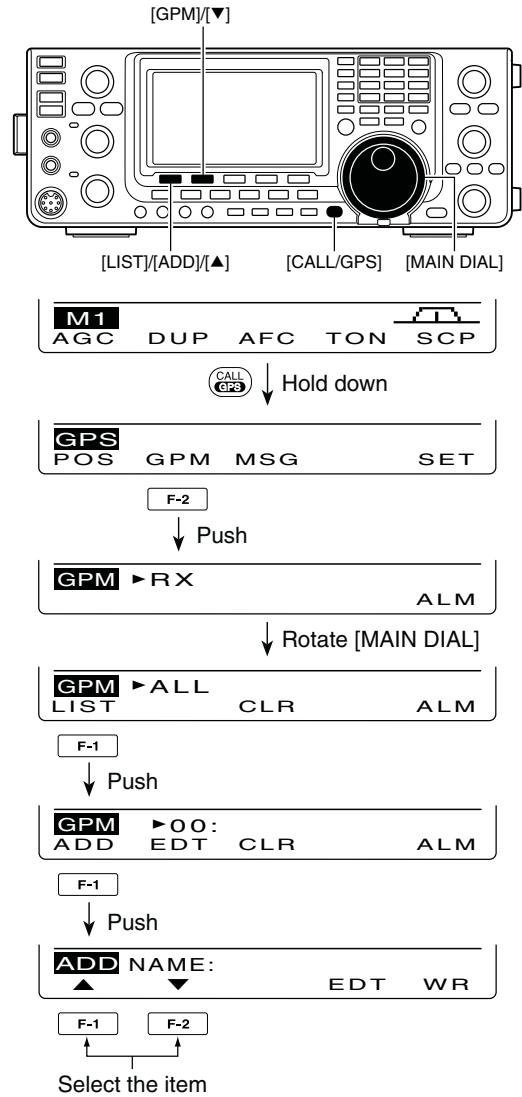
- ⑤ Push [▲](F-1) or [▼](F-2) to select the item.

Memory Name programming

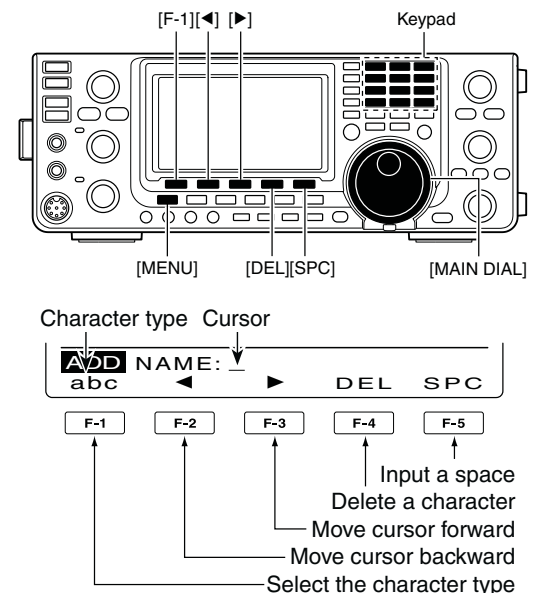
- ① When “NAME” is selected, push [EDT](F-4) to enter the memory name programming mode.
 - A cursor appears and blinks.
- ② Push [F-1] one or more times to select the desired character type.

Character type	Selectable characters
ABC	A to Z
abc	a to z
etc	! # \$ % & \ ? " ' ^ + - * / . , ; = < > () [] { } _ ` @

- ③ Rotate [MAIN DIAL] to select the first character or symbol to input.
 When inputting numbers or a decimal point, push the appropriate keypad.
 - Push [DEL](F-4) to delete the selected character, symbol or number.
 - Push [SPC](F-5) to input a space.
 - When all 9 characters have been programmed, an error beep sounds. If you want to reprogram, push [◀](F-2) or [▶](F-3) to select a character, then push [DEL](F-4) to delete it.
- ④ Push [◀](F-2) to move the cursor backward, or push [▶](F-3) to move the cursor forward.
- ⑤ Repeat steps ② through ④ to program a name of up to 9 characters.
- ⑥ Push [MENU] to save the programmed name, and return to the “ADD” screen.



• To program a GPS memory name



Latitude data programming

- ⑦ When “LAT” is selected, rotate [MAIN DIAL] to enter the desired latitude data.
 - A cursor blinks on the programmable digit.
 - Push [◀ ▶](F-3) to select the digit.
 - Select “N” to input N; North latitude.
 - Select “S” to input S; South latitude.
 - You cannot use the keypad keys.
- ⑧ Push [▲](F-1) or [▼](F-2) to save the programmed latitude data, and select other item.

Longitude data programming

- ⑨ When “LON” is selected, rotate [MAIN DIAL] to enter the desired longitude data.
 - A cursor blinks on the programmable digit.
 - Push [◀ ▶](F-3) to select the digit.
 - Select “W” to input W; West longitude.
 - Select “E” to input E; East longitude.
 - You cannot use the keypad keys.
- ⑩ Push [▲](F-1) or [▼](F-2) to save the programmed longitude data, and select other items.

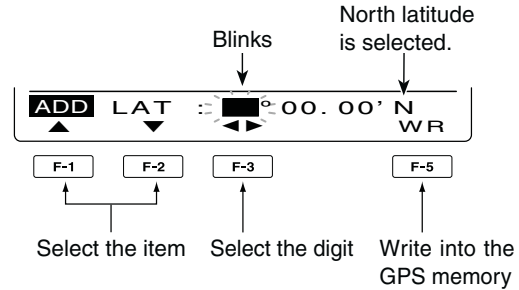
Time data programming

- ⑪ When “TIME” is selected, rotate [MAIN DIAL] to enter the desired time data.
 - A cursor blinks on the programmable digit.
 - Push [◀ ▶] to move the cursor forward and backward.
 - You cannot use the keypad keys.
- ⑫ Push [▲](F-1) or [▼](F-2) to save the programmed time data, and select other item.

Memory bank setting

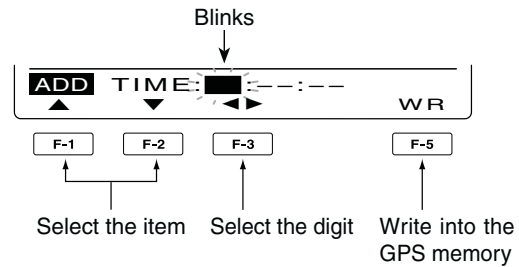
- ⑬ When “BANK” is selected, rotate [MAIN DIAL] to select the desired bank letter.
 - ⑭ Push [EDT](F-4) to enter the bank name programming mode.
 - A cursor appears and blinks.
 - ⑮ Repeat steps ② through ④ of ‘Name programming’ on the previous page to program a bank name of up to 9 characters.
 - ⑯ Push [MENU] to save the programmed bank name, and return to the “ADD” screen.
- ⑤ After programming, hold down [WR](F-5) for 1 second to write the data into the GPS memory, and return to the “GPM” screen (GPS Memory).
- ⑥ Push [MENU] two times to return to the “GPS” screen.

• To program a latitude or longitude

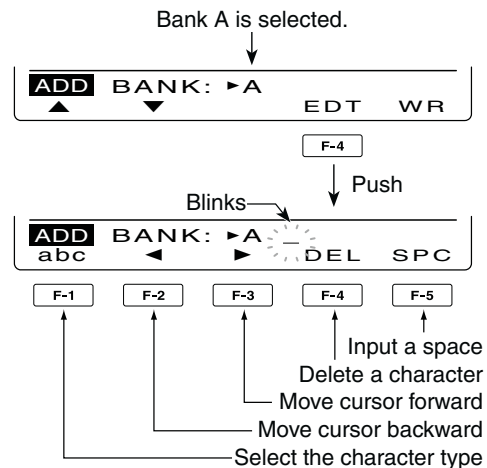


(This illustration is based on entering a latitude.)

• To program a time data



• To program a bank name

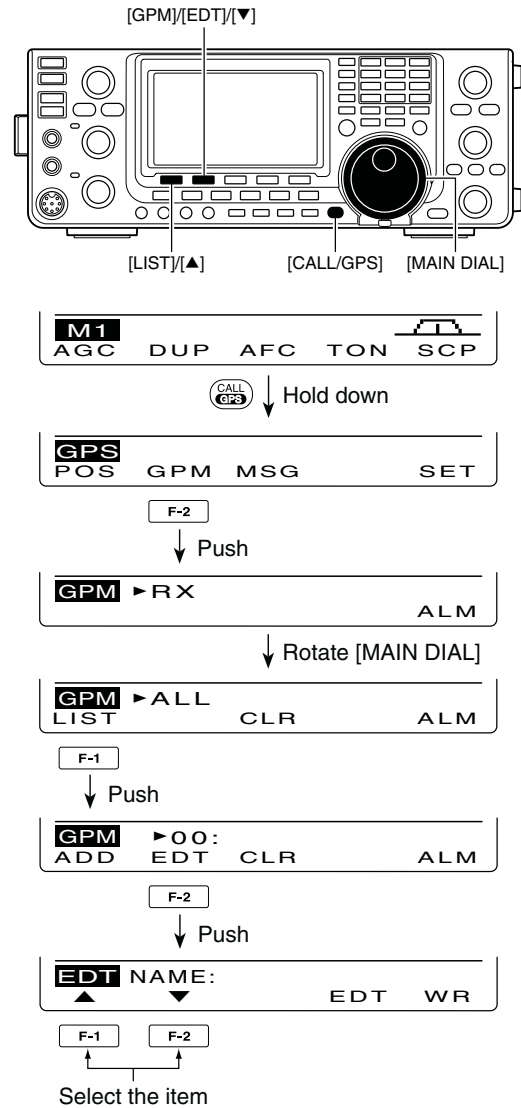


■ GPS memory operation (Continued)

◇ Edit a GPS memory

The GPS memory name, latitude and longitude data, time data and a memory bank name can be edited.

- ① Hold down [CALL/GPS] for 1 second to display the “GPS” screen.
 - ② Push [GPM](F-2) to display the “GPM” screen (GPS Memory).
 - ③ Rotate [MAIN DIAL] to select “ALL” or desired memory bank.
 - The bank can be selected in ‘Memory bank setting,’ as described on page 128.
 - ④ Push [LIST](F-1), then push [EDT](F-2) to enter the “EDT” screen (GPS Memory Edit) to edit the programmed data.
 - “Blank” appears when no memory is programmed.
- To cancel the programmed data:**
 When the “EDT” screen is selected, push [MENU] to display “Cancel OK?.” Push [YES](F-4) to cancel programming and return to the “GPM” screen, or push [NO](F-5) to keep programming and return to the “ADD” screen.
- ⑤ Push [▲](F-1) or [▼](F-2) to select the item.
 - ⑥ Enter a memory name, latitude data, longitude data, time and memory bank name, as described in steps ① to ④ of ‘◇ Add a GPS memory’ on pages 127 and 128.
 - ⑦ After programming, hold down [WR](F-5) for 1 second to write the data into the GPS memory, and return to the “GPM” screen (GPS Memory).
 - ⑧ Push [MENU] two times to return to the “GPS” screen.



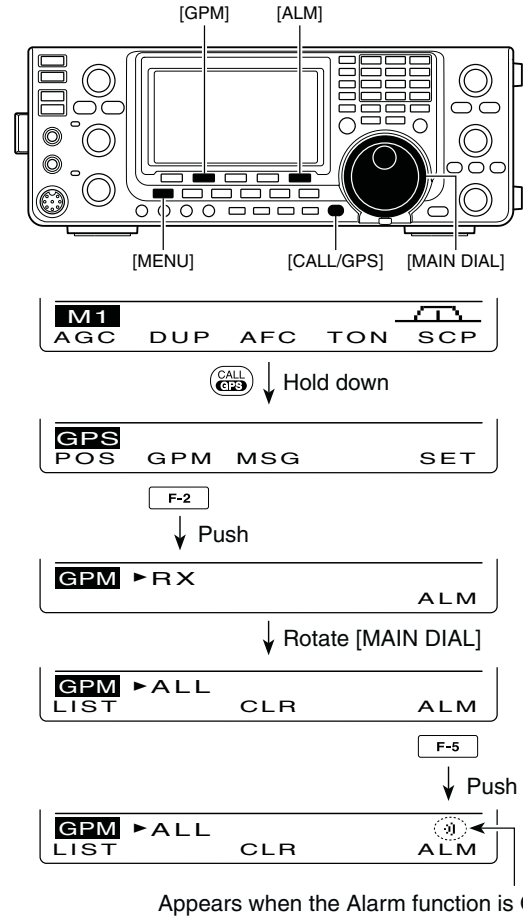
◇ GPS alarm setting

A GPS alarm can sound when a target position comes into the alarm area. This function can be set to the caller station, all GPS Memory channels, a specified Memory bank or a specified Memory channel.

- ① Hold down [CALL/GPS] for 1 second to display the “GPS” screen.
- ② Push [GPM](F-2) to display the “GPM” screen (GPS Memory).
- ③ Rotate [MAIN DIAL] to select the desired memory group, or memory channel.
 - “RX,” “ALL,” a memory bank or memory channel can be selected.
 - You can select a memory channel after pushing [LIST] (F-1) when “ALL” or a memory bank is selected.
- ④ Push [ALM](F-5) to turn ON the Alarm function.
 - Push [ALM](F-5) again to turn OFF the Alarm function.
- ⑤ Push [MENU] to return to the “GPS” screen.

✓ For your information!

- When “RX” or memory channel is selected in step ③, the alarm functions depend on “Alarm Area2” setting in the GPS Set mode. (p. 133)
- When “ALL” or a memory bank is selected in step ③, the alarm functions depend on “Alarm Area1” setting in the GPS Set mode. (p. 133)

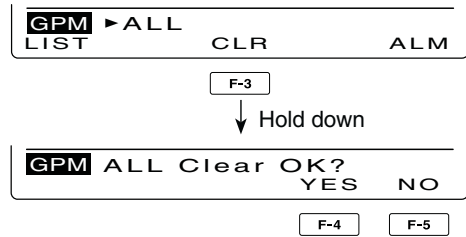
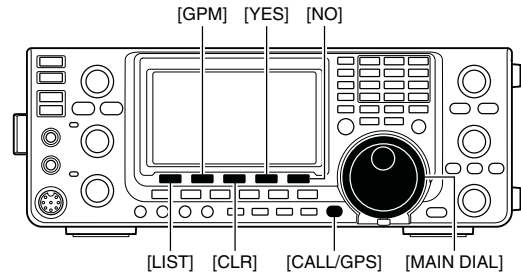


■ GPS memory operation (Continued)

◇ GPS memory clearing

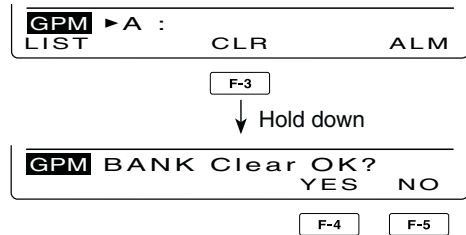
• Clear all memory channels

- ① Hold down [CALL/GPS] for 1 second to display the “GPS” screen.
- ② Push [GPM](F-2) to display the “GPM” screen (GPS Memory).
- ③ Rotate [MAIN DIAL] to select “ALL.”
- ④ Hold down [CLR](F-3) for 1 second to clear all Memory channels.
 - “ALL Clear OK?” appears.
- ⑤ Push [YES](F-4) for 1 second to clear.
 - To cancel clearing, push [NO](F-5).
- ⑥ Push [MENU] two times to return to the “GPS” screen.



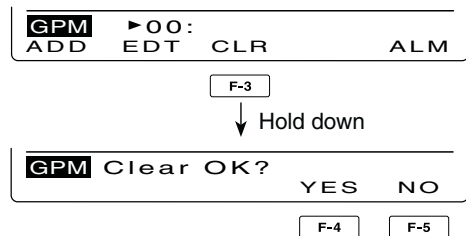
• Clear a desired bank

- ① Hold down [CALL/GPS] for 1 second to display the “GPS” screen.
- ② Push [GPM](F-2) to display the “GPM” screen (GPS Memory).
- ③ Rotate [MAIN DIAL] to select the desired Memory bank.
- ④ Hold down [CLR](F-3) for 1 second to clear the selected Memory bank.
 - “BANK Clear OK?” appears.
- ⑤ Push [YES](F-4) for 1 second to clear.
 - To cancel clearing, push [NO](F-5).
- ⑥ Push [MENU] two times to return to the “GPS” screen.



• Clear a desired memory channel

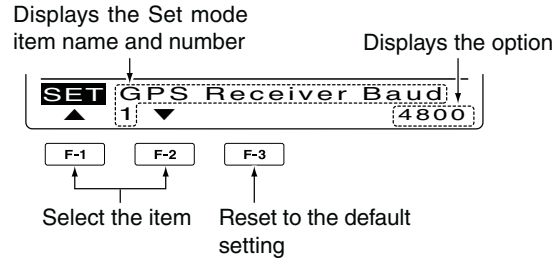
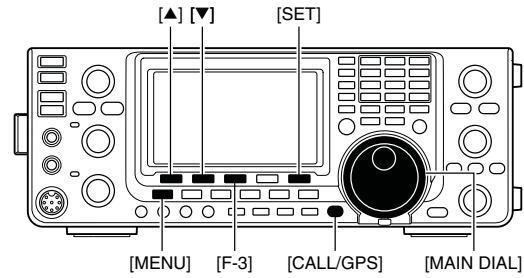
- ① Hold down [CALL/GPS] for 1 second to display the “GPS” screen.
- ② Push [GPM](F-2) to display the “GPM” screen (GPS Memory).
- ③ Rotate [MAIN DIAL] to select “ALL” or a Memory bank, then push [LIST](F-1).
- ④ Rotate [MAIN DIAL] to select the desired GPS Memory channel to be cleared.
- ⑤ Hold down [CLR](F-3) for 1 second to clear the selected Memory channel.
 - “Clear OK?” appears.
- ⑥ Push [YES](F-4) for 1 second to clear.
 - To cancel clearing, push [NO](F-5).
- ⑥ Push [MENU] two times to return to the “GPS” screen.



■ GPS Set mode

The following individual settings are selectable in the GPS Set mode. Set them to suit your GPS operating needs.

- ① Hold down [CALL/GPS] for 1 second to display the "GPS" screen.
- ② Push [SET](F-5) to enter the GPS Set mode.
- ③ Push [▲](F-1) or [▼](F-2) to select the desired item.
- ④ Rotate [MAIN DIAL] to select the desired option.
 - Hold down [F-3] for 1 second to reset to the default setting, if desired.
- ⑤ Push [MENU] to save, and return to the "GPS" screen.



1. GPS Receiver Baud (Default: 4800)

Set the baud rate of the GPS receiver to 4800 bps or 9600 bps.

2. Position Format (Default: ddd°mm.mm')

Select either the ddd°mm.mm' or ddd°mm'ss" format to display position information.

3. Units (Default: feet/mile)

Select either meter or feet/mile format to display the distance and elevation information.

4. COMPASS Direction (Default: North REF)

Select the compass display type. When the position data is displayed, push [F-1] to select the compass type.

- North REF : The top of the compass represents north.
- South REF : The top of the compass represents south.

5. UTC Offset (Default: ±0:00)

Set the time difference between UTC (Universal Time Coordinated) and the local time to between -14:00 and +14:00 in 00:05 steps.

6. GPS Indicator (Default: ON)

Turn the GPS icon ("📶") display function ON or OFF.

- OFF : "📶" does not appear.
- ON : "📶" appears on the display when a valid position data is received; blinks when an invalid data is received.

7. MY Position (Default: GPS)

Select either GPS or Manual to enter your current position.

- GPS : The GPS receiver's position data is used.
- Manual : Manually entered position data is used. However, when the GPS receiver is connected to the transceiver, this setting will automatically switch to "GPS."

8. Manual Position (Default: LAT : 0°00.00'N LON : 0°00.00'E)

Manually enter your latitude and longitude data. The manually programmed data can be memorised. This item does not appear when "GPS" is selected in "My Position."

- ① Push [EDT](F-4) to enter the position data edit mode.
- ② Push [▲](F-1) or [▼](F-2) to select "LAT" or "LON," and rotate [MAIN DIAL] to enter the desired position data.
 - When "LAT" is selected, enter the latitude data.
 - When "LON" is selected, enter the longitude data.
 - See page 128 for details.
- ③ Hold down [WR](F-5) to write the data.

■ GPS Set mode (Continued)

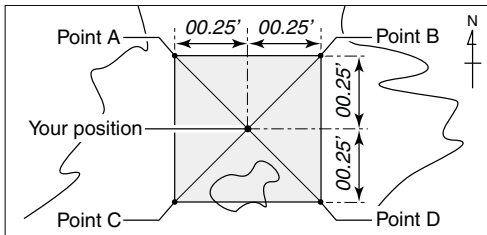
9. Alarm Area1 (Default: 0.25')

When the GPS Alarm function is set to "ALL" or one of the memory banks, set the GPS alarm active range. When ddd°mm.mm' is selected in "Position Format," the active range can be set to between 00'08" and 59'99" in 00'01" steps.

When ddd°mm'ss" is selected in "Position Format," the active range can be set to between 00'05" and 59'59" in 00'01" steps.

See page 132 for details.

- **Example:** Your position : 35°N/135°E
Alarm Area1 setting : 00.25'



- Position of point A : 35°00.25'N/134°59.75'E
- Position of point B : 35°00.25'N/135°00.25'E
- Position of point C : 34°59.75'N/134°59.75'E
- Position of point D : 34°59.75'N/135°00.25'E

(This description is based on the ddd°mm.mm' position format; p. 132)

When a target position enters the alarm area, the GPS alarm sounds.

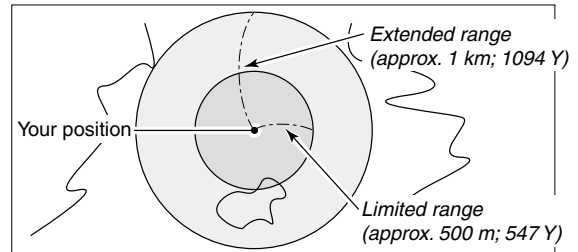
10. Alarm Area2 (Default: Both)

When the GPS Alarm function is set to the memory channel or "RX," set the GPS alarm active range to "Both," "Extended" or "Limited."

- **Limited** : When the target position is in the approximate 500 meter range, the GPS alarm sounds three times.
- **Extended** : When the target position is in the approximate 1 kilometer range, the GPS alarm sounds three times.
- **Both** : When the target position is in the approximate 1 kilometer range, the GPS alarm sounds one beep, and when it is in the approximate 500 meter range, the alarm sounds three beeps.

500 meter (547 yard)
1 kilometer (1094 yard)

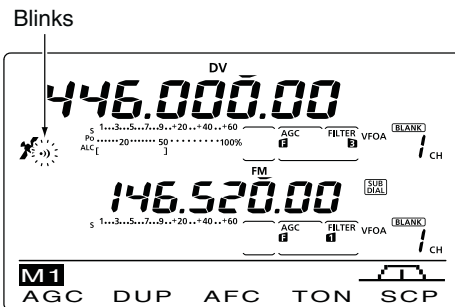
- **Example:**



The target position definitions for Alarm Area 2.

Alarm indication

When a target position comes into the alarm area, the icon below appears.



11. GPS Auto TX (Default: OFF)

Select the desired interval from OFF, 5, 10, 30 seconds, 1, 3, 5, 10 or 30 minutes for automatic position data transmission.

The current position data, received from a GPS receiver, is transmitted at the selected interval when “GPS” or “GPS-A” is selected as the “GPS TX Mode” option as described below.

The GPS message is transmitted as well as the position data, if it is programmed.

Even if this setting is set to OFF, you can manually transmit the position data by pushing [TRANSMIT] or [PTT] (microphone).

NOTE:

- When four GPS sentences are selected at the same time, “5sec” cannot be selected.
- When “Manual” is selected in “My Position,” the current position data will not be automatically transmitted.

12. GPS TX Mode (Default: Disable)

Select the GPS or GPS-A operating mode to transmit the position data from a GPS receiver, or turn OFF the function.

NOTE: When “GPS” or “GPS-A” is selected, low-speed data communication cannot be used.

13. GPS Sentence (RMC)*1 (Default: OFF)

Turn the GPS sentence formatter “RMC” ON or OFF.

14. GPS Sentence (GGA)*1 (Default: ON)

Turn the GPS sentence formatter “GGA” ON or OFF.

15. GPS Sentence (GLL)*1 (Default: OFF)

Turn the GPS sentence formatter “GLL” ON or OFF.

16. GPS Sentence (GSA)*1 (Default: OFF)

Turn the GPS sentence formatter “GSA” ON or OFF.

17. GPS Sentence (VTG)*1 (Default: OFF)

Turn the GPS sentence formatter “VTG” ON or OFF.

18. GPS Sentence (GSV)*1 (Default: OFF)

Turn the GPS sentence formatter “GSV” ON or OFF.

NOTE for GPS sentences:

- Up to four GPS sentences are usable at the same time.
- See page 122 for GPS sentence setting details.

19. Unproto Address*2

(Default: API910,DSTAR*)

Enter an unproto address of up to 56 characters. The manually programmed data can be memorized.

• Unproto address programming

- 1 Push [EDT](F-4) to enter the unproto address edit mode.
- 2 Push [F-1] one or more times to select the desired character type.

Character type	Selectable characters
ABC	A to Z
abc	a to z
etc	! # \$ % & \ ? " ' ` ^ + - * / . , ; = < > () [] { } ! _ ' @

- 3 Rotate [MAIN DIAL] to select the first character or symbol to input.
 - When entering number or a decimal point, push the appropriate keypad key.
 - Push [DEL](F-4) to delete the selected character, symbol or number.
 - Push [SPC](F-5) to input a space.
 - When all 56 characters have been programmed, an error beep sounds. If you want to reprogram, push [◀](F-2) or [▶](F-3) to select a character, then push [DEL](F-4) to delete it.
- 4 Push [◀](F-2) to move the cursor backward, or push [▶](F-3) to move the cursor forward.
- 5 Repeat steps 2 through 4 to program an unproto address of up to 56 characters.
- 6 Push [MENU] to save the unproto address, and return to the “SET” screen.

*1 Appears when “GPS” is selected in “GPS TX Mode.”
 *2 Appears when “GPS-A” is selected in “GPS TX Mode.”

■ GPS Set mode (Continued)

20. Data Extension* (Default: OFF)

Set the data extension capability to “Course/Speed” or OFF.

When you select “Course/Speed,” the transceiver’s course and speed information is transmitted along with the position data.

NOTE: When “Course/Speed” is selected, “Comment (Extension)” appears instead of “Comment,” and number of characters is limited to 36.

21. Time Stamp* (Default: OFF)

Select either the DHM or HMS format to transmit the current UTC (Universal Time Coordinated) time as a time stamp, or turn OFF the function.

- OFF : Does not transmit the time information.
- DHM : Transmits the time stamp in the Day, Hour, and Minute format.
- HMS : Transmits the time stamp in the Hour, Minute, and Second format.

22. GPS-A Symbol*
(Default: House QTH (VHF))

Select the desired GPS-A symbol which represents your means of transportation.

Selectable symbols:

Ambulance, Bus, Fire Truck, Bicycle, Yacht, Helicopter, Small Aircraft, Ship, Car, Motorcycle, Balloon, Jeep, RV, Truck, Van, House QTH (VHF) and Other

If there is no symbol you want to use, you can make a desired symbol code, as described below.

• **Symbol programming**

- ① Rotate [MAIN DIAL] to select “Other.”
 - [EDT](F-4) and the current symbol code appear.
- ② Push [EDT](F-4) to enter the programming mode.
 - A cursor blinks on “/”.
- ③ Rotate [MAIN DIAL] to select the first digit character to input.

Usable characters: /, \, 0 to 9, A to Z
- ④ Push [▶](F-3) to select the second digit.
 - A cursor blinks on “-”.

- ⑤ Push [F-1] one or more times to select the desired character type.

Character type	Selectable characters
ABC	A to Z
abc	a to z
etc	! # \$ % & \ ? " ' ` ^ + - * / . , ; = < > () [] { } ! _ ' @ (space)

- ⑥ Rotate [MAIN DIAL] to select the second digit character to input.

When inputting numbers or a decimal point, push the appropriate keypad key.
- ⑦ Push [MENU] to save the symbol code, and return to the “SET” screen.

When “Other” is selected, check the symbol codes of APRS®, and set them correctly.

23. SSID* (Default: ---)

To assist in identifying a station’s type, the displayed APRS® based SSID is added after the GPS-A data call sign.

- --- : Does not use any SSID. However, if you use a capital letter, it will be used as an SSID.

(Example)
JA3YUA → JA3YUA
JA3YUA A → JA3YUA-A
- (-0) : No SSID. If you use a capital letter, it will be deleted.

(Example)
JA3YUA → JA3YUA
JA3YUA A → JA3YUA
- -1 to -15 : Adds an SSID of -1 to -15 to your call sign. If you use a capital letter, it will be replaced with the SSID.

(Example; “-9” is entered)
JA3YUA → JA3YUA-9
JA3YUA A → JA3YUA-9

NOTE: If you have multiple transceivers, your call signs are distinguished by a single capital letter in the D-STAR* system. When you use an SSID, the capital letter will be replaced by the SSID, depending on the setting.

* Appears when “GPS-A” is selected in “GPS TX Mode.”

24. Comment*

Program a comment of up to 43 characters.
The programmed comment is transmitted with the GPS position data.
See 'Comment programming,' as described below.
This item appears when "Data Extension" is set to OFF, as described on page 135.

25. Comment (Extension)*

Program a comment of up to 36 characters.
The programmed comment is transmitted with the GPS position data.
See 'Comment programming,' as described below.
This item appears when "Course/Speed" is selected in "Data Extension," as described on page 135.

• Comment programming

- ① Push [EDT](F-4) to enter the programming mode.
 - A cursor appears and blinks.
- ② Push [F-1] one or more times to select the desired character type.

Character type	Selectable characters
ABC	A to Z
abc	a to z
etc	! # \$ % & \ ? " ' ` ^ + - * / . , ; = < > () [] { } ! _ - @

- ③ Rotate [MAIN DIAL] to select the first character or symbol to enter.
When inputting numbers or a decimal point, push the appropriate keypad key.
 - Push [DEL](F-4) to delete the selected character, symbol or number.
 - Push [SPC](F-5) to input a space.
 - When all 43 or 36 characters have been programmed, an error beep sounds. If you want to reprogram, push [◀](F-2) or [▶](F-3) to select a character, then push [DEL](F-4) to delete it.
- ④ Push [◀](F-2) to move the cursor backward, or push [▶](F-3) to move the cursor forward.
- ⑤ Repeat steps ② through ④ to program a comment of up to 43 characters*.
* 36 characters can only be programmed when "Course/Speed" is selected in "Data Extension."
- ⑥ Push [MENU] to save the comment, and return to the "SET" screen.

■ GPS-A operation

◇ GPS-A function

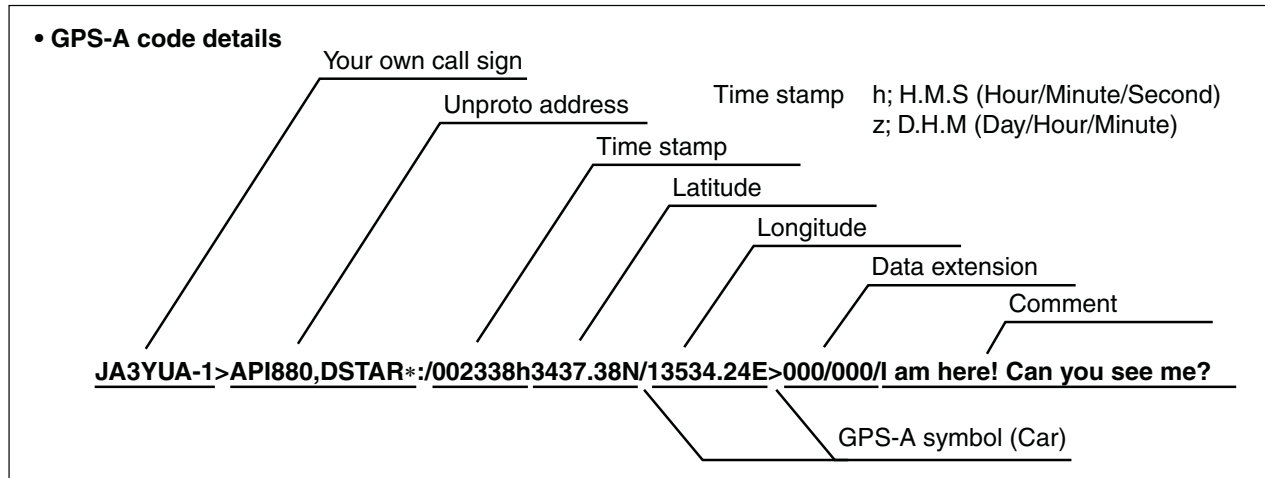
Set the following to activate the GPS-A function.

- ① Push [DV•DR] to select the DV mode.
- ② Enter the GPS Set mode.
- ③ Set the desired position data transmitting interval in "GPS Auto TX." (p. 134)
- ④ Select "GPS-A" in "GPS TX Mode." (p. 134)
- ⑤ Set the GPS-A mode operation's items. (pp. 134–136)

◇ GPS-A code details

In GPS-A operation, the following codes are transmitted to the PC connected to the IC-9100.

GPS-A code is based on APRS® code.
(APRS® : Automatic Position Reporting System)



When connecting the PC with the USB port

Connect a USB cable* between the transceiver's USB port on the rear panel and the PC. (p. 26)

When "DV dat" is selected as the "USB2/DATA1 Func" (63) item option, the GPS-A data can be send from the USB port. (p. 167)

* Purchase separately

When connecting the PC with the [DATA1] jack

Connect the optional OPC-1529R between the transceiver's [DATA1] jack on the rear panel and the PC. (p. 26)

When "DV dat" is selected as the "USB2/DATA1 Func" (64) item option, the GPS-A data can be send from the [DATA1] port. (p. 168)

■ General description

The transceiver has 106 Memory channels in each frequency band. (99 regular, 6 scan edges and 1 call)
The Memory mode is very useful to quickly change to often-used frequencies.

While in the memory mode, all 106 Memory channels are tunable, which means the programmed frequency can be tuned temporarily with [MAIN DIAL].

NOTE:

Memory data can be erased by static electricity, electric transients, etc. In addition, they can be erased by malfunction and during repairs. Therefore, we recommend that memory data be backed up or be saved to a PC using the optional CS-9100 CLONING SOFTWARE.

Memory Channels	Descriptions
1–99	Regular Memory channels with Split frequency capability.*
1A/1b–3A/3b	Program Scan Edge Memory channels with only Simplex capability. Stores the scan edge frequencies for programmed scans.
C	Call channel with Split frequency capability*. Instantly recalls a specified frequency.

*Usable only on HF/50 MHz frequency bands.

◇ Memory channel contents

The following information can be programmed into Memory channels:

- Operating frequency (p. 37)
- Operating mode (p. 43)
- IF filter number (p. 73)
- Split data (p. 82)
(Usable only on the regular Memory channels and Call channel on HF/50 MHz frequency bands.)
- Memory name (p. 143)
- Duplex direction (+DUP or –DUP) and frequency offset (pp. 65, 163)
- Subaudible tone encoder (p. 65), tone squelch or DTCS squelch ON/OFF (pp. 62, 63)
- Subaudible tone frequency (p. 65), tone squelch frequency or DTCS code with polarity (pp. 62, 63)
- UR Station call sign (p. 86)
- R1/R2 call sign (p. 87)
- Call sign squelch or Digital code squelch ON/OFF (p. 114)
- Digital code (p. 114)

The optional UT-121 is required for DV mode operation.

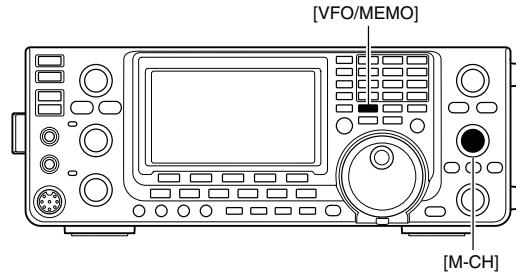
Memory channel selection

When the SUB Band setting is turned ON, you can select a Memory channel in the SUB Band as well as in the MAIN Band. (p. 33)

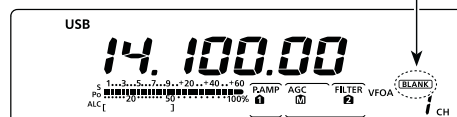
- “**SUB**” appears when the SUB Band setting is ON.

Selection in the VFO mode

- ① Push [VFO/MEMO] to select the VFO mode.
- ② Rotate [M-CH] to select a Memory channel number.
 - Rotate clockwise to select a higher Memory channel number; rotate counterclockwise to select a lower Memory channel number.
 - All Memory channels, including blank channels, can be selected.
 - “**BLANK**” appears when no information has been programmed into the Memory channel. (Blank channel)
- ③ Push [VFO/MEMO] to select the Memory mode.
 - “MEMO” and contents of the Memory channel appear.



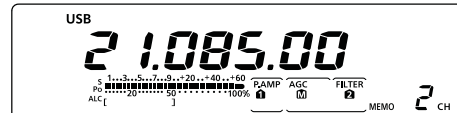
Appears if the selected Memory channel has no information.



While in the VFO mode

Selection in the Memory mode

- ① Push [VFO/MEMO] to select the Memory mode.
- ② Rotate [M-CH] to select a Memory channel.
 - Rotate clockwise to select a higher Memory channel number; rotate counterclockwise to select a lower Memory channel number.
 - All Memory channels, including blank channels, can be selected.
 - “**BLANK**” appears when no information has been programmed into the Memory channel. (Blank channel)
 - Memory channels can also be selected using the microphone [UP]/[DN] keys. In such case, the blank channels are skipped.

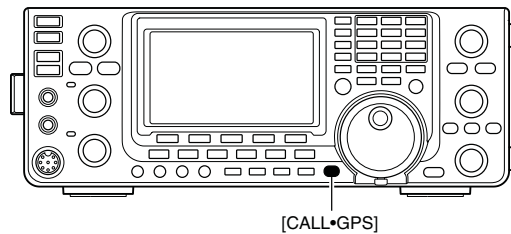


While in the Memory mode

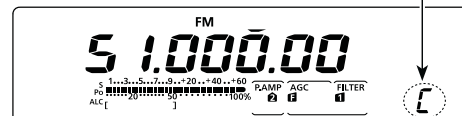
Call channel selection

Each frequency band has its own Call channel. Factory default frequency and operating modes are programmed into the Call channel. Change these to suit your operating needs. (see page 141)

- ① Push [CALL•GPS] to select the Call channel.
 - A capital “C” appears.
- ② Push [CALL•GPS] again to return to the previous screen display.



Appears



Memory channel programming

Memory channels can be programmed in either the VFO mode or the Memory mode.

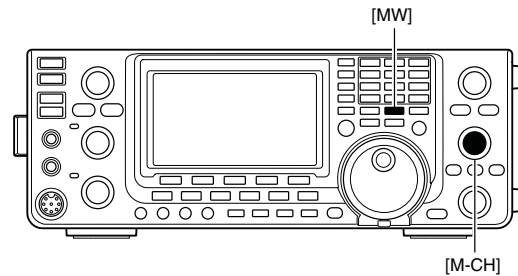
◇ Programming in the VFO mode

- ① Push [VFO/MEMO] to select the VFO mode.
- ② Set the desired settings into both VFO A and VFO B.
 - Select the band using [BAND](MAIN/SUB).
 - Set the frequency with [MAIN DIAL] or the keypad. (p. 37)
 - Set the operating mode with the mode switch. (p. 43)
 - Set other data (e.g. frequency offset, duplex direction, tone squelch, split frequency operation, etc.), if desired. (p. 138)
- ③ Rotate [M-CH] to select the Memory channel number to be programmed.
 - “[BLANK]” appears if the selected Memory channel is a blank channel.
- ④ Hold down [MW] for 1 second to program the contents into the Memory channel.
 - Three beeps sound when the memory programming is complete.

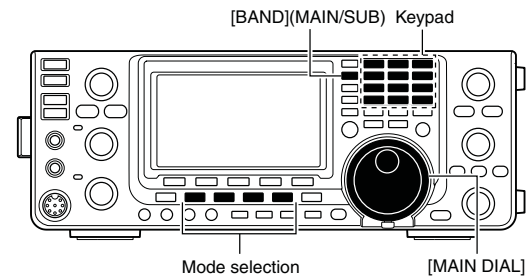
◇ Programming in the Memory mode

- ① Push [VFO/MEMO] to select the Memory mode.
- ② Rotate [M-CH] to select the Memory channel to be programmed.
 - The contents of the Memory channel appear in the display.
 - “[BLANK]” appears if the selected Memory channel is a blank channel.
- ③ Set the desired settings into the Memory channel.
 - Set the frequency with [MAIN DIAL] or the keypad. (p. 37)
 - When a blank channel is selected, you must set the desired frequency using the keypad.
 - Set the operating mode with the mode switch.
 - Set other data (e.g. frequency offset, duplex direction, tone squelch, etc.), if desired.
- ④ Hold down [MW] for 1 second to program the contents into the Memory channel.
 - Three beeps sound when the memory programming is complete.

NOTE: If you perform the above operations in a pre-programmed channel, the previous channel data will be overwritten.

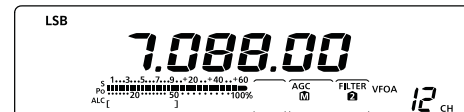


• During setting the contents



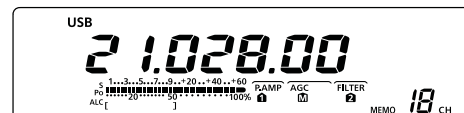
[EXAMPLE]:

Programming 7.088 MHz/LSB into the Memory channel 12 while in the VFO mode.



[EXAMPLE]:

Programming 21.280 MHz/USB into Memory channel 18 while in the Memory mode.



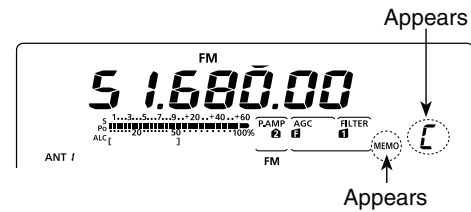
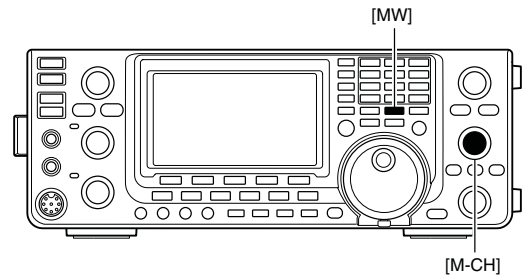
Call channel programming

The Call channel is programmed in the same way as the regular Memory channels are. It is convenient to program a most-often-used frequency into the Call channel for quick recall. As with Memory channels, the Call channel can also hold split frequencies, and other parameters. See page 138 for details.

- ① Rotate [M-CH] to select the Call channel.
 - A capital “C” appears.
- ② Select the desired frequency and operating mode to program into the Call channel.
- ③ Hold down [MW] for 1 second to program the displayed frequency and operating mode into the Call channel.
 - Three beeps sound when memory programming is complete.

IMPORTANT!

When the Call channel is selected with [CALL•GPS], you cannot change the memory contents. However, when the Call channel is selected using [M-CH] in the VFO or Memory mode, the memory contents can be changed.



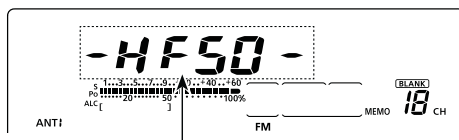
Memory clearing

Any no-longer-used regular Memory channels can be cleared, and then become blank channels.

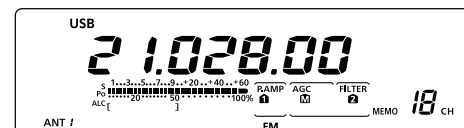
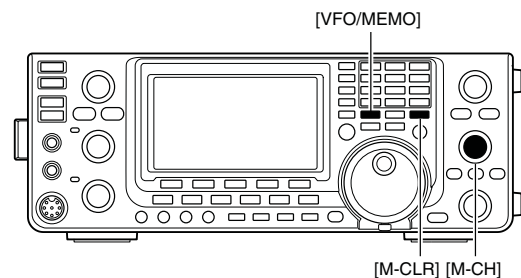
- ① Push [VFO/MEMO] to select the Memory mode.
- ② Rotate [M-CH] to select the regular Memory channel to be cleared.
- ③ Hold down [M-CLR] for 1 second to clear the contents.
 - The programmed contents disappear.
 - “[BLANK]” appears.
 - Three beeps sound when the memory clearing is complete.
- ④ To clear other Memory channels, repeat steps ② and ③.

About the blank channel display

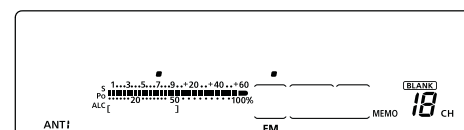
When a blank channel is selected, or after clearing the Memory channel contents, the “[BLANK]” icon appears, and then after 2 seconds, the operating band appears.



The operating band appears.



[M-CLR] Hold down



Memory contents copying

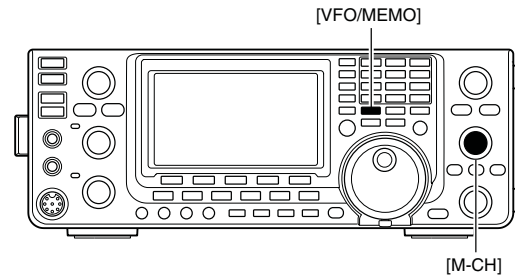
The Memory channel contents (frequency, operating mode, etc.) can be copied to the VFO.

The copy can be performed in either the VFO mode or the Memory mode.

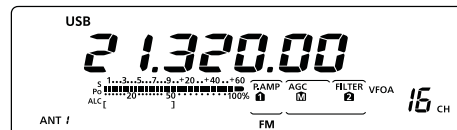
◇ Copying in the VFO mode

This is useful for copying programmed contents to a displayed VFO.

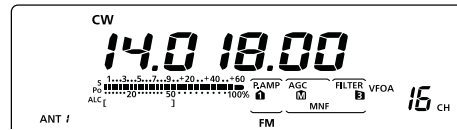
- ① Push [VFO/MEMO] to select the VFO mode.
- ② Rotate [M-CH] to select the Memory channel number to be copied.
 - “BLANK” appears if the selected Memory channel is a blank channel. In this case nothing can be copied.
- ③ Hold down [VFO/MEMO] for 1 second to copy the Memory channel contents into the VFO.
 - Three beeps sound when the copy is complete.



While in the VFO mode



[VFO/MEMO] Hold down



The Memory channel contents are transferred

◇ Copying in the Memory mode

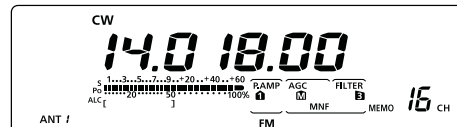
This is useful for copying the Memory channel contents while operating in the Memory mode.

When you have changed the displayed frequency, operating mode, etc. in the selected Memory channel:

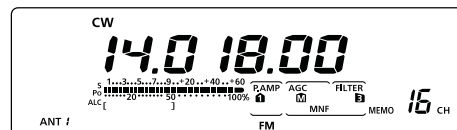
- **Displayed** data is copied.
- **Programmed** contents in the Memory channel are not copied, but remain only in the Memory channel.

- ① Push [VFO/MEMO] to select the Memory mode.
- ② Rotate [M-CH] to select the Memory channel to be copied.
 - “BLANK” appears if the selected Memory channel is a blank channel. In this case nothing can be copied.
 - Set the frequency or operating mode if required.
- ③ Hold down [VFO/MEMO] for 1 second to copy the Memory channel contents into the VFO.
 - Three beeps sound when the transfer is complete.
- ④ Push [VFO/MEMO] to select the VFO mode.

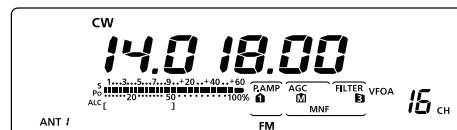
While in the Memory mode



[VFO/MEMO] Hold down



[VFO/MEMO] Push



The Memory channel contents are transferred

Memory name programming

All Memory channels, including scan edges and Call channel, can be tagged with alphanumeric names of up to 9 characters each.

[EXAMPLE]: Programming a memory name into Memory channel 99.

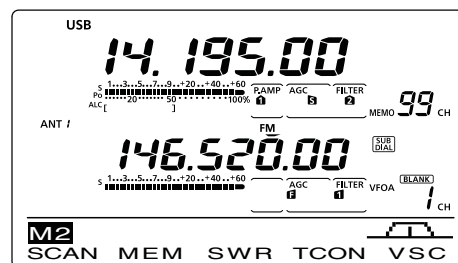
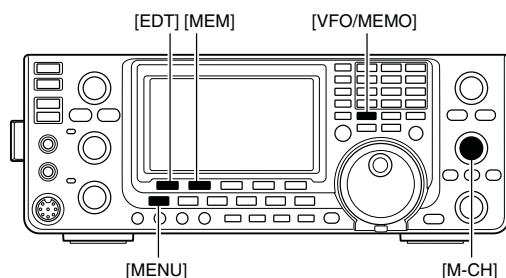
- ① Push [VFO/MEMO] to select the Memory mode.
- ② Rotate [M-CH] to select Memory channel 99.
- ③ Push [MENU] one or more times to display the “M2” screen (Menu 2).
- ④ Push [MEM](F-2) to display the “MEM” screen (Memory Menu).
- ⑤ Push [EDT](F-1) to display the “EDT” screen (Memory name Edit).
 - A cursor appears and blinks.
 - If the channel you select is a blank channel, an error beep sounds after pushing [EDT](F1).
- ⑥ Push [F-1] one or more times to select the desired character type.
 - See “Character table list,” as shown below.
- ⑦ Rotate [MAIN DIAL] to select the first character or symbol to input.

When inputting numbers and a decimal point, push the appropriate keypad key.

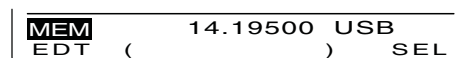
 - Push [DEL](F-4) to delete the selected character, symbol or number.
 - Push [SPC](F-5) to input a space.
 - When all 9 characters have been programmed, an error beep sounds. If you want to reprogram, push [◀](F-2) or [▶](F-3) to select a character, then push [DEL](F-4) to delete it.
- ⑧ Push [◀](F-2) to move the cursor backwards, or push [▶](F-3) to move the cursor forwards.
- ⑨ Repeat steps ⑥ to ⑧ to program a memory name of up to 9 characters.
- ⑩ Push [MENU] to save the name, and return to the “MEM” screen (Memory Menu).
- ⑪ Push [MENU] to return to the “M2” screen (Menu 2).

Character table list

Character type	Selectable characters
ABC	A to Z
abc	a to z
etc	! # \$ % & \ ? " ' ` ^ + - * / . , ; = < > () [] { } _ ' @



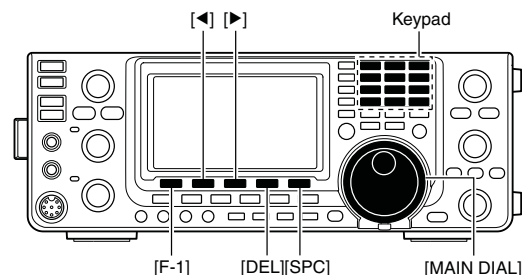
F-2
↓ Push



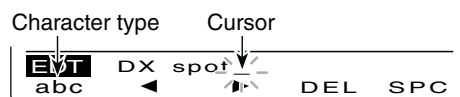
F-1
↓ Push



• When programming a memory name



[EXAMPLE]: Programming “DX spot” into Memory channel 99.



F-1 F-2 F-3 F-4 F-5

Input a space
Delete a character
Move cursor forwards
Move cursor backwards
Select character type

■ Memo pad function

The transceiver has a Memo pad function to store the displayed data for easy writing and recalling. The memo pads are separate from the Memory channels. The default number of memo pads is 5. However, you can increase the number to 10 in the “Memopad Numbers” item of the Set mode, if desired. (p. 164)

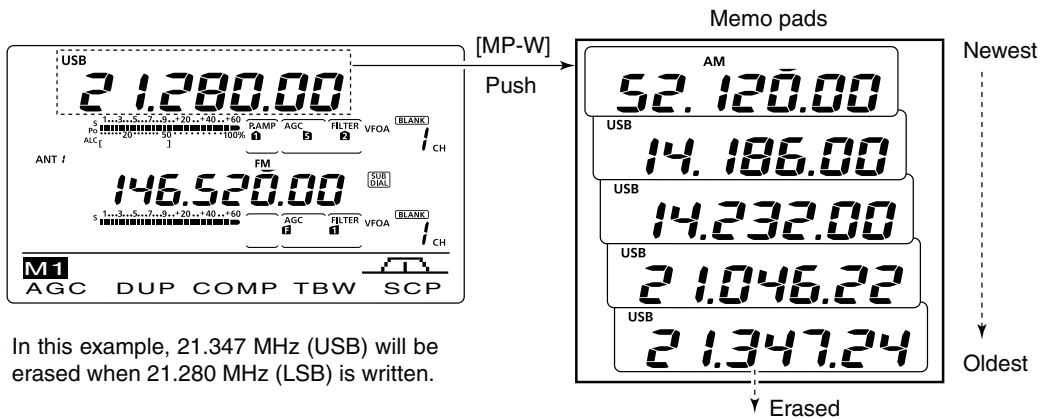
Memo pads are convenient when you want to memorize the displayed data temporarily, such as when you find a DX station in a pile-up, or when a desired station is busy for a long time and you want to temporarily search for other stations.

Use the transceiver’s memo pads instead of relying on hastily scribbled notes that are easily misplaced.

◇ Writing the displayed data into memo pads

You can store the displayed data by pushing [MP-W]. When you store the 6th data into memo pads, the oldest stored entry is automatically erased, to make room for the new data.

NOTE: Each memo pad must have its own unique set of data; memo pads having identical data cannot be written.



◇ Calling up the memo pads

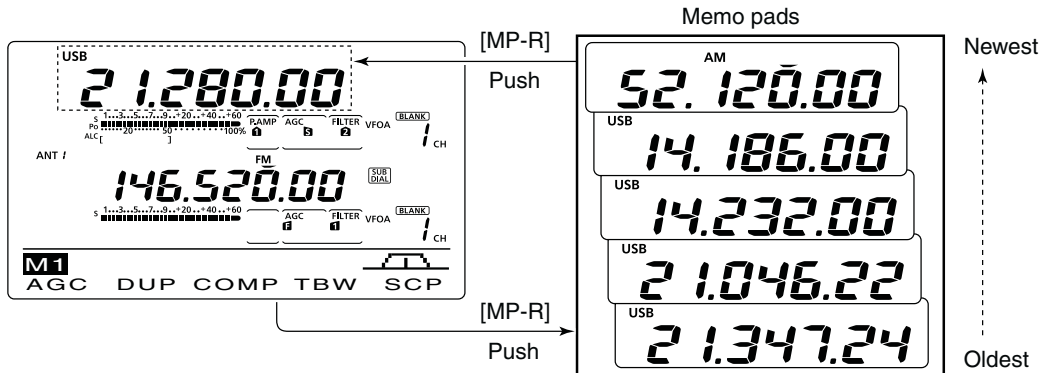
You can call up a memo pad by pushing [MP-R] one or more times while in either the VFO or Memory mode.

- The memo pad data is called up, starting from the most recently written.

When you call up a memo pad, the previously displayed data is automatically stored in a temporary pad. The temporary pad can be recalled by pushing [MP-R] one or more times.

- You may think there are 6 memo pads because 6 different frequencies (5 are in memo pads and 1 is in the temporary pad) are called up by [MP-R].

If you change the data called up from a memo pad, the stored temporary pad data is replaced with the changed data.



11 SCANS

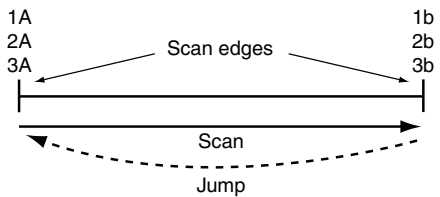
■ Scan types

Scanning automatically searches for signals and makes it easier to locate new stations for contact or listening purposes. The IC-9100 has several scan types; Programmed scan, Memory scan, Select Memory scan, Mode Select scan and ΔF (Delta Frequency) scan.

The MAIN and SUB Bands can be independently scanned. When the SUB Band setting mode is turned ON (“**SUB**” appears), the SUB Band is scanned.

PROGRAMMED SCAN (p. 149)

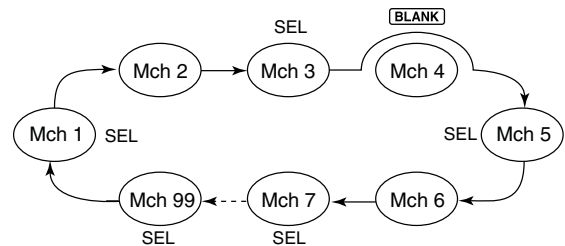
Repeatedly scans between scan edges. P1 scans between 1A and 1b, P2 scans between 2A and 2b, and P3 scans between 3A and 3b frequencies. This scan operates in the VFO mode.



MEMORY SCAN (p. 150)

Repeatedly scans all programmed Memory channels.

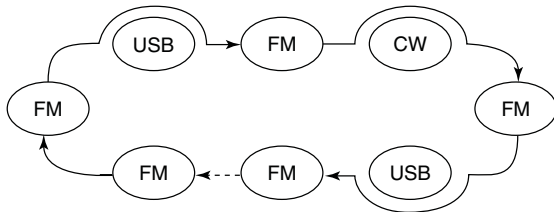
This scan operates in the memory mode.



MODE SELECT SCAN (p. 150)

Repeatedly scans all selected mode Memory channels.

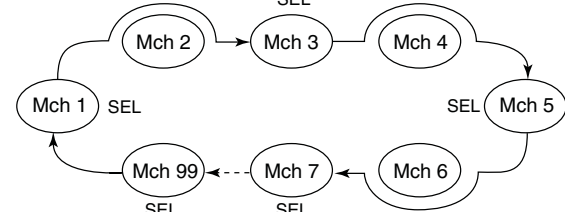
This scan operates in the memory mode.



SELECT MEMORY SCAN (p. 151)

Repeatedly scans all Select Memory channels.

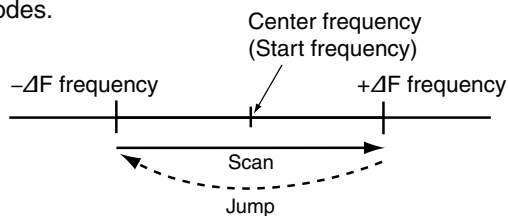
This scan operates in the memory mode.



ΔF SCAN (p. 152)

Repeatedly scans within the ΔF span area.

This scan operates in both VFO and memory modes.



■ Preparation

For a Programmed scan:

Program scan edge frequencies into Program Scan Edge channels “1A–3A” and “1b–3b.” (p. 148)

For a Memory scan:

Program two or more Memory channels. (Program Scan Edge channels will not be scanned.) (p. 140)

For a Mode Select scan:

Program two or more Memory channels, all with the same operating mode. (p. 43)

For a Select Memory scan:

Program two or more Memory channels as Select Memory channels. (p. 151)

For a ΔF scan:

Set the ΔF span (ΔF scan range) in the “SCAN” screen. (p. 152)

• Scan Resume function

You can select the scan to resume or cancel when detecting a signal in the Scan Set mode. The Scan Resume function must be set before operating a scan. (p. 147)

• Scan speed

The scan speed can be set to high or low in the Scan Set mode. (p. 147)

• [MAIN DIAL] function

How the [MAIN DIAL] functions during a scan, can be set in the Scan Set mode. (p. 147)

• Squelch status

○ The scan starts with the squelch open

For a programmed scan:

When the tuning step is 1 kHz or less:

The scan continues until it is stopped manually— it does not pause*, even if signals are detected.

* The scan is paused when the squelch is closed and then opened. The scan resumes, or is cancelled, depending on the Scan Resume setting.

When the tuning step is 5 kHz or more:

If Scan Resume is ON, the scan pauses on each step when a signal is detected, then resumes.

If the Scan Resume is OFF, the scan does not start.

For memory scan:

If Scan Resume is ON, the scan pauses on each channel when a signal is detected, then resumes.

If Scan Resume is OFF, the scan does not start.

○ The scan starts with squelch closed

The scan pauses when signals are detected. The scan resumes, or is cancelled, depending on the Scan Resume setting.

■ Voice Squelch Control function

(Mode: SSB/AM/FM)

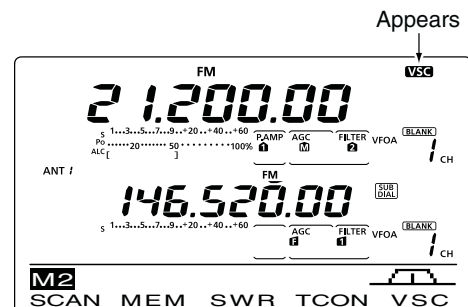
This function is useful when you do not want unmodulated signals pausing or cancelling a scan. When the Voice Squelch Control (VSC) function is ON, the receiver checks received signals for voice components.

The scan pauses, or is cancelled, if a received signal includes voice components, and the tone of the voice components changes within 1 second. See “Squelch status” as described above.

The scan resumes if the received signal includes no voice components, or the tone of the voice components does not change within 1 second.

- ① Push [SSB] or [AM/FM] once or twice to select the operating mode.
- ② Push [MENU] to display the “M2” screen (Menu 2).
- ③ Push [VSC](F-5) to turn the VSC function ON or OFF.
 - “VSC” appears when the VSC function is ON.
 - Push [MENU] to return to the previous display.

- The VSC function is available for phone modes (SSB, AM and FM).
- The VSC function resumes the scan on unmodulated signals, regardless of whether the Scan Resume function is set to ON or OFF.



■ Scan set mode

The scan speed, Scan Resume function and [MAIN DIAL] scan function can be set in the Scan Set mode.

- ① Push [MENU] one or more times to display the “M2” screen (Menu 2).
- ② Push [SCAN](F-1) to display the “SCAN” screen.
- ③ Push [SET](F-5) to enter the Scan Set mode.
- ④ Push [▲](F-1) or [▼](F-2) to select the desired item.
- ⑤ Rotate [MAIN DIAL] to select the desired option.
 - Hold down [F-3] for 1 second to reset to the default value.
- ⑥ Push [MENU] to save, and return to the “SCAN” screen.
- ⑦ Push [MENU] again to return to the “M2” screen (Menu 2).

1. SCAN Speed (Default: HIGH)

Select the desired scan speed between high and low.

- HIGH : The scan is faster.
- LOW : The scan is slower.

2. SCAN Resume (Default: ON)

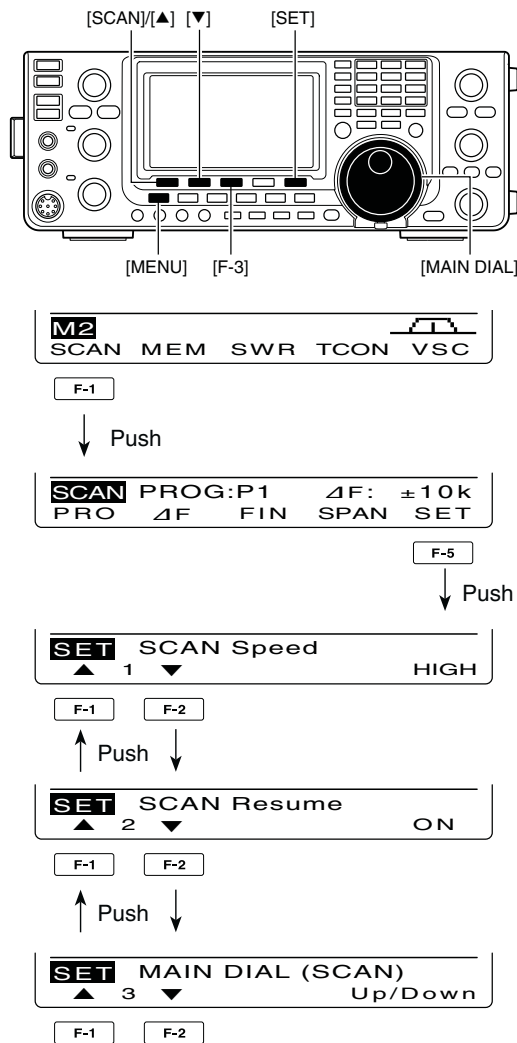
Set the Scan Resume function ON or OFF.

- ON : When a signal is detected, the scan pauses for 10 seconds, then resumes. When a signal disappears, the scan resumes 2 seconds later.
- OFF: When a signal is detected, the scan is cancelled.

3. MAIN DIAL (SCAN) (Default: Up/Down)

Select how the [MAIN DIAL] functions, during a scan.

- OFF : Rotating [MAIN DIAL] cancels the scan.
- Up/Down : Rotating [MAIN DIAL] changes the scanning direction.



■ Scan edges programming

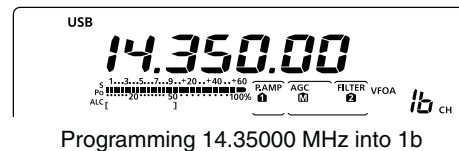
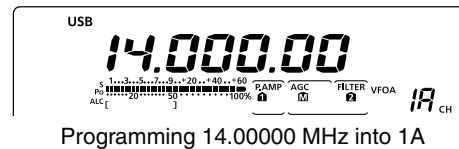
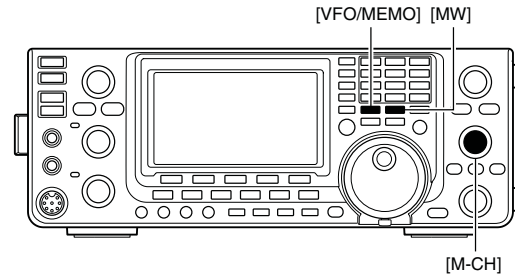
Memory channels 1A–3A and 1b–3b are the Program Scan Edge channels. They are used to program the upper and lower frequency edges for programmed scans. (p. 149)

Each frequency band has its own Scan Edge channels. Factory default frequency and operating modes are programmed into the Scan Edge channels.

▨ If both upper and lower band edges are programmed with the same frequency, a programmed scan cannot start.

EXAMPLE: Programming 14.00000 MHz into 1A and 14.35000 MHz into 1b.

- ① Push [VFO/MEMO] to select the VFO mode.
- ② Rotate [M-CH] to select scan edge 1A.
- ③ Set 14.00000 MHz as the lower frequency.
- ④ Hold down [MW] for 1 second to program 14.00000 MHz into scan edge 1A.
 - Three beeps sound when the programming is complete.
- ⑤ Rotate [M-CH] to select scan edge 1b.
- ⑥ Set 14.35000 MHz as the upper frequency.
- ⑦ Hold down [MW] for 1 second to program 14.35000 MHz into scan edge 1b.
 - Three beeps sound when the programming is complete.
- ⑧ If 1A/1b is selected as the scanning range when a programmed scan is started, it will search for signals between 14.00000 MHz and 14.35000 MHz. (p. 149)

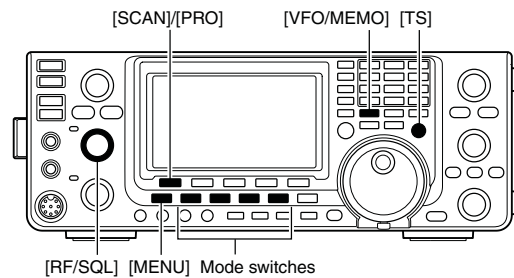


■ Programmed scan/Fine programmed scan (VFO mode)

A programmed scan searches for signals between Program Scan Edge channels “1A–3A” and “1b–3b.” Before starting the programmed scan, scan edges must be programmed into these channels. See the previous page for scan edge programming.

▨ If the same frequencies are programmed into the Program Scan Edge channels, the programmed scan will not start.

- ① Push [VFO/MEMO] to select the VFO mode.
- ② Push the mode switch to select the desired operating mode.
 - The operating mode can also be changed while scanning.
- ③ Push [TS] one or more times to select a tuning step. (p. 38)
 - The tuning step can also be changed while scanning.
- ④ Push [MENU] one or more times to display the “M2” screen (Menu 2).
- ⑤ Push [SCAN](F-1) to display the “SCAN” screen.
- ⑥ Set [RF/SQL] open or closed.
 - The scan performance differs, depending on the squelch setting when the scan was started. See page 146 for details.
 - If the [RF/SQL] control function is set to “AUTO,” the squelch is always open in the SSB, CW and RTTY modes. (pp. 44, 162)
- ⑦ Hold down [PRO](F-1) for 1 second to select the desired scan range between “P1,” “P2” and “P3.”
 - The scan searches between programmed scan channels 1A–1b (P1), 2A–2b (P2) or 3A–3b (P3).
- ⑧ Push [PRO](F-1) to start the programmed scan.
 - The MHz and kHz decimal points, and the selected scan range display blink while scanning.
 - If “Up/Down” is selected as the “MAIN DIAL (SCAN)” option in the Scan Set mode, rotating [MAIN DIAL] changes the scanning direction. (p. 147)
- ⑨ When the scan detects a signal, the scan stops, pauses or ignores it, depending on the Scan Resume function, the VSC function or the squelch status.
- ⑩ Push [PRO](F-1) to cancel the scan.



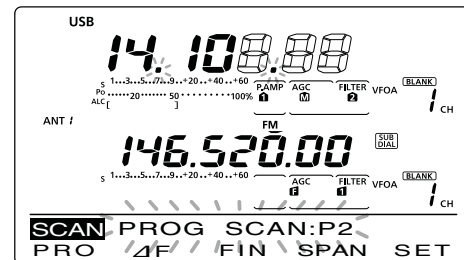
F-1
↓ Push



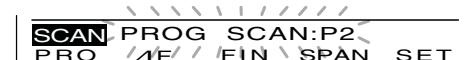
F-1
↓ Hold down



F-1
↓ Push



While Programmed scanning



F-3
↑ ↓ Push



F-3

While Fine programmed scanning

◆ About the Fine programmed scan

When a signal is received during Fine programmed scan, the scanning tuning step is temporarily set to 10 Hz and the scan speed decreases.

- ① Start the programmed scan.
 - Follow steps ① through ⑧ as described above.
- ② While scanning, push [FIN](F-3) to switch the scan function between a programmed scan and a Fine programmed scan.
- ③ Push [PRO](F-1) to cancel the scan.

Memory scan (Memory mode)

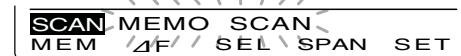
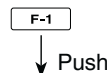
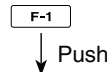
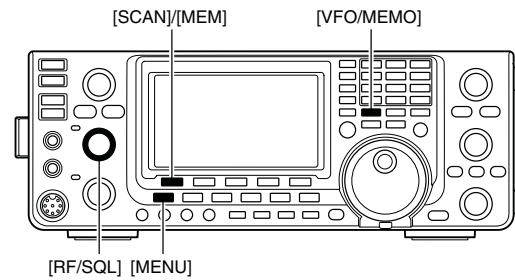
Memory scan

A Memory scan searches for signals through Memory channels 1 to 99.

Blank (unprogrammed) Memory channels are skipped.

NOTE: For a Memory scan to start, two or more Memory channels must be programmed. (p. 140)

- ① Push [VFO/MEMO] to select the memory mode.
- ② Push [MENU] to display the "M2" screen (Menu 2).
- ③ Push [SCAN](F-1) to display the "SCAN" screen.
- ④ Set [RF/SQL] open or closed.
 - The scan performance differs, depending on the squelch setting when the scan was started. See page 146 for details.
 - If the [RF/SQL] control function is set to "AUTO," the squelch is always open in the SSB, CW and RTTY modes. (pp. 44, 162)
- ⑤ Push [MEM](F-1) to start the Memory scan.
 - The MHz and kHz decimal points, and "MEMO SCAN" blink while scanning.
 - If "Up/Down" is selected as the "MAIN DIAL (SCAN)" option in the Scan Set mode, rotating [MAIN DIAL] changes the scanning direction. (p. 147)
- ⑥ Push [MEM](F-1) to cancel the scan.



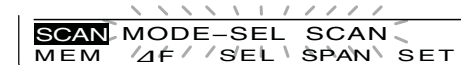
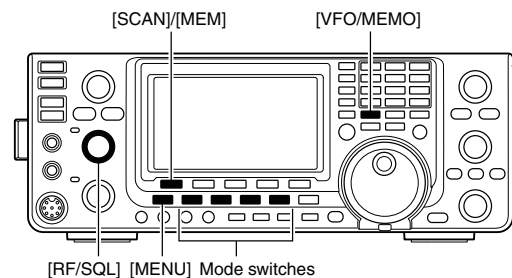
While Memory scanning

Mode Select scan

Repeatedly scans all Memory channels with the same operating mode as the displayed mode.

NOTE: For a Mode Select scan to start, two or more Memory channels must be programmed, and their operating mode must be the same as the displayed mode.

- ① Follow steps ① through ④ as described above.
- ② Hold down [MEM](F-1) for 1 second to turn ON the Mode Select scan.
 - "MODE-S" appears.
- ③ Push the mode switch to select the desired operating mode to be scanned.
- ④ Push [MEM](F-1) to start the Mode Select scan.
 - The MHz and kHz decimal points, and "MODE-SEL SCAN" blink while scanning.
 - If "Up/Down" is selected as the "MAIN DIAL (SCAN)" option in the Scan Set mode, rotating [MAIN DIAL] changes the scanning direction. (p. 147)
 - Memory scan and Mode Select scan can be switched by holding down [MEM](F-1) for 1 second.
- ⑤ Push [MEM](F-1) to cancel the scan.



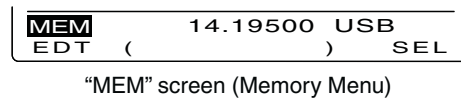
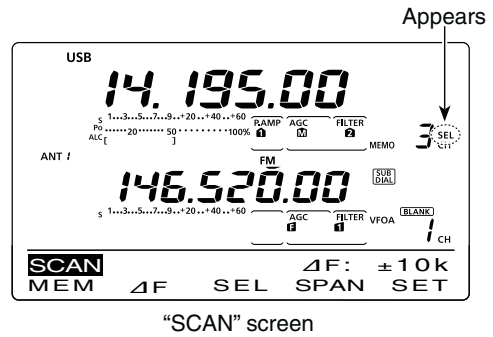
While Mode Select scanning

■ Memory scan (Memory mode) (Continued)

◇ Setting/Canceling Select Memory channels

All Memory channels can be set as Select Memory channels, except for the Scan Edge and Call channels.

- ➔ When the “SCAN” screen is displayed, push [SEL] (F-3), or when the “MEM” screen (Memory Menu) is displayed, push [SEL](F-5) to set or cancel the displayed Memory channel as a Select Memory channel.
 - “SEL” appears when the channel is set as a Select Memory channel.
 - An error beep sounds when the displayed Memory channel is a blank channel.
 - Holding down [SEL](F-3) or [SEL](F-5) for 1 second displays “SEL ALL Clear?.” Hold down [YES](F-4) to clear all Select Memory channel settings.

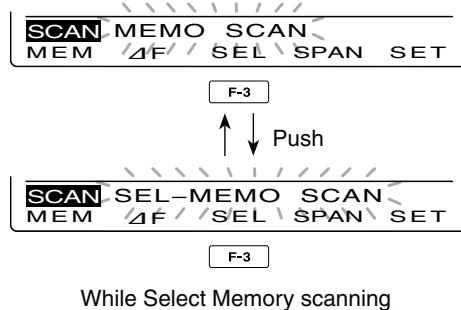


◇ Select Memory scan

Select Memory scan searches for signals through Memory channels specified as “Sel” (Select).

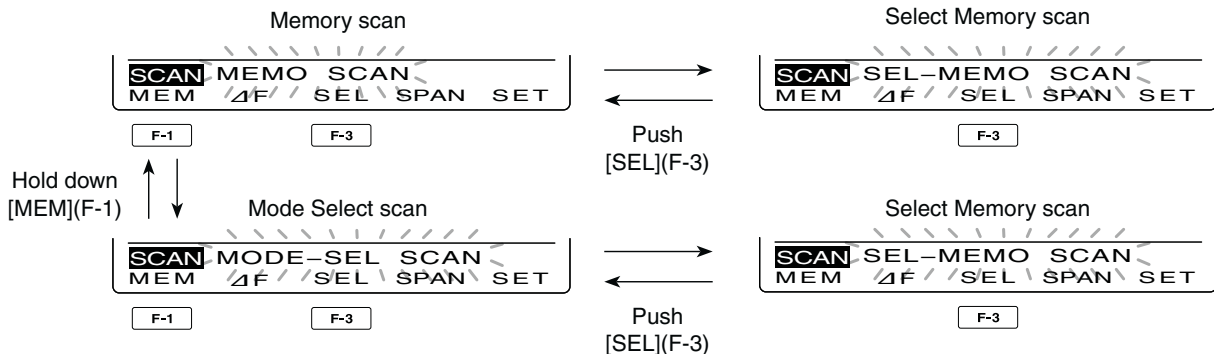
/// **NOTE:** For a Select Memory scan to start, two or more Memory channels must be designated as Select Memory channels. (See above)

- ① Follow steps ① through ⑤ as described in ‘◇ Memory scan’ on the previous page, to start Memory scan.
 - While scanning, holding down [MEM](F-1) for 1 second turns ON the Mode Select scan.
- ② Push [SEL](F-3) to turn ON the Select Memory scan.
 - The scan changes to a Select Memory scan.
 - “SEL-MEMO SCAN” blinks while scanning.
 - Pushing [SEL](F-3) toggles between Memory scan (or Mode Select scan)* and Select Memory scan.
 - *Only when the Mode Select scan is turned ON.
 - If “Up/Down” is selected as the “MAIN DIAL (SCAN)” option in the Scan Set mode, rotating [MAIN DIAL] changes the scanning direction. (p. 147)
- ③ Push [MEM](F-1) to cancel the scan.



About the scan type switching procedure

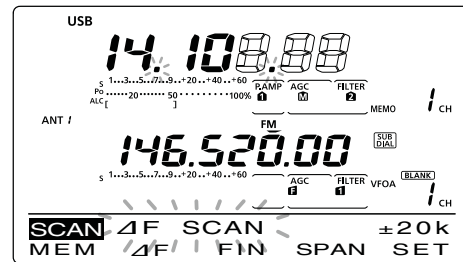
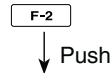
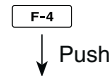
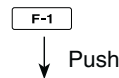
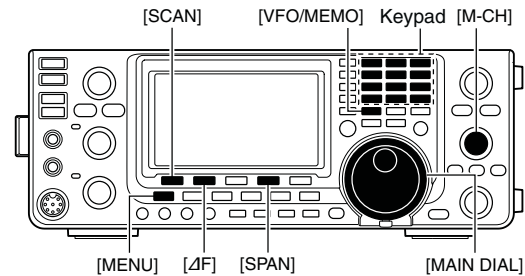
You can switch the scan type between various scans while scanning, as shown below.



■ ΔF scan and Fine ΔF scan

ΔF (Delta Frequency) scan searches for signals within the specified range with the displayed VFO frequency or Memory channel frequency as the center frequency. The frequency range is specified by the width of the selected span.

- ① Push [VFO/MEMO] once or twice to select the VFO mode or memory mode.
- ② Push [MENU] one or more times to display the "M2" screen (Menu 2).
- ③ Push [SCAN](F-1) to display the "SCAN" screen.
- ④ Set [RF/SQ] open or closed.
 - The scan performance differs, depending on the squelch setting when the scan was started. See page 146 for details.
 - If the [RF/SQ] control function is set to "AUTO," the squelch is always open in the SSB, CW and RTTY modes. (pp. 44, 162)
- ⑤ Push [SPAN](F-4) one or more times to select the desired ΔF span width.
 - ± 5 kHz, ± 10 kHz, ± 20 kHz, ± 50 kHz, ± 100 kHz, ± 500 kHz and ± 1 MHz are selectable.
- ⑥ Set the center frequency of the ΔF scan.
 - In the VFO mode, push the keypad or rotate [MAIN DIAL] to set the center frequency.
 - In the memory mode, rotate [M-CH] to select the desired Memory channel whose frequency will be the center frequency.
- ⑦ Push [ΔF](F-2) to start the ΔF scan.
 - " ΔF SCAN," the MHz and kHz decimal points blink while scanning.
 - If "Up/Down" is selected as the "MAIN DIAL (SCAN)" option in the Scan Set mode, rotating [MAIN DIAL] changes the scanning direction. (p. 147)
- ⑧ When the scan detects a signal, the scan stops, pauses or ignores it, depending on the Scan Resume function, VSC function or the squelch status.
- ⑨ Push [ΔF](F-2) again to cancel the ΔF scan.



While ΔF scanning

11

◇ About the Fine ΔF scan

When a signal is received during Fine ΔF scan, the scanning tuning step is temporarily set to 10 Hz and the scan speed decreases.

- ① Start ΔF scan.
 - Follow steps ① through ⑦ as described above.
- ② While scanning, push [FIN](F-3) to switch the scan function between ΔF scan and Fine ΔF scan.
- ③ Push [ΔF](F-2) to cancel the scan.



While Fine ΔF scanning

12 SATELLITE OPERATION

■ Satellite communications outline

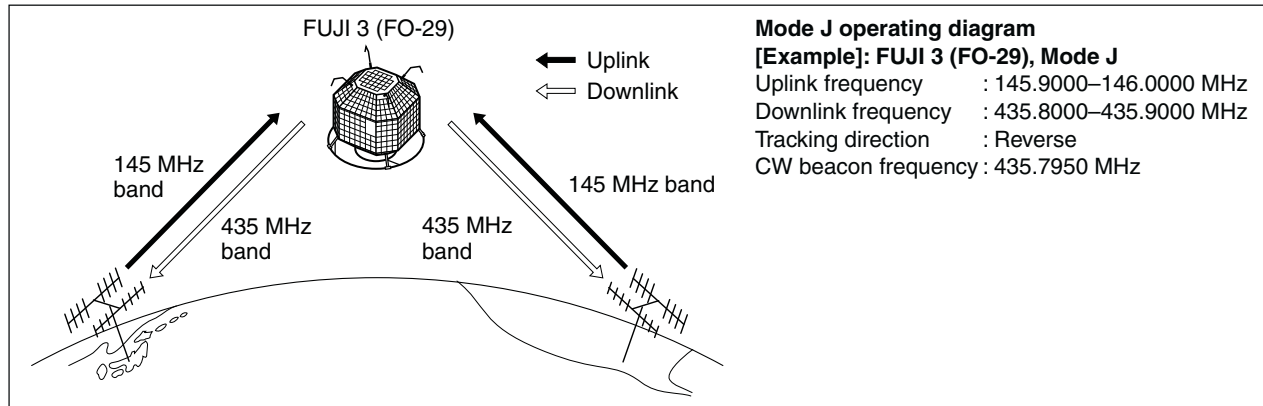
Both Satellite Mode B (435 MHz uplink, 145 MHz downlink) and Mode J (145 MHz uplink, 435 MHz downlink) can be operated with the IC-9100, and Mode L can be operated when the optional UX-9100 1200 MHz BAND UNIT is installed.

Satellite communications is possible only when a satellite is in view and its transponder is operating.

Orbit information

Orbit information describes satellite location, reaching angles, etc. This information may be available in ham magazines or organization publications, such as those from ARRL, RSGB handbook, etc.

Satellite tracking software is also convenient.



■ Satellite notes

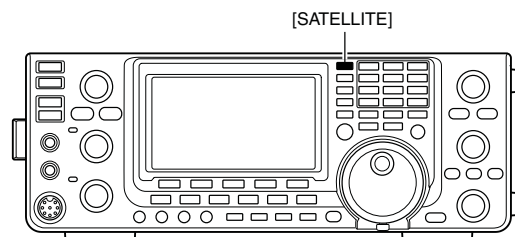
1. **NEVER** set the output power too high. Too much power will shorten the satellite's life. Set your transmit power so that your downlink signal level is lower than the beacon's signal level.
2. Confirm a satellite's operating mode in advance through documentation (magazines, etc.) or via appropriate satellite tracking software. In the wrong mode, you cannot use the satellite, even if you receive its beacon signal.
3. Preampifiers may be necessary to receive satellite signals. Optional amplifiers, AG-25, AG-35 and AG-1200* (for the UX-9100), can be used with the IC-9100. (p. 71)
*AG-1200 has been discontinued, but it can be still be used.
4. When you use a reverse tracking satellite in the SSB mode, use LSB for the uplink frequency and USB for the downlink frequency.
 - When using a normal tracking satellite in SSB mode, use USB for both the uplink and downlink frequencies.

■ Selecting the satellite mode

Operating frequencies in the satellite mode can be selected either before or after selecting the mode. Normal and reverse tracking are selectable.

◇ Transferring the VFO frequencies to the satellite VFO

- ① Select the downlink frequency (receive) in the MAIN band, and the uplink frequency (transmit) in the SUB band.
- ② Hold down [SATELLITE] for 1 second to transfer the frequencies, selected in step ①, to the satellite VFO.
 - The satellite mode is automatically selected after transferring.
 - "[SATELLITE]" and the last operated tracking icon ("[NORMAL]" or "[REVERSE]") appear.
 - VFO or Memory mode data is displayed on the SUB band during satellite mode.

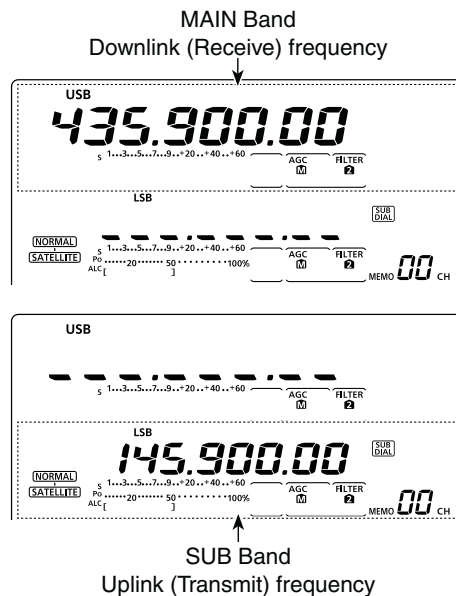
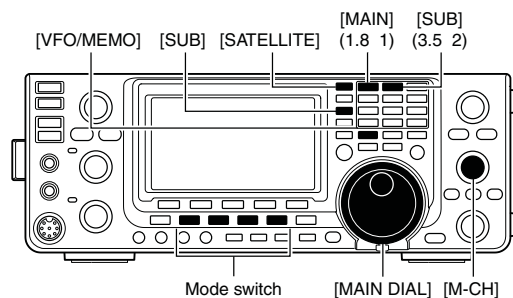


■ Setting the satellite VFO

- ① Push [SATELLITE] to enter the satellite mode.
 - “SATELLITE” and either “NORMAL” or “REVERSE” appear.
- ② Push [VFO/MEMO] to toggle between the satellite VFO and Memory mode.
 - VFO or Memory mode data is displayed on the SUB band while in the satellite mode.
- ③ Push [MAIN](1.8 1) to enable downlink frequency tuning.
 - The uplink frequency disappears.
- ④ Select the downlink frequency and the operating mode.
 - Push [MAIN](1.8 1) again after tuning.
- ⑤ Push [SUB](3.5 2) to enable uplink frequency tuning.
 - The downlink frequency disappears.
 - Push [SUB](3.5 2) again after tuning.

NOTE: To select the operating mode for uplink, push [SUB] to enable the SUB band setting mode.

In the DR mode, pushing [SATELLITE] cancels it, and then switches the transceiver to the satellite mode. If you want to operate in the DR mode after exiting the satellite mode, you must hold down [DV•DR] for 1 second.



■ Tracking selection

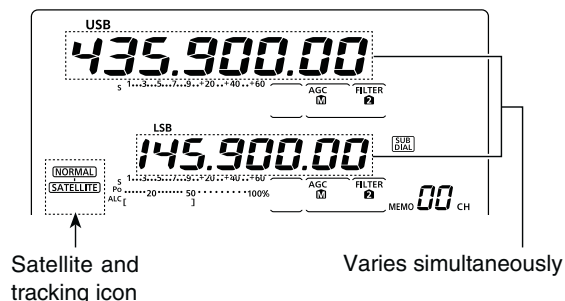
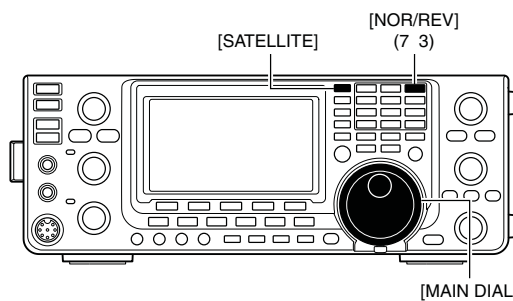
- ① Push [SATELLITE] to enter the satellite mode.
 - “SATELLITE” and either “NORMAL” or “REVERSE” appears.
- ② Push [NOR/REV](7 3) to toggle between normal and reverse tracking.

◇ Normal tracking

Both downlink and uplink frequencies simultaneously increase or decrease in the same steps when you rotate the [MAIN DIAL].

◇ Reverse tracking

The downlink frequency follows the tuning dial rotation, however, the uplink frequency changes in the reverse direction to the [MAIN DIAL] rotation, in the same steps.

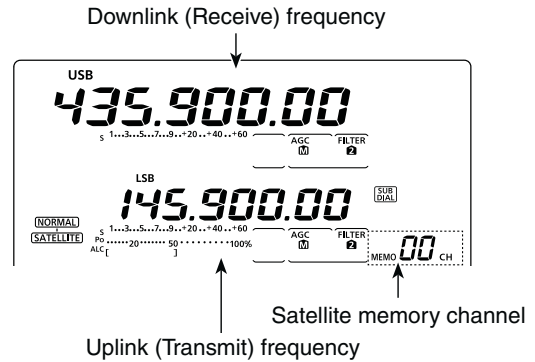


■ Satellite memory

The IC-9100 has 20 satellite memory channels (CH 00 to 19) to memorize both uplink and downlink frequencies, operating modes and other data.

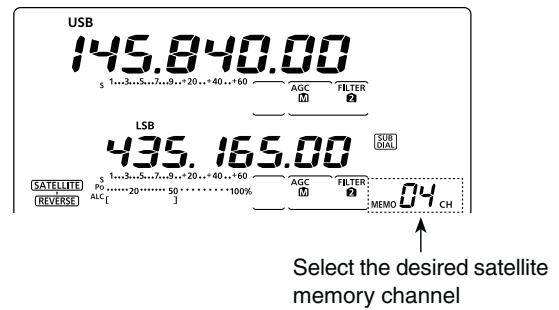
◇ Satellite memory selection

- ① Push [SATELLITE] to enter the satellite mode.
- ② Push [VFO/MEMO] to select the satellite memory mode.
 - “MEMO” and the memory channel number are displayed beside the uplink frequency (SUB band) display.
- ③ Rotate [M-CH] to select a satellite mode Memory channel.



◇ Satellite memory programming

- ① Push [SATELLITE] to enter the satellite mode.
- ② Push [VFO/MEMO] to select the satellite memory mode.
- ③ Rotate [M-CH] to select the desired Memory channel.
- ④ Select the desired downlink frequency in the MAIN band, and uplink frequency in the SUB band, as well as the operating mode.
- ⑤ Hold down [MW] for 1 second to program the contents into the Memory channel.
 - Three beeps sound when the memory programming has completed.



/// **NOTE:** Tracking selection, normal or reverse, is not programmed in the satellite memory channels.

■ Preparation

- ① Decide on a usable satellite, and point your antenna direction towards it.
- ② Confirm the approximate location of the satellite and operating mode (e.g. “B,” “J,” etc.) through a publication (magazine, etc.) or an appropriate satellite tracking software.
- ③ Push [SATELLITE] to enter the satellite mode.
- ④ Push [NOR/REV](7 3) to toggle between normal and reverse tracking.
- ⑤ Select the operating mode as listed below.
 - To select the operating mode for the uplink, push [SUB] before selecting the operating mode.

Satellite	Downlink (MAIN band)	Uplink (SUB band)
Reverse tracking type	USB (or CW)	LSB (or CW)
Normal tracking type	USB (or CW)	LSB (or CW)

- ⑥ Select the desired downlink frequency in the MAIN band to match the beacon frequency.
 - Refer to a ham magazine or book for detailed information.
 - Adjust the antenna direction so that the S-meter shows its strongest level.
 - The S-meter level should be noted to adjust transmit power during a loop test.
- ⑦ Perform a loop test.

Loop test procedures

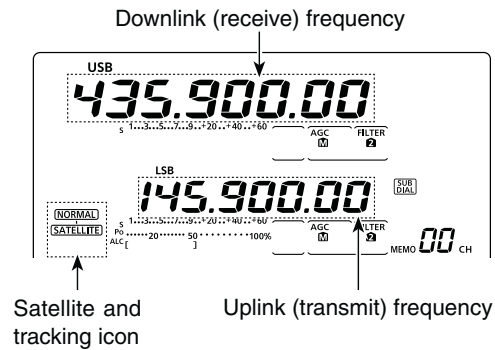
- ① Rotate [MAIN DIAL] to select a vacant frequency, within the satellite’s coverage, as the downlink frequency on the MAIN band.
- ② Push [PTT] on the microphone to transmit. (or [TRANSMIT] on the transceiver)
- ③ Push [SUB](3.5 2), then select the uplink frequency on the SUB band while transmitting a single tone such as a whistle to find your downlink signal and monitor your own signal correctly.
- ④ Push [SUB](3.5 2) again after setting.

NOTE: To avoid excessive power, set the output power so that the downlink signal strength is lower than the beacon’s strength.

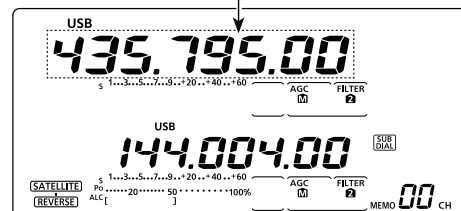
- ⑧ Select the desired frequency to begin your satellite communications.
 - Both the downlink and uplink frequencies change simultaneously.
- ⑨ When your downlink audio drifts (Doppler effect), push [SUB](3.5 2) then rotate [MAIN DIAL] to adjust the uplink frequency (SUB band).
 - After adjusting, push [SUB](3.5 2) again.
 - When a particular station’s audio is off frequency, use the RIT function (push [RIT]).
- ⑩ To exit the satellite operation, push [SATELLITE].

✓ For your convenience

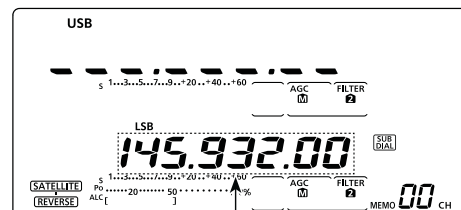
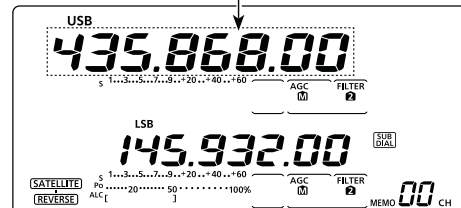
As the transceiver has 20 satellite memory channels, once entered, desired satellite frequencies can be recalled instantly.



Select the downlink frequency to match with the beacon frequency.



Select a vacant frequency as the downlink frequency, within the satellite’s coverage.



Adjust the uplink frequency

■ Satellite operation

When your own signal can be received with a loop test, satellite communication can be performed.

- ① When a frequency is shifted by the Doppler effect, push [SUB](3.5 2), then rotate [MAIN DIAL] to re-tune the uplink frequency.
 - The downlink frequency display disappears.
- ② When the other station's signal frequency is shifted, push [MAIN](1.8 1), then rotate [MAIN DIAL] to re-tune the downlink frequency.
 - The uplink frequency display disappears.
 - You can tune the downlink frequency ± 9.99 kHz with the RIT. (p. 69)

■ Antenna connection and selection

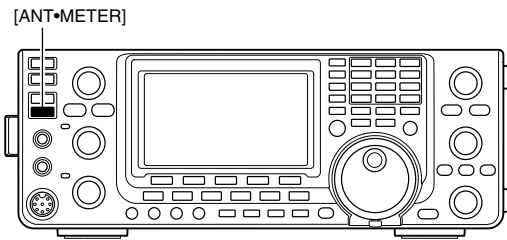
The IC-9100 has 2 antenna connectors for the HF/50 MHz bands, [ANT1] and [ANT2], and a dedicated antenna connector for each of the 144 MHz, 430 MHz and 1200 MHz* bands; a total of 5 antenna connectors.

You can memorize the antenna for each operating band the IC-9100 covers.

When you change the operating band to one outside of the current memorized antenna band, the antenna is automatically selected for the new band. (See below)

This function is especially convenient when you use 2 antennas for HF and 50 MHz band operation.

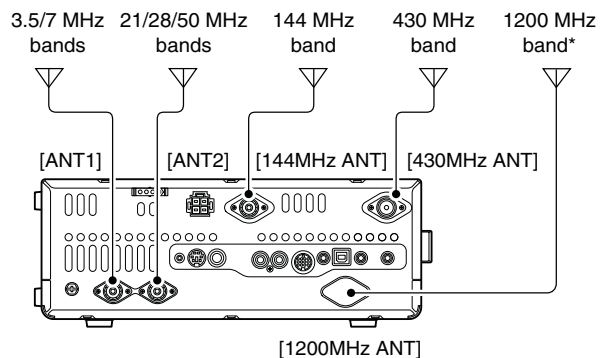
To use the band memory, select “Auto” as the “[ANT] Switch” option in the Set mode. (p. 163)



- **Antenna selection mode: “Auto”** (default)

Once an antenna has been selected for use with a band by pushing [ANT•METER], the antenna is automatically selected whenever that band is accessed.

[EXAMPLE]: a 3.5/7 MHz antenna is connected to [ANT1], a 21/28/50 MHz antenna is connected to [ANT2]. When the antenna selector function is set to “Auto,” the correct antenna is automatically selected when you changes bands.

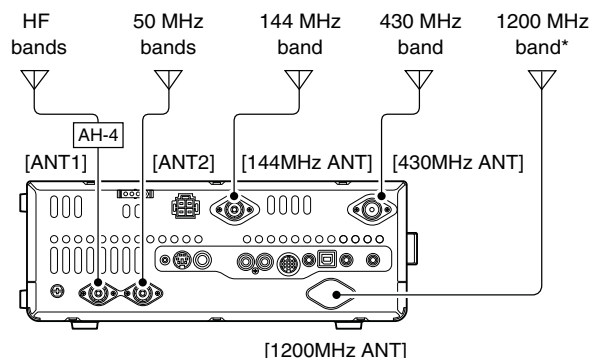


- **Antenna selection mode: “Manual”**

[ANT•METER] functions, however, the band memory function is disabled. In this case, you must select an antenna manually.

- The antenna connectors for the 144 MHz, 430 MHz and 1200 MHz* bands are automatically selected.

[EXAMPLE]: an optional antenna tuner and HF antenna are connected to [ANT1] and a 50 MHz antenna is connected to [ANT2].



- **Antenna selection mode: “OFF”**

[ANT•METER] does not function. The [ANT1] connector is always selected during HF and 50 MHz band operation.

* The optional UX-9100 is required for 1200 MHz frequency band operation.

■ Antenna tuner operation

The internal automatic antenna tuner automatically matches the transceiver to the selected antenna. After the tuner matches an antenna, the variable capacitor settings are memorized as a preset point for each frequency range (100 kHz steps). Therefore, when you change the frequency range, the variable capacitors are automatically preset to the memorized setting.

CAUTION: NEVER transmit with the tuner ON when no antenna is connected. This will damage the transceiver. Be careful of the antenna selection.

✓ For your convenience

When you purchase a brand-new antenna, or you want to change the antenna settings, you can erase all of the internal antenna tuner preset points with “Tuner Preset Clear” in the Set mode. (p. 163)

◇ Tuner operation

- ➔ Push [TUNER] to turn ON the internal antenna tuner. The antenna is automatically tuned when the antenna SWR is higher than 1.5:1.
 - When the tuner is ON, “**TUNE**” appears.

◇ Manual tuning

Transmitting in SSB with a soft voice, the internal tuner may not automatically tune correctly. In such cases, manual tuning is helpful.

- ➔ Hold down [TUNER] for 1 second to start manual tuning.
 - A sidetone sounds, “**TUNE**” blinks and the TX/RX indicator (MAIN Band) lights red while tuning.
 - If the tuner cannot reduce the SWR to less than 1.5:1 after 20 sec. of tuning, “**TUNE**” disappears and the TX/RX indicator (MAIN Band) goes out.

○ If the tuner cannot tune the antenna, check the following and try again:

- the correct antenna connector selection.
- the antenna connection and feedline.
- the untuned antenna SWR. (Less than 3:1 for the HF bands; Less than 2.5:1 for the 50 MHz band)
- the transmit power. (8 W for the HF bands; 15 W for the 50 MHz band)
- the power source voltage/current capacity.

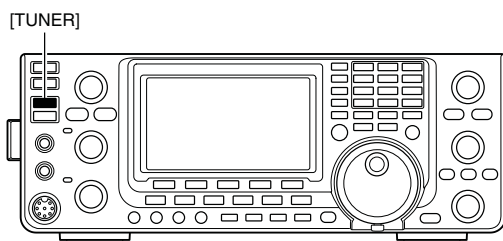
If the tuner still cannot reduce the SWR to less than 1.5:1 after checking the above, perform the following:

- try manual tuning one or more times.
- adjust the antenna feedline length. (This is effective for higher frequencies in some cases.)

Even if manual tuning does not match the antenna and the tuner turns OFF the first time, it may match the antenna the second time.

NOTES:

- The internal antenna tuner can only tune the HF and 50 MHz bands— the 144 MHz, 430 MHz and 1200 MHz* bands cannot be tuned.
- **NEVER** transmit without an antenna properly connected to each antenna port in use.
- When 2 antennas are connected, select the antenna to be used with [ANT•METER].
- If the SWR is higher than about 1.5:1 when tuning farther than 100 kHz from an antenna’s programmed preset point, hold down [TUNER] for 1 second to start manual tuning.
- The internal tuner may not be able to tune in the AM mode. In such cases, hold down [TUNER] for 1 second to manually tune.



○ Tuning a narrow bandwidth antenna

Some antennas, especially for the low bands, have a narrow bandwidth. These antennas may not be tuned beyond the edge of their operating bandwidth, therefore, manually tune such an antenna as follows:

[Example]: Suppose you have an antenna which has an SWR of 1.5:1 at 3.55 MHz and an SWR of 3:1 at 3.8 MHz.

- ① Select 3.55 MHz and hold down [TUNER] for 1 second. to start manual tuning.
- ② Select 3.80 MHz and hold down [TUNER] for 1 second to start manual tuning.

• **Automatic tuner start** (HF bands only)

If you want to deactivate the tuner when the VSWR is 1.5:1 or less, use the auto tuner start function and turn OFF the tuner. This function activates the tuner automatically when the SWR is high, and is controlled in the Set mode. (p. 163).

- The tuner may not start if the TX power output is not stable longer than the specified time period in the SSB or CW mode operation.

• **PTT tuner start**

Tuning of the internal*/external antenna tuner starts when [PTT] is pushed on a new frequency that is more than 1% away from the last-tuned frequency. This function removes the “holding down [TUNER]” operation, and starts tuning on the first transmission on a new frequency.

*Tuning starts if the internal antenna tuner is ON. This function is turned ON in the Set mode. (p. 163).

■ Optional external tuner operation

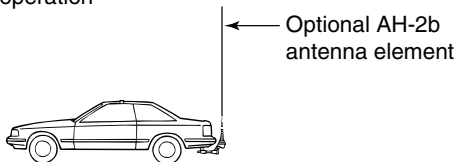
• **AH-4 HF/50 MHz AUTOMATIC ANTENNA TUNER**

The optional AH-4 matches the IC-9100 to a long wire antenna more than 7 m/23 ft long (3.5 MHz and above).

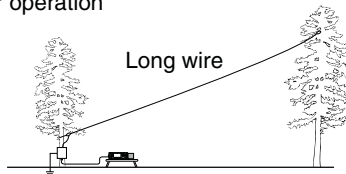
- See page 29 for the transceiver and AH-4 connection.
- See the AH-4 instruction manual installation and antenna connection details.

AH-4 setting example:

For mobile operation



For outdoor operation



⚠ DANGER HIGH VOLTAGE!
NEVER touch the antenna element while tuning or transmitting.

CAUTION: operate the AH-4 without an antenna wire or element. The tuner and transceiver will be damaged.

NEVER operate the AH-4 when it is not grounded.

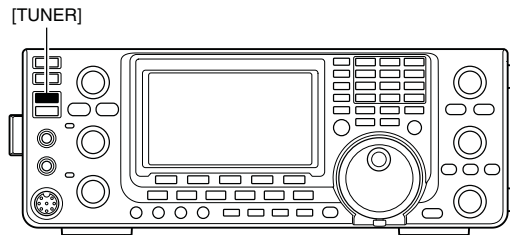
Transmitting before tuning may damage the transceiver. Note that the AH-4 cannot tune when using a $\frac{1}{2} \lambda$ long wire or multiple of the operating frequency.

When connecting the AH-4, the antenna connector assignments are [ANT2] for the internal tuner and [ANT1] for the AH-4. The antenna icon in the LCD displays “ANT” when the AH-4 is connected and selected.

• **AH-4 operation**

Tuning is required for each frequency. Be sure to re-tune the antenna before transmitting when you change the frequency— even slightly.

- ① Select the desired frequency in an HF or 50 MHz band for use with the AH-4.
 - The AH-4 will not operate on frequencies outside the ham bands.
- ② Hold down [TUNER] for 1 second.
 - “TUNE” blinks while tuning.
- ③ “TUNE” appears constantly when tuning is complete.
 - When the connected wire cannot be tuned, “TUNE” disappears and the AH-4 is bypassed. At that point the antenna wire connection route is to the transceiver directly, and not via the AH-4 antenna tuner.
- ④ To bypass the AH-4 manually, push [TUNER].



• **Antenna tuner of the IC-PW1/EURO**

When using an external antenna tuner such as the IC-PW1/EURO's tuner, tune when the internal tuner is turned OFF. After tuning has completed, turn ON the internal tuner.

Otherwise, both tuners simultaneously tune, and proper tuning may fail.

See the instruction manual included with each antenna tuner for their respective operations.

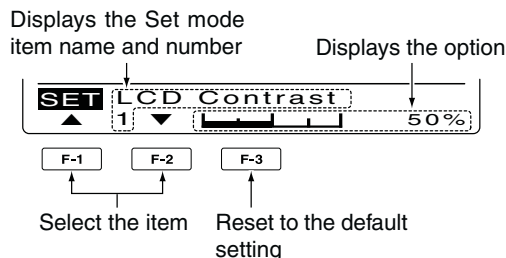
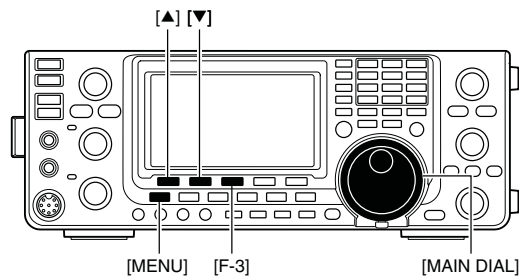
14 SET MODE

■ Set mode description

The Set mode is used for programming infrequently changed values or functions.

◇ The Set mode settings

- ① Hold down [MENU] for 1 second to enter the Set mode.
- ② Push [▲](F-1) or [▼](F-2) to select the desired item.
- ③ Rotate [MAIN DIAL] to select the desired option.
 - Hold down [F-3] for 1 second to reset to the default setting, if desired.
- ④ Push [MENU] to save, and exit the Set mode.



1. LCD Contrast (Default: 50%)

Adjust the LCD contrast to between 0% and 100% in 1% steps.

2. LCD Backlight (Default: 50%)

Adjust the LCD backlight brightness to between 0% and 100% in 1% steps.

NOTE: Regardless of this setting, the LCD backlight brightness is maximum (100%) at power ON by design. (It is not an equipment malfunction.) Then, the brightness level automatically returns to the adjusted value.

3. Beep Level (Default: 50%)

Adjust the confirmation and band edge beep tones output level to between 0% and 100% in 1% steps.

4. Beep Level Limit (Default: ON)

Turn the confirmation and band edge beep tones output level limiting ON or OFF.

When you set this item to ON, the beep tones are adjusted by the [AF] control until rotating the [AF] control reaches the level specified in the "Beep Level" item, as described above. Further rotation will not increase the volume of the beep tones.

- OFF : Beep level adjustment is not limited.
- ON : Beep level adjustment is limited to the level specified in "Beep Level," above.

5. Beep (Default: ON)

Turn the confirmation beep ON or OFF. Set the beep output level in the "Beep Level" item as described to the left.

- OFF : The confirmation beep is OFF. (Silent operation)
- ON : The confirmation beep sounds each time a switch is pushed.

6. Band Edge Beep (Default: ON(Default))

When you tune into or out of an amateur band's frequency range, you can hear a beep tone. If you select "ON (User)" or "ON (User) & TX," you can program a total of 30 band edge frequencies in the "User band Edge" item.

You can set the beep output level in the "Beep Level" item as described to the left.

- OFF : Band edge beep is OFF
- ON (Default) : When you tune into or out of the default amateur band's frequency range, a beep sounds.
- ON (User) : When you tune into or out of a user programmed amateur band's frequency range, a beep sounds.
- ON (User) & TX : When you tune into or out of a user programmed amateur band's frequency range, a beep sounds. In addition, transmission is inhibited outside the programmed range.

7. User Band Edge

This “User Band Edge” item appears only when “ON (User)” or “User (ON) & TX” is selected in the “Band Edge Beep” item. (p. 161)

When you select “ON (User)” or “ON (User) & TX” in the “Band Edge Beep” item, you can program a total of 30 band edge frequencies in this item. See page 42 for programming details.

8. Beep Sound (MAIN) (Default: 1000Hz)

Set a desired beep frequency for the MAIN Band to between 500 Hz and 2000 Hz in 10 Hz steps.

You can set the beep output level in the “Beep Level” item. (p. 161)

9. Beep Sound (SUB) (Default: 1000Hz)

Set a desired beep frequency for the SUB Band to between 500 Hz and 2000 Hz in 10 Hz steps.

You can set the beep output level in the “Beep Level” item. (p. 161)

10. RF/SQL Control (Default: RF+SQL)

Set the [RF/SQL] control operation.

- AUTO : [RF/SQL] functions as only an RF gain control in SSB, CW and RTTY; a squelch control in AM, FM and DV.
- SQL : [RF/SQL] functions as a squelch control.
- RF+SQL : [RF/SQL] functions as a noise squelch or an S-meter squelch in FM; only as an S-meter squelch in SSB, CW, RTTY, AM and DV.

11. Meter Peak Hold (Default: ON)

Turn the Meter Peak Hold function ON or OFF.

When this function is set to ON, the peak level of a received signal strength or the output power is displayed for approximately 0.5 seconds.

12. FM/DV Center Error (Default: ON)

Turn the FM and DV center error detection ON or OFF.

When an off-frequency signal is received, the MAIN and SUB Band’s TX/RX indicators blink.

13. Time Out Timer (Default: OFF)

To prevent a prolonged transmission, the transceiver has a Time-Out Timer function.

If a continuous transmission exceeds the set period, the transmission will be cut off.

Set the time period to 3, 5, 10, 20 or 30 minutes, or turn OFF the Time-Out Timer function.

14. PTT Lock (Default: OFF)

Turn the PTT Lock function ON or OFF.

To prevent accidental transmissions, this function inhibits transmitting, when turned ON.

15. Quick SPLIT (Default: ON)

Turn the Quick Split function ON or OFF.

When this item is set to ON, hold down [SPLIT] for 1 second to shift the transmit frequency from the receive frequency, according to the “SPLIT Offset” option as described below. See page 83 for details.

16. SPLIT Offset (Default: 0.000MHz)

Set the offset* for the quick split function.

*The difference between transmit and receive frequencies.

The frequency offset can be set to between –9.999 MHz and +9.999 MHz in 1 kHz steps.

17. SPLIT LOCK (Default: OFF)

Turn the Split Lock function ON or OFF.

When this item is set to ON, you can use [MAIN DIAL] to adjust the transmit frequency while holding down [XFC], even while the Dial Lock function is enabled.

See pages 82, 83 for split frequency operation details.

■ Set mode description (Continued)

18. DUP Offset

Set the offset* for duplex operation. You can set the repeater offset for each band.

*The difference between transmit and receive frequencies.

- ➔ When you select this item, hold down [BAND](MAIN/SUB) for 1 second to select the desired frequency band. Then, rotate [MAIN DIAL] to set the offset.
 - The frequency offset can be set to between 0.0000 MHz and 9.9999 MHz*.
 - *99.9999 MHz for the 1200 MHz frequency band.

▨ The default value may differ, depending on the selected frequency band and transceiver version.

NOTE:

- You can use this setting only when the Split function is OFF for the HF/50 MHz frequency band.
- “-.-.-.-” is displayed when a blank memory channel is selected, or the satellite mode is ON.

The optional UX-9100 is required for 1200 MHz frequency band operation.

19. One Touch Repeater (Default: DUP-)

Set the one touch repeater shift direction.

- DUP- : The transmit frequency shifts down from the receive frequency by the offset amount.
- DUP+ : The transmit frequency shifts up from the receive frequency by the offset amount.

20. Auto Repeater

(Default: ON-1 ; for U.S.A. version
ON ; for Korea version)

(Only U.S.A. and Korea versions)

Set the Auto Repeater function ON or OFF.

To activate the Auto Repeater function, first program the auto repeater frequency range, then select ON. (p. 67)

U.S.A. version:

- ON-1 : Activates duplex only.
- ON-2 : Activates duplex and tone.
- OFF : Auto repeater function is turned OFF.

Korea version:

- ON : Activates duplex and tone.
- OFF : Auto repeater function is turned OFF.

21. Tuner (Auto Start) (Default: OFF)

Turn the Automatic Antenna Tuner function ON or OFF. This function is for only the HF bands.

- OFF : The internal antenna tuner remains OFF even when the SWR is high.
- ON : The internal antenna tuner automatically starts tuning when the SWR is high, even if the tuner is turned OFF.

22. Tuner (PTT Start) (Default: OFF)

Whenever you push [PTT], the internal or external antenna tuner automatically starts tuning if the operating frequency has changed by more than 1% from the last-tuned frequency.

- OFF : Tuning starts only when [TUNER] is pushed.
- ON : (Internal antenna tuner) Tuning starts when you push [PTT] on a new frequency, if the internal antenna tuner is ON.
(External antenna tuner) Tuning always starts when you push [PTT] on a new frequency, regardless of whether the external antenna tuner is ON or OFF.

23. Tuner Preset Clear

Select the desired antenna.

The selected antenna's preset memory* is cleared by holding down [CLR](F-4) for 1 second.

*The variable capacitor settings are memorized as a preset point for each frequency range (100 kHz steps) after the tuner matches an antenna.

- CLR ANT1 : The preset memory of [ANT1]'s antenna is cleared.
- CLR ANT2 : The preset memory of [ANT2]'s antenna is cleared.

24. [ANT] Switch (Default: Auto)

Set the antenna switch function to Auto, Manual or OFF. When you change the operating frequency on the HF/50 MHz frequency band, this function will automatically select the correct antenna, or you must do it manually.

- OFF : [ANT•METER] does not function. The [ANT1] connector is always selected.
- Manual : You must manually change the antenna by pushing [ANT•METER].
- Auto : The antenna memorized by the band memory is automatically selected. You can also manually change the antenna by pushing [ANT•METER].

25. SPEECH Level (Default: 50%)

Adjust the speech audio output level to between 0% (no output) and 100% (maximum output).

26. SPEECH Language (Default: English)

Select English or Japanese as the speech language.

27. SPEECH Speed (Default: HIGH)

Select HIGH (faster) or LOW (slower) speech speed.

28. SPEECH S-Level (Default: ON)

The signal level announcement with the voice synthesizer can be turned ON or OFF.

- OFF : Signal level is not announced. Operating frequency and mode are announced.
- ON : Signal level, operating frequency and mode are announced.

29. SPEECH [MODE] SW (Default: OFF)

Turn the Operating Mode Speech function ON or OFF. When this function is ON, the selected operating mode is verbally announced when a mode switch is pushed.

- OFF : The operating mode Speech function is OFF.
- ON : The operating mode Speech function is ON.

30. [SPEECH/LOCK] SW (Default: SPEECH/LOCK)

Select the [SPEECH/LOCK] switch action.

- SPEECH/LOCK: Pushing the [SPEECH/LOCK] switch turns ON the voice synthesizer function. Holding down the [SPEECH/LOCK] switch turns the dial lock function ON or OFF.
- LOCK/SPEECH: Pushing the [SPEECH/LOCK] switch turns the dial lock function ON or OFF. Holding down the [SPEECH/LOCK] switch turns ON the voice synthesizer function.

31. Memopad Numbers (Default: 5)

Set the number of available memo pads to 5 or 10. See page 144 for details.

32. MAIN DIAL Auto TS (Default: HIGH)

Set the Auto Tuning Step function for [MAIN DIAL]. When rapidly rotating [MAIN DIAL], the tuning step automatically changes as selected.

There are two types of auto tuning steps: LOW (Faster) and HIGH (Fastest).

- OFF : Auto tuning step is turned OFF.
- LOW : Approximately 2 times faster.
- HIGH : Approximately 5 times faster when the tuning step is set to 1 kHz or smaller steps; approximately 2 times faster when the tuning step is set to 5 kHz or larger steps.

33. MIC Up/Down Speed (Default: HIGH)

Set the rate at which frequencies are scanned while holding down the microphone [UP]/[DN] switches.

- LOW : Low speed (25 tuning steps/second)
- HIGH : High speed (50 tuning steps/second)

34. Quick RIT Clear (Default: OFF)

Select the RIT/ Δ TX frequency offset clearing operation with [CLEAR].

- OFF : Holding down [CLEAR] for 1 second clears the RIT and Δ TX frequency offset.
- ON : Pushing [CLEAR] instantly clears the RIT and Δ TX frequency offset.

35. AFC Limit (Default: ON)

Turn the AFC (Automatic Frequency Control) limit function ON or OFF.

The AFC function automatically compensates the tuning when a received frequency drifts or goes off frequency.

- OFF : The AFC function continues to tune until the displayed frequency changes to reflect the center of the signal.
- ON : The AFC function stops tuning when the frequency goes off the limited frequency range, even if received frequency is off frequency.

AFC limit value:

IF Filter width	AFC limit value
15 kHz	± 10 kHz
10 kHz	± 7 kHz
7 kHz	± 5 kHz

■ Set mode description (Continued)

36. [NOTCH] SW (SSB) (Default: Auto/Manual)

Select the Auto, Manual or Auto/Manual notch filter to be used for SSB mode operation.

- Auto : Only the Auto notch filter can be used.
- Manual : Only the Manual notch filter can be used.
- Auto/Manual: Both the Auto and Manual notch filters can be used.

37. [NOTCH] SW (AM) (Default: Auto/Manual)

Select the Auto, Manual or Auto/Manual notch filter used for AM mode operation.

- Auto : Only the Auto notch filter can be used.
- Manual : Only the Manual notch filter can be used.
- Auto/Manual: Both the Auto and Manual notch filters can be used.

38. MN-Q Popup (MN ON) (Default: ON)

Turn the manual notch filter width display ON or OFF. When this item set to ON, and the manual notch filter is selected with [NOTCH], and the manual notch filter width appears on the function display.

39. BW Popup (PBT) (Default: ON)

Turn the IF filter passband width and shift value display ON or OFF. When this item set to ON, and the [TWIN PBT] control is rotated, the passband width and shifting value appear on the function display.

40. BW Popup (FIL) (Default: ON)

Turn the IF filter passband width and shift value display ON or OFF. When this item set to ON, and [FILTER] is pushed, the passband width and shifting value appear on the function display.

41. SSB/CW Sync Tuning (Default: OFF)

Turn the displayed frequency shift function ON or OFF.

When this function is turned ON, the audio pitch or tones of the received signal will remain the same, even when the operating mode is changed between SSB and CW.

The amount of frequency shift may differ, depending on the CW pitch setting.

- OFF : The displayed frequency does not shift.
- ON : The displayed frequency shifts when the operating mode is changed between SSB and CW.

42. CW Normal Side (Default: LSB)

Select the sideband used to receive CW in the CW normal mode between LSB and USB.

43. KEYER 1st Menu (Default: KEYER-Root)

Select KEYER-Root or KEYER-SEND as the menu that appears first after pushing [KEY](F-4) in the "M1" screen (Menu 1), when the CW mode is selected.

- KEYER-Root : Memory keyer menu appears first.
- KEYER-SEND: Keyer SEND menu appears first.

44. GPS 1st Menu (Default: GPS-Root)

Select GPS-Root or GPS-POS as the menu that appears first after holding down [CALL/GPS].

- GPS-Root : GPS menu appears first.
- GPS-POS : Position menu appears first.

45. EXT-P.AMP (144) (Default: OFF)

Switch the preamplifier control ON or OFF. When using the optional AG-25, ON must be selected. Otherwise, the preamplifier is never enabled.

DO NOT connect any equipment, such as an SWR or power meter, between the transceiver and preamplifier. In such case, the preamplifier may not function correctly.

46. EXT-P.AMP (430) (Default: OFF)

Switch the preamplifier control ON or OFF. When using the optional AG-35, ON must be selected. Otherwise, the preamplifier is never enabled.

DO NOT connect any equipment, such as an SWR or power meter, between the transceiver and preamplifier. In such case, the preamplifier may not function correctly.

47. EXT-P.AMP (1200) (Default: OFF)

Switch the preamplifier control ON or OFF. When using the optional AG-1200*, ON must be selected. Otherwise, the preamplifier will not function.

*AG-1200 has been discontinued, but it can be still be used.

DO NOT connect any equipment, such as an SWR or power meter, between the transceiver and preamplifier. In such case, the preamplifier may not function correctly.

This item appears only when the optional UX-9100 is installed.

48. EXT-SP Separate (Default: Separate)

Select the audio output method when the optional external speakers are connected to both [EXT-SP (MAIN)] and [EXT-SP (SUB)] jacks.

- Separate : The MAIN and SUB Band audio are separately sent to the [EXT-SP (MAIN)] and [EXT-SP (SUB)] jacks.
- Mix : The MAIN and SUB Band audio are combined and sent to both the [EXT-SP (MAIN)] and [EXT-SP (SUB)] jacks.

49. Phone Separate (Default: Auto)

Select the audio output method when headphones are connected to the transceiver.

- Separate : The MAIN and SUB Band audio are separately sent to the right speaker (MAIN Band) and left speaker (SUB Band).
- Mix : The MAIN and SUB Band audio are combined, and sent to both the right and left speakers.
- Auto : When the SUB Band is displayed, the MAIN and SUB Band audio are separately sent to the right speaker (MAIN Band) and left speaker (SUB Band). When the SUB Band is not displayed, the MAIN Band audio is sent to both the left and right speakers.

50. Sub Band Mute (TX) (Default: OFF)

Turn the SUB Band Audio Mute function ON or OFF. While transmitting, the SUB band audio is muted when this function is turned ON.

- OFF : The SUB Band audio is not muted while transmitting.
- ON(SP Only) : The SUB Band audio, sent to the speaker, is muted while transmitting.
- ON(SP & USB) : The SUB Band audio, sent to the speaker and USB port, is muted while transmitting.

51. ACC AF/SQL Select (Default: MAIN)

Set the [ACC] socket's pin 12 (AF) and pin 13 (SQLS) output usage.

- MAIN : Sends the MAIN Band's receive audio and squelch.
- SUB : Sends the SUB Band's receive audio and squelch.

52. DATA AF/SQL Select (Default: MAIN)

Set the [DATA2] socket's pin 4 (DATA), pin 5 (AF) and pin 6 (SQL) output usage.

- MAIN : Sends the MAIN Band's receive audio and squelch.
- SUB : Sends the SUB Band's receive audio and squelch.

53. VSEND Select (Default: ON)

Set the [ACC] socket's pin 7 (VSEND) and pin 3 (HSEND) output usage.

- OFF : VSEND is not used. HSEND is used for all bands.
- UHF Only : VSEND is used for the 430 MHz and 1200 MHz bands. HSEND is used for the HF/50 MHz and 144 MHz bands.
- ON : VSEND is used for the 144 MHz, 430 MHz, and 1200 MHz bands. HSEND is used for the HF/50 MHz bands.

■ Set mode description (Continued)

54. External Keypad (Default: OFF)

Turn the external keypad ON or OFF for keyer memory transmission.

See page 26 for the equivalent circuit of an external keypad and connection.

- OFF : The external keypad does not function.
- KEYER SEND: In the CW mode, pushing one of external keypad switches transmits the desired keyer memory contents.

55. USB Audio SQL (Default: OFF(OPEN))

Select whether or not to output the audio from the [USB] connector on the rear panel, according to the squelch state.

The same audio signals are sent from the [USB] connector and the [ACC] sockets.

- The beep tones and the voice synthesizer announcements are not sent.
- The received audio output level cannot be adjusted with the [AF] control.

- OFF (OPEN) : The received audio is always sent, regardless of the squelch state.
- ON : The received audio is sent when the squelch is open.

56. USB MOD Level (Default: 50%)

Set the input modulation level of the [USB] connector to between 0% and 100% in 1% steps.

57. 9600bps Mode (Default: OFF)

Turn the [DATA2] socket's 9600 bps data transmission ON or OFF.

- OFF : For only the regular audio (or slow data) transmission.
- ON : For 9600 bps data transmission.

58. DATA OFF MOD (Default: MIC,ACC)

Select the desired connector(s) for data modulation input in the data OFF mode.

- MIC : Use the signals from [MIC].
- ACC : Use the signals from [ACC] (pin 11).
- MIC, ACC : Use the signals from [MIC] and [ACC] (pin 11).
- USB : Use the signals from [USB].

59. DATA MOD (Default: ACC)

Select the desired connector(s) for data modulation input in the data mode.

- MIC : Use the signals from [MIC].
- ACC : Use the signals from [ACC] (pin 11).
- MIC, ACC : Use the signals from [MIC] and [ACC] (pin 11).
- USB : Use the signals from [USB].

60. CI-V Baud Rate (Default: Auto)

Set the CI-V data transfer rate between 300, 1200, 4800, 9600, 19200 bps and "Auto."

When "Auto" is selected, the baud rate is automatically set according to the data rate of the connected controller.

61. CI-V Address (Default: 7Ch)

To distinguish equipment, each CI-V transceiver has its own Icom standard address in hexadecimal code.

The IC-9100's address is 7Ch.

When 2 or more IC-9100's are connected to an optional CT-17 CI-V level converter, rotate [MAIN DIAL] to select a different address for each IC-9100; the range is 01h to DFh.

62. CI-V Transceive (Default: ON)

Turn the transceive function using the CI-V system ON or OFF.

When this item is set to ON, changing the frequency, operating mode, etc. on the IC-9100 automatically changes those settings on other Icom transceivers or receivers, and vice versa.

- OFF : Transceive function OFF
- ON : Transceive function ON

63. USB2/DATA1 Func (Default: [----]/GPS)

Two COM port numbers are assigned to the [USB] connector. One of them is "USB1," used for cloning and CI-V operation. The other one is "USB2," and the function is selected by this item.

- ---- : "USB2" is not used.
- RTTY : Used to send RTTY decoded signals.
- DVdat : Used for low-speed data input and output.
 - If you set the function of the [DATA1] jack to "GPS," and "DATA1 → USB2" is selected as the "GPS Out" item's option, as described below, "USB2" will be used for the low-speed data input and GPS data output.

64. USB2/DATA1 Func (Default: -----/[GPS])

Select the function of the [DATA1] jack.

- ----- : The [DATA1] jack is not used.
- RTTY : Used to send RTTY decoded signals.
- DVdat : Used for low-speed data input and output.
- GPS : Used for the GPS receiver connection for position data input.

65. GPS Out (Default: OFF)

When a GPS receiver is connected to the [DATA1] jack, the GPS position data is input through the jack.

You can select whether or not to send the data from the COM port ("USB2").

/// **NOTE:** You can use this function only when "-----" or "DVdat" is selected as the "USB2/DATA1 Func" (63) option, and "GPS" is selected as the "USB2/DATA1 Func" (64) option.

- OFF : Turns the function OFF.
- DATA1 → USB2 : Sends the GPS position data from the COM port ("USB2").

66. DVdat/GPS Out Baud (Default: 4800)

Set the DV or GPS data transfer speed to 4800 or 9600 bps.

67. RTTY Decode Baud (Default: 9600)

Set the RTTY decode monitor speed to 300, 1200, 4800, 9600 or 19200 bps.

68. Calibration Marker (Default: OFF)

Use as a simple frequency check of the transceiver. See page 179 for calibration procedure.

/// **NOTE:** Turn OFF the calibration marker after checking the frequency of the transceiver.

- OFF : Calibration marker OFF
- ON : Calibration marker ON

69. REF Adjust

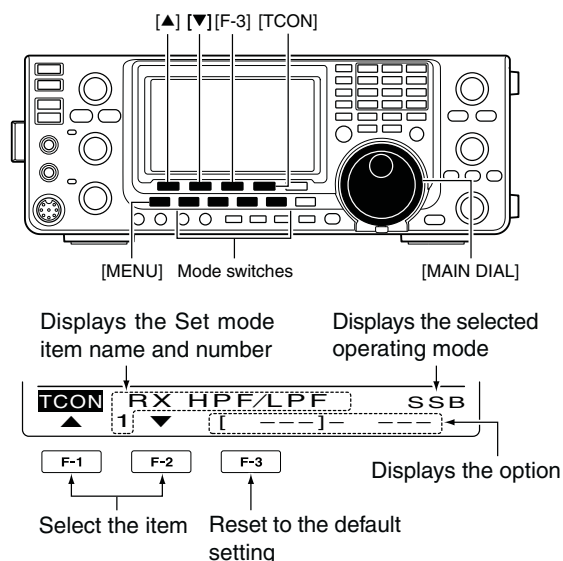
During frequency calibration, set the internal reference frequency to between 0% and 100% range in 1% steps.

/// **NOTE:** The default setting is different for each transceiver.

■ Tone control Set mode description

◇ The Tone control Set mode settings

- ① Push [MENU] one or more times to display the “M2” screen (Menu 2).
- ② Push [TCON](F-4) to enter the Tone control Set mode.
- ③ Push a mode switch to select the desired operating mode.
- ④ Push [▲](F-1) or [▼](F-2) to select the desired item.
 - Selectable items differ, depending on the selected operating mode.
- ⑤ Rotate [MAIN DIAL] to select the desired option.
 - You can select the option for each operating mode.
 - Hold down [F-3] for 1 second to reset to the default setting, if desired.
- ⑥ Push [MENU] to save, and exit the Set mode.



1. RX HPF/LPF (Default: OFF) (Mode: SSB/CW/RTTY/AM/FM/DV)

First select the operating mode, then set the receive audio high-pass filter to between 100 Hz and 2000 Hz in 100 Hz steps.

/// **NOTE:** When the receive audio high-pass and low-pass filters are active, “RX Bass” and “RX Treble” items will be reset to the default value.

2. RX HPF/LPF (Default: OFF) (Mode: SSB/CW/RTTY/AM/FM/DV)

First select the operating mode, then set the receive audio low-pass filter to between 500 Hz and 2400 Hz in 100 Hz steps.

/// **NOTE:** When the receive audio high-pass and low-pass filters are active, “RX Bass” and “RX Treble” items will be reset to the default value.

3. RX Bass (Default: 0) (Mode: SSB/AM/FM/DV)

First select the operating mode, then set the receive audio bass level to between -5 and +5.

4. RX Treble (Default: 0) (Mode: SSB/AM/FM/DV)

First select the operating mode, then set the receive audio treble level to between -5 and +5.

5. TX Bass (Default: 0) (Mode: SSB/AM/FM/DV)

First select the operating mode, then set the transmit audio bass level to between -5 and +5.

6. TX Treble (Default: 0) (Mode: SSB/AM/FM/DV)

First select the operating mode, then set the transmit audio treble level to between -5 and +5.

7. TBW(WIDE) L (Default: 100) (Mode: SSB)

Set the lower cut-off frequency of the transmission passband width for your wide setting to 100, 200, 300 or 500 Hz.

8. TBW(WIDE) H (Default: 2900) (Mode: SSB)

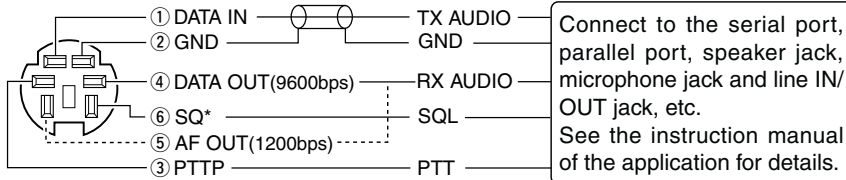
Set the higher cut-off frequency of the transmission passband width for your wide setting to 2500, 2700, 2800 or 2900 Hz.

15 DATA COMMUNICATION

■ Connections

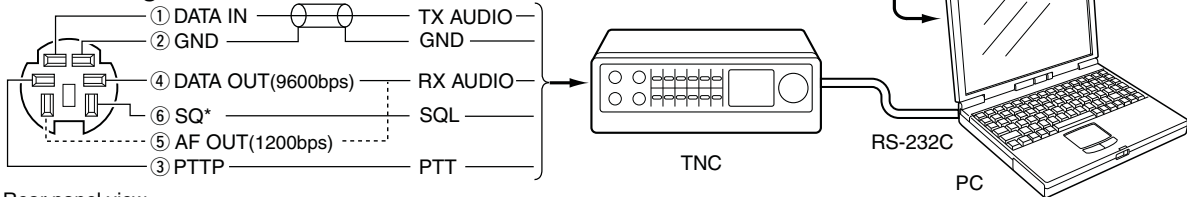
◇ When connecting to [DATA2]

• When using a PC application



* When connecting the squelch line, consult the necessary manual (TNC, etc.).

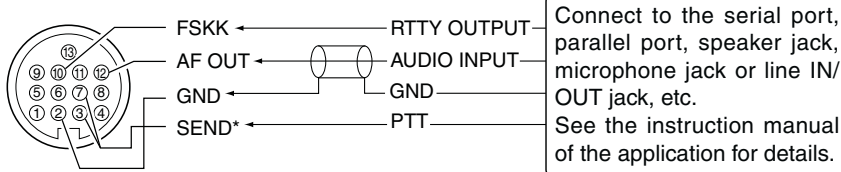
• When using a TNC



Rear panel view

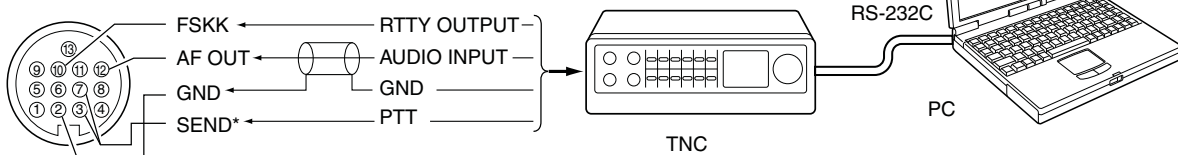
◇ When connecting to [ACC]

• When using a PC application



*③ HF/50 MHz : HSEND
⑦ 144/430/1200 MHz : VSEND

• When using a TNC

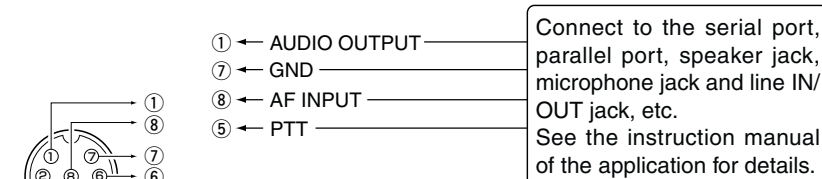


Rear panel view

• Select pin 7 (VSEND) and pin 3 (HSEND) output usage in the Set mode. (p. 166)

◇ When connecting to [MIC]

• When using a PC application



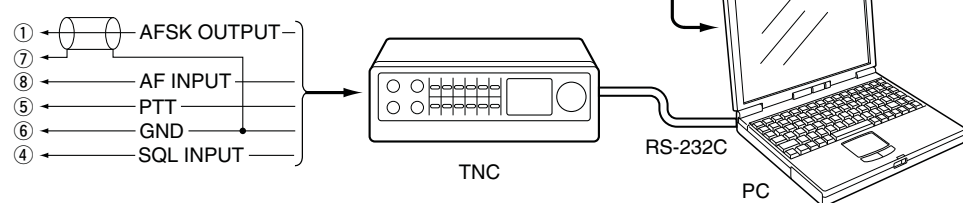
*1 When using the VOX function, no connection is needed. Refer to the instruction manual of the external equipment.

*2 When connecting the squelch line, consult the necessary manual.



Rear panel view

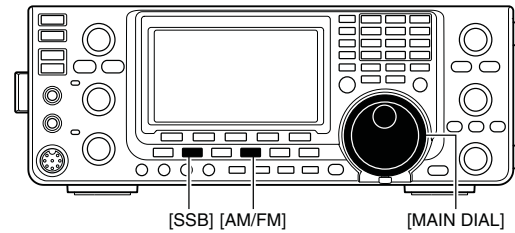
• When using a TNC



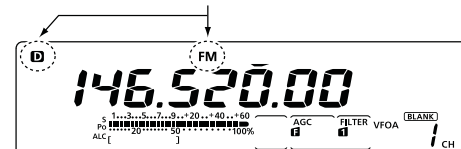
■ Packet (AFSK) operation

Before operating packet (AFSK), be sure to consult the operating manual that came with your TNC.

- ① Connect the TNC and PC. (p. 171)
- ② Select the desired band. (p. 35)
- ③ Push [SSB] or [AM/FM] to select the desired operating mode. (p. 43)
- ④ Hold down the same key you pushed in step ③ to select the Data mode.
- ⑤ Rotate [MAIN DIAL] to select the desired frequency.
- ⑥ Transmit your AFSK signals using your PC's keyboard.
 - Rotate [RF POWER] to set the output power.
 - While using a TNC, the relative strength of the transmitted signal is indicated on the Po meter.
 - When operating in the SSB data mode, adjust the output power so that the ALC meter reading stays in the ALC zone.



Appears when the FM data mode is selected.



NOTE: When connecting the TNC to the ACC socket on the rear panel, select the USB, LSB, AM and FM data mode, or disconnect the microphone and rotate [MIC GAIN] fully counterclockwise.

When the SSB data mode is selected, the audio input from the [MIC] connector is automatically cut, and the audio input from the [ACC] socket is used.

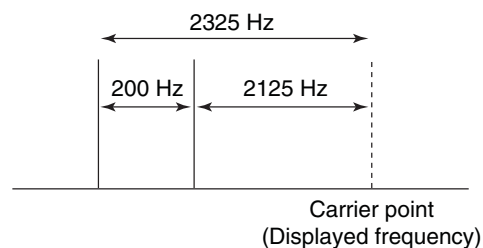
Also, when the SSB data mode is selected, the fixed settings listed below are automatically selected;

- Speech compressor : OFF
- Transmit bandwidth : MID (Fixed to the default value; 300 Hz to 2700 Hz.)
- Tx tone (Bass) : 0
- Tx tone (Treble) : 0

◇ Frequency display during AFSK operation

When operating AFSK in the SSB mode, the displayed frequency is the signal's carrier point.

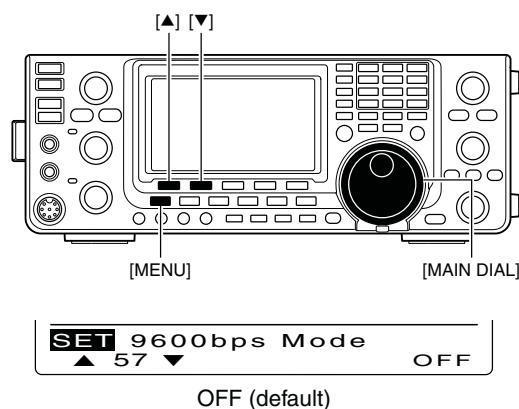
- **Example**— LSB/LSB data mode
 Mark freq.: 2125 Hz
 Shift freq.: 200 Hz



■ Data transmission speed

In the FM data mode, the transceiver can be set to a maximum data speed of 9600 bps.

- ① Hold down [MENU] for 1 second to enter the Set mode.
- ② Push [▲](F-1) or [▼](F-2) to select “9600bps Mode.”
- ③ Rotate [MAIN DIAL] to turn the 9600 bps mode ON or OFF.
 - ON : 9600 bps data speed
 - OFF : Disables data transmission at 9600 bps.
This is used for only regular audio or slower data transmission.
- ④ Push [MENU] to save and exit the Set mode.



■ Adjusting the TNC output level

When the data transmission speed is set to 9600 bps, the data signal coming from the TNC is applied exclusively to the internal limiter circuitry to automatically maintain band width.

NEVER apply data levels from the TNC of over 0.6 Vp-p. Otherwise the transceiver will not be able to maintain the band width, and your transmitted signal may possibly interfere with other stations.

◇ Using a level meter or synchroscope

When using a level meter or synchroscope, adjust the TX audio output level (DATA IN level) from the TNC as follows.

- 0.4 Vp-p (0.2 Vrms) : recommended level
- 0.2–0.5Vp-p (0.1–0.25 Vrms) : acceptable level

◇ Not using a measuring device

- ① Connect the TNC to the transceiver. (p. 171)
- ② Enter a test mode (“CAL,” etc.) on the TNC, then transmit some test data.
- ③ If the transceiver fails to transmit the test data, or transmits sporadically, (TX/RX indicator doesn’t light or it flashes):
 - Decrease the TNC output level until the transmit indicator lights continuously.
 If transmission is not successful, even though the TX indicator lights continuously:
 - Increase the TNC output level.

INFORMATION!

When “RTTY” is selected as the “USB2/DATA1 Func” (63) item option in the Set mode, the USB port sends RTTY decode signal. In this case, you must connect a USB cable* between the transceiver’s USB port on the rear panel and the PC. (p. 167)

*Purchase separately

- The USB driver and the installation guide can be downloaded from our website.
URL: <http://www.icom.co.jp/world/index.html>.

■ Opening the transceiver's case

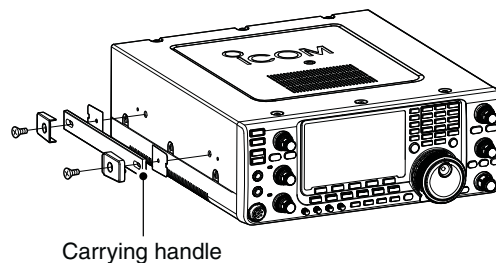
Icom strongly suggests that the customer have their dealer or Icom distributor, for a reasonable fee, install Icom options at the time of the order. Icom understands that even the simplest of installations demands the judgment of a trained Icom technician. Therefore, Icom will not be responsible for damage to the optional unit, or subsequent damage to the transceiver due to user installation problems. The option's or the transceiver's Warranty can be voided in such situations, at the sole judgment of Icom.

For those customers who still wish to install their own options, knowing the risks and possible consequences, the following information is provided for information purposes only.

The following are instructions for removing the covers of the IC-9100.

⚠ WARNING! Turn OFF the power and disconnect the DC power cable from the transceiver before performing any work on the transceiver. Otherwise, there is danger of electric shock and/or equipment damage.

① Remove the two screws from the carrying handle and remove it from the transceiver.

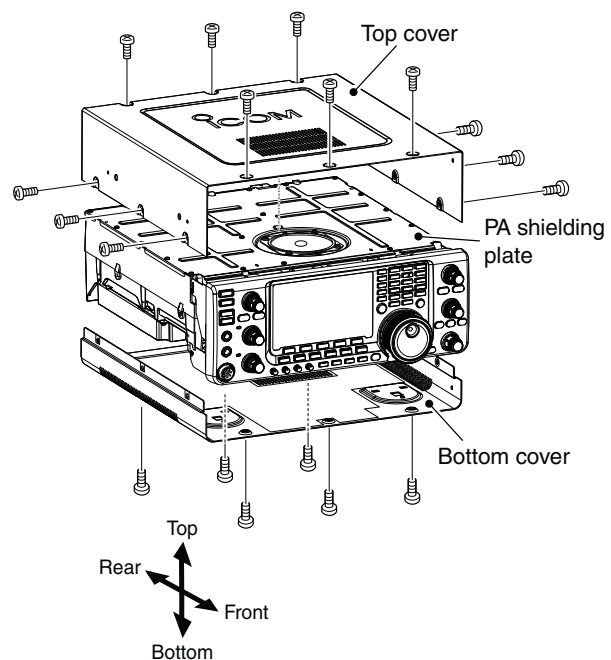


② Remove the seven screws from the top of the transceiver and the six screws from the sides, then lift up the top cover.

③ Turn the transceiver upside-down.

CAUTION: NEVER HOLD THE UNIT BY THE MAIN DIAL OR ANY OTHER KNOBS when you turn the transceiver upside down. This may damage them, or cause you to drop the transceiver.

④ Remove the six screws from the bottom, and then lift off the bottom cover.



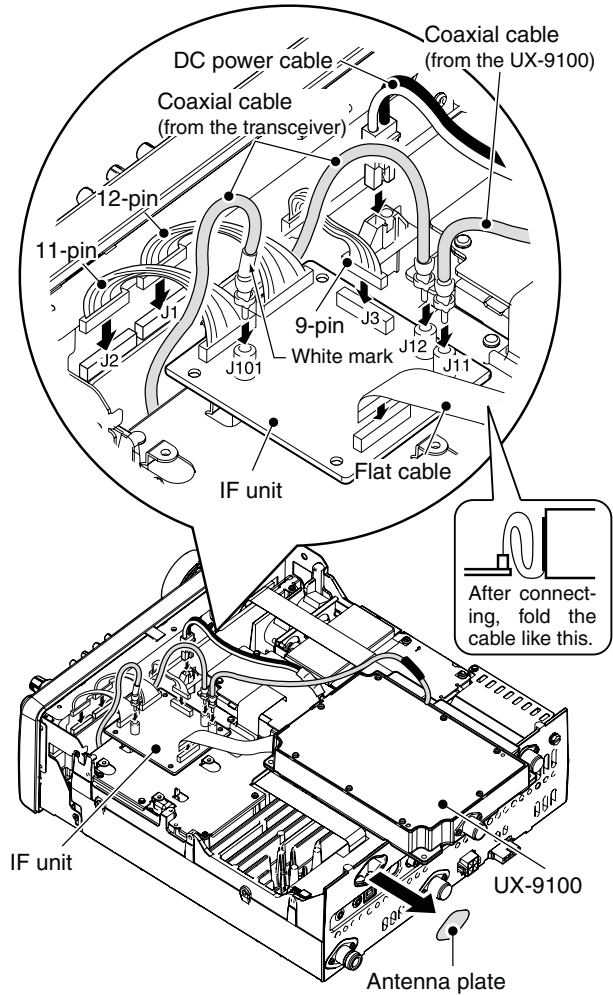
✓ About the leg pads

To detach the leg pads from the right side panel of the top/bottom cover, push them out from the inside of each cover, after completing steps ① through ④ above.

■ UX-9100 1200 MHz BAND UNIT installation

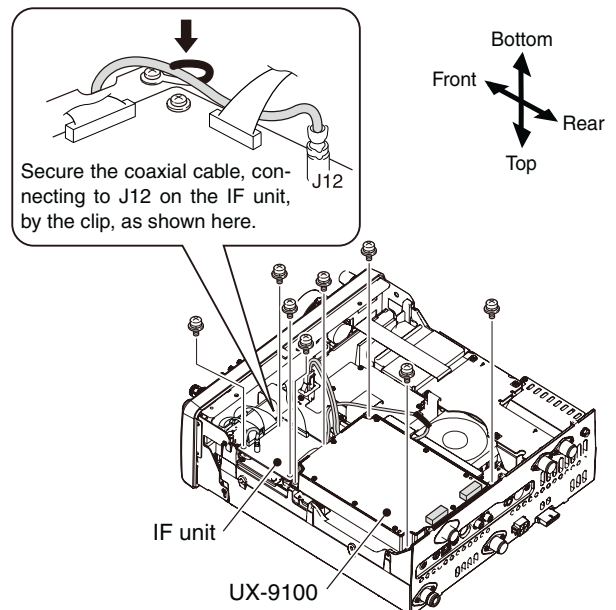
The optional UX-9100 is required to operate on the 1200 MHz frequency band.

- ① Remove the top and bottom covers as shown in the diagram on page 174.
- ② Remove the antenna plate from the chassis on the rear panel using a standard flat screwdriver.
 - ⚠ **WARNING! NEVER** push on the antenna plate using your finger to remove it. This may cause an injury.
- ③ Connect the DC power cable, coaxial cables and flat cable, as shown to the right.
 - ➔ Connect the longer coaxial cable from the transceiver to J12, and the other one, with a white mark near the connector, to J101 on the IF unit.
 - ➔ Connect the coaxial cable from the UX-9100's main unit to J11 on the IF unit.
 - ➔ Ensure the flat cable is connected to the IF unit correctly, and not upside down. After connecting, fold the cable, but not too tightly, as illustrated to the right.
- ④ Connect the 9-pin connector from the transceiver's front unit to J3 on the IF unit.
- ⑤ Connect the 12-pin connector from the IF unit to J1, and the 11-pin connector to J2 on the transceiver's front unit.



- ⑥ Attach the UX-9100 and IF unit using the eight supplied screws.
 - Make sure the flat cable is not pinched when the UX-9100 is installed.
- ⑦ Return the top and bottom covers to their original positions.

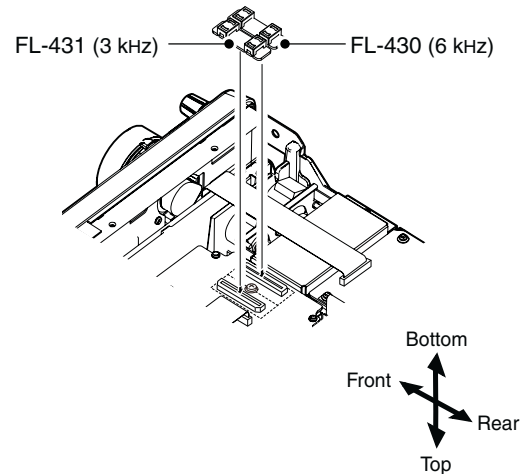
⚠ **WARNING!** When UX-9100 is installed, the unit continues to draw current, even when the transceiver is turned OFF. Therefore, when you don't intend to use the transceiver for a long period of time, disconnect the transceiver's DC power cable.



■ FL-430/FL-431 1ST IF FILTER installation

The optional Roofing Filters, FL-430 1ST IF FILTER (6 kHz) or FL-431 1ST IF FILTER (3 kHz) provides 6 or 3 kHz filtering to reduce interference from strong nearby signals.

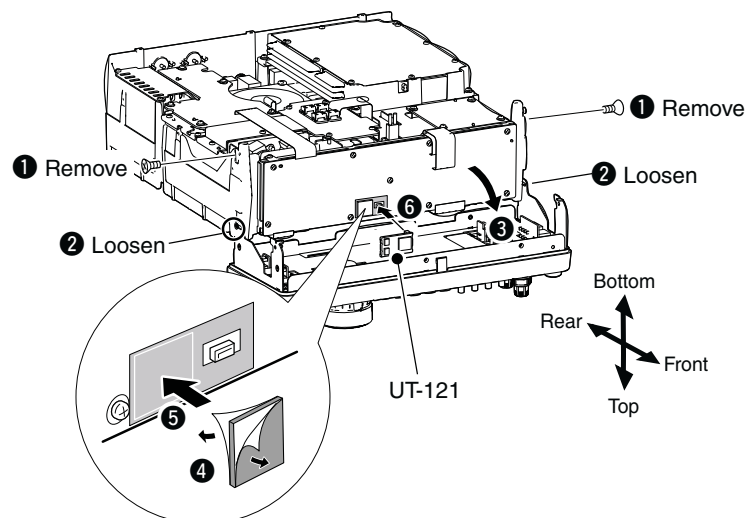
- ① Remove the top and bottom covers as shown on page 174.
- ② Install the FL-430 or FL-431 as shown to the right.
 - The connectors on the IC-9100 are marked for the appropriate filter.
 - Ensure the FL-430 or FL-431 is installed correctly.
- ③ Return the top and bottom covers to the original positions.



■ UT-121 DIGITAL UNIT installation

The optional UT-121 DIGITAL UNIT is required for DV mode operation, including the DR mode.

- ① Remove the top and bottom covers as shown on page 174.
- ② Remove the upper two screws from the front panel (①).
- ③ Loosen the lower two screws on the front panel (②), then slowly fold down the front panel in the direction of the arrow (③).
- ④ Remove the protective paper from one side of the double sided adhesive sheet (④), then place the sheet on the panel, as shown below. (⑤).
- ⑤ Remove the other side of the protective paper, and install the UT-121 as shown below (⑥).
- ⑥ Return the front panel, top and bottom covers to their original positions.



17 MAINTENANCE

■ Troubleshooting

The following chart is designed to help you correct problems which are not equipment malfunctions.

If you are unable to locate the cause of a problem, or solve it through the use of this chart, contact your nearest Icom Dealer or Service Center.

◇ Transceiver power

PROBLEM	POSSIBLE CAUSE	SOLUTION	REF.
Power does not turn ON when the [POWER] switch is pushed.	<ul style="list-style-type: none"> • The power cable is improperly connected. • A fuse is blown. 	<ul style="list-style-type: none"> • Re-connect the DC power cable correctly. • Correct the cause, then replace the fuse with an equivalent fuse. (Fuses are installed in the DC power cable and in the internal PA unit.) 	p. 27 p. 180

◇ Transmit and receive

PROBLEM	POSSIBLE CAUSE	SOLUTION	REF.
No sound from the speaker.	<ul style="list-style-type: none"> • The audio volume level is too low. • The squelch is closed. • The transceiver is in transmit. 	<ul style="list-style-type: none"> • Rotate the [AF] control clockwise to obtain a suitable listening level. • Rotate the [RF/SQL] control to 11 o'clock position to open the squelch. • Push [TRANSMIT] to receive or check the SEND line of an external unit, if connected. 	p. 45 p. 44 p. 46
Sensitivity is too low, and only strong signals are audible.	<ul style="list-style-type: none"> • The antenna is not connected properly. • The antenna for another band is selected. • The antenna is not properly tuned. • The attenuator is turned ON. 	<ul style="list-style-type: none"> • Re-connect to the antenna connector. • Select an antenna suitable for the operating frequency. • Hold down [TUNER] for 1 second to manually tune the antenna. • Push [P.AMP/ATT] one or more times to select "ATT OFF." 	— p. 158 p. 159 p. 71
Received audio is unclear or distorted.	<ul style="list-style-type: none"> • The operating mode is not matched. • The Passband Tuning function is turned ON. • Noise Blanker functions when receiving a strong signal. • Pre-amplifier is turned ON. • The Noise Reduction function is turned ON and the [NR] control is too far clockwise. 	<ul style="list-style-type: none"> • Select a suitable operating mode. • Hold down [PBT-CLR] for 1 second to reset the function. • Push [NB] to turn OFF the function. • Push [P.AMP/ATT] one or more times to turn OFF the function. • Set the [NR] control for maximum readability. 	p. 43 p. 75 p. 76 p. 71 p. 77
[ANT•METER] does not function	<ul style="list-style-type: none"> • The Antenna Switch function has not been turned ON. 	<ul style="list-style-type: none"> • Set the Antenna Switch function to "Auto" or "Manual" in the Set mode. 	p. 163
Transmitting is impossible.	<ul style="list-style-type: none"> • The operating frequency is outside the selected ham band. 	<ul style="list-style-type: none"> • Set the frequency to be within the selected ham band. 	p. 37
Output power is too low.	<ul style="list-style-type: none"> • The [RF POWER] control is set too far counterclockwise • The [MIC GAIN] control is set too far counterclockwise • The antenna for another band is selected. • The antenna is not properly tuned. 	<ul style="list-style-type: none"> • Rotate the [RF POWER] control clockwise. • Set the [MIC GAIN] control to a suitable position. • Select an antenna suitable for the operating frequency. • Hold down [TUNER] for 1 second to manually tune the antenna. 	p. 46 p. 46 p. 158 p. 159
No contact can be made with another station.	<ul style="list-style-type: none"> • The RIT or ΔTX function is turned ON. • The Split function and/or Duplex function are turned ON. 	<ul style="list-style-type: none"> • Push [RIT] or [ΔTX] to turn OFF the function. • Push [SPLIT] and/or [DUP](F-2) (in the "M1" screen) to turn OFF the function. 	pp. 69, 81 pp. 65, 82
Transmit signal is unclear or distorted.	<ul style="list-style-type: none"> • The [MIC GAIN] control is set too far clockwise. 	<ul style="list-style-type: none"> • Set the [MIC GAIN] control to a suitable position. 	p. 46
Repeater cannot be accessed.	<ul style="list-style-type: none"> • The split or duplex function is not turned ON. • The programmed subaudible tone frequency is wrong. 	<ul style="list-style-type: none"> • Push [SPLIT] and/or [DUP](F-2) (in the "M1" screen) to turn ON the function. • Reset the frequency. 	pp. 65, 82 p. 65
AM cannot be selected.	<ul style="list-style-type: none"> • The 1200 MHz frequency band is selected. 	<ul style="list-style-type: none"> • Select the HF/50/144/430 MHz frequency band. 	pp. 43, 61
Transmitting is impossible in AM.	<ul style="list-style-type: none"> • The 144/430/1200 MHz frequency band is selected. 	<ul style="list-style-type: none"> • Select the HF/50 MHz frequency band. 	pp. 43, 46

◇ Scanning

PROBLEM	POSSIBLE CAUSE	SOLUTION	REF.
Programmed scan does not stop.	<ul style="list-style-type: none"> • Squelch is open. 	<ul style="list-style-type: none"> • Set the [RF/SQL] control to the threshold point. 	pp. 44, 146
Programmed scan does not start.	<ul style="list-style-type: none"> • The same frequencies have been programmed into both "1A-3A" and "1b-3b" of the scan edge memory channels. 	<ul style="list-style-type: none"> • Program different frequencies into the "1A-3A" and "1b-3b" scan edge memory channels. 	p. 148
Memory scan does not start.	<ul style="list-style-type: none"> • 2 or more memory channels have not been programmed. 	<ul style="list-style-type: none"> • Program more than 2 memory channels. 	p. 140
Select memory scan does not start.	<ul style="list-style-type: none"> • 2 or more memory channels have not been designated as select channels. 	<ul style="list-style-type: none"> • Designate more than 2 memory channels as select channels for the scan. 	p. 151
Mode select memory scan does not start.	<ul style="list-style-type: none"> • 2 or more memory channels with desired mode have not been programmed. 	<ul style="list-style-type: none"> • Program more than 2 memory channels with the desired operating mode. 	p. 43
ΔF scan does not start.	<ul style="list-style-type: none"> • The center frequency for ΔF scan is not programmed. 	<ul style="list-style-type: none"> • Program the center frequency for a ΔF scan. 	p. 152

◇ Display

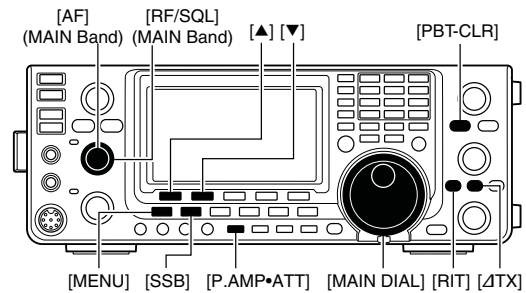
PROBLEM	POSSIBLE CAUSE	SOLUTION	REF.
The displayed frequency does not change properly.	<ul style="list-style-type: none"> • The dial lock function is turned ON. • The Set mode screen is selected. • The internal CPU has malfunctioned. 	<ul style="list-style-type: none"> • Hold down [SPEECH/LOCK] for 1 second to turn OFF the function. • Push [MENU] to exit the Set Mode. • Reset the CPU. 	<p>p. 77</p> <p>p. 161</p> <p>p. 181</p>

■ Frequency calibration (approximate)

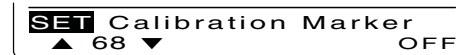
A very accurate frequency counter is required to calibrate the frequency of the transceiver. However, a rough check may be performed by receiving radio station WWV, WWVH, or other standard frequency signals.

CAUTION: The IC-9100 has been thoroughly adjusted and tested at the factory before being shipped. You should not have to re-calibrate it.

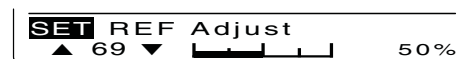
- ① Push [SSB] to select the USB mode.
- ② Push [PBT-CLR] for 1 second to clear the PBT settings and make sure that the RIT/ Δ TX function is not turned ON.
- ③ Set the frequency to the standard frequency station minus 1 kHz.
 - When receiving WWV or WWVH (at 15.000.00 MHz) as a standard frequency, set the operating frequency for 14.999.00 MHz.
 - Other standard frequencies can also be used.
- ④ Hold down [MENU] for 1 second to enter the Set mode.
- ⑤ Push [\blacktriangle](F-1) or [\blacktriangledown](F-2) to select “Calibration Marker.”
- ⑥ Rotate [MAIN DIAL] to turn ON the calibration marker.
 - A sidetone may be heard.
- ⑦ Push [\blacktriangledown](F-2) to select “REF Adjust.”
- ⑧ Rotate [MAIN DIAL] to adjust for a zero beat with the received standard signal.
 - Zero beat means that two signals are exactly the same frequency, resulting in a single tone being heard.
- ⑨ Push [\blacktriangle](F-1) to select “Calibration Marker.”
- ⑩ Rotate [MAIN DIAL] to turn OFF the calibration marker.
- ⑪ Push [MENU] to save, and exit the Set mode.



• Calibration marker item



• REF Adjust item

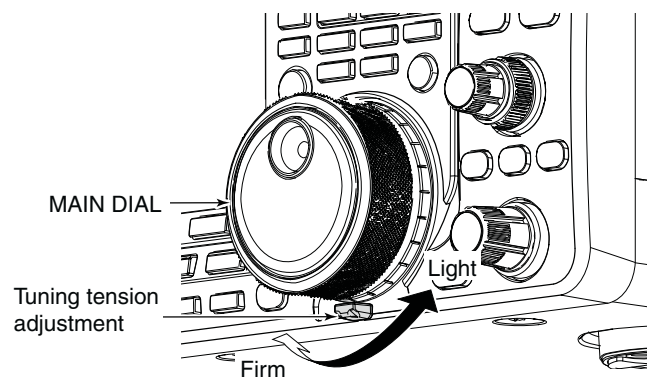


■ Main dial tuning tension adjustment

The tuning tension of [MAIN DIAL] may be adjusted to suit your preference.

The tension adjustment is located on the bottom side of the front panel. See the figure to the right.

Slide the tension adjustment to a comfortable level while turning the dial continuously and evenly in one direction.



■ Fuse replacement

If a fuse blows, or the transceiver stops functioning, find the source of the problem, and repair it. Then replace the damaged fuse with a new, adequately rated fuse.

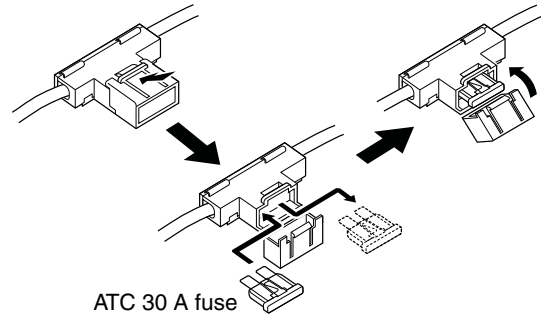
⚠ **WARNING!** Turn OFF the power and disconnect the DC power cable from the transceiver before performing any work on the transceiver. Otherwise, there is danger of electric shock, equipment damage and/or fire injury.

The IC-9100 has two fuse types installed for transceiver protection.

- DC power cable fuses ATC 30 A
- Circuitry fuse ATC 5 A

◇ DC power cable fuse replacement

Refer the figure described to the right for the DC power cable fuse replacement.

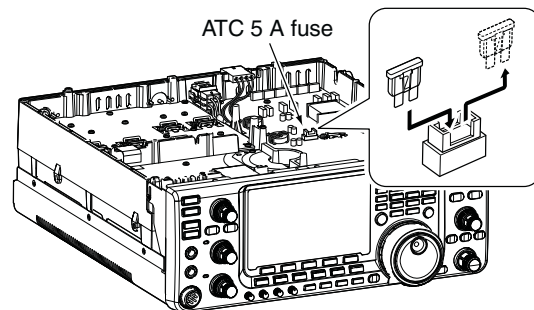
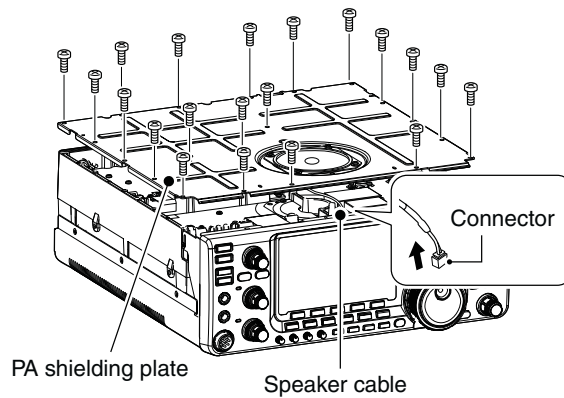


◇ Circuitry fuse replacement

Except for the power amplifier, the 13.8 V DC from the DC power cable is applied to all units in the IC-9100, through the circuitry fuse. This fuse is located in the PA unit.

- ① Remove the top cover. (p. 174)
- ② Remove the 22 screws, then remove the PA shielding plate as shown to the right.
- ③ Remove the speaker cable from the connector on the PA unit as shown to the right.
- ④ Replace the circuitry fuse as shown in the diagram to the right.
- ⑤ Replace the speaker cable, PA shielding plate, top cover and screws to their original position.

⚠ **CAUTION: DO NOT** pull the speaker cable when removing the PA shielding plate, or **DO NOT** put the speaker cable under the PA shielding plate when replacing it. This could damage the transceiver.



■ Resetting the CPU

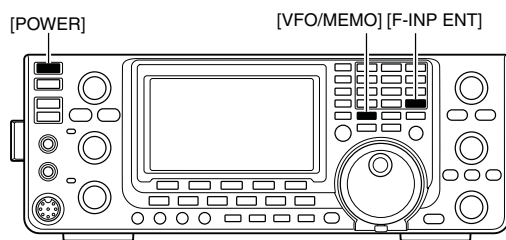
◇ Partial reset

If you want to reset the operating parameters to their default values (VFO frequency, VFO settings, menu group's contents) without clearing certain data as described below, a partial reset can be performed.

The following data will not be cleared when doing a Partial reset:

- Memory contents
- Call sign memories
- Repeater lists
- TX messages
- GPS memories
- GPS messages
- Memory keyer contents
- Programmed user band edge frequencies
- Programmed Auto Repeater frequency ranges
- REF Adj (Reference frequency) setting

- ① First, turn OFF the transceiver power.
- ② While holding down [F-INP ENT] and [VFO/MEMO], push [POWER] to turn ON the power.
 - During start-up, the transceiver displays "PARTIAL RESET," then its initial VFO frequencies when resetting is complete.
 - If you operate the transceiver before "PARTIAL RESET" disappears, the resetting will be cancelled.
- ③ If desired, edit the Set mode settings after resetting.



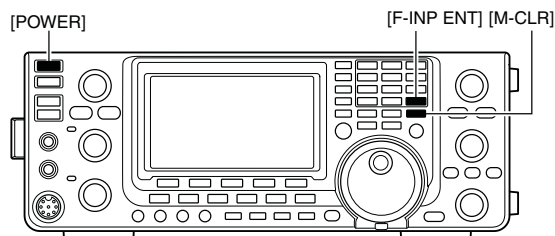
◇ All reset

The display may occasionally display erroneous information (e.g. when first applying power). This may be caused externally by static electricity or by other factors.

If this problem occurs, turn OFF the power. After waiting a few seconds, turn ON the power again. If the problem persists, perform the following procedure.

/// **NOTE:** Resetting the CPU **CLEARs** all programmed contents and returns them to their default settings.

- ① First, turn OFF the transceiver power.
- ② While holding down [F-INP ENT] and [M-CLR], push [POWER] to turn ON the power.
 - During start-up, the transceiver displays "ALL CLEAR," then when resetting is complete, then displays the initial VFO frequencies.
 - If you operate the transceiver before "ALL CLEAR" disappears, the resetting will be cancelled.
- ③ After resetting, edit the Set mode settings, if desired.



■ Data cloning

◇Cloning between transceivers

The IC-9100 has transceiver-to-transceiver data cloning capability.

This function is useful when you want to copy all of the programmed contents from one IC-9100 to another.

- A mini plug cable is required. (Purchase separately)

- ① Connect a mini plug cable to the [REMOTE] jack of the master and sub transceivers.
 - The master transceiver is used to send data to the sub transceiver.
- ② **Sub transceiver's operation:**
While holding down [F-1] on the sub transceiver, push [POWER] to turn ON the power and enter the cloning mode.

Master transceiver's operation:

While holding down [F-2] on the master transceiver, push [POWER] to turn ON the power and enter the cloning mode.

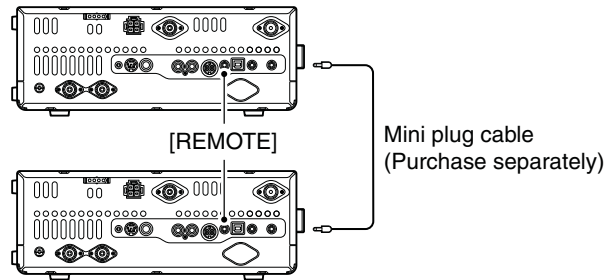
- "CLONE" appears and the transceivers enter the clone standby mode.
 - "M" appears on the master transceiver's display to indicate it as the master transceiver.
- ③ Push [OUT](F-5) on the master transceiver.
 - "CLONE OUT" appears on the master transceiver's display, and the bar meter shows that data is being transferred to the sub-transceiver.
 - "CLONE IN" appears automatically on the sub-transceiver's display, and the bar meter shows that data is being received from the master transceiver.
 - ④ When cloning is finished, turn power OFF, then ON again to exit the cloning mode.
 - "CLONE END" appears automatically on the sub-transceiver's display after the cloning is completed.

◇Cloning using a personal computer

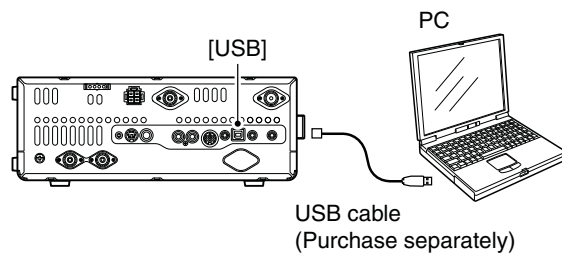
The optional CS-9100 CLONING SOFTWARE is also available to clone/edit contents with a PC using ICF format files.

Microsoft® Windows® XP (32bit), Windows Vista® (32/64bit) or Windows® 7 (32/64bit) OS is required.

- A USB cable is required to connect the transceiver and a PC. (Purchase separately)



- /// Use as short a mini plug cable as possible.
- /// Depending on the length of the cable, data cloning cannot be done.

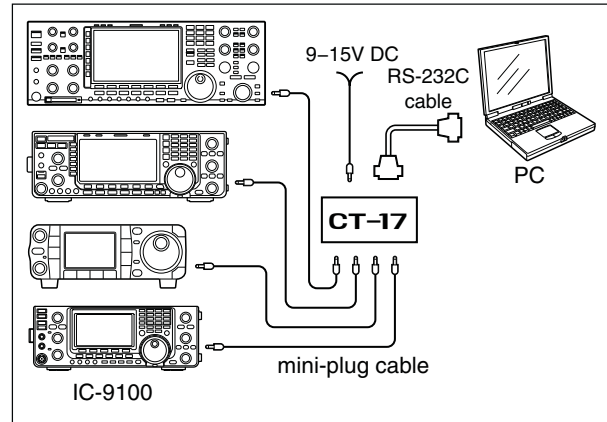


18 CONTROL COMMAND

■ Remote jack (CI-V) information

◇ CI-V connection example

The transceiver can be connected through an optional CT-17 CI-V LEVEL CONVERTER to a PC equipped with an RS-232C port. The Icom Communications Interface-V (CI-V) controls the transceiver. Up to 4 Icom CI-V transceivers or receivers can be connected to the PC. See p. 167 for setting the CI-V condition using the set mode.

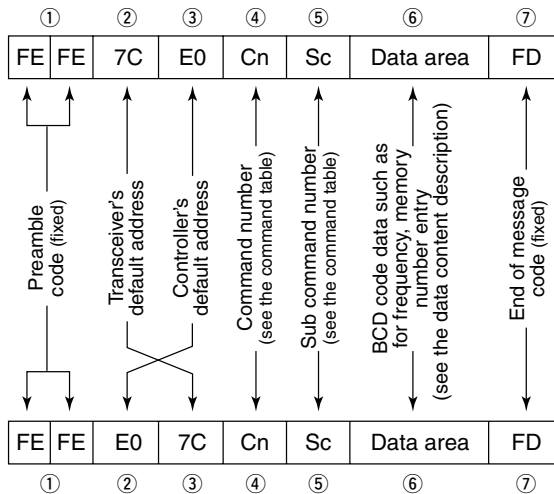


When the transceiver is connected to a PC with the USB cable (purchased separately), the optional CT-17 is not required.

◇ Data format

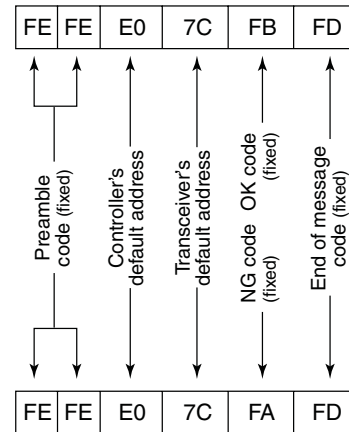
The CI-V system can be operated using the following data formats. Data formats differ depending on command numbers. A data area or sub command is added to some commands.

Controller to IC-9100



IC-9100 to controller

OK message to controller



NG message to controller

◇ Command table

Cmd.	Sub cmd.	Data	Description
00		see p. 190	Send operating frequency for transceiver
01		see p. 190	Send operating mode for transceiver
02		see p. 191	Read band edge frequencies
03		see p. 190	Read operating frequency
04		see p. 190	Read operating mode
05		see p. 190	Send operating frequency
06		see p. 190	Send operating mode
07			Select VFO mode
	00		Select VFO A
	01		Select VFO B
	A0		Equalize VFO A and VFO B Or, equalize MAIN and SUB Bands
	B0		Exchange VFO A and VFO B Or, exchange MAIN and SUB Bands
	D0		Select MAIN Band
	D1		Select SUB Band
08			Select Memory mode
		0001 to 0105	Select Memory channel (0001=M-CH01 to 0099=M-CH99, 0100=1A, 0101=1b, 0102=2A, 0103=2b, 0104=3A, 0105=3b)
		0106	Select Call channel
		00 to 19	Select Satellite Memory channel (00=Satellite M-CH00 to 19=Satellite M-CH19)
09			Memory write
0A			Memory copy to VFO
0B			Memory clear
0C			Read offset frequency
0D			Send offset frequency
0E			Scan stop
	00		Programmed/memory scan start
	01		Programmed scan start
	02		Programmed scan start
	03		ΔF scan start
	12		Fine programmed scan start
	13		Fine ΔF scan start
	22		Memory scan start
	23		Select memory scan start
	24		Mode select scan start
	A1		Set ΔF scan span ±5 kHz
	A2		Set ΔF scan span ±10 kHz
	A3		Set ΔF scan span ±20 kHz
	A4		Set ΔF scan span ±50 kHz
	A5		Set ΔF scan span ±100 kHz
	A6		Set ΔF scan span ±500 kHz
	A7		Set ΔF scan span ±1 MHz
	B0		Set as non-select channel
	B1		Set as select channel (The previously set number by CI-V is set after turning power ON, or "1" is selected if no selection is performed.)
	D0		Set scan resume OFF
	D3		Set scan resume ON
0F			Read Split function or duplex setting
	00		Set the Split function OFF
	01		Set the Split function ON
	10		Set simplex operation
	11		Set -DUP operation
	12		Set +DUP operation

Cmd.	Sub cmd.	Data	Description
10		00	Send/read the tuning step 10 Hz (1 Hz)
		01	Send/read the tuning step 100 Hz
		02	Send/read the tuning step 1 kHz
		03	Send/read the tuning step 5 kHz
		04	Send/read the tuning step 6.25 kHz
		05	Send/read the tuning step 9 kHz
		06	Send/read the tuning step 10 kHz
		07	Send/read the tuning step 12.5 kHz
		08	Send/read the tuning step 20 kHz
		09	Send/read the tuning step 25 kHz
		10	Send/read the tuning step 50 kHz
		11	Send/read the tuning step 100 kHz
		12	Send/read the tuning step 1 MHz (except for HF/50 MHz band)
11		00	Send/read attenuator OFF
		20	Send/read 20 dB attenuator
12	00		Send/read ANT1 selection
	01		Send/read ANT2 selection
13	00		Announce operating frequency, operating mode and S-meter level with voice syn- thesizer
	01		Announce operating frequency and S- meter level with voice synthesizer
	02		Announce operating mode with voice syn- thesizer
14	01	0000 to 0255	Send/read [AF] position (0000=max. CCW, 0255=max. CW)
	02	0000 to 0255	Send/read [RF/SQL] position (RF gain level) (0000=max. CCW, 0255=11 o'clock)
	03	0000 to 0255	Send/read [RF/SQL] position (squelch level) (0000=11 o'clock, 0255=max. CW)
	06	0000 to 0015	Send/read [NR] position (0000=max. CCW, 0255=max. CW)
	07	0000 to 0255	Send/read inner [TWIN PBT] position (0000=max. CCW, 0128=center, 0255=max. CW)
	08	0000 to 0255	Send/read outer [TWIN PBT] position (0000=max. CCW, 0128=center, 0255=max. CW)
	09	0000 to 0255	Send/read [CW PITCH] position (0000=max. CCW, 0128=center, 0255=max. CW)
	0A	0000 to 0255	Send/read [RF POWER] position (0000=max. CCW to 0255=max. CW)
	0B	0000 to 0255	Send/read [MIC GAIN] position (0000=max. CCW to 0255=max. CW)
	0C	0000 to 0255	Send/read [KEY SPEED] position (0000=max. CCW to 0255=max. CW)
	0D	0000 to 0255	Send/read [NOTCH] position (0000=max. CCW, 0128=center, 0255=max. CW)
	0E	0000 to 0255	Send/read COMP level (0000=0 to 0255=10)
	0F	0000 to 0255	Send/read Break-IN Delay setting (0000=2.0d to 0255=13.0d)
	12	0000 to 0255	Send/read NB level (0000=0% to 0255=100%)
	15	0000 to 0255	Send/read Monitor gain (0000=0% to 0255=100%)
	16	0000 to 0255	Send/read VOX gain (0000=0% to 0255=100%)
	17	0000 to 0255	Send/read Anti VOX gain (0000=0% to 0255=100%)
	18	0000 to 0255	Send/read CONTRAST level (0000=0% to 0255=100%)
	19	0000 to 0255	Send/read BRIGHT level (0000=0% to 0255=100%)

18 CONTROL COMMAND

◇ Command table (continued)

Cmd.	Sub cmd.	Data	Description
15	01	00	Read squelch status (squelch close)
		01	Read squelch status (squelch open)
	02	0000 to 0255	Read S-meter level (0000=S0, 0120=S9, 0240=S9+60 dB)
	11	0000 to 0255	Read RF power meter (0000=0%, 0141=50%, 0215=100%)
	12	0000 to 0255	Read SWR meter (0000=SWR1.0, 0041=SWR1.5, 0081=SWR2.0, 0120=SWR3.0)
	13	0000 to 0255	Read ALC meter (0000=Min. to 0120=Max.)
	14	0000 to 0255	Read COMP meter (0000=0 dB, 0120=15 dB, 0240=30 dB)
16	02	00	Send/read Preamp OFF
		01	Send/read Preamp ON (144/430/1200 MHz)
		02	Send/read Preamp 2 ON (HF/50 MHz)
	12	01	Send/read AGC FAST
		02	Send/read AGC MID
		03	Send/read AGC SLOW
	22	00	Send/read Noise Blanker OFF
		01	Send/read Noise Blanker ON
	40	00	Send/read Noise Reduction OFF
		01	Send/read Noise Reduction ON
	41	00	Send/read Auto Notch function OFF
		01	Send/read Auto Notch function ON
	42	00	Send/read Repeater tone OFF
		01	Send/read Repeater tone ON
	43	00	Send/read Tone squelch OFF
		01	Send/read Tone squelch ON
	44	00	Send/read Speech compressor OFF
		01	Send/read Speech compressor ON
	45	00	Send/read Monitor function OFF
		01	Send/read Monitor function ON
	46	00	Send/read VOX function OFF
		01	Send/read VOX function ON
	47	00	Send/read BK-IN function OFF
		01	Send/read Semi BK-IN function ON
		02	Send/read Fill BK-IN function ON
	48	00	Send/read Manual notch function OFF
		01	Send/read Manual notch function ON
	4A	00	Send/read AFC function OFF
		01	Send/read AFC function ON
	4B	00	Send/read DTCS OFF
		01	Send/read DTCS ON
	4C	00	Send/read VSC function OFF
		01	Send/read VSC function ON
	4F	00	Send/read Twin Peak Filter OFF
01		Send/read Twin Peak Filter ON	
50	00	Send/read Dial lock function OFF	
	01	Send/read Dial lock function ON	
55	00	Send/read 1st IF filter 3 kHz	
	01	Send/read 1st IF filter 6 kHz	
	02	Send/read 1st IF filter 15 kHz	
56	00	Send/read DSP filter type SHARP	
	01	Send/read DSP filter type SOFT	
57	00	Send/read manual notch width WIDE	
	01	Send/read manual notch width MID	
	02	Send/read manual notch width NAR	
58	00	Send/read SSB transmit bandwidth WIDE	
	01	Send/read SSB transmit bandwidth MID	
	02	Send/read SSB transmit bandwidth NAR	

Cmd.	Sub cmd.	Data	Description	
16	59	00	Send/read Sub band OFF	
		01	Send/read Sub band ON	
	5A	00	Send/read Satellite mode OFF	
		01	Send/read Satellite mode ON	
	5B	00	Send/read DSQ/CSQ OFF (DV mode only)	
		01	Send/read DSQ ON (DV mode only)	
02		Send/read CSQ ON (DV mode only)		
17		see p. 191	Send CW messages	
19	00		Read the transceiver ID	
1A	00	see p. 195	Send/read memory contents	
	01	see p. 191	Send/read band stacking register contents	
	02	see p. 191	Send/read memory keyer contents*1	
	03	00 to 49	Send/read the selected filter width (AM: 00=200 Hz, 49=10 kHz; other than AM modes: 00=50 Hz, 40/31=3600 Hz/2700 Hz)	
	04	00 to 13	Send/read the selected AGC time constant (00=OFF, AM: 01=0.3 sec. to 13=8.0 sec. SSB/CW/RTTY: 01=0.3 sec. to 13=8.0 sec.)	
	05	0001	0000 to 0255	Send/read LCD contrast level (0000=0% (low) to 0255=100% (high))
		0002	0000 to 0255	Send/read LCD backlight brightness level (0000=0% (dark) to 0255=100% (bright))
		0003	0000 to 0255	Send/read beep level (0000=0% to 0255=100%)
		0004	00	Send/read beep level limit OFF
			01	Send/read beep level limit ON
		0005	00	Send/read confirmation beep OFF
			01	Send/read confirmation beep ON
0006		00	Send/read band edge beep OFF (Beep sounds with a default band)	
		01	Send/read band edge beep ON	
		02	Send/read band edge beep with user setting ON	
0007		0050 to 0200	Send/read beep audio frequency for MAIN Band (0050=500 Hz to 0200=2000 Hz)	
0008		0050 to 0200	Send/read beep audio frequency for SUB Band (0050=500 Hz to 0200=2000 Hz)	
0009	00	Send/read Auto selection for [RF/SQL]		
	01	Send/read SQL selection for [RF/SQL]		
	02	Send/read RF+SQL selection for [RF/SQL]		
0010	00	Send/read Meter Peak Hold function OFF		
	01	Send/read Meter Peak Hold function ON		
0011	00	Send/read FM/DV Center Error function OFF		
	01	Send/read FM/DV Center Error function ON		
0012	00	Send/read Time-Out Timer OFF		
	01	Send/read 3 min. Time-Out Timer		
	02	Send/read 5 min. Time-Out Timer		
	03	Send/read 10 min. Time-Out Timer		
	04	Send/read 20 min. Time-Out Timer		
0013	00	Send/read PTT Lock function OFF		
	01	Send/read PTT Lock function ON		
0014	00	Send/read Quick Split function OFF		
	01	Send/read Quick Split function ON		
0015	see p. 192	Send/read Split offset frequency		

Cmd.	Sub cmd.	Data	Description	
1A	05	0016	00	Send/read Split Lock function OFF
			01	Send/read Split Lock function ON
		0017	see p. 192	Send/read Duplex offset frequency
		0018	00	Send/read One Touch Repeater DUP-
			01	Send/read One Touch Repeater DUP+
		0019	00	Send/read Auto Repeater OFF
			01	Send/read Auto Repeater ON-1 (for USA version) or ON (for Korea version)
			02	Send/read Auto Repeater ON-2 (for USA version)
		0020	00	Send/read Tuner Auto Start OFF
			01	Send/read Tuner Auto Start ON
		0021	00	Send/read PTT Tune OFF
			01	Send/read PTT Tune ON
		0022	00	Send/read antenna selection OFF
			01	Send/read manual antenna selection
			02	Send/read auto antenna selection
		0023	0000 to 0255	Send/read voice synthesizer level (0000=0% to 0255=100%)
		0024	00	Send/read English selection for voice synthesizer speech language
			01	Send/read Japanese selection for voice synthesizer speech language
		0025	00	Send/read speech speed slow
			01	Send/read speech speed fast
		0026	00	Send/read S-meter level announcement OFF
			01	Send/read S-meter level announcement ON
		0027	00	Send/read operating mode announcement (after pushing mode switch) OFF
			01	Send/read operating mode announcement (after pushing mode switch) ON
		0028	00	Send/read [SPEECH/LOCK] key function setting (Push=SPEECH, Hold down=LOCK)
			01	Send/read [SPEECH/LOCK] key function setting (Push=LOCK, Hold down=SPEECH)
		0029	00	Send/read number of memo pad channels 5
			01	Send/read number of memo pad channels 10
		0030	00	Send/read auto TS for [MAIN DIAL] OFF
			01	Send/read auto TS for [MAIN DIAL] Low
			02	Send/read auto TS for [MAIN DIAL] High
		0031	00	Send/read Low selection for microphone Up/Down speed
			01	Send/read High selection for microphone Up/Down speed
		0032	00	Send/read Quick RIT/ Δ TX clear OFF
			01	Send/read Quick RIT/ Δ TX clear ON
		0033	00	Send/read AFC functioning range limit OFF
			01	Send/read AFC functioning range limit ON
		0034	00	Send/read Auto Notch selection for SSB mode
			01	Send/read Manual notch selection for SSB mode
			02	Send/read Auto/Manual Notch selection for SSB mode
		0035	00	Send/read Auto Notch selection for AM mode
			01	Send/read Manual Notch selection for AM mode
02	Send/read Auto/Manual Notch selection for AM mode			

Cmd.	Sub cmd.	Data	Description	
1A	05	0036	00	Send/read Manual Notch filter width pop-up OFF
			01	Send/read Manual Notch filter width pop-up ON
		0037	00	Send/read BW Popup (PBT) setting OFF
			01	Send/read BW Popup (PBT) setting ON
		0038	00	Send/read BW Popup (FIL) setting OFF
			01	Send/read BW Popup (FIL) setting ON
		0039	00	Send/read SSB/CW Synchronous Tuning function OFF
			01	Send/read SSB/CW Synchronous Tuning function ON
		0040	00	Send/read LSB selection for CW normal side
			01	Send/read USB selection for CW normal side
		0041	00	Send/read KEYSER-Root selection for keyer 1st menu
			01	Send/read KEYSER-SEND selection for keyer 1st menu
		0042	00	Send/read GPS-Root selection for GPS 1st Menu
			01	Send/read GPS-POS selection for GPS 1st Menu
		0043	00	Send/read external preamplifier (AG-25) control for 144 MHz band OFF
			01	Send/read external preamplifier (AG-25) control for 144 MHz band ON
		0044	00	Send/read external preamplifier (AG-35) control for 430 MHz band OFF
			01	Send/read external preamplifier (AG-35) control for 430 MHz band ON
		0045	00	Send/read external preamplifier (AG-1200) control for 1200 MHz band OFF
			01	Send/read external preamplifier (AG-1200) control for 1200 MHz band ON
		0046	00	Send/read Separate selection for the external speaker output method
			01	Send/read Mix selection for the external speaker output method
		0047	00	Send/read Separate selection for the headphone audio output method
			01	Send/read Mix selection for the headphone audio output method
			02	Send/read Auto selection for the headphone audio output method
		0048	00	Send/read SUB Band audio mute during transmit on the main band OFF
			01	Send/read SUB Band audio mute during transmit on the main band ON
		0049	00	Send/read MAIN selection for the [ACC] AF/SQL line output
			01	Send/read SUB selection for the [ACC] AF/SQL line output
		0050	00	Send/read MAIN selection for the [DATA] AF/SQL line output
			01	Send/read SUB selection for the [DATA] AF/SQL line output
		0051	00	Send/read VSEND select OFF
			01	Send/read UHF Only selection for VSEND
02	Send/read VSEND select ON			
0052	00	Send/read external keypad OFF		
	01	Send/read KEYSER SEND selection for the external keypad		
0053	00	Send/read USB audio squelch OFF (OPEN)		
	01	Send/read USB audio squelch ON		

◇ Command table (continued)

Cmd.	Sub cmd.	Data	Description
1A	05	0054	0000 to 0255 Send/read USB modulation level (0000=0% to 0255=100%)
		0055	00 Send/read 9600 bps mode OFF
			01 Send/read 9600 bps mode ON
		0056	00 Send/read MIC selection for the modulation input during DATA mode OFF
			01 Send/read ACC selection for the modulation input during DATA mode OFF
			02 Send/read MIC+ACC selection for the modulation input during DATA mode OFF
			03 Send/read USB selection for the modulation input during DATA mode OFF
		0057	00 Send/read MIC selection for the modulation input during DATA mode ON
			01 Send/read ACC selection for the modulation input during DATA mode ON
			02 Send/read MIC+ACC selection for the modulation input during DATA mode ON
			03 Send/read USB selection for the modulation input during DATA mode ON
		0058	00 Send/read CI-V transceive OFF
			01 Send/read CI-V transceive ON
		0059	00 Send/read no function selection for "USB2" (COM port) function
			01 Send/read RTTY selection for "USB2" (COM port) function
			02 Send/read DVdat selection for "USB2" (COM port) function
		0060	00 Send/read no function selection for [DATA1] function
			01 Send/read RTTY selection for [DATA1] function
			02 Send/read DVdat selection for [DATA1] function
		0061	00 Send/read OFF selection for GPS Out
			01 Send/read DATA->USB2 selection for GPS Out
		0062	00 Send/read 4800 bps selection for GPS position data transmission speed of [DATA1]
			01 Send/read 9600 bps selection for GPS position data transmission speed of [DATA1]
		0063	00 Send/read 300 bps selection for RTTY Decode Baud rate
			01 Send/read 1200 bps selection for RTTY Decode Baud rate
			02 Send/read 4800 bps selection for RTTY Decode Baud rate
			03 Send/read 9600 bps selection for RTTY Decode Baud rate
			04 Send/read 19200 bps selection for RTTY Decode Baud rate
		0064	00 Send/read Calibration marker OFF
			01 Send/read Calibration marker ON
		0065	0000 to 0255 Send/read reference frequency (0000=0% to 0255=100%)
		0066	00 to 10 Send/read COMP level (00= Minimum to 10= Maximum)
		0067	see p. 192 Send/read SSB RX HPF/LPF setting
0068	00 to 10 Send/read SSB RX Tone (Bass) level (00=-5 to 10=+5)		
0069	00 to 10 Send/read SSB RX Tone (Treble) level (00=-5 to 10=+5)		
0070	00 to 10 Send/read SSB TX Tone (Bass) level (00=-5 to 10=+5)		
0071	00 to 10 Send/read SSB TX Tone (Treble) level (00=-5 to 10=+5)		
0072	see p. 192 Send/read SSB TX bandwidth for WIDE		

Cmd.	Sub cmd.	Data	Description	
1A	05	0073	see p. 192 Send/read SSB TX bandwidth for MID	
		0074	see p. 192 Send/read SSB TX bandwidth for NARROW	
		0075	see p. 192 Send/read AM RX HPF/LPF setting	
		0076	00 to 10 Send/read AM RX tone (Bass) level (00=-5 to 10=+5)	
		0077	00 to 10 Send/read AM RX Tone (Treble) level (00=-5 to 10=+5)	
		0078	00 to 10 Send/read AM TX tone (Bass) level (00=-5 to 10=+5)	
		0079	00 to 10 Send/read AM TX Tone (Treble) level (00=-5 to 10=+5)	
		0080	see p. 192 Send/read FM RX HPF/LPF setting	
		0081	00 to 10 Send/read FM RX tone (Bass) level (00=-5 to 10=+5)	
		0082	00 to 10 Send/read FM RX Tone (Treble) level (00=-5 to 10=+5)	
		0083	00 to 10 Send/read FM TX tone (Bass) level (00=-5 to 10=+5)	
		0084	00 to 10 Send/read FM TX Tone (Treble) level (00=-5 to 10=+5)	
		0085	see p. 192 Send/read DV RX HPF/LPF setting	
		0086	00 to 10 Send/read DV RX tone (Bass) level (00=-5 to 10=+5)	
		0087	00 to 10 Send/read DV RX Tone (Treble) level (00=-5 to 10=+5)	
		0088	00 to 10 Send/read DV TX tone (Bass) level (00=-5 to 10=+5)	
		0089	00 to 10 Send/read DV TX Tone (Treble) level (00=-5 to 10=+5)	
		0090	see p. 192 Send/read CW RX HPF/LPF setting	
		0091	see p. 192 Send/read RTTY RX HPF/LPF setting	
		0092	00 Send/read Normal selection for contest number style	
			01 Send/read "190 → ANO" selection for contest number style	
			02 Send/read "190 → ANT" selection for contest number style	
			03 Send/read "90 → NO" selection for contest number style	
		0093	04 Send/read "90 → NT" selection for contest number style	
			01 Send/read M1 selection for count up trigger channel	
			02 Send/read M2 selection for count up trigger channel	
			03 Send/read M3 selection for count up trigger channel	
		0094	04 Send/read M4 selection for count up trigger channel	
			0001 to 9999 Send/read present number (0001=1 to 9999=9999)	
			0095	0000 to 0255 Send/read CW sidetone gain (0000=0% to 0255=100%)
			0096	00 Send/read CW sidetone gain limit OFF
		01 Send/read CW sidetone gain limit ON		
		0097	01 to 60 Send/read CW keyer repeat time (01=1 sec. to 60=60 sec.)	
0098	00 Send/read Normal selection for message display			
	01 Send/read Message selection for message display			
0099	28 to 45 Send/read CW keyer dot/dash ratio (28=1:1.2.8 to 45=1:1.4.5)			
0100	00 Send/read 2 msec. selection for CW Rise time			
	01 Send/read 4 msec. selection for CW Rise time			
	02 Send/read 6 msec. selection for CW Rise time			
	03 Send/read 8 msec. selection for CW Rise time			

Cmd.	Sub cmd.	Data	Description
1A	05	0101	00 Send/read Normal selection for paddle polarity
			01 Send/read Reverse selection for paddle polarity
		0102	00 Send/read Straight selection for keyer type
			01 Send/read BUG-Key selection for keyer type
			02 Send/read ELEC-Key selection for keyer type
		0103	00 Send/read Mic. up/down keyer OFF
			01 Send/read Mic. up/down keyer ON
		0104	00 Send/read 1275 Hz selection for RTTY mark frequency
			01 Send/read 1615 Hz selection for RTTY mark frequency
			02 Send/read 2125 Hz selection for RTTY mark frequency
		0105	00 Send/read 170 Hz selection for RTTY shift width
			01 Send/read 200 Hz selection for RTTY shift width
			02 Send/read 425 Hz selection for RTTY shift width
		0106	00 Send/read Normal selection for RTTY keying polarity
			01 Send/read Reverse selection for RTTY keying polarity
		0107	00 Send/read RTTY decode USOS OFF
			01 Send/read RTTY decode USOS ON
		0108	00 Send/read "CR,LF,CR+LF" selection for RTTY decode new line code
			01 Send/read "CR+LF" selection for RTTY decode new line code
		0109	00 Send/read 2 lines selection for number of RTTY decoder line
			01 Send/read 3 lines selection for number of RTTY decoder line
		0110	00 Send/read Scan speed Low
			01 Send/read Scan speed High
		0111	00 Send/read Scan resume OFF
			01 Send/read Scan resume ON
		0112	00 Send/read OFF selection for MAIN DIAL function during a scan
			01 Send/read Up/Down selection for MAIN DIAL function during a scan
		0113	0000 to 0255 Send/read NB level (HF/50 MHz) (0000=0% to 0255=100%)
		0114	00 to 09 Send/read NB depth (HF/50 MHz) (00=1 to 09=10)
		0115	0000 to 0255 Send/read NB width (HF/50 MHz) (0000=1 to 0255=100)
		0116	0000 to 0255 Send/read NB level (144 MHz) (0000=0% to 0255=100%)
		0117	00 to 09 Send/read NB depth (144 MHz) (00=1 to 09=10)
0118	0000 to 0255 Send/read NB width (144 MHz) (0000=1 to 0255=100)		
0119	0000 to 0255 Send/read NB level (430 MHz) (0000=0% to 0255=100%)		
0120	00 to 09 Send/read NB depth (430 MHz) (00=1 to 09=10)		
0121	0000 to 0255 Send/read NB width (430 MHz) (0000=1 to 0255=100)		
0122	0000 to 0255 Send/read NB level (1200 MHz) (0000=0% to 0255=100%)		
0123	00 to 09 Send/read NB depth (1200 MHz) (00=1 to 09=10)		
0124	0000 to 0255 Send/read NB width (1200 MHz) (0000=1 to 0255=100)		

Cmd.	Sub cmd.	Data	Description
1A	05	0125	0000 to 0255 Send/read VOX gain (0000=0% to 0255=100%)
			0126 0000 to 0255 Send/read ANTI-VOX gain (0000=0% to 0255=100%)
		0127	00 to 20 Send/read VOX delay time (00=0.0 sec. to 20=2.0 sec.)
		0128	00 Send/read VOX voice delay OFF
			01 Send/read Short selection for VOX voice delay
			02 Send/read Mid selection for VOX voice delay
		0129	00 Send/read Long selection for VOX voice delay
			0130 0000 to 0255 Send/read BK-IN delay time (0020=2.0d to 0130=13.0d)
		0130	0000 to 0255 Send/read MONITOR gain (0000=0% to 0255=100%)
		0131	00 Send/read Standby Beep OFF
			01 Send/read ON-1 selection for Standby Beep
			02 Send/read ON-2 selection for Standby Beep
		0132	00 Send/read Auto Reply OFF
			01 Send/read Auto Reply ON
		0133	00 Send/read PTT selection for DV Data TX
			01 Send/read Auto selection for DV Data TX
		0134	00 Send/read Auto selection for Digital Monitor
			01 Send/read Digital selection for Digital Monitor
		0135	00 Send/read Analog selection for Digital Monitor
			01 Send/read Digital RPT Set OFF
		0136	00 Send/read Digital RPT Set ON
			01 Send/read RX Call Sign Auto Write OFF
		0137	00 Send/read Auto selection for RX Call Sign Auto Write
			01 Send/read RX RPT Call Sign Auto Write OFF
		0138	00 Send/read Auto selection for RX RPT Call Sign Auto Write
			01 Send/read DV Auto Detect OFF
		0139	00 Send/read DV Auto Detect ON
			01 Send/read Call Sign Edit Record OFF
		0140	00 Send/read Select selection for Call Sign Edit Record
			01 Send/read Auto selection for Call Sign Edit Record
		0141	00 Send/read Gateway Auto Set OFF
			01 Send/read Auto selection for Gateway Auto Set
0142	00 Send/read ALL selection for RX Record (RPT)		
	01 Send/read Latest Only selection for RX Record (RPT)		
0143	00 Send/read RX Call Sign Auto Display OFF		
	01 Send/read UR selection for TX Call Sign Display		
0144	00 Send/read MY selection for TX Call Sign Display		
	01 Send/read RX Message Display OFF		
0145	00 Send/read Auto selection for RX Message Display		
	01 Send/read Scrolling speed slow		
	01 Send/read Scrolling speed fast		

◇ Command table (continued)

Cmd.	Sub cmd.	Data	Description		
1A	05	0146	00	Send/read DR Call Sign Popup OFF	
			01	Send/read DR Call Sign Popup ON	
		0147	00	Send/read Opening Call Sign OFF	
			01	Send/read Opening Call Sign ON	
		0148	00	Send/read BK function OFF	
			01	Send/read BK function ON	
		0149	00	Send/read EMR mode OFF	
			01	Send/read EMR mode ON	
		0150	0000 to 0255	Send/read EMR AF Level (0000=0% to 0255=100%)	
		0151	00	00	Send/read 4800 bps selection for GPS Receiver Baud
				01	Send/read 9600 bps selection for GPS Receiver Baud
		0152	00	00	Send/read ddd°mm.mm' selection for Position Format
				01	Send/read ddd°mm'ss" selection for Position Format
		0153	00	00	Send/read Meter selection for the displaying unit
				01	Send/read Feet/Mile selection for the displaying unit
		0154	00	00	Send/read North REF selection for compass direction
				01	Send/read South REF selection for compass direction
		0155	see p. 192	Send/read UTC Offset	
		0156	00	00	Send/read GPS Indicator OFF
				01	Send/read GPS Indicator ON
		0157	00	00	Send/read GPS selection for MY Position input method
				01	Send/read Manual selection for MY Position input method
		0158	see p. 192	Send/read my position information	
		0159	see p. 193	Send/read Alarm Area1	
		0160	00	00	Send/read Limited selection for Alarm Area2
				01	Send/read Extended selection for Alarm Area2
				02	Send/read Both selection for Alarm Area2
		0161	00	00	Send/read GPS Auto TX OFF
				01	Send/read 5 sec. selection for GPS Auto TX interval
				02	Send/read 10 sec. selection for GPS Auto TX interval
				03	Send/read 30 sec. selection for GPS Auto TX interval
				04	Send/read 1 min. selection for GPS Auto TX interval
05	Send/read 3 min. selection for GPS Auto TX interval				
06	Send/read 5 min. selection for GPS Auto TX interval				
07	Send/read 10 min. selection for GPS Auto TX interval				
0162	00	00	Send/read Disable selection for GPS TX Mode		
		01	Send/read GPS selection for GPS TX Mode		
		02	Send/read GPS-A selection for GPS TX Mode		
0163	00	00	Send/read GPS Sentence (RMC) OFF		
		01	Send/read GPS Sentence (RMC) ON		
0164	00	00	Send/read GPS Sentence (GGA) OFF		
		01	Send/read GPS Sentence (GGA) ON		

Cmd.	Sub cmd.	Data	Description		
1A	05	0165	00	Send/read GPS Sentence (GLL) OFF	
			01	Send/read GPS Sentence (GLL) ON	
		0166	00	Send/read GPS Sentence (GSA) OFF	
			01	Send/read GPS Sentence (GSA) ON	
		0167	00	Send/read GPS Sentence (VTG) OFF	
			01	Send/read GPS Sentence (VTG) ON	
		0168	00	Send/read GPS Sentence (GSV) OFF	
			01	Send/read GPS Sentence (GSV) ON	
		0169	see p. 193	Send/read Unproto Address	
		0170	00	00	Send/read position data extension OFF
				01	Send/read Course/Speed selection for position data extension
		0171	00	00	Send/read Time Stamp OFF
				01	Send/read DHM selection for Time Stamp
		0172	00 to 16	00	Send/read HMS selection for Time Stamp
				01 to 16	Send/read GPS-A Symbol (00=Ambulance, 01=Bus, 02=Fire Truck, 03=Bicycle, 04=Yacht, 05=Helicopter, 06=Small Aircraft, 07=Ship, 08=Car, 09=Motorcycle, 10=Balloon, 11=Jeep, 12=RV, 13=Truck, 14=Van, 15=House QTH(VHF), 16=Other)
		0173	see p. 193	Send/read GPS-A Symbol Other	
		0174	00 to 16	Send/read GPS-A SSID (00=--, 01=(-0), 02=-1 to 16, -15)	
		0175	see p. 193	Send/read Comment	
		0176	see p. 193	Send/read Comment (Extension)	
		0177	see p. 193	Send/read GPS TX Message	
		06	see p. 193	Send/read DATA mode selection	
		07	see p. 196	Send/read Satellite memory contents	
		1B	00	see p. 193	Send/read Repeater tone frequency
			01	see p. 193	Send/read Tone squelch frequency
			02	see p. 193	Send/read DTCS code and polarity
			07	see p. 193	Send/read CSQ code (DV mode)
		1C	00	00	Send/read Transceiver's status (RX)
				01	Send/read Transceiver's status (TX)
			01	00	Send/read Antenna tuner OFF (through)
				01	Send/read Antenna tuner ON
		02	00	Send/read Manual tuning selection	
			01	Send/read Transmit frequency monitor check ON	
1E	00		Read number of available TX frequency band		
	01	see p. 191	Read TX band edge frequencies		
	02		Read number of user-set TX frequency band		
	03	see p. 191	Send/read User-set TX band edge frequencies		
1F	00	see p. 193	Send/read DV MY call sign		
	01	see p. 194	Send/read DV TX call signs		
	02	see p. 194	Send/read DV TX message		
20	00	00	00*2	Send/read Auto DV RX Callsigns output OFF	
			01*2	Send/read Auto DV RX Callsigns output ON	
		01	00	see p. 194	Output DV RX Callsigns
			02	see p. 194	Read DV RX Callsigns
	01	00	00*2	Send/read Auto DV RX message output OFF	
			01*2	Send/read Auto DV RX message output ON	
		01	see p. 194	Output DV RX message	
		02	see p. 194	Read DV RX message	

Cmd.	Sub cmd.	Data	Description
20	02	00	00* ² Send/read Auto DV RX status output OFF
		01* ²	Send/read Auto DV RX status output ON
	01	see p. 194	Output DV RX status
	02	see p. 194	Read DV RX status

*¹ The counter can be inserted into only one channel.

*² Output setting is automatically turned OFF after turning the power OFF, then ON.

◇ Data content description

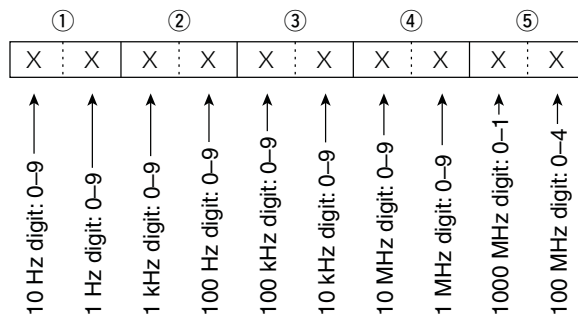
• Character code setting

Command : 1A 00, 1A 05 0169, 1A 05 0173,
1A 05 0175, 1A 05 0176, 1A 05 0177,
1F 02, 20 0001, 20 0002, 20 0101,
20 0102

Character	ASCII code	Character	ASCII code
A–Z	41–5A	a–z	61–7A
0–9	30–39	Space	20
!	21	#	23
\$	24	%	25
&	26	\	5C
?	3F	"	22
'	27	`	60
^	5E	+	2B
–	2D	*	2A
/	2F	.	2E
,	2C	:	3A
;	3B	=	3D
<	3C	>	3E
(28)	29
[5B]	5D
{	7B	}	7D
!	7C	_	5F
-	7E	@	40

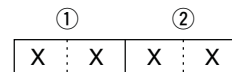
• Operating frequency

Command : 00, 03, 05



• Operating mode

Command : 01, 04, 06



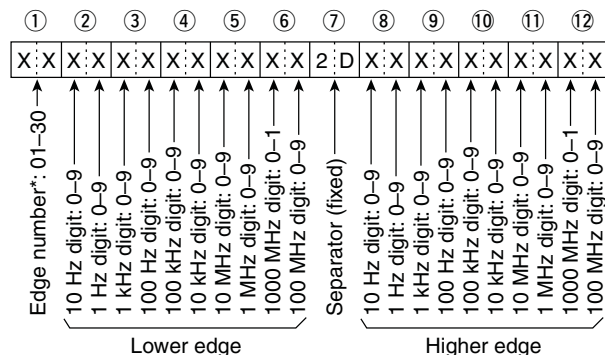
① Operating mode			② Filter setting
00: LSB	03: CW	07: CW-R	01: FIL1
01: USB	04: RTTY	08: RTTY-R	02: FIL2
02: AM	05: FM	17: DV	03: FIL3

Filter setting (②) can be skipped with command 01 and 06. In that case, "FIL1" is automatically selected with command 01, and the default filter setting of the operating mode is automatically selected with command 06.

◇ Data content description (continued)

• **Band edge frequency setting**

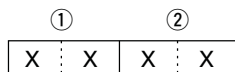
Command 02*, 1E 01, 1E 03



* Edge number setting is not necessary with command 02.

• **Band stacking register**

Command : 1A 01



When sending the contents, the codes, such as operating frequency and operating mode*, should be added after the register code, as shown below.

*See ⑤ to ⑤① on 'Memory content setting' for details. (p. 195)

① Frequency band code

Code	Freq. band	Frequency range (unit: MHz)
01	1.8	1.800000- 1.999999
02	3.5	3.400000- 4.099999
03	7	6.900000- 7.499999
04	10	9.900000-10.499999
05	14	13.900000-14.499999
06	18	17.900000-18.499999
07	21	20.900000-21.499999
08	24	24.400000-25.099999
09	28	28.000000-29.999999
10	50	50.000000-54.000000
11	VHF	108.000000-174.000000
12	UHF	420.000000-480.000000
13	1.2G	1240.000000-1320.000000
14	GENE	Other than above

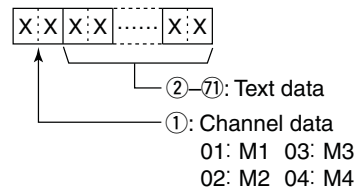
② Register code

Code	Registered No.
01	1 (latest)
02	2
03	3 (oldest)

For example, when reading the oldest contents in the 21 MHz band, the code "0703" is used.

• **Memory keyer contents**

Command : 1A 02



• **Character's code**

Character	ASCII code	Description
0-9	30-39	Number
A-Z	41-5A	Alphabetical characters
a-z	61-7A	Alphabetical characters
space	20	Word space
/	2F	Symbol
?	3F	Symbol
,	2C	Symbol
.	2E	Symbol
@	40	Symbol
^	5E	e.g., to send BT, enter ^BT
*	2A	Inserts contest number (can be used for 1 channel only)

• **CW message contents**

Command : 17

Set a CW message of up to 30 characters.

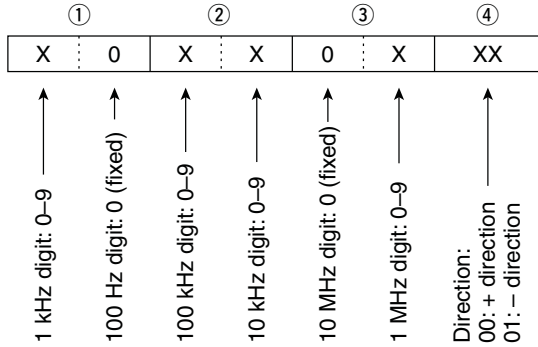
• **Character's code**

Character	ASCII code	Description
0-9	30-39	Number
A-Z	41-5A	Alphabetical characters
a-z	61-7A	Alphabetical characters
space	20	Word space
/	2F	Symbol
?	3F	Symbol
.	2E	Symbol
-	2D	Symbol
,	2C	Symbol
:	3A	Symbol
'	27	Symbol
(28	Symbol
)	29	Symbol
=	3D	Symbol
+	2B	Symbol
"	22	Symbol
@	40	Symbol

• "FF" stops sending CW messages.
• "^" is used to transmit a string of characters with no inter-character space.

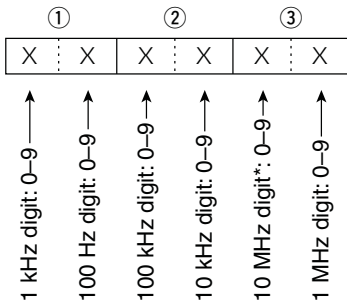
• Split offset frequency setting

Command : 1A 05 0015



• Duplex Offset frequency setting

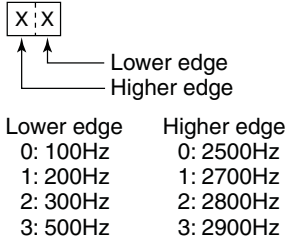
Command : 1A 05 0017



*10 MHz digit can be entered on only the 1200 MHz frequency band.

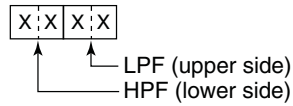
• SSB transmission bandwidth setting

Command : 1A 05 0072, 0073, 0074



• RX HPF and LPF settings in each operating mode

Command : 1A 05 0067, 0075, 0080, 0085, 0090, 0091



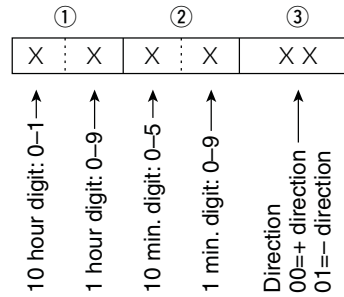
HPF
00: through
01 to 20: 100 to 2000 Hz

LPF
05 to 24: 500 to 2400 Hz
25: through

Set the LPF value larger than HPF one.

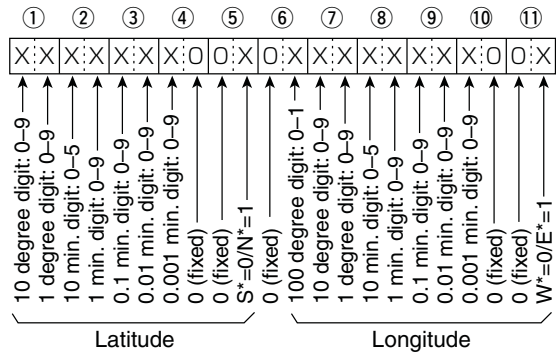
• UTC Offset setting

Command : 1A 05 0155



• My position data setting

Command : 1A 05 0158

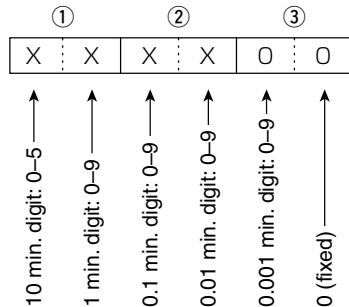


*S: South latitude N: North latitude
W: West longitude E: East longitude

◇ Data content description (continued)

• **Alarm area 1 setting**

Command : 1A 05 0159



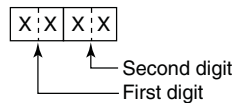
• **Unproto Address setting**

Command : 1A 05 0169

Set an unproto address of up to 56 characters. See 'Character code setting' for details. (p. 190)

• **GPS-A Symbol setting**

Command : 1A 05 0173



/, \, 0 to 9, A to Z can be used for the first digit character. See 'Character code setting' for the second digit character. (p. 190)

• **Comment setting**

Command : 1A 05 0175

Set a comment of up to 43 characters. See 'Character code setting' for details. (p. 190)

• **Comment (Extension) setting**

Command : 1A 05 0176

Set a comment of up to 36 characters. See 'Character code setting' for details. (p. 190)

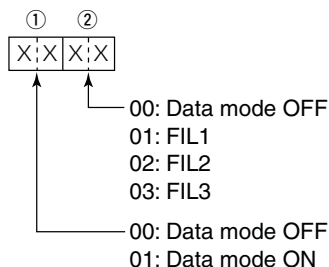
• **GPS message setting**

Command : 1A 05 0177

Set a GPS message of up to 20 characters. See 'Character code setting' for details. (p. 190)

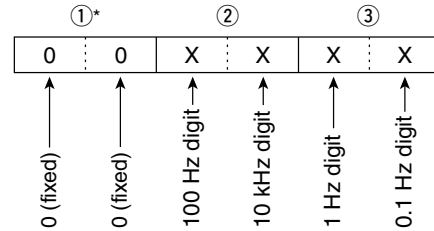
• **Data mode with filter width setting**

Command : 1A 06



• **Repeater tone/tone squelch frequency setting**

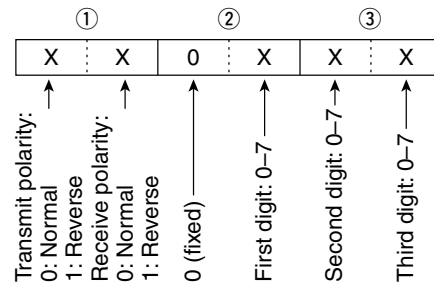
Command : 1B 00, 1B 01



*Not necessary when setting a frequency.

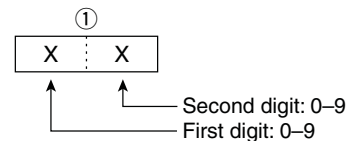
• **DTCS code and polarity setting**

Command : 1B 02



• **Digital code squelch setting**

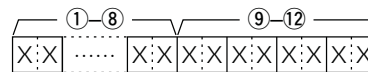
Command : 1B 07



• **DV MY call sign setting**

Command : 1F 00

Set your own call sign and note of up to 12 characters.



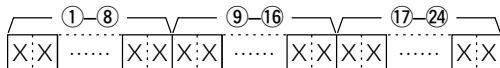
①-⑧ Your own call sign setting

⑨-⑫ Note setting

• DV TX call signs setting

Command : 1F 01

Set "UR," "R1" and "R2" call signs of up to 8 characters.



- ①–⑧ UR (Destination) call sign setting
- ⑨–⑯ R1 (Access/Area repeater) call sign setting
- ⑰–⑳ R2 (Link/Gateway repeater) call sign setting

- Character's code of the call sign

Character	ASCII code	Character	ASCII code
0–9	30–39	A–Z	41–5A
Space	20	/	2F

• DV TX message setting

Command : 1F 02

Set the transmit message of up to 20 characters.

See 'Character code setting' for details. (p. 190)

/// "FF" stops sending or reading messages.

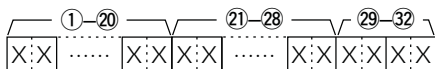
• DV RX Status setting

Command : 20 0201, 20 0202

Data		Status	Description
Bit			
7	0	—	—
6	0/1	Receiving a voice call	During receiving a digital voice signal, select "1." (Regardless of DSQ1 and CSQ1 setting)
5	0/1	Last call finisher	When the last call was finished by you, select "1."
4	0/1	Receiving a signal	When the audio tone can be heard, select "1."
3	0/1	Receiving a BK call	During receiving a BK call, select "1."
2	0/1	Receiving a EMR call	During receiving a EMR call, select "1."
1	0/1	Receiving a signal other than DV	When "DV" and "FM" are blinking, select "1."
0	0/1	Packet loss status	During displaying a packet loss

• DV RX message setting

Command : 20 0101, 20 0102



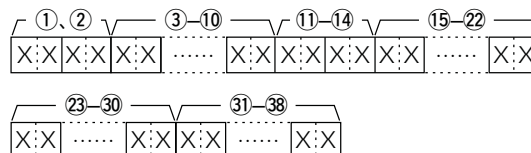
- ①–⑳ RX message (up to 20 characters)
- ㉑–㉘ Call sign of the calling station (up to 8 characters)
- ㉙–㉚ Note of the calling station (up to 4 characters)

See 'Character code setting' for details. (p. 190)

/// "FF" stands for no message receiving after turning ON the transceiver.

• DV RX call sign setting

Command : 20 0001, 20 0002



- ① Header flag data (First byte)

Data		Description
Bit		
7	0 (fixed)	—
6	0 (fixed)	—
5	0 (fixed)	—
4	0/1	0= Voice, 1= Data
3	0/1	0= Direct, 1= Through repeater
2	0/1	0= No Break-in, 1= Break-in
1	0/1	0= Data, 1= Control
0	0/1	0= Normal, 1= Emergency

- ② Header flag data (Second byte)

Data			Function
Bit 2	Bit 1	Bit 0	
1	1	1	Repeater control
1	1	0	Send auto acknowledge
1	0	1	(Not used)
1	0	0	Request to re-transmit
0	1	1	Send acknowledge
0	1	0	Receive no reply
0	0	1	Repeater disabled
0	0	0	NULL

- ③–⑩ Call sign of the calling station (up to 8 characters)
- ⑪–⑭ Note of the calling station (up to 4 characters)
- ⑮–⑳ Call sign of the station that was called (up to 8 characters)
- ㉑–㉘ Call sign of the access/area repeater (R1) (up to 8 characters)
- ㉙–㉚ Call sign of the link/gateway repeater (R2) (up to 8 characters)

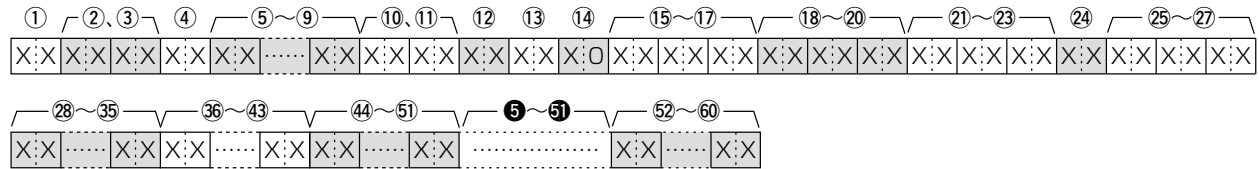
See 'Character code setting' for details. (p. 190)

/// "FF" stands for no call sign receiving after turning ON the transceiver.

◇ Data content description (continued)

• **Memory content setting**

Command : 1A 00



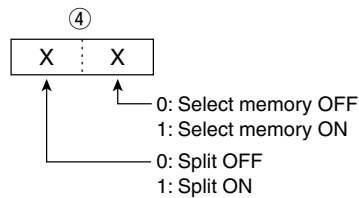
① Frequency band setting

- 00: HF/50 MHz frequency band
- 01: 144 MHz band frequency band
- 02: 430 MHz band frequency band
- 03: 1200 MHz band frequency band

②, ③ Memory channel number

- 0001–0099 : Memory channel 0 to 99
- 0100 : Programmed scan edge 1A
- 0101 : Programmed scan edge 1b
- 0102 : Programmed scan edge 2A
- 0103 : Programmed scan edge 2b
- 0104 : Programmed scan edge 3A
- 0105 : Programmed scan edge 3b
- 0106 : Call channel

④ Split and Select memory settings



When the program channel is selected, both settings should be "0."

When the Call channel is selected, the Select memory setting should be "0."

⑤–⑨ Operating frequency setting

See '• Operating frequency.'

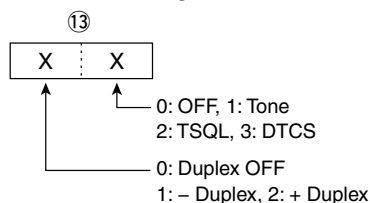
⑩, ⑪ Operating mode setting

See '• Operating mode.'

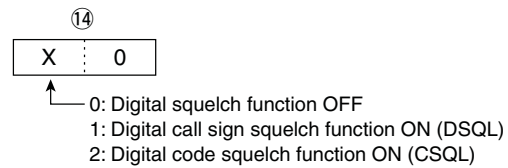
⑫ **Data mode setting**

- 1 byte data (XX)
- 00: Data mode OFF
- 01: Data mode ON

⑬ Duplex and Tone settings



⑭ Digital squelch setting



⑮–⑰ Repeater tone frequency setting

⑱–⑳ Tone squelch frequency setting
See '• Repeater tone/tone squelch setting.'

㉑–㉓ DTCS code setting

See '• DTCS code and polarity setting.'

㉔ Digital code squelch setting

See '• Digital code squelch setting.'

㉕–㉗ Duplex offset frequency setting

See '• Duplex Offset frequency setting.'

㉘–㉙ Destination call sign setting
(up to 8 characters)

㉚–㉛ R1 (Access/Area repeater) call sign setting
(up to 8 characters)

㉜–㉝ R2 (Link/Gateway repeater) call sign setting
(up to 8 characters)

See '• DV TX call signs setting.'

㉞–① Memory name setting

Up to 9 characters.

See '• Character code setting.'

About clearing operation:

"1A 00" command with the format as below clears the data of the selected memory channel.

②, ③ : Memory channel 0 to 99

④ : FF

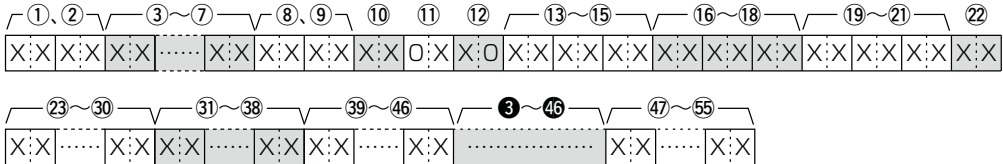
⑤ or later : None

NOTE:

- The same data as ⑤–⑤ are stored in ⑤–⑤.
- When the Split function is ON, the data of ⑤–⑤ is used for transmit.
- Even if the Split function is OFF, enter the data into ⑤–⑤ to match your transceiver. We recommend that you set the same data as ⑤–⑤.

• Satellite memory content setting

Command : 1A 07



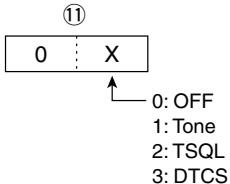
①, ② Satellite memory channel number
0001-0099 : Satellite memory channel 00 to 19

③-⑦ Operating frequency setting
See '• Operating frequency.'

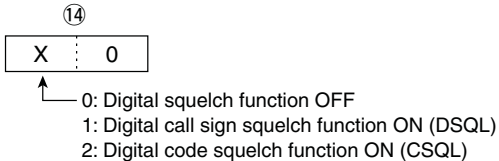
⑧, ⑨ Operating mode setting
See '• Operating mode.'

⑩ Data mode setting
1 byte data (XX)
00: Data mode OFF
01: Data mode ON

⑪ Tone setting



⑫ Digital squelch setting



⑬-⑮ Repeater tone frequency setting
⑯-⑰ Tone squelch frequency setting
See '• Repeater tone/tone squelch setting.'

⑱-⑲ DTCS code setting
See '• DTCS code and polarity setting.'

⑳ Digital code squelch setting
See '• Digital code squelch setting.'

㉓-⑳ Destination call sign setting
(up to 8 characters)
㉑-㉒ R1 (Access/Area repeater) call sign setting
(up to 8 characters)
㉑-㉒ R2 (Link/Gateway repeater) call sign setting
(up to 8 characters)
See '• DV TX call signs setting.'

㉑-㉒ Memory name setting
Up to 9 characters.
See '• Character code setting.'

NOTE:
• The same data as ③-④⑥ are stored in ③-④⑥.
• ③-④⑥ is used for the uplink frequency (transmit).
• ③-④⑥ is used for the downlink frequency (receive).

19 SPECIFICATIONS

■ General

- Frequency coverage : (unit: MHz)
 - Receive
 - 0.030–60.000^{*1*2}
 - 136.000–174.000^{*1*2}
 - 420.000–480.000^{*1*2}
 - 1240.000–1320.000[†]
 - Transmit
 - 1.800–1.999^{*2}, 3.500–3.999^{*2},
 - 5.33200^{*3}, 5.34800^{*3}, 5.35850^{*3},
 - 5.37300^{*3}, 5.40500^{*3},
 - 7.000–7.300^{*2}, 10.100–10.150^{*2},
 - 14.000–14.350^{*2}, 18.068–18.168^{*2},
 - 21.000–21.450^{*2}, 24.890–24.990^{*2},
 - 28.000–29.700^{*2}, 50.000–54.000^{*2}
 - 144.000–148.000^{*2}, 430.000–450.000^{*2}
 - 1240.000–1300.000[†]
- Mode : USB, LSB, CW, RTTY, AM, FM, DV
- No. of memory channels : 297CH (99CH × 3 band)
(396CH with UX-9100[†]; 99CH × 4 bands)
- No. of scan edge memory channels : 18CH (6 × 3 band)
(24CH with UX-9100[†]; 6CH × 4 bands)
- No. of call channels : 3CH (1 × 3 band)
(4CH with UX-9100[†]; 1CH × 4 bands)
- No. of Satellite memory channels : 20
- Antenna connector type : SO-239 × 3
(50 Ω impedance for HF/50 MHz and 144 MHz bands)
Type-N × 2
(50 Ω impedance for 430 MHz and 1200 MHz[†] bands)
- Temperature range : 0°C to +50°C (+32°F to +122°F)
- Frequency stability : Less than ±0.5 ppm 5 min. after power ON. (0°C to +50°C; +32°F to +122°F)
- Frequency resolution : 1 Hz
- Power supply : 13.8 V DC ±15% (negative ground)
- Power consumption
 - Transmit
 - Max. power : 24.0 A (HF/50/144/430 MHz band)
9.0 A (1200 MHz band)[†]
 - Receive
 - Standby : 3.0 A (HF/50/144/430 MHz band)
4.0 A (1200 MHz band)[†]
 - Max. audio : 4.5 A (HF/50/144/430 MHz band)
5.5 A (1200 MHz band)[†]
- Dimensions : 315(W) × 116(H) × 343(D) mm
(projections not included) 12⁵/₁₆(W) × 4⁹/₁₆(H) × 13¹/₂(D) in
- Weight (approximately) : 11.0 kg; 24.2 lb
11.95 kg; 26.3 lb (with UX-9100)
- ACC connector : 13-pin
- CI-V connector : 2-conductor 3.5 (d) mm (1/8")

^{*1}Some frequency bands are not guaranteed.
^{*2}Depending on version. ^{*3}USA version only.

■ Transmitter

- Output power (continuously adjustable)

Frequency band	Output power
HF/50 MHz	2 to 100 W (AM: 2 to 30 W)*
144 MHz	2 to 100 W
430 MHz	2 to 75 W
1200 MHz [†]	1 to 10 W

(at 13.8 V DC/+25°C)

* In the AM mode, transmission can be performed only on the HF/50 MHz frequency band.

- Modulation system
 - SSB : Digital PSN modulation
 - AM : Digital Low power modulation
 - FM : Digital Phase modulation
 - DV : GMSK Digital Phase modulation
- Spurious emission
 - (Spurious domain)
 - HF bands : Less than -50 dB
 - 50/144 MHz band : Less than -63 dB
 - 430 MHz band : Less than -61.8 dB
 - 1200 MHz band[†] : Less than -53 dB
 - (Out-of-band domain)
 - HF bands : Less than -40 dB
 - 50/144/430 MHz band : Less than -60 dB
 - 1200 MHz band[†] : Less than -50 dB
- Carrier suppression : More than 40 dB
- Unwanted sideband suppression : More than 55 dB
(1200 MHz: More than 40 dB)[†]
- ΔTX variable range : ±9.999 kHz
- Microphone connector : 8-pin connector
- Microphone impedance : 600 Ω
- ELEC-KEY connector : 3-conductor 6.35(d) mm (1/4")
- KEY connector : 3-conductor 6.35(d) mm (1/4")
- SEND connector : Phono jack (RCA)
- ALC connector : Phono jack (RCA)

[†] The optional UX-9100 is required for 1200 MHz frequency band operation.

[‡] When the 1200 MHz frequency band is selected. (The optional UX-9100 is required.)

Receiver

- Receive system
 - HF/50/144/430 MHz band: Double superheterodyne system
 - 1200 MHz band[†] : Triple superheterodyne system
- Intermediate frequencies
 - 1st : 64.455 MHz (HF/50 MHz band)
10.850 MHz (144 MHz band)
71.250 MHz (430 MHz band)
243.950 MHz (1200 MHz band)[†]
 - 2nd : 36 kHz (HF/50/144/430 MHz)
10.950 MHz (1200 MHz)[†]
 - 3rd : 36 kHz (1200 MHz)[†]
- Sensitivity
 - SSB, CW : 0.16 μ V (1.80–29.99 MHz)^{*4}
(10 dB S/N) BW=2.4 kHz 0.13 μ V (50.0–54.0 MHz)^{*5}
0.11 μ V (144/430/1200[†] MHz)
 - AM (10 dB S/N) : 12.6 μ V (0.5–1.799 MHz)^{*4}
BW=6 kHz 2.0 μ V (1.80–29.99 MHz)^{*4}
1.6 μ V (50.0–54.0 MHz)^{*5}
1.4 μ V (144/430 MHz)
 - FM (12 dB SINAD) : 0.5 μ V (28.0–29.7 MHz)^{*4}
BW=15 kHz 0.32 μ V (50.0–54.0 MHz)^{*5}
0.18 μ V (144/430/1200[†] MHz)
 - DV (1% BER) : 1.0 μ V (28.0–29.7 MHz)^{*4}
CH Space=12.5 kHz 0.63 μ V (50.0–54.0 MHz)^{*5}
0.35 μ V (144/430/1200[†] MHz)
- Squelch sensitivity

Frequency band	Squelch sensitivity
HF	SSB : Less than 5.6 μ V ^{*4}
	FM : Less than 0.3 μ V ^{*4}
50 MHz	SSB : Less than 5.6 μ V ^{*5}
	FM : Less than 0.3 μ V ^{*5}
144/430 MHz	SSB : Less than 1.0 μ V
	FM : Less than 0.18 μ V
1200 MHz [†]	SSB : Less than 1.0 μ V
	FM : Less than 0.18 μ V

^{*4} Pre-amp 1 is ON. ^{*5} Pre-amp 2 is ON.

- Selectivity (IF filter shape is set to SHARP)
 - SSB (BW: 2.4 kHz) : More than 2.4 kHz/–6 dB
Less than 3.4 kHz/–40 dB
 - CW (BW: 500 Hz) : More than 500 Hz/–6 dB
Less than 700 Hz/–40 dB
 - RTTY (BW: 500 Hz) : More than 500 Hz/–6 dB
Less than 800 Hz/–40 dB
 - AM (BW: 6 kHz) : More than 6.0 kHz/–6 dB
Less than 10.0 kHz/–40 dB
 - FM (BW: 15 kHz) : More than 12.0 kHz/–6 dB
Less than 22.0 kHz/–40 dB
 - DV (CH space: 12.5 kHz): More than –50 dB
- Spurious and image rejection ratio
 - HF/50 MHz band* : More than 70 dB
*except IF through on 50 MHz band
 - 144/430 MHz band : More than 60 dB
 - 1200 MHz band[†] : More than 50 dB
- AF output power : More than 2.0 W at 10%
(at 13.8 V DC) distortion with an 8 Ω load
- AF output impedance : 8 Ω
- RIT variable range : \pm 9.999 kHz

- PHONES connector : 3-conductor 6.35 (d) mm (¹/₄"
- External SP connector : 2-conductor 3.5 (d) mm
(¹/₈")/8 Ω
- DSP ANF attenuation : More than 30 dB
(with 1 kHz single tone)
- DSP MNF attenuation : More than 70 dB
- DSP NR attenuation : More than 6 dB
(noise rejection in SSB)

Antenna tuner

- Matching impedance range
 - HF bands : 16.7 to 150 Ω unbalanced
(Less than VSWR 1:3)
 - 50 MHz band : 20 to 125 Ω unbalanced
(Less than VSWR 1:2.5)
- Minimum operating input power : 8 W (HF bands)
15 W (50MHz band)
- Tuning accuracy : VSWR 1:1.5 or less
- Insertion loss : Less than 1.0 dB
(after tuning at RF power 100 W)

Spurious signals may be displayed on the spectrum scope screen regardless of the transceiver's state (Tx or Rx). They are generated in the scope circuit. This does not indicate a transceiver malfunction.

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

20 OPTIONS

IC-PW1/EURO HF/50 MHz ALL BAND 1 kW LINEAR AMPLIFIER



Full-duty 1 kW linear amplifier including an automatic antenna tuner. Has automatic tuning and band selection capability. Full break-in (QSK) operation is possible. The amplifier/power supply unit and the remote control unit can be separated. The optional OPC-599 ADAPTER CABLE is required for connection.

AH-4 HF AUTOMATIC ANTENNA TUNER



Specially designed to tune a long wire antenna for the HF/50 MHz bands, particularly in portable or mobile operation. The "PTT tune" function provides simple operation.

- Input power rating: 120 W

PS-126 DC POWER SUPPLY



- Output voltage : 13.8 V DC
- Max. output current : 25 A

SP-23 EXTERNAL SPEAKER



- 4 audio filters; headphone jack; can connect to 2 transceivers.
- Input impedance: 8 Ω
 - Max. input power: 4 W

AH-2b ANTENNA ELEMENT



A 2.5 m long antenna element for mobile operation with the AH-4.

- Frequency coverage 7–54 MHz band with the AH-4

SP-21 EXTERNAL SPEAKER



Designed for base station operation.

- Input impedance: 8 Ω
- Max. input power: 5 W

SM-30 DESKTOP MICROPHONE



Unidirectional, electret microphone for base station operation. Includes a low cut switch and mic gain control.

SM-50 DESKTOP MICROPHONE



Unidirectional, dynamic microphone for base station operation. Includes [UP]/[DOWN] switches, a low cut switch and mic gain control.

HM-36 HAND MICROPHONE



Hand microphone equipped with [UP]/[DOWN] switches. The same as that attached with the transceiver.

UX-9100 1200 MHz BAND UNIT



Allows you additional all mode operation on the 1200 MHz frequency band.

FL-430 1ST IF FILTER (6 kHz)

FL-431 1ST IF FILTER (3 kHz)

(Both filters are for HF/50 MHz Band)



The roofing filters reduce interference from strong nearby signals.

CT-17 CI-V LEVEL CONVERTER UNIT



For remote transceiver control using a personal computer equipped with an RS-232C port. You can change frequencies, operating mode, memory channels, etc., via your computer.

- **AG-25** WEATHER-PROOF PREAMPLIFIER (for 144 MHz Band)
- **AG-35** WEATHER-PROOF PREAMPLIFIER (for 430 MHz Band)
External all-weather, mast mounting preamplifiers for compensating for coaxial cable loss.
- **AG-2400** DOWN CONVERTER UNIT
All-weather, satellite down converter with superior NF and gain.
Input frequency : 2400–2402 MHz
Output frequency : 144–146 MHz
Conversion gain : More than 25 dB
Total NF : Less than 1.5 dB
- **OPC-1529R** DATA COMMUNICATION CABLE (RS-232C type)
Allows low-speed data communication in the DV mode, and receiving a GPS data from a third-party GPS receiver.
- **OPC-599** ADAPTER CABLE
13-pin, ACC connector to 7-pin + 8-pin ACC connector.
- **MB-123** CARRYING HANDLE
Convenient when carrying the transceiver.
The same as that attached with the transceiver.
- **CS-9100** CLONING SOFTWARE
Use this software to program settings, memory channels and set mode contents quickly and easily via your PC's USB port.
A USB cable is required. (A-B type, purchase separately)
- **RS-BA1** IP REMOTE CONTROL SOFTWARE
// To remotely control radios using the RS-BA1, **BE SURE** that you comply with your local regulations.

Approved Icom optional equipment is designed for optimal performance when used with an Icom transceiver.

Icom is not responsible for the destruction or damage to an Icom transceiver in the event the Icom transceiver is used with equipment that is not manufactured or approved by Icom.

INSTALLATION NOTES

For amateur base station installations it is recommended that the forward clearance in front of the antenna array is calculated relative to the EIRP (Effective Isotropic Radiated Power). The clearance height below the antenna array can be determined in most cases from the RF power at the antenna input terminals.

As different exposure limits have been recommended for different frequencies, a relative table shows a guideline for installation considerations.

Below 30 MHz, the recommended limits are specified in terms of V/m or A/m fields as they are likely to fall within the near-field region. Similarly, the antennas may be physically short in terms of electrical length and that the installation will require some antenna matching device which can create local, high intensity magnetic fields. Analysis of such MF installations is best considered in association with published guidance notes such as the FCC OET Bulletin 65 Edition 97-01 and its annexes relative to amateur transmitter installations.

The EC recommended limits are almost identical to the FCC specified 'uncontrolled' limits and tables exist that show pre-calculated safe distances for different antenna types for different frequency bands. Further information can be found at <http://www.arrl.org/>.

• Typical amateur radio installation

Exposure distance assumes that the predominant radiation pattern is forward and that radiation vertically downwards is at unity gain (sidelobe suppression is equal to main lobe gain). This is true of almost every gain antenna today. Exposed persons are assumed to be beneath the antenna array and have a typical height of 1.8 m.

The figures assume the worst case emission of a constant carrier.

For the bands 10 MHz and higher the following power density limits have been recommended:

10–400 MHz 2 W/sq m
435 MHz 2.2 W/sq m

EIRP clearance heights by frequency band


Watts	10–2 m	70 cm	23 cm	13 cm and above
1	2.1 m	2 m	2 m	2 m
10	2.8 m	2.7 m	2.5 m	2.3 m
25	3.4 m	3.3 m	2.7 m	2.5 m
100	5 m	4.7 m	3.6 m	3.2 m
1000	12 m	11.5 m	7.3 m	6.3 m


Forward clearance, EIRP by frequency band

Watts	10–2 m	70 cm	23 cm	13 cm and above
100	2 m	2 m	1.1 m	0.7 m
1,000	6.5 m	6 m	3.5 m	3 m
10,000	20 m	18 m	11 m	7 m
100,000	65 m	60 m	35 m	29 m

In all cases any possible risk depends on the transmitter being activated for long periods. (actual recommendation limits are specified as an average during 6 minutes) Normally the transmitter is not active for long periods of time. Some radio licenses will require that a timer circuit automatically cuts off the transmitter after 1–2 minutes etc.

Similarly some modes of transmission, SSB, CW, AM etc. have a lower 'average' output power and the assessed risk is even lower.

 Versions of the IC-9100 which display the "CE" symbol on the serial number label, comply with the essential requirements of the European Radio and Telecommunication Terminal Directive 1999/5/EC.

 This warning symbol indicates that this equipment operates in non-harmonised frequency bands and/or may be subject to licensing conditions in the country of use. Be sure to check that you have the correct version of this radio or the correct programming of this radio, to comply with national licensing requirement.

• List of Country codes (ISO 3166-1)

	Country	Codes		Country	Codes
1	Austria	AT	18	Liechtenstein	LI
2	Belgium	BE	19	Lithuania	LT
3	Bulgaria	BG	20	Luxembourg	LU
4	Croatia	HR	21	Malta	MT
5	Czech Republic	CZ	22	Netherlands	NL
6	Cyprus	CY	23	Norway	NO
7	Denmark	DK	24	Poland	PL
8	Estonia	EE	25	Portugal	PT
9	Finland	FI	26	Romania	RO
10	France	FR	27	Slovakia	SK
11	Germany	DE	28	Slovenia	SI
12	Greece	GR	29	Spain	ES
13	Hungary	HU	30	Sweden	SE
14	Iceland	IS	31	Switzerland	CH
15	Ireland	IE	32	Turkey	TR
16	Italy	IT	33	United Kingdom	GB
17	Latvia	LV			



DECLARATION OF CONFORMITY

We Icom Inc. Japan
1-1-32, Kamiminami, Hirano-ku
Osaka 547-0003, Japan

Declare on our sole responsibility that this equipment complies with the essential requirements of the Radio and Telecommunications Terminal Equipment Directive, 1999/5/EC, and that any applicable Essential Test Suite measurements have been performed.

Kind of equipment: HF/VHF/UHF TRANSCEIVER

Type-designation: IC-9100

Version (where applicable):

This compliance is based on conformity with the following harmonised standards, specifications or documents:

- i) EN 301 489-1 v1.6.1 (September 2005)
- ii) EN 301 489-15 v1.2.1 (August 2002)
- iii) EN 301 783-2 v1.1.1 (September 2000)
- iv) EN 60950-1 2006 A11: 2009
- v) _____
- vi) _____



Bad Soden 11th Jan. 2011
Place and date of issue

Icom (Europe) GmbH
Communication Equipment
Auf der Krautweide 24,
65812 Bad Soden am Taunus,
Germany

Authorized representative name

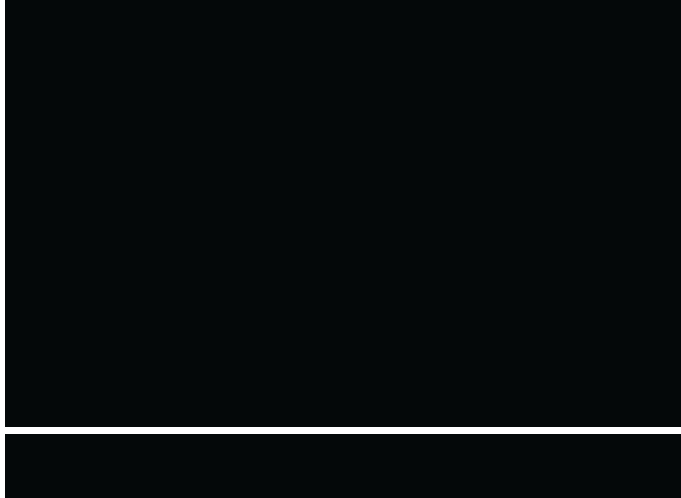
Y. Furukawa
General Manager

Signature

Icom Inc.

About AG-25, AG-35 and AG-1200 preamplifiers:

The use of IC-9100 (#03, #04, #05, #06, #11) in combination with AG-25, AG-35 and/or AG-1200 preamplifiers do not comply with the European Harmonised Standard regulations. Please do not use the IC-910H with these preamplifiers (AG-25, AG-35 and/or AG-1200) intended for the US, Asian, Oceanian and African markets.



IC-9100 #03
(Europe)

< Intended Country of Use >
AT BE CY CZ DK EE
FI FR DE GR HU IE
IT LV LT LU MT NL
PL PT SK SI ES SE
GB IS LI NO CH BG
RO TR HR

IC-9100 #04
(Europe-1)

< Intended Country of Use >
AT BE CY CZ DK EE
FI FR DE GR HU IE
IT LV LT LU MT NL
PL PT SK SI ES SE
GB IS LI NO CH BG
RO TR HR

IC-9100 #05
(Italy)

< Intended Country of Use >
AT BE CY CZ DK EE
FI FR DE GR HU IE
IT LV LT LU MT NL
PL PT SK SI ES SE
GB IS LI NO CH BG
RO TR HR

IC-9100 #06
(Spain)

< Intended Country of Use >
AT BE CY CZ DK EE
FI FR DE GR HU IE
IT LV LT LU MT NL
PL PT SK SI ES SE
GB IS LI NO CH BG
RO TR HR

IC-9100 #11
(France)

< Intended Country of Use >
AT BE CY CZ DK EE
FI FR DE GR HU IE
IT LV LT LU MT NL
PL PT SK SI ES SE
GB IS LI NO CH BG
RO TR HR
